FD2 Series FlexDraper® Header with FM200 Float Module

Operator's Manual

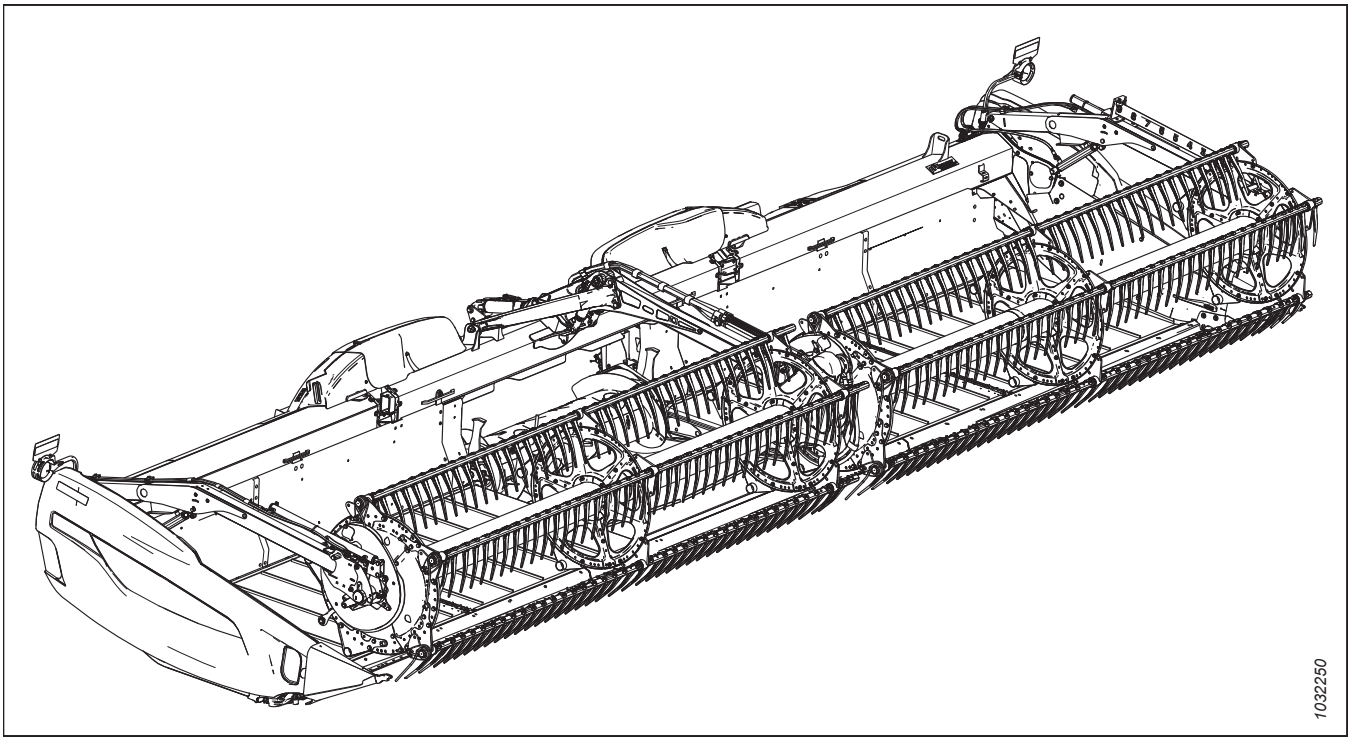
215549 Revision B

Original Instruction

Featuring MacDon FLEX-FLOAT Technology™

The Harvesting Specialists.

FD2 Series FlexDraper® Header



Published: March 2022

Declaration of Conformity

EC Declaration of Conformity

[1] MacDon

MacDon Industries Ltd.
680 Moray Street,
Winnipeg, Manitoba, Canada
R3J 3S3

[2] Combine Header

[3] MacDon FD2 Series

[4] As per Shipping Document

[5] May 12, 2021

[6] _____
Adrienne Tankeu
Product Integrity

EN

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfils all the relevant provisions of the Directive 2006/42/EC.

Harmonized standards used, as referred to in Article 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Place and date of declaration: [5]

Identity and signature of the person empowered to draw up the declaration: [6]

Name and address of the person authorized to compile the technical file:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germany)
bvonriedesel@macdon.com

BG

Ние, [1]

декларираме, че следният продукт:

Тип машина: [2]

Наименование и модел: [3]

Сериен номер(а) [4]

отговаря на всички приложими разпоредби на директива 2006/42/ЕО.

Използвани са следните хармонизирани стандарти според чл. 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Място и дата на декларацията: [5]

Име и подпис на лицето, упълномощено да изготви декларацията: [6]

Име и адрес на лицето, упълномощено да състави техническия файл:

Бенедикт фон Рийдезел
Управител, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Германия)
bvonriedesel@macdon.com

CZ

My, [1]

Prohlašujeme, že produkt:

Typ zařízení: [2]

Název a model: [3]

Sériové(á) číslo)a): [4]

splňuje všechna relevantní ustanovení směrnice 2006/42/EC.

Byly použity harmonizované standardy, jak je uvedeno v článku 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Místo a datum prohlášení: [5]

Identita a podpis osoby oprávněné k vydání prohlášení: [6]

Jméno a adresa osoby oprávněné k vyplnění technického souboru:

Benedikt von Riedesel
generální ředitel, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Německo)
bvonriedesel@macdon.com

DA

Vi, [1]

erklærer, at prduktet:

Maskintype [2]

Navn og model: [3]

Serienummer (-numre): [4]

Opfylder alle bestemmelser i direktiv 2006/42/EF.

Anvendte harmoniserede standarder, som henvist til i paragraf 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Sted og dato for erklæringen: [5]

Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6]

Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil:

Benedikt von Riedesel
Direktør, MacDon Europe GmbH
Hagenauer Straße 59
D-65203 Wiesbaden (Tyskland)
bvonriedesel@macdon.com

DE

Wir, [1]

Erklären hiermit, dass das Produkt:

Maschinentyp: [2]

Name & Modell: [3]

Seriennummer (n): [4]

alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt.

Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Ort und Datum der Erklärung: [5]

Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6]

Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden
bvonriedesel@macdon.com

ES

Nosotros [1]

declaramos que el producto:

Tipo de máquina: [2]

Nombre y modelo: [3]

Números de serie: [4]

cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC.

Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Lugar y fecha de la declaración: [5]

Identidad y firma de la persona facultada para draw redactar la declaración: [6]

Nombre y dirección de la persona autorizada para elaborar el expediente técnico:

Benedikt von Riedesel
Gerente general - MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Alemania)
bvonriedesel@macdon.com

ET

Meie, [1]

deklareerime, et toode

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumbrid: [4]

vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.

Kasutatud on järgnevaid harmoniseeritud standardeid, millele on viidatud ka punktis 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Deklaratsiooni koht ja kuupäev: [5]

Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]

Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:

Benedikt von Riedesel
Peadirektor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Saksamaa)
bvonriedesel@macdon.com

FR

Nous soussignés, [1]

Déclarons que le produit :

Type de machine : [2]

Nom et modèle : [3]

Numéro(s) de série : [4]

Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC.

Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Lieu et date de la déclaration : [5]

Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6]

Nom et adresse de la personne autorisée à constituer le dossier technique :

Benedikt von Riedesel
Directeur général, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Allemagne)
bvonriedesel@macdon.com

EC Declaration of Conformity

IT

Noi, [1]

Dichiariamo che il prodotto:

Tipo di macchina: [2]

Nome e modello: [3]

Numero(i) di serie: [4]

soddisfa tutte le disposizioni rilevanti della direttiva 2006/42/CE.

Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Luogo e data della dichiarazione: [5]

Nome e firma della persona autorizzata a redigere la dichiarazione: [6]

Nome e persona autorizzata a compilare il file tecnico:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
bvonriedesel@macdon.com

HU

Mi, [1]

Ezennel kijelentjük, hogy a következő termék:

Gép típusa: [2]

Név és modell: [3]

Szériaszám(ok): [4]

teljesíti a következő irányelv összes vonatkozó előírásait: 2006/42/EK.

Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

A nyilatkozattétel ideje és helye: [5]

Azon személy kiléte és aláírása, aki jogosult a nyilatkozat elkészítésére: [6]

Azon személy neve és aláírása, aki felhatalmazott a műszaki dokumentáció összeállítására:

Benedikt von Riedesel
Vezérigazgató, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Németország)
bvonriedesel@macdon.com

LT

Mes, [1]

Pareiškiame, kad šis produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.

Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklaracijos vieta ir data: [5]

Asmens tapatybės duomenys ir parašas asmens, įgalioto sudaryti šią deklaraciją: [6]

Vardas ir pavardė asmens, kuris įgaliotas sudaryti šį techninį failą:

Benedikt von Riedesel
Generalinis direktorius, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vokietija)
bvonriedesel@macdon.com

LV

Mēs, [1]

Deklarējam, ka produkts:

Mašīnas tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.

Piemēroti šādi saskaņotie standarti , kā minēts 7. panta 2. punktā:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklarācijas parakstīšanas vieta un datums: [5]

Tās personas vārds, uzvārds un paraksts, kas ir pilnvarota sagatavot šo deklarāciju: [6]

Tās personas vārds, uzvārds un adrese, kas ir pilnvarota sastādīt tehnisko dokumentāciju:

Benedikts fon Rīdīzels
Ģenerāldirektors, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vācija)
bvonriedesel@macdon.com

NL

Wij, [1]

Verklaren dat het product:

Machinetype: [2]

Naam en model: [3]

Serienummer(s): [4]

voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.

Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plaats en datum van verklaring: [5]

Naam en handtekening van de bevoegde persoon om de verklaring op te stellen: [6]

Naam en adres van de geautoriseerde persoon om het technisch dossier samen te stellen:

Benedikt von Riedesel
Algemeen directeur, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Duitsland)
bvonriedesel@macdon.com

PO

My niżej podpisani, [1]

Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.

Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykułem 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data i miejsce oświadczenia: [5]

Imię i nazwisko oraz podpis osoby upoważnionej do przygotowania deklaracji: [6]

Imię i nazwisko oraz adres osoby upoważnionej do przygotowania dokumentacji technicznej:

Benedikt von Riedesel
Dyrektor generalny, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Niemcy)
bvonriedesel@macdon.com

PT

Nós, [1]

Declaramos, que o produto:

Tipo de máquina: [2]

Nome e Modelo: [3]

Número(s) de Série: [4]

cumpre todas as disposições relevantes da Directiva 2006/42/CE.

Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Local e data da declaração: [5]

Identidade e assinatura da pessoa autorizada a elaborar a declaração: [6]

Nome e endereço da pessoa autorizada a compilar o ficheiro técnico:

Benedikt von Riedesel
Gerente Geral, MacDon Europa Ltda.
Hagenauer Straße 59
65203 Wiesbaden (Alemanha)
bvonriedesel@macdon.com

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul mașinii: [2]

Denumirea și modelul: [3]

Număr (numere) serie: [4]

corespunde tuturor dispozițiilor esențiale ale directivei 2006/42/EC.

Au fost aplicate următoarele standarde armonizate conform articolului 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data și locul declarației: [5]

Identitatea și semnătura persoanei împuternicite pentru întocmirea declarației: [6]

Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice:

Benedikt von Riedesel
Manager General, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
bvonriedesel@macdon.com

SR

Mi, [1]

Izjavljujemo da proizvod

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Ispunjava sve relevantne odredbe direktive 2006/42/EC.

Korišæeni su usklađeni standardi kao što je navedeno u èlanu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Datum i mesto izdavanja deklaracije: [5]

Identitet i potpis lica ovlašæenog za sastavljanje deklaracije: [6]

Ime i adresa osobe ovlašæene za sastavljanje tehnièke datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemačka)
bvonriedesel@macdon.com

SV

Vi, [1]

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

uppfyller alla relevanta villkor i direktivet 2006/42/EG.

Harmonierade standarder används, såsom anges i artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plats och datum för intyget: [5]

Identitet och signatur för person med befogenhet att upprätta intyget: [6]

Namn och adress för person behörig att upprätta den tekniska dokumentationen:

Benedikt von Riedesel
Administrativ chef, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Tyskland)
bvonriedesel@macdon.com

SL

Mi, [1]

izjavljamo, da izdelek:

Vrsta stroja: [2]

Ime in model: [3]

Serijska/-e številka/-e: [4]

ustreza vsem zadevnim določbam Direktive 2006/42/ES.

Uporabljeni usklajeni standardi, kot je navedeno v členu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Kraj in datum izjave: [5]

Istovetnost in podpis osebe, opolnomočene za pripravo izjave: [6]

Ime in naslov osebe, pooblaščene za pripravo tehnične datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemčija)
bvonriedesel@macdon.com

SK

My, [1]

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

spĺňa príslušné ustanovenia a základné požiadavky smernice č. 2006/42/ES.

Použité harmonizované normy, ktoré sa uvádzajú v Článku č. 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Miesto a dátum prehlásenia: [5]

Meno a podpis osoby oprávnenej vypracovať toto prehlásenie: [6]

Meno a adresa osoby oprávnenej zostaviť technický súbor:

Benedikt von Riedesel
Generálny riaditeľ MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemecko)
bvonriedesel@macdon.com

EC Declaration of Conformity

[1] MacDon

MacDon Industries Ltd.
680 Moray Street,
Winnipeg, Manitoba, Canada
R3J 3S3

[2] Float Module

[3] MacDon FM200

[4] As per Shipping Document

[5] May 12, 2021

[6] _____
Adrienne Tankeu
Product Integrity

EN

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfils all the relevant provisions of the Directive 2006/42/EC.

Harmonized standards used, as referred to in Article 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Place and date of declaration: [5]

Identity and signature of the person empowered to draw up the declaration: [6]

Name and address of the person authorized to compile the technical file:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germany)
bvonriedesel@macdon.com

BG

Ние, [1]

декларираме, че следният продукт:

Тип машина: [2]

Наименование и модел: [3]

Сериен номер(а) [4]

отговаря на всички приложими разпоредби на директива 2006/42/ЕО.

Използвани са следните хармонизирани стандарти според чл. 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Място и дата на декларацията: [5]

Име и подпис на лицето, упълномощено да изготви декларацията: [6]

Име и адрес на лицето, упълномощено да състави техническия файл:

Бенедикт фон Рийдезел
Управител, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Германия)
bvonriedesel@macdon.com

CZ

My, [1]

Prohlašujeme, že produkt:

Typ zařízení: [2]

Název a model: [3]

Sériové(á) číslo)a): [4]

splňuje všechna relevantní ustanovení směrnice 2006/42/EC.

Byly použity harmonizované standardy, jak je uvedeno v článku 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Místo a datum prohlášení: [5]

Identita a podpis osoby oprávněné k vydání prohlášení: [6]

Jméno a adresa osoby oprávněné k vyplnění technického souboru:

Benedikt von Riedesel
generální ředitel, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Německo)
bvonriedesel@macdon.com

DA

Vi, [1]

erklærer, at prduktet:

Maskintype [2]

Navn og model: [3]

Serienummer (-numre): [4]

Opfylder alle bestemmelser i direktiv 2006/42/EF.

Anvendte harmoniserede standarder, som henvist til i paragraf 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Sted og dato for erklæringen: [5]

Identitet på og underskrift fra den person, som er bemyndiget til at udarbejde erklæringen: [6]

Navn og adresse på den person, som er bemyndiget til at udarbejde den tekniske fil:

Benedikt von Riedesel
Direktør, MacDon Europe GmbH
Hagenauer Straße 59
D-65203 Wiesbaden (Tyskland)
bvonriedesel@macdon.com

DE

Wir, [1]

Erklären hiermit, dass das Produkt:

Maschinentyp: [2]

Name & Modell: [3]

Seriennummer (n): [4]

alle relevanten Vorschriften der Richtlinie 2006/42/EG erfüllt.

Harmonisierte Standards wurden, wie in folgenden Artikeln angegeben, verwendet 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Ort und Datum der Erklärung: [5]

Name und Unterschrift der Person, die dazu befugt ist, die Erklärung auszustellen: [6]

Name und Anschrift der Person, die dazu berechtigt ist, die technischen Unterlagen zu erstellen:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden
bvonriedesel@macdon.com

ES

Nosotros [1]

declaramos que el producto:

Tipo de máquina: [2]

Nombre y modelo: [3]

Números de serie: [4]

cumple con todas las disposiciones pertinentes de la directriz 2006/42/EC.

Se utilizaron normas armonizadas, según lo dispuesto en el artículo 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Lugar y fecha de la declaración: [5]

Identidad y firma de la persona facultada para draw redactar la declaración: [6]

Nombre y dirección de la persona autorizada para elaborar el expediente técnico:

Benedikt von Riedesel
Gerente general - MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Alemania)
bvonriedesel@macdon.com

ET

Meie, [1]

deklareerime, et toode

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumbrid: [4]

vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.

Kasutatud on järgnevaid harmoniseeritud standardeid, millele on viidatud ka punktis 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Deklaratsiooni koht ja kuupäev: [5]

Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]

Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:

Benedikt von Riedesel
Peadirektor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Saksamaa)
bvonriedesel@macdon.com

FR

Nous soussignés, [1]

Déclarons que le produit :

Type de machine : [2]

Nom et modèle : [3]

Numéro(s) de série : [4]

Est conforme à toutes les dispositions pertinentes de la directive 2006/42/EC.

Utilisation des normes harmonisées, comme indiqué dans l'Article 7(2):

EN ISO 4254-1:2013
EN ISO 4254-7:2009

Lieu et date de la déclaration : [5]

Identité et signature de la personne ayant reçu le pouvoir de rédiger cette déclaration : [6]

Nom et adresse de la personne autorisée à constituer le dossier technique :

Benedikt von Riedesel
Directeur général, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Allemagne)
bvonriedesel@macdon.com

EC Declaration of Conformity

IT

Noi, [1]

Dichiariamo che il prodotto:

Tipo di macchina: [2]

Nome e modello: [3]

Numero(i) di serie: [4]

soddisfa tutte le disposizioni rilevanti della direttiva 2006/42/CE.

Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Luogo e data della dichiarazione: [5]

Nome e firma della persona autorizzata a redigere la dichiarazione: [6]

Nome e persona autorizzata a compilare il file tecnico:

Benedikt von Riedesel
General Manager, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
bvonriedesel@macdon.com

HU

Mi, [1]

Ezennel kijelentjük, hogy a következő termék:

Gép típusa: [2]

Név és modell: [3]

Szériaszám(ok): [4]

teljesíti a következő irányelv összes vonatkozó előírásait: 2006/42/EK.

Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

A nyilatkozattétel ideje és helye: [5]

Azon személy kiléte és aláírása, aki jogosult a nyilatkozat elkészítésére: [6]

Azon személy neve és aláírása, aki felhatalmazott a műszaki dokumentáció összeállítására:

Benedikt von Riedesel
Vezérigazgató, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Németország)
bvonriedesel@macdon.com

LT

Mes, [1]

Pareiškiame, kad šis produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.

Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklaracijos vieta ir data: [5]

Asmens tapatybės duomenys ir parašas asmens, įgalioto sudaryti šią deklaraciją: [6]

Vardas ir pavardė asmens, kuris įgaliotas sudaryti šį techninį failą:

Benedikt von Riedesel
Generalinis direktorius, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vokietija)
bvonriedesel@macdon.com

LV

Mēs, [1]

Deklarējam, ka produkts:

Mašīnas tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.

Piemēroti šādi saskaņotie standarti , kā minēts 7. panta 2. punktā:

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklarācijas parakstīšanas vieta un datums: [5]

Tās personas vārds, uzvārds un paraksts, kas ir pilnvarota sagatavot šo deklarāciju: [6]

Tās personas vārds, uzvārds un adrese, kas ir pilnvarota sastādīt tehnisko dokumentāciju:

Benedikts fon Rīdīzels
Ģenerāldirektors, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Vācija)
bvonriedesel@macdon.com

NL

Wij, [1]

Verklaren dat het product:

Machinetype: [2]

Naam en model: [3]

Serienummer(s): [4]

voldoet aan alle relevante bepalingen van de Richtlijn 2006/42/EC.

Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plaats en datum van verklaring: [5]

Naam en handtekening van de bevoegde persoon om de verklaring op te stellen: [6]

Naam en adres van de geautoriseerde persoon om het technisch dossier samen te stellen:

Benedikt von Riedesel
Algemeen directeur, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Duitsland)
bvonriedesel@macdon.com

PO

My niżej podpisani, [1]

Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.

Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykułem 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data i miejsce oświadczenia: [5]

Imię i nazwisko oraz podpis osoby upoważnionej do przygotowania deklaracji: [6]

Imię i nazwisko oraz adres osoby upoważnionej do przygotowania dokumentacji technicznej:

Benedikt von Riedesel
Dyrektor generalny, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Niemcy)
bvonriedesel@macdon.com

PT

Nós, [1]

Declaramos, que o produto:

Tipo de máquina: [2]

Nome e Modelo: [3]

Número(s) de Série: [4]

cumpre todas as disposições relevantes da Directiva 2006/42/CE.

Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Local e data da declaração: [5]

Identidade e assinatura da pessoa autorizada a elaborar a declaração: [6]

Nome e endereço da pessoa autorizada a compilar o ficheiro técnico:

Benedikt von Riedesel
Gerente Geral, MacDon Europa Ltda.
Hagenauer Straße 59
65203 Wiesbaden (Alemanha)
bvonriedesel@macdon.com

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul mașinii: [2]

Denumirea și modelul: [3]

Număr (numere) serie: [4]

corespunde tuturor dispozițiilor esențiale ale directivei 2006/42/EC.

Au fost aplicate următoarele standarde armonizate conform articolului 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data și locul declarației: [5]

Identitatea și semnătura persoanei împuternicite pentru întocmirea declarației: [6]

Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice:

Benedikt von Riedesel
Manager General, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Germania)
bvonriedesel@macdon.com

SR

Mi, [1]

Izjavljujemo da proizvod

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Ispunjava sve relevantne odredbe direktive 2006/42/EC.

Korišæeni su usklađeni standardi kao što je navedeno u èlanu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Datum i mesto izdavanja deklaracije: [5]

Identitet i potpis lica ovlašæenog za sastavljanje deklaracije: [6]

Ime i adresa osobe ovlašæene za sastavljanje tehnièke datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemačka)
bvonriedesel@macdon.com

SV

Vi, [1]

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

uppfyller alla relevanta villkor i direktivet 2006/42/EG.

Harmonierade standarder används, såsom anges i artikel 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plats och datum för intyget: [5]

Identitet och signatur för person med befogenhet att upprätta intyget: [6]

Namn och adress för person behörig att upprätta den tekniska dokumentationen:

Benedikt von Riedesel
Administrativ chef, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Tyskland)
bvonriedesel@macdon.com

SL

Mi, [1]

izjavljamo, da izdelek:

Vrsta stroja: [2]

Ime in model: [3]

Serijska/-e številka/-e: [4]

ustreza vsem zadevnim določbam Direktive 2006/42/ES.

Uporabljeni usklajeni standardi, kot je navedeno v členu 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Kraj in datum izjave: [5]

Istovetnost in podpis osebe, opolnomočene za pripravo izjave: [6]

Ime in naslov osebe, pooblaščene za pripravo tehnične datoteke:

Benedikt von Riedesel
Generalni direktor, MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemčija)
bvonriedesel@macdon.com

SK

My, [1]

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

spĺňa príslušné ustanovenia a základné požiadavky smernice č. 2006/42/ES.

Použité harmonizované normy, ktoré sa uvádzajú v Článku č. 7(2):

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Miesto a dátum prehlásenia: [5]

Meno a podpis osoby oprávnenej vypracovať toto prehlásenie: [6]

Meno a adresa osoby oprávnenej zostaviť technický súbor:

Benedikt von Riedesel
Generálny riaditeľ MacDon Europe GmbH
Hagenauer Straße 59
65203 Wiesbaden (Nemecko)
bvonriedesel@macdon.com

Introduction

This instructional manual contains information on the FD2 Series FlexDraper® and the FM200 Float Module. It must be used in conjunction with your combine operator's manual.

The FD2 Series FlexDraper® is specially designed to work well in all straight cut conditions, whether cutting on or above the ground, using a three-piece flexible frame to closely follow ground contours. The FM200 Float Module is used to attach an FD2 Series FlexDraper® to most makes and models of combines.

Carefully read all the material provided before attempting to use the machine.

Use this manual as your first source of information about the machine. If you follow the instructions provided, your header will work well for many years. Contact your Dealer if you need assistance, information, or additional copies of this manual.

MacDon provides warranty for Customers who operate and maintain their equipment as described in this manual. A copy of the MacDon Industries Limited Warranty Policy, which explains this warranty, should have been provided to you by your Dealer. Damage resulting from any of the following conditions will void the warranty:

- Accident
- Misuse
- Abuse
- Improper maintenance or neglect
- Abnormal or extraordinary use of the machine
- Failure to use the machine, equipment, component, or part in accordance with the manufacturer’s instructions

The following conventions are used in this document:

- Right and left are determined from the operator’s position. The front of the header faces the crop; the back of the header attaches to the float module and combine.
- Unless otherwise noted, use the standard torque values provided in Chapter *7.1 Torque Specifications, page 711*.

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise machine function and machine life and may result in a hazardous situation.

The Table of Contents and Index will guide you to specific areas of this manual. Study the Table of Contents to familiarize yourself with how the information is organized.

Keep this manual handy for frequent reference and to pass on to new Operators or Owners. The manual storage case (A) is located at the rear of the header, beside the right outer leg.

NOTE:

Keep your MacDon publications up-to-date. The most current English version can be downloaded from our website (*www.macdon.com*) or from our Dealer-only site (*https://portal.macdon.com*) (login required).

Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

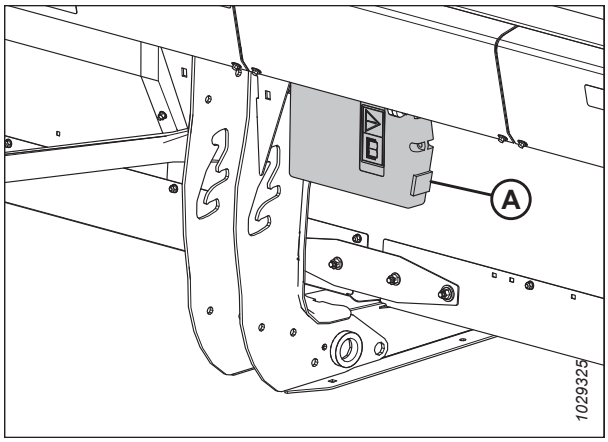


Figure 1: Manual Storage Location

This document is available in the following languages:

- Czech
- Danish
- English
- Estonian
- French
- German
- Latvian
- Lithuanian
- Polish
- Portuguese
- Romanian
- Russian
- Spanish

These manuals can be ordered from MacDon, downloaded from the MacDon Dealer Portal (*https://portal.macdon.com*) (login required), or downloaded from the MacDon website (*http://www.macdon.com*).

Summary of Changes

The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
Various	Added short descriptions	Technical publications
Removing Outboard Flex Linkage Covers, page 57	Added topic.	Technical Publications
Installing Outboard Flex Linkage Covers, page 60	Added topic.	Technical Publications
Attaching Header to an AGCO Challenger®, Gleaner, or Massey Ferguson® Combine, page 68	Updated images.	ECN 62346 ECN 62076
Detaching Header from a Challenger®, Gleaner, or Massey Ferguson® Combine, page 72	Updated images.	ECN 62346 ECN 62076
Attaching Header to an IDEAL™ Series Combine, page 76	Updated images.	ECN 62346 ECN 62076
Detaching Header from IDEAL™ Series Combine, page 78	Updated images.	ECN 62346 ECN 62076
Attaching Header to Case IH Combine, page 80	Updated images.	ECN 62346 ECN 62076
Detaching Header from Case IH Combine, page 83	Updated images.	ECN 62346 ECN 62076
Attaching Header to CLAAS Combine, page 87	Updated images.	ECN 62346 ECN 62076
Detaching Header from CLAAS Combine, page 91	Updated images.	ECN 62346 ECN 62076
Attaching Header to John Deere Combine, page 95	Updated images.	ECN 62346 ECN 62076 ECN 62101
Detaching Header from John Deere Combine, page 99	Updated images.	ECN 62346 ECN 62076 ECN 62101
Attaching Header to New Holland CR/CX Combine, page 103	Updated images.	ECN 62346 ECN 62076
Detaching Header from New Holland CR/CX Combine, page 107	Updated images.	ECN 62346 ECN 62076
Attaching Header to Rostselmash Combine, page 112	Added topic.	ECN 62102
Detaching Header From Rostselmash Combine, page 115	Added topic.	ECN 62102
3.6.9 Attaching Side-Hill Driveline to a Combine, page 128	Updated images.	ECN 62346 ECN 62076
3.6.10 Detaching Side-Hill Driveline From a Combine, page 129	Updated images.	ECN 62346 ECN 62076
Leveling ContourMax™ Wheel Height, page 185	Added topic.	UECN 31452
3.9.9 Knife Speed Information, page 229	Added footnote.	Product support
Checking and Adjusting Reel Height Sensor, page 231	Added torque values.	ECN 62563
3.10.3 Manually Checking Voltage Limits, page 273	Updated topic.	Product Support
Header Settings Quick Reference – Case IH 130 and 140 Series, page 280	Added topic.	Technical Publications
Header Settings Quick Reference – Case IH 120, 230, 240, and 250 Series, page 290	Added topic.	Technical Publications

Section	Summary of Change	Internal Use Only
Header Settings Quick Reference – Claas 7000 and 8000 Series, page 330	Added topic.	Technical Publications
Header Settings Quick Reference – Gleaner S9 Series Combines, page 342	Added topic.	Technical Publications
Header Settings Quick Reference – IDEAL™, page 365	Added topic.	Technical Publications
Header Settings Quick Reference – New Holland CR Series, page 419	Added topic.	Technical Publications
Setting up Auto Header Height Control – New Holland CR Series, page 426	Updated topic.	Product support
Setting up Reel Speed – New Holland CR Series, page 429	Updated topic.	Technical Publications
Checking Voltage Range from Combine Cab – New Holland CR Series, page 436	Moved topic.	Product support
Setting Preset Cutting Height – New Holland CR Series, page 440	Updated topic.	Product support
4.4.4 Changing Oil Filter, page 498	Changed filter part number from 202986 to 320360 and added footnote.	ECN 61432
4.10.1 Replacing Feed Draper, page 575 • Step *6, page 575*	Updated illustrations and step to include model years 2021 to 2022.	ECN 60381 ECN 60922
4.10.1 Replacing Feed Draper, page 575 • Step *8, page 576* • Step *16, page 577*	Revised step to include model years 2020–2022. Added threadlocker.	ECN 60580 ECN 61244 ECN 61448
4.10.1 Replacing Feed Draper, page 575 • Step *17, page 577*	Added torque value of 12 Nm (9 lbf·ft).	ECN 61244
4.10.1 Replacing Feed Draper, page 575 • Step *20, page 578*	Updated illustrations and step to include model years 2021 to 2022.	ECN 60381 ECN 60922
Removing Feed Draper Drive Roller, page 580	Added topic.	ECN 61244
Installing Feed Draper Drive Roller, page 582	Added topic.	ECN 61244 ECN 61678
Removing Feed Draper Drive Roller Bearing, page 583	Added topic.	ECN 61244
Installing Feed Draper Drive Roller Bearing, page 585	Added topic.	ECN 61244 ECN 61678
Removing Feed Draper Idler Roller, page 586 • Step *10, page 587*	Updated hardware in illustration.	ECN 61448
Removing Feed Draper Idler Roller, page 586 • Step *11, page 587*	Revised step to include model years 2020–2022.	ECN 60580 ECN 61244 ECN 61448
Installing Feed Draper Idler Roller, page 588 • Step *14, page 590* • Step *16, page 590*	Revised steps to include model years 2020–2022. Added threadlocker.	ECN 60580 ECN 61244 ECN 61448
Installing Feed Draper Idler Roller, page 588 • Step *17, page 590*	Changed torque from 10–14 Nm (7–10 lbf·ft) to 12 Nm (9 lbf·ft).	ECN 61244

Section	Summary of Change	Internal Use Only
Installing Feed Draper Idler Roller, page 588 • Step *19, page 590*	Updated hardware in illustration.	ECN 61448
Replacing Feed Draper Idler Roller Bearing, page 591 • Step *8, page 592* • Step *20, page 594* • Step *22, page 594*	Revised steps to include model years 2020–2022. Added threadlocker.	ECN 60580 ECN 61244 ECN 61448
Replacing Feed Draper Idler Roller Bearing, page 591 • Step *23, page 594*	Changed torque from 10–14 Nm (7–10 lbf·ft) to 12 Nm (9 lbf·ft).	ECN 61244
Replacing Feed Draper Idler Roller Bearing, page 591 • Step *25, page 594*	Updated hardware in illustration.	ECN 61448
4.12.3 Adjusting Deck Height, page 605	Added topic.	Technical Publications
Removing Double-Reel or Triple Reel Drive U-Joint, page 659	Updated topic.	ECN 61363
Installing Double-Reel or Triple Reel U-Joint, page 661	Updated topic.	ECN 61363
5.3.1 10V Sensor Adapter Kit, page 687	Added topic.	Technical Publications
5.3.2 Crop Deflector Kits, page 687	Added topic.	Technical Publications
5.3.3 Extended Center Filler, page 688	Added topic.	Technical Publications
5.3.5 Full Interface Filler Kit, page 689	Added topic.	Technical Publications
5.3.7 Lateral Tilt Plug Kit, page 690	Added topic.	Technical Publications
5.4.1 ContourMax™ Contour Wheels Kit, page 691	Updated topic.	ECN 62423
5.4.4 Floating Crop Dividers, page 693	Added topic.	ECN 62422
5.4.5 Inboard Steel End Finger Kit, page 694	Added topic.	ECN 62718
5.4.6 Outboard Steel End Finger Kit, page 694	Added topic.	ECN 62718
5.4.11 Sunflower Attachment, page 697	Added topic.	Technical Publications

Model and Serial Number

Record the model number, serial number, and model year of the header, float module, and transport/stabilizer wheel option (if installed) in the spaces provided.

FD2 Series FlexDraper® Header

Header Model: _____

Serial Number: _____

Model Year: _____

The header's serial number plate (A) is located on the back of the header, beside the left endsheet.

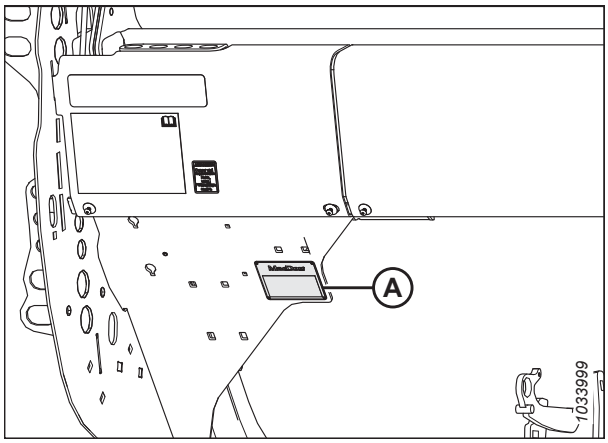


Figure 2: Header Serial Number Plate Location

FM200 Float Module for Combine

Serial Number: _____

Model Year: _____

The float module's serial number plate (A) is located on the top left side of the float module.

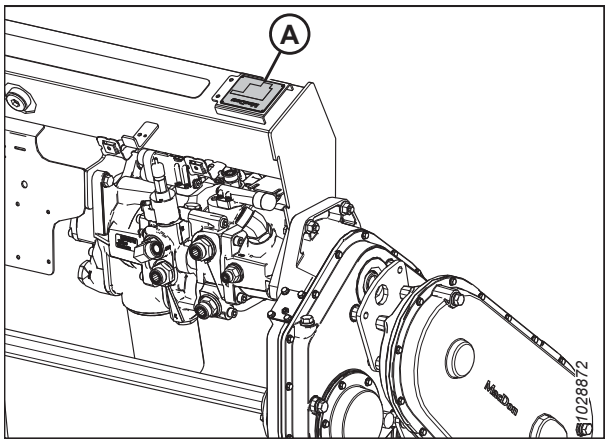


Figure 3: Float Module Serial Number Plate Location

EasyMove™ Transport Option

Serial Number: _____

Model Year: _____

The EasyMove™ transport's serial number plate (A) is located on the right axle assembly.

NOTE:

The transport is an option and may not be installed on this machine.

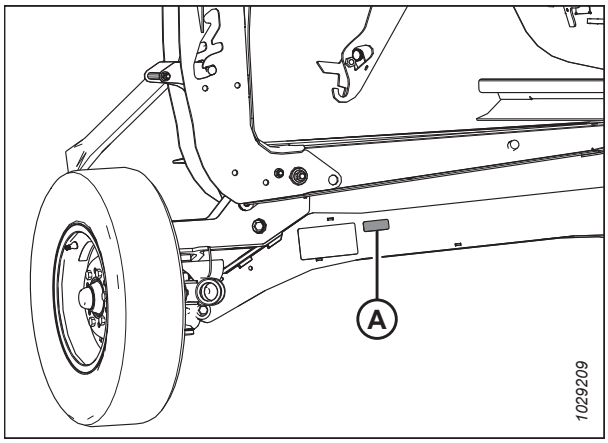


Figure 4: EasyMove™ Transport Option

Chapter 1: Safety

Understanding and following safety procedures consistently will help to ensure the safety of machine operators and bystanders.

Safety

Understanding and consistently following these safety procedures will help to ensure the safety of those operating the machine and of bystanders.

1.1 Safety Alert Symbols

The safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

- **ATTENTION!**
- **BECOME ALERT!**
- **YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

- Accidents disable and kill
- Accidents cost
- Accidents can be avoided

Figure 1.1: Safety Symbol

1.2 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information.

Signal words are selected using the following guidelines:

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It may also be used to alert against unsafe practices.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.

IMPORTANT:

Indicates a situation that, if not avoided, could result in a malfunction or damage to the machine.

NOTE:

Provides additional information or advice.

1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

The following general farm safety precautions should be part of your operating procedure for all types of machinery.

Wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do **NOT** take chances. You may need the following:

- Hard hat
- Protective footwear with slip-resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Respirator or filter mask

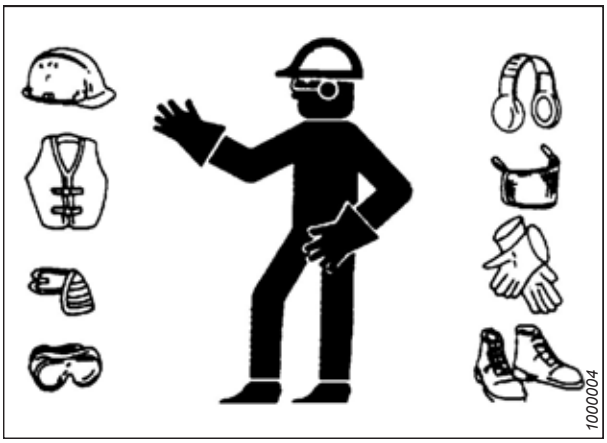


Figure 1.2: Safety Equipment

In addition, take the following precautions:

- Be aware that exposure to loud noises can cause hearing impairment. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.

Figure 1.3: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. Familiarize yourself with its use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when Operators are fatigued or in a hurry. Take time to consider the safest way to accomplish a task. **NEVER** ignore the signs of fatigue.

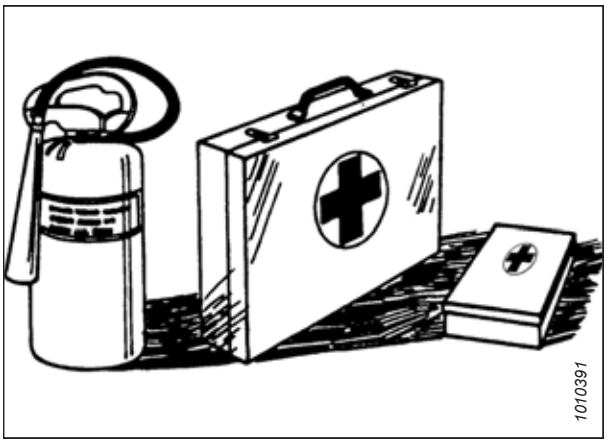


Figure 1.4: Safety Equipment

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Ensure that the driveline guards can rotate independently of their shaft, and that they can telescope freely.
- Use only service and repair parts made or approved by the equipment manufacturer. Parts from other manufacturers may not meet the correct strength, design, or safety requirements.

Figure 1.5: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.
- Do **NOT** modify the machine. Unauthorized modifications may impair the functionality and/or safety of the machine. It may also shorten the machine's service life.
- To avoid injury or death from the unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

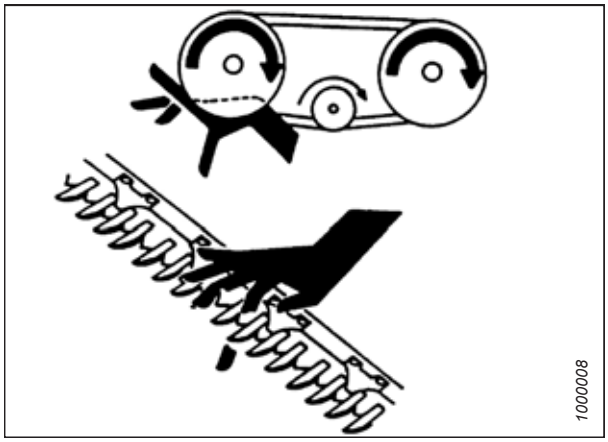


Figure 1.6: Safety around Equipment

- Keep the machine service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Ensure that all electrical outlets and tools are properly grounded.
- Keep the work area well-lit.
- Keep machinery clean. Straw and chaff on a hot engine are fire hazards. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before they are stored.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover any sharp or extending components to prevent injury from accidental contact.

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Protect yourself when maintaining machinery.

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operating or performing maintenance on the machine.
- Place all controls in Neutral, stop the engine, set the parking brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, or repairing the machine.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Ensure that electrical outlets and tools are properly grounded
  - Keep the work area well lit

Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install the transport lock or place safety stands under the frame before working under the machine.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or another mechanically driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

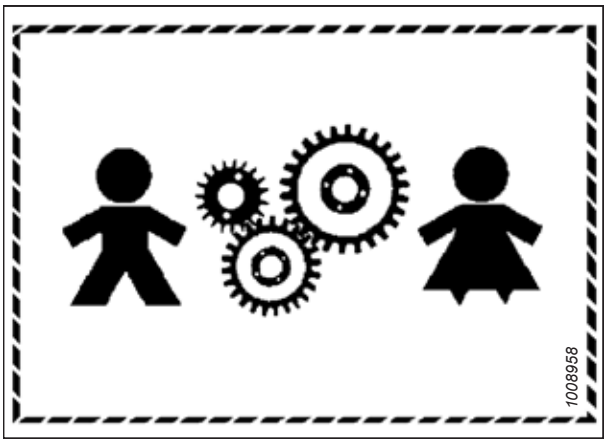


Figure 1.9: Equipment is NOT Safe for Children

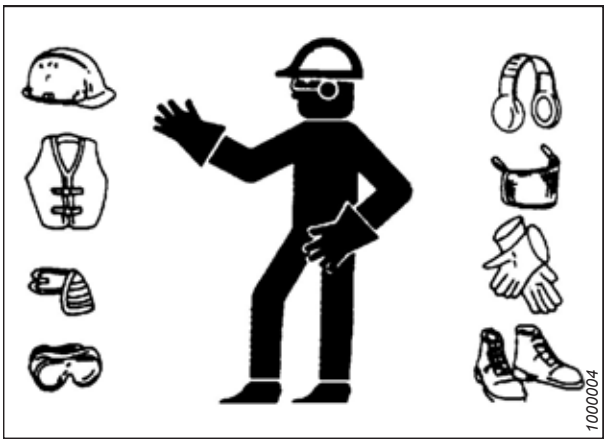


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

Protect yourself when assembling, operating, and servicing hydraulic components.

- Always place all hydraulic controls in Neutral before leaving the operator's seat.
- Make sure that all components in the hydraulic system are kept clean and in good condition.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do **NOT** attempt any makeshift repairs to hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high pressure. Makeshift repairs can fail suddenly and create hazardous conditions.

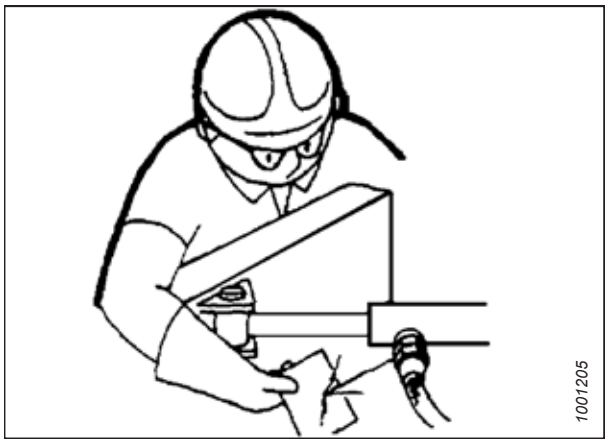


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic fluid leaks. Use a piece of cardboard as a backstop instead of your hands to isolate and identify a leak.
- If injured by a concentrated, high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin.

Figure 1.12: Hydraulic Pressure Hazard

- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.

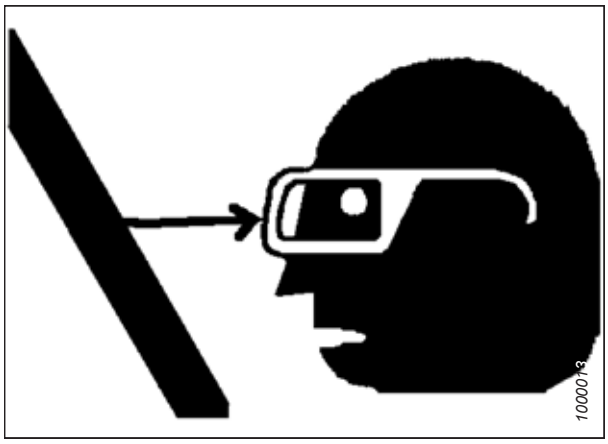


Figure 1.13: Safety around Equipment

1.6 Safety Signs

Safety signs are decals placed on the machine where there is a risk of personal injury, or where the Operator should take extra precautions before operating the controls. They are usually yellow.

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or illegible.
- If the original part on which a safety sign was installed is replaced, ensure that the repair part displays the current safety sign.
- Replacement safety signs are available from your MacDon Dealer Parts Department.

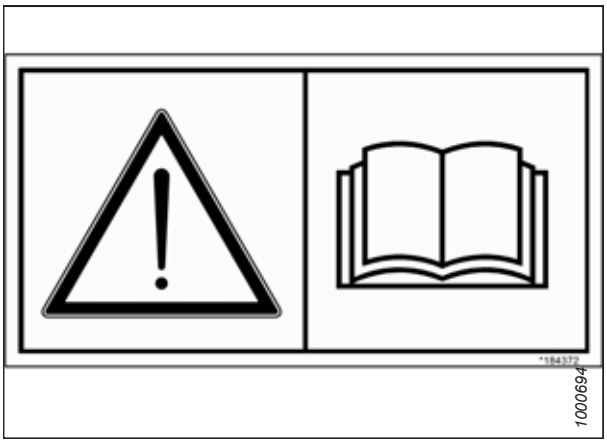


Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

Replace any safety decals that are worn or damaged.

1. Decide exactly where you are going to place the decal.
2. Clean and dry the installation area.
3. Remove the smaller portion of the split backing paper.
4. Place the decal in position and slowly peel back the remaining paper, smoothing the decal as it is applied.
5. Prick small air pockets with a pin and smooth them out.

1.7 Safety Decal Locations

Safety signs are usually yellow decals, and are placed on the machine where there is a risk of personal injury, or where the operator has to take extra precaution before operating controls.

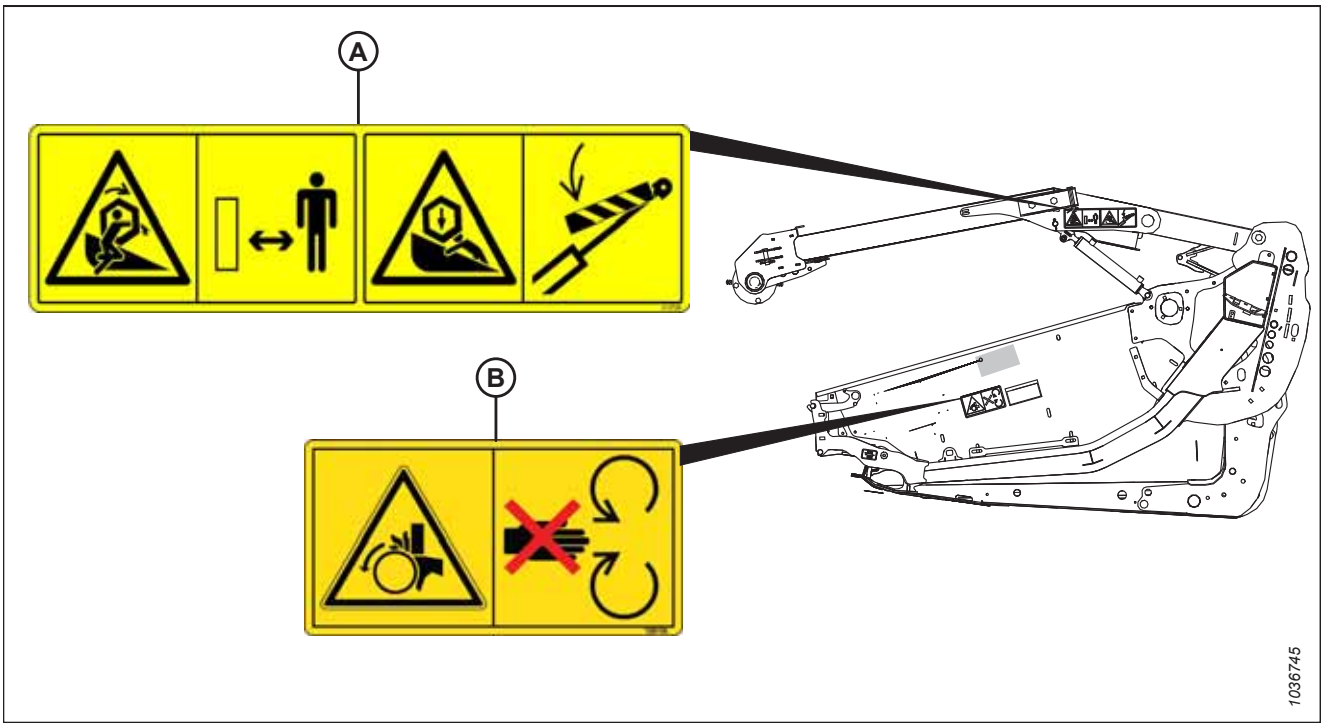


Figure 1.15: Reel Arms and Endsheets

A - MD #313726 – Reel Entanglement/ Hazard (Two Locations)

B - MD #288195 – Danger, Rotating Part (Two Locations)

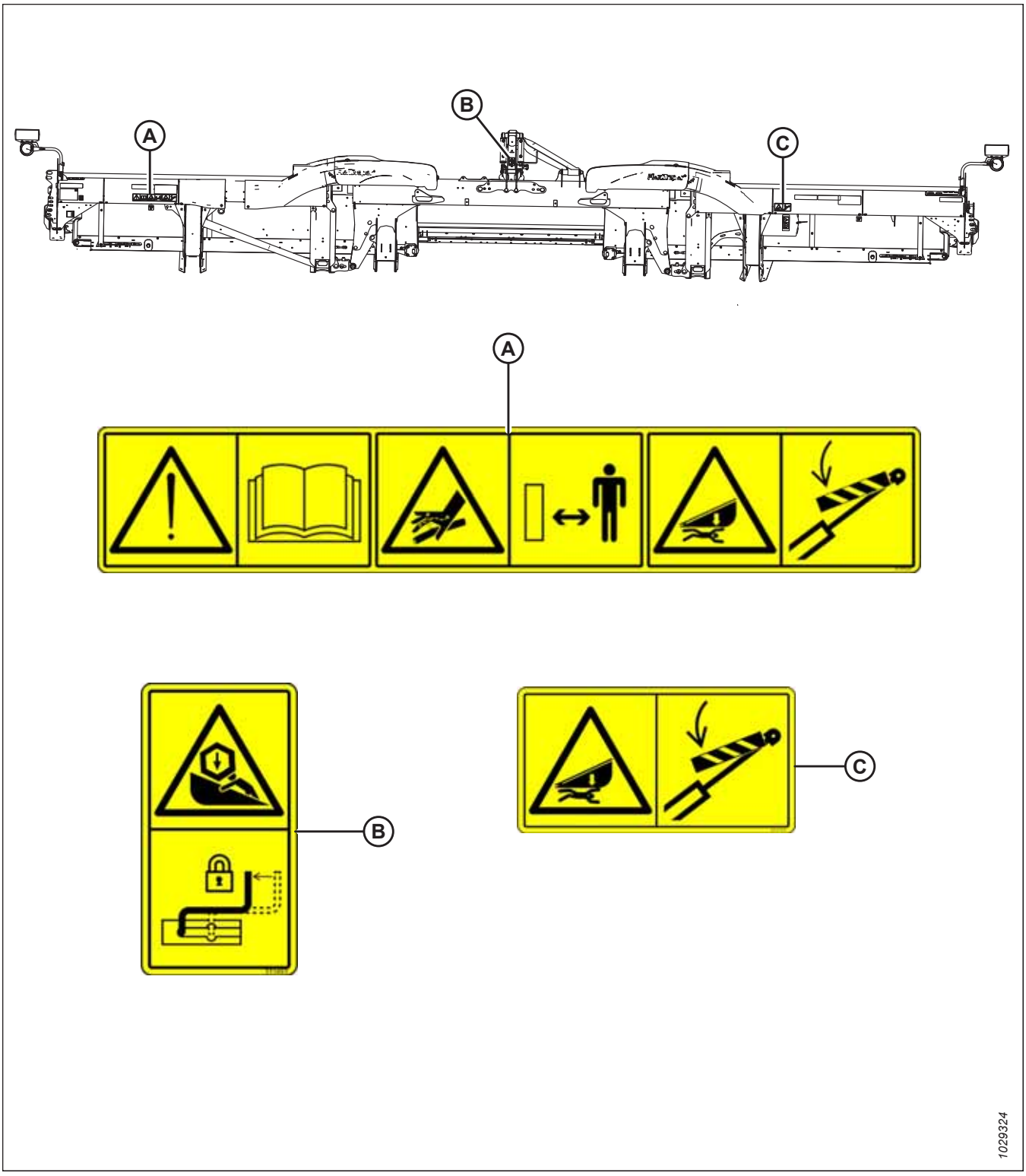


Figure 1.16: Backtube

A - MD #313725 – Read Manual / High Pressure Fluid / Header Hazard
B - MD #311493 – Center Prop Lock
C - MD #313733 – Header Crushing Hazard

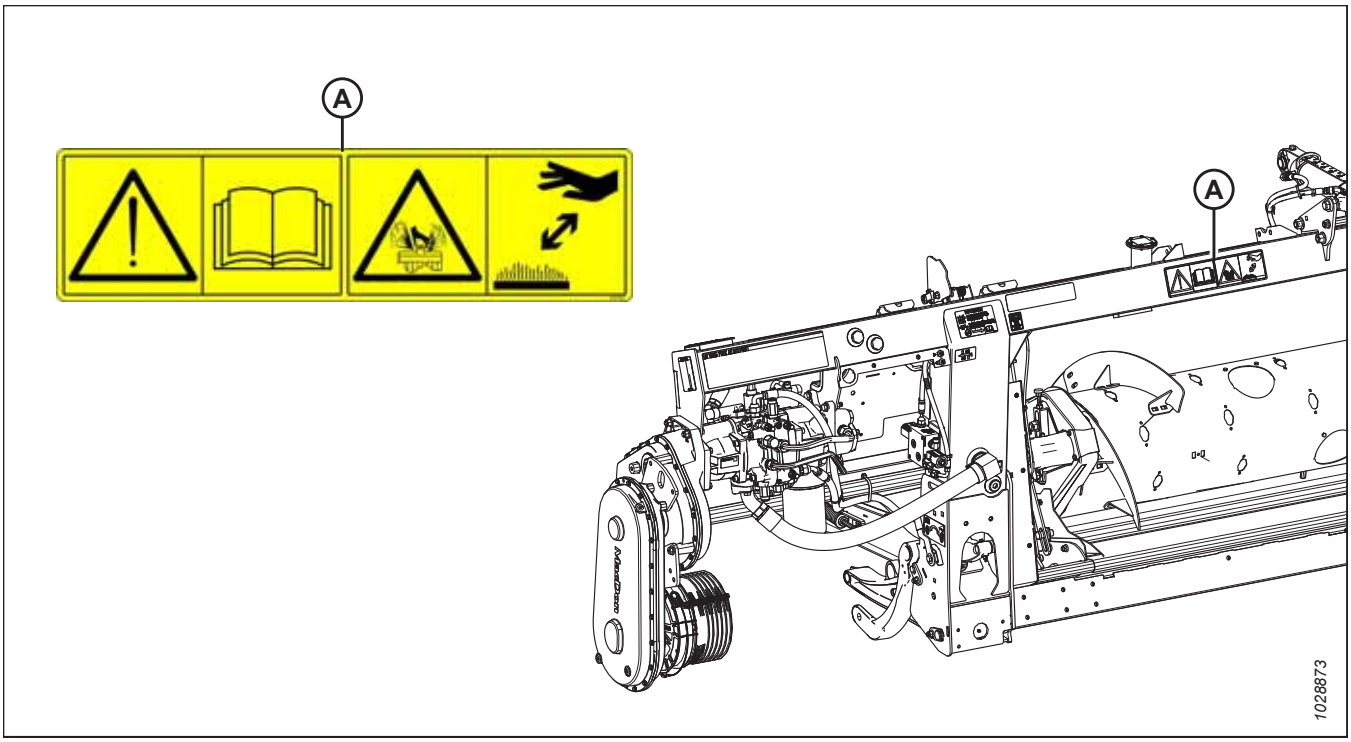


Figure 1.17: FM200 Float Module

A - MD #313728 – Read Manual / Fluid Spray Hazard

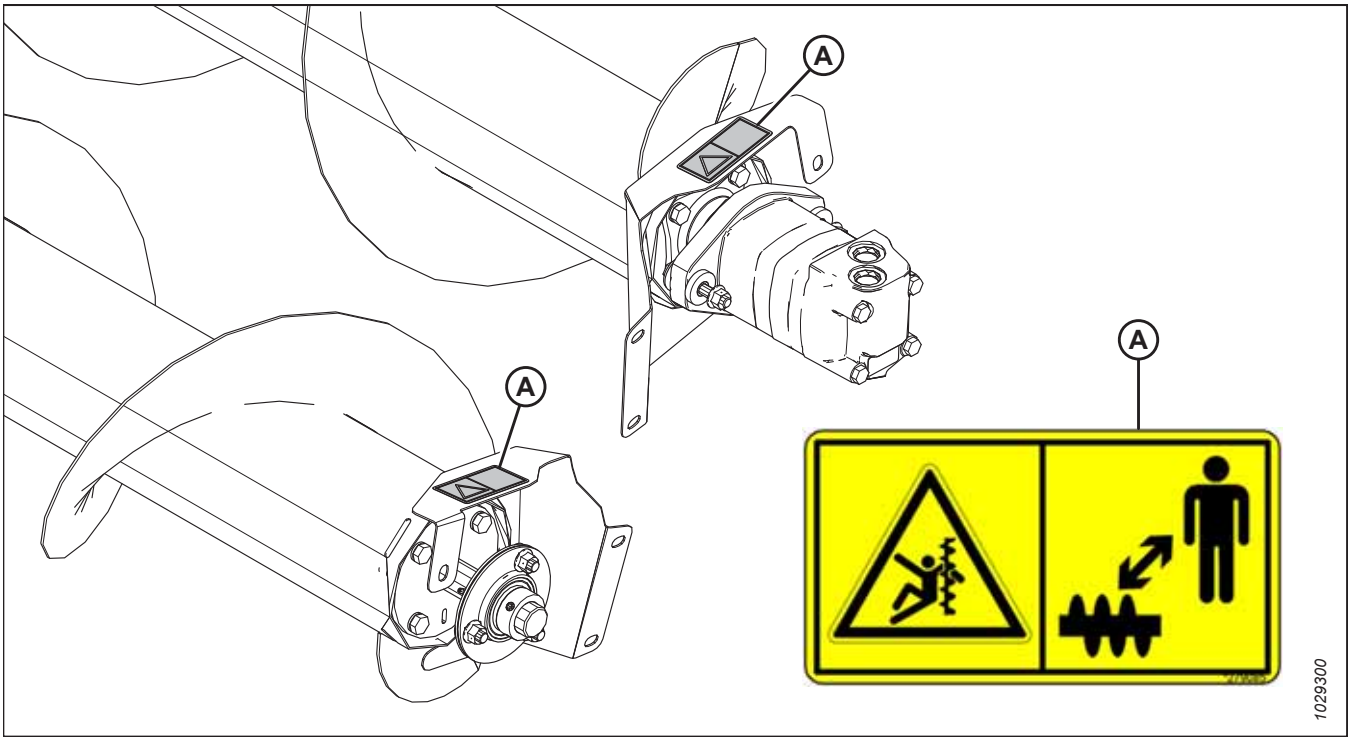


Figure 1.18: Upper Cross Auger

A - MD #279085 – Auger Warning

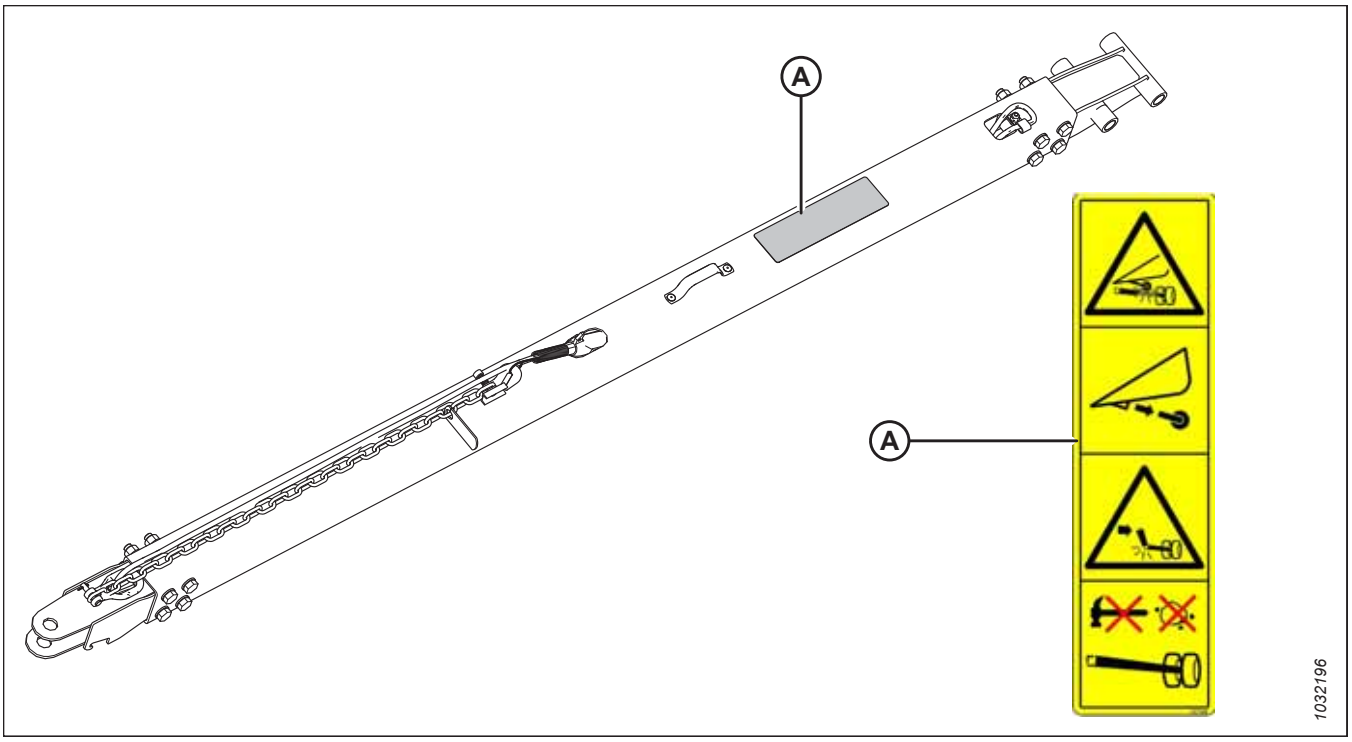


Figure 1.19: EasyMove™ Transport System – Tow-Bar (Short Bar Shown; Long Bar Similar)

A - MD #327588 – Hitch Damage Hazard

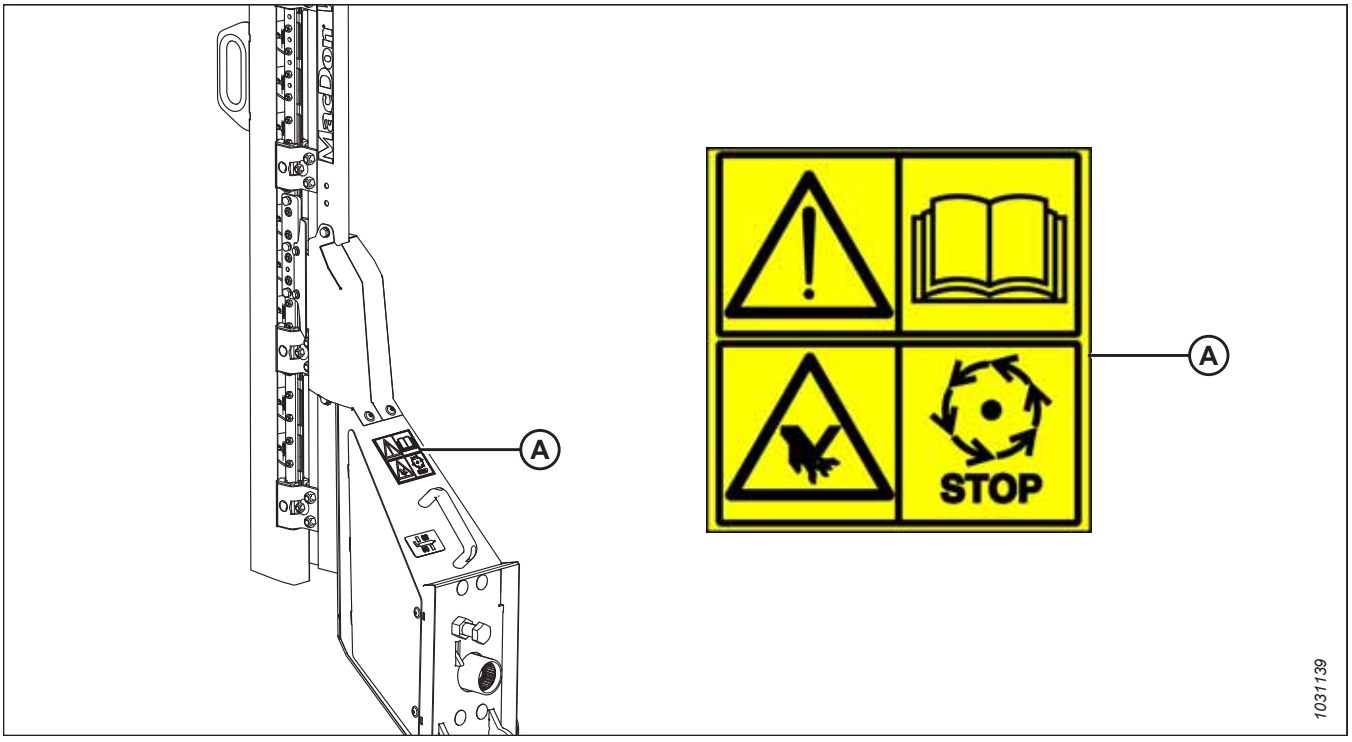


Figure 1.20: Vertical Knife

A - MD #313881 – Knife Hazard

1.8 Understanding Safety Signs

Refer to this topic to learn the hazards that each type of safety decal denotes.

MD #174436

High-pressure oil hazard

WARNING

High-pressure hydraulic fluid can penetrate human skin, which can cause serious injury such as gangrene, which can be fatal. To prevent this:

- Do **NOT** go near hydraulic fluid leaks.
- Do **NOT** use a finger or skin to check for hydraulic fluid leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any hydraulic fittings.
- If you are injured, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic fluid which has penetrated the skin.

Figure 1.21: MD #174436

MD #220799

Loss of control hazard

WARNING

To prevent serious injury or death from loss of control:

- Ensure that the tow-bar lock mechanism is locked.

Figure 1.22: MD #220799

MD #279085

Auger entanglement hazard

DANGER

To prevent injury from the rotating auger:

- Stand clear of the auger while the machine is running.
- Stop the engine and remove the key before servicing the auger.
- Do **NOT** reach into moving parts while the machine is running.

Figure 1.23: MD #279085

MD #288195

Rotating object pinch hazard

CAUTION

To prevent injury:

- Stop the engine and remove the key before opening the shield.
- Do **NOT** operate without shields in place.

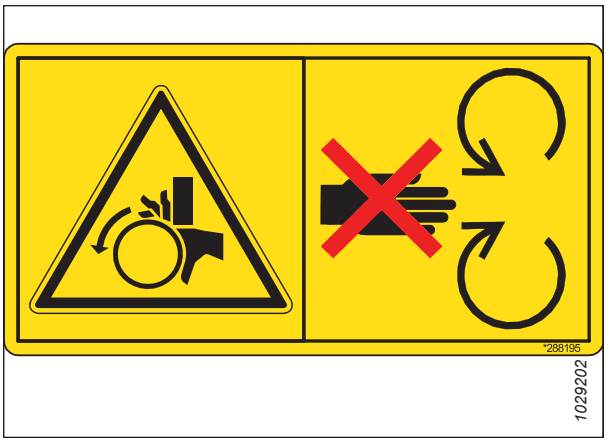


Figure 1.24: MD #288195

MD #311493

Center Prop Lock

DANGER

- To prevent injury from the fall of a raised reel; fully raise the reel. Stop the engine and remove the key, and engage the mechanical safety lock on each reel support arm before working on or under the reel.

Figure 1.25: MD #311493

MD #313725

Read manual / high pressure fluid / header crushing hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety locks to prevent lowering of raised unit before servicing in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

To prevent injury or death from fall of a raised header:

- Fully raise the header, stop the engine, remove the key, and engage the mechanical safety locks on the combine before going under the header.
- Alternatively, rest the header on the ground, stop the engine, and remove the key before servicing.

WARNING

To prevent serious injury, gangrene, or death:

- Do **NOT** go near leaks.
- Do **NOT** use a finger or skin to check for leaks.
- Lower the load or relieve hydraulic pressure before loosening fittings.
- High-pressure oil can easily puncture skin, and can cause serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.

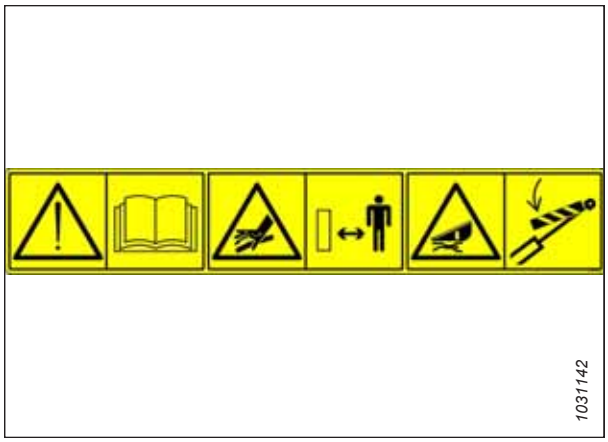


Figure 1.26: MD #313725

MD #313726

Reel entanglement / reel crushing hazard

DANGER

- To prevent injury from entanglement with the rotating reel; stand clear of the header while the machine is running.
- To prevent injury from the fall of the raised reel; fully raise the reel, stop the engine, remove the key, and engage the mechanical safety lock on each reel support arm before working on or under the reel.

Figure 1.27: MD #313726

MD #313728

General hazard pertaining to machine operation and servicing / Hot fluid spray hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage safety locks to prevent the lowering of a raised unit before servicing it in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

CAUTION

To prevent injury from hot fluids:

- Do **NOT** remove the fluid fill cap when the machine is hot.
- Allow the machine to cool down before opening the fluid fill cap.
- Fluid is under pressure and may be hot.

Figure 1.28: MD #313728

MD #313733

Header crushing hazard

DANGER

To prevent injury or death from the fall of a raised header:

- Fully raise the header, stop the engine, remove the key, and engage the mechanical safety locks on the combine before going under the header.
- Alternatively, rest the header on the ground, stop the engine, and remove the key before servicing.

Figure 1.29: MD #313733

MD #313881

General hazard pertaining to machine operation and servicing / knife hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all the safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety locks to prevent lowering of the raised unit before servicing it in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

WARNING

To prevent injury from sharp cutting knife:

- Wear heavy canvas or leather gloves when working with the knife.
- Be sure no one is near the vertical knife when removing or rotating the knife.

Figure 1.30: MD #313881

MD #327588

Hitch damage hazard

DANGER

To prevent serious injury or death:

- Remove the left contour wheel before transporting the header with transport.
- Do **NOT** tow a header if the transport hitch is damaged.

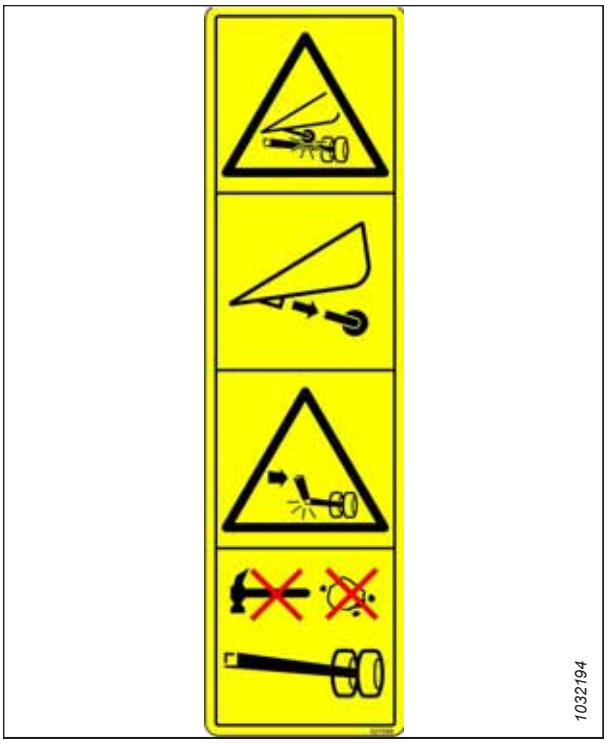


Figure 1.31: MD #327588

1.1 Safety Decal Locations

Safety signs are usually yellow decals, and are placed on the machine where there is a risk of personal injury, or where the operator has to take extra precaution before operating controls.

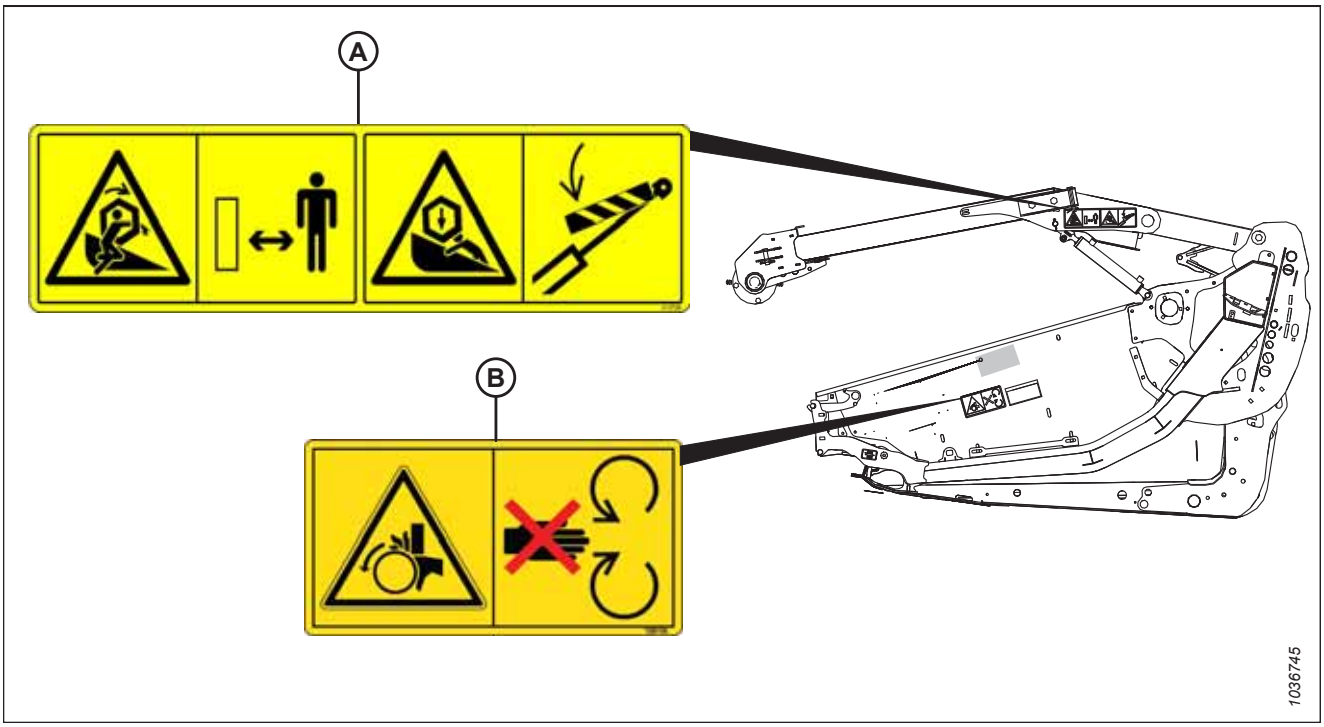


Figure 1.32: Reel Arms and Endsheets

A - MD #313726 – Reel Entanglement/ Hazard (Two Locations)

B - MD #288195 – Danger, Rotating Part (Two Locations)

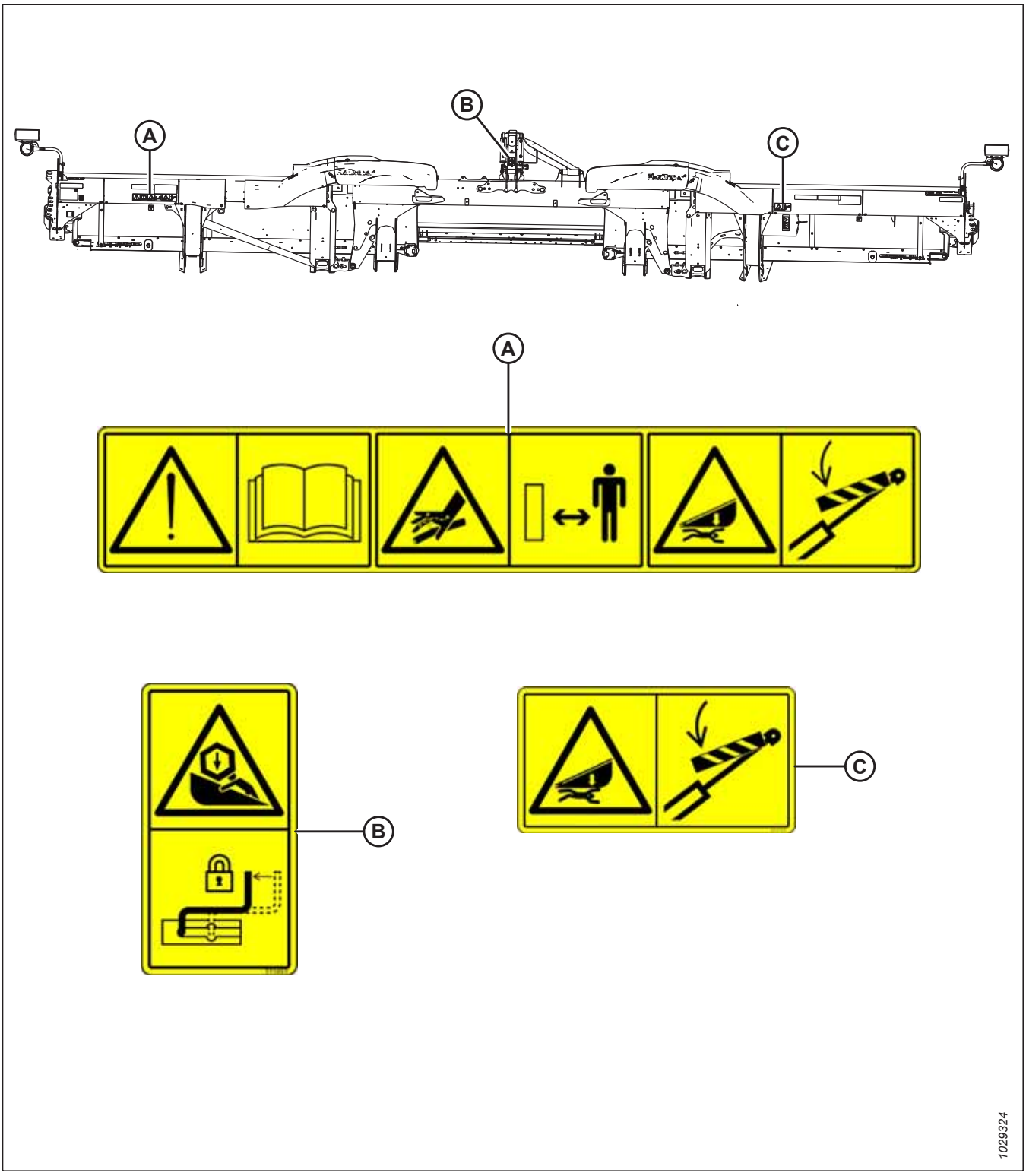


Figure 1.33: Backtube

A - MD #313725 – Read Manual / High Pressure Fluid / Header Hazard
B - MD #311493 – Center Prop Lock
C - MD #313733 – Header Crushing Hazard

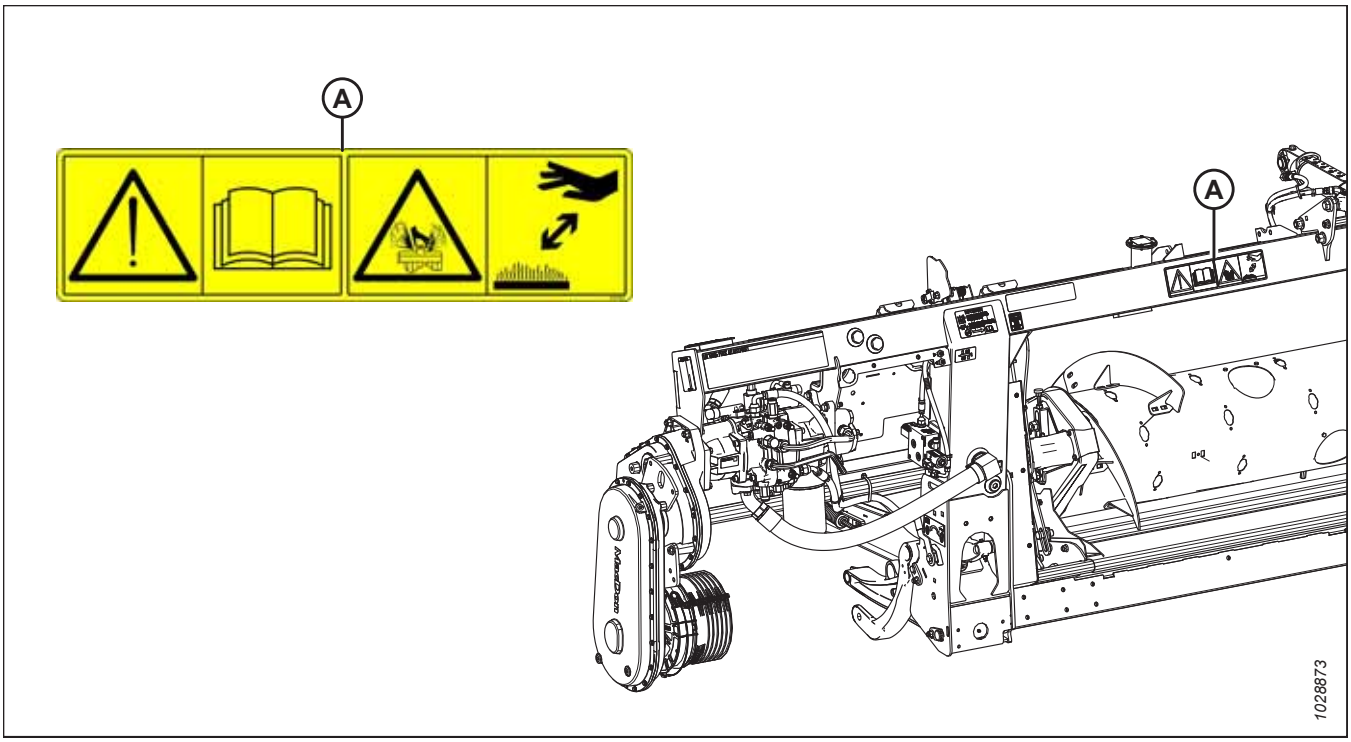


Figure 1.34: FM200 Float Module

A - MD #313728 – Read Manual / Fluid Spray Hazard

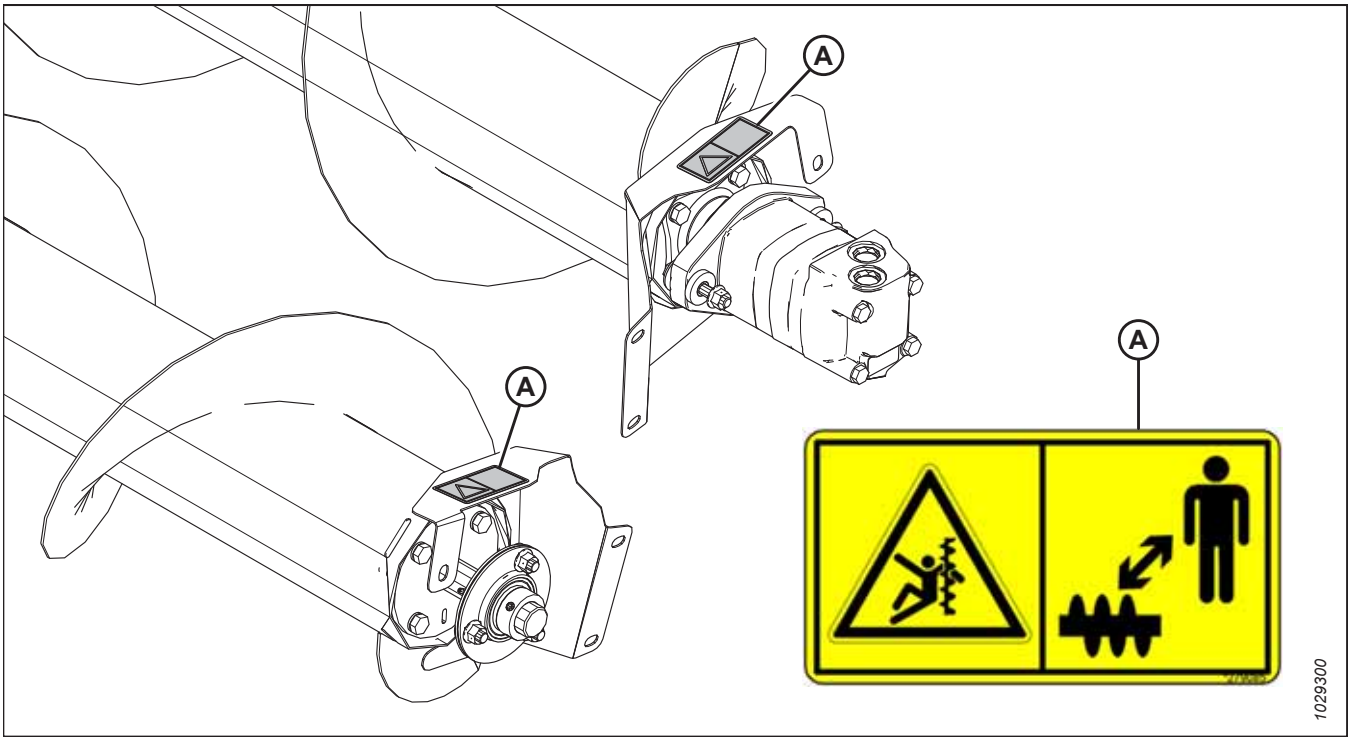


Figure 1.35: Upper Cross Auger

A - MD #279085 – Auger Warning

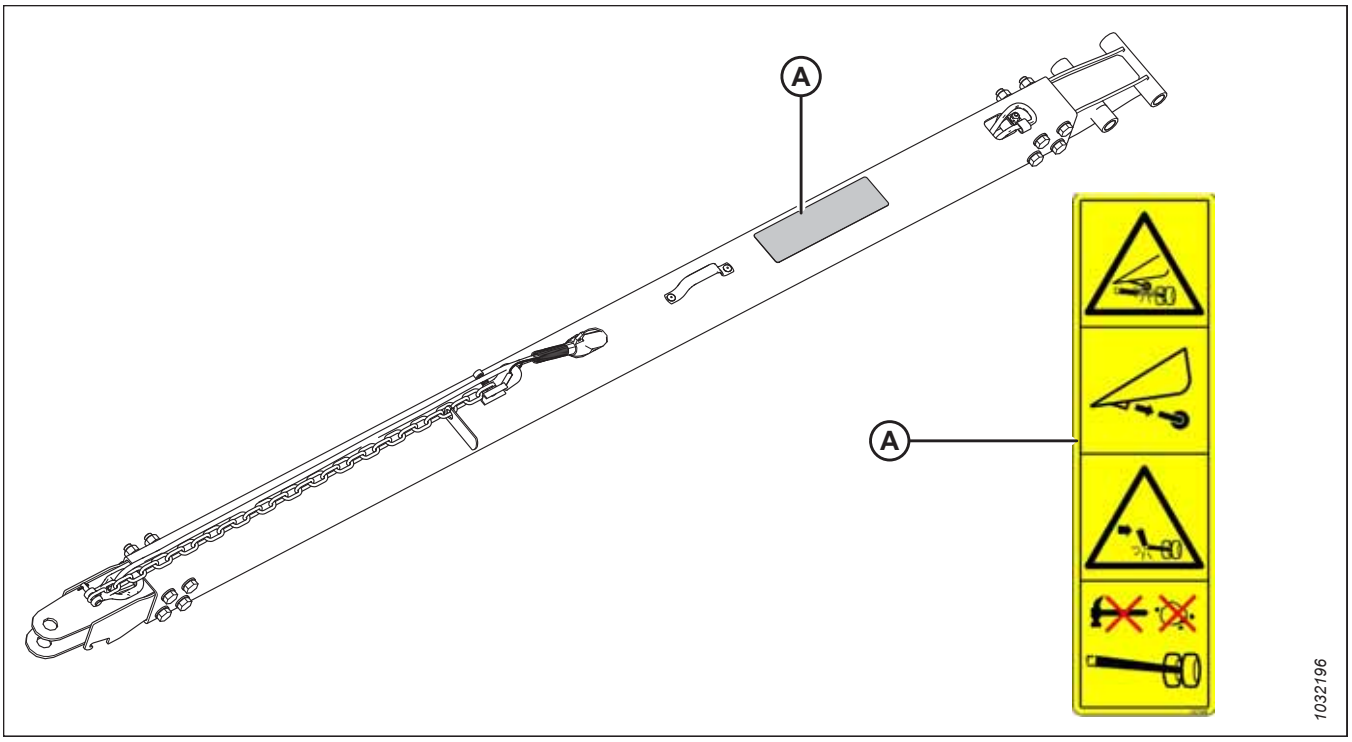


Figure 1.36: EasyMove™ Transport System – Tow-Bar (Short Bar Shown; Long Bar Similar)

A - MD #327588 – Hitch Damage Hazard

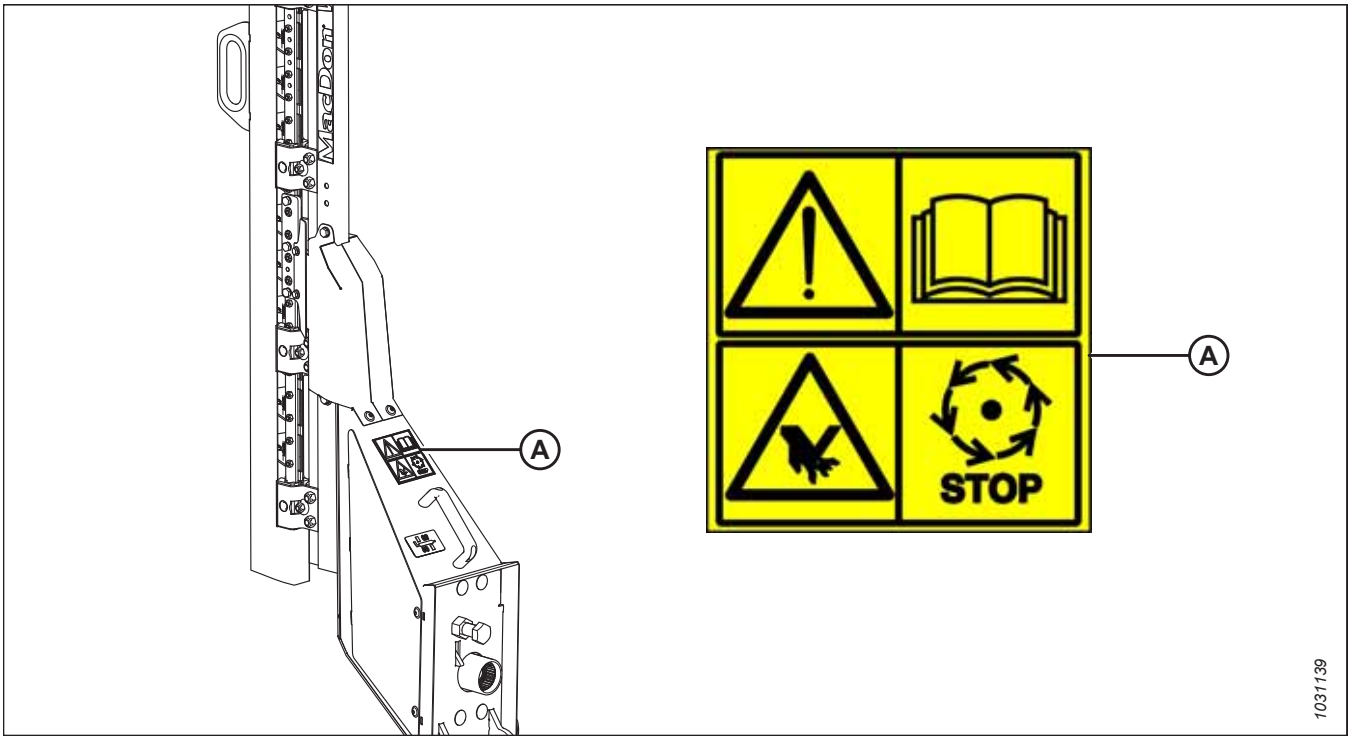


Figure 1.37: Vertical Knife

A - MD #313881 – Knife Hazard

1.2 Understanding Safety Signs

Refer to this topic to learn the hazards that each type of safety decal denotes.

MD #174436

High-pressure oil hazard

WARNING

High-pressure hydraulic fluid can penetrate human skin, which can cause serious injury such as gangrene, which can be fatal. To prevent this:

- Do **NOT** go near hydraulic fluid leaks.
- Do **NOT** use a finger or skin to check for hydraulic fluid leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any hydraulic fittings.
- If you are injured, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic fluid which has penetrated the skin.

Figure 1.38: MD #174436

MD #220799

Loss of control hazard

WARNING

To prevent serious injury or death from loss of control:

- Ensure that the tow-bar lock mechanism is locked.

Figure 1.39: MD #220799

MD #279085

Auger entanglement hazard

DANGER

To prevent injury from the rotating auger:

- Stand clear of the auger while the machine is running.
- Stop the engine and remove the key before servicing the auger.
- Do **NOT** reach into moving parts while the machine is running.

Figure 1.40: MD #279085

MD #288195

Rotating object pinch hazard

CAUTION

To prevent injury:

- Stop the engine and remove the key before opening the shield.
- Do **NOT** operate without shields in place.

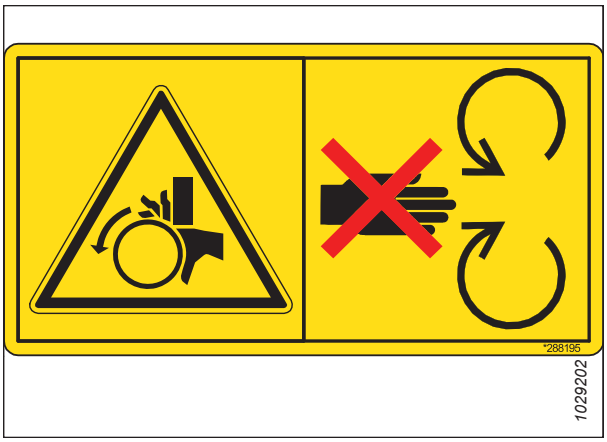


Figure 1.41: MD #288195

MD #311493

Center Prop Lock

DANGER

- To prevent injury from the fall of a raised reel; fully raise the reel. Stop the engine and remove the key, and engage the mechanical safety lock on each reel support arm before working on or under the reel.

Figure 1.42: MD #311493

MD #313725

Read manual / high pressure fluid / header crushing hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety locks to prevent lowering of raised unit before servicing in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

To prevent injury or death from fall of a raised header:

- Fully raise the header, stop the engine, remove the key, and engage the mechanical safety locks on the combine before going under the header.
- Alternatively, rest the header on the ground, stop the engine, and remove the key before servicing.

WARNING

To prevent serious injury, gangrene, or death:

- Do **NOT** go near leaks.
- Do **NOT** use a finger or skin to check for leaks.
- Lower the load or relieve hydraulic pressure before loosening fittings.
- High-pressure oil can easily puncture skin, and can cause serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.

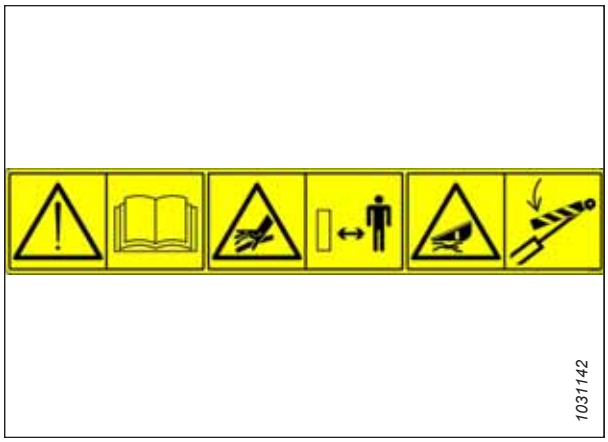


Figure 1.43: MD #313725

MD #313726

Reel entanglement / reel crushing hazard

DANGER

- To prevent injury from entanglement with the rotating reel; stand clear of the header while the machine is running.
- To prevent injury from the fall of the raised reel; fully raise the reel, stop the engine, remove the key, and engage the mechanical safety lock on each reel support arm before working on or under the reel.

Figure 1.44: MD #313726

MD #313728

General hazard pertaining to machine operation and servicing / Hot fluid spray hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage safety locks to prevent the lowering of a raised unit before servicing it in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

CAUTION

To prevent injury from hot fluids:

- Do **NOT** remove the fluid fill cap when the machine is hot.
- Allow the machine to cool down before opening the fluid fill cap.
- Fluid is under pressure and may be hot.

Figure 1.45: MD #313728

MD #313733

Header crushing hazard

DANGER

To prevent injury or death from the fall of a raised header:

- Fully raise the header, stop the engine, remove the key, and engage the mechanical safety locks on the combine before going under the header.
- Alternatively, rest the header on the ground, stop the engine, and remove the key before servicing.

Figure 1.46: MD #313733

MD #313881

General hazard pertaining to machine operation and servicing / knife hazard

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review safety instructions with all Operators every year.
- Ensure that all the safety signs are installed and legible.
- Make certain everyone is clear of the machine before starting the engine and during operation.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the safety locks to prevent lowering of the raised unit before servicing it in the raised position.
- Use a slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

WARNING

To prevent injury from sharp cutting knife:

- Wear heavy canvas or leather gloves when working with the knife.
- Be sure no one is near the vertical knife when removing or rotating the knife.

Figure 1.47: MD #313881

MD #327588

Hitch damage hazard

DANGER

To prevent serious injury or death:

- Remove the left contour wheel before transporting the header with transport.
- Do **NOT** tow a header if the transport hitch is damaged.

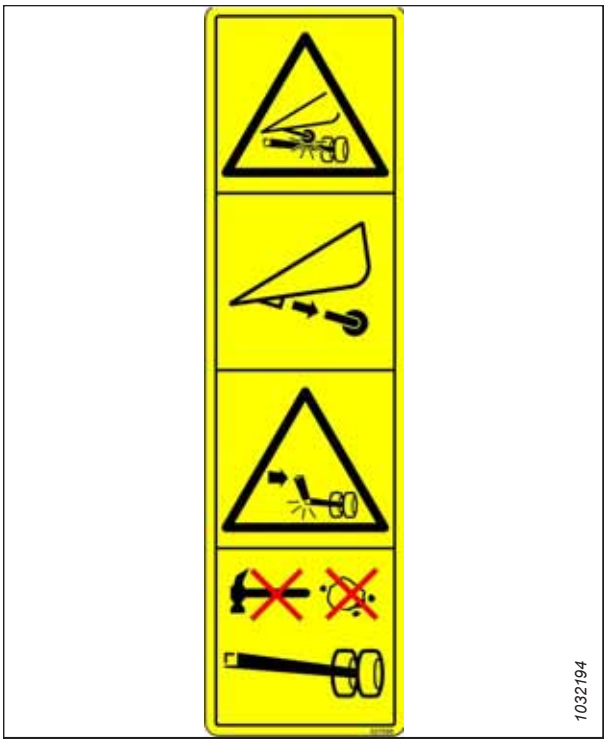


Figure 1.48: MD #327588

Chapter 2: Product Overview

Refer to this section to learn the definitions of the technical terms used in this manual, the machine's specifications, and the locations of key components.

2.1 Definitions

The following terms, abbreviations, and acronyms are used in this manual.

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Center-link	A hydraulic cylinder connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
Export header	The header configuration typical outside North America
FD2 Series header	MacDon FD230, FD235, FD240, FD241, FD245, or FD250 FlexDraper® header
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position in which the given sealing surfaces or components are making contact with each other and the fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
FM200	The float module used with an FD2 Series FlexDraper® header for combining
FSI	Float setting indicator
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
n/a	Not applicable
North American header	The header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-Ring Seal
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when inserted into a mating part
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket

Term	Definition
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
UCA	Upper cross auger
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism

2.2 FD2 Series FlexDraper® Header and FM200 Float Module Specifications

Use the specification table to reference information about a machine's specific configuration. The table lists dimensions, weights, performance ranges, and features.

The following symbols and letters are used in specification tables:

– S: standard / O_F: optional (factory installed) / O_D: optional (dealer installed) / –: not available

Cutterbar			
Effective cutting width (distance between crop divider points; cut width plus divider gather)			
FD230		9.2 m (361 in.)	S
FD235		10.7 m (421 in.)	S
FD240		12.2 m (481 in.)	S
FD241		12.5 m (493 in.)	S
FD245		13.7 m (541 in.)	S
FD250		15.3 m (601 in.)	S
Cutterbar lift range		Varies with combine model	S
Knife			
Single-knife drive (FD230–FD240): hydraulic motor mounted to enclosed heavy duty MacDon knife drive box on the left side of header.			O_F
Double knife drive (FD235–FD250): one hydraulic motor, untimed, one mounted to enclosed heavy duty MacDon knife drive box on each side of header.			O_F
Knife stroke		76 mm (3 in.)	S
Single-knife speed (strokes per minute)	FD230 and FD235	1200–1500 spm	S
Single-knife speed (strokes per minute)	FD240	1200–1400 spm	S
Double-knife speed (strokes per minute)	FD235, FD240, FD241, FD245, and FD250	1200–1500 spm	S
Knife Sections			
Over-serrated, ClearCut™, QuickChange, bolted, 3.5 serrations per cm (9 serrations per inch)			S
Knife overlap at center (double-knife headers)		3 mm (1/8 in.)	S
Guards and Hold-Downs			
Guard: ClearCut™ pointed, forged and double heat treated (DHT) Hold-down: forged, single adjustment bolt			O_F
Guard: PlugFree™, forged and double heat treated (DHT) Hold-down: forged, dual adjustment bolt			O_F
Guard Angle (Cutterbar on the Ground)			
Center-link retracted		1.7 degrees	S
Center-link extended		8.9 degrees	S
Draper and Decks			
Draper width		1.27 m (50 in.)	S
Draper drive		Hydraulic	S
Draper speed: FM200 Float Module controlled		209 m/min. (687 fpm)	S
Delivery opening width		1905 mm (75 in.)	S
PR15 Pick-Up Reel			
Quantity of tine tubes		5 or 6 tine tubes	

Center tube diameter: all reel sizes except FD235 single span		203 mm (8 in.)	S
Finger tip radius	Factory-set	800 mm (31 1/2 in.)	S
Finger tip radius	Adjustment range	766–800 mm (30 3/16–31 1/2 in.)	S
Effective reel diameter (via shaped cam action)		1.650 m (65 in.)	S
Finger length		290 mm (11 in.)	S
Finger spacing (nominal, staggered on alternate bats)		100 mm (4 in.)	S
Reel drive		Hydraulic	S
Reel speed (adjustable from cab, varies with combine model)		0–67 rpm	S
FM200 Float Module			
Feed draper	Width	2 m (78 11/16 in.)	S
Feed draper	Speed	107–122 m/min (350–400 fpm)	S
Feed auger	Width	1.630 m (64 1/8 in.)	S
Feed auger	Outside diameter	559 mm (22 in.)	S
Feed auger	Tube diameter	356 mm (14 in.)	S
Feed auger	Speed (varies with combine model)	191–195 rpm (varies with combine model)	S
Oil reservoir capacity		95 liters (25 US gallons)	S
Oil type		Single grade transmission/hydraulic fluid (THF).	—
THF viscosity at 40°C (104°F)		60.1 cSt	—
THF viscosity at 100°C (212°F)		9.5 cSt	—
Upper Cross Auger			O_D
Outside diameter		330 mm (13 in.)	—
Tube diameter		152 mm (6 in.)	—
Stabilizer Wheel / EasyMove™ Transport			O_D
Wheels		38 cm (15 in.)	—
Tires		225/75 R-15	—
Weight			
Estimated weight range – base header with float module – variances are due to different package configurations.			
FD230	North America	3701–3743 kg (8160–8253 lb.)	
FD235	North America	3901–4036 kg (8600–8898 lb.)	
FD240	North America	4050–4315 kg (8928–9512 lb.)	
FD241	Export	4,287–4,340 kg (9,452–9,569 lb.)	

FD245	North America	4,498–4,555 kg (9,916–10,043 lb.)
	Export	4,635–4,692 kg (10,218–10,345 lb.)
FD250	North America	4693–4756 kg (10,346–10,485 lb.)
	Export	4,853–4,916 kg (10,699–10,838

2.3 FD2 Series FlexDraper® Header Dimensions

When operating a header it is important to know the dimensions of the machine.

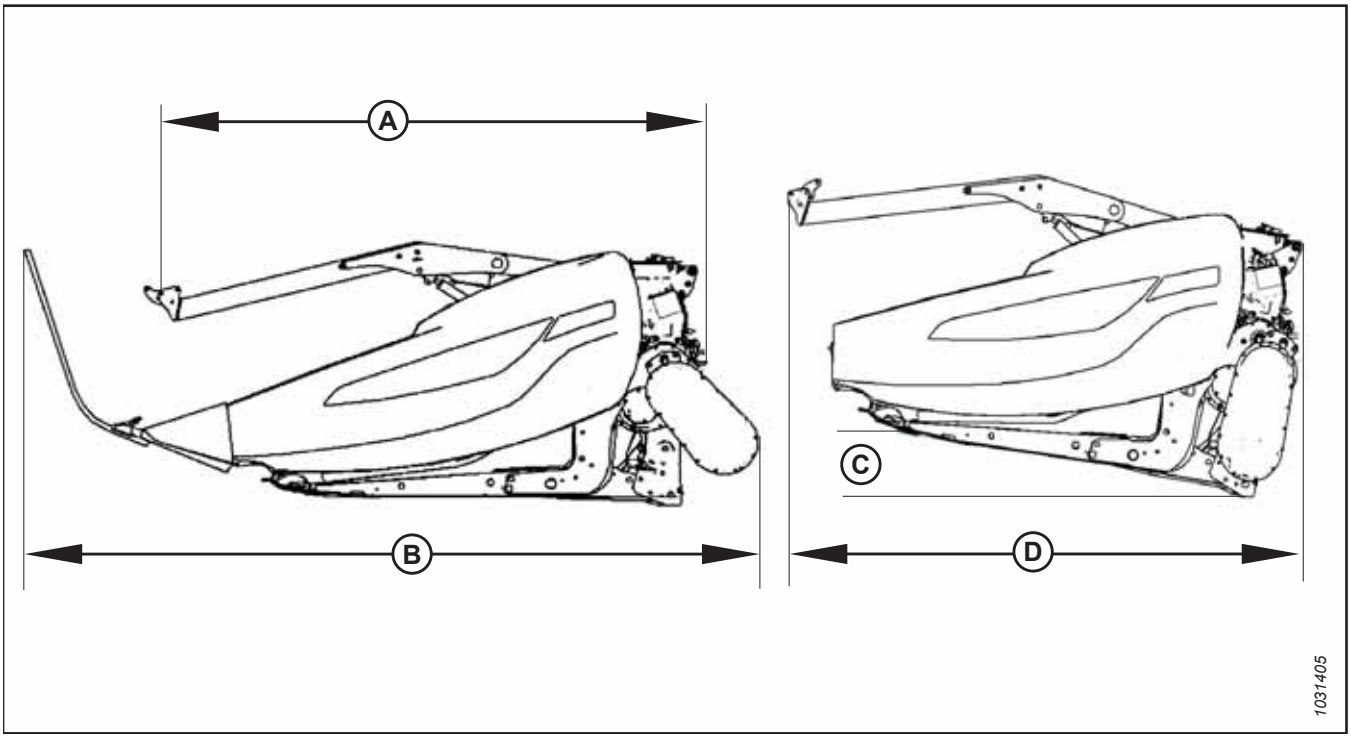


Figure 2.1: Header Dimensions

Table 2.1 Header Dimensions

Frame and Structure		
Feature Being Measured	**Reference to Figure *2.1, page 38***	**Dimension**
Header width in field mode	—	Cut width + 500 mm (19 1/5 in.)
Cutterbar width	—	Cut width - 500 mm (19 1/5 in.)
Header width in transport position with FM200 installed (shortest center-link)	(A) Gearbox rotated (storage), dividers removed (refer to *2.1, page 38*)	2.6 m (103 in.)
Header width in transport position with FM200 installed (shortest center-link)	(B) Gearbox operational, standard dividers installed (refer to *2.1, page 38*)	3.5 m (138 in.)
Header width in transport position with reel fully retracted and FM200 installed (shortest center-link)	Gearbox rotated, dividers removed (refer to *2.1, page 38*) Angle (C) required to achieve transport width (D) **NOTE:** Dimension (D) can be decreased by using a transport trailer with greater angle.	8° 2.591 m (102 in.)

2.4 FD2 Series FlexDraper® Header Component Identification

Familiarizing yourself with the main components of the header will make it easier to follow the operation and maintenance instructions provided in this manual.

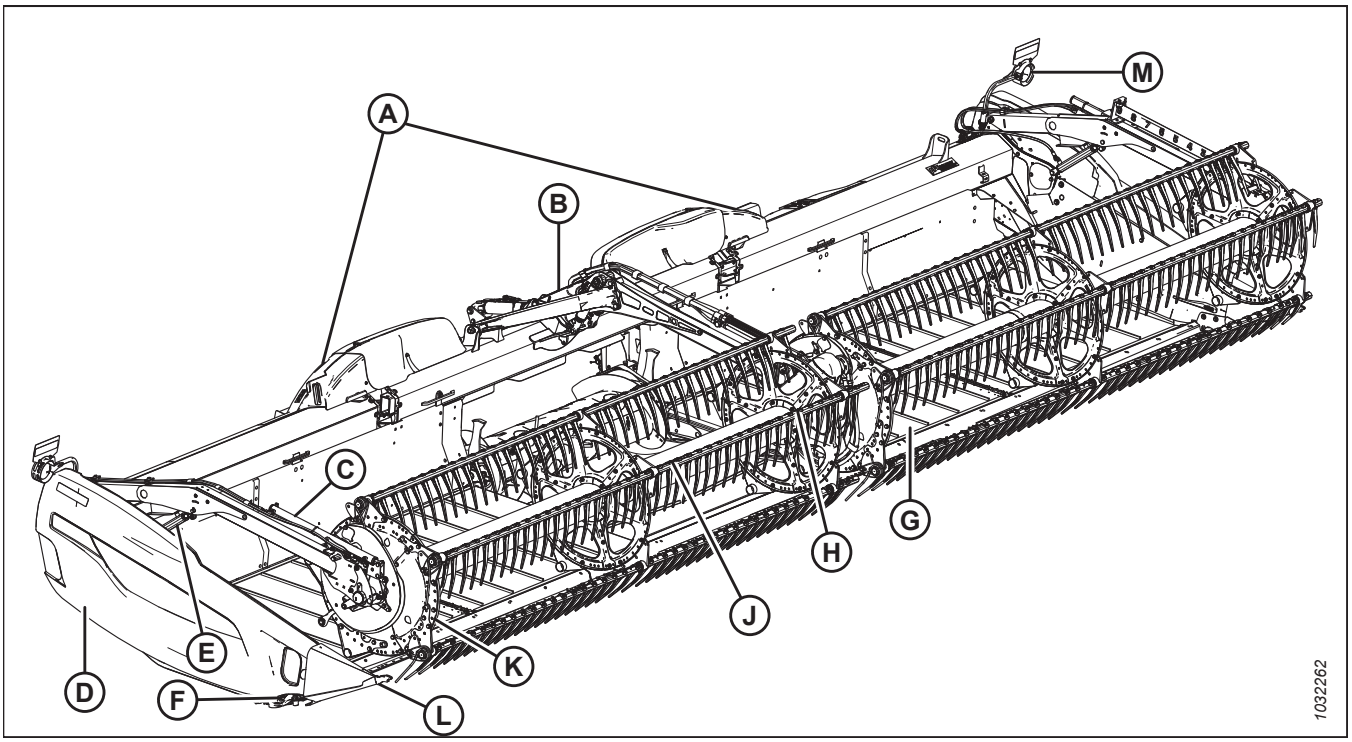


Figure 2.2: FD2 Series FlexDraper® Header Components

A - Wing Float Linkage
B - Center Reel Arm
C - Reel Fore-Aft Cylinder
D - Endshield
E - Reel Lift Cylinder
F - Knife Drive Box (inside endshield)
G - Side Draper
H - Center Reel Drive
J - Pick-up Reel
K - Reel Endshield
L - Crop Divider
M - Header Light (except Europe)

2.5 FM200 Float Module Component Identification

Familiarizing yourself with the main components of the float module will make it easier to follow the operation and maintenance instructions provided in this manual.

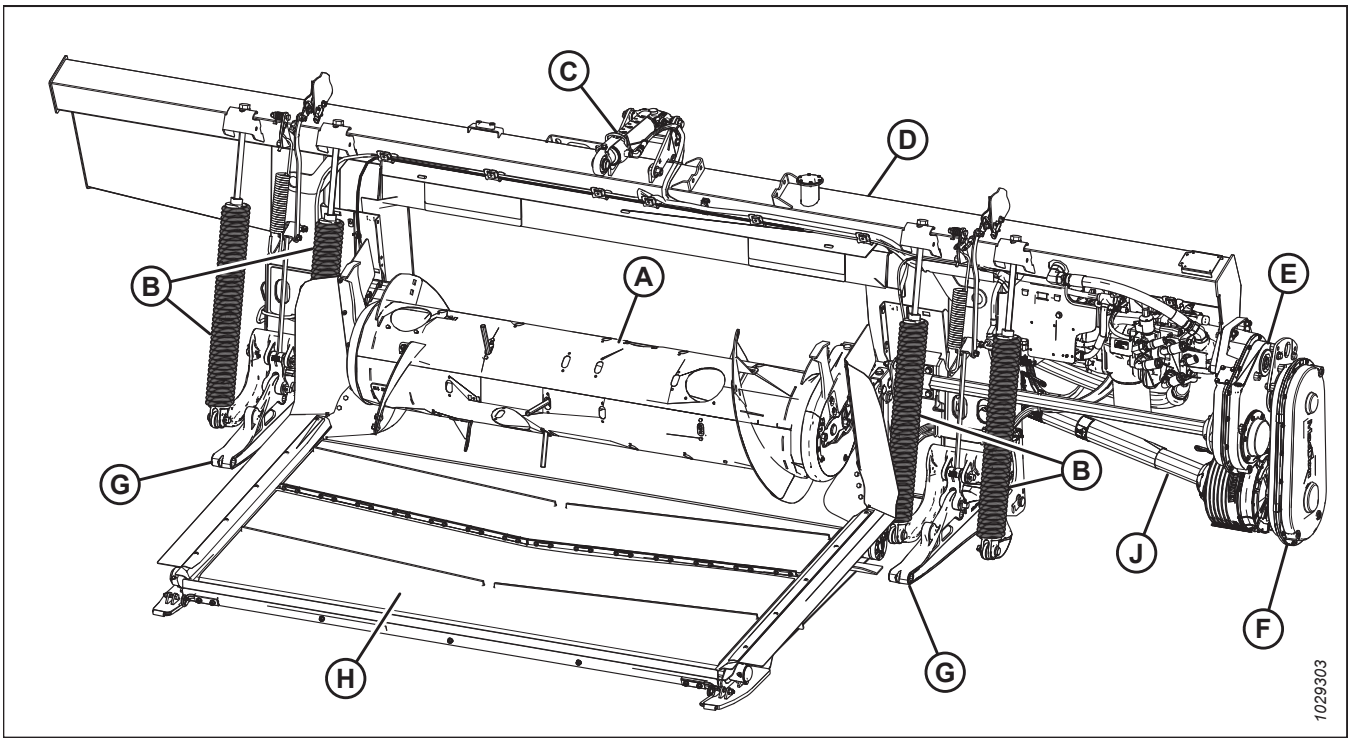


Figure 2.3: Header Side of FM200 Float Module

A - Feed Auger
B - Header Float Springs (x4)
C - Center-Link
D - Hydraulic Reservoir
E - Main Gearbox
F - Completion Gearbox
G - Header Support Arms (x2)
H - Feed Draper
J - Driveline

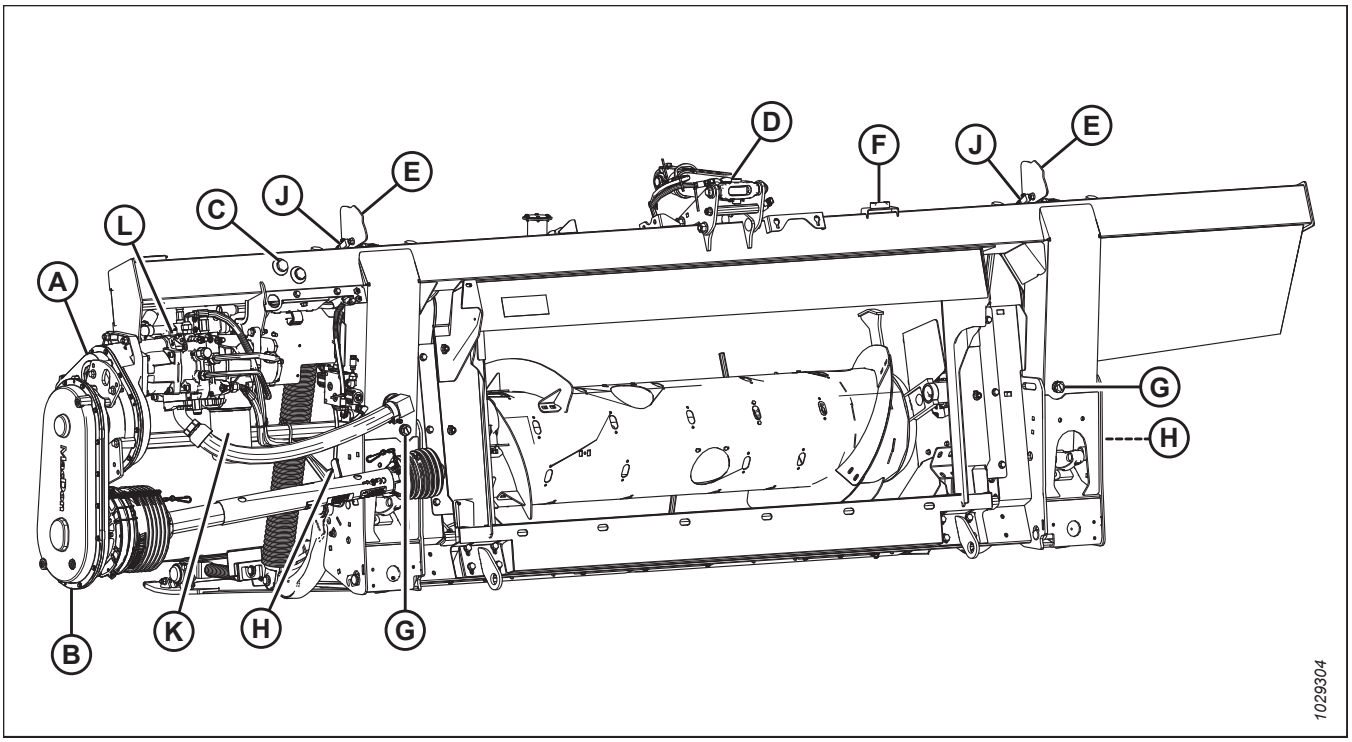


Figure 2.4: Combine Side of FM200 Float Module

A - Main Gearbox
B - Completion Gearbox
C - Reservoir Oil Level Sight Glass
D - Center-Link
E - Header Height Control Indicator (x2)
F - Bubble Level
G - Drain Plug (x2)
H - Float Lock Handle (x2)
J - Auto Header Height Control (AHHC) Sensor (x2)
K - Hydraulic Filter
L - Knife, Side Draper, and Feed Draper Pump

Chapter 3: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

3.1 Owner/Operator Responsibilities

Owning and operating heavy equipment comes with certain duties.

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety decals on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing someone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all Operators annually.**
- **Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do NOT modify the machine. Unauthorized modifications may impair the function and/or safety of the machine and may reduce the length of service you receive from your machine.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**

3.2 Operational Safety

Follow all the safety and operational instructions given in this manual.

CAUTION

Adhere to the following safety precautions:

- **Follow all safety and operational instructions provided in your operator's manuals. If you do not have a combine manual, get one from your Dealer and read it thoroughly.**
- **Never attempt to start the engine or operate the machine except from the operator's seat.**
- **Check the operation of all controls in a safe, clear area before starting work.**
- **Do NOT allow riders on the combine.**

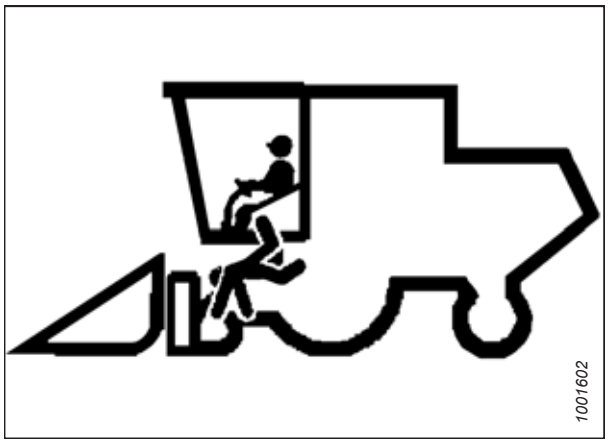


Figure 3.1: No Riders

CAUTION

- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Avoid travelling over loose fill, rocks, ditches, or holes.**
- **Drive slowly through gates and doorways.**
- **When working on inclines, travel uphill or downhill whenever possible. Be sure to keep transmission in gear when travelling downhill.**
- **Never attempt to get on or off a moving machine.**
- **Do NOT leave the operator's station while the engine is running.**
- **To avoid bodily injury or death from the unexpected startup of a machine, always stop the engine and remove the key before adjusting or removing plugged material from the machine.**

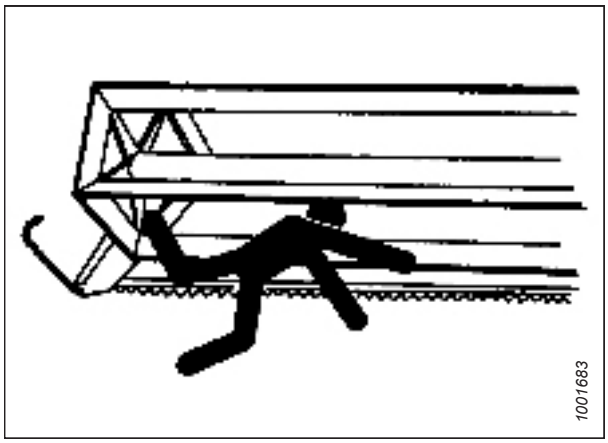


Figure 3.2: Bystander Safety

- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow the proper shutdown procedure. For instructions, refer to *3.4 Shutting down the Combine, page 66*.**
- **Operate only in daylight or good artificial light.**

3.2.1 Header Safety Props

The header safety props located on the header lift cylinders prevent the lift cylinders from unexpectedly retracting and lowering the header. For instructions, refer to your combine operator's manual.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

3.2.2 Reel Safety Props

The reel safety props are located on the reel support arms and prevent the reel from falling unexpectedly.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

IMPORTANT:

To prevent damage to the reel support arms, do **NOT** transport the header whilen the reel safety props are engaged.

Engaging Reel Safety Props

Engage reel safety props anytime you need to work around a raised reel. When engaged, reel safety props prevent the reel from unexpectedly lowering.

Outer reel arms

1. Raise reel to maximum height.
2. Lift up on safety prop (A) and push forward to remove prop off hook (B).

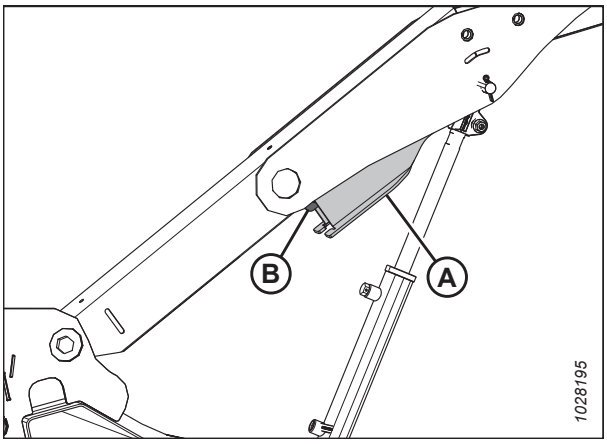


Figure 3.3: Outer Right Arm

3. Lower safety prop (A) and engage on the cylinder shaft as shown. Repeat on the opposite arm.

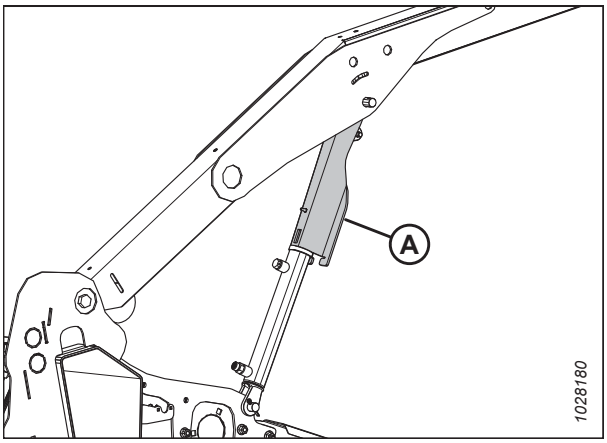


Figure 3.4: Engaged Reel Safety Prop – Outer Right Arm

Center reel arm

4. Rotate handle (A) to release the spring tension and allow the spring to guide the pin into the locked position.

   NOTE:

   For triple-reel headers, the illustration shows the center right arm. The center left arm is opposite.

5. On triple-reel headers, repeat previous step on the center left arm.

6. Lower reel until safety props contact the outer arm cylinder mounts and the center arm pins.

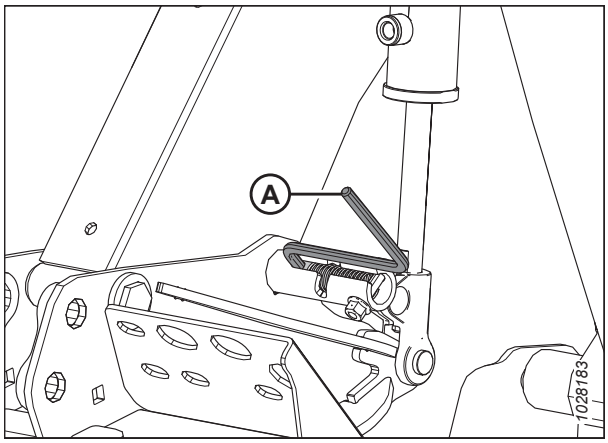


Figure 3.5: Engaged Reel Safety Prop – Center Arm

Disengaging Reel Safety Props

Disengage the reel safety props once you have completed working on or around a raised reel to ensure the proper operation of the reel and header.

Outer reel arms

1. Raise the reel to its maximum height.

2. Move reel safety prop (A) up onto hook (B) under the reel arm. Repeat on the opposite arm.

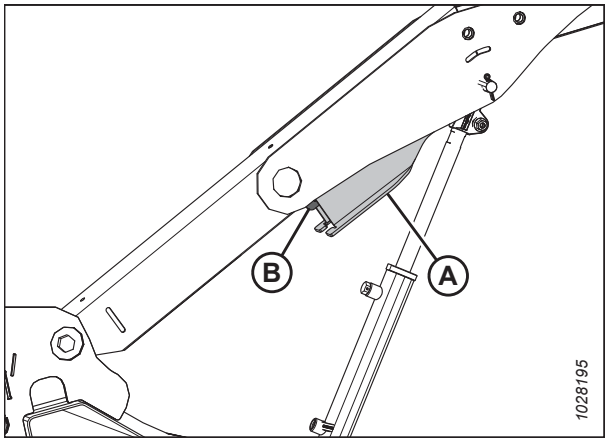


Figure 3.6: Reel Safety Prop – Right Outer Arm

Center reel arm

3. Move handle (A) outboard and into slot (B) to put the pin in the unlocked position.

   NOTE:

   For triple-reel headers, the illustration shows the center right arm. The center left arm is opposite.

4. On triple-reel headers, repeat previous step on the center left arm.

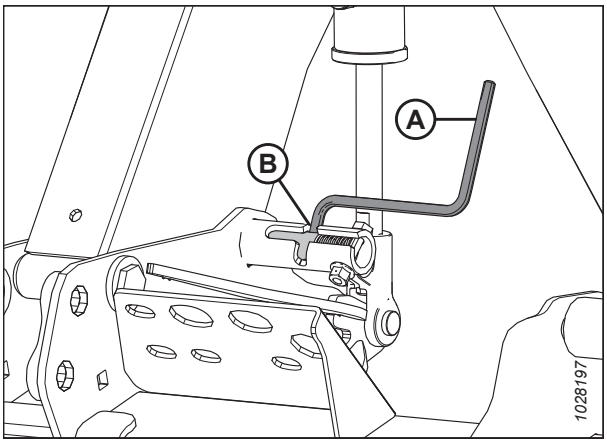


Figure 3.7: Reel Safety Prop – Center Arm

3.2.3 Header Endshields

A hinged, polyethylene endshield is fitted on each end of the header to protect critical drive components.

Opening Header Endshields

The header endshields cover components. To access the components you will need to open the endshield.

1. Push release lever (B) using access hole (A) on the backside of the header endshield to unlock the shield.

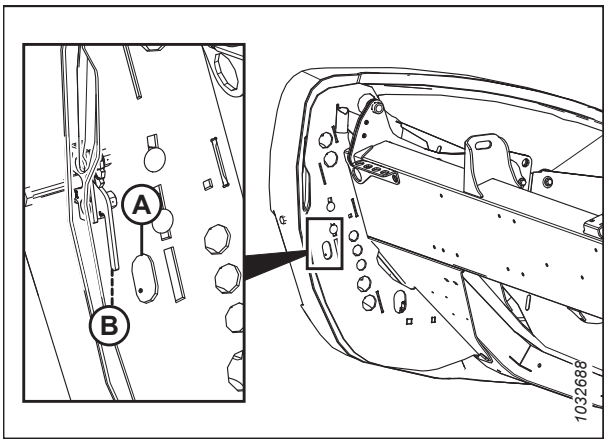


Figure 3.8: Left Header Endshield

2. Pull header endshield (A) open.

   NOTE:

   The header endshield is retained by tab (B) and will open in direction (C).

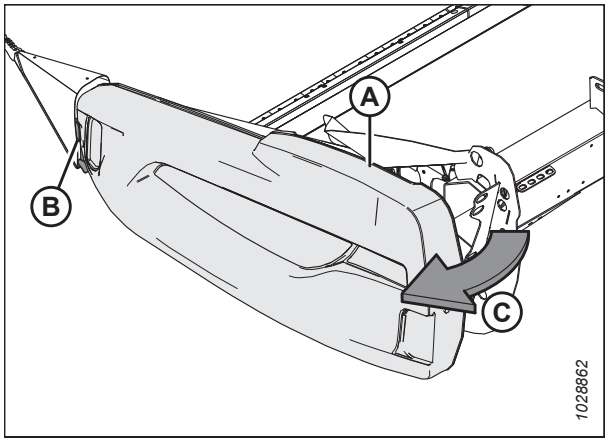


Figure 3.9: Left Header Endshield

3. If additional clearance is required, pull the header endshield free of tab (A) and then swing the shield toward the rear of the header.
4. Engage safety latch (B) on hinge arm (C) to secure the shield in the fully open position.

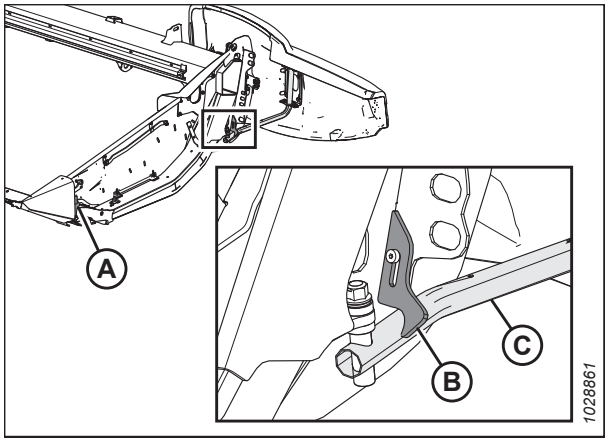


Figure 3.10: Left Header Endshield

Closing Header Endshields

The header endshields cover components. After accessing the components you will need to close the endshield.

1. If the endshield is fully opened and secured behind the header, disengage lock (A) to allow header endshield (B) to move.
2. Rotate the header endshield toward the front of the header.

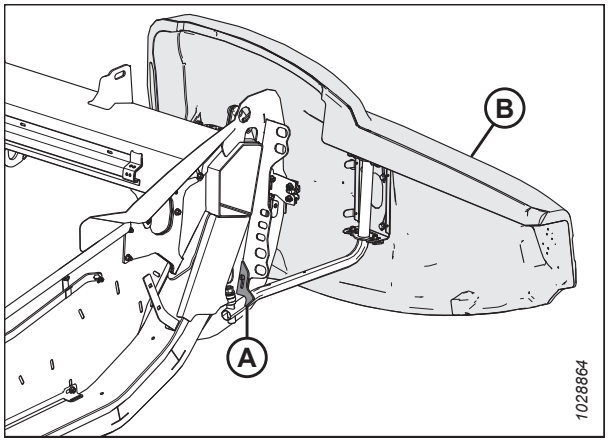


Figure 3.11: Left Header Endshield

3. While closing the endsield, ensure header endshield (A) does not contact the top of endsheet (B). If adjustment is required, refer to *Checking and Adjusting Header Endshields, page 49*.

   IMPORTANT:

   The aluminum endsheet will be damaged if the weight of the plastic endshield rests on it.

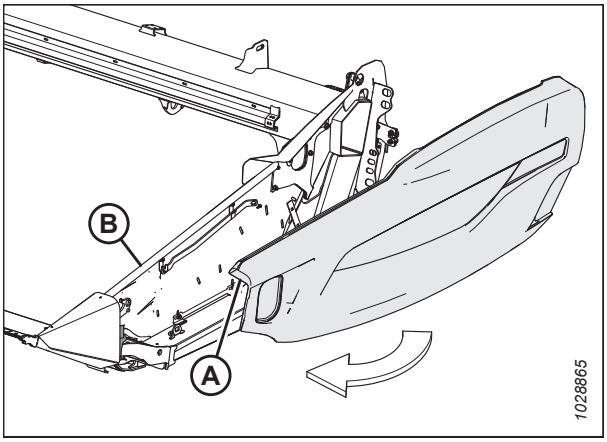


Figure 3.12: Left Header Endshield

4. Insert the front of the header endshield behind hinge tab (B) and into the divider cone.
5. Swing the header endshield in direction (A) into the closed position. Engage two-stage latch (C) with a firm push.

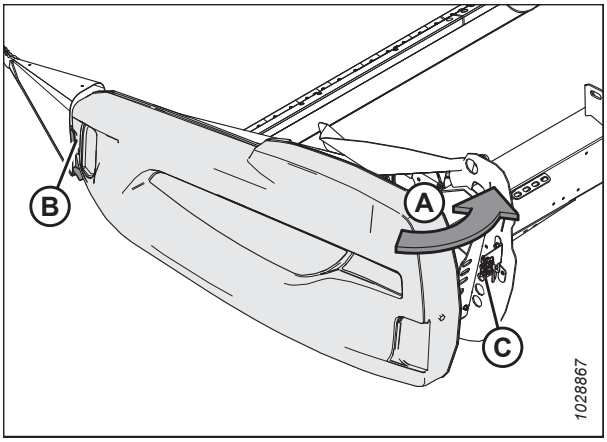


Figure 3.13: Left Header Endshield

IMPORTANT:

Check that the header endshield is locked. Ensure bolt (A) is fully engaged on two-stage latch (B) to prevent the header endshield from opening while operating the header.

NOTE:

The header endshield is transparent in the illustration to show the latch.

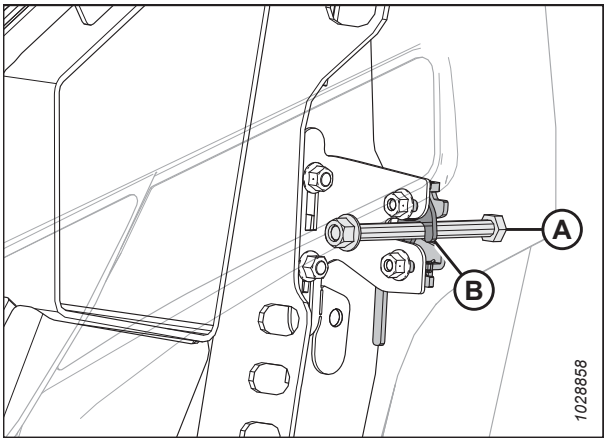


Figure 3.14: Two-Stage Latch

Checking and Adjusting Header Endshields

Header endshields are subject to expansion or contraction caused by large temperature variations. The position of the header endshield can be adjusted to compensate for dimensional changes.

IMPORTANT:

Damage to the aluminum endsheet will result if the weight of the plastic header endshield rests on it.

1. Check if gap (A) between header endshield (B) and endsheet (C) is 1–3 mm (0.04–0.12 in.).

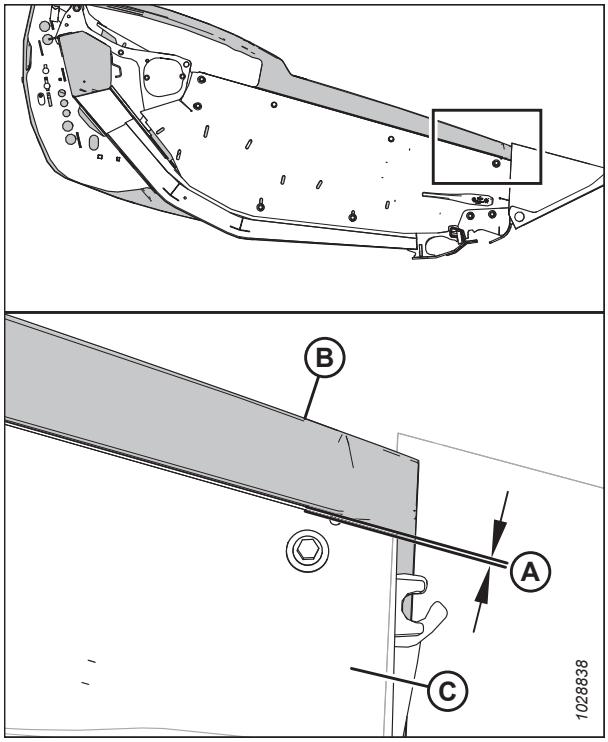


Figure 3.15: Gap between Header Endshield and Endsheet

2. If adjustment is required, adjust support bracket (A) as follows:
   a. Loosen bolts (B).
   b. Move support bracket (A) up or down as required to achieve the correct clearance.
   c. Retighten the hardware.

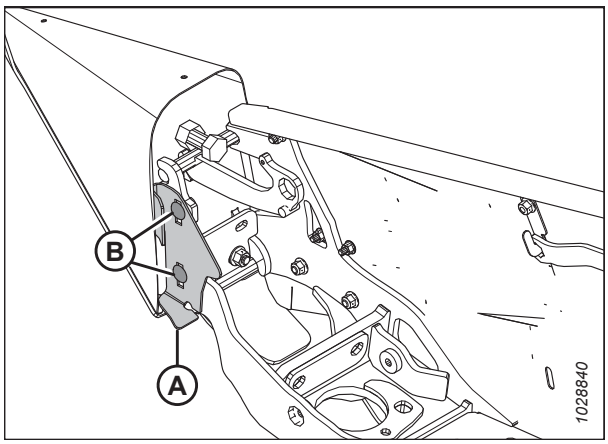


Figure 3.16: Header Endshield Support Bracket

3. Check if gap (A) between the front of the header endshield and support bracket (B) is 6–10 mm (1/4–3/8 in.).

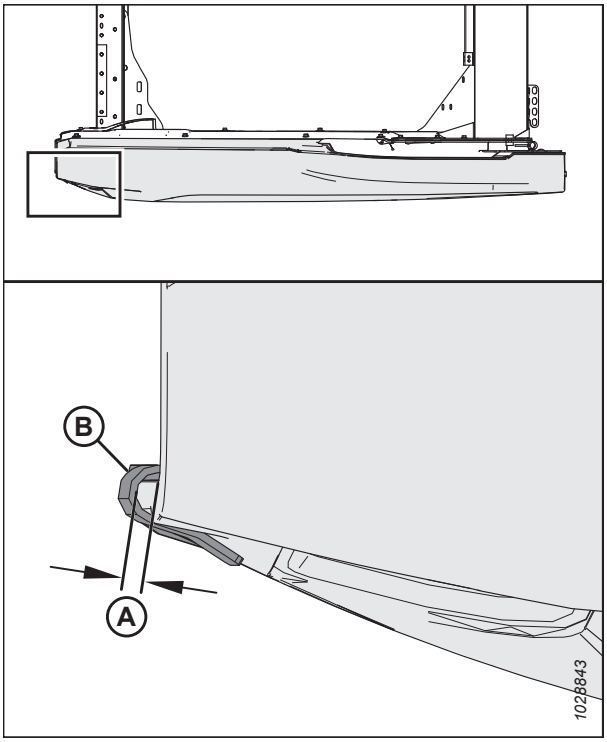


Figure 3.17: Gap between Header Endshield and Support Bracket

4. If adjustment is required, adjust the position of hinge arm (A) as follows:

   a. Loosen four nuts (B).

   b. Slide brackets (C) and hinge arm (A) fore or aft as required to achieve the correct clearance.

   c. Retighten the hardware.

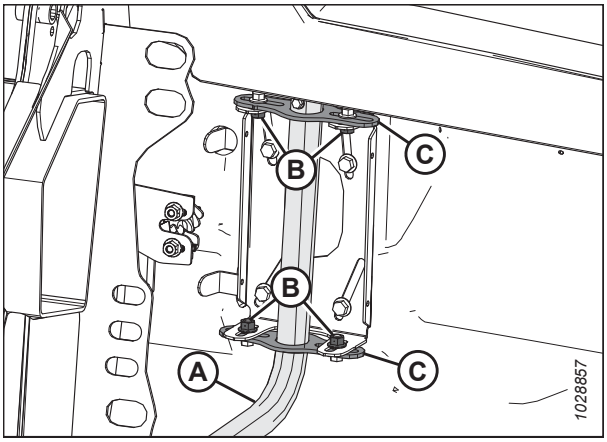


Figure 3.18: Left Header Endshield

IMPORTANT:

After making adjustments, ensure bolt (A) is fully engaged on two-stage latch (B) to prevent the header endshield from opening during operation.

NOTE:

The header endshield is shown transparent in the illustration.

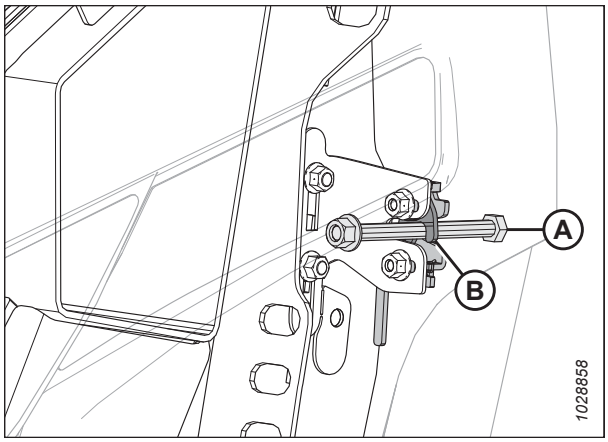


Figure 3.19: Two-Stage Latch

Removing Header Endshields

To ensure the endshields are removed correctly, follow the recommended installation procedure provided here.

1. Fully open the header endshield. For instructions, refer to *Opening Header Endshields, page 47*.
2. Engage latch (A) to prevent endshield movement.
3. Remove self-tapping screw (B).
4. Slide header endshield upwards and remove from hinge arm (C).
5. Place header endshield away from work area.

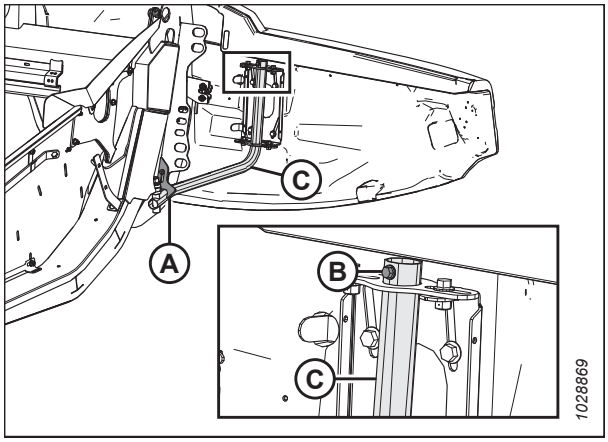


Figure 3.20: Left Header Endshield

Installing Header Endshields

To ensure the endshields are installed correctly, follow the recommended installation procedure provided here.

1. Guide header endshield onto hinge arm (C) and slowly slide it downwards.
2. Install self-tapping screw (B).
3. Disengage latch (A) to allow header endshield movement.
4. Close header endshield. For instructions, refer to *Closing Header Endshields, page 48*.

   NOTE:

   Header endshields may expand or contract when subjected to large temperature changes. The header endshield position can be adjusted to compensate for dimensional changes. For instructions, refer to *Checking and Adjusting Header Endshields, page 49*.

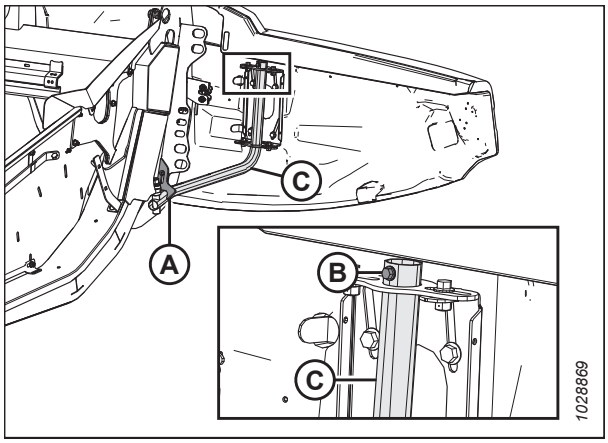


Figure 3.21: Left Header Endshield

3.2.4 Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris.

Removing Reel Drive Cover

The reel drive cover protects the drive components from weather and debris. The two-piece cover can be removed to access the components for service.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine.
2. Adjust the reel fully forward.
3. Lower the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Rotate spring latch (A) up and over the back plate.

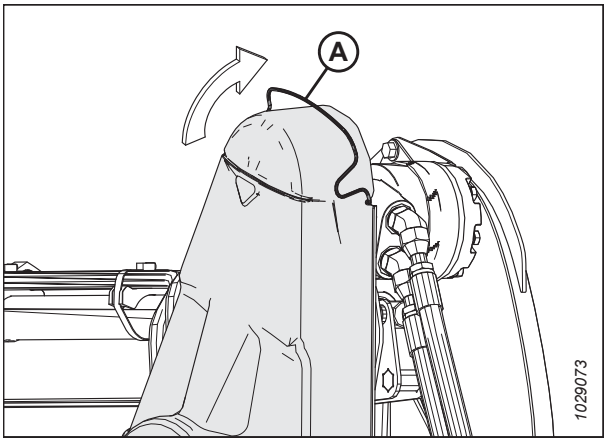


Figure 3.22: Upper Drive Cover

6. Unclip upper cover (A) from the lower cover at locations (B), and remove the upper cover. Keep the two clips engaged on the lower cover.

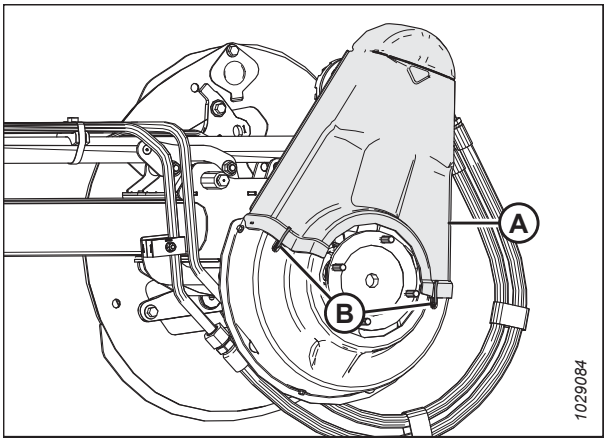


Figure 3.23: Upper Drive Cover

7. If necessary, remove lower cover (B) by removing three bolts (A).

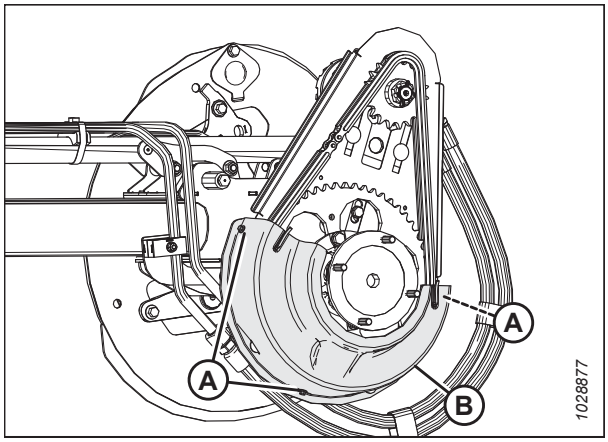


Figure 3.24: Lower Drive Cover

Installing Reel Drive Cover

The reel drive cover protects the drive components from weather and debris.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

2. Position lower drive cover (B) (if previously removed) onto the reel drive, and secure with three bolts (A).

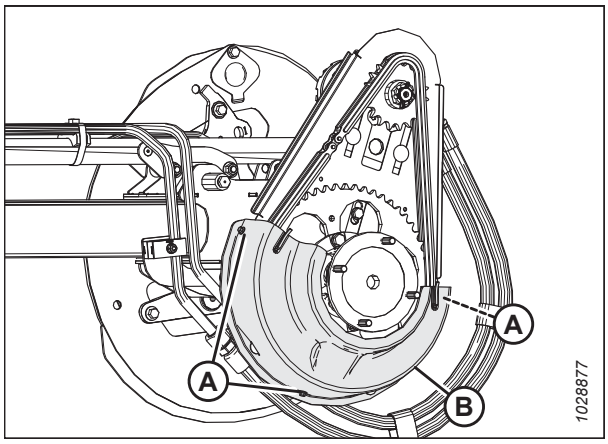


Figure 3.25: Lower Drive Cover

3. Position upper cover (A) onto the reel drive, and secure in place using two clips (B) on the lower cover.

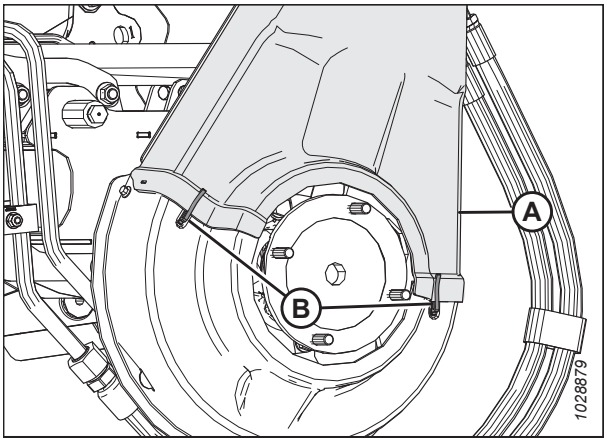


Figure 3.26: Upper Drive Cover

4. Rotate spring latch (A) down to secure the upper cover to the reel drive. Ensure V-shaped loop (C) points down, and the spring end remains inserted into back plate hole (B) on both sides of the reel drive.

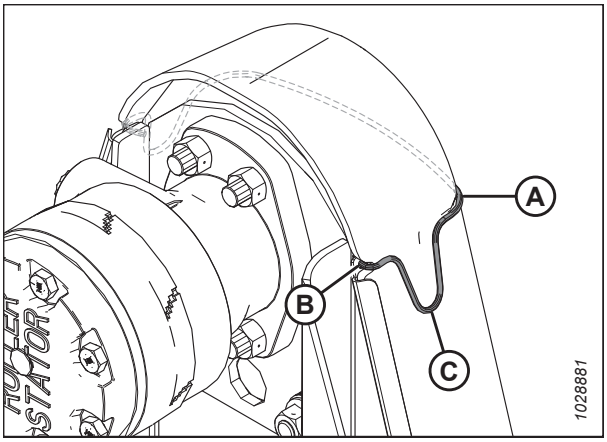


Figure 3.27: Reel Drive

3.2.5 Flex Linkage Cover

Plastic covers are attached to the header frame to protect the header wing balance mechanism from debris and weather.

Removing Inboard Flex Linkage Covers

Remove the flex linkage covers to access the header wing balance mechanism or the hydraulic lines.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.

3. Remove hair pin (A) and lynch pin (B) that secure flex linkage cover (C) to the backtube.
4. Slide flex linkage cover (C) inboard, then lift it upward and remove it.

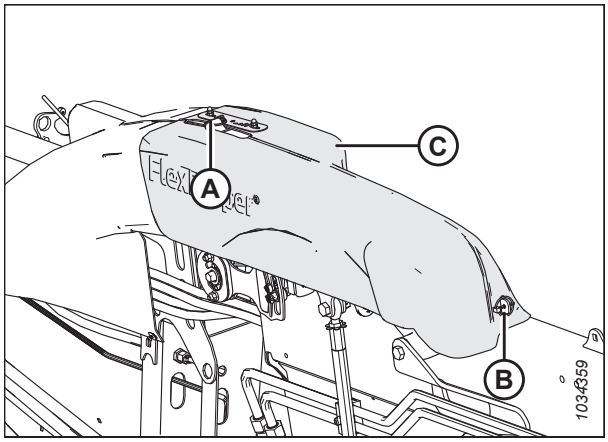


Figure 3.28: Inboard Flex Linkage Cover – Left Side

Installing Inboard Flex Linkage Covers

The inboard flex linkage covers protect the header wing balance mechanism from debris and weather. They are secured to the header with pins.

1. Lower flex linkage cover (A) over the linkage. Ensure that slots (B) line up with tabs (C) and (D).
2. Slide the flex linkage cover outboard so that tab (D) extends beyond the slot.

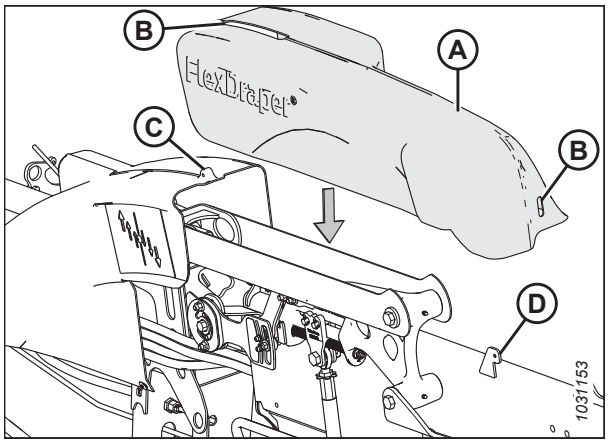


Figure 3.29: Inboard Flex Linkage Cover – Left Side

3. Secure flex linkage cover (C) with hair pin (A), and lynch pin (B).

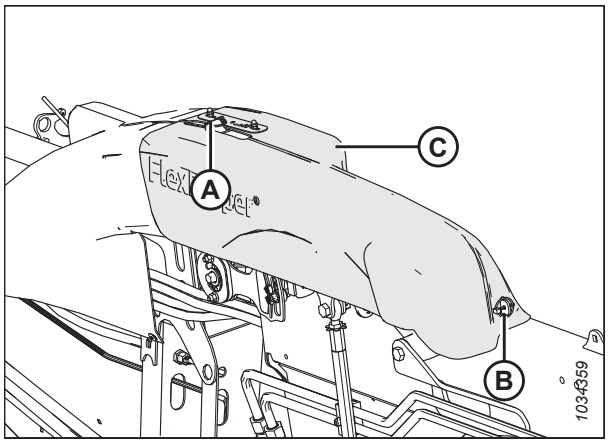


Figure 3.30: Inboard Flex Linkage Cover – Left Side

Removing Outboard Flex Linkage Covers

Remove the flex linkage covers to access the header wing balance mechanism or the hydraulic lines.

1. **FD245 and FD250 headers:** Remove screw (A) and the nut (not shown) securing outboard linkage cover (B) to the bracket (not shown).
2. **FD245 and FD250 headers:** Remove pin (C). Remove the cover by lifting it up and over frame protrusions (D).

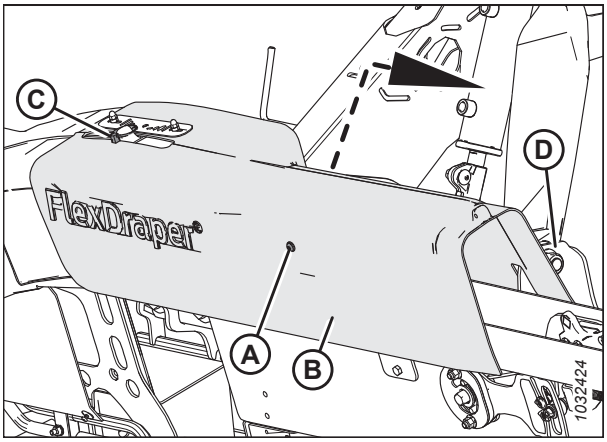


Figure 3.31: Outboard Linkage Cover – FD245 and FD250 Headers Only

3. Remove screw (B), washer (C), and nut (D) securing the front of the left linkage cover to bracket (A).

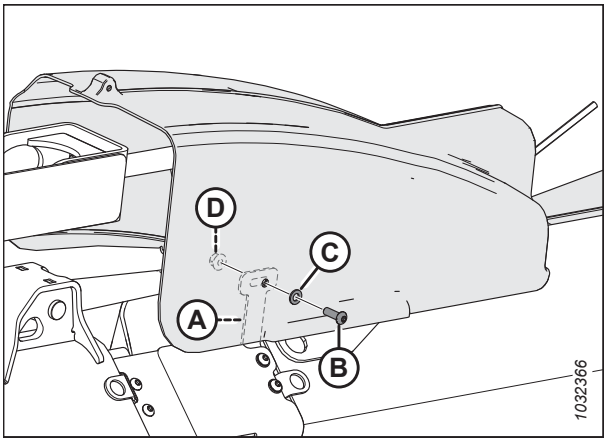


Figure 3.32: Left Linkage Cover – Front of Header

NOTE:

To remove snap rivets, unscrew rivet head (A) and push bottom (B) of the rivet out of clamp protrusion (C) from behind cover (D).

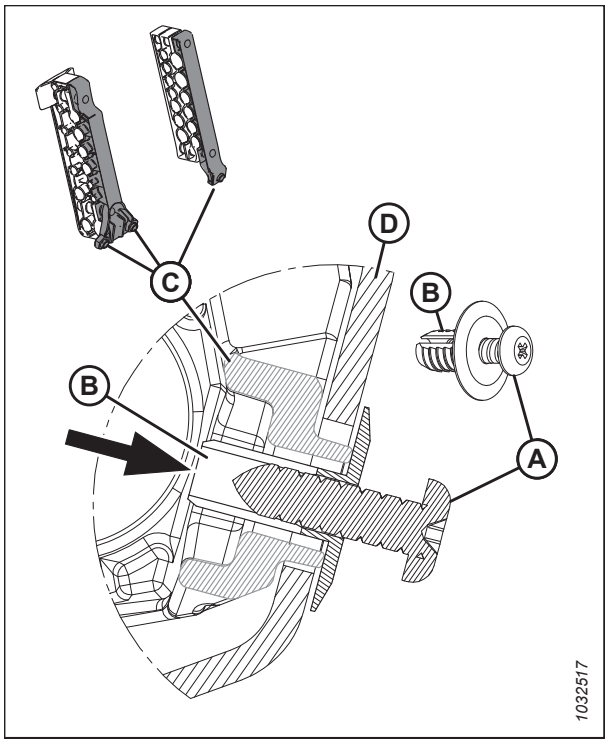


Figure 3.33: Rivets Used to Attach Covers

4. Remove M8 Torx® bolt (C) and Nyloc nut (D) securing the cover to the hose clamp.

5. Remove screw (A), then remove rivet (B).

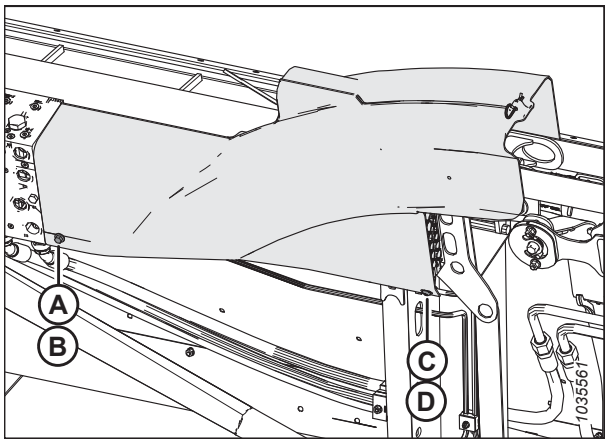


Figure 3.34: Left Linkage Cover – Rear of Header

6. Remove the cover by lifting it up and over wing lock (A) as shown.

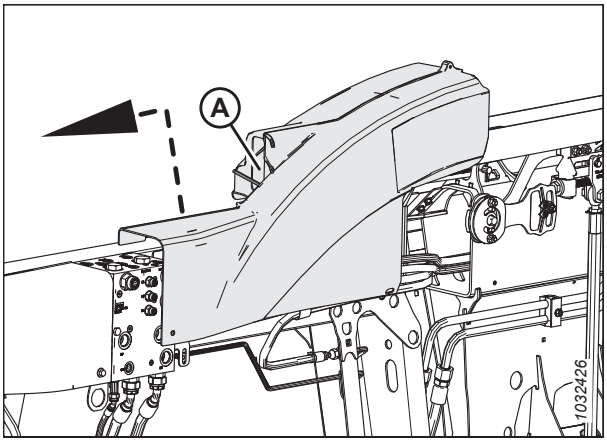


Figure 3.35: Left Linkage Cover – Rear of Header

7. Remove screw (B), flat washer (C), and nut (D) securing the front of the right linkage cover to bracket (A).

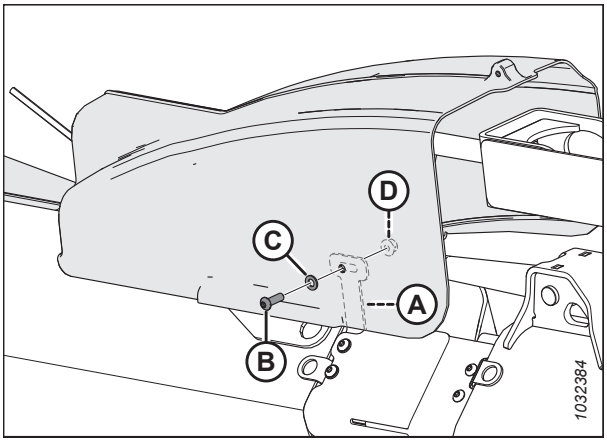


Figure 3.36: Right Linkage Cover – Front of Header

8. Remove Nyloc nut and M8 Torx® screw (A) and M8 Torx® screw (B) securing the cover to the hose clamps.

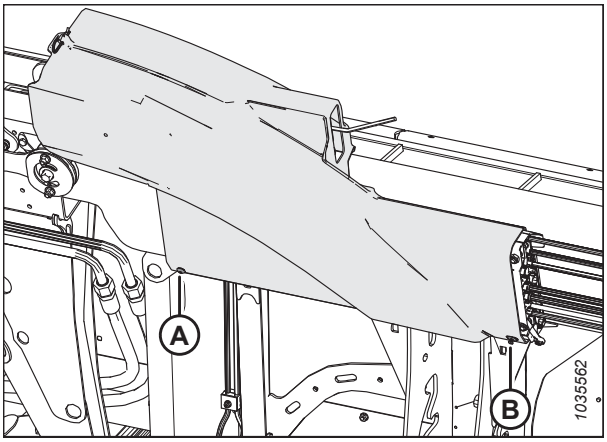


Figure 3.37: Right Linkage Cover – Rear of Header

9. Remove the cover by lifting it up and over wing lock (A) as shown.

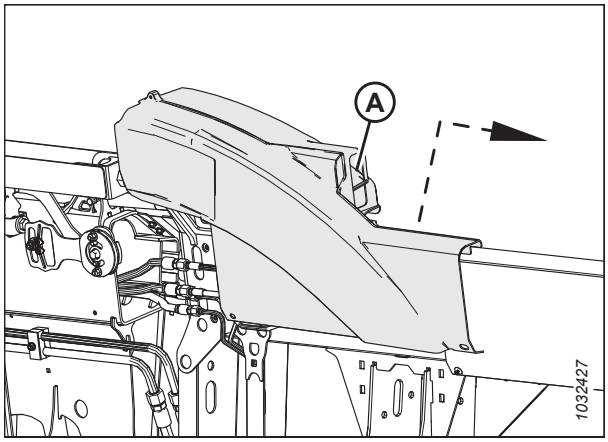


Figure 3.38: Right Linkage Cover – Rear of Header

Installing Outboard Flex Linkage Covers

Flex linkage covers protect the header wing balance mechanism from debris and weather.

1. Position the left outboard linkage cover so that hole (A) goes over the wing lock.

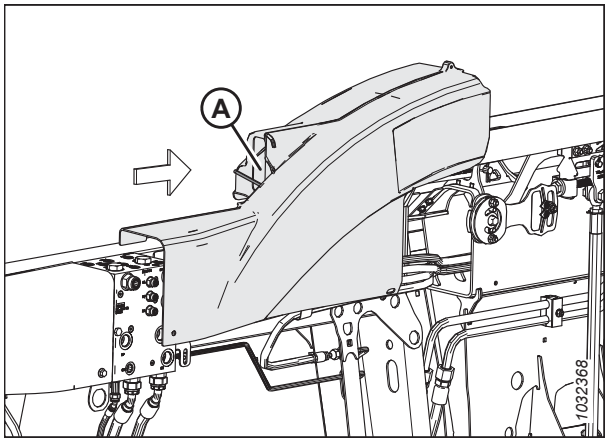


Figure 3.39: Left Linkage Cover – Rear of Header

2. Seat the notch in the cover behind bracket (A) on the backtube, and line up the end so that it is flush with manifold (B).

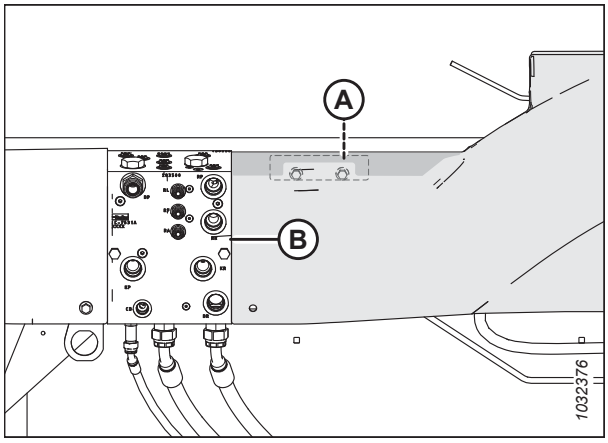


Figure 3.40: Left Linkage Cover – Rear of Header

NOTE:

To install snap rivets (if equipped), install cover (A) over clamp protrusion (B), push rivet housing (C) into clamp protrusion (B), and screw rivet head (D) in until the rivet head screw bottoms out.

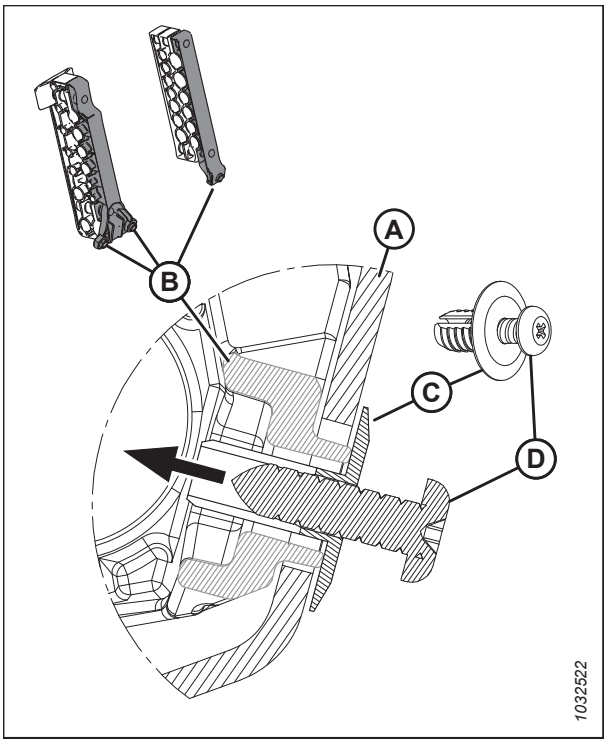


Figure 3.41: Rivets Used to Attach Covers

3. Attach the cover to the hose clamp using an M8 Torx® bolt (C) and Nyloc nut (D). Torque the hardware to 14 Nm (10 lbf·ft).

4. Fully insert rivet (A) into hole (B). Turn the screw until it bottoms out.

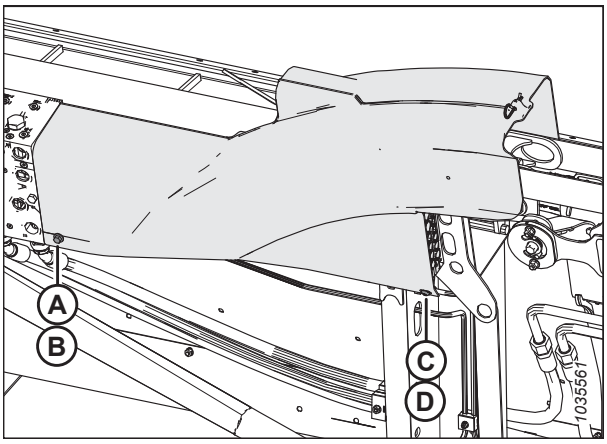


Figure 3.42: Left Linkage Cover – Rear of Header

5. **FD245 and FD250 headers:** On the left side of the header, place outboard flex cover (A) over flex cover (B) and over frame protrusions (C). .

6. Attach cover (A) to the bracket (not shown) using screw (D) and the nut (not shown). Torque the nut on screw (D) to 8 Nm (6 lbf·ft). Reinstall pin (E).

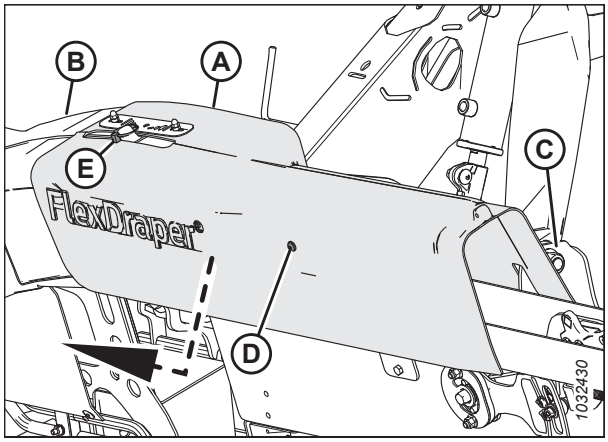


Figure 3.43: Outboard Linkage Cover – FD245 and FD250 Headers Only

7. Attach the front of the cover to bracket (A) using M8 x 25 mm socket screw (B), flat washer (C), and M8 center lock hex nut (D). Torque the hardware to 8 Nm (6 lbf·ft).

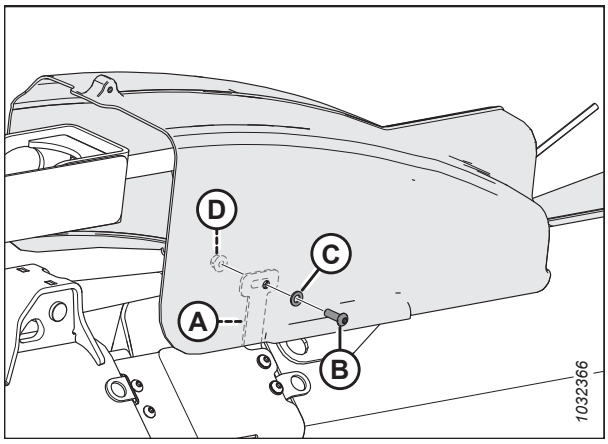


Figure 3.44: Left Linkage Cover – Front of Header

8. Position the right outboard linkage cover so that hole (A) goes over the wing lock.

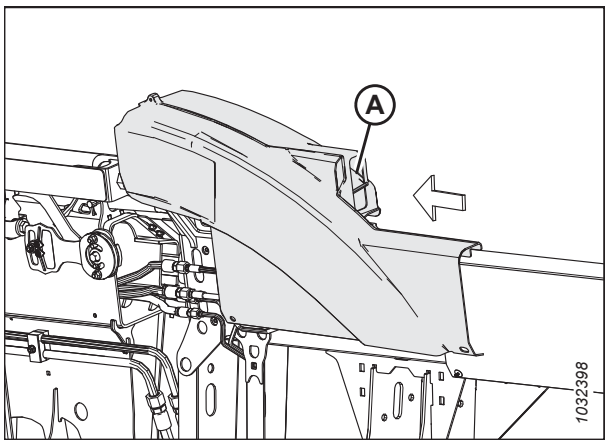


Figure 3.45: Right Linkage Cover – Rear of Header

9. Seat the notch in the cover behind hose clamp (A) on the backtube.

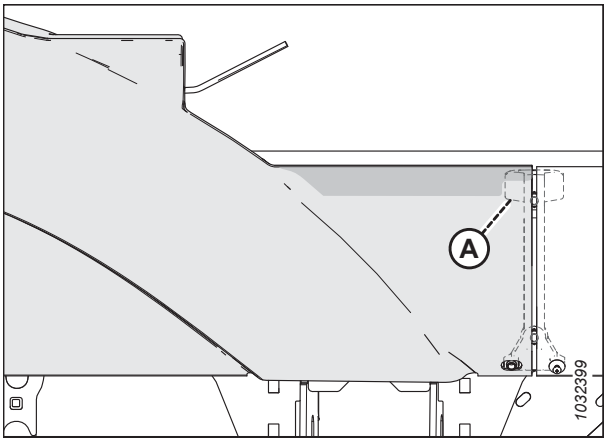


Figure 3.46: Right Linkage Cover – Rear of Header

10. Attach the cover to the hose clamps using a Nyloc nut and Torx® truss-head M8-1.25 20 mm long screw (A) and Torx® truss-head M8-1.25 x 16 mm long screw (B).

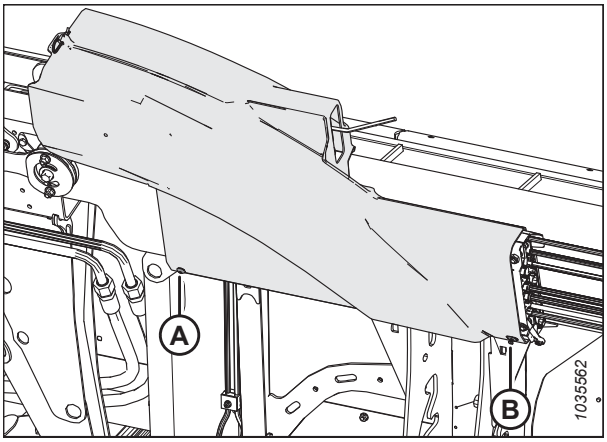


Figure 3.47: Right Linkage Cover – Rear of Header

11. Attach the front of the cover to bracket (A) using M8 x 25 mm socket screw (B), flat washer (C), and M8 center lock hex nut (D). Torque the hardware to 8 Nm (6 lbf·ft).

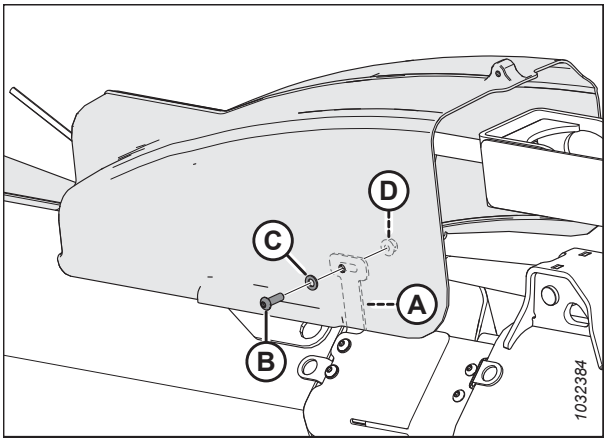


Figure 3.48: Right Linkage Cover – Front of Header

3.2.6 Daily Start-Up Check

Perform these checks daily before attempting to operate the machine.

CAUTION

- **Clear the area of bystanders. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.**
- **Wear close-fitting clothing and protective shoes equipped with slip-resistant soles.**
- **Remove potentially hazardous objects from the machine and from the surrounding area.**
- **Carry with you any protective clothing and personal safety devices that could be necessary through the day. Do NOT take chances. Personal safety devices that may be needed include a hard hat, protective glasses or goggles, heavy gloves, a respirator or filter mask, or wet weather gear.**
- **Protect against noise. Wear a suitable hearing protection device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.**

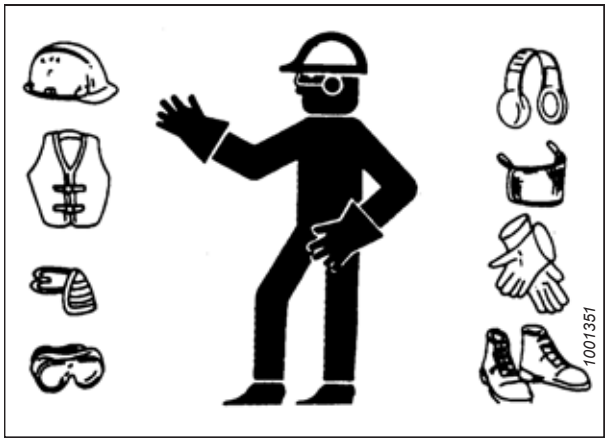


Figure 3.49: Safety Devices

Perform the following checks before starting the machine:

1. Check the machine for leaks and for any parts that are missing, damaged, or nonfunctional.

IMPORTANT:

Use the proper procedure when searching for pressurized fluid leaks. For instructions, refer to *4.2.5 Checking Hydraulic Hoses and Lines, page 478*.

2. Clean all the lights and reflectors on the machine.

3. Perform all daily maintenance. For instructions, refer to *4.2.1 Maintenance Schedule/Record, page 474*.

3.3 Break-in Period

During the first 50 hours of operation, certain systems on the header will require extra attention. Follow this procedure to ensure the service life of the header.

NOTE:

Until you become familiar with the sound and feel of your new header, be extra alert and attentive.

DANGER

Before investigating an unusual sound or attempting to correct a problem, shut off the engine and remove the key from the ignition.

After attaching the header to the combine for the first time, follow these steps:

1. Operate the machine with the reels, drapers, and knives running slowly for five minutes. Watch and listen **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

NOTE:

The reels and side drapers will not operate until hydraulic oil fills the lines.

2. Refer to *4.2.2 Break-In Inspection, page 476* and perform all specified tasks.

3.4 Shutting down the Combine

Before leaving the operator's seat for any reason, shut down the combine.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

To shut down the combine, do the following:

1. Park on level ground whenever possible.
2. Lower the header fully.
3. Place all controls in NEUTRAL or PARK.
4. Disengage the header drive.
5. Lower and fully retract the reel.
6. Shut down the engine, and remove the key from the ignition.
7. Wait for the machine to stop moving.

3.5 Cab Controls

The header is controlled from the combine cab.

WARNING

Be sure all bystanders are clear of the machine before starting the engine or engaging any header drives.

For instructions, refer to your combine operator's manual for identification of the following in-cab controls:

- Header engage/disengage control
- Header height
- Header angle
- Ground speed
- Reel speed
- Reel height
- Reel fore-aft position

3.6 Header Attachment/Detachment

This chapter includes instructions for configuring, attaching, and detaching the header.

Combine	Refer to
AGCO (Challenger®, Gleaner, and Massey Ferguson®) Combines	*3.6.1 Challenger®, Gleaner, and Massey Ferguson® Combines, page 68*
AGCO IDEAL™ Series	*3.6.2 IDEAL™ Series Combines, page 76*
Case IH 7010/8010, 120, 130, 230, 240, 250 Series	*3.6.3 Case IH Combines, page 80*
CLAAS 500 (including R Series), 600, and 700 Series, 7000/8000 Series, and Tucano	*3.6.4 CLAAS Combines, page 86*
John Deere 60, 70, S, and T Series	*3.6.5 John Deere Combines, page 95*
New Holland CR, CX	*3.6.6 New Holland Combines, page 103*

NOTE:

Ensure the applicable functions (e.g., Automatic Header Height Control [AHHC], draper header option, hydraulic center-link option, hydraulic reel drive) are enabled on the combine and the combine computer. Failure to do so may result in improper header operation.

3.6.1 Challenger®, Gleaner, and Massey Ferguson® Combines

To attach the header to or to detach it from a Challenger®, Gleaner, or Massey Ferguson® combine, follow the relevant procedure in this section.

Attaching Header to an AGCO Challenger®, Gleaner, or Massey Ferguson® Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Use lock handle (B) to retract lugs (A) at the base of the feeder house.

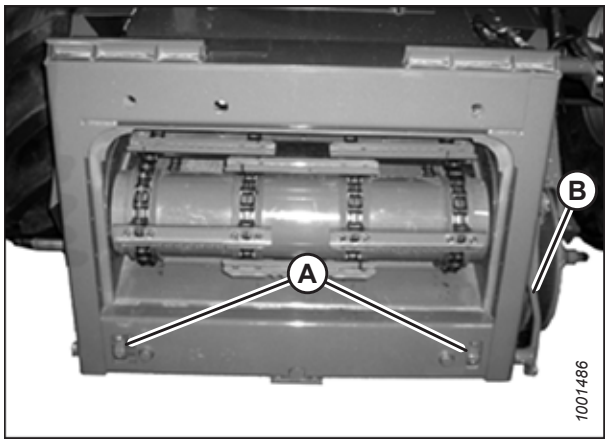


Figure 3.50: AGCO Group Feeder House

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

3. Start the engine and slowly approach the header until the feeder house is directly under float module top cross member (A) and alignment pins (C) (refer to Figure *3.52, page 69*) on the feeder house are aligned with holes (B) in the float module frame.

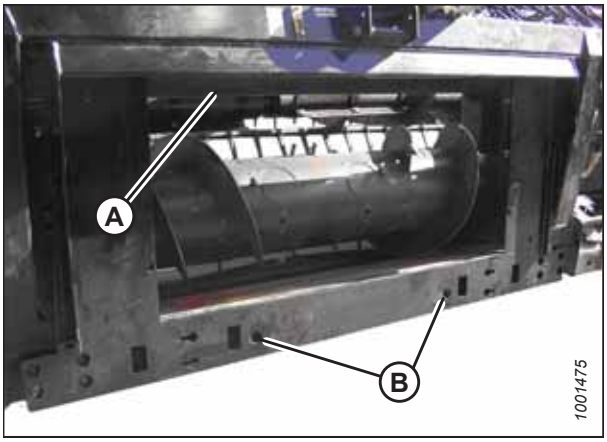


Figure 3.51: Float Module

NOTE:

Your combine feeder house may not be exactly as shown.

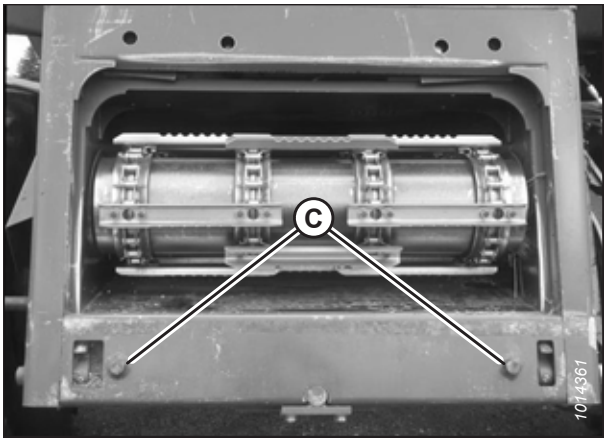


Figure 3.52: AGCO Group Alignment Pins

4. Raise the feeder house slightly to lift the header, ensuring feeder house saddle (A) is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.

Figure 3.53: Feeder House and Float Module

6. Use lock handle (B) to engage lugs (A) with the float module.

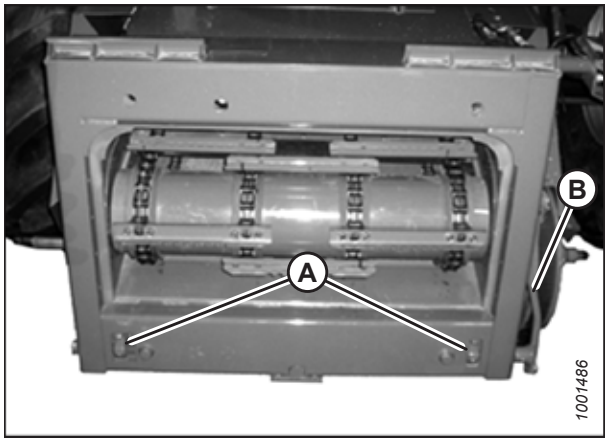


Figure 3.54: AGCO Group Feeder House

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

7. Start the engine. For instructions, refer to the combine operator's manual.

8. Lower the header fully.

NOTE:

The float module is equipped with a multicoupler that connects to the combine. If your combine is equipped with individual connectors, a multicoupler kit (single-point connector) must be installed. Refer to Table *3.1, page 70* for a list of kits and installation instructions that are available through your combine Dealer.

Table 3.1 Multicoupler Kits

Combine	AGCO Kit Number
Challenger®	71530662
Gleaner R/S Series	71414706
Massey Ferguson®	71411594

9. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

   NOTE:

   Illustration at right shows the right side of the header. Float lock on left side of header opposite.

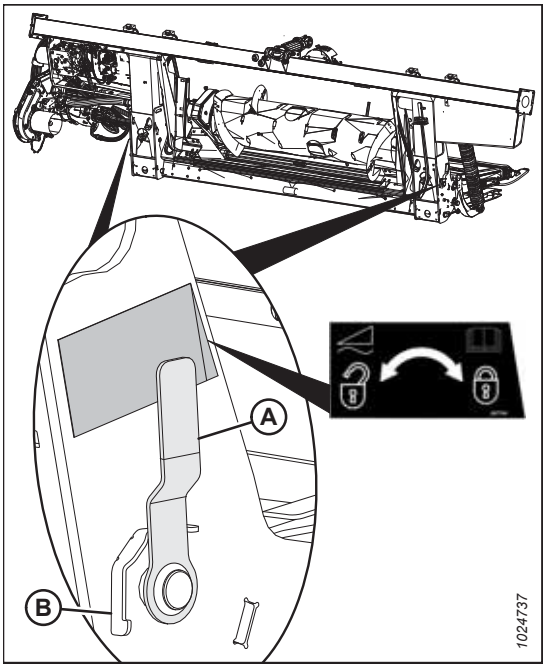


Figure 3.55: Float Lock Handle

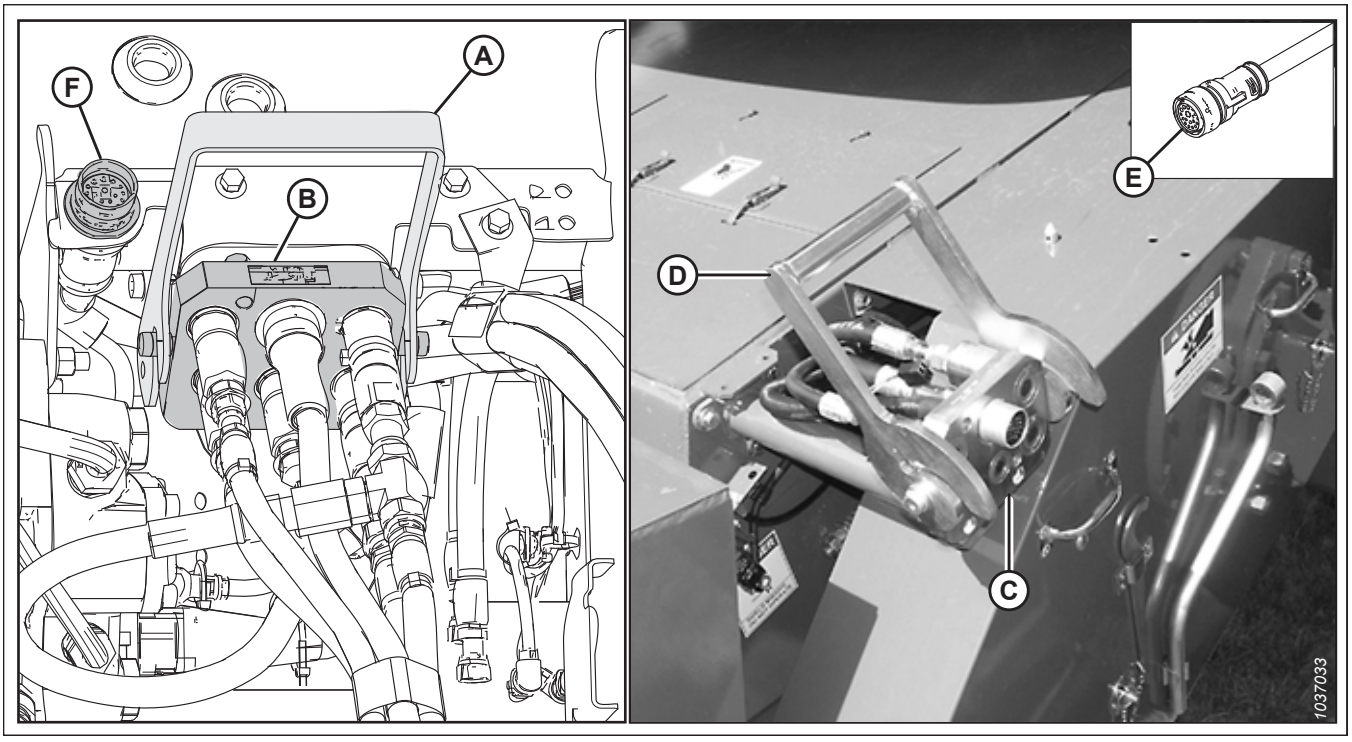


Figure 3.56: Hydraulics and Electrical Multicoupler

10. Raise handle (A) to release multicoupler (B) from float module.

11. Raise handle (D) on the combine to the fully-opened position, and clean the mating surfaces of multicoupler (B) and receptacle (C).

12. Position multicoupler (B) onto the combine receptacle (C), and pull handle (D) to fully engage the multicoupler into the receptacle.

13. Retrieve cab control kit connector C81A (E) from the storage location on the combine and connect it to C81B (F) on the float module. Turn the collar on the connector to lock it in place.

14. Detach safety chain (C) from support bracket (B).

15. Pull driveline collar (A) back to release driveline from support bracket. Remove the driveline from the support bracket.

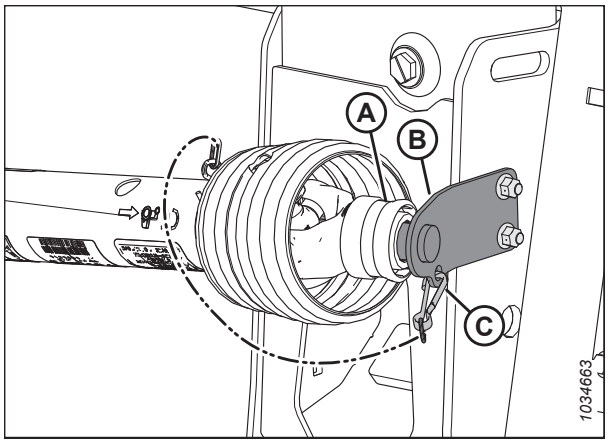


Figure 3.57: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

16. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

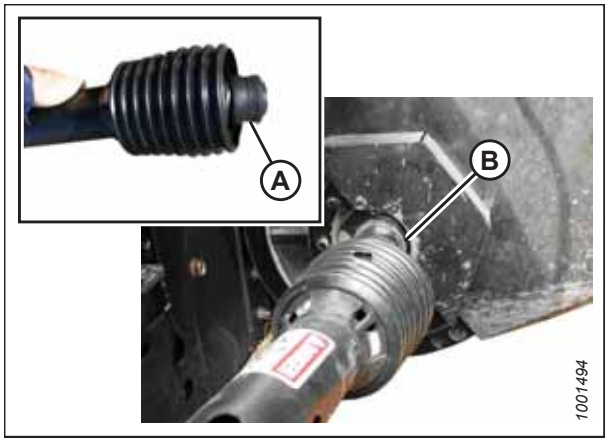


Figure 3.58: Driveline

Detaching Header from a Challenger®, Gleaner, or Massey Ferguson® Combine

Each combine model has specific instructions on how to detach the header.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Choose a level area and position the header slightly above the ground.

2. Shut down the engine, and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.

3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   Illustration at right shows the right side of the header. Float lock on left side of header opposite.

4. Disconnect driveline (A) from combine output shaft (B).

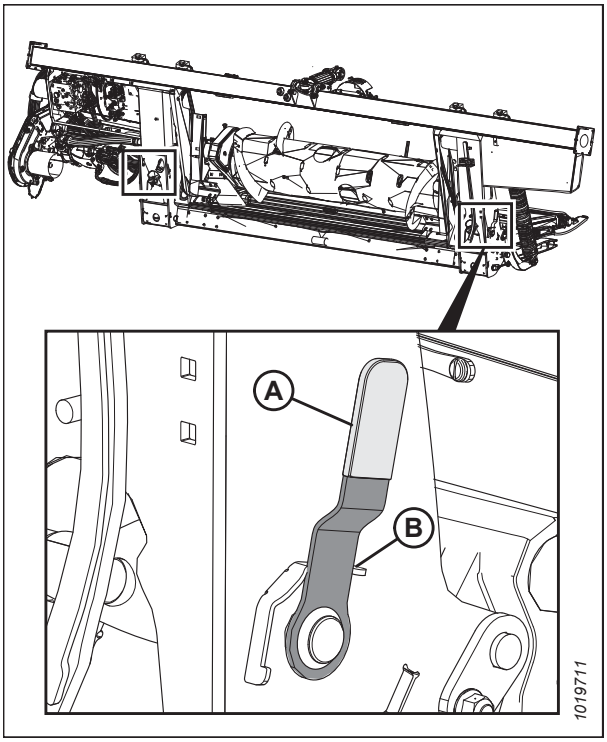


Figure 3.59: Float Lock Handle – Right Shown in Detail, Left Opposite

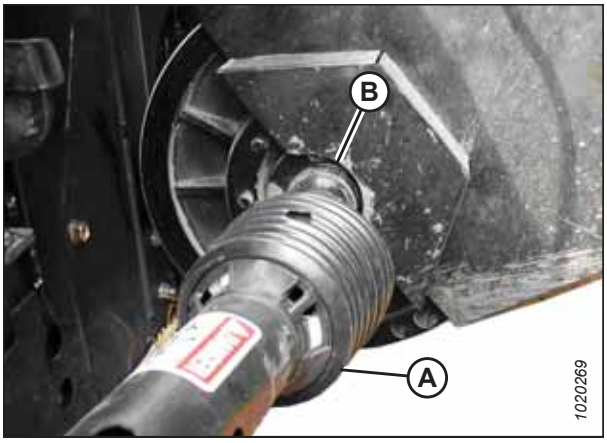


Figure 3.60: Driveline

5. Store driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it over the support bracket body and releasing the collar so it locks into place.

6. Attach driveline safety chain (C) to bracket (B).

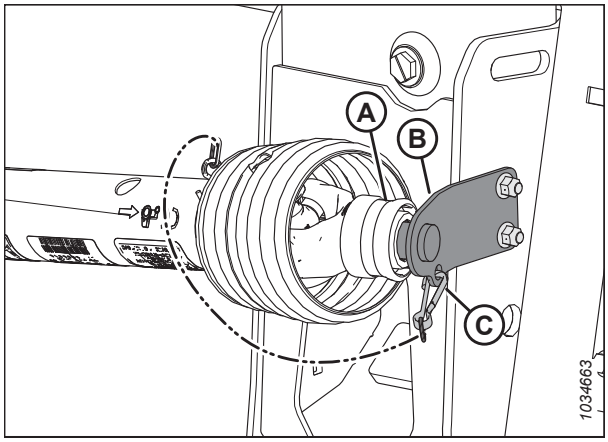


Figure 3.61: Storing the Driveline

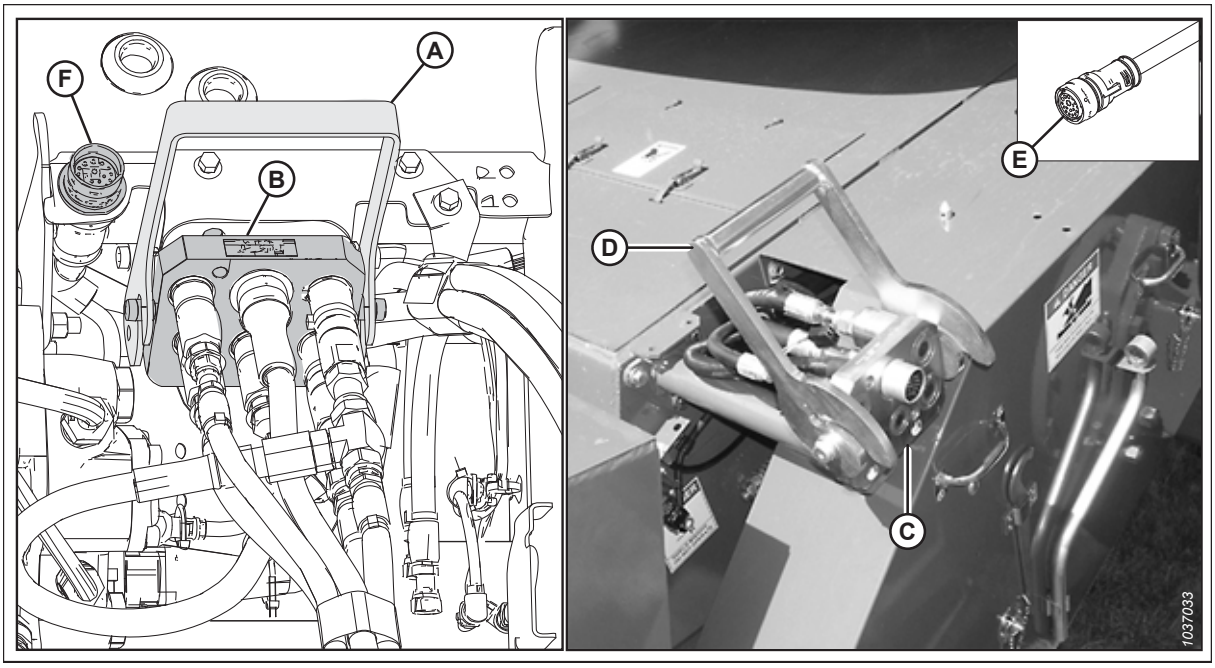


Figure 3.62: Hydraulics and Electrical Multicoupler

7. Turn collar to release cab kit control connector from receptacle C81B (F), and return connector (E) to a storage location on the combine.

8. Raise handle (D) to the fully open position to release the multicoupler from receptacle (C) on the combine.

9. Raise handle (A) on the float module, and place multicoupler (B) on the float module receptacle.

10. Lower handle (A) to lock multicoupler (B).

11. Use lock handle (B) to retract lugs (A) at the base of the feeder house.

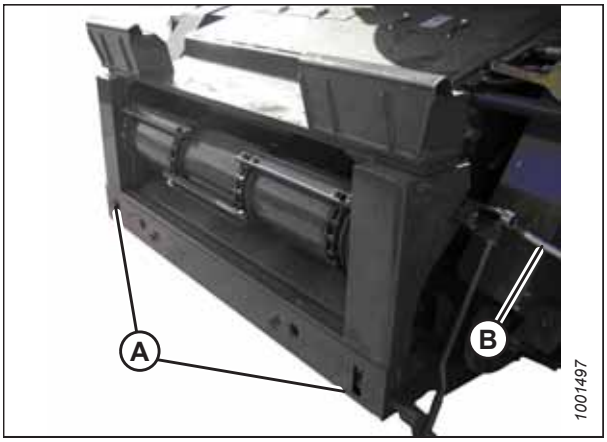


Figure 3.63: Challenger® and Massey Ferguson®

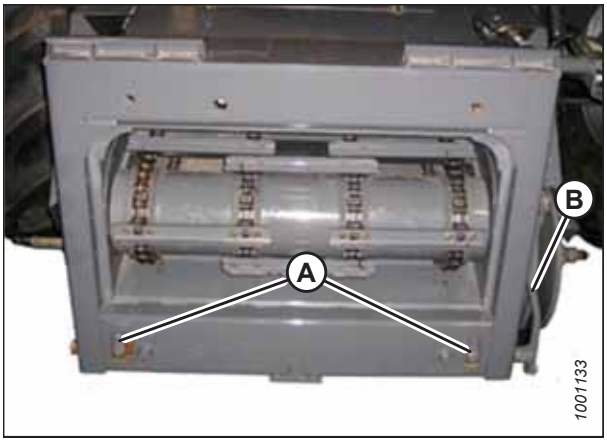


Figure 3.64: Gleaner R and S Series

12. Lower the feeder house until saddle (A) disengages and clears float module support (B).
13. Back the combine away slowly from the float module.

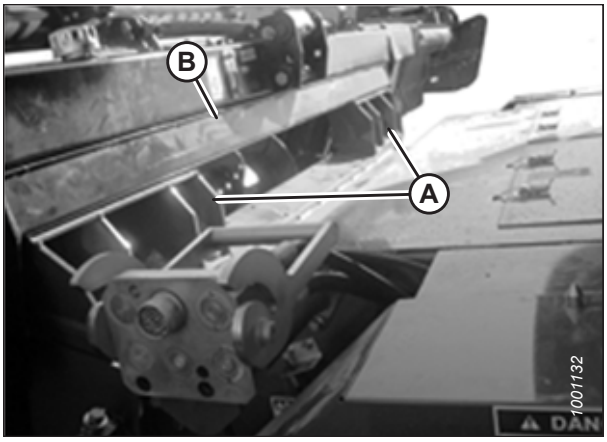


Figure 3.65: Float Module on Combine

3.6.2 IDEAL™ Series Combines

To attach the header to or detach it from an IDEAL™ combine, follow the relevant procedure in this section.

Attaching Header to an IDEAL™ Series Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Pull lever (A) up to retract pins (B) at the bottom left and right sides of the feeder house.
3. Start the engine. For instructions, refer to the combine operator's manual.

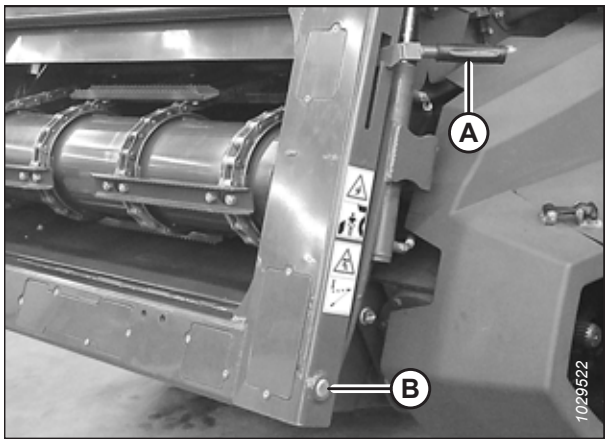


Figure 3.66: Feeder House

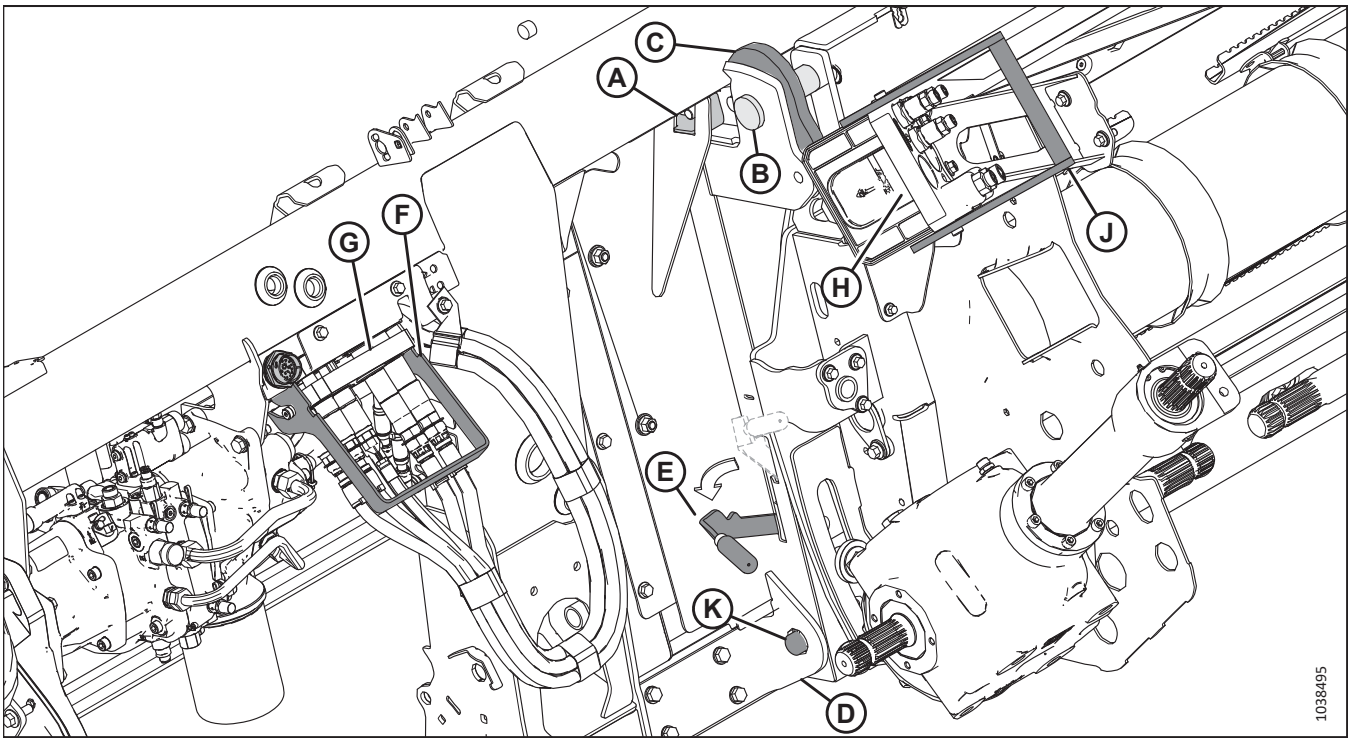


Figure 3.67: Float Module

4. Drive the combine slowly up to the header until the feeder house is directly under top beam (A), and pins (B) are under hooks (C) on the transition frame.
5. Raise the feeder house until transition frame top beam (A) is fully resting on the feeder house. Raise the header slightly off the ground.

   IMPORTANT:

   The full weight of the header must be on the feeder house, **NOT** on pins (B).
6. Position the bottom of the feeder house so that locking pins (K) align with the holes in mount (D).
7. Push lever (E) down to extend locking pins (K) so they engage in mount (D).
8. Lower handle (F) to release multicoupler (G) from the header.
9. Open the cover on the combine receptacle (H).
10. Push handle (J) to the fully open position.
11. Clean the mating surfaces of the coupler and receptacle if necessary.
12. Position coupler (G) onto combine receptacle (H), and pull handle (J) to fully engage the multicoupler into the receptacle.
13. Detach safety chain (C) from support bracket (B).
14. Pull driveline collar (A) back to release the driveline from the support bracket. Remove the driveline from the support bracket.

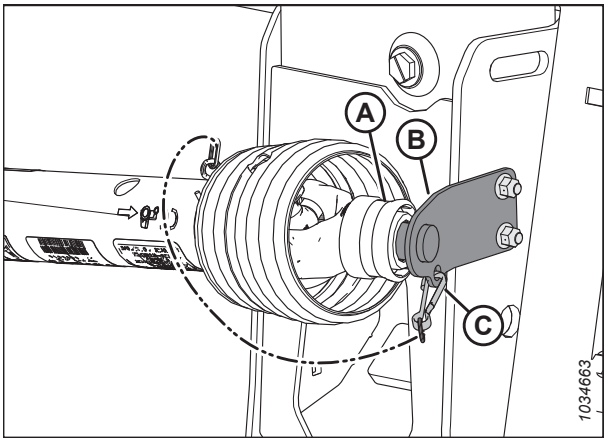


Figure 3.68: Driveline in Storage Position

15. Pull back collar (A) on the end of driveline and push it onto combine output shaft (B) until the collar locks.

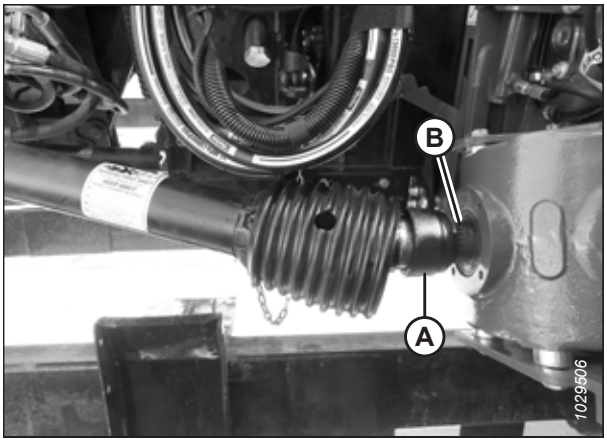


Figure 3.69: Connecting Driveline to Combine

Detaching Header from IDEAL™ Series Combine

The header will need to be physically disconnected from the combine, and the hydraulic and electrical connections removed.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat.

1. Park the combine on a level surface.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Push combine receptacle handle (B) to the fully-open position to release multicoupler (A).

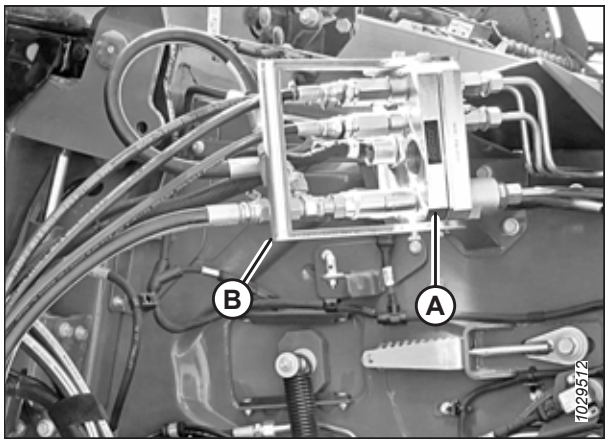


Figure 3.70: Combine Receptacle

5. Position multicoupler (B) onto the header receptacle, and move handle (A) to a vertical position to lock the multicoupler.

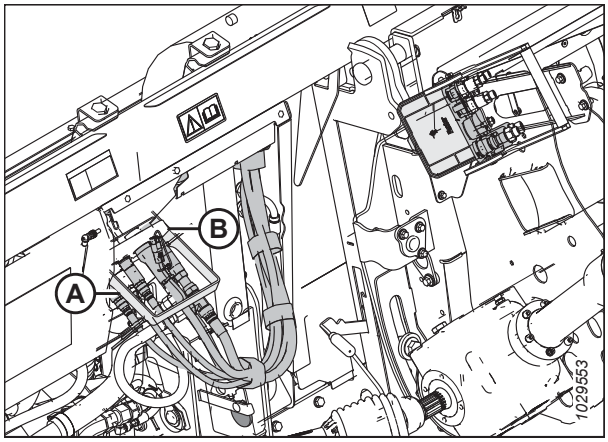


Figure 3.71: Locking Multicoupler

6. Pull back driveline collar (A) and remove the driveline from combine output shaft (B).

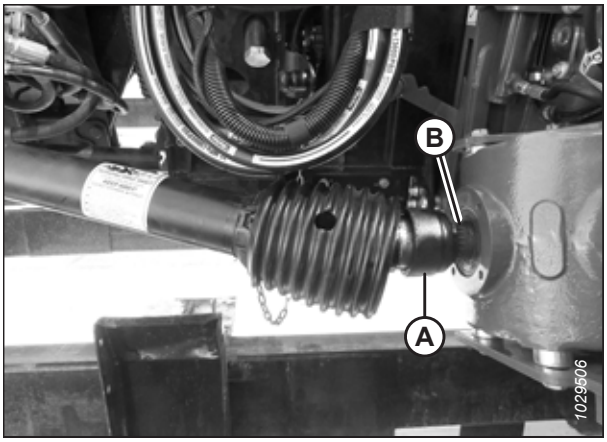


Figure 3.72: Detaching Driveline

7. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the bracket.
8. Attach safety chain (C) to support bracket (B).

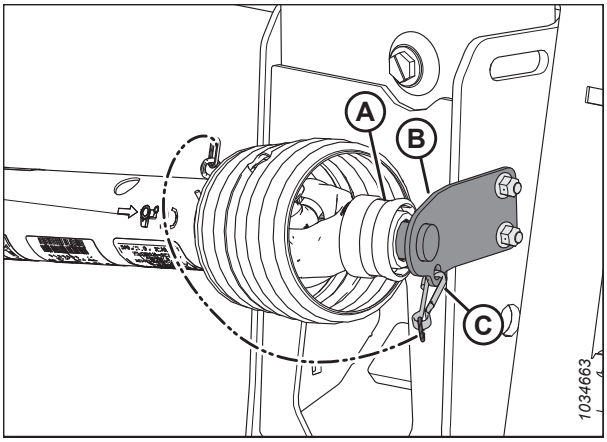


Figure 3.73: Driveline in Storage Position

9. Pull lever (A) up to retract pins (B) at the base of the feeder house.

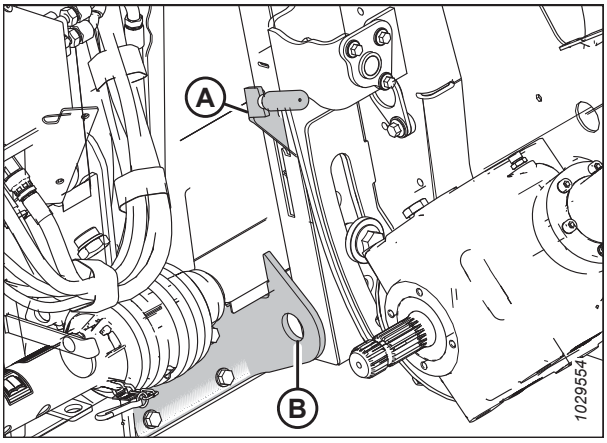


Figure 3.74: Feeder House Locking Pins

10. Start the combine and lower the header to the ground until feeder house pins (A) are clear of hooks (B).
11. Slowly back the combine away from the header.

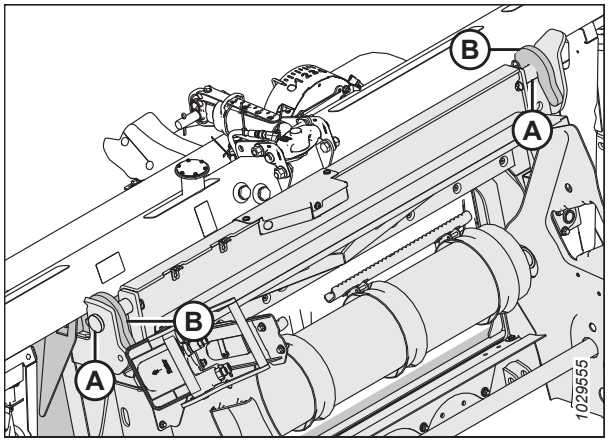


Figure 3.75: Lowering Feeder House

3.6.3 Case IH Combines

To attach the header to or detach it from a Case IH combine, follow the relevant procedure in this section.

Attaching Header to Case IH Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. On the combine, ensure lock handle (A) is positioned so hooks (B) can engage the float module.

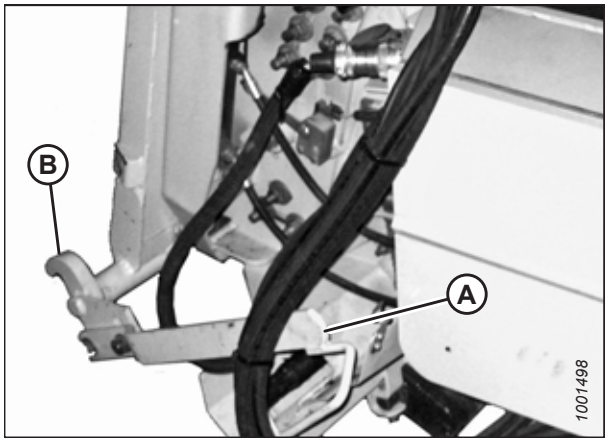


Figure 3.76: Feeder House Locks

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

2. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).

3. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.

4. Shut down the engine, and remove the key from the ignition.

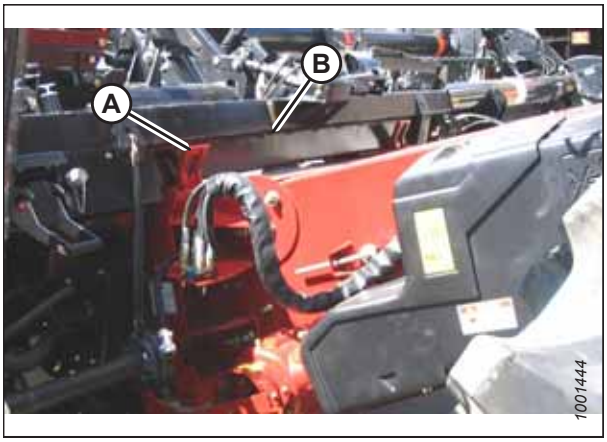


Figure 3.77: Combine and Float Module

5. On the left side of the feeder house, lift lever (A) on the float module and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.

6. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.

7. If lock (C) does not fully engage the pin on the float module, loosen bolts (D) and adjust lock. Retighten the bolts.

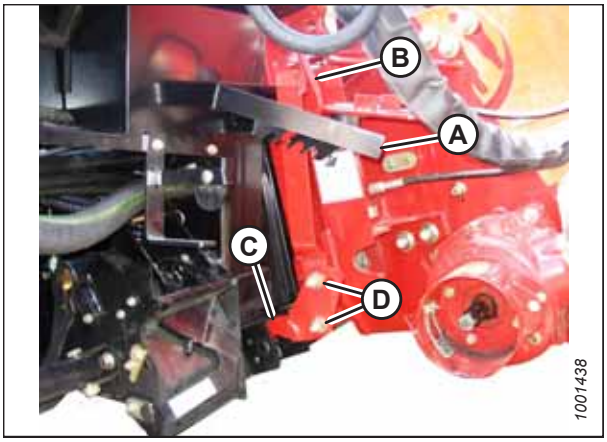


Figure 3.78: Combine and Float Module

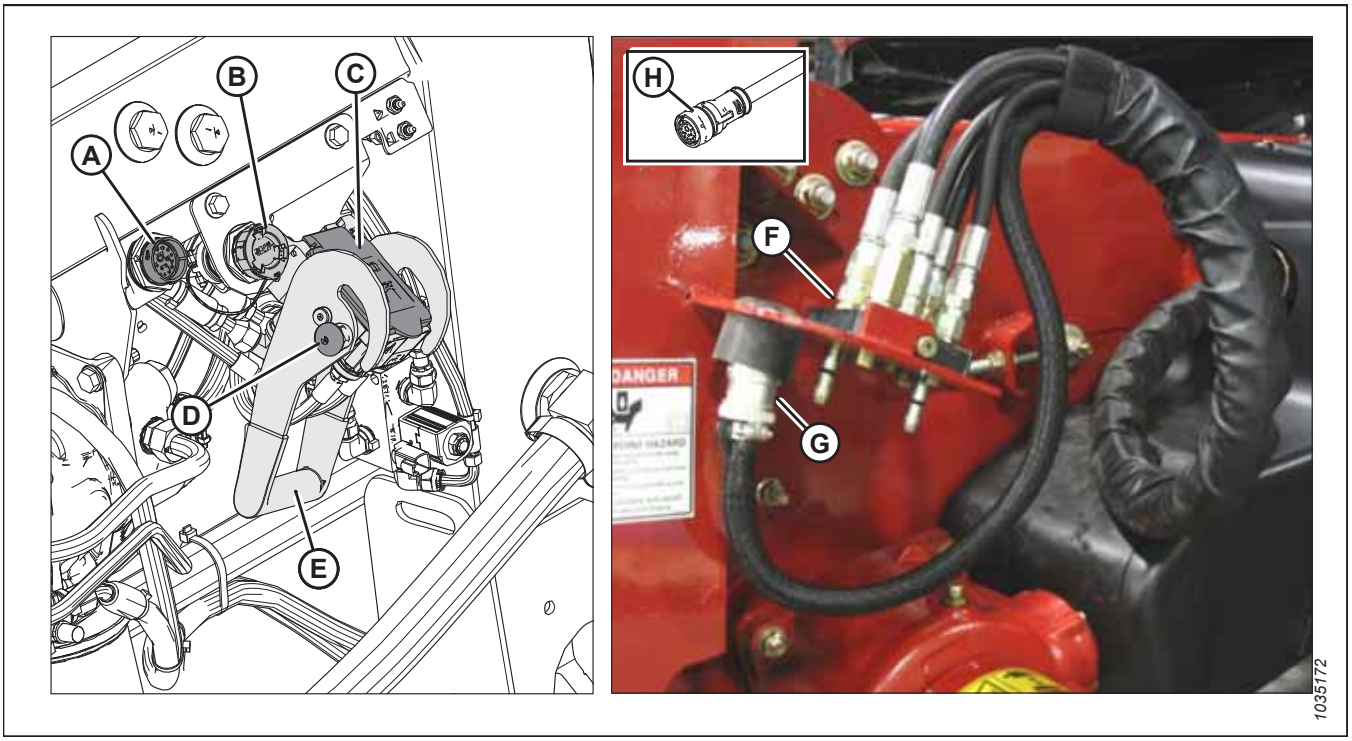


Figure 3.79: Multicoupler and Electrical Connections

8. Remove the caps from connectors C81B (A) and (B).
9. Remove the cover from hydraulic receptacle (C). Clean the receptacle mating surfaces.
10. Push in lock button (D) and pull handle (E) to the fully open position.
11. Remove hydraulic quick coupler (F) from the storage plate on the combine. Clean the mating surface of the coupler.
12. Position coupler (F) onto the float module receptacle (C), and push handle (E) to engage the pins into the receptacle.
13. Push handle (E) to closed position until lock button (D) snaps out.
14. Remove combine connector (G) from the storage location on the combine and connect it to receptacle (B). Turn the collar on the connector to lock it in place.
15. Remove cab control kit connector C81A (H) from the storage location on the combine and connect it to C81B (A). Turn the collar on the connector to lock it in place.
16. Detach safety chain (C) from support bracket (B).
17. Pull driveline collar (A) back to release the driveline from the support bracket. Remove the driveline from the support bracket.

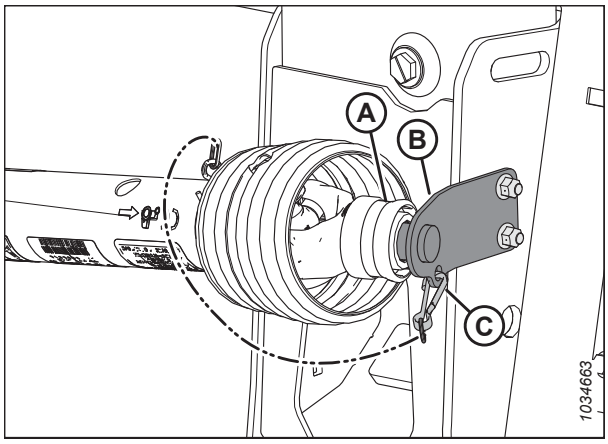


Figure 3.80: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

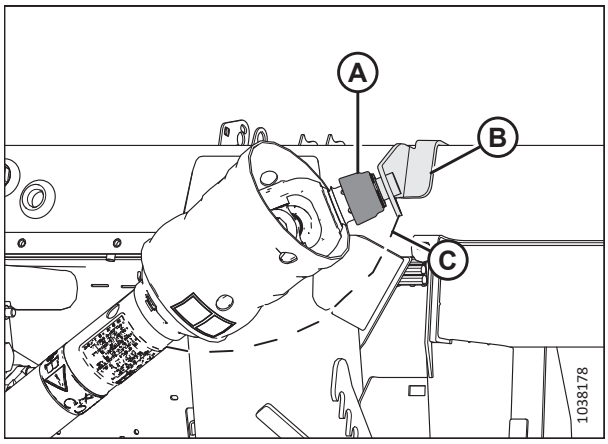


Figure 3.81: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7180, MD #B7181, or MD #B7326

18. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

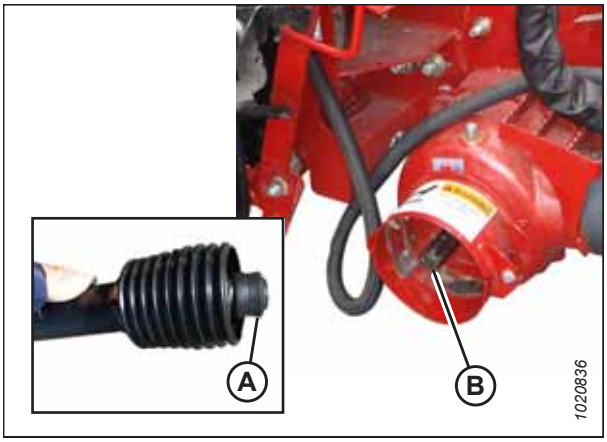


Figure 3.82: Combine Output Shaft

19. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

    NOTE:

    The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.

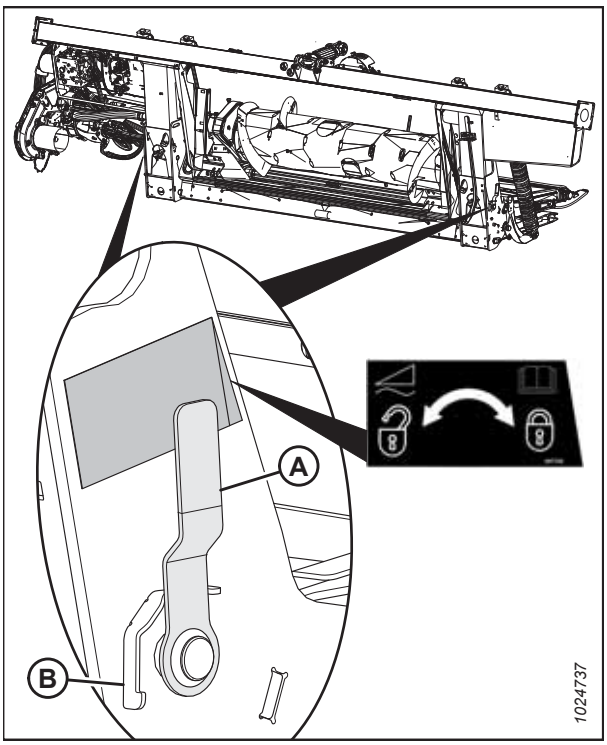


Figure 3.83: Float Lock Handle

Detaching Header from Case IH Combine

The header will need to be physically disconnected from the combine, and the hydraulic and electrical connections removed.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Park the combine on a level surface.
2. Position the header slightly above the ground.
3. Shut down the engine, and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.
4. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.
5. Push back collar (A) on the end of the driveline and pull the driveline out of combine output shaft (B) until the collar disengages.

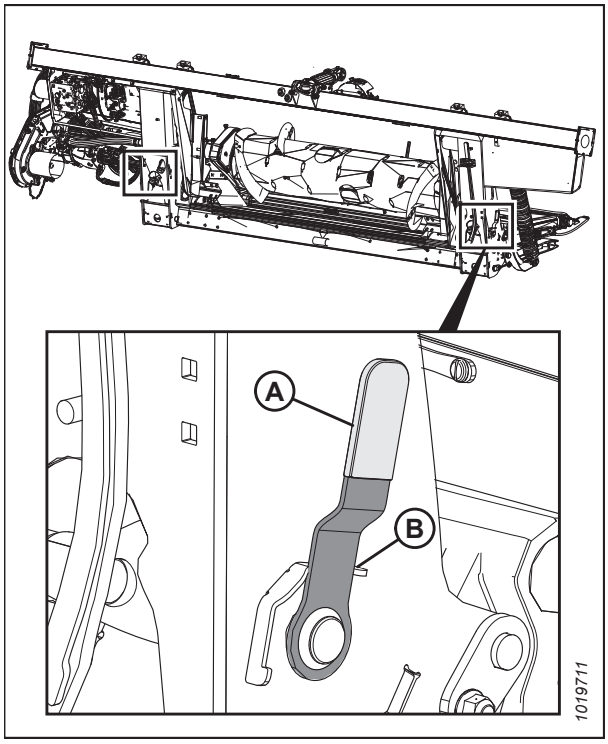


Figure 3.84: Float Lock Handle

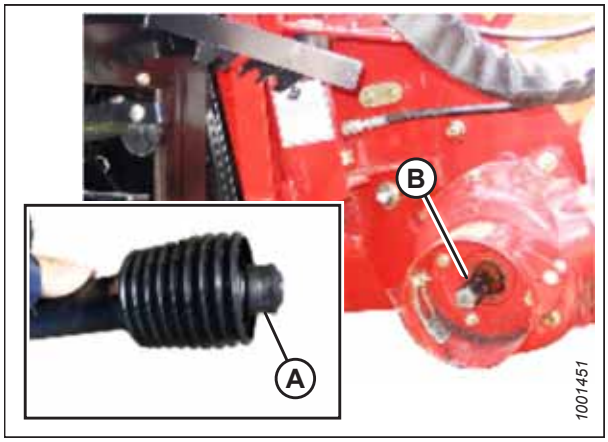


Figure 3.85: Driveline

6. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the support bracket.

7. Attach safety chain (C) to support bracket (B).

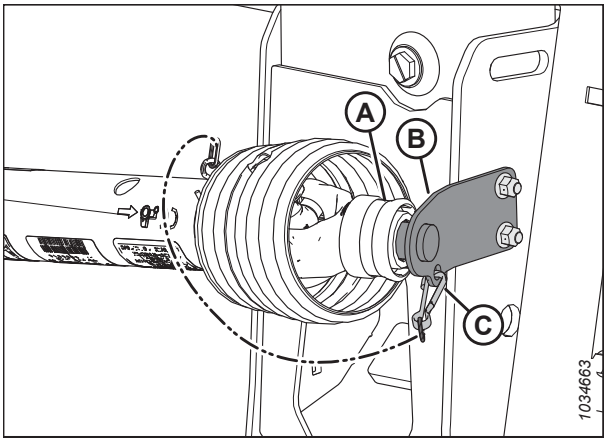


Figure 3.86: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

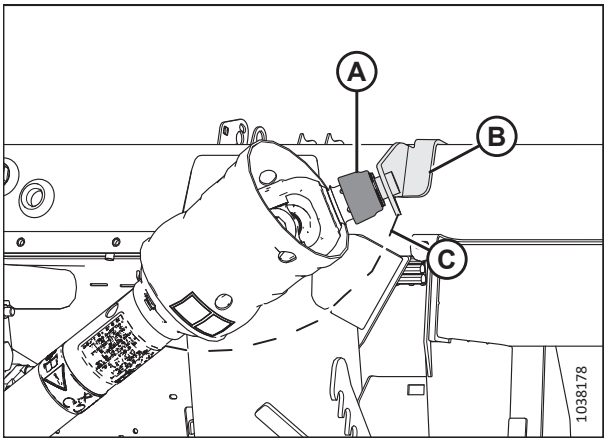


Figure 3.87: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7180, MD #B7181, or MD #B7326

8. Remove electrical connector (A) and replace cover (B).

9. Push in lock button (C) and pull handle (D) to release multicoupler (E).

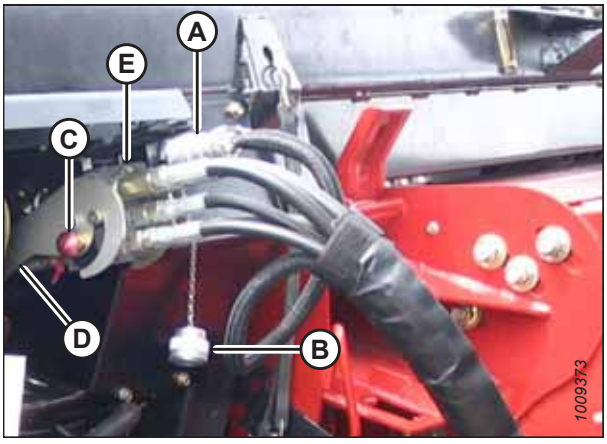


Figure 3.88: Multicoupler

10. Position multicoupler (A) onto storage plate (B) on the combine.
11. Place electrical connector (C) in storage cup (D).

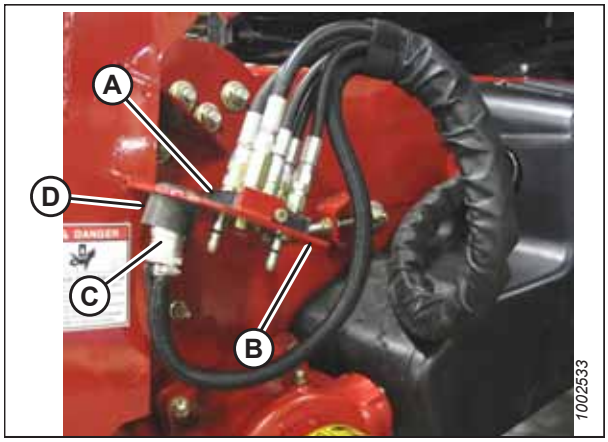


Figure 3.89: Multicoupler Storage

12. Push handle (A) on the float module receptacle to the closed position until lock button (B) snaps out. Close the cover.

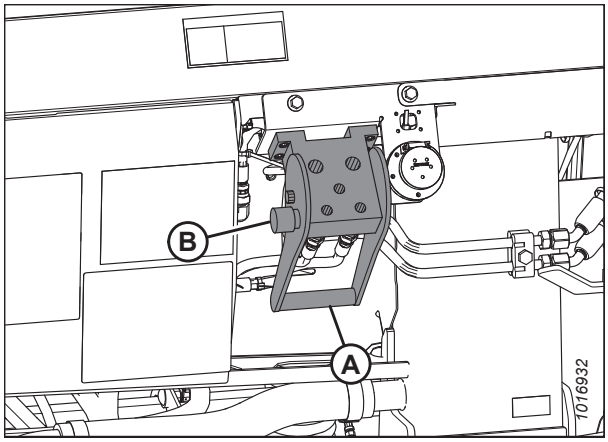


Figure 3.90: Float Module Receptacle

13. Lift lever (A) and pull, and lower handle (B) to disengage feeder house/float module lock (C).

WARNING

Check to be sure all bystanders have cleared the area.

14. Lower the feeder house until it disengages the float module support.
15. Back the combine away slowly from the float module.

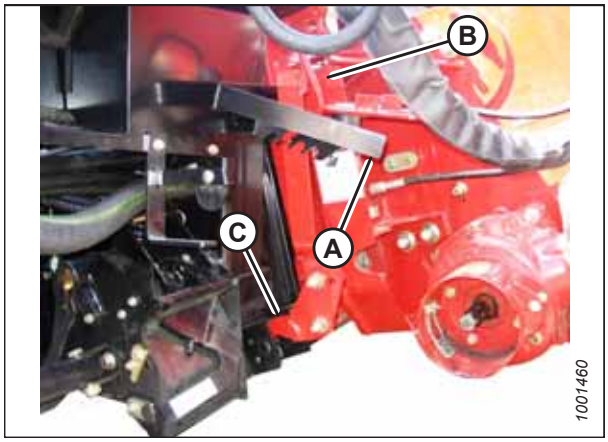


Figure 3.91: Feeder House Locks

3.6.4 CLAAS Combines

To attach the header to or detach it from a CLAAS combine, follow the relevant procedure in this section.

The FD2 Series FlexDraper® Header is compatible with CLAAS Lexion 500, 600, and 700 series, Tucano, and 7000, 8000 series combines.

Attaching Header to CLAAS Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Move handle (A) on the float module into the raised position, and ensure pins (B) at the bottom corners of the float module are retracted.

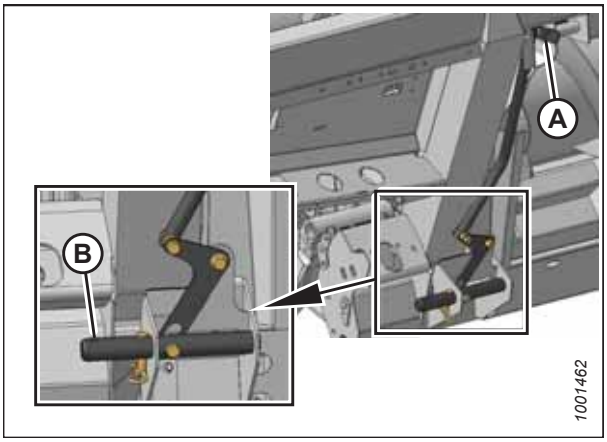


Figure 3.92: Pins Retracted

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).
4. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.
5. Shut down the engine, and remove the key from the ignition.

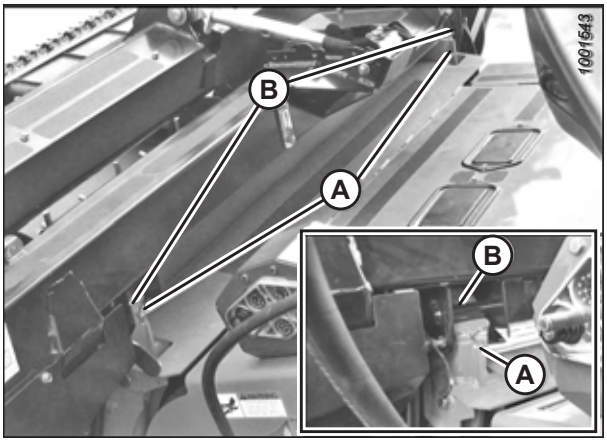


Figure 3.93: Header on Combine

6. Remove locking pin (B) from float module pin (A).

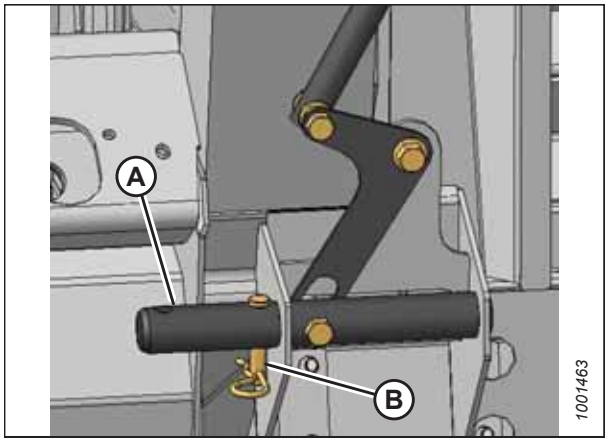


Figure 3.94: Locking Pins

7. Lower handle (A) to engage float module pins (B) into the feeder house. Reinsert locking pin (C) and secure with the hairpin.

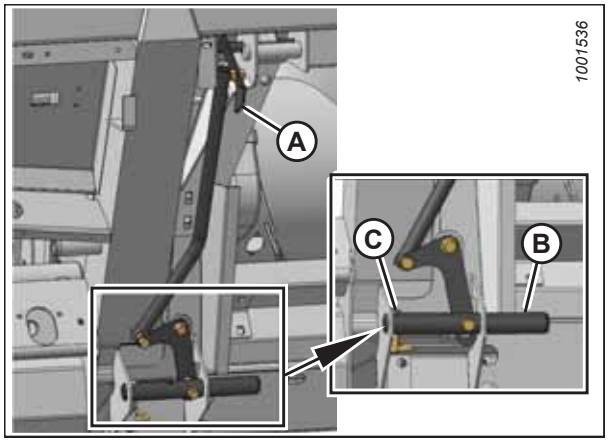


Figure 3.95: Engaging Pins

8. Remove float module receptacle cover (A). Clean the receptacle.

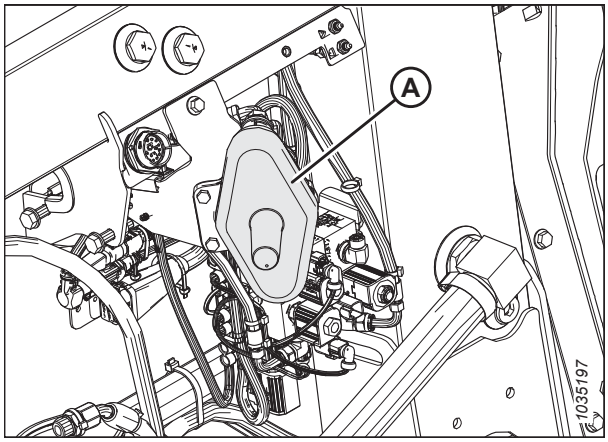


Figure 3.96: Receptacle Cover

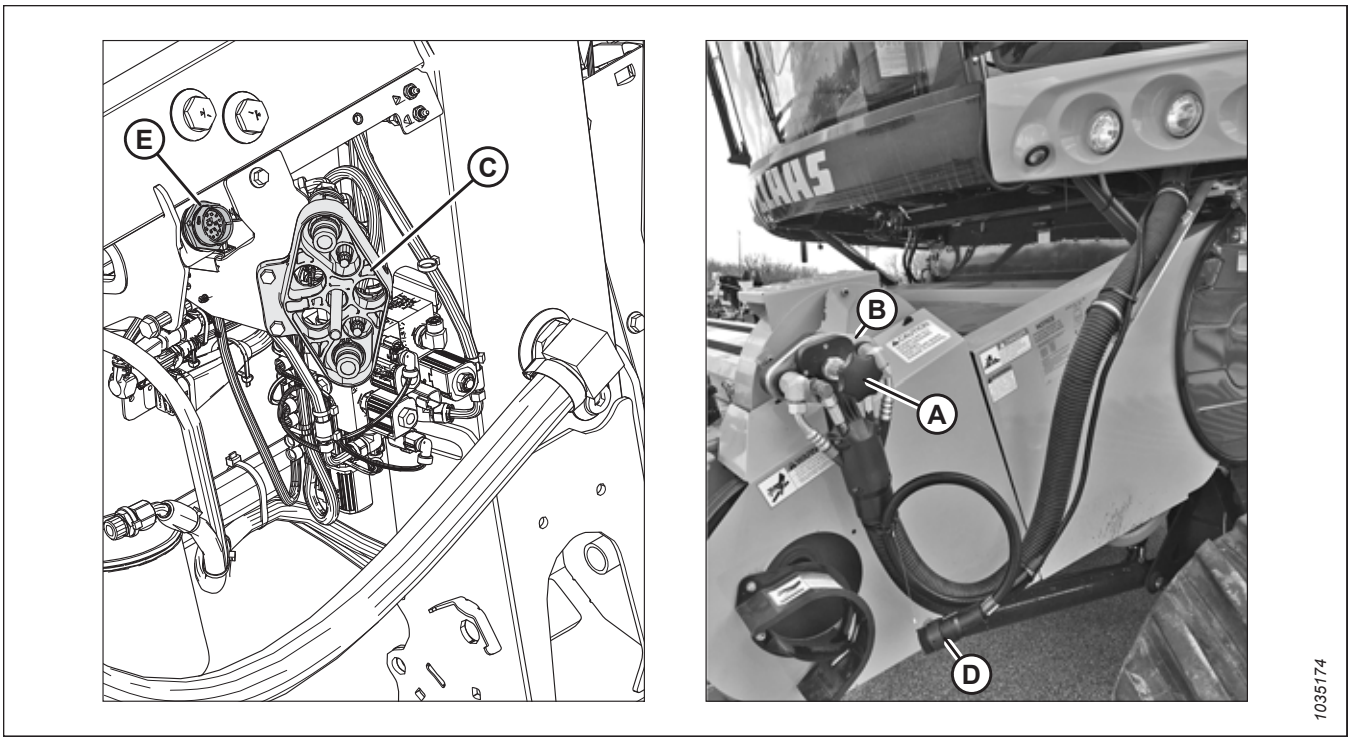


Figure 3.97: Multicoupler and Electrical Connections

9. Unscrew knob (A) on combine coupler (B) to release the coupler from the receptacle.

10. Clean coupler (B), and the receptacle.

11. Install combine coupler (B) onto float module receptacle (C) and secure using knob (A).

12. Remove cab control kit connector C81A (D) from the storage location on the combine and connect it to C81B (E) on the float module. Turn the collar on the connector to lock it in place.

13. Place float module receptacle cover (A) onto the combine receptacle.

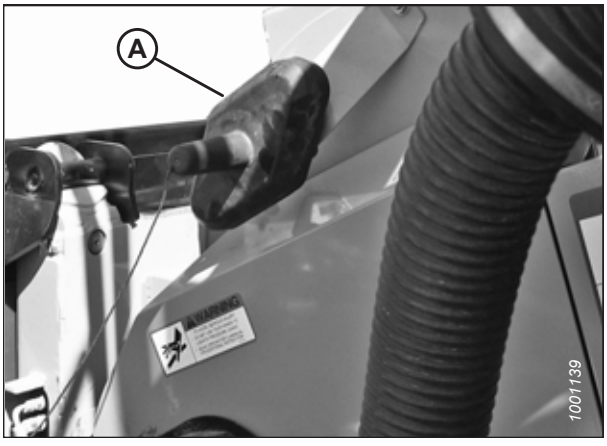


Figure 3.98: Receptacle Cover

14. Detach safety chain (C) from support bracket (B).

15. Pull driveline collar (A) back to release driveline from the support bracket. Remove the driveline from the support bracket.

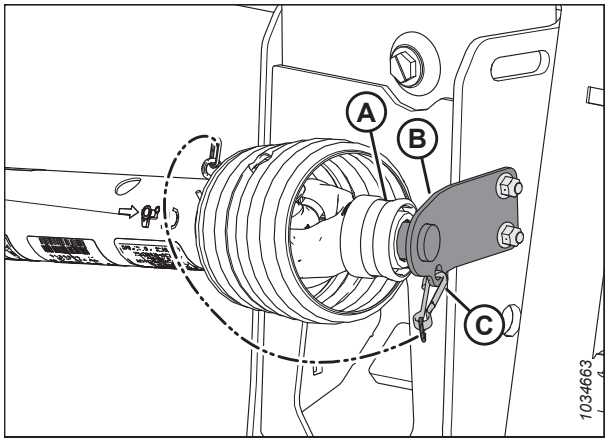


Figure 3.99: Driveline in Storage Position – Driveline MD #B7039

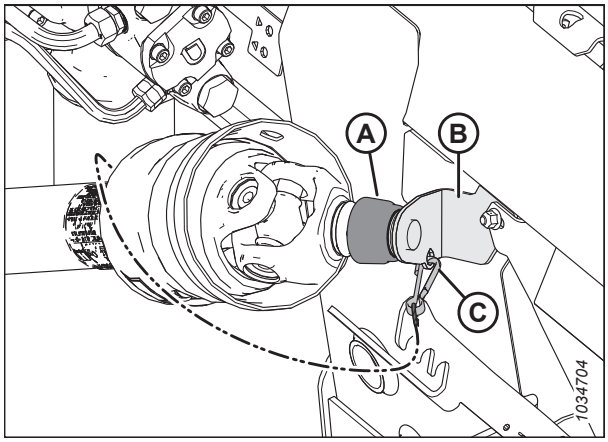


Figure 3.100: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7182

16. Attach driveline (A) to the combine output shaft.

Figure 3.101: Driveline and Output Shaft

17. Disengage both header float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

    NOTE:

    The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.

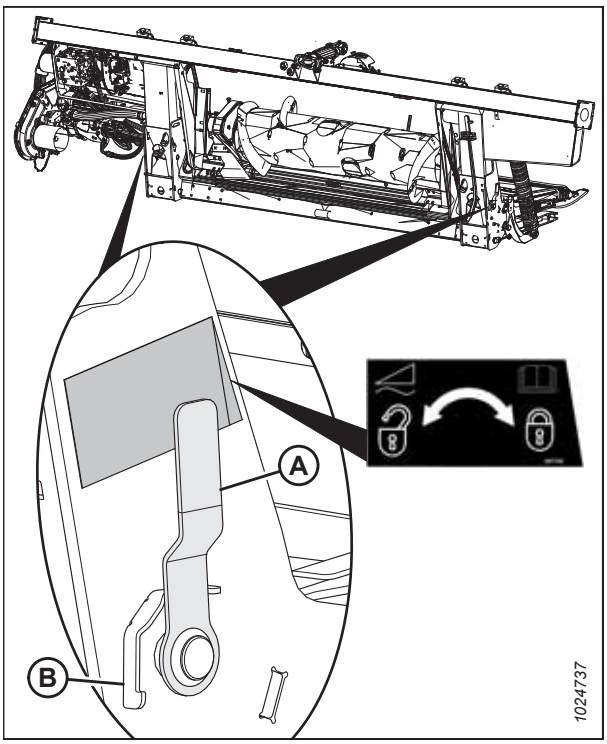


Figure 3.102: Float Lock Handle

Detaching Header from CLAAS Combine

The header will need to be physically disconnected from the combine, and the hydraulic and electrical connections removed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Choose a level area and position the header slightly above the ground.
2. Shut down the engine, and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.
3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.
4. Disconnect driveline (A) from the combine.

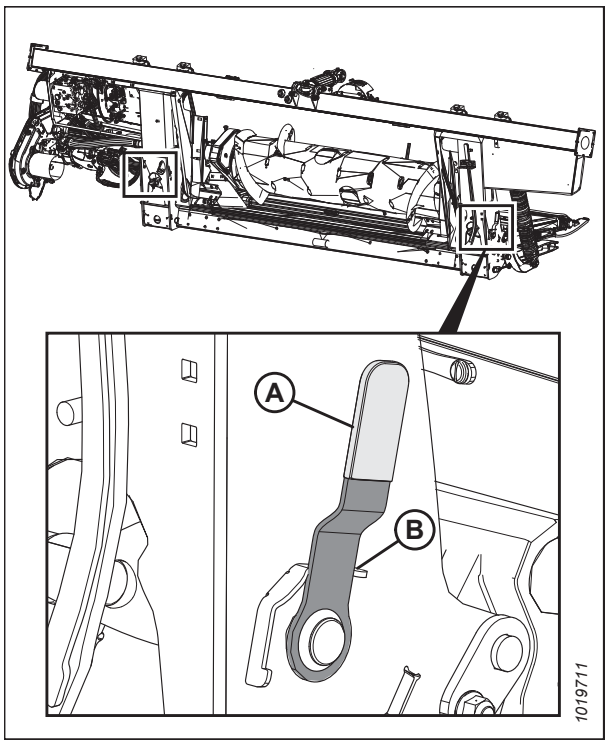


Figure 3.103: Float Lock Handle

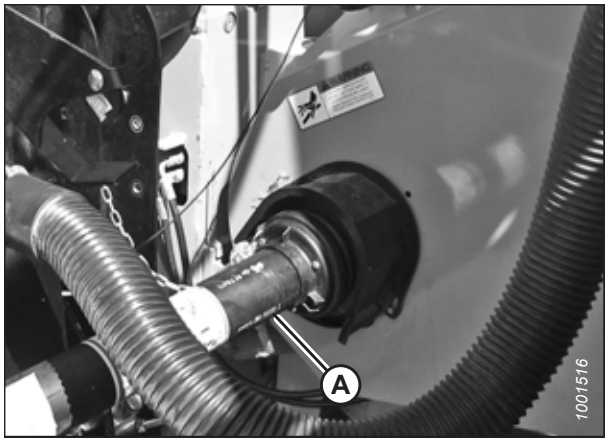


Figure 3.104: Driveline

5. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the bracket.

6. Attach safety chain (C) to support bracket (B).

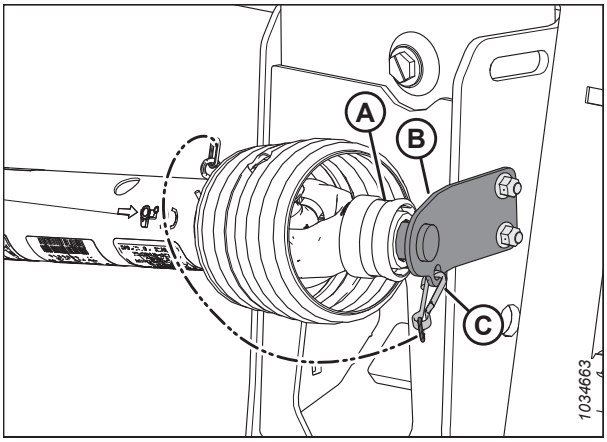


Figure 3.105: Driveline in Storage Position – Driveline MD #B7039

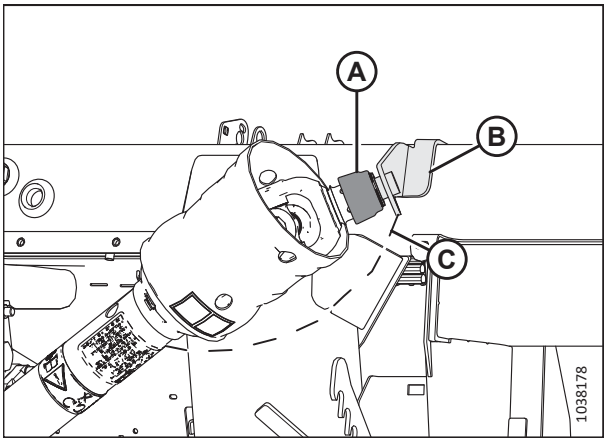


Figure 3.106: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7182

7. Remove cover (A) from the combine receptacle.

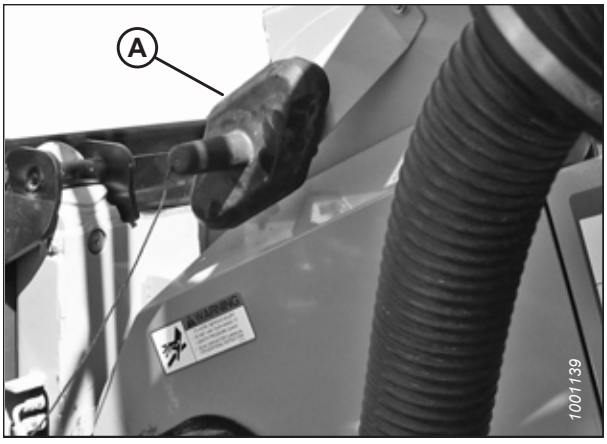


Figure 3.107: Cover

8. Position coupler (A) onto the combine receptacle, and turn knob (B) to secure the coupler to the receptacle.

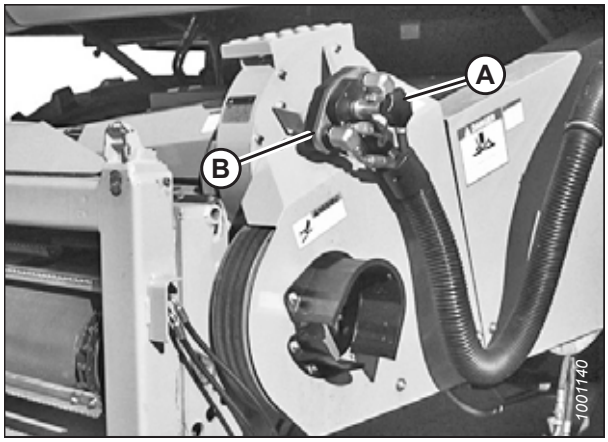


Figure 3.108: Combine Coupler

9. Place cover (A) on the float module receptacle.

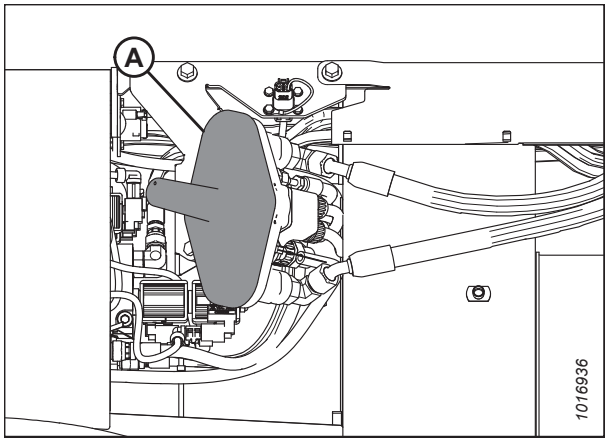


Figure 3.109: Float Module

10. Remove locking pin (A) from float module pin (B).
11. Raise handle (C) to disengage float module pins (B) from the feeder house.
12. Replace locking pin (A) in the float module pin, and secure it with the hairpin.

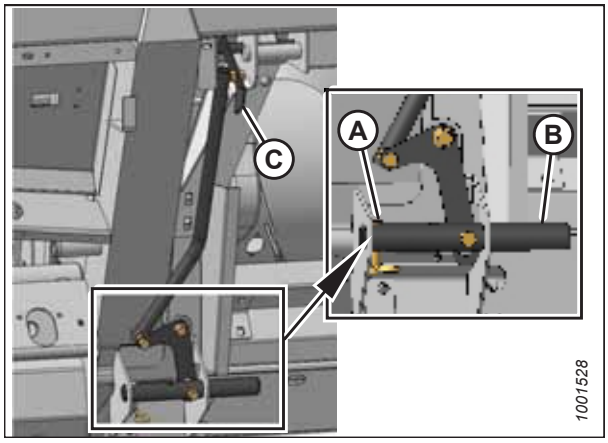


Figure 3.110: Feeder House Locks

13. Lower the feeder house until feeder house posts (A) disengage float module (B).

14. Back the combine away slowly from the float module.

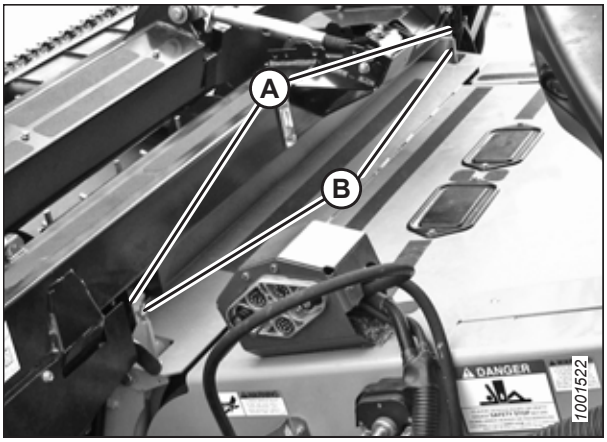


Figure 3.111: Header on Combine

3.6.5 John Deere Combines

To attach the header to or detach it from a John Deere combine, follow the relevant procedure in this section.

The FD2 Series FlexDraper® Header is compatible with John Deere 60, 70, S, T, and X9 Series combines.

Attaching Header to John Deere Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

2. Push handle (A) on the combine multicoupler receptacle towards the feeder house to retract pins (B) at the bottom corners of the feeder house. Clean the receptacle.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (C) is directly under float module top cross member (D).

4. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.

5. Shut down the engine, and remove the key from the ignition.

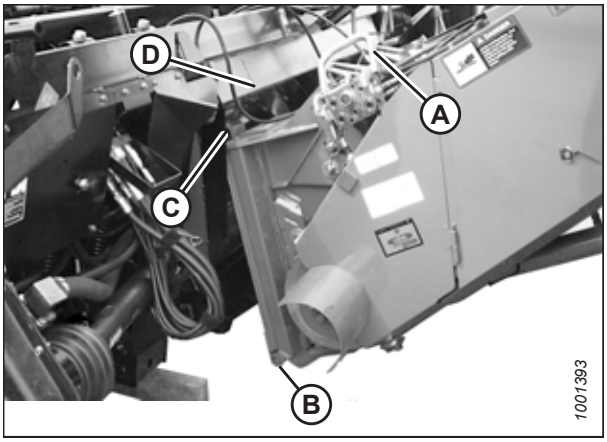


Figure 3.112: Combine and Float Module

6. Pull handle (A) on the float module to release multicoupler (B) from the storage position. Remove the multicoupler, and push the handle back into the float module to store.

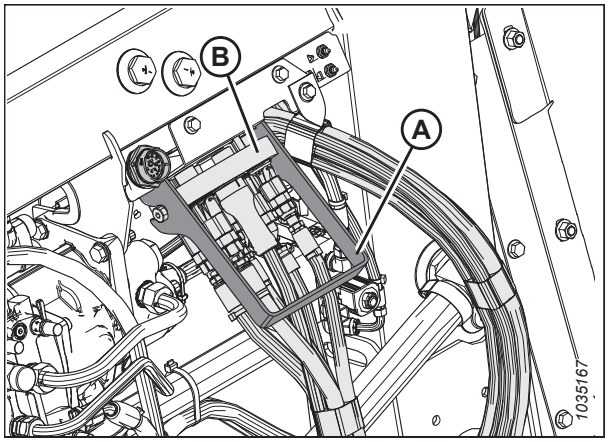


Figure 3.113: Multicoupler Storage

7. Position multicoupler (A) onto the receptacle, and pull handle (B) to engage the lugs on the multicoupler into the handle.
8. Pull handle (B) to a horizontal position and ensure multicoupler (A) is fully engaged into the receptacle.

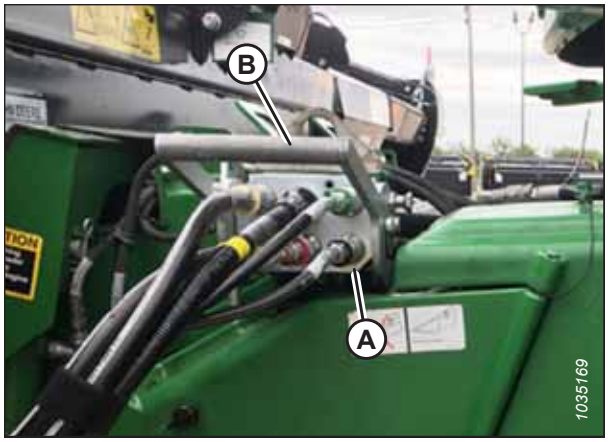


Figure 3.114: Multicoupler

9. Ensure that both feeder house pins (A) are fully engaged into the float module brackets.

   NOTE:

   If pins (A) do not fully engage the float module brackets, loosen bolts (B) and adjust the bracket as required.

10. Tighten bolts (B).

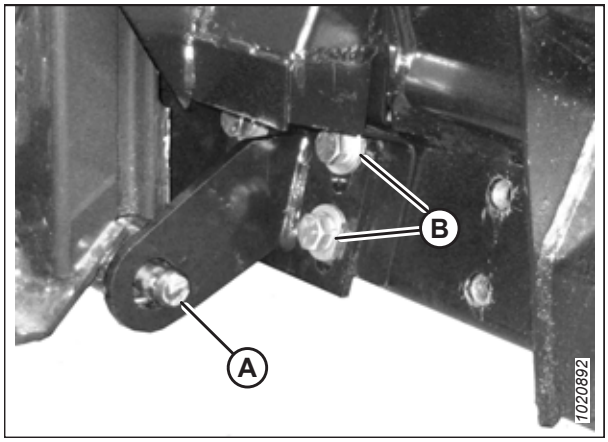


Figure 3.115: Feeder House Pin

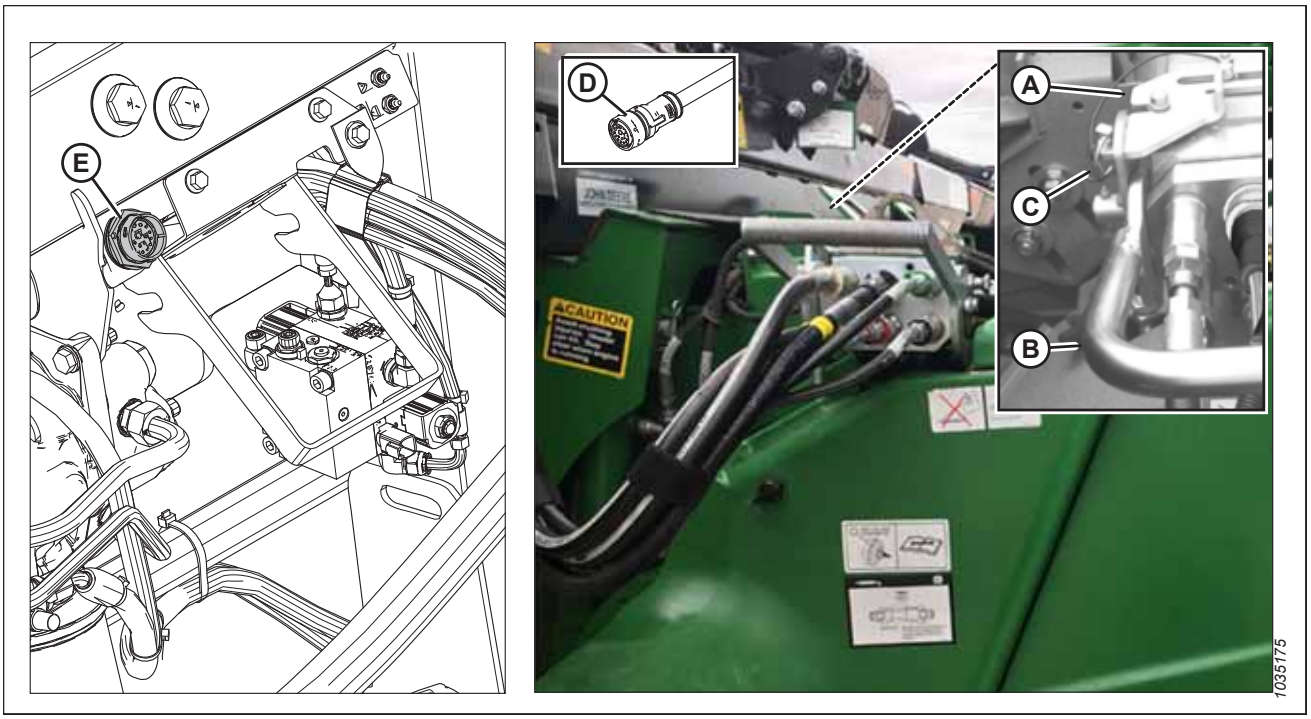


Figure 3.116: Multicoupler Lock, Electrical Connections

11. Slide latch (A) to lock handle (B) in position and secure with lynch pin (C).

12. Remove cab control kit connector C81A (D) from the storage location on the combine and connect it to C81B (E) on the float module. Turn the collar on the connector to lock it in place.

13. Detach safety chain (C) from support bracket (B).

14. Pull driveline collar (A) back to release the driveline from the support bracket. Remove the driveline from the support bracket.

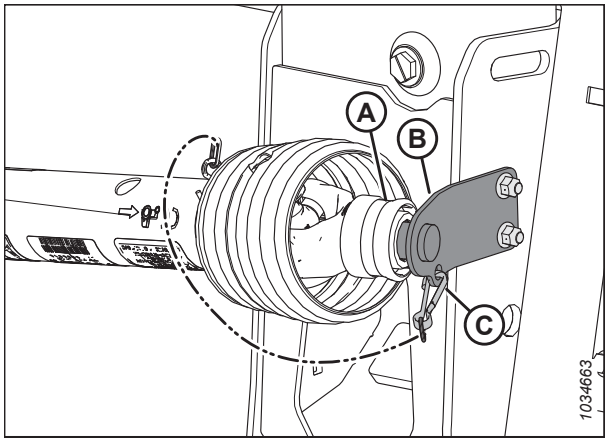


Figure 3.117: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

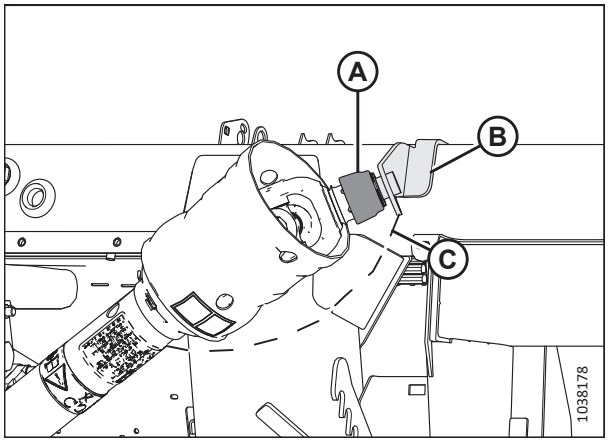


Figure 3.118: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7326,, or MD #B7182

15. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

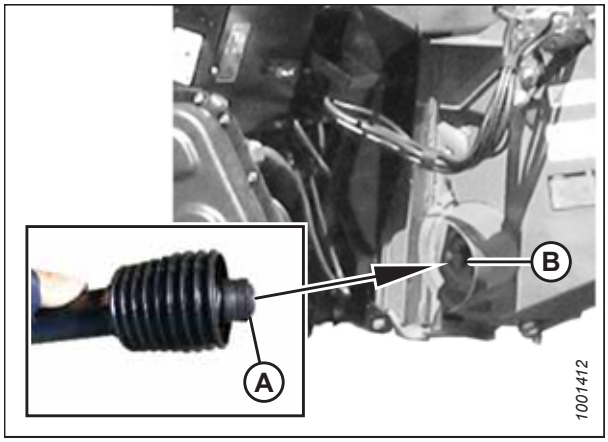


Figure 3.119: Driveline

16. Disengage the float locks by pulling each float lock handle (A) away from the float module, and setting it in unlocked position (B).

    NOTE:

    The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.

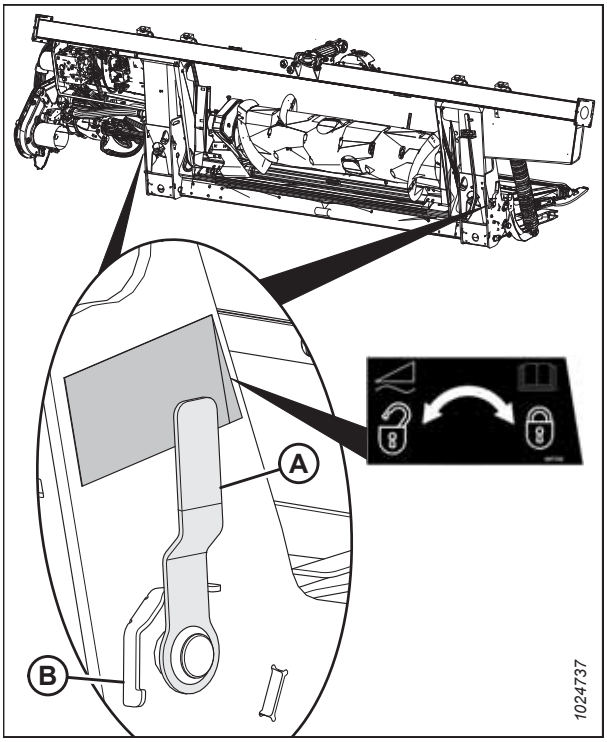


Figure 3.120: Float Lock Handle

Detaching Header from John Deere Combine

The header will need to be physically disconnected from the combine, and the hydraulic and electrical connections removed.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Choose a level area and position the header slightly above the ground.
2. Shut down the engine, and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.
3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.
4. Open shield (A) on the combine, pull back the collar on driveline (B), and pull the driveline off the combine output shaft.

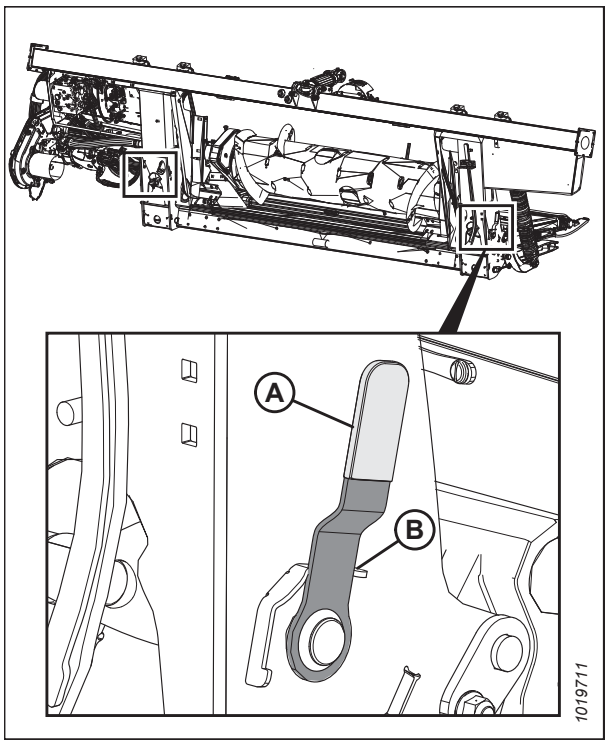


Figure 3.121: Float Lock Handle

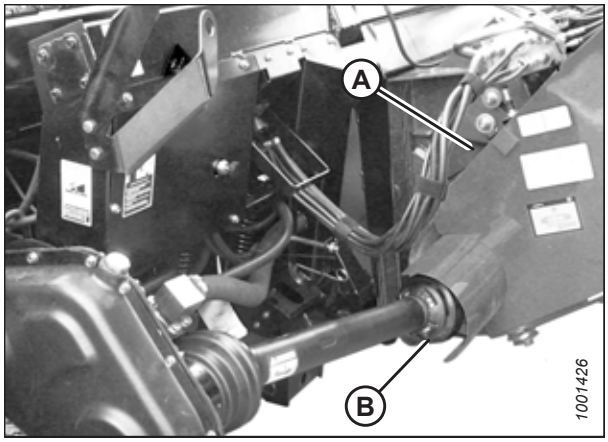


Figure 3.122: Driveline

5. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the support bracket.

6. Attach safety chain (C) to support bracket (B).

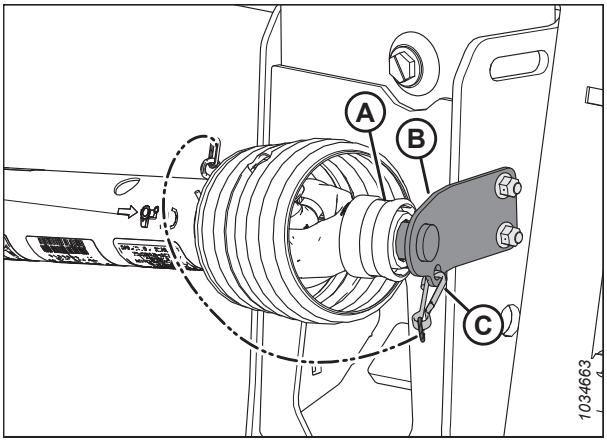


Figure 3.123: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

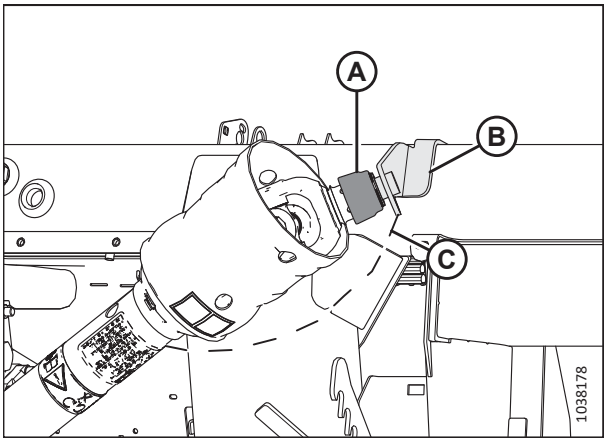


Figure 3.124: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7326,, or MD #B7182

7. Lift handle (A) on the float module.

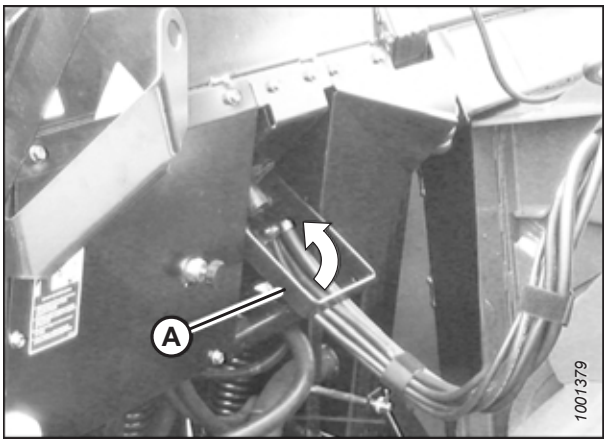


Figure 3.125: Multicoupler Storage

8. Disconnect harness (A) from the combine connector.
9. Remove lynch pin (B) and slide lock (C) to release handle (D).
10. Lift handle (D) to full vertical position to release multicoupler (E) from the combine.

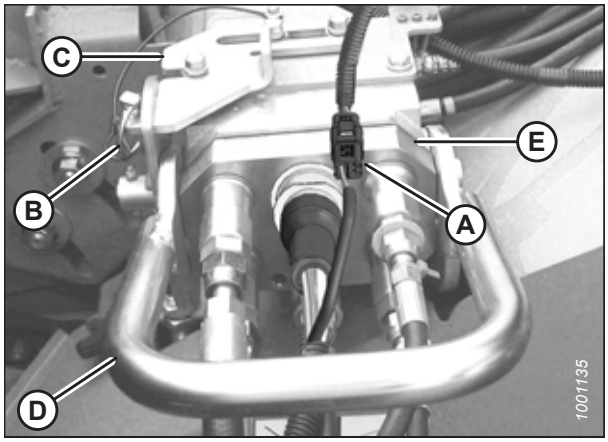


Figure 3.126: Multicoupler

11. Position multicoupler (A) on the float module receptacle and lower handle (B) to lock the multicoupler.

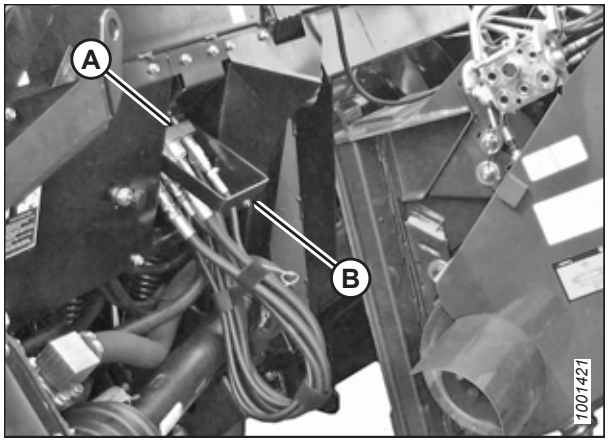


Figure 3.127: Multicoupler Storage

12. Push handle (A) on the combine towards the feeder house to disengage feeder house pin (B) from the float module.

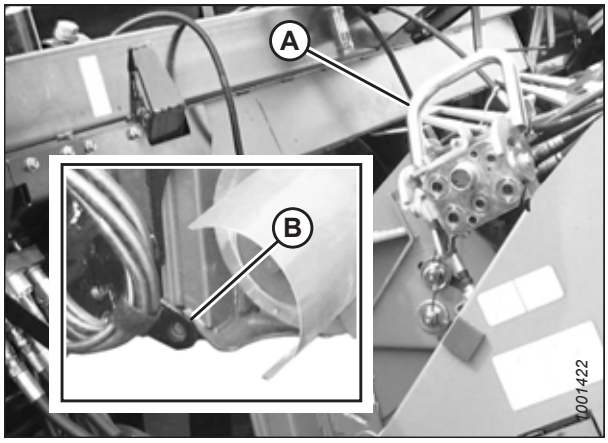


Figure 3.128: Feeder House Locks

13. Lower the feeder house until saddle (A) disengages and clears float module support (B).
14. Back the combine away slowly from the float module.

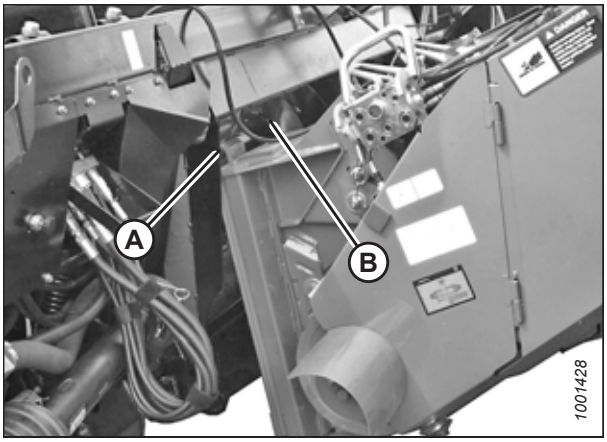


Figure 3.129: Float Module and Feeder House

3.6.6 New Holland Combines

To attach the header to or detach it from a New Holland combine, follow the relevant procedure in this section.

Refer to the table below for information on the New Holland combine models that are compatible with this header.

Table 3.2 New Holland Combine Compatibility

New Holland Combine Series	Combine Model
CR	920, 940, 960, 970, 980
	9020, 9040, 9060, 9065, 9070, 9080
	6090, 7090, 8080, 8090, 9090
	6.80, 6.90, 7.90, 8.90, 9.90, 10.90
CX	840, 860, 870, 880
	8070, 8080, 8090
	8080 Elevation, 8090 Elevation

Attaching Header to New Holland CR/CX Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.

2. Ensure handle (A) is positioned so locks (B) can engage the float module.

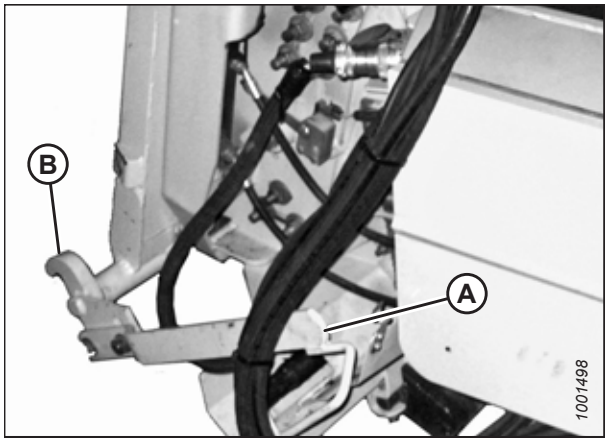


Figure 3.130: Feeder House Locks

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

3. Start the engine and slowly drive the combine up to the float module until feeder house saddle (A) is directly under float module top cross member (B).

4. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.

5. Shut down the engine, and remove the key from the ignition.

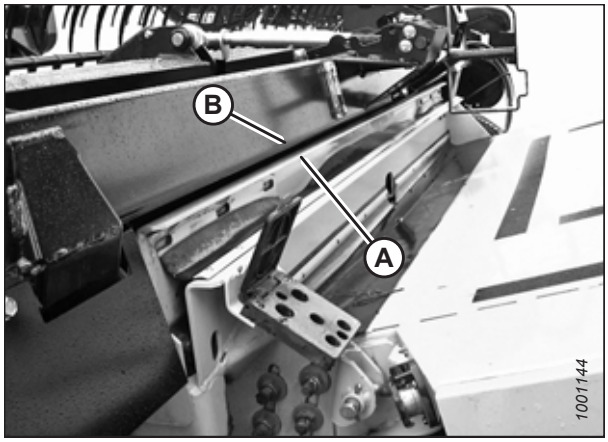


Figure 3.131: Header on Combine

6. Lift lever (A) on the float module on the left side of the feeder house, and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.

7. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.

8. If the lock does not fully engage pin (D) on the float module when lever (A) and handle (B) are engaged, loosen bolts (E) and adjust lock (C). Retighten the bolts.

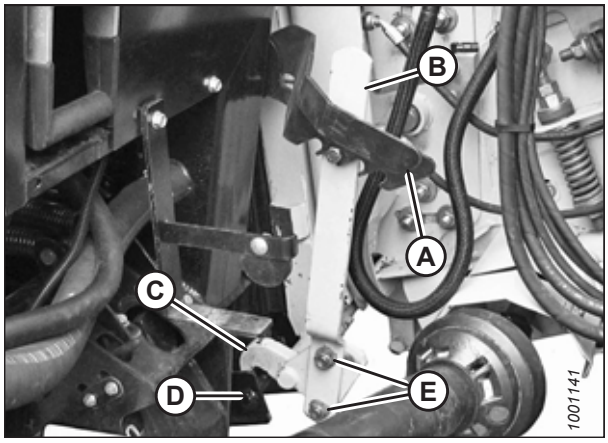


Figure 3.132: Feeder House Locks

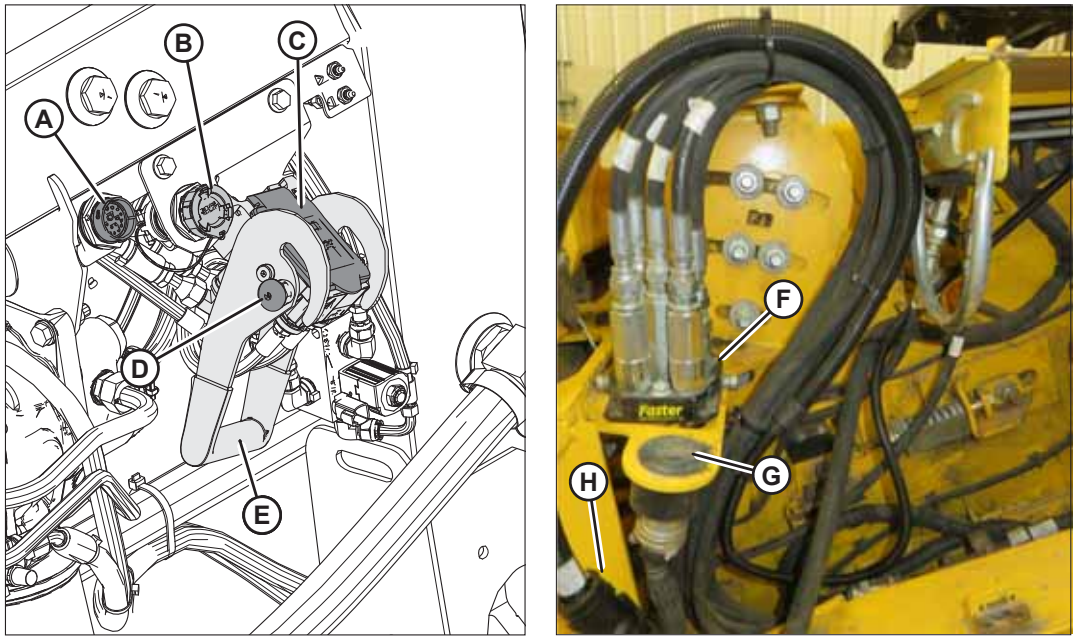


Figure 3.133: Multicoupler and Electrical Connections

9. Remove the caps from connectors C81B (A) and (B).
10. Remove the cover from hydraulic receptacle (C). Clean the receptacle mating surfaces
11. Push in lock button (D) and pull handle (E) to the fully open position.
12. Remove hydraulic quick coupler (F) from the storage plate on the combine. Clean the mating surface of the coupler.
13. Position coupler (F) onto the float module receptacle (C), and push handle (E) to engage the pins into the receptacle.
14. Push handle (E) to closed position until lock button (D) snaps out.
15. Remove combine connector (G) from the storage location on the combine and connect it to receptacle (B). Turn the collar on the connector to lock it in place.
16. Remove cab control kit connector C81A (H) from the storage location on the combine and connect it to C81B (A). Turn the collar on the connector to lock it in place.

17. Detach safety chain (C) from support bracket (B).

18. Pull driveline collar (A) back to release the driveline from the support bracket. Remove the driveline from the support bracket.

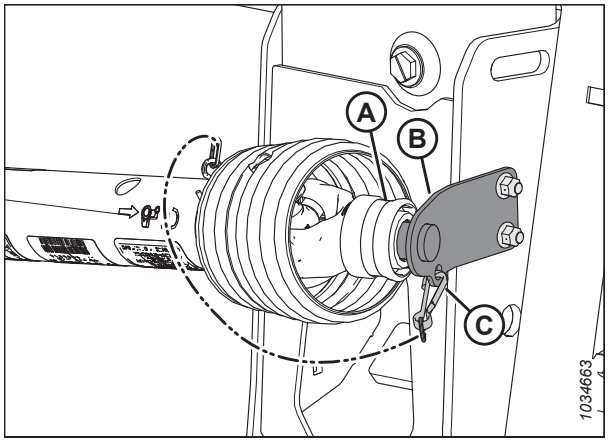


Figure 3.134: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

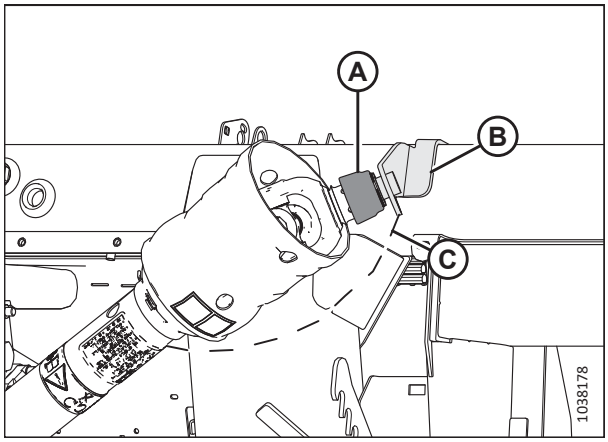


Figure 3.135: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7180, MD #B7181, or MD #B7326

19. Pull back the collar on the end of the driveline, and push the driveline onto combine output shaft (A) until the collar locks.

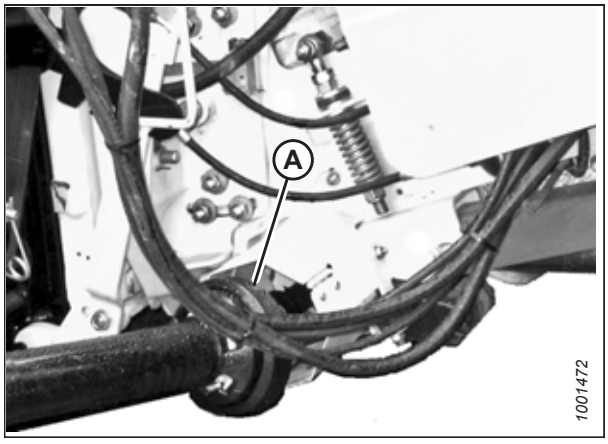


Figure 3.136: Driveline and Output Shaft

20. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

    NOTE:

    The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.

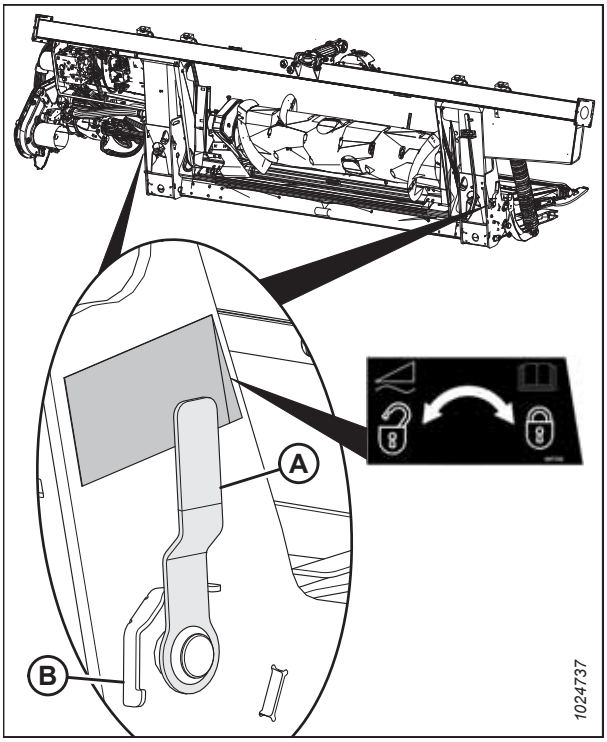


Figure 3.137: Float Lock Handle

Detaching Header from New Holland CR/CX Combine

The header will need to be physically disconnected from the combine, and the hydraulic and electrical connections removed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Choose a level area and position the header slightly above the ground.
2. Stop the engine and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.
3. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.
4. Disconnect driveline (A) from the combine. Push back collar (A) on the end of the driveline and pull the driveline out of combine output shaft (B) until the collar disengages.

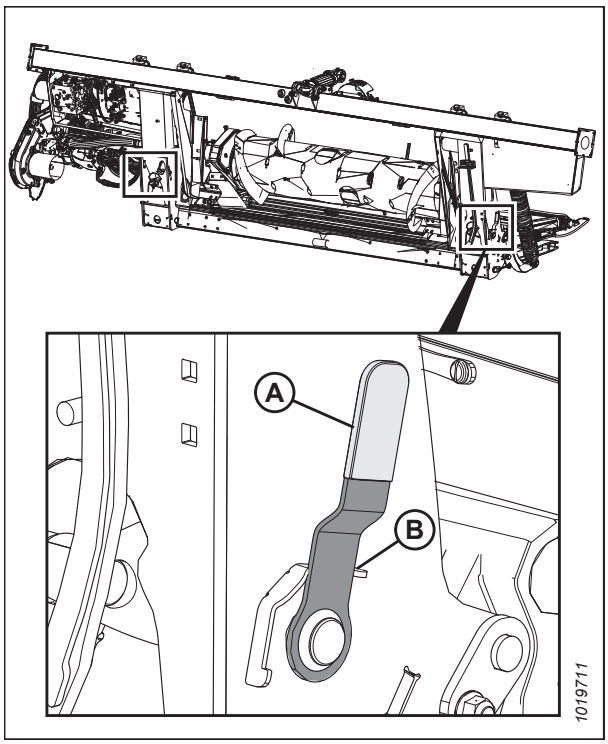


Figure 3.138: Float Lock Handle

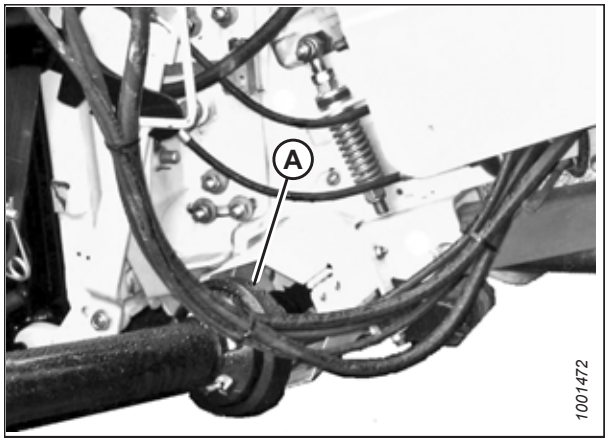


Figure 3.139: Driveline

5. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the bracket.

6. Attach safety chain (C) to support bracket (B).

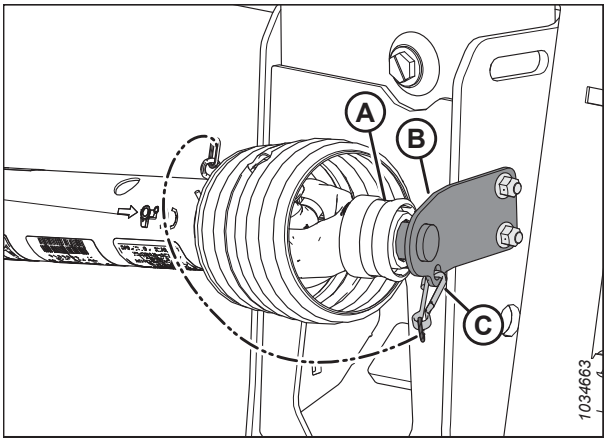


Figure 3.140: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

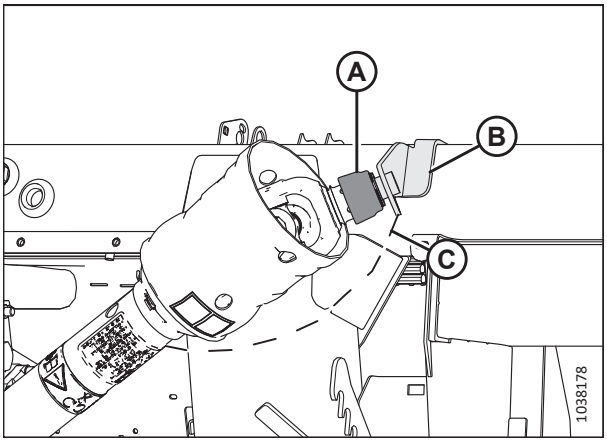


Figure 3.141: Driveline in Storage Position – Sidehill/ Hillside Driveline MD #B7180, MD #B7181, or MD #B7326

7. Push in lock button (B), and pull handle (C) to release multicoupler (A).

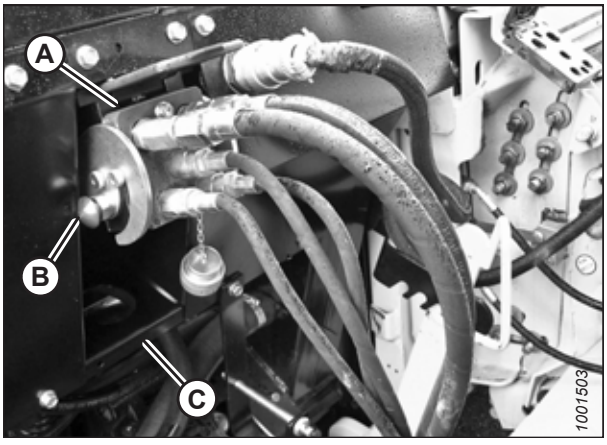


Figure 3.142: Float Module Connections

8. Push handle (A) to the closed position until lock button (B) snaps out. Close the cover.

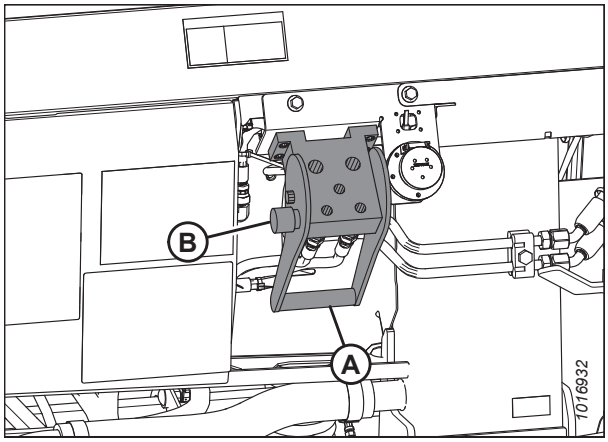


Figure 3.143: Float Module Receptacles

9. Position hydraulic quick coupler (A) onto storage plate (B) on the combine.

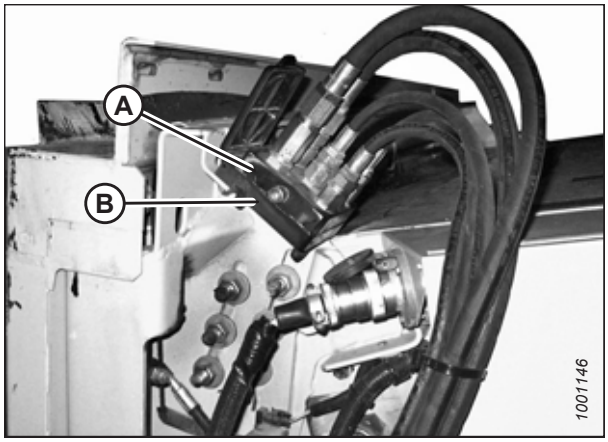


Figure 3.144: Combine Coupler

10. Remove electrical connector (A) from the float module.

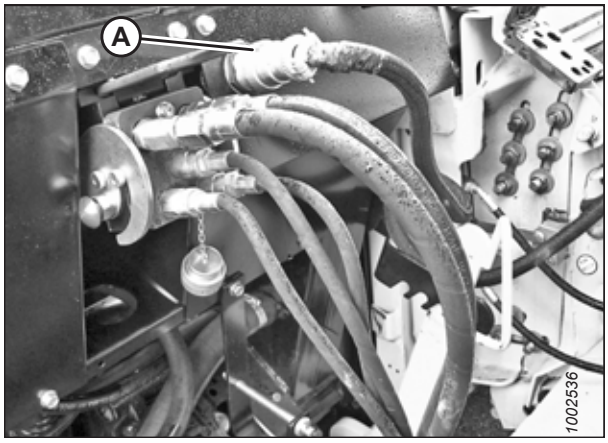


Figure 3.145: Float Module Connections

11. Connect the electrical connector to the combine at location (A).

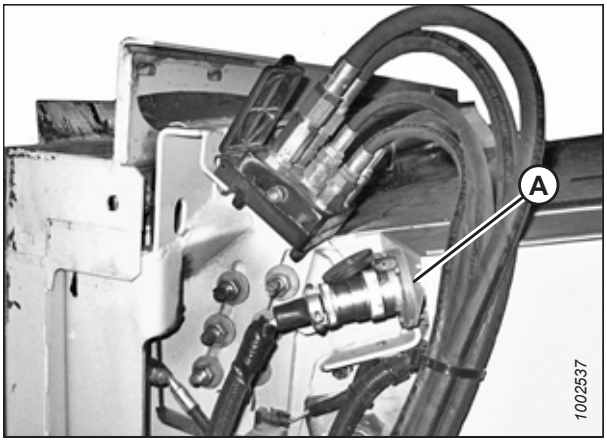


Figure 3.146: Combine Couplers

12. Replace cover (A) on the float module receptacle.

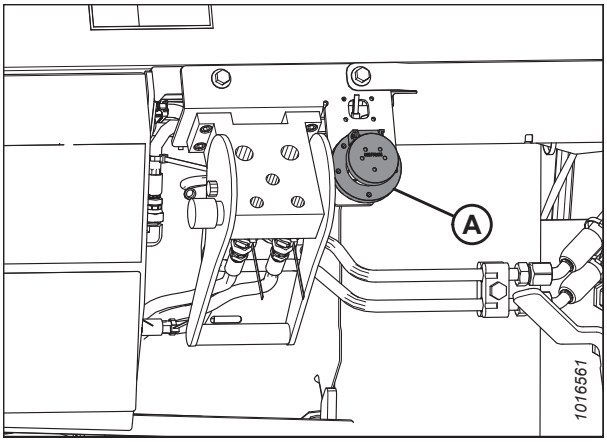


Figure 3.147: Float Module Receptacles

13. Lift lever (A) and pull and lower handle (B) to disengage feeder house/float module lock (C).

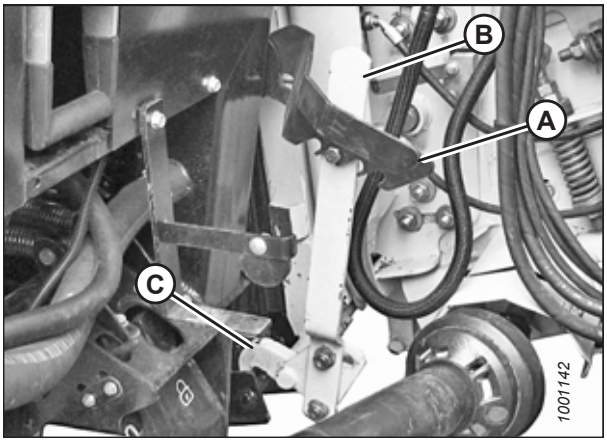


Figure 3.148: Feeder House Locks

14. Lower feeder house (A) until the feeder house disengages float module support (B).
15. Back the combine slowly away from the header.

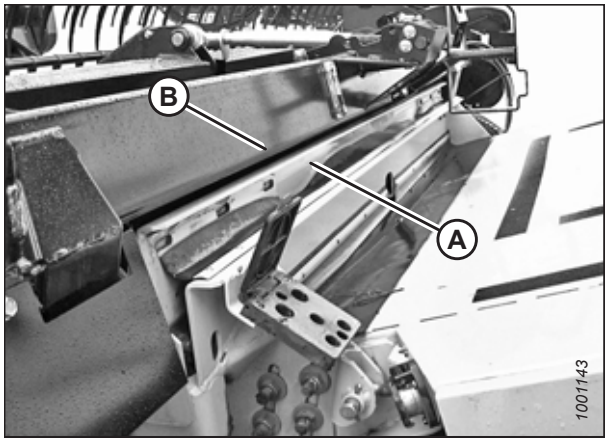


Figure 3.149: Header on Combine

Feeder Deflectors – New Holland CR Series Combines

On New Holland CR Series combines, feeder deflectors may need to be installed. Feeder deflectors are **NOT** necessary on New Holland CX Series combines.

For New Holland CR combines only: Wide feeder deflectors have been factory-installed on the float module to improve feeding into the feeder house. Remove the feeder deflectors if necessary. For instructions, refer to *4.11.3 Replacing Feed Deflectors on New Holland CR Combines, page 601*.

Long feeder kits are provided for narrow feeder house combines and can be installed to replace the short feeder deflectors.

Table 3.3 FM200 Feeder Kits for CR Model Combines

Feeder House Size	Feeder Kit Size	MacDon Part Number
1250–1350 mm (49–65 in.)	Narrow: 200 mm (7 7/8 in.)	MD #328082, 328083
1100 mm (43 1/2 in.) and below	Wide: 325 mm (12 13/16 in.)	MD #314690, 314691

3.6.7 Rostselmash Series Combines

Attaching Header to Rostselmash Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).
2. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.
3. Shut down the engine, and remove the key from the ignition.

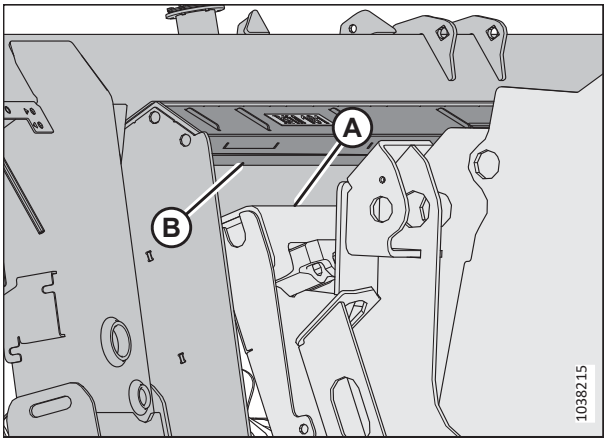


Figure 3.150: Combine and Float Module

4. Pull pin (A) outward and rotate handle (B) until both feeder house pins (C) are fully engaged into float module brackets (D).

   NOTE:

   If pins (C) do not fully engage the float module brackets, loosen bolts (E) and adjust brackets (D) as required.

5. Tighten nuts (E).

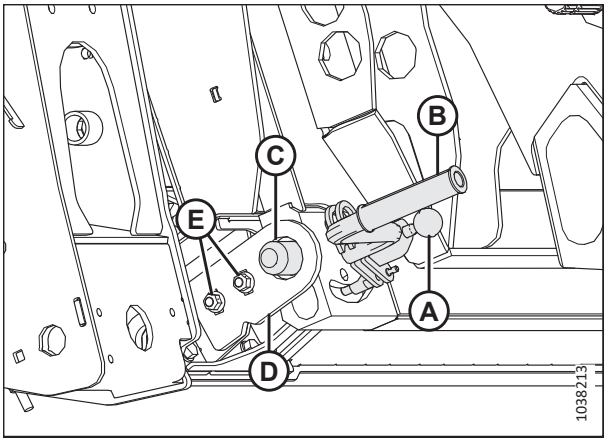


Figure 3.151: Feeder House Pin

6. Push in lock button (A) and pull handle (B) to the fully open position.
7. Remove the hydraulic quick coupler from the storage plate on the combine. Clean the mating surface of the coupler.
8. Position the combine coupler onto the float module receptacle. Push down on the handle to engage the pins into the receptacle.
9. Push the handle down to the closed position until lock button (B) snaps out.
10. Remove the combine connector from the storage location on the combine and connect it to receptacle (C). Turn the collar on the connector to lock it in place.
11. Remove the cab control kit connector C81A from the storage location on the combine and connect it to C81B (D). Turn the collar on the connector to lock it in place.

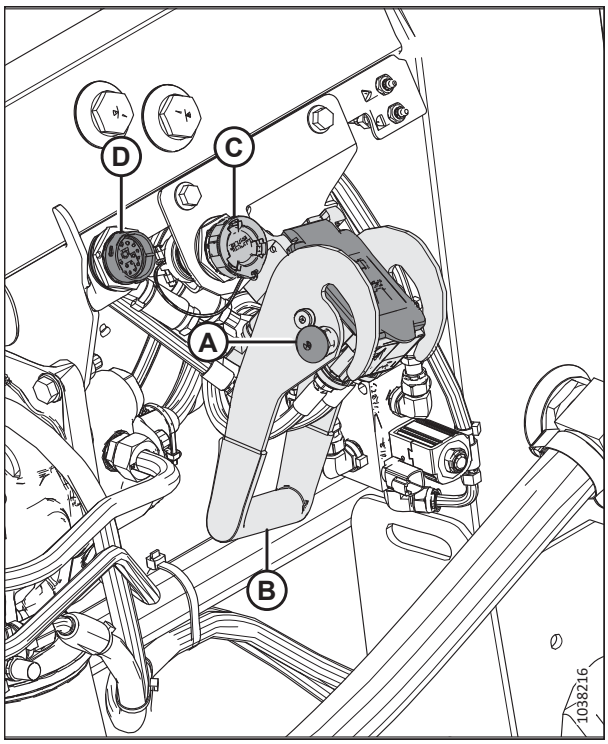


Figure 3.152: Multicoupler Storage

12. Detach safety chain (C) from support bracket (B).
13. Pull driveline collar (A) back to release the driveline from the support bracket. Remove the driveline from the support bracket.

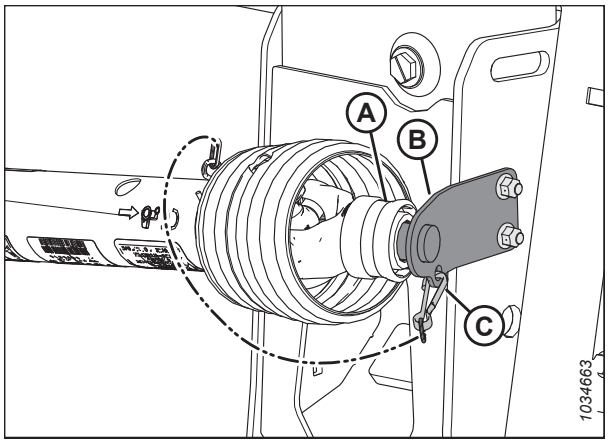


Figure 3.153: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

14. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

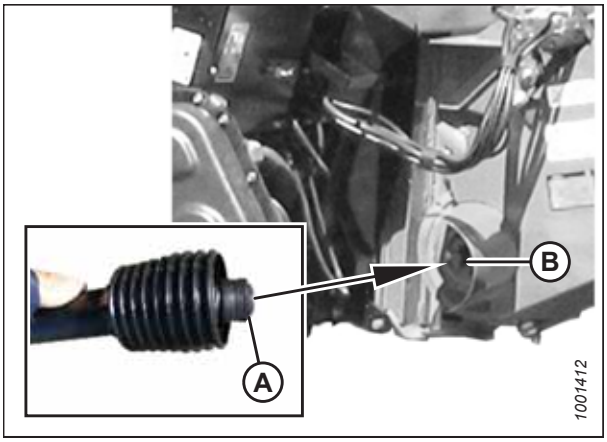


Figure 3.154: Driveline

15. Disengage the float locks by pulling each float lock handle (A) away from the float module, and setting it in unlocked position (B).

    NOTE:

    The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.

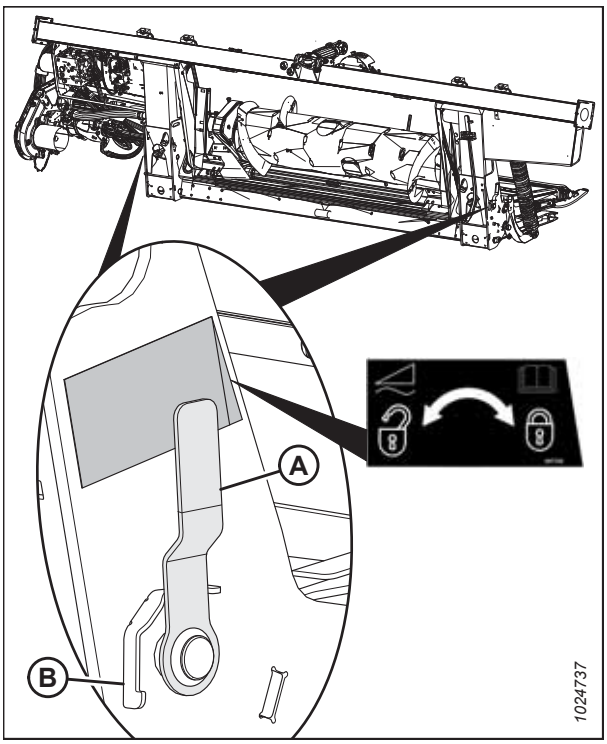


Figure 3.155: Float Lock Handle

Detaching Header From Rostselmash Combine

Each combine model has specific instructions on how to attach the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. Park the combine on a level surface.
2. Position the header slightly above the ground.
3. Shut down the engine, and remove the key from the ignition.

   IMPORTANT:

   If transport wheels are installed, the header may be detached in either transport or field mode. If detaching with the wheels in field mode, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

   IMPORTANT:

   If stabilizer wheels are installed, set the wheels to the storage or uppermost working position, otherwise the header may tilt forward, making reattachment difficult. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.
4. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

   NOTE:

   The illustration at the right shows the right side of the header. The float lock on the left side of the header is opposite.
5. Disconnect combine cab control harness connector C81A (D) from Connector C81B (D).
6. Disconnect the combine electrical harness from connector (C).
7. Push in lock button (A) and lift handle (B) to release the multicoupler. Remove the hydraulic quick coupler from the combine and return to its storage location on the combine.

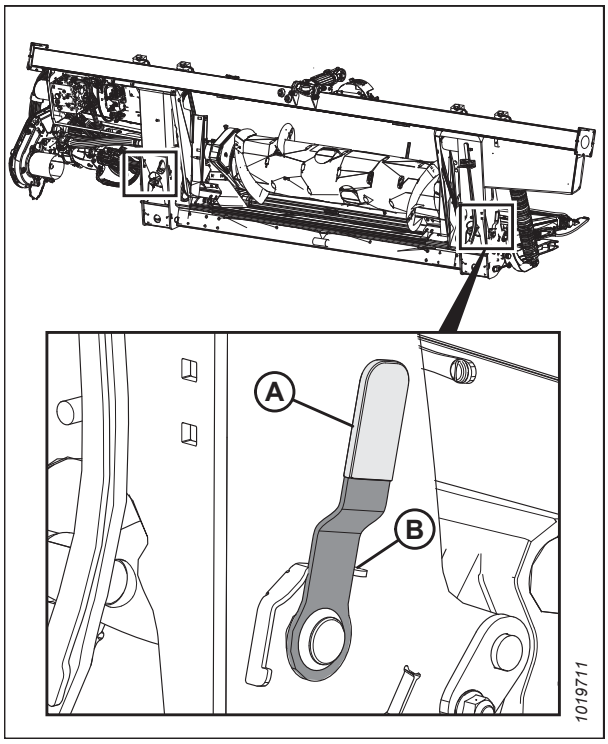


Figure 3.156: Float Lock Handle

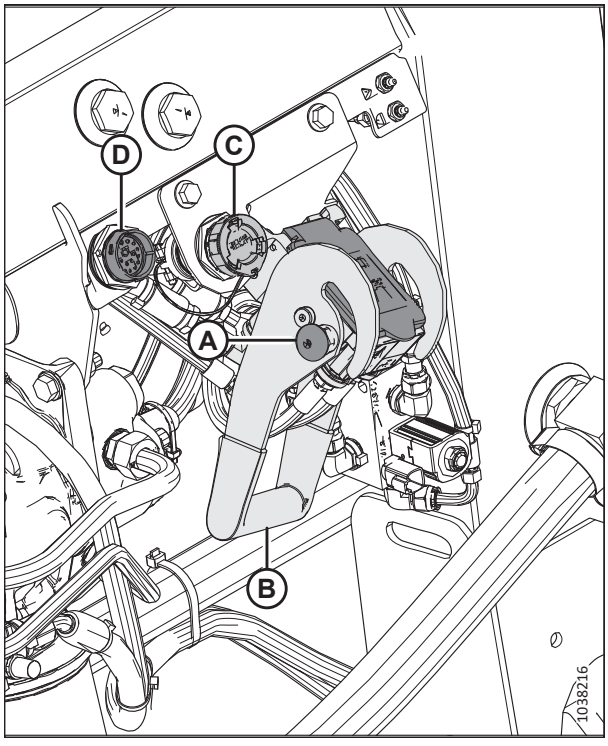


Figure 3.157: Float Lock Handle

8. Pull back collar (A) on the end of the driveline, and pull the driveline out of combine output shaft (B) until the collar disengages.

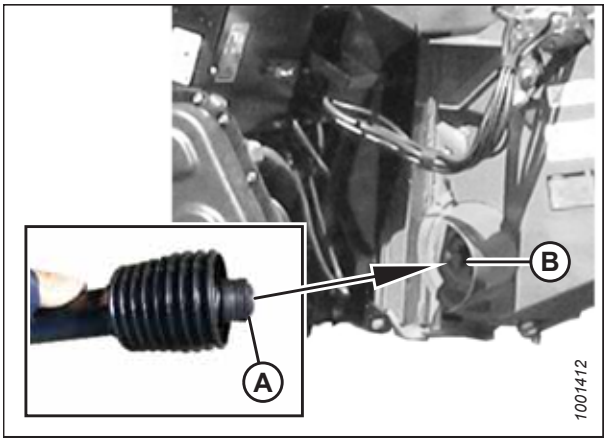


Figure 3.158: Driveline

9. Store the driveline on driveline support bracket (B) by pulling back collar (A) on the driveline and fitting it onto support bracket (B). Release the collar so it locks into place on the support bracket.

10. Attach safety chain (C) to support bracket (B).

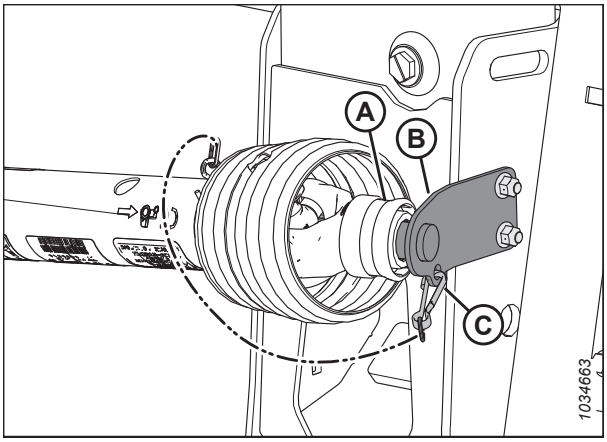


Figure 3.159: Driveline in Storage Position – Driveline MD #B7038 or MD #B7039

11. Pull pin (A) outward and rotate handle (B) clockwise until both feeder house pins (C) are fully retracted into float module brackets (D).

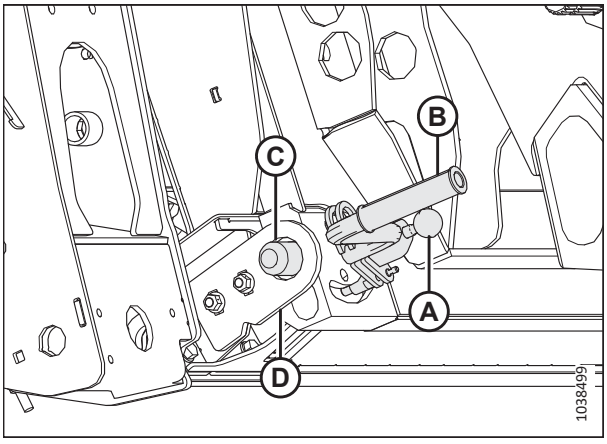


Figure 3.160: Feeder House Pin

12. Start the engine and lower feeder house (A) until it disengages float module support (B).
13. Back the combine away slowly from the float module.
14. Shut down the engine, and remove the key from the ignition.

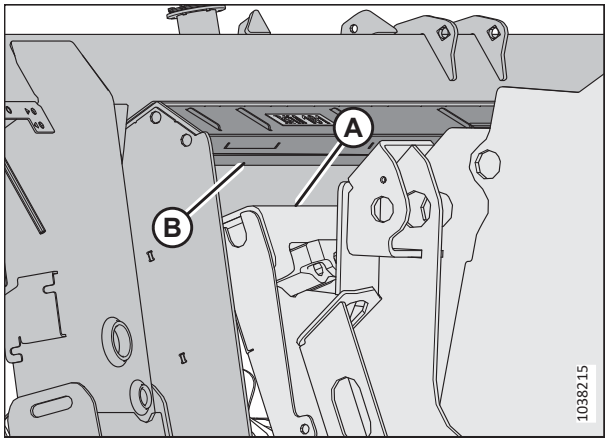


Figure 3.161: Combine and Float Module

3.6.8 Attaching Header to / Detaching Header from FM200 Float Module

To attach the float module to, or detach it from, the header, follow the relevant procedure. These procedures require that the float module remain attached to the combine.

NOTE:

If the header is equipped with transport wheels, the float module can be attached to and detached from the header while it is in either transport or field mode.

Detach the float module from the header only in the following cases:

- The header is needed for use on a windrower
- A different, float module-compatible header will be attached to the combine
- The header or float module need service or repair, and the service or repair procedures require that the float module be detached from the header

Detaching Header from FM200 Float Module

The FM200 Float Module attaches to the header, giving it the ability to closely follow ground contours. If necessary, the FM200 can be disconnected from the header.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

WARNING

Keep hands clear of the area between guards and knife at all times.

WARNING

Wear heavy gloves when working around or handling knives.

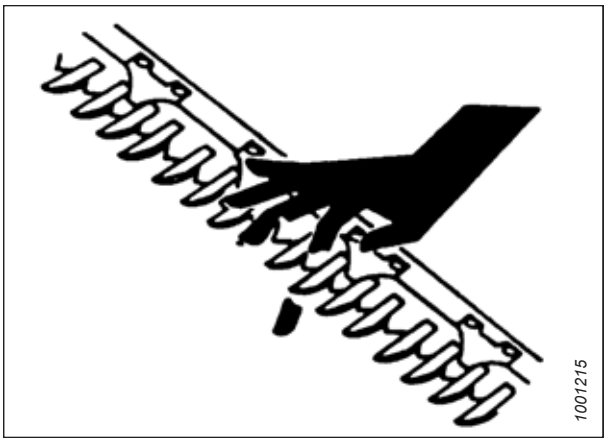


Figure 3.162: Cutterbar Hazard

1. Start the engine, and then lower header.
2. Increase clearance under the float module feed draper by tilting the header and fully extending cylinder (A) until indicator (B) is at position **E**.
3. Raise the reel to its full height.
4. Stop the engine, and then remove key from the ignition.
5. Engage the reel safety props.

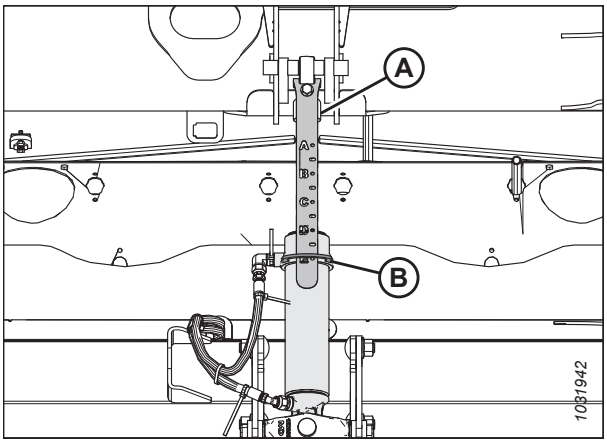


Figure 3.163: Center-Link

6. Move lever (A) to lock position to engage wing locks.

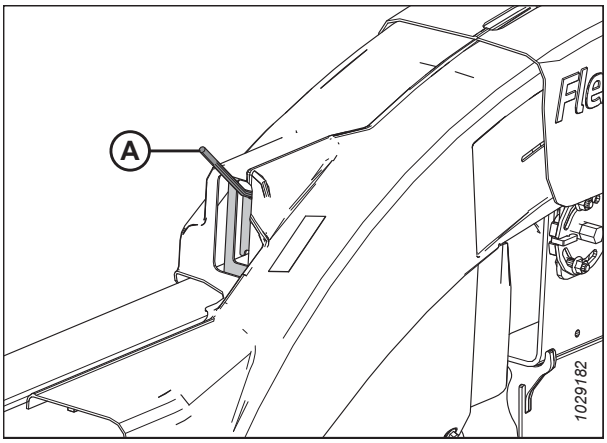


Figure 3.164: Wing Lock – Left Side Shown

7. Engage the float locks by pulling each float lock handle (A) away from the float module and setting it in locked position (B).

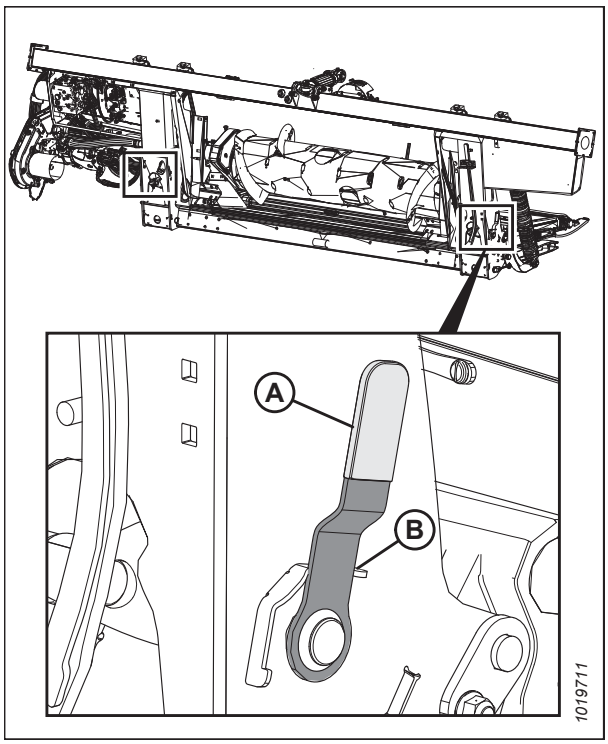


Figure 3.165: Float Lock

8. On the back of the float module frame, remove bolts (A) to release the tension on trim springs (B).
9. Unhook trim springs (B) from spring tensioners (C). Allow the springs to hang on balance channel (D).
10. Reinstall the springs tensioner's onto the float module. Secure with bolts (A).
11. Repeat on the opposite side.

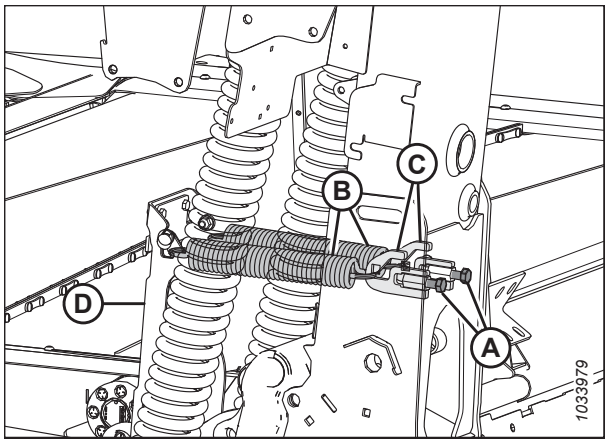


Figure 3.166: Trim Springs – Left side

12. Remove two bolts (A) and fillers (B) from transition pan support angle (C). Repeat on opposite side.

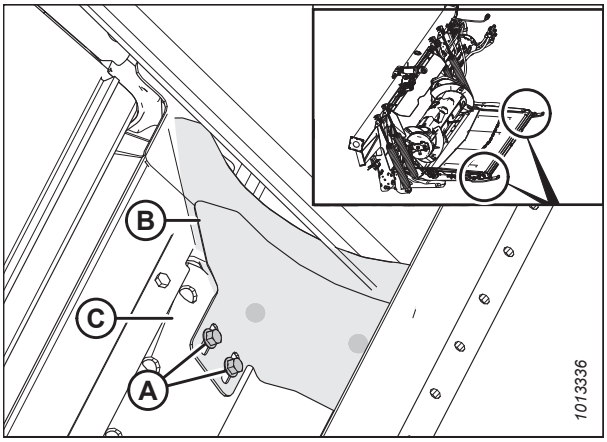


Figure 3.167: Fillers

13. Remove and retain screw (A).
14. Remove the 9/16 in. nut from bolt (B).
15. Use a 24 mm (15/16 in.) wrench on hex bolt (C) to rotate latch downwards and slightly raise the feed deck to remove bolt (B).
16. Rotate latch up and back to lower the float module deck and disengage the transition pan tube.
17. Install screw (A).
18. Repeat for the opposite side of the feed draper deck.

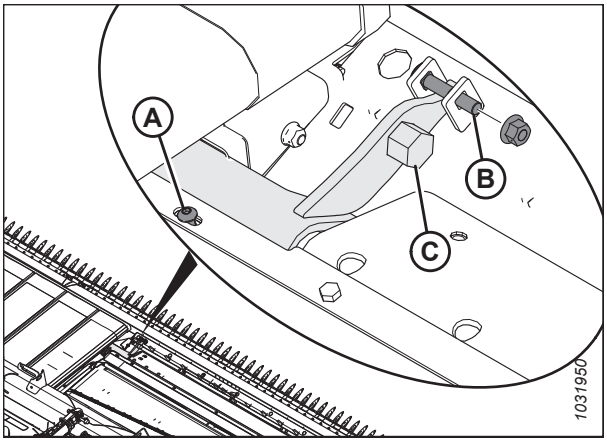


Figure 3.168: Float Module Latch

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

19. Disengage the reel safety props, start the engine, lower the reel, and fully raise the header.
20. Stop the engine, remove the key from the ignition, and engage the combine safety props.
21. Loosen nut and bolt (A), and disengage hook (B) from leg on both sides of float module.

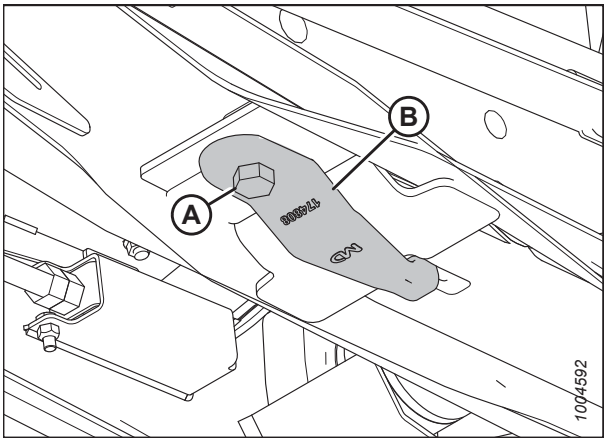


Figure 3.169: Float Module Underside

22. Rotate hook (B) 90° for storage, and retighten bolt (A) and nut.

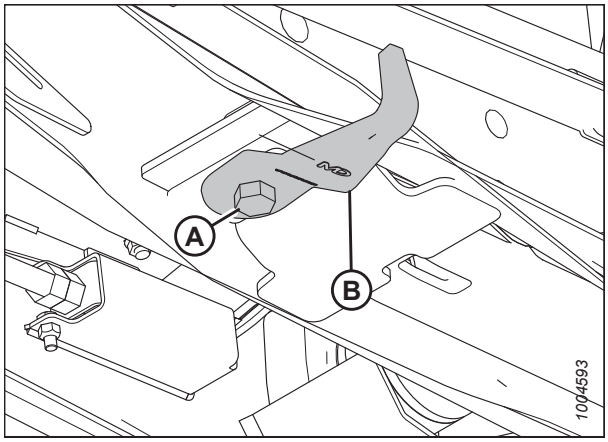


Figure 3.170: Float Module Underside

23. Place a 150 mm (6 in.) block (A) under the header leg. This will assist with disconnecting the center-link.

24. Disengage the combine lift cylinder locks, start the engine, and lower the header until the header leg rests on the block or stabilizer wheels are on the ground.

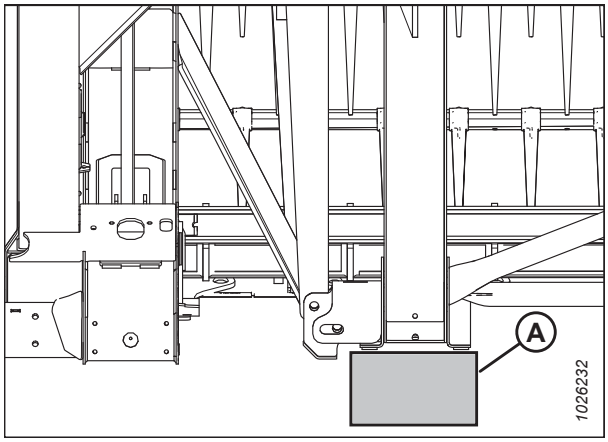


Figure 3.171: Header Leg on Block

25. Disconnect the hydraulic center-link as follows:

    a. Remove lynch pin (A) and pin (B), and lift center-link (C) clear of the bracket.

    b. Reinstall pin (B) on the bracket, and secure with lynch pin (A).

    NOTE:

    It may be necessary to raise or lower the feeder house to adjust the length of the center-link and relieve excess load on the center-link.

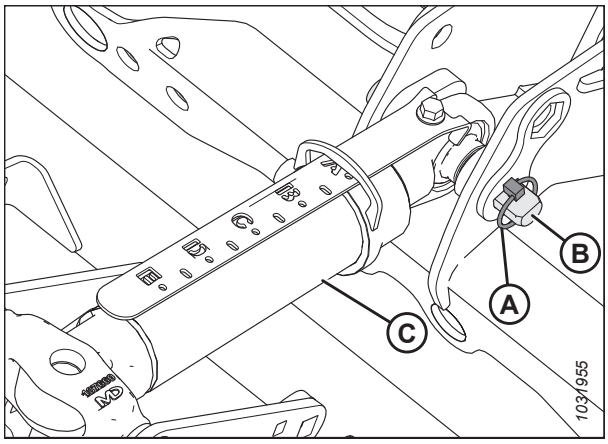


Figure 3.172: Hydraulic Center-Link

NOTE:

- If on the ground: Push reel fully forward to reduce oil loss.
- If on transport: Pull reel fully back.

26. Disconnect electrical connector (A).

NOTE:

If colored plastic ties are missing from any of the hoses, replace them before disconnecting the hoses.

27. Disconnect all of the hoses between the module and manifold (B). Immediately cap the hose ends to prevent oil loss.

NOTE:

Mark hose locations to assist with reattachment.

28. Store and secure hoses on float module frame.

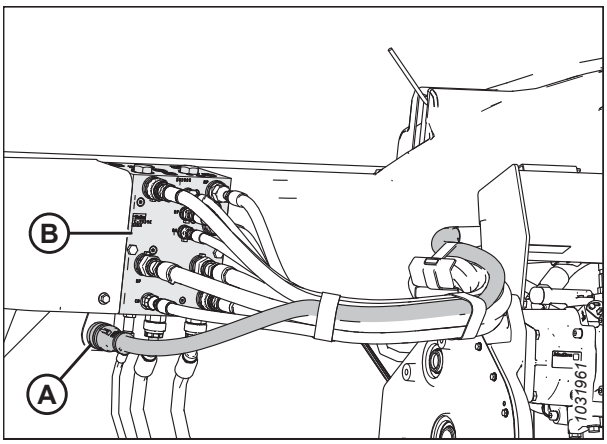


Figure 3.173: Header Connections

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

29. Start the engine.
30. Lower the float module to disengage it from the header.
31. Slowly back away in a straight line from header.
32. Shut down the engine, and remove the key from the ignition.

Attaching Header to FM200 Float Module

The FD2 Series headers can be attached to the float module from either field or transport configuration.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

The transport wheels can be used to support the header. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179*.

1. Prop up hydraulic center-link (A) with a pin (or equivalent tool) at location (B) as shown.

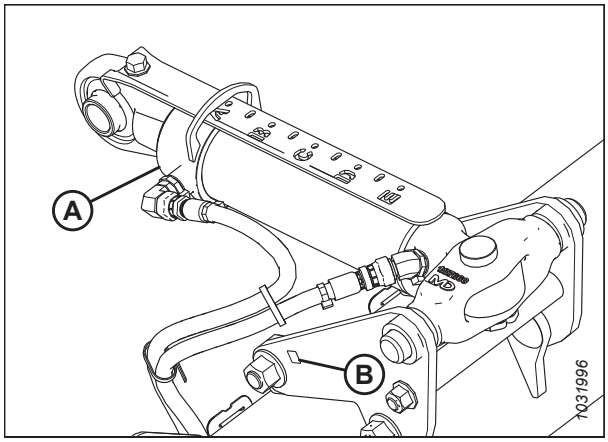


Figure 3.174: Center-Link

2. Ensure latches (A) at the front corners of the float module are rotated towards the rear of the float module.

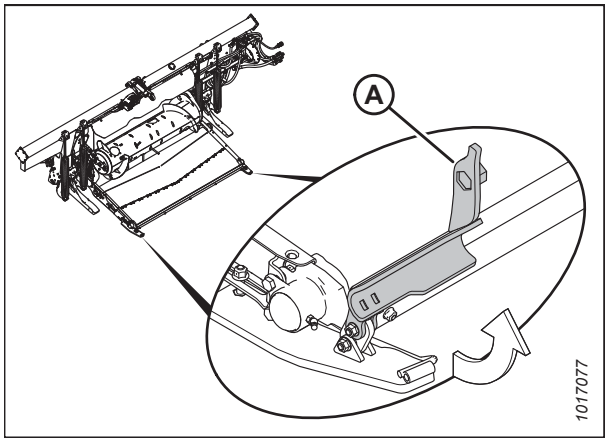


Figure 3.175: Latch

WARNING

Check to be sure all bystanders have cleared the area.

3. Start engine, and lower the combine feeder house so that float module arms (A) are aligned with header balance channels (B).
4. Drive slowly forward, maintaining alignment between float module arms (A) and header balance channels (B).
5. Keep float module arms (A) just under balance channels (B) to ensure float module legs seat properly in the header linkage supports at location (C).

   IMPORTANT:

   Keep hydraulic hoses clear to prevent damage when driving into header.
6. Continue forward until float module arms (A) contact stops in balance channels (B).

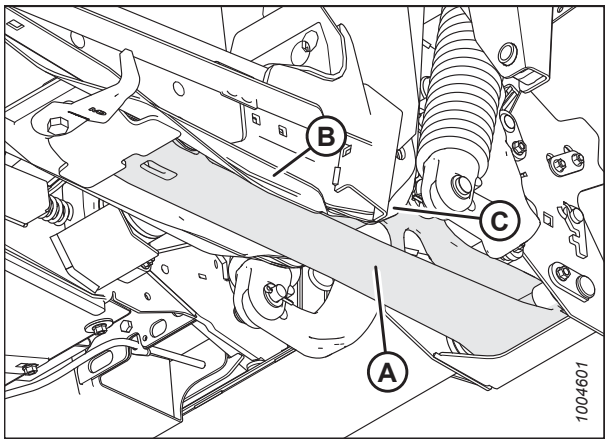


Figure 3.176: Float Module Underside

7. Adjust length of center-link (A) using the header angle hydraulics to approximately align center-link eye (B) with the hole in the header bracket.
8. Shut down the engine, and remove the key from the ignition.
9. Remove lynch pin (C) and pull pin (D) partially out of the bracket. Remove the item used to prop up center-link (A).

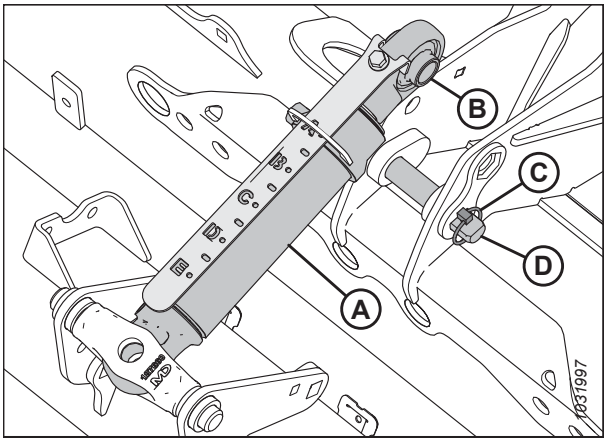


Figure 3.177: Center-Link

10. Align center-link eye (A) with the hole in the bracket, install pin (B), and secure with lynch pin (C).

CAUTION

Always connect center-link before fully raising header.

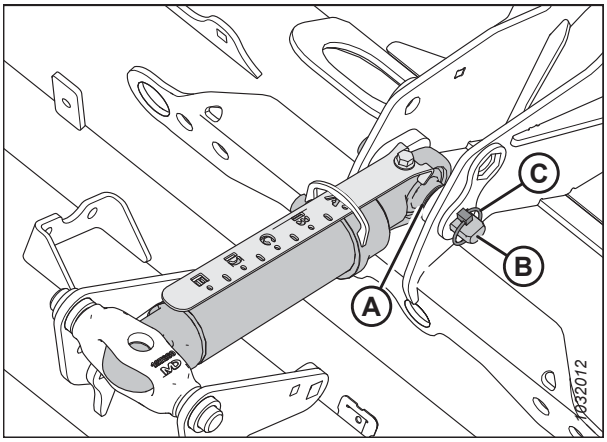


Figure 3.178: Center-Link

WARNING

Check to be sure all bystanders have cleared the area.

11. Start the engine.
12. Raise the float module while making sure the float module legs engage the header legs.
13. Raise the header fully.
14. Shut down the engine, and remove the key from the ignition.
15. Engage the header's safety props. For instructions, refer to the combine operator's manual.

16. Loosen nut and bolt (A), and reposition hook (B) as shown to engage float module arm. Tighten bolt and nut (A).

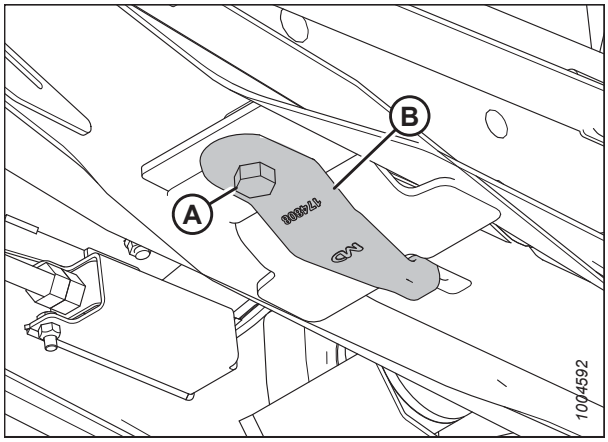


Figure 3.179: Float Module Underside

17. On the back of the float module frame, remove bolts (A), and spring tensioners (C).
18. Hook trim springs (B) that are hang on balance channel (D) to spring tensioners (C).
19. Reinstall the springs tensioners onto the float module. Tighten bolts (A) all the way.
20. Repeat on the opposite side.

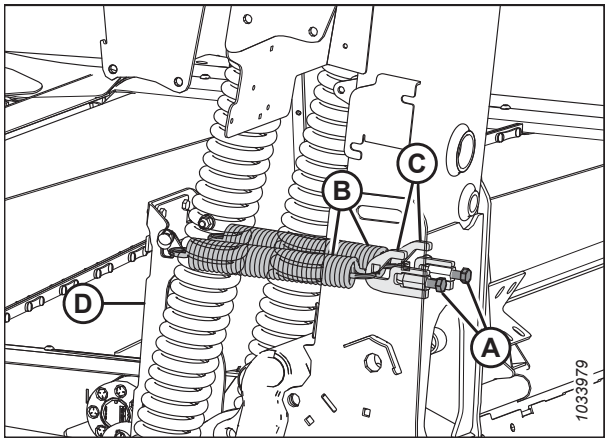


Figure 3.180: Trim Springs – Left side

WARNING

Wear heavy gloves when working around or handling knives.

21. Remove screw (A) and remove nut and bolt (B) from both sides of the opening to allow the attachment of the float module deck.
22. Rotate latch (C) forward and down to engage the transition pan tube.

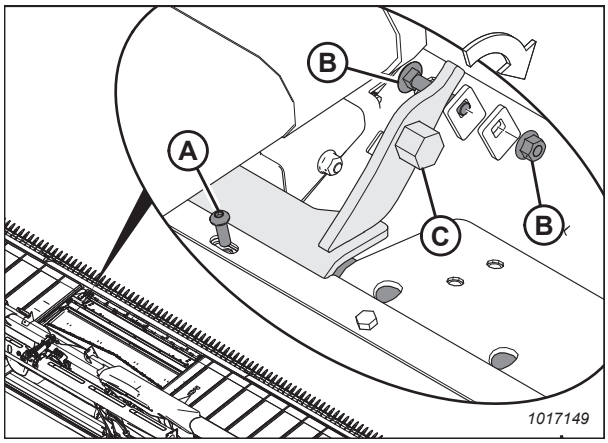


Figure 3.181: Float Module Latch

23. Use a 24 mm (15/16 in.) wrench on hex bolt (C) to rotate latch downwards and slightly raise the feed deck. Install nut and bolt (B) to lock the latch position.
24. Install screw (A).
25. Repeat for the opposite side of the feed draper deck.

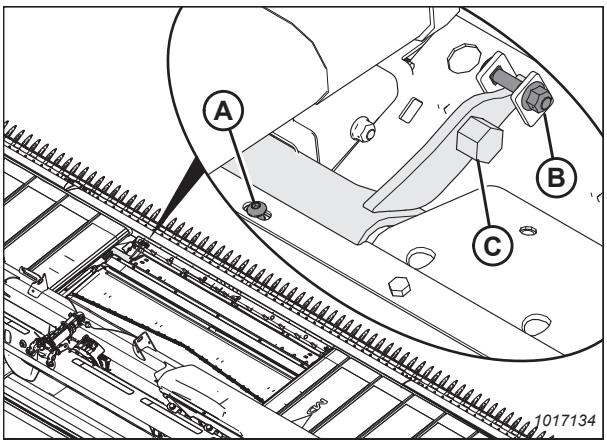


Figure 3.182: Float Module Latch

26. Install fillers (B) on transition pan support angle (C) using two bolts (A).

    NOTE:

    Ensure that there is no contact with the side draper slats.

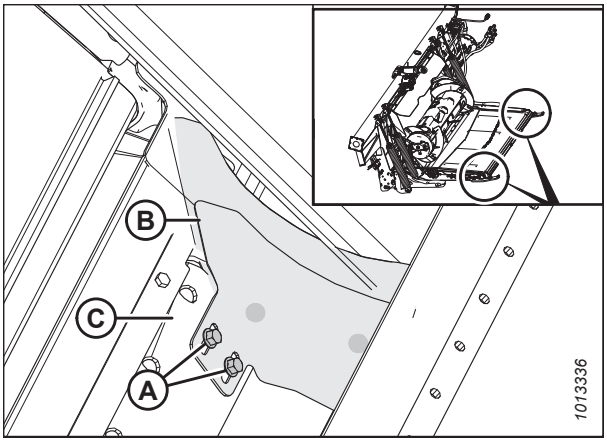


Figure 3.183: Fillers

27. Use a clean cloth to remove debris from couplers and receptacles.
28. Attach the following hydraulic hoses to manifold (B):
    - Knife pressure to port KP on manifold (orange cable tie)
    - Knife return to port KR on manifold (blue cable tie)
    - Draper pressure to port DP on manifold (green cable tie)
    - Draper return to port DR on manifold (red cable tie)
    - Case drain to port CD on manifold
29. Attach electrical connector C20C (A).

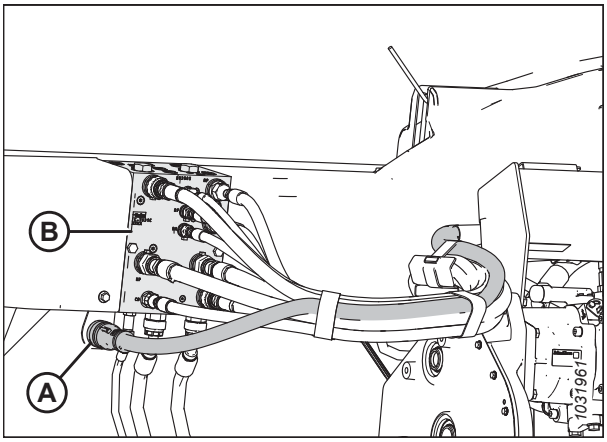


Figure 3.184: Header Connections

30. Check the float and confirm the header is level. For instructions, refer to the following:
    - *3.9.3 Header Float, page 190*
    - *3.11 Leveling Header, page 446*

CAUTION

Be sure all bystanders are clear of machine before starting engine or engaging any header drives.

31. Start the combine and perform the following inspections:
    - Raise and lower the reel to ensure the hoses are properly connected.
    - Run the header to ensure the hoses are properly connected.
32. Check for leaks.

3.6.9 Attaching Side-Hill Driveline to a Combine

When using the float module with a combine leveling system you will require a driveline that can extend far enough.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open any shielding around the combine power take off (PTO).
3. Disconnect chain (D) from support bracket (B).
4. Pull back quick disconnect collar (A), on driveline (C), to release the driveline yoke.
5. Slide the yoke off of support bracket (B).

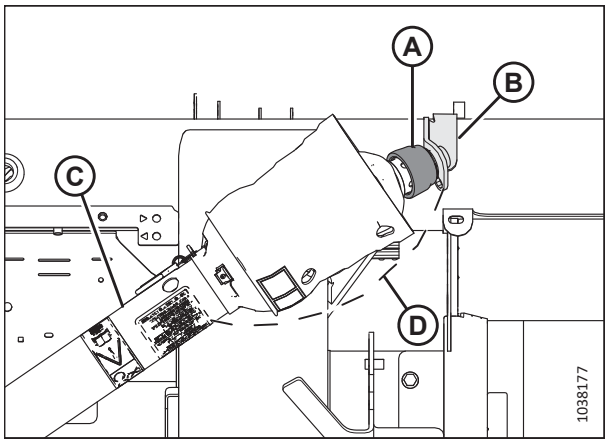


Figure 3.185: Side-Hill Driveline

NOTE:

Some parts hidden for clarity.

6. Align driveline (A) with power take off (PTO) shaft (B) on the combine.
7. Pull back quick disconnect collar (C), on driveline (A), to release the driveline yoke.

NOTE:

Ensure that arrow (E) is pointing towards the PTO on the combine.

8. Slide the collar and yoke onto PTO shaft (B) until it locks onto the shaft.
9. Connect chain (D) to the combine shielding.
10. Close any shielding around the PTO that may have been moved.

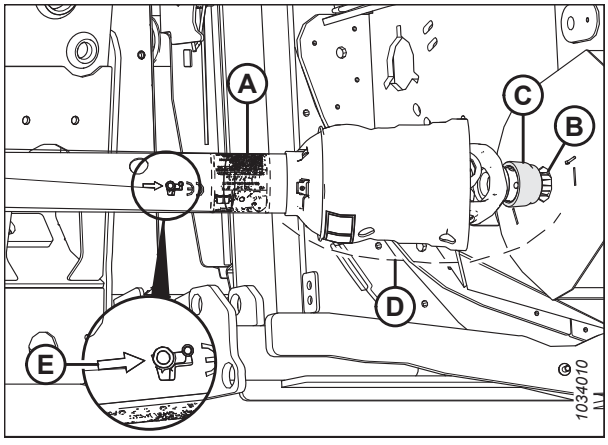


Figure 3.186: Side-Hill Driveline

3.6.10 Detaching Side-Hill Driveline From a Combine

When using the float module with a combine leveling system, a different driveline is required, that can extend and retract enough when following steep terrain.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open any shielding around the combine power take off (PTO).

   NOTE:

   Some parts hidden for clarity.
3. Disconnect chain (D) from the combine shielding.
4. Pull back quick disconnect collar (C) to release the driveline yoke.
5. Slide the yoke and collar off of power take off shaft (B).

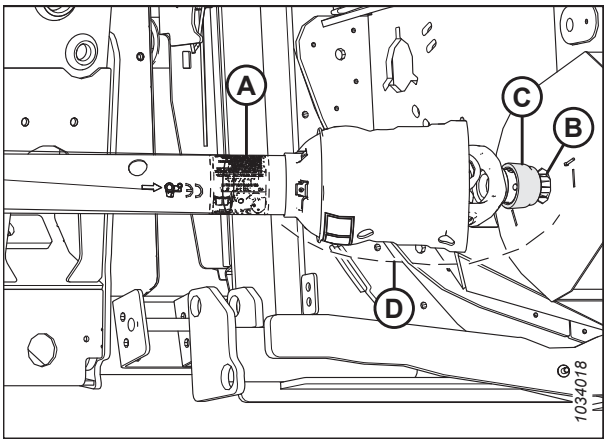


Figure 3.187: Side-Hill Driveline

6. Align driveline (C) with support bracket (B).
7. Pull back quick disconnect collar (A), on driveline (C), to release the driveline yoke.
8. Slide the yoke onto support bracket (B) until it locks onto the shaft.
9. Connect safety chain (D) to the support bracket.
10. Close any shielding around the PTO that may have been moved.

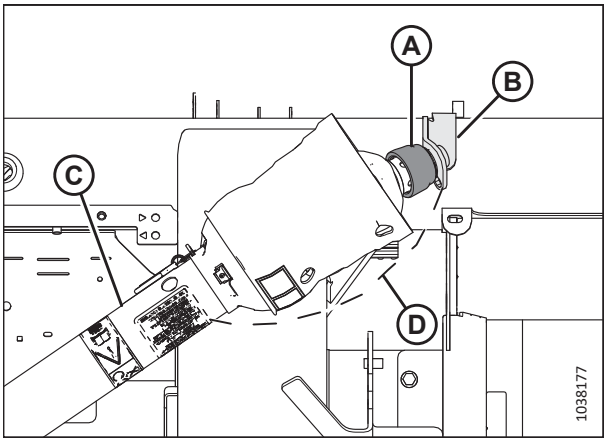


Figure 3.188: Side-Hill Driveline

3.7 Header Setup

For optimal performance, the header must be configured specifically for various harvesting conditions and crops.

3.7.1 Header Attachments

Optional attachments can improve performance in specific conditions or add features to the header. Optional attachments can be ordered and installed by your MacDon Dealer.

Refer to *5 Options and Attachments, page 683* for descriptions of available items.

3.7.2 Header Settings

The following tables provide a guideline for setting up the header for various harvesting conditions and crops.

For information on the reel settings, refer to *3.7.4 Reel Settings, page 142*.

For information on configuring the FM200 auger, refer to *3.8.1 FM200 Feed Auger Configurations, page 147*.

NOTE:

Increase side draper speed for increased performance due to increased crop material or due to increased ground speed.

Table 3.4 Recommended FD2 Series / FM200 Draper Header Settings for Cereals

Stubble Height	102 mm (<4 in.)						
Stabilizer Wheels[1]	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[2]	**Header Angle**[3, 4]	**Reel Cam**	**Reel Speed %**[5]	**Reel Position**	**Upper Cross Auger**
Light	Off	8	B – C	3	10–15	6 or 7	Not required
Normal	On	7	B – C	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Recommended
Lodged	Off	7	B – C	3 or 4	5–10	4 or 5	Not required
Stubble Height	102–203 mm (4–8 in.)						
Stabilizer Wheels	As required						
Skid Shoe Position	Down for lodged crop conditions, middle or down for other crop conditions						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[2]	**Header Angle**[3, 4]	**Reel Cam**	**Reel Speed %**[5]	**Reel Position**	**Upper Cross Auger**
Light	Off	8	B – C	4	10–15	6 or 7	Not required
Normal	On	7	A	2	10	6 or 7	Not required
Heavy	On	7	A	2	10	6 or 7	Recommended
Lodged	Off	7	D	3 or 4	5–10	4 or 5	Not required

1. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
2. Setting on FM200 draper control.
3. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
4. Cutting height is controlled with a combination of skid shoes and header angle.
5. Percentage above ground speed.

Table 3.4 Recommended FD2 Series / FM200 Draper Header Settings for Cereals (continued)

Stubble Height	203 mm + (8 in. +)						
Stabilizer Wheels	As required						
Skid Shoe Position	Not applicable						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[2]	**Header Angle**[3, 4]	**Reel Cam**	**Reel Speed %**[5]	**Reel Position**	**Upper Cross Auger**
Light	Off	8	A	4	10–15	6 or 7	Not required
Normal	On	7	A	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Not required
Lodged	Off	7	B – C	3 or 4	5–10	4 or 5	Not required

Table 3.5 Recommended FD2 Series / FM200 Draper Header Settings for Lentils

Stubble Height	On ground						
Stabilizer Wheels[6]	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[7]	**Header Angle**[8, 9]	**Reel Cam**	**Reel Speed %**[10]	**Reel Position**	**Upper Cross Auger**
Light	On	8	B – C	2	5–10	6 or 7	Not required
Normal	On	7	B – C	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Not required
Lodged	On	7	D	2	5–10	6 or 7	Not required

6. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
7. Setting on FM200 draper control.
8. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
9. Cutting height is controlled with a combination of skid shoes and header angle.
10. Percentage above ground speed.

Table 3.6 Recommended FD2 Series / FM200 Draper Header Settings for Peas

Stubble Height	On ground						
Stabilizer Wheels[11]	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[12]	**Header Angle**[13, 14]	**Reel Cam**	**Reel Speed %**[15]	**Reel Position**	**Upper Cross Auger**
Light	On	7	B – C	2	5–10	6 or 7	Recommended
Normal	On	7	B – C	2	10	6 or 7	Recommended
Heavy	On	7	B – C	2	10	4 or 5	Recommended
Lodged	On	7	D	2	5–10	4 or 5	Recommended

11. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
12. Setting on FM200 draper control.
13. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
14. Cutting height is controlled with a combination of skid shoes and header angle.
15. Percentage above ground speed.

Table 3.7 Recommended FD2 Series / FM200 Draper Header Settings for Canola

Stubble Height	102–203 mm (4–8 in.)						
Stabilizer Wheels[16]	As required						
Skid Shoe Position	Down for light or heavy crop conditions, middle or down for normal or lodged crop conditions						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[17]	**Header Angle**[18, 19]	**Reel Cam**	**Reel Speed %**[20]	**Reel Position**	**Upper Cross Auger**
Light	On	7	A	2	5–10	6 or 7	Recommended
Normal	On	7	B – C	1	10	6 or 7	Recommended
Heavy	On	8	B – C	1	10	3 or 4	Recommended
Lodged	On	7	D	2	5–10	3 or 4	Recommended
Stubble Height	203 mm + (8 in. +)						
Stabilizer Wheels[16]	As required						
Skid Shoe Position	Not applicable						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[17]	**Header Angle**[18 , 19]	**Reel Cam**	**Reel Speed %**[20]	**Reel Position**	**Upper Cross Auger**
Light	On	7	A	2	5–10	6 or 7	Recommended
Normal	On	7	B – C	2	10	6 or 7	Recommended
Heavy	On	8	B – C	1 or 2	10	3 or 4	Recommended
Lodged	On	7	D	2 or 3	5–10	3 or 4	Recommended

16. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
17. Setting on FM200 draper control.
18. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
19. Cutting height is controlled with a combination of skid shoes and header angle.
20. Percentage above ground speed.

Table 3.8 Recommended FD2 Series / FM200 Draper Header Settings for California Rice

Stubble Height	102 mm (<4 in.)						
Stabilizer Wheels[21]	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	**Divider Rods**[22]	**Draper Speed Setting**[23]	**Header Angle**[24, 25]	**Reel Cam**	**Reel Speed %**[26]	**Reel Position**	**Upper Cross Auger**
Light	Rice divider rod	4	D	2	10–15	6 or 7	Not required
Normal	Rice divider rod	4	B – C	2	10	4 or 5	Not required
Heavy	Rice divider rod	4	B – C	2	10	4 or 5	Not required
Lodged	Rice divider rod	4	D	2	5–10	4 or 5	Not required
Stubble Height	102–203 mm (4–8 in.)						
Stabilizer Wheels[21]	As required						
Skid Shoe Position	Middle or down						
Crop Condition	**Divider Rods**[22]	**Draper Speed Setting**[23]	**Header Angle**[24 , 25]	**Reel Cam**	**Reel Speed %**[26]	**Reel Position**	**Upper Cross Auger**
Light	Rice divider rod	4	D	3	10–15	6 or 7	Not required
Normal	Rice divider rod	4	B – C	3	10	6 or 7	Not required
Heavy	Rice divider rod	4	B – C	3	10	6 or 7	Not required
Lodged	Rice divider rod	4	D	4	5–10	6 or 7	Not required

21. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
22. The rice divider rod is available. Rice divider rod not required on both ends of header.
23. Setting on FM200 draper control.
24. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
25. Cutting height is controlled with a combination of skid shoes and header angle.
26. Percentage above ground speed.

Table 3.8 Recommended FD2 Series / FM200 Draper Header Settings for California Rice (continued)

Stubble Height	203 mm + (8 in. +)						
Stabilizer Wheels[21]	As required						
Skid Shoe Position	Not applicable						
Crop Condition	**Divider Rods**[22]	**Draper Speed Setting**[23]	**Header Angle**[24 , 25]	**Reel Cam**	**Reel Speed %**[26]	**Reel Position**	**Upper Cross Auger**
Light	Rice divider rod	4	A	3	10–15	6 or 7	Not required
Normal	Rice divider rod	4	B – C	3	10	6 or 7	Not required
Heavy	Rice divider rod	4	B – C	3	10	6 or 7	Not required
Lodged	Rice divider rod	4	D	4	5–10	6 or 7	Not required

Table 3.9 Recommended FD2 Series / FM200 Draper Header Settings for Delta Rice

Stubble Height	51–152 mm (2–6 in.)						
Stabilizer Wheels[27]	As required						
Skid Shoe Position	Middle or down						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[28]	**Header Angle**[29, 30]	**Reel Cam**	**Reel Speed %**[31]	**Reel Position**	**Upper Cross Auger**
Light	Off	6	D	2 or 3	10–15	6 or 7	Not required
Normal	Off	6	B – C	2 or 3	10	6 or 7	Not required
Heavy	Off	6	B – C	2 or 3	10	6 or 7	Not required
Lodged	Off	6	D	3 or 4	5–10	4 or 5	Not required
Stubble Height	152 mm + (6 in. +)						
Stabilizer Wheels[27]	As required						
Skid Shoe Position	Not applicable						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[28]	**Header Angle**[29 , 30]	**Reel Cam**	**Reel Speed %**[31]	**Reel Position**	**Upper Cross Auger**
Light	Off	6	A	2 or 3	10–15	6 or 7	Not required
Normal	Off	6	B – C	2 or 3	10	6 or 7	Not required
Heavy	Off	6	B – C	2 or 3	10	6 or 7	Not required
Lodged	Off	6	D	3 or 4	5–10	4 or 5	Not required

27. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
28. Setting on FM200 draper control.
29. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
30. Cutting height is controlled with a combination of skid shoes and header angle.
31. Percentage above ground speed.

Table 3.10 Recommended FD2 Series / FM200 Draper Header Settings for Edible Beans

Stubble Height	On ground						
Stabilizer Wheels[32]	Storage						
Skid Shoe Position	Up or middle						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[33]	**Header Angle**[34, 35]	**Reel Cam**	**Reel Speed %**[36]	**Reel Position**	**Upper Cross Auger**
Light	On	8	D	2	5–10	6 or 7	Not required
Normal	On	7	B – C	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Not required
Lodged	On	7	D	2	5–10	6 or 7	Not required

32. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
33. Setting on FM200 draper control.
34. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
35. Cutting height is controlled with a combination of skid shoes and header angle.
36. Percentage above ground speed.

Table 3.11 Recommended FD2 Series / FM200 Draper Header Settings for Flax

Stubble Height	51–153 mm (2–6 in.)						
Stabilizer Wheels[37]	As required						
Skid Shoe Position	Down for lodged crop conditions, middle or down for other crop conditions						
Crop Condition	**Divider Rods**	**Draper Speed Setting**[38]	**Header Angle**[39, 40]	**Reel Cam**	**Reel Speed %**[41]	**Reel Position**	**Upper Cross Auger**
Light	On	8	B – C	2	5–10	6 or 7	Not required
Normal	On	7	A	2	10	6 or 7	Not required
Heavy	On	7	B – C	2	10	6 or 7	Not required
Lodged	On	7	D	2	5–10	6 or 7	Not required

37. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
38. Setting on FM200 draper control.
39. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
40. Cutting height is controlled with a combination of skid shoes and header angle.
41. Percentage above ground speed.

3.7.3 Optimizing Header for Straight-Combining Canola

Ripe canola can be straight-combined, but most varieties are susceptible to pod shatter and subsequent seed loss. This section provides recommended attachments, settings, and adjustments to optimize FD2 Series FlexDraper® Headers for straight-combining canola to reduce seed loss.

Recommended attachments

To optimize the header for straight-combining canola, make the following modifications:

- Install a full-length upper cross auger
- Install vertical knives

NOTE:

Each kit includes installation instructions and the necessary hardware. For more information, refer to *5 Options and Attachments, page 683*.

Recommended settings

To optimize the header for straight-combining canola, make the following adjustments:

- Relieve the tension on the auger spring. For instructions, refer to *3.8.5 Checking and Adjusting Feed Auger Springs, page 176*.
- Set the reel speed so that it is equal to the combine's ground speed. Increase the speed as needed For instructions, refer to *3.9.6 Reel Speed, page 225*.
- Set the side draper speed to position six on in-cab side draper speed control. For instructions, refer to *3.9.8 Side Draper Speed, page 227*.
- Adjust the reel height so that fingers just engage the crop. For instructions, refer to *3.9.10 Reel Height, page 231*.
- Adjust the reel fore-aft position. For instructions, refer to *Adjusting Reel Fore-Aft Position, page 237*.
- Move the reel fore-aft cylinders to the alternative aft location. For instructions, refer to *Repositioning Fore-Aft Cylinders – Double Reel, page 237* or *Repositioning Fore-Aft Cylinders – Triple Reel, page 241*.
- Set the reel cam to position 1. For instructions, refer to *Adjusting Reel Cam, page 248*.
- Set auger to floating position. For instructions, refer to *3.8.4 Setting Auger Position, page 174*.

3.7.4 Reel Settings

Refer to this procedure to learn how various combinations of reel position and cam setting affect the reel finger profile.

Table 3.12 FD2 Series Recommended Reel Settings

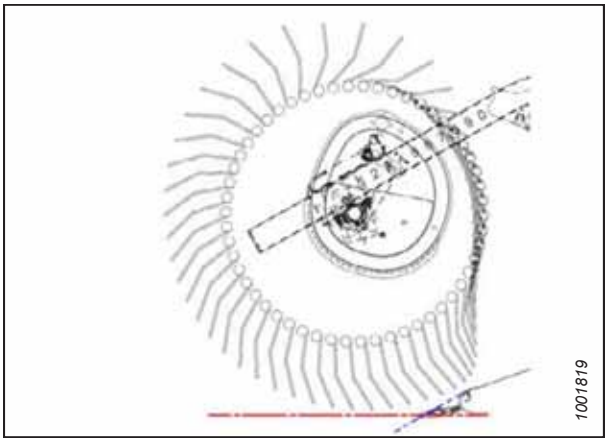
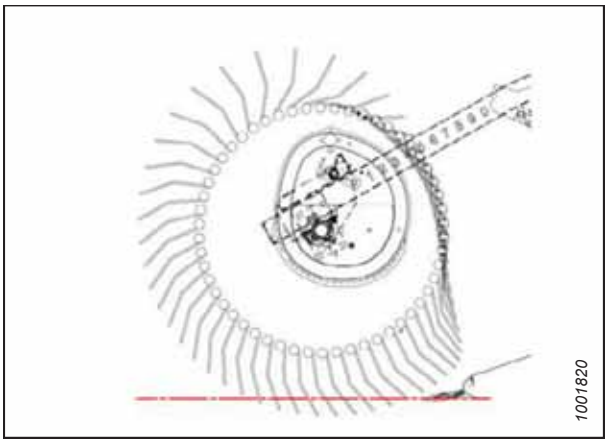
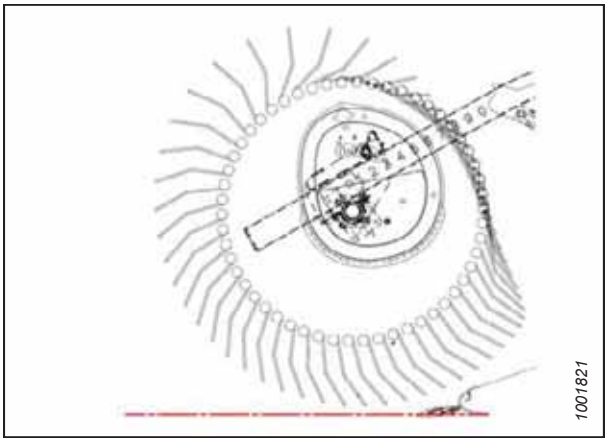
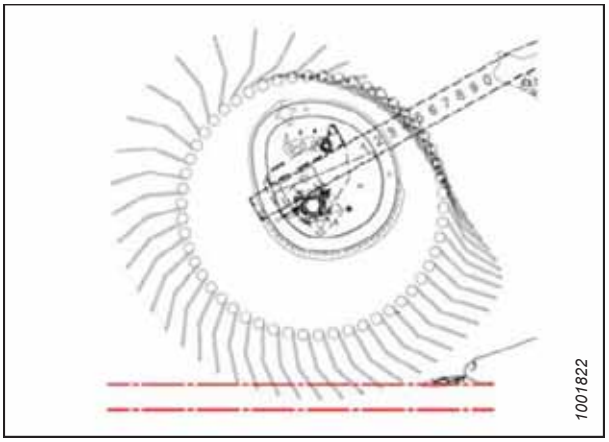
Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
1 (0%)	6 or 7	
2 (20%)	6 or 7	

Table 3.12 FD2 Series Recommended Reel Settings (continued)

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
3 (30%)	3 or 4	
4 (35%)	2 or 3	

NOTE:

- Adjust the reel forward to get closer to the ground while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust the skid shoes or header angle to compensate. Adjust the reel rearward to position the reel farther away from the ground when tilting the header forward.
- Header tilt can be increased to position the reel closer to the ground, or decreased to position the reel farther from the ground, while keeping material flowing onto drapers.
- To leave the maximum amount of stubble in lodged crop, raise the header and increase the header tilt to keep the reel close to the ground. Position the reel fully forward.
- The reel may have to be moved back to prevent lumps or plugging on the cutterbar in thinner crops.
- Minimum crop carrying capacity (the minimum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest aft position.
- Maximum crop carrying capacity (the maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the farthest forward position.
- Due to the nature of the cam action, the tip speed of the fingers/tines at the cutterbar becomes higher than that of the reel speed at higher cam settings. For more information, refer to Table *3.12, page 142*.

3.7.5 Floating Crop Divider Settings – Optional

Floating crop dividers can be adjusted for different crop conditions.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. For instructions on how to make adjustments to the floating crop divider. Refer to *Adjusting Crop Dividers, page 260*. For settings, refer to the correct stubble height table below.

Table 3.13 Stubble Height 50 mm to 125 mm (2 Inch to 5 Inch)

	Header Angle[42]	Stubble Height	Header Main Shoes	DownStop	Fore Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Whisker
Normal	A	125 mm 5 inch	Down	2	1	1	C	In
	A	125 mm 5 inch	Down	2	3	1	C	In
	E	50 mm 2 inch	Down	1	1	1.5	C	In
	E	50 mm 2 inch	Down	1	3	1.5	C	In
Lodged	A	125 mm 5 inch	Down	2	3	1	C	Out
	A	125 mm 5 inch	Down	2	4	1	C	Out
	E	50 mm 2 inch	Down	1	3	2	D	Out
	E	50 mm 2 inch	Down	1	4	2	D	Out
Severely Lodged	A	125 mm 5 inch	Down	2	4	3	D	Out
	A	125 mm 5 inch	Down	2	5	4	D	Out
	E	50 mm 2 inch	Down	1	4	3	C	Out
	E	50 mm 2 inch	Down	1	5	4	C	Out

Table 3.14 Stubble Height 20 mm to 100 mm (3/4 Inch to 4 Inch)

	Header Angle[42]	Stubble Height	Header Main Shoes	DownStop	Fore Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Whisker
Normal	A	100 mm 4 inch	MID	2	1	1	C	In
	A	100 mm 4 inch	MID	2	3	1	C	In
	E	20 mm 3/4 inch	MID	1	1	1	C	In

42. A (min) – E (max)

Table 3.14 Stubble Height 20 mm to 100 mm (3/4 Inch to 4 Inch) (continued)

	Header Angle[42]	Stubble Height	Header Main Shoes	DownStop	Fore Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Whisker
	E	20 mm 3/4 inch	MID	1	3	1	C	In
Lodged	A	100 mm 4 inch	MID	2	3	1	C	Out
	A	100 mm 4 inch	MID	2	4	2	C	Out
	E	20 mm 3/4 inch	MID	1	3	1	D	Out
	E	20 mm 3/4 inch	MID	1	4	2	D	Out
Severely Lodged	A	100 mm 4 inch	MID	2-3	4	3	D	Out
	A	100 mm 4 inch	MID	2-3	5	4	D	Out
	E	20 mm 3/4 inch	MID	1	4	3	C	Out
	E	20 mm 3/4 inch	MID	1	5	4	C	Out

Table 3.15 Stubble Height 16 mm to 50 mm (5/8 Inch to 2 Inch) Cutterbar on Ground

	Header Angle[42]	Stubble Height	Header Main Shoes	DownStop	Fore Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Whisker
Normal	A	50 mm 2 inch	Up	2	1-3	1	C	In
	A	50 mm 2 inch	Up	2	1-3	1	C	In
	E	16 mm 5/8 inch	Up	1	1	2	C	In
	E	16 mm 5/8 inch	Up	1	3	1	C	In
Lodged	A	50 mm 2 inch	Up	2	3	1	C	Out
	A	50 mm 2 inch	Up	3	4	1	C	Out
	E	16 mm 5/8 inch	Up	1	3-4	2	D	Out
	E	16 mm 5/8 inch	Up	1	3-4	2	D	Out
Severely Lodged	A	50 mm 2 inch	Up	2-3	4	3	D	Out
	A	50 mm 2 inch	Up	2-3	5	4	D	Out

Table 3.15 Stubble Height 16 mm to 50 mm (5/8 Inch to 2 Inch) Cutterbar on Ground (continued)

	Header Angle[42]	Stubble Height	Header Main Shoes	DownStop	Fore Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Whisker
	E	16 mm 5/8 inch	Up	1	4	2.5	C	Out
	E	16 mm 5/8 inch	Up	1	5	4	C	Out

3.8 Float Module Setup

The following sections outline the recommended float module setup guidelines for your specific combine model and crop type; however, the recommendations cannot cover all conditions.

If feeding problems develop with the float module, refer to *6 Troubleshooting, page 699*.

3.8.1 FM200 Feed Auger Configurations

The FM200 feed auger can be configured to suit various crop conditions; there are five configurations available.

Ultra Narrow: Ultra Narrow configuration uses 8 long bolt-on flightings (4 on the left and 4 on the right) and 18 auger fingers. This optional configuration may improve feeding performance on combines with narrow feeder houses. It may also be helpful when harvesting rice.

NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

NOTE:

You will need to drill holes in the flighting and in the drum to install the extra flighting.

For more information on converting to Ultra Narrow configuration, refer to *Ultra Narrow Configuration – Auger Flighting, page 149*.

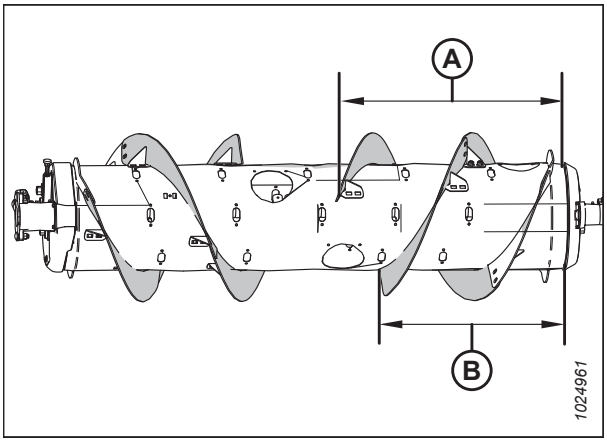


Figure 3.189: Ultra Narrow Configuration – Rear View

A - 760 mm (29 15/16 in.) **B - 602 mm (23 11/16 in.)**

Narrow Configuration: The narrow configuration uses 4 long bolt-on flightings (2 on the left and 2 on the right) and 18 feed auger fingers.

NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

Narrow configuration is a standard configuration for the following combines:

- IDEAL™ 7/8/9/10
- Gleaner R6/75, R6/76, S6/77, S6/7/88, S96/7/8
- New Holland CR 920/940/960, 9020/40/60/65, 6090/7090, 8060/8070/8080

Optional configuration for the following combines:

- Case 2166/88, 2344/66/77/88, 2577/88, 5/6/7088, 5/6/7130, 5/6/7140, 5/6/7150

For more information on converting to Narrow configuration, refer to *Narrow Configuration – Auger Flighting, page 153*.

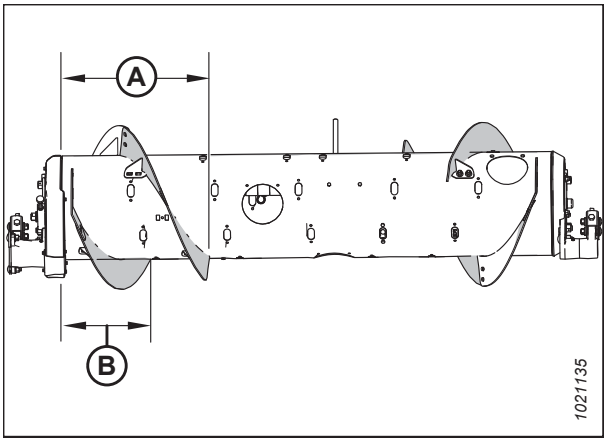


Figure 3.190: Narrow Configuration – Rear View

A - 514 mm (20 1/4 in.) **B - 356 mm (14 in.)**

Medium Configuration: The medium configuration uses 4 short bolt-on flightings (2 on the left and 2 on the right) and 22 feed auger fingers.

NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

Medium configuration is a standard configuration for the following combines:

- Case IH 2166/88, 2344/66/77/88, 2577/88, 5/6/7088, 5/6/7130, 5/6/7140,5/6/7150,7/8/9230, 7/8/9240, 7/8/9250
- Challenger® 66/67/680B, 54/560C, 54/560E
- CLAAS 56/57/58/590R, 57/58/595R, 62/63/64/65/66/670, 73/74/75/76/77/780, ,6X00, 7X00, 8X00
- Fendt 9490x, 6335C
- GleanerA66/76/86
- John Deere 95/96/97/9860, 95/96/97/9870, S65/66/67/68/690, T670
- Massey Ferguson® 92/9380, 96/97/9895, 9520/40/60, 9500, 9545/65
- New Holland CR 970/980, 9070/9080, 8090/9090, X.90, X.80
- New Holland CX 8X0, 80X0, 8.X0
- Rostselmash 161, T500, TORUM 7X0, TORUM 785

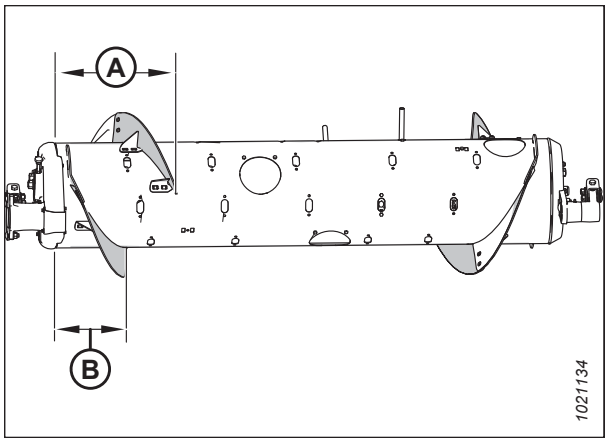


Figure 3.191: Medium Configuration – Rear View

A - 410 mm (16 1/8 in.) **B - 260 mm (10 1/4 in.)**

For more information on converting to Medium configuration, refer to *Medium Configuration – Auger Flighting, page 156*.

Wide Configuration: The wide configuration uses 2 short bolt-on flightings (1 on the left and 1 on the right) and 30 feed auger fingers.

NOTE:

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

Wide configuration is a standard configuration for the following combines:

- John Deere **X9:** 1000, 1100

Optional configuration for the following combines:

- Challenger® 670B/680B, 540C/560C, 540E/560E
- CLAAS 590R/595R, 660/670, 760/770/780, 6X00, 7X00, 8X00
- Massey Ferguson® 9895, 9540, 9560, 9545, 9565, 9380
- New Holland CX 8X0, 80X0, 8.X0

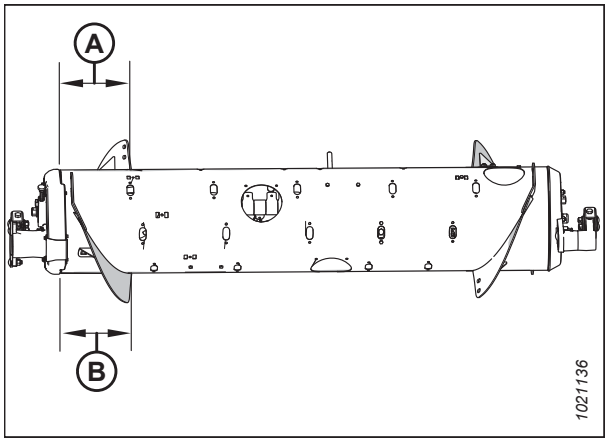


Figure 3.192: Wide Configuration – Rear View

A - 257 mm (10 1/8 in.) **B - 257 mm (10 1/8 in.)**

NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.

For more information on converting to Wide configuration, refer to *Wide Configuration – Auger Flighting, page 158*.

Ultra-Wide: The Ultra Wide configuration uses only factory-welded flighting (A) is responsible for conveying the crop. No bolt-on flighting is installed and a total of 30 auger fingers are recommended for this configuration.

Ultra Wide configuration is an optional configuration for wide feeder house combines.

NOTE:

This configuration may improve feeding for wide feeder house combines.

For more information on converting to Ultra Wide configuration, refer to *Ultra Wide Configuration – Auger Flighting, page 161*.

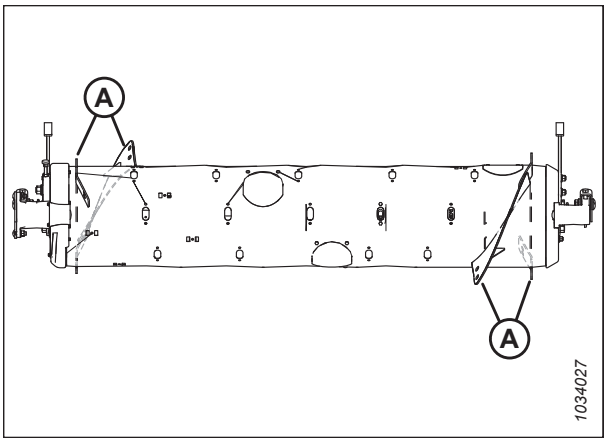


Figure 3.193: Ultra Wide Configuration – Rear View

Ultra Narrow Configuration – Auger Flighting

Ultra Narrow configuration uses eight long bolt-on flightings (four on the left and four on the right), and 18 auger fingers are recommended.

NOTE:

You will need to drill holes in the flighting and in the drum to install the four additional flightings.

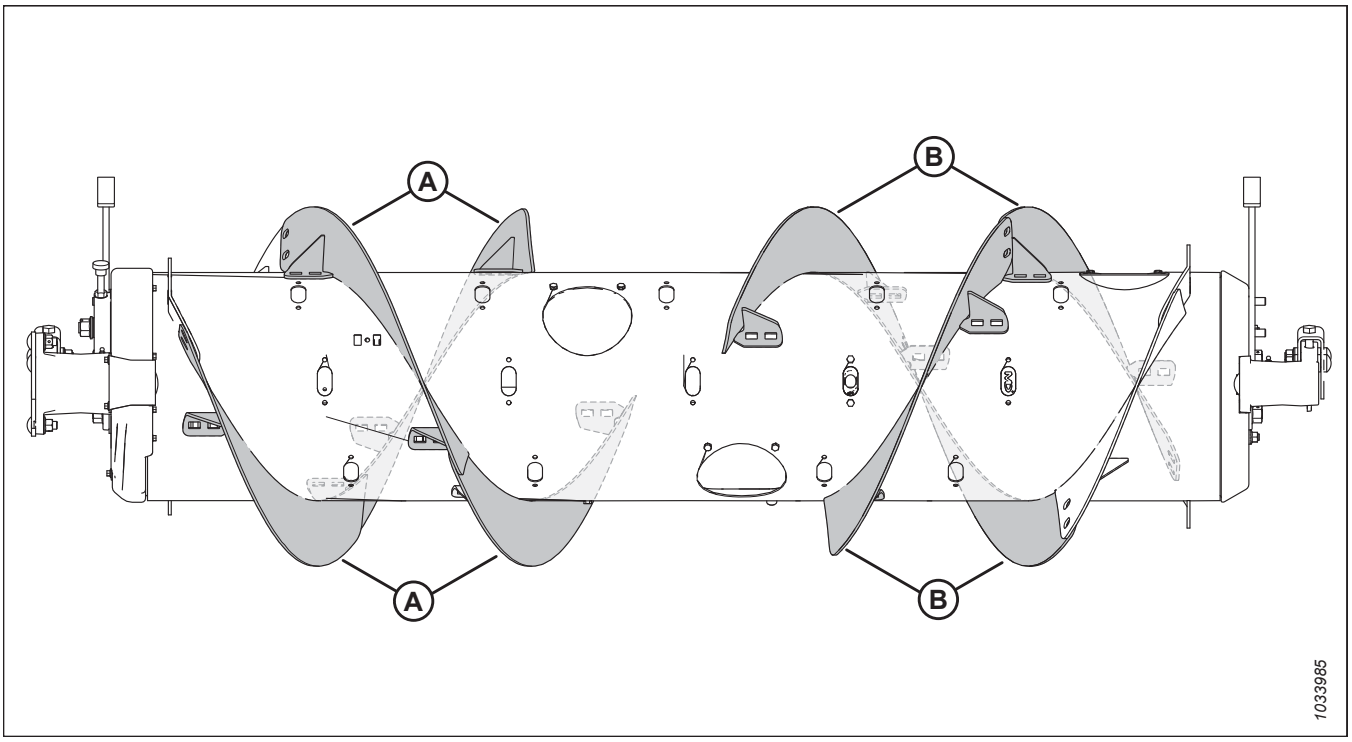


Figure 3.194: Ultra Narrow Configuration

A - Left Long Flighting (MD #287889)

B - Right Long Flighting (MD #287890)

To convert to Ultra Narrow configuration from Narrow Configuration:

One flighting kit (MD #357234 or MD #B7345[43]) and some hole-drilling are required to install flightings (A). Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions.

IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware at the correct location to prevent damage and to maximize performance.

- For flighting installation instructions, refer to *Installing Bolt-On Flighting, page 165*.
- To install the additional flightings that require hole drilling, refer to *Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 168*.
- For finger installation/removal instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172* and *3.8.2 Removing Feed Auger Fingers, page 170*.

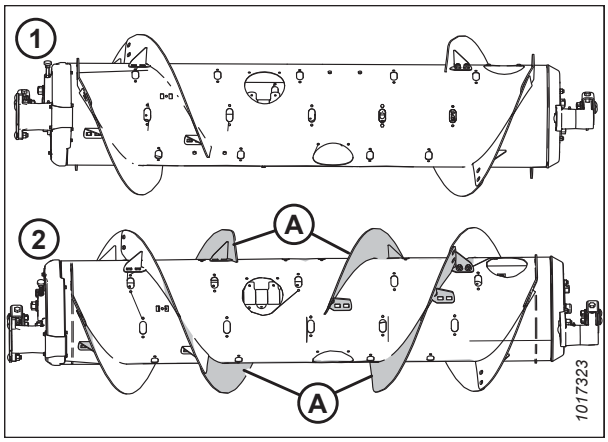


Figure 3.195: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**

To convert to Ultra Narrow configuration from Medium, Wide, or Ultra Wide configuration:

Two flighting kits (MD #357234 or MD #B7345[43]) and some hole-drilling is required to convert to this configuration.

You will need to replace existing short flightings (A)[44] with long flightings (B). Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions.

IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

- For flighting replacement instructions, refer to *Removing Bolt-On Flighting, page 163* and *Installing Bolt-On Flighting, page 165*.
- To install the additional flightings that require hole drilling, refer to *Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 168*.
- For finger installation/removal instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172* and *3.8.2 Removing Feed Auger Fingers, page 170*.

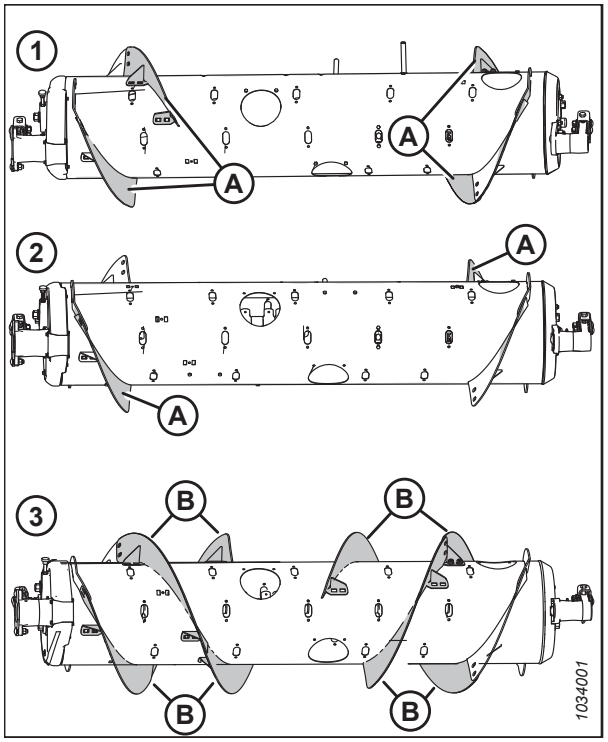


Figure 3.196: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**
3 - Ultra Narrow Configuration

43. MD #357234 is available only through MacDon Parts. MD #B7345 is available only through Whole Goods. Both kits contain wear-resistant flightings.
44. The quantity of existing short flightings is either 0, 2, or 4, depending on the current configuration.

NOTE:

If converting from Ultra Wide configuration, there is no existing bolt-on flighting to remove because that configuration uses only the factory-welded flighting (A).

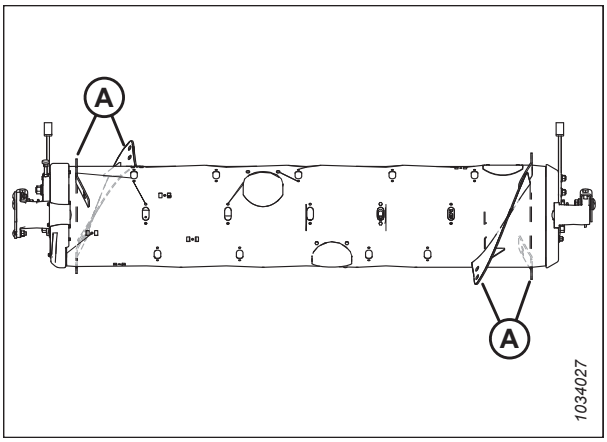


Figure 3.197: Ultra Wide Configuration

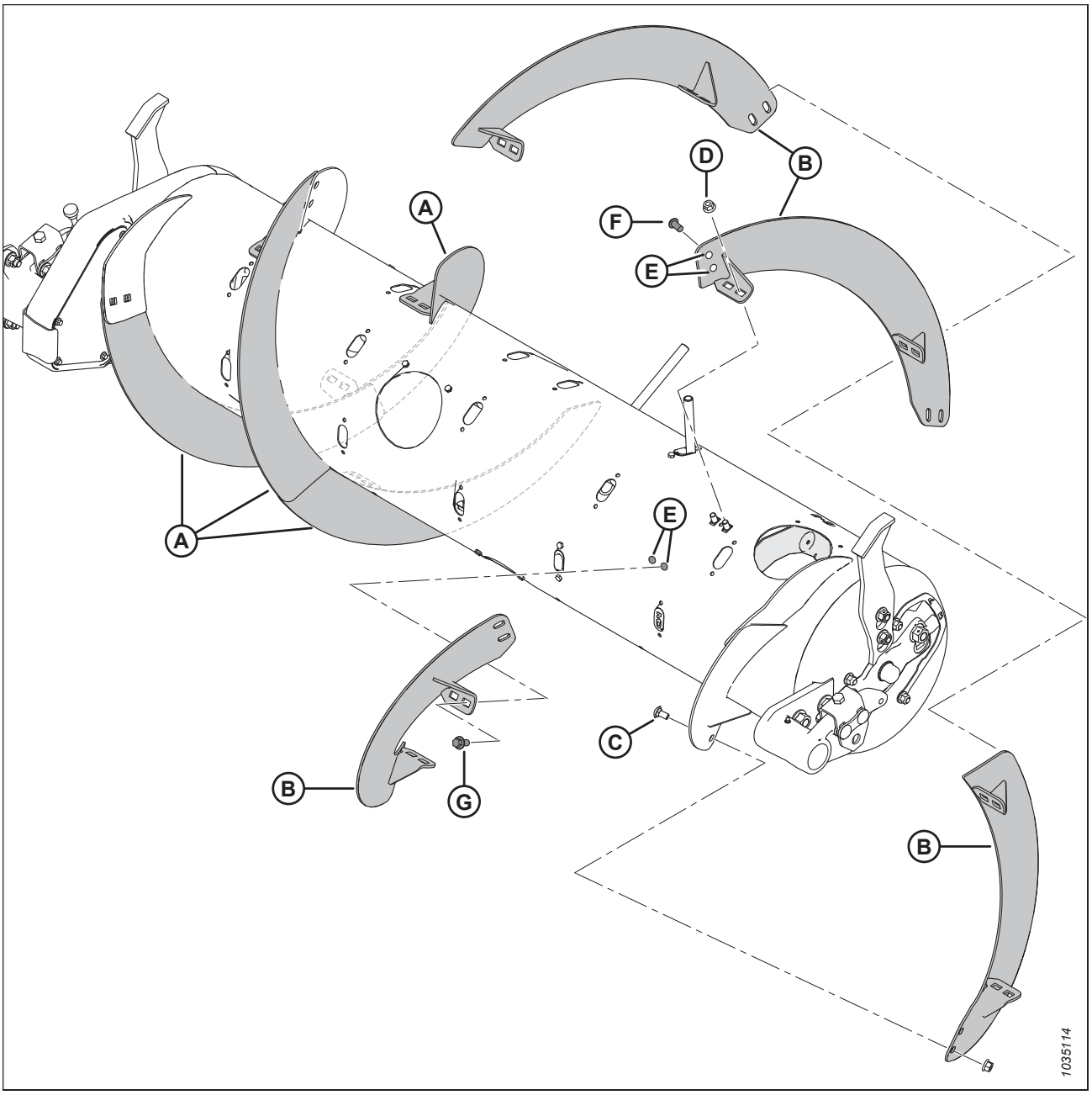


Figure 3.198: Ultra Narrow Configuration

A - Left Long Flighting (MD #287889)
B - Right Long Flighting (MD #287890)
C - M10 x 20 mm Carriage Bolt (MD #136178)
D - M10 Center Lock Flange Nut (MD #135799)
E - Drilled Holes – 11 mm (7/16 in.) [45]
F - M10 x 20 mm Button Head Bolt (MD #135723)[46]
G - M10 x 20 mm Flange Head Bolt (MD #152655)[47]

45. Each of the four additional flightings require six drilled holes to install (four in the auger and two in the adjacent flighting).
46. Used on the holes drilled in the existing flighting.
47. Used on the holes drilled in the auger.

Narrow Configuration – Auger Flighting

Narrow configuration uses four long bolt-on flightings (two on the left and two on the right), and 18 auger fingers.

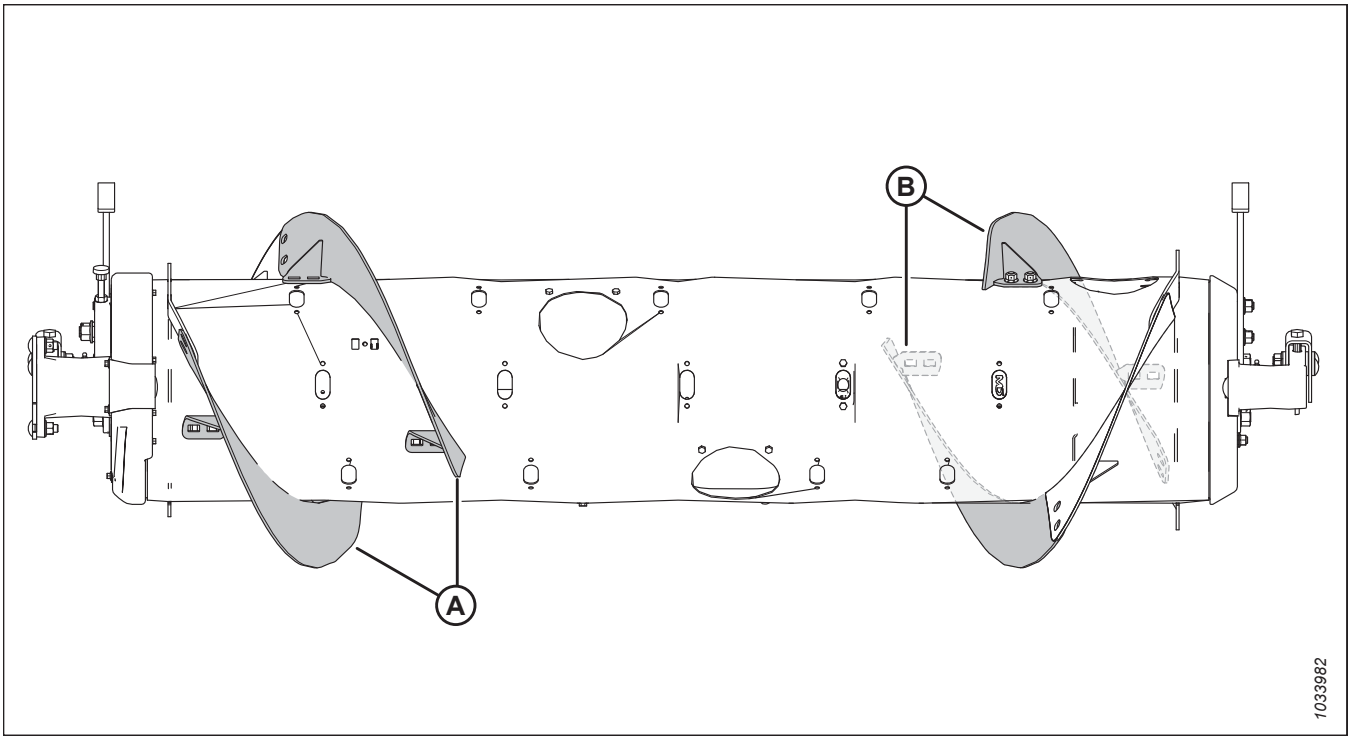


Figure 3.199: Narrow Configuration

A - Left Long Flighting (MD #287889) **B - Right Long Flighting (MD #287890)**

To convert to Narrow configuration from Ultra Narrow Configuration:

Remove four flightings (A) from the auger and install additional auger fingers. A total of 18 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to *Removing Bolt-On Flighting, page 163*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172*.

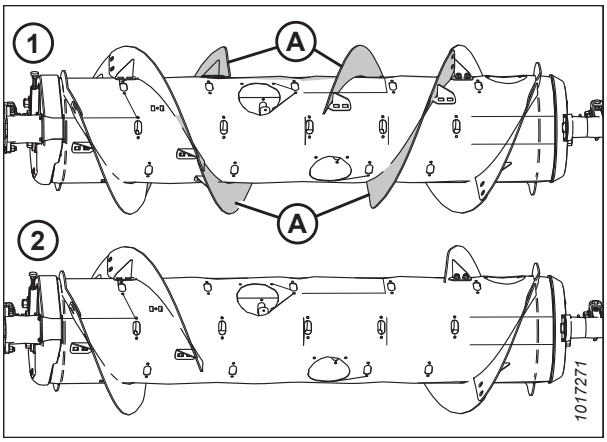


Figure 3.200: Auger Configurations – Rear View

1 - Ultra Narrow Configuration **2 - Narrow Configuration**

To convert to Narrow configuration from Medium, Wide, or Ultra Wide configuration:

One flighting kit (MD #357234 or MD #B7345[48]) is required. You will need to replace any of the existing short flightings (A)[49] with long flightings (B) and remove the extra auger fingers. A total of 18 auger fingers is recommended for this configuration.

IMPORTANT:

Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

- For flighting replacement instructions, refer to *Removing Bolt-On Flighting, page 163* and *Installing Bolt-On Flighting, page 165*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 170*.

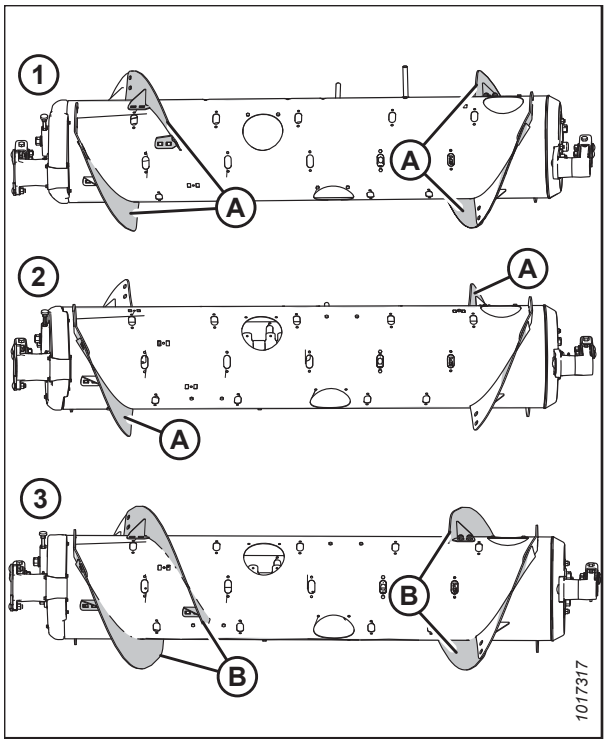


Figure 3.201: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**
3 - Narrow Configuration

NOTE:

If converting from Ultra Wide configuration, there is no existing bolt-on flighting to remove because that configuration uses only the factory-welded flighting (A).

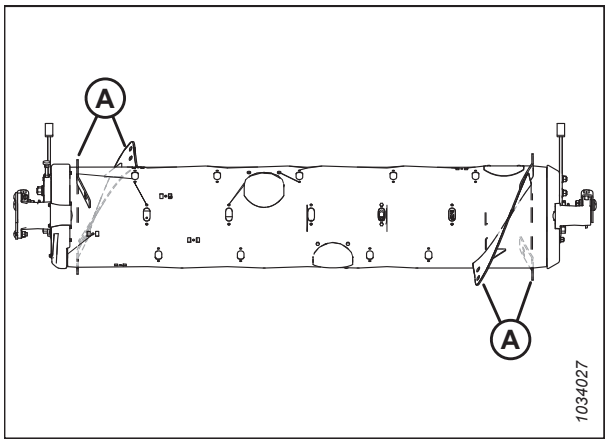


Figure 3.202: Ultra Wide Configuration

48. MD #357234 is available only through MacDon Parts. B7345 is available only through Whole Goods. Both kits contain wear-resistant flightings.
49. The quantity of existing short flightings is either 0, 2, or 4, depending on the current configuration.

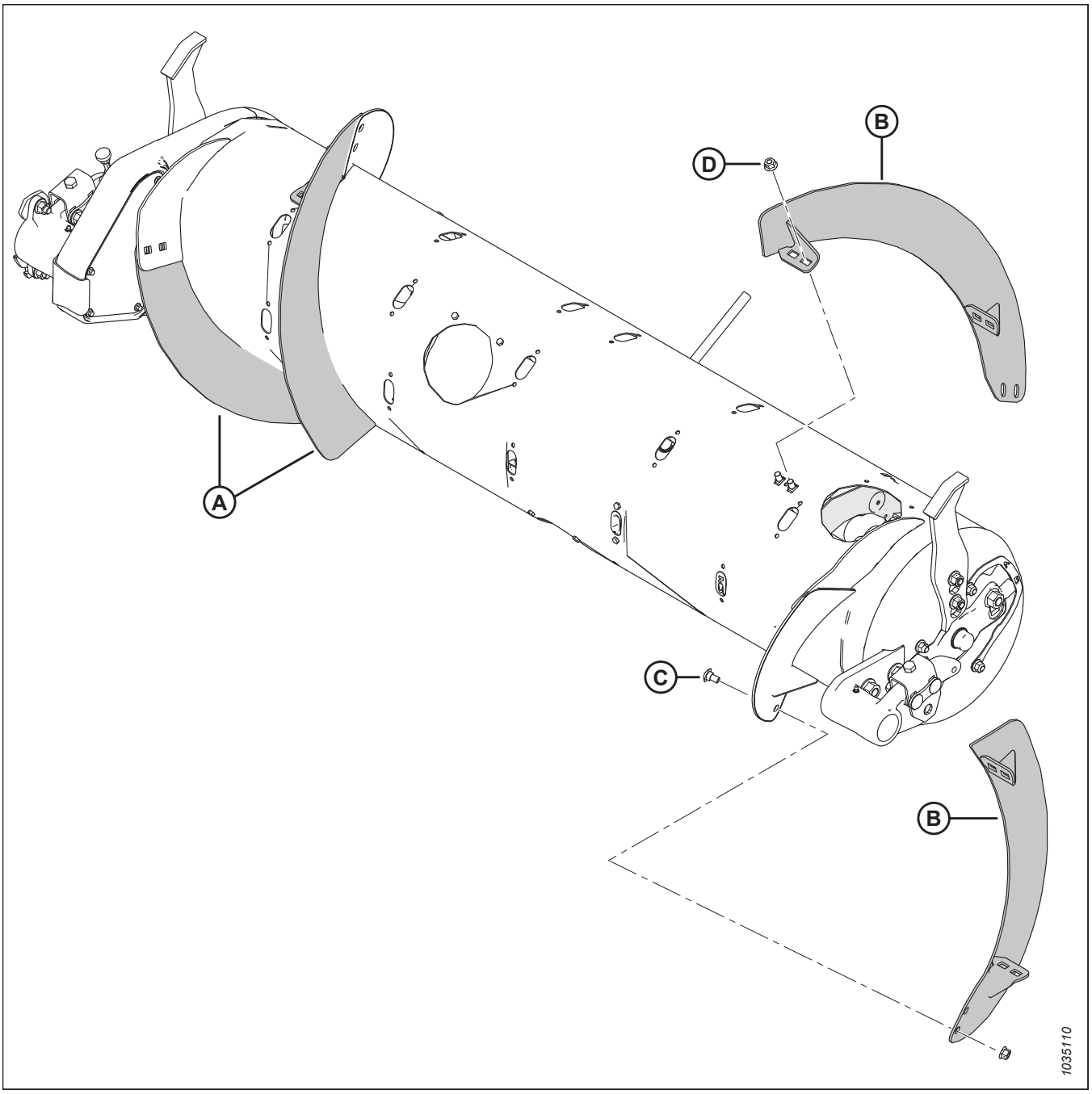


Figure 3.203: Narrow Configuration

A - Left Long Flighting (MD #287889)

B - Right Long Flighting (MD #287890)

C - M10 x 20 mm Carriage Bolt (MD #136178)

D - M10 Center Lock Flange Nut (MD #135799)

Medium Configuration – Auger Flighting

Medium configuration uses four short bolt-on flightings (two on the left and two on the right), and 22 auger fingers are recommended.

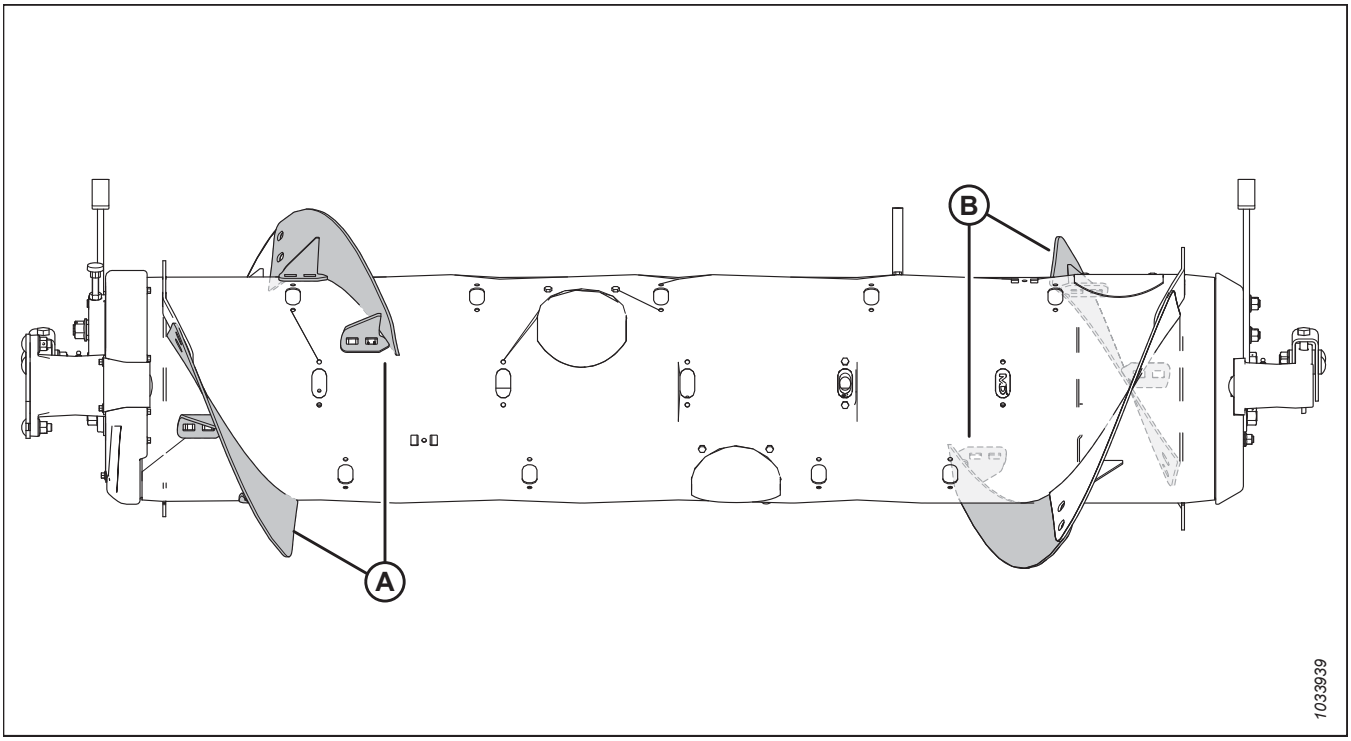


Figure 3.204: Medium Configuration

A - Left Short Flighting (MD #287888) **B - Right Short Flighting (MD #287887)**

To convert to Medium configuration from Wide configuration:

One flighting kit (MD #357233 or MD #B7344[50]) is required. You will need to install new flightings (A) and remove the extra auger fingers. A total of 22 auger fingers is recommended for this configuration.

- For flighting installation instructions, refer to *Installing Bolt-On Flighting, page 165*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 170*.

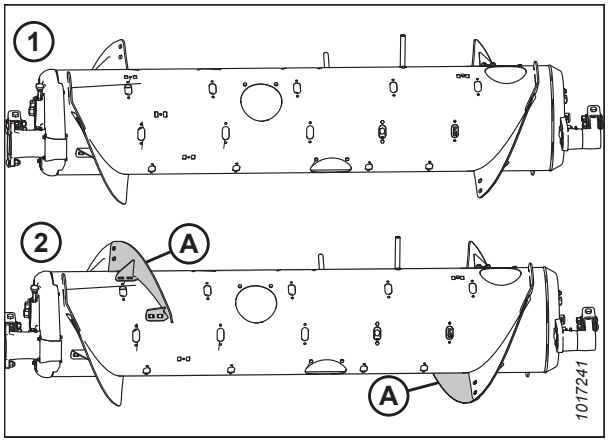


Figure 3.205: Auger Configurations – Rear View

1 - Wide Configuration **2 - Medium Configuration**

50. MD #357233 is available only through MacDon Parts. MD #B7344 is available only through Whole Goods. Both kits contain wear-resistant flightings.

To convert to Medium configuration from Narrow or Ultra Narrow configuration:

Two flighting kits (MD #357233 or MD #B7344[50]) are required. You will need to replace long flightings (A)[51] with short flightings (B) and install additional auger fingers. A total of 22 auger fingers is recommended for this configuration.

- For flighting replacement instructions, refer to *Removing Bolt-On Flighting, page 163* and *Installing Bolt-On Flighting, page 165*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172*.

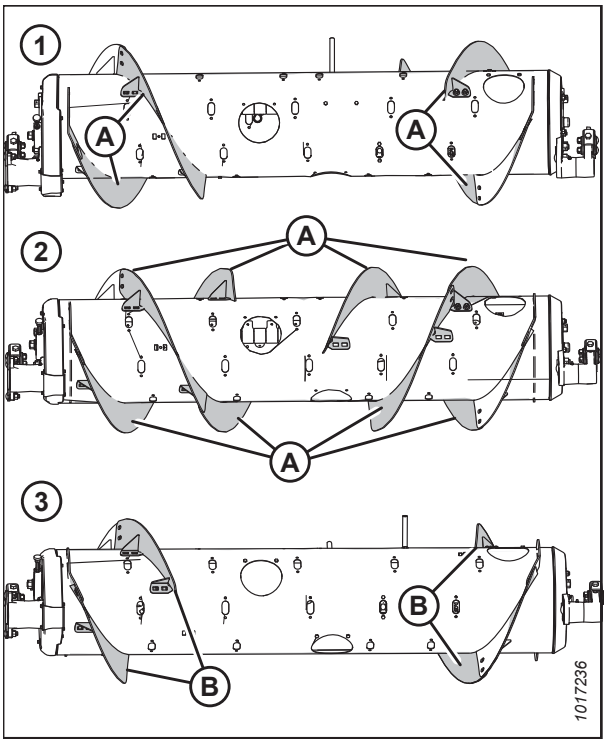


Figure 3.206: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**
3 - Medium Configuration

To convert to Medium configuration from Ultra Wide configuration:

Two flighting kits (MD #357233 or MD #B7344[50]) are required. You will need to install four short flightings onto the existing welded flightings (A) and remove the extra auger fingers. A total of 22 auger fingers is recommended for this configuration.

- For flighting installation instructions, refer to *Installing Bolt-On Flighting, page 165*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 170*.

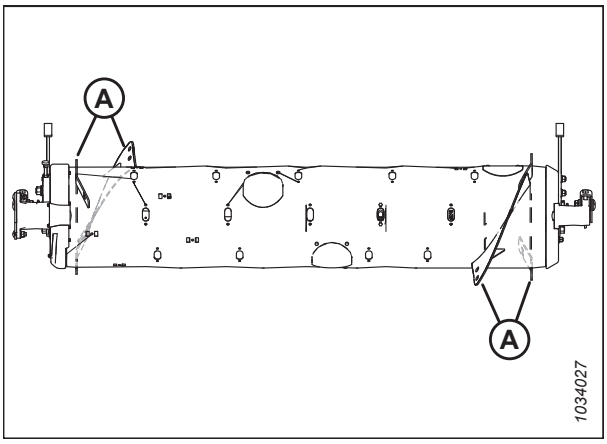


Figure 3.207: Ultra Wide Configuration

51. The quantity of existing long flightings is either 4 or 8, depending on the current configuration.

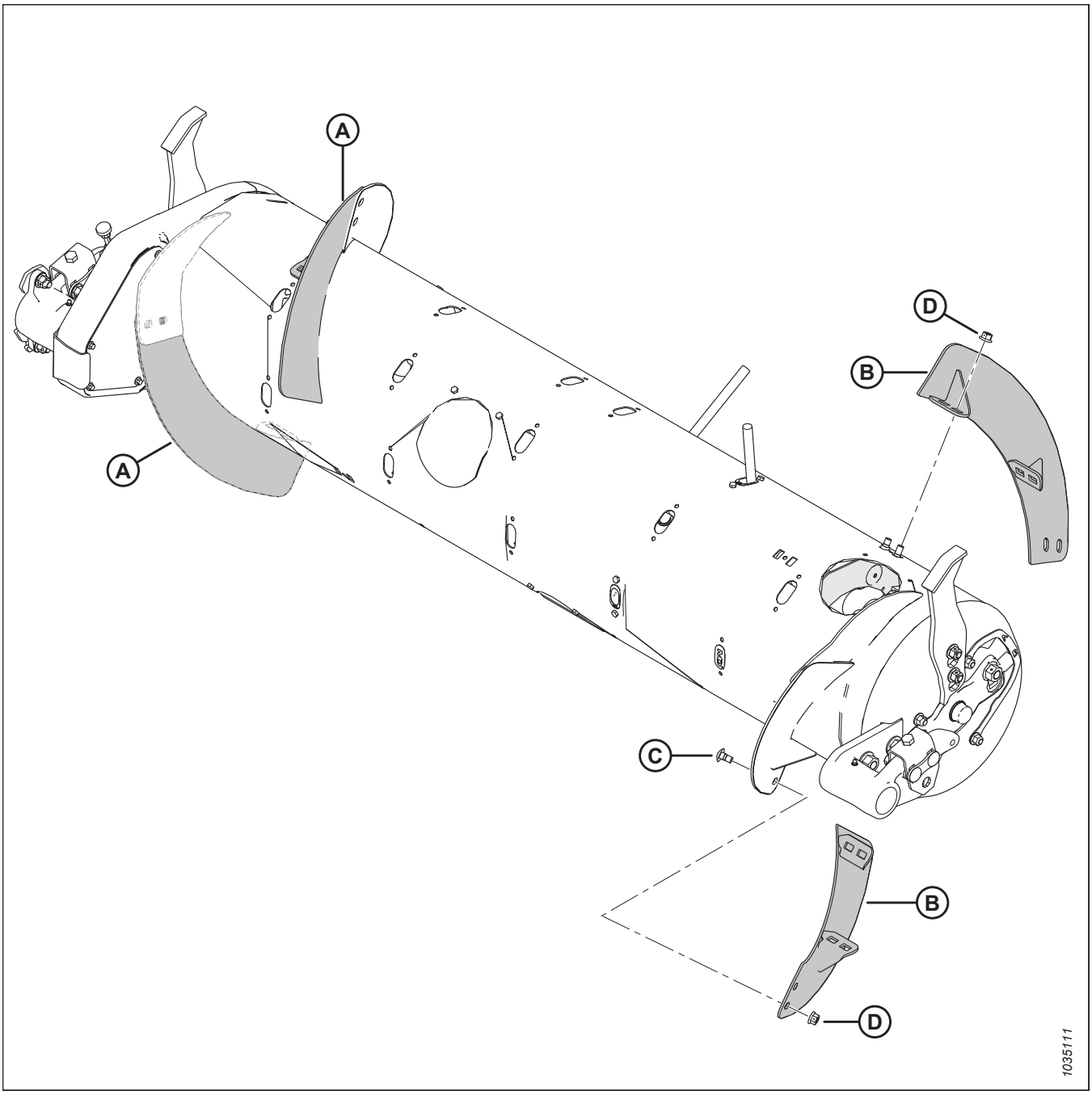


Figure 3.208: Medium Configuration

A - Left Short Flighting (MD #287888)

B - Right Short Flighting (MD #287887)

C - M10 x 20 mm Carriage Bolt (MD #136178)

D - M10 Center Lock Flange Nut (MD #135799)

Wide Configuration – Auger Flighting

Wide configuration uses two short bolt-on flightings (one on the left and one on the right), and 30 auger fingers are recommended.

NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.

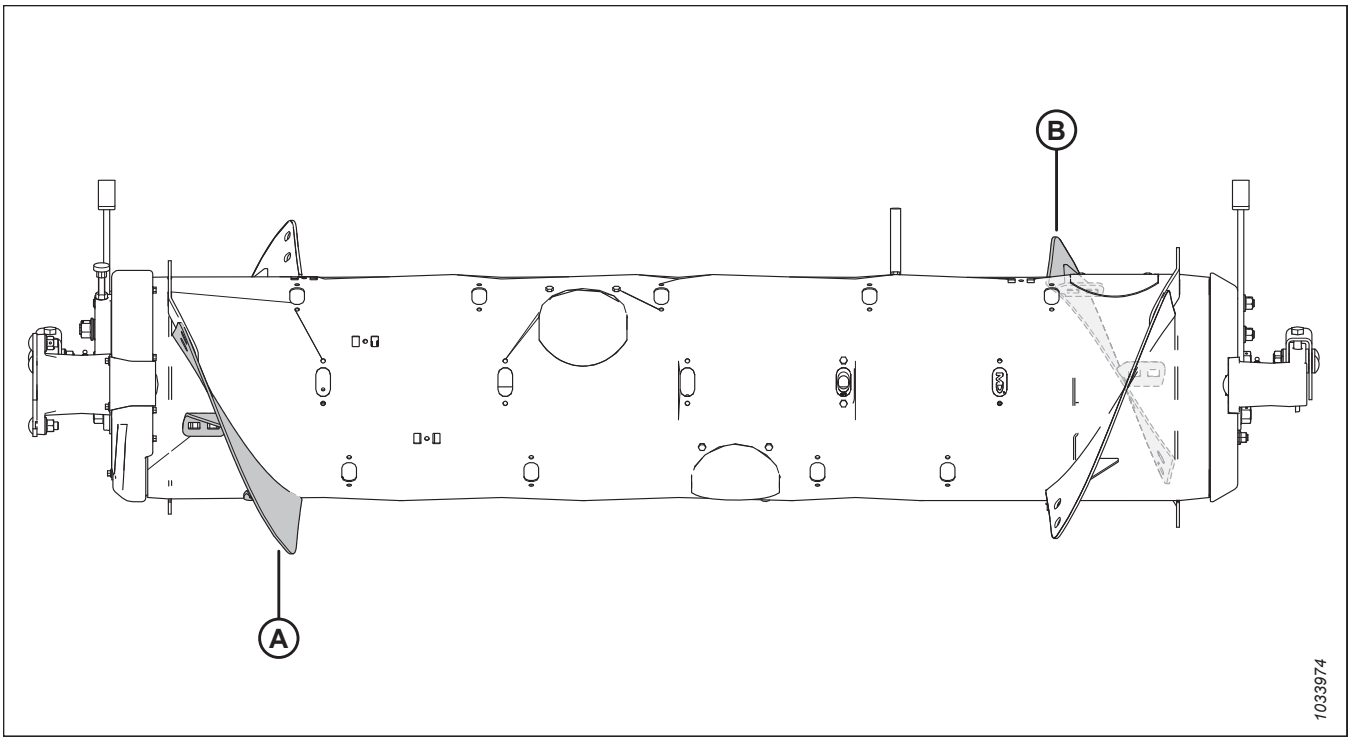


Figure 3.209: Wide Configuration

A - Left Short Flighting (MD #287888) **B - Right Short Flighting (MD #287887)**

To convert to Wide configuration from Medium Configuration:

Remove existing flightings (A) from the auger and install additional auger fingers. A total of 30 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to *Removing Bolt-On Flighting, page 163*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172*.

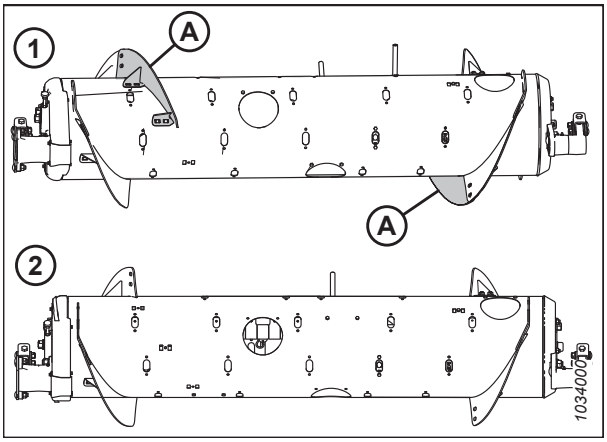


Figure 3.210: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**

To convert to Wide configuration from Ultra Wide configuration:

One flighting kits (MD #357233 or MD #B7344[52]) is required. You will need to install two short flightings onto the existing welded flightings (A). A total of 30 auger fingers is recommended for this configuration.

- For flighting installation instructions, refer to *Installing Bolt-On Flighting, page 165*.
- If required to remove auger fingers, refer to *3.8.2 Removing Feed Auger Fingers, page 170*.

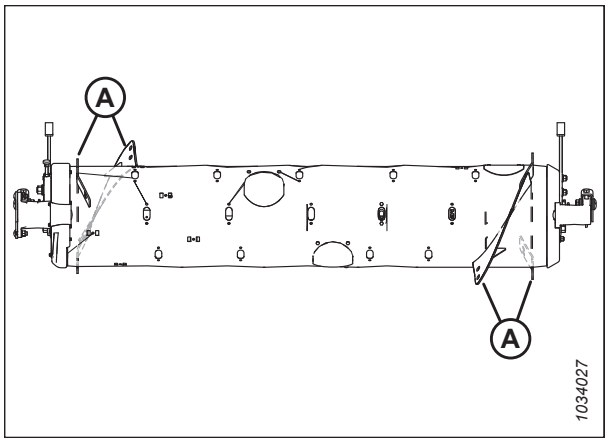


Figure 3.211: Ultra Wide Configuration

To convert to Wide configuration from Narrow or Ultra Narrow configuration:

One flighting kit (MD #357233 or MD #B7344[52]) is required. You will need to replace existing long flightings (A)[53] with short flightings (B) and install additional auger fingers. A total of 30 auger fingers is recommended for this configuration.

- For flighting replacement instructions, refer to *Removing Bolt-On Flighting, page 163* and *Installing Bolt-On Flighting, page 165*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172*.

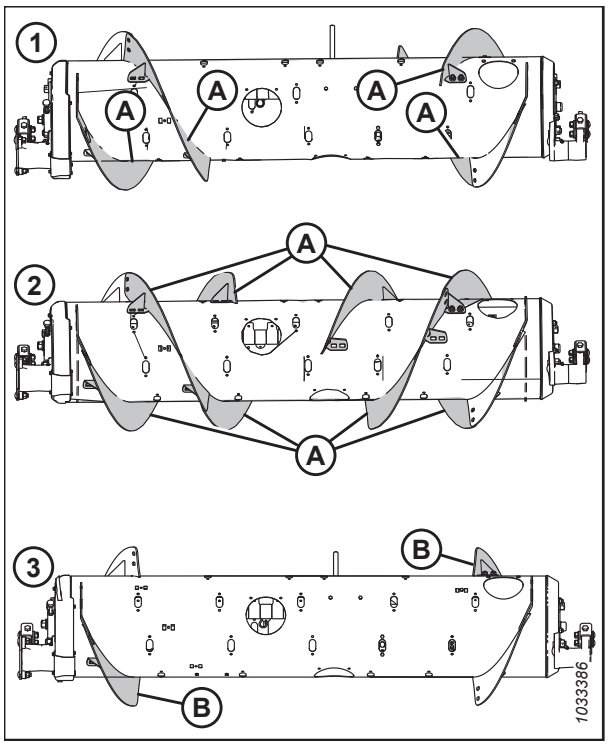


Figure 3.212: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**
3 - Wide Configuration

52. MD #357233 is available only through MacDon Parts. MD #B7344 is available only through Whole Goods. Both kits contain wear-resistant flightings.
53. The quantity of existing long flightings is either 4 or 8, depending on the current configuration.

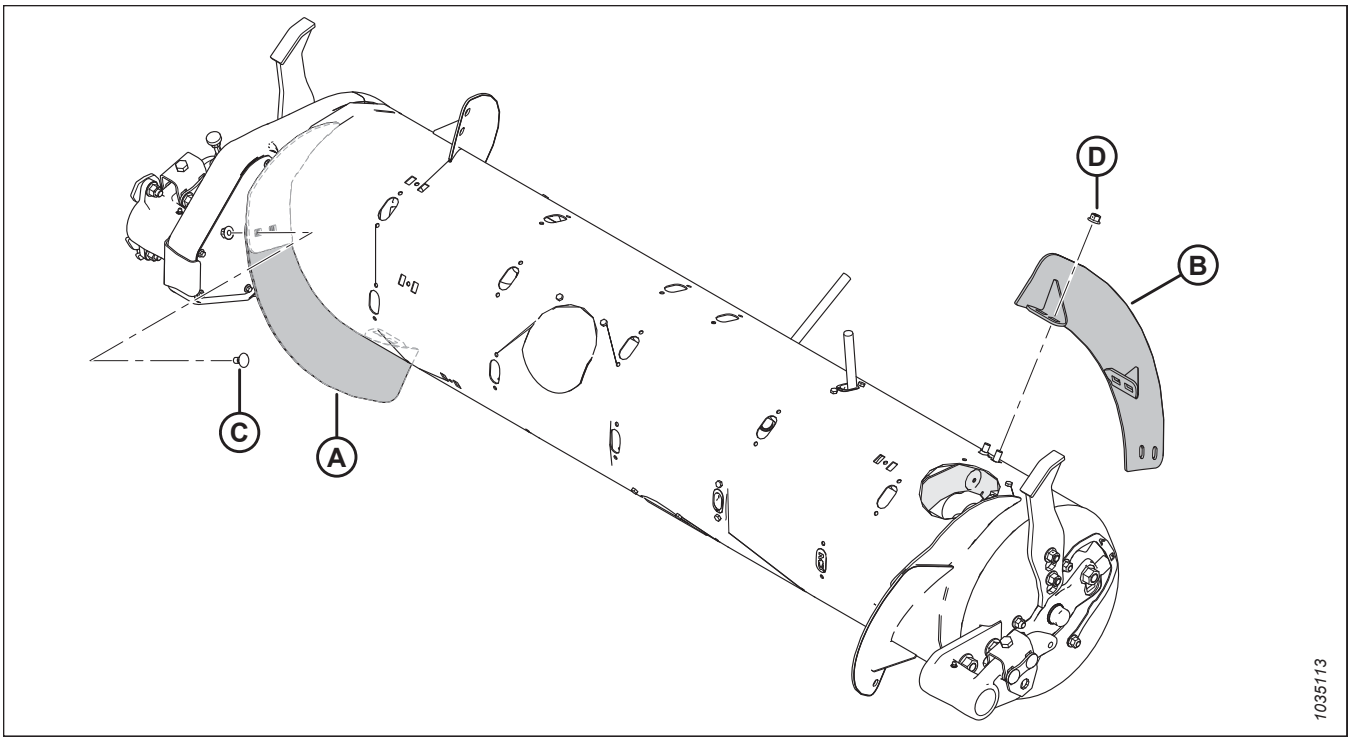


Figure 3.213: Wide Configuration

A - Left Short Flighting (MD #287888)

B - Right Short Flighting (MD #287887)

C - M10 x 20 mm Carriage Bolt (MD #136178)

D - M10 Center Lock Flange Nut (MD #135799)

Ultra Wide Configuration – Auger Flighting

Ultra Wide configuration uses no bolt-on flighting; only factory-welded flighting is responsible for conveying the crop. A total of 30 auger fingers is recommended for this configuration.

NOTE:

This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.

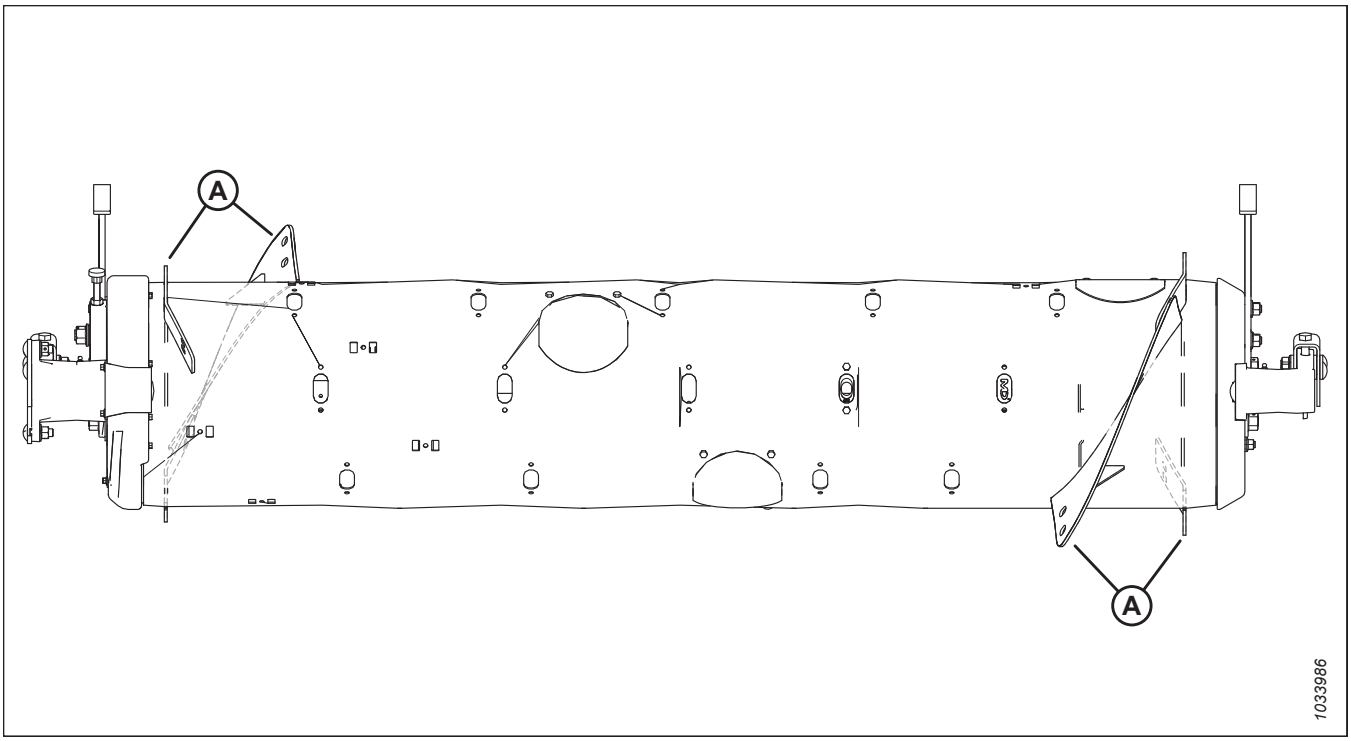


Figure 3.214: Ultra Wide Configuration

A - Factory-Welded Flighting

To convert to Ultra Wide configuration:

Remove all existing bolt-on flightings (A) from the auger and install additional auger fingers if required. A total of 30 auger fingers is recommended for this configuration.

- For flighting removal instructions, refer to *Removing Bolt-On Flighting, page 163*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 172*.

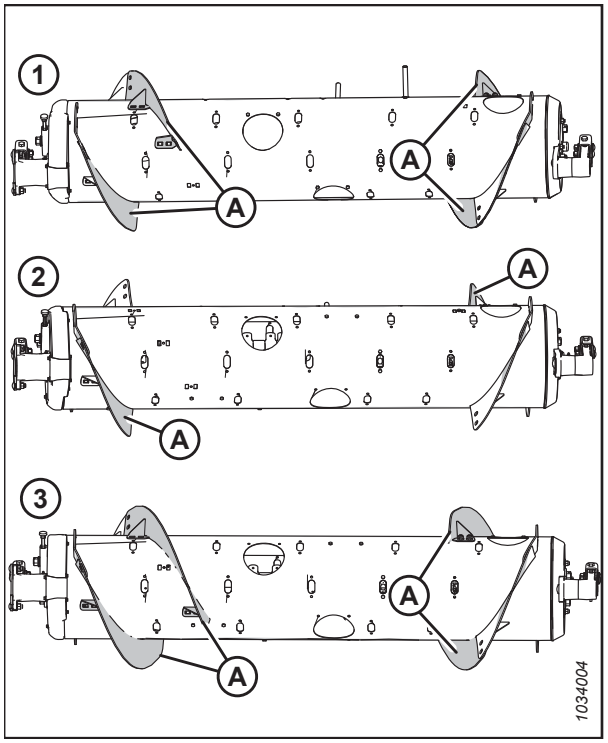


Figure 3.215: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**
3 - Narrow Configuration

Auger Flighting

The auger flighting on the FM200 can be configured for particular harvesting and crop conditions.

For instructions, refer to *3.8.1 FM200 Feed Auger Configurations, page 147* for combine/crop specific configurations.

Removing Bolt-On Flighting

The feed auger has removable flighting that can be customized to the different models of combines.

Before removing the bolt-on flighting, determine the quantity and type of flighting required. For information on the different flighting configurations, refer to *3.8.1 FM200 Feed Auger Configurations, page 147*.

To remove bolt-on flighting, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. To improve access, remove the float module from the combine.

   NOTE:

   All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

2. Shut down the engine, and remove the key from the ignition.
3. Rotate the auger as required.
4. Remove bolts (A) and access cover (B). Retain for reassembly. If necessary, remove multiple access covers.

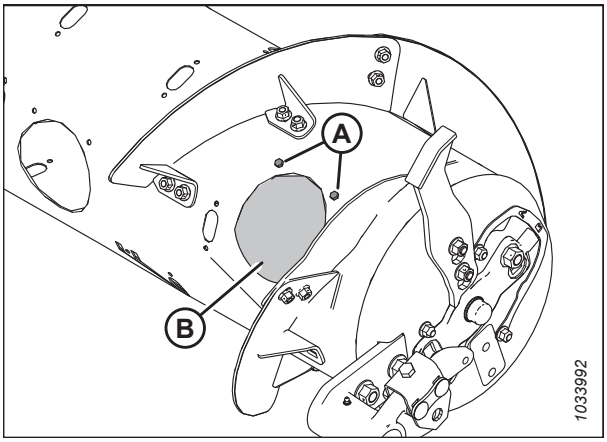


Figure 3.216: Auger Access Cover – Right Side

5. Remove bolts and nuts (B) and remove flighting (A).

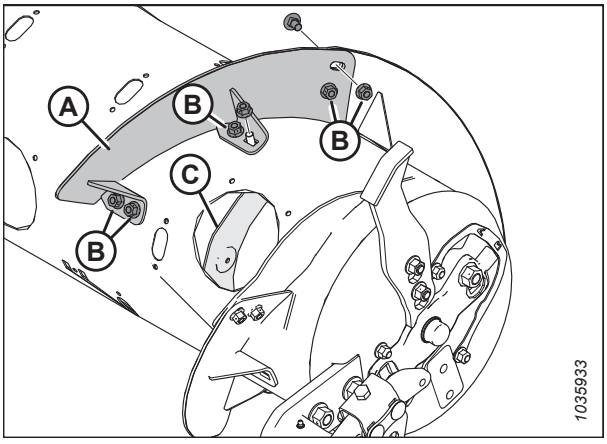


Figure 3.217: Short Flighting – Right Side

NOTE:

Illustration shows new long flighting (A) installed.

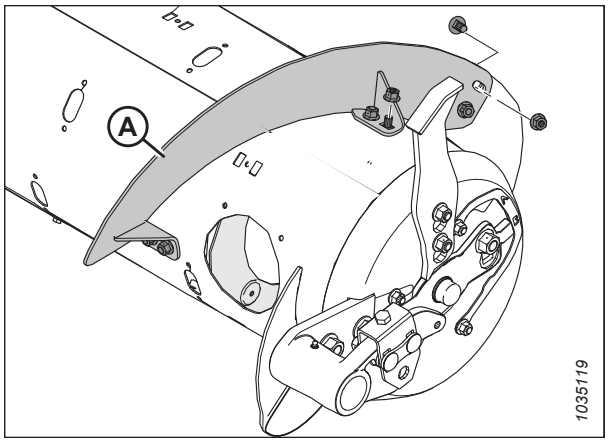


Figure 3.218: Long Flighting – Right Side

6. Install slot plug (A) with M6 bolt (B) and tee nut (C) at each location the flighting was removed from the auger. Torque to 9 Nm (80 lbf·in).

   NOTE:

   If plug bolts are **NOT** new, coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) prior to installation.

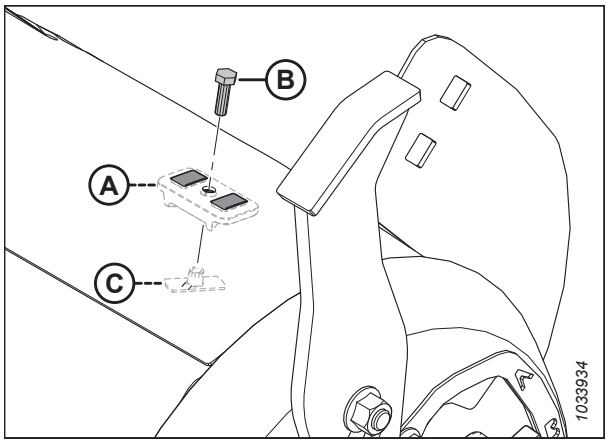


Figure 3.219: Installing Slot Plugs

7. Repeat the procedure to remove flighting (A) from the left side of the auger.

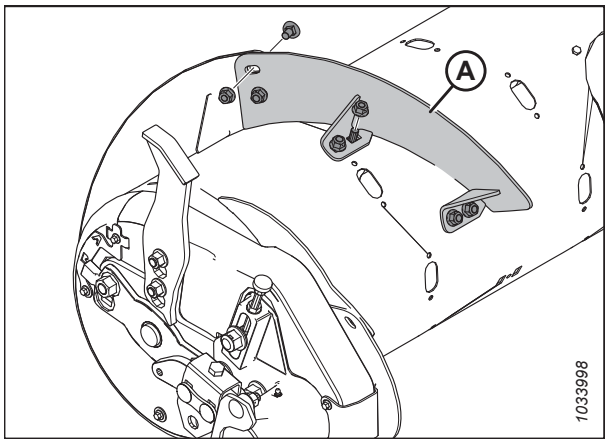


Figure 3.220: Short Flighting – Left Side

8. Reinstall access cover(s) (A) using retained bolts (B) and the welded nuts inside the auger. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf·in).

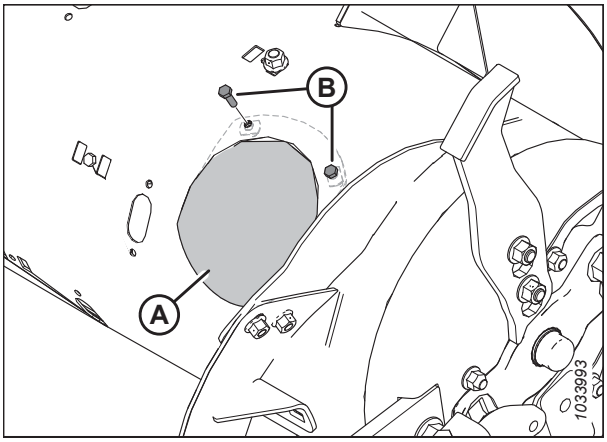


Figure 3.221: Access Cover – Right Side

Installing Bolt-On Flighting

The feed auger has removable flighting that can be customized to the different models of combines.

Before installing the bolt-on flighting, determine the quantity and type of flighting required. For information on the different flighting configurations, refer to *3.8.1 FM200 Feed Auger Configurations, page 147*.

To install bolt-on flighting, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. To improve access and ease installation, remove the float module from the combine.

   NOTE:

   All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

2. Shut down the engine, and remove the key from the ignition.

3. Rotate the auger as required.

4. Remove bolts (A) and access cover (B). Retain for reassembly. If necessary, remove multiple access covers.

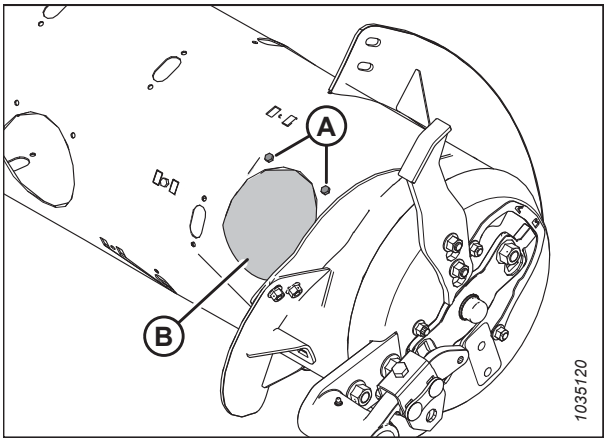


Figure 3.222: Auger Access Cover – Right Side

5. Line up the new bolt-on flighting (A) in position to determine which slot plugs need to be removed from the auger. The new flighting overlaps on the outboard side of the adjacent flighting.

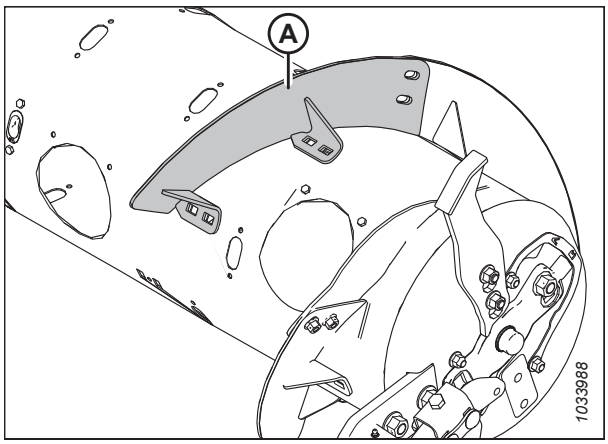


Figure 3.223: Right Side of Auger

6. Remove applicable slot plugs(s) (A).

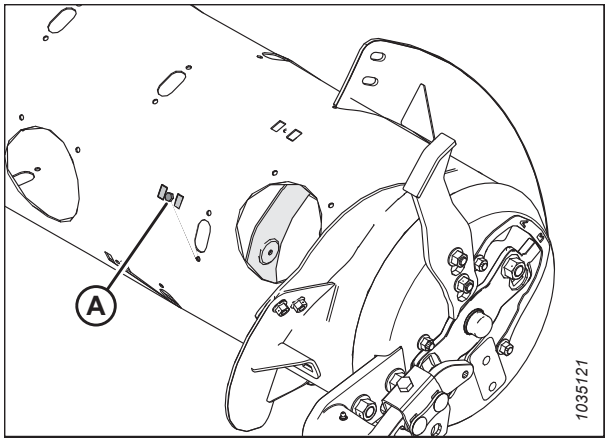


Figure 3.224: Right Side of Auger

7. Install flighting (A) using M10 x 20 mm square neck carriage bolts and center lock nuts at locations (B).

   IMPORTANT:

   Bolt heads must be installed on the inside of the auger to avoid damaging internal components.

   IMPORTANT:

   The bolts that attach the flightings to each other must have the bolt heads on the inboard (crop side) of the flighting.

8. Torque the six nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on the flighting, then retorque them to 61 Nm (45 lbf·ft).

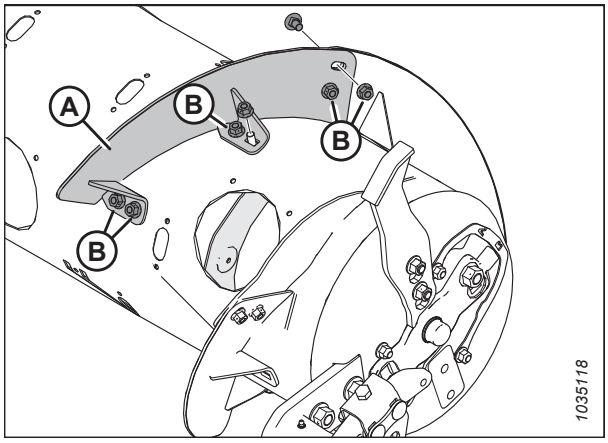


Figure 3.225: Short Flighting – Right Side

NOTE:

The illustration shows long flighting (A) installed.

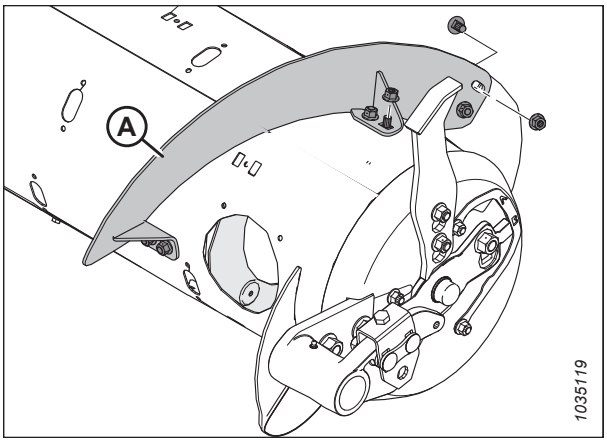


Figure 3.226: Long Flighting – Right Side

9. Repeat the procedure to install flighting (A) on the left side of the auger.

   NOTE:

   Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

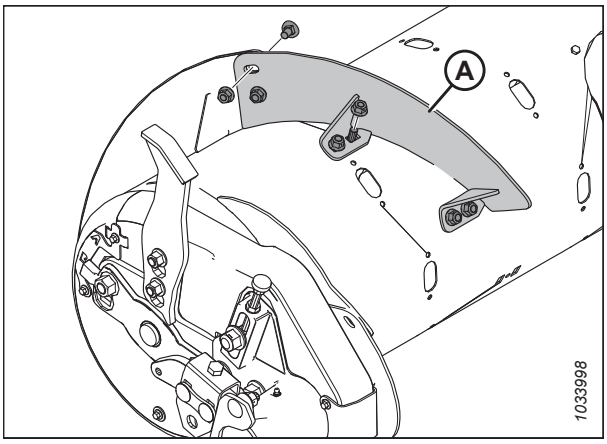


Figure 3.227: Short Flighting – Left Side

10. Reinstall access cover(s) (A) using retained bolts (B) and the welded nuts inside the auger. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf·in).

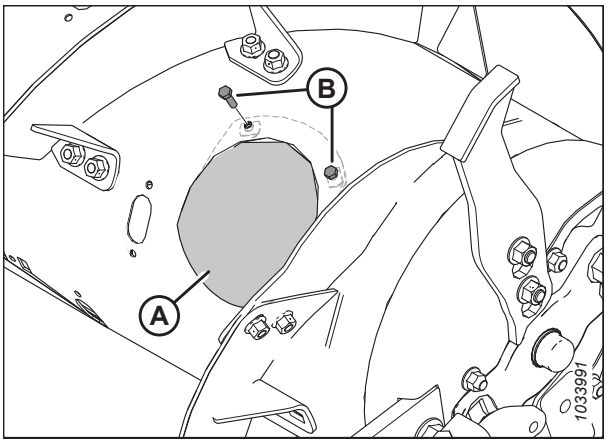


Figure 3.228: Access Cover – Right Side

11. If converting to Ultra Narrow configuration and drilling is required to install the remaining flighting, proceed to *Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 168*.

Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only

When converting to Ultra Narrow configuration, some hole drilling is required to install the additional flighting.

NOTE:

This procedure assumes the feed auger is currently in Narrow configuration (4 long flightings [A] installed).

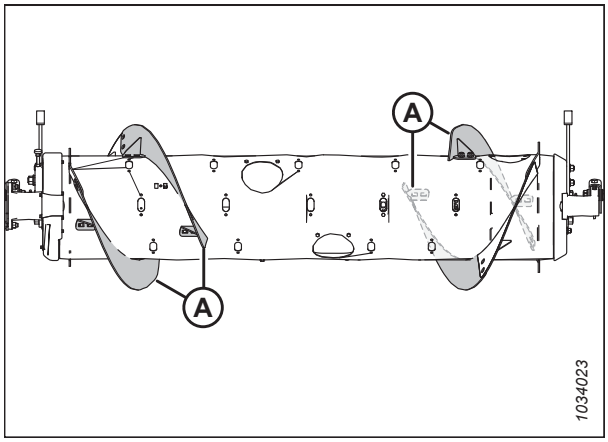


Figure 3.229: Narrow Configuration

To install the four additional long flightings for Ultra Narrow configuration, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator's seat, and always engage safety props before going under the machine for any reason.

1. To improve access and ease installation, remove the float module from the combine.

   NOTE:

   All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

2. Rotate the auger as required.
3. Place new flighting (A) outboard of existing flighting (B) on the left side of the auger, as shown.
4. Mark hole locations (C) onto existing flighting (B).
5. Remove nearest access cover to existing flighting (B). Retain hardware for reassembly.
6. Remove existing bolt-on flighting (B) from the auger. Retain hardware for reassembly.

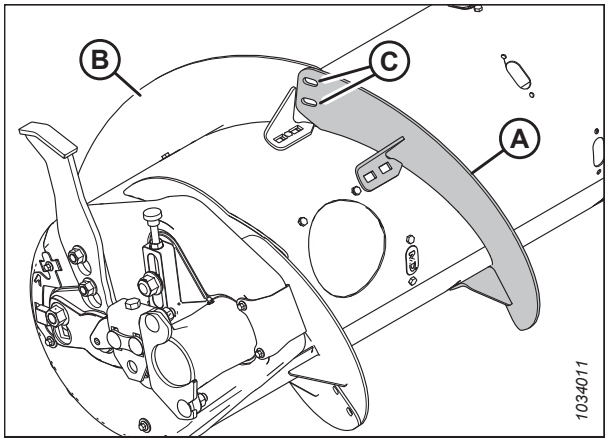


Figure 3.230: Left Side of Auger

7. Drill two 11 mm (7/16 in.) holes at the marked locations (A) on the existing flighting.

8. Reinstall the existing bolt-on flighting.

   IMPORTANT:

   Ensure carriage bolt heads are on the inside of the auger to prevent damage to internal components.

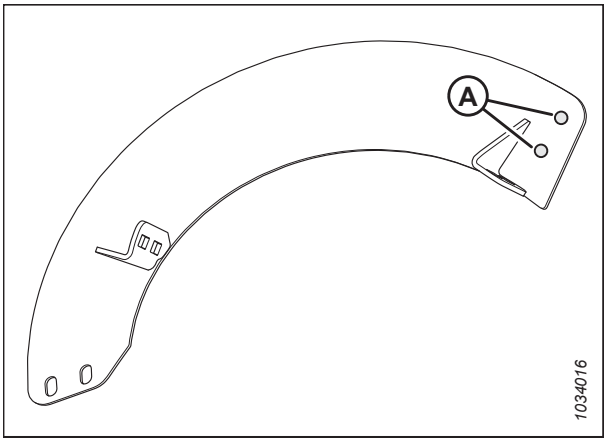


Figure 3.231: Drilling Locations

9. Place new flighting (A) into position on the auger, outboard of existing flighting (B).

10. Secure with two M10 x 20 mm button head bolts and center lock nuts (C).

    IMPORTANT:

    Ensure bolt heads are on the inboard (crop side) and nuts are on the outboard side of the flighting.

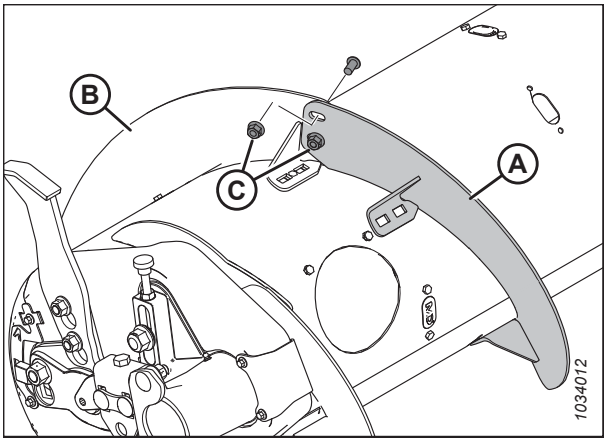


Figure 3.232: Left Side of Auger

11. Stretch flighting (A) to fit auger tube as shown. Use slotted holes on flighting to get the best fit around the auger tube.

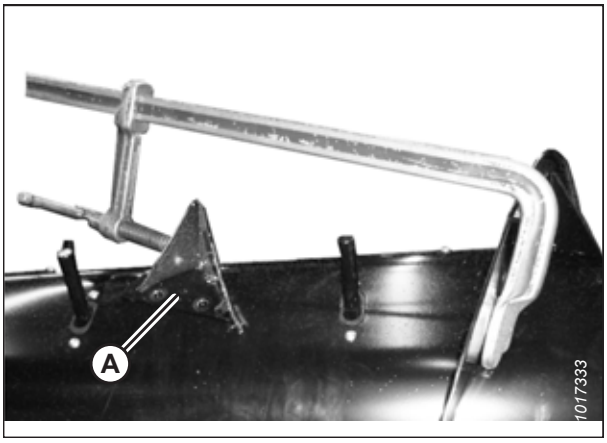


Figure 3.233: Flighting Stretched Axially

12. With flighting in desired position, mark four hole locations (A) and drill 11 mm (7/16 in.) holes in the auger tube.

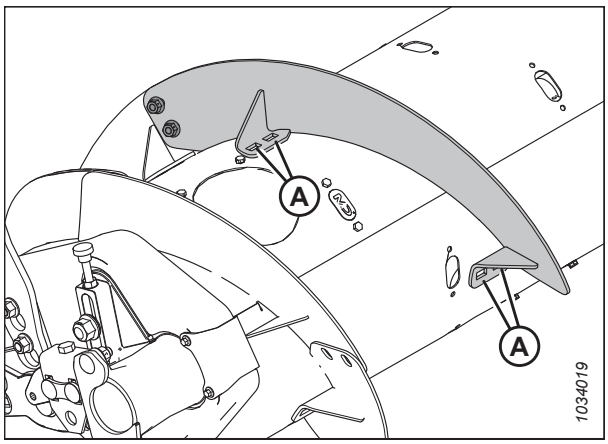


Figure 3.234: Flighting on Left Side of Auger

13. Remove nearest access cover(s) (B). Retain for reinstallation.
14. Secure flighting to the auger at drilled holes (A) using four M10 x 20 mm flange head bolts and center lock nuts.
15. Repeat Step *2, page 168* to Step *14, page 170* for the other flighting on the left side of the auger.
16. Repeat Step *2, page 168* to Step *14, page 170* for both flightings on the right side of the auger.
17. Torque all flighting nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque nuts and bolts again to 61 Nm (45 lbf·ft).

    NOTE:

    Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

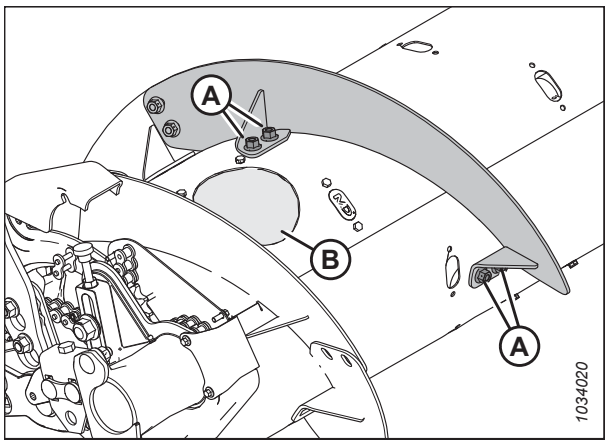


Figure 3.235: Left Side of Auger

18. Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions. For instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 170* or *3.8.3 Installing Feed Auger Fingers, page 172*.
19. If not adding or removing auger fingers, reinstall all access covers and secure with bolts. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf·in).

3.8.2 Removing Feed Auger Fingers

The feed auger uses fingers to bring crop into the feeder house. The quantity of fingers varies for the different models of combines.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

IMPORTANT:

When removing auger fingers, work from outside inward. Make sure there is an equal number of fingers on both sides of the auger when complete.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain parts for reinstallation.

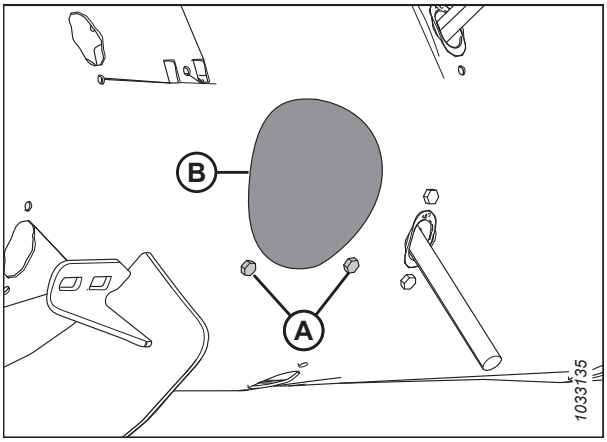


Figure 3.236: Auger Access Hole Cover

6. Remove finger as follows:
   a. Remove hairpin (A). Pull finger (B), out of finger holder (C).
   b. Push finger (B) through guide (D) and into the drum. Pull the finger out of the drum access hole.

   NOTE:

   If the finger is broken, remove any remnants from holder (C) and from inside the drum.

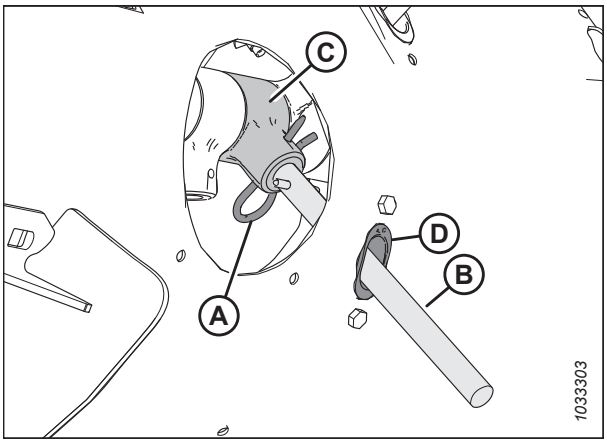


Figure 3.237: Auger Finger

7. Remove and retain two bolts (A) and tee nuts (not shown) securing finger guide (B) to the auger. Remove guide (B).

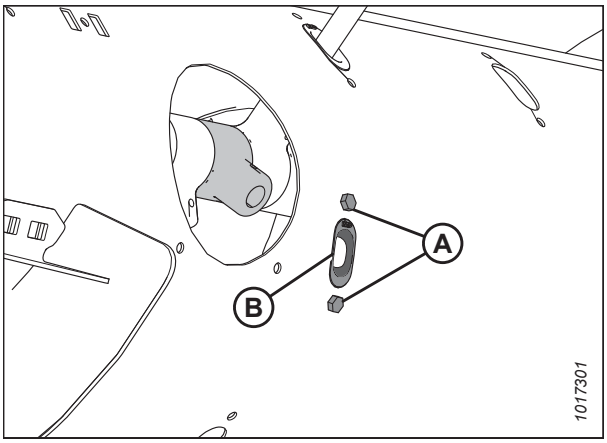


Figure 3.238: Auger Finger Hole

8. Position plug (A) into the hole from inside the auger. Secure with two M6 hex head bolts (B) and tee nuts. Torque to 9 Nm (80 lbf·in).

   NOTE:

   Bolts (B) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (B), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

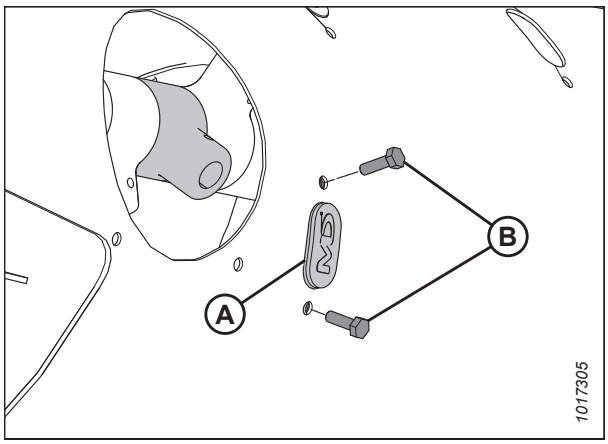


Figure 3.239: Plug

9. Secure access cover (B) in place with bolts (A). Torque bolts to 9 Nm (80 lbf·in).

   NOTE:

   Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

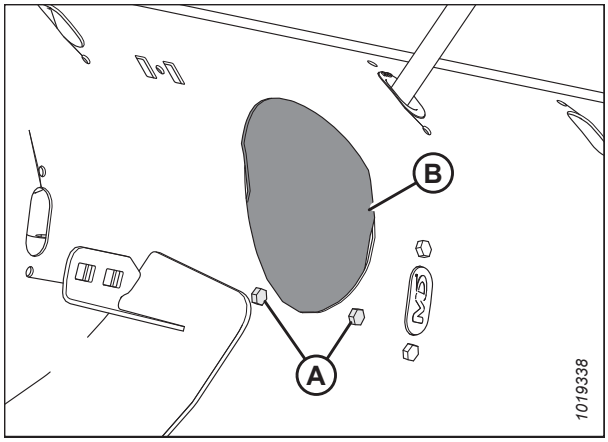


Figure 3.240: Auger Access Hole Cover

3.8.3 Installing Feed Auger Fingers

The feed auger uses fingers to bring crop into the feeder house. The quantity of fingers varies for the different models of combines.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

IMPORTANT:

When installing additional fingers, ensure you install an equal number on each side of the auger.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

4. Insert guide (B) from inside the auger and secure it with bolts (A) and tee nuts (not shown).

   IMPORTANT:

   Always install a new guide when replacing a solid finger.

   NOTE:

   Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

5. Torque bolts (A) to 9 Nm (80 lbf·in).

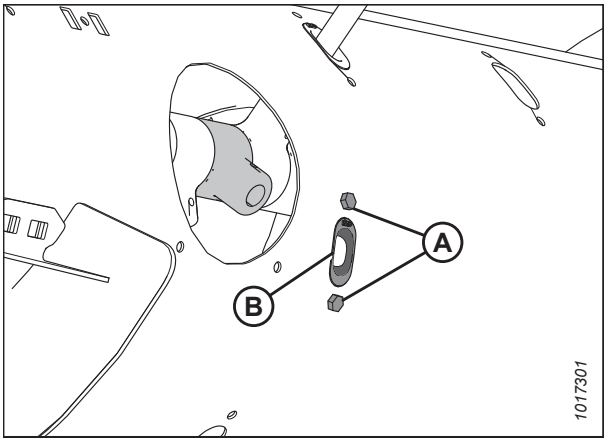


Figure 3.241: Auger Finger Hole

6. Place auger finger (A) inside the drum. Insert auger finger (A) up through the bottom of guide (B) and insert other end into holder (C).

7. Secure the finger by inserting hairpin (D) into the holder. Make sure the round end (S-shaped side) of the hairpin faces the chain drive side of the auger. Make sure the closed end of the hairpin points in the direction of auger-forward rotation.

   IMPORTANT:

   Position the hairpin correctly as described in this step to prevent the hairpin from falling out during operation. If fingers are lost, the header might not be able to feed crop into the combine properly. Fingers that fall into the drum might damage internal components.

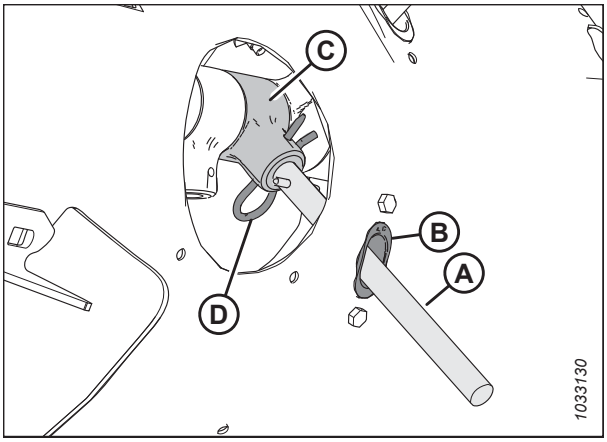


Figure 3.242: Auger Finger

8. Secure access cover (B) in place with bolts (A). Torque bolts to 9 Nm (80 lbf·in).

   NOTE:

   Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

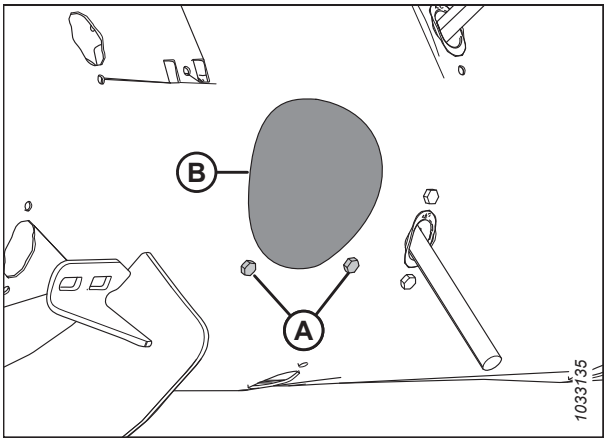


Figure 3.243: Auger Access Hole Cover

3.8.4 Setting Auger Position

The auger position has two settings: floating and fixed. The factory setting is the floating position, and is recommended for most crop conditions.

Auger float adjustment arms (A) are located at the bottom left and bottom right of the float module.

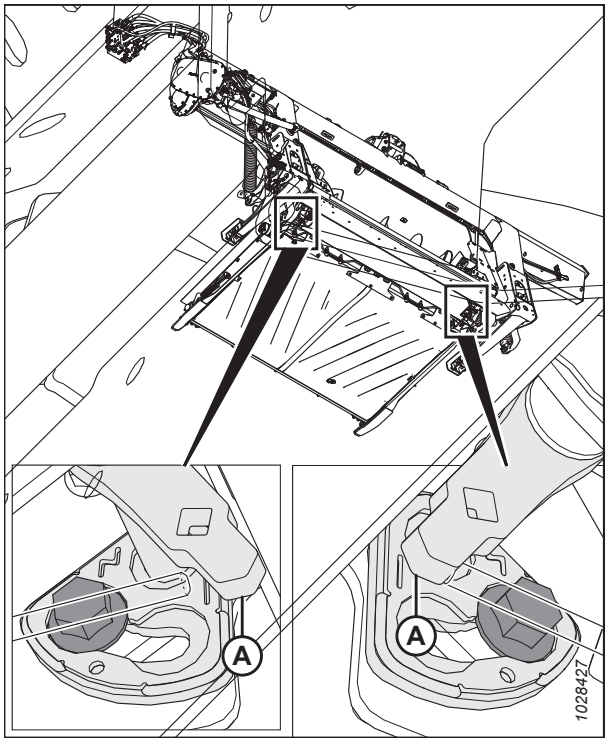


Figure 3.244: Auger Float Adjustment Arms

If bolt (A) is next to floating symbol (B), the auger is in the floating position. If bolt (A) is next to fixed symbol (C), the auger is in the fixed position.

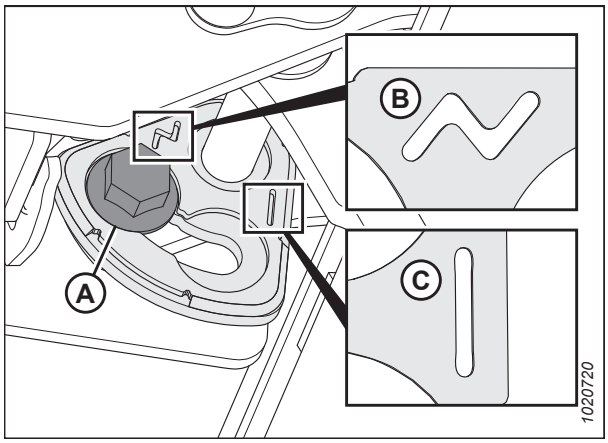


Figure 3.245: Auger Float Positions

CAUTION

Make sure left and right brackets are set to the same position; two bolts (A) must be in the same location to prevent damage to the machine during operation.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

To set the auger position, follow these steps:

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the header fully.
3. Engage the header's safety props. For instructions, refer to the combine operator's manual.
4. Shut down the engine, and remove the key from the ignition.

5. Using a 21 mm wrench, loosen bolt (A) until the bolt head is clear of bracket (B).

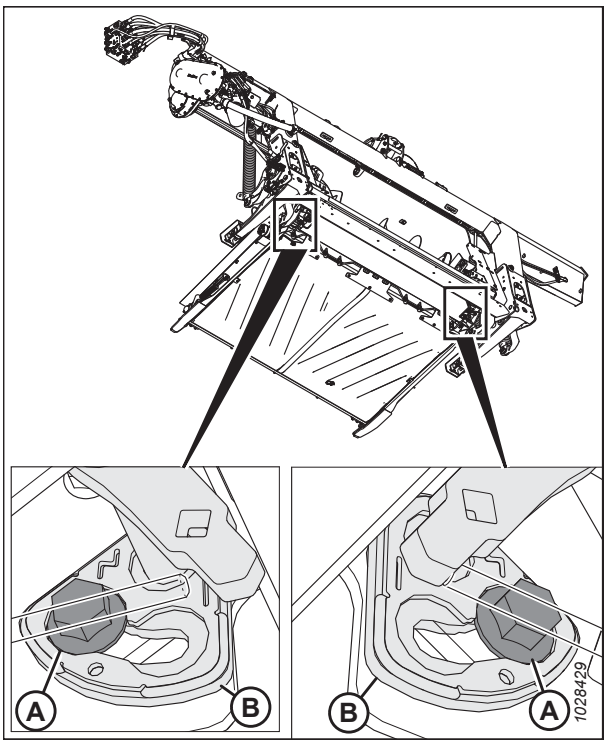


Figure 3.246: Feed Auger Float Adjustment

6. Using a breaker bar in the square hole on arm (B), move the arm forward until bolt (A) is in the slot on bracket next to the fixed symbol.

   NOTE:

   If changing the auger position from fixed to floating, move the arm in the opposite direction.

7. Tighten bolt (A) to 122 Nm (90 lbf·ft).

   IMPORTANT:

   Bolt (A) must be properly seated in recess on bracket before tightening bolt. If arm (B) can be moved after tightening bolt, then bolt (A) is not seated properly.

8. Repeat on the opposite side.

   IMPORTANT:

   Bolt (A) on each side of the float module must be in the same position to prevent damage to the machine during operation.

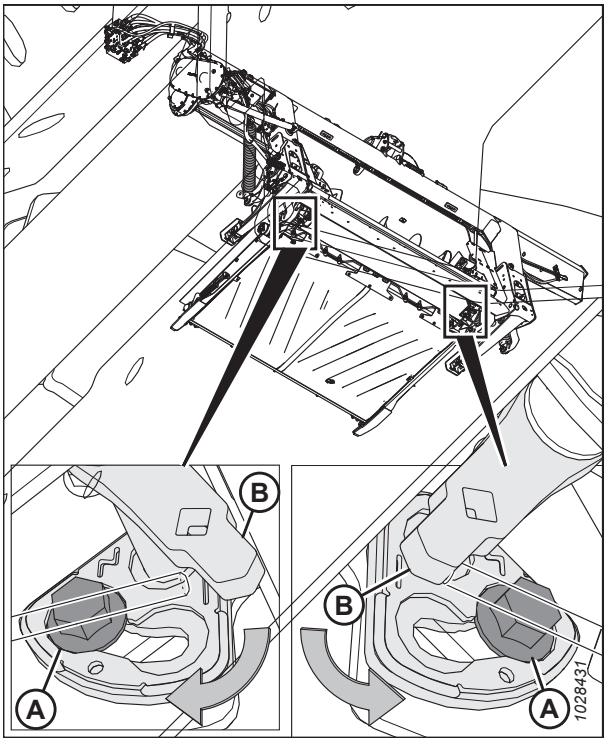


Figure 3.247: Feed Auger Float Adjustment

3.8.5 Checking and Adjusting Feed Auger Springs

The feed auger has an adjustable spring tensioning system that allows the auger to float on top of the crop instead of crushing and damaging it. The factory-set tension is adequate for most crop conditions.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props. Refer to the combine operator's manual for instructions.
5. Check the thread length protruding past nut (A). Length should be 22–26 mm (7/8–1 in.).

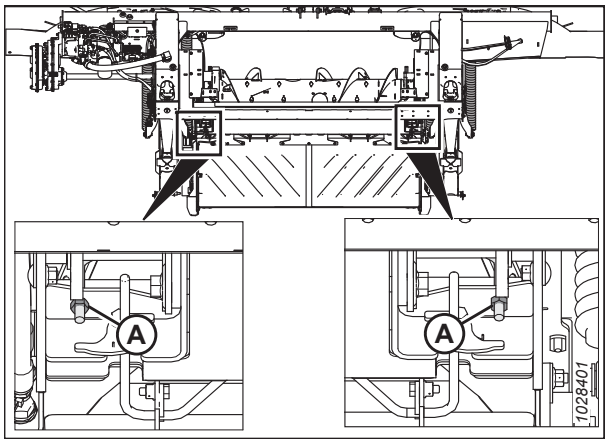


Figure 3.248: Spring Tensioner

If adjustment is required, follow these steps:

6. Loosen upper jam nut (A) on the spring tensioner.

   NOTE:

   Upper jam nut is located on other side of the plate.

7. Turn lower nut (B) until thread (C) protrudes 22–26 mm (7/8–1 in.).
8. Tighten jam nut (A).
9. Repeat Steps *6, page 176* to *8, page 176* on the opposite side.

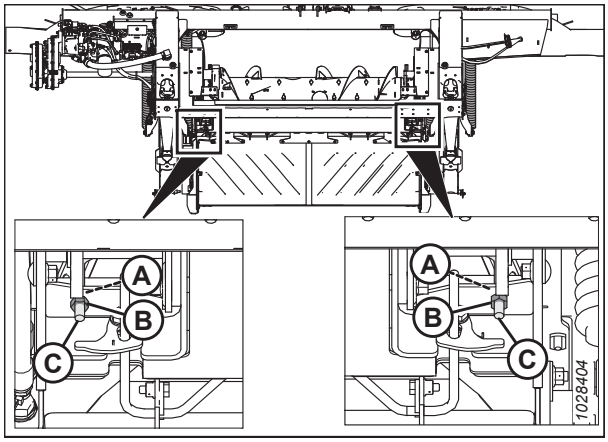


Figure 3.249: Spring Tensioner

3.8.6 Stripper Bars

A stripper bar kit may have been supplied with your header. Installing the stripper bar kit improves feeding in certain crops, such as rice.

For information on removing and installing the stripper bars, refer to *4.11 FM200 Stripper Bars, page 600*.

3.9 Header Operating Variables

Satisfactory function of the header requires making adjustments to suit various crops and conditions.

Correctly adjusting the header reduces crop loss and speeds harvesting. Proper adjustments, along with timely maintenance, will also increase the service life of the header.

The variables listed in Table *3.16, page 178* and detailed on the following pages will affect the performance of your header.

You will quickly become adept at adjusting the machine to achieve the results you desire. Most of the settings below have been configured at the factory, but the settings can be changed to suit various crops and harvesting conditions.

Table 3.16 Operating Variables

Variable	Refer to
Cutting height	*3.9.1 Cutting above Ground Level, page 178* *3.9.2 Cutting on Ground Level, page 188*
Header float	*3.9.3 Header Float, page 190*
Header angle	*3.9.5 Header Angle, page 217*
Reel speed	*3.9.6 Reel Speed, page 225*
Ground speed	*3.9.7 Ground Speed, page 226*
Draper speed	*3.9.8 Side Draper Speed, page 227*
Knife speed	*3.9.9 Knife Speed Information, page 229*
Reel height	*3.9.10 Reel Height, page 231*
Reel fore-aft position	*3.9.11 Reel Fore-Aft Position, page 236*
Reel tine pitch	*3.9.12 Reel Tine Pitch, page 246*
Crop divider rods	*3.9.14 Crop Dividers, page 252*
Feed auger configurations	*3.8.1 FM200 Feed Auger Configurations, page 147*

3.9.1 Cutting above Ground Level

The header's design allows you to cut crop above the ground, which results in stubble being cut to a uniform height. Follow these recommendations when configuring the header to cut above ground level.

When cutting above ground level:

- Use the stabilizer wheels on the header (if this optional component is installed) to set the cutting height. The stabilizer wheel system is designed to minimize bouncing at the header ends and may be used to float the header to achieve an even cutting height when cutting above ground level in cereal grains.

  NOTE:

  FlexDraper® headers must have the wings locked rigid when using the stabilizer wheel system.

- The ContourMax™ contour wheels provide consistent cutting height information back to the header so it can flex, maintain accurate and consistent cutting height, and still use the combine's auto height control seamlessly. The contour wheels contact the ground, which allows the cutterbar to remain at a fixed height above the ground even through rolling contours. There is no adjustment necessary to the factory auto height control settings.

  NOTE:

  FlexDraper® headers must have the wings unlocked when using the ContourMax™ system.

The stabilizer wheel system (or stabilizer/transport wheel system) cutting height is controlled by the combine header height control.

If the Stabilizer Wheels kit is installed, refer to *Adjusting Stabilizer Wheels, page 179* to change the wheel position.

If the Stabilizer Wheels / Slow Speed Transport option is installed, refer to *Adjusting EasyMove™ Transport Wheels, page 179* to change the wheel position.

If the ContourMax wheels are installed, refer to *Adjusting ContourMax™ Wheels with Foot Switch, page 180* to change the wheel position.

Adjusting Stabilizer Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float and the amount carried by the stabilizer wheels.

Refer to *3.7.2 Header Settings, page 130* for recommended use in specific crops and crop conditions.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Raise the header until the stabilizer wheels are off the ground. Shut down engine and remove the key.
2. Hold axle pivot handle (B); do **NOT** lift.

   NOTE:

   Lifting the handle will make the system harder to take out from slot (C).
3. Pull suspension handle (A) rearward to remove pin from slot (C).
4. Lift the wheel using support (B) to desired height position, and engage the support channel into center slot (C) in the upper support.
5. Suspension handle (A) should snap into the slot. If not, push in (for middle and lower position) or pull in (for top position) suspension handle to ensure it is seated into the slot.
6. Use the combine's auto header height control (AHHC) to automatically maintain cutting height. For instructions, refer to *3.10 Auto Header Height Control, page 270* and your combine operator's manual for details.

   NOTE:

   The height sensor on the FM200 Float Module must be connected to the combine height control system in the cab.

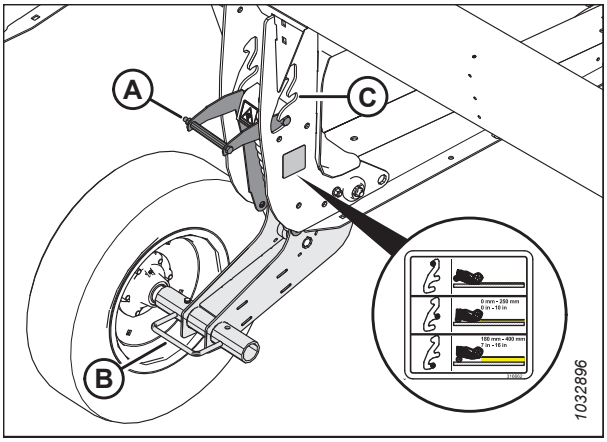


Figure 3.250: Stabilizer Wheel

Adjusting EasyMove™ Transport Wheels

A properly adjusted header will achieve a balance between the amount of header weight carried by the float and the amount carried by the transport wheels.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Raise the header so the transport wheels are off the ground.
2. Shut down the engine, and remove the key from the ignition.

3. Check that the float is working properly. For instructions, refer to *Checking and Adjusting Header Float, page 190*.
4. Hold axle pivot handle (C); do **NOT** lift.

   NOTE:

   Lifting the handle will make the system harder to take out from slot (B).
5. Pull suspension handle (A) rearward to remove pin from slot (B).
6. Adjust wheel to desired slot position.
7. Suspension handle (A) should snap into slot. If not, push in (for middle position) or pull in (for top position) suspension handle to ensure it is seated into the slot.

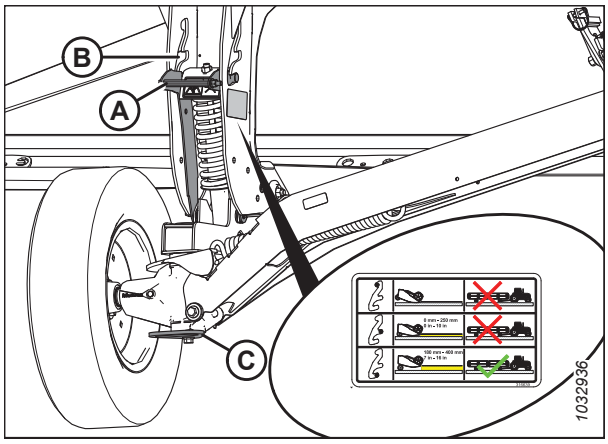


Figure 3.251: Right Wheel

8. Hold axle pivot handle (A); do **NOT** lift.

   NOTE:

   Lifting the handle will make the system harder to take out from the slot.
9. Pull suspension handle (B) rearward to remove pin from the slot.
10. Adjust wheel to desired slot position.
11. Suspension handle (B) should snap into the slot. If not, pull out suspension handle to ensure it is seated into the slot.
12. Use the combine's auto header height control (AHHC) to automatically maintain cutting height. For instructions, refer to *3.10 Auto Header Height Control, page 270* and your combine operator's manual for details.

    NOTE:

    The height sensor on the FM200 Float Module must be connected to the combine header control module in the cab.

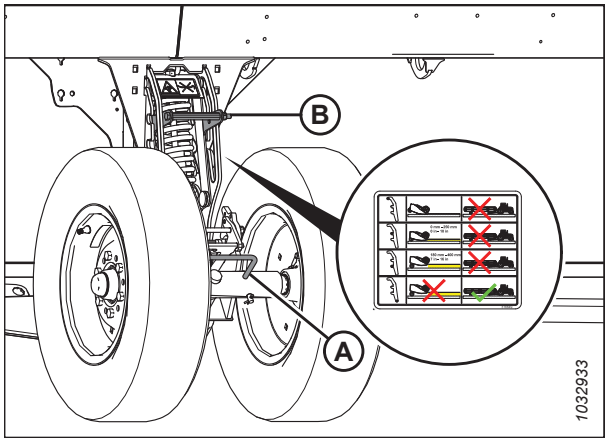


Figure 3.252: Left Wheel

Adjusting ContourMax™ Wheels with Foot Switch

The ContourMax™ wheels allow the header to mirror the contours of the ground, and can be adjusted between 100 mm (4 in.) and 250 mm (10 in.) from the ground surface. A foot switch allows the wheel's electronically actuated hydraulic functions to be controlled from the combine cab.

DANGER

To avoid bodily injury or death from the unexpected startup or fall of the raised header, stop the engine, remove the key from the ignition, and engage the safety props before going under the header for any reason. If using a lifting vehicle, be sure the header is secure before proceeding.

WARNING

Check to be sure all bystanders have cleared the area.

If the combine is equipped with the CLAAS Integration kit (MD #B7231) or the John Deere Integration kit (MD #B7237), the foot switch is not required. For ContourMax™ Contour Wheels control instructions, refer to the FD2 Series FlexDraper® Combine Header with FM200 Float Module Operator's Manual.

1. Ensure that all bystanders have cleared the area, and start the combine engine.
2. Locate the ContourMax™ foot switch installed in the cab.
3. Press and hold the foot switch to activate the ContourMax™ Wheels.

   NOTE:

   When the ContourMax™ foot switch is activated and the reel fore-aft button on the combine's multifunction handle is pressed, the contour wheels will move regardless of the fore-aft / header tilt switch position.
4. To ensure the hydraulic cylinders are properly phased, press and hold the REEL AFT button on the combine multifunction handle to extend the wheels all the way down, then hold the button for 30 seconds. Press and hold the REEL FORE button on the combine multifunction handle to fully retract the wheels, then hold the button for 30 seconds.
5. Operate the hydraulic controls on the multifunction handle to move the wheels to the desired height.
6. Release the foot switch to deactivate the ContourMax™ Wheels. The header tilt and the fore-aft functions should operate normally.

The following table describes what functionality the reel fore/aft buttons will have on the header when the contour wheel foot switch and the fore-aft/header tilt switch are in various (active/inactive) states. The X indicates a switch is active.

Table 3.17 Control Logic Chart

Activated Switch				
ContourMax™ Foot Switch Condition	Fore-Aft / Header Angle Switch Position		Combine Multifunction Handle Controls	
	Fore-Aft	Angle	Reel Fore	Reel Aft
—	X	—	Reel forward	Reel back
—	—	X	Header angle extend	Header angle retract
X	—	X	ContourMax™ retract (decrease cut height)	ContourMax™ extend (increase cut height)
X	X	—		

NOTE:

When the contour wheels are fully retracted, the cutterbar can be on the ground when the header angle is set approximately between (B) and (E); the contour wheels will contact the ground when the header angle is set between (A) and (B).

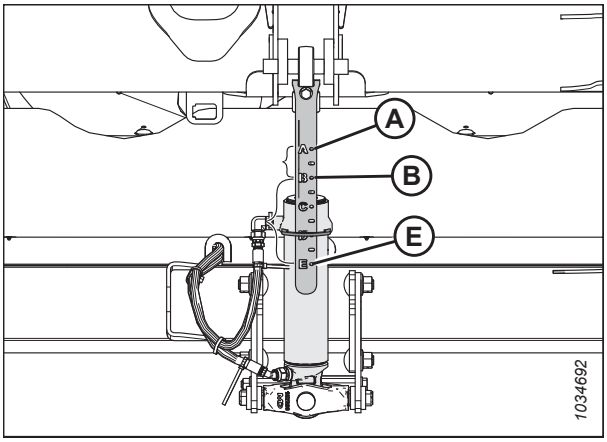


Figure 3.253: Header Angle Indicator

Adjusting ContourMax™ Wheels with CLAAS Integration Kit

The ContourMax™ wheel option mirrors the contours of the ground, and can be adjusted between 100 mm (4 in.) and 250 mm (10 in.) from the ground surface.

NOTE:

Functions controlled by the multi-function trigger rocker switch will be available only when the header function switch is in the VARIO table extend/retract position.

1. Press HOTKEY switch (A) on the operator's console to deck plate position (the header icon [A] with the arrows pointing to each other).

Figure 3.254: Multi-Function Trigger Rocker Switch

2. If the combine is equipped with the standard lever, push toggle (A) up while simultaneously pressing the reel fore-aft button.
   - Reel fore will retract the contour wheels, decreasing the cut height.
   - Reel aft will extend the contour wheels, increasing the cut height.

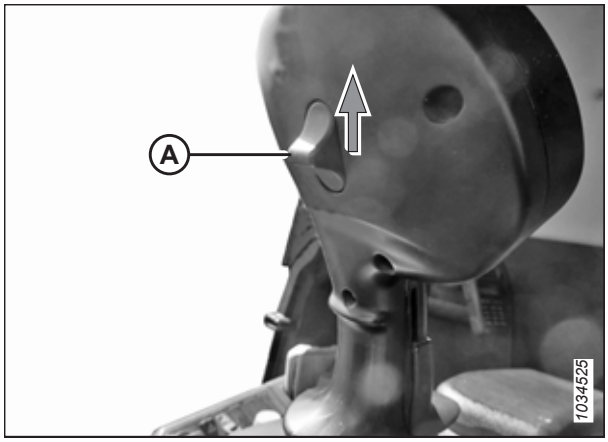


Figure 3.255: Standard Multi-Function Lever

3. If the combine is equipped with the CMOTION multi-function lever, pull the multi-function trigger rocker switch (A) toward you while simultaneously pressing the reel fore-aft button.
   - Reel fore will retract the contour wheels, decreasing the cut height.
   - Reel aft will extend the contour wheels, increasing the cut height.

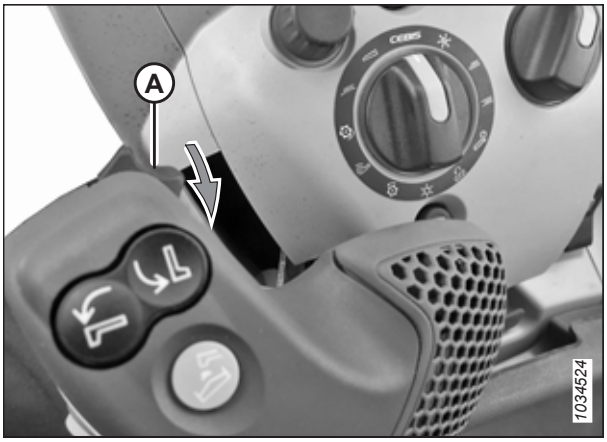


Figure 3.256: CMOTION Multi-Function Lever

Adjusting ContourMax™ Wheels with John Deere Integration Kit

The ContourMax™ wheel option mirrors the contours of the ground, and can be adjusted between 100 mm (4 in.) and 250 mm (10 in.) from the ground surface.

1. Locate the multi function lever attached to the console.
2. Double tap reel lower button (B).

   NOTE:

   A double tap consists of two presses of the button within 0.5 second.
3. Press the reel fore-aft button to move the ContourMax™.
   - Reel fore (C) (left) will retract the contour wheels, decreasing the cut height
   - Reel aft (D) (right) will extend the contour wheels, increasing the cut height.
4. To exit ContourMax™ wheels adjustment mode, press the reel raise button (A) once or wait for fifteen seconds.

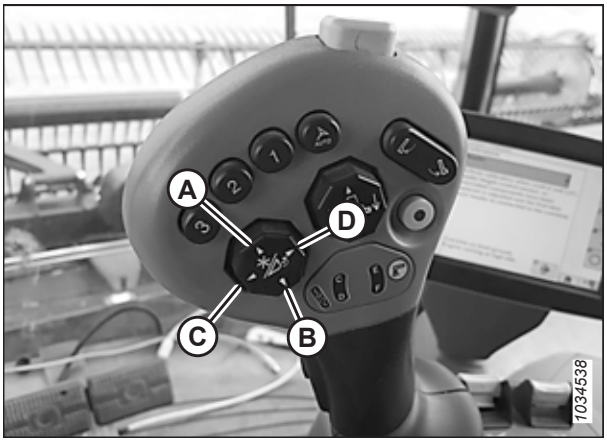


Figure 3.257: Multi-function Handle

Selecting the Default Function for the Multifunction Lever Toggle Switch (with CLAAS Integration Kit)

The Operator selects the default function for the multifunction lever toggle switch. For example, when cutting on the ground, the default function can be set so that the multifunction lever's toggle switch activates the pitch control cylinder. Likewise, when cutting off the ground, the default function can be changed so that the toggle switch controls the contour wheels.

CAUTION

Ensure that all bystanders are clear of the machine before starting the engine or engaging the header drives.

1. Start the engine.

To select pitch control as the default toggle function:

2. **If the combine is equipped with the standard lever:** push toggle (A) up while simultaneously pressing the REEL FORE button. Hold these switches for 30 seconds.

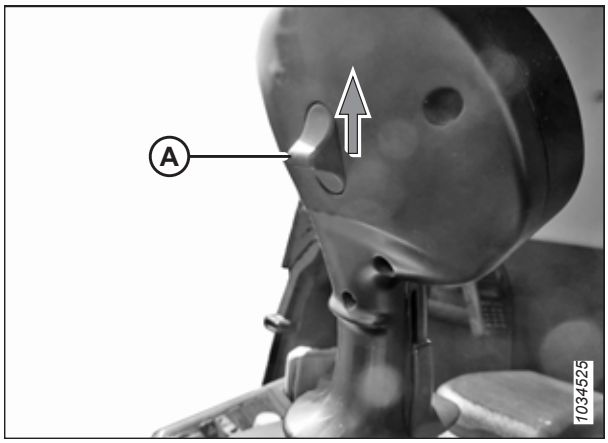


Figure 3.258: Standard Lever

3. **If the combine is equipped with the CMOTION multifunction lever:** pull multifunction lever toggle switch (A) toward you while simultaneously pressing the REEL FORE button. Hold these switches for 30 seconds.

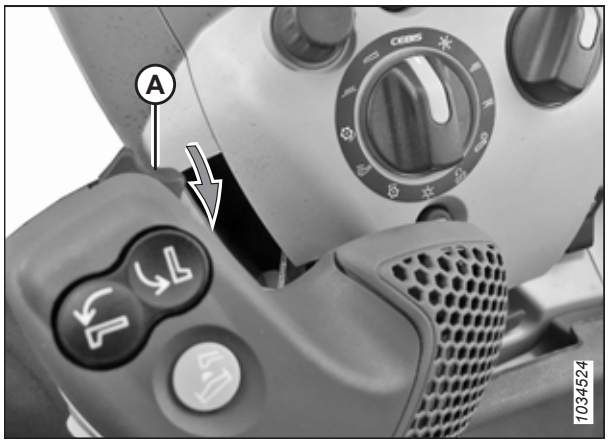


Figure 3.259: CMOTION Lever

To select contour wheel as the default toggle function, do the following:

4. **If the combine is equipped with the standard lever:** push toggle (A) up while simultaneously pressing the REEL AFT button. Hold these switches for 30 seconds.

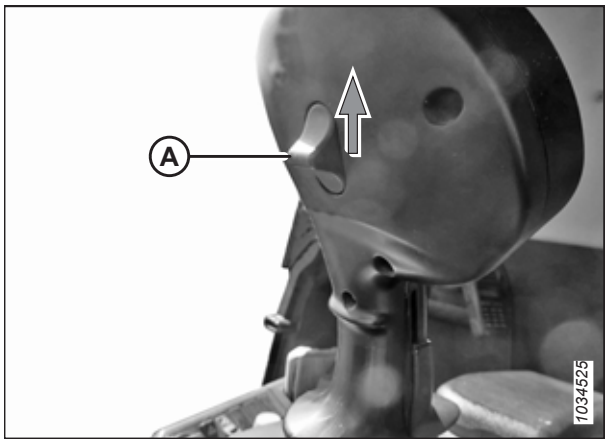


Figure 3.260: Standard Lever

5. **If the combine is equipped with the CMOTION multifunction lever:** pull multifunction lever toggle switch (A) toward you while simultaneously pressing the REEL AFT button. Hold these switches for 30 seconds.

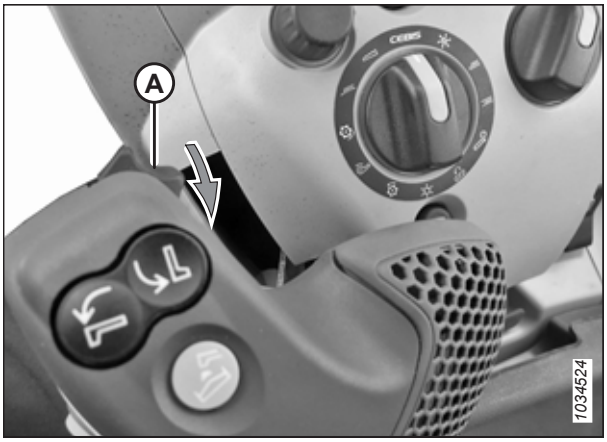


Figure 3.261: CMOTION Lever

Leveling ContourMax™ Wheel Height

The ContourMax™ wheels allow the header to mirror the contours of the ground, and can be adjusted between 0 mm (0 in.) and 457 mm (18 in.) from the ground surface.

DANGER

To avoid bodily injury or death from the unexpected startup or fall of the raised header, stop the engine, remove the key from the ignition, and engage the safety props before going under the header for any reason. If using a lifting vehicle, be sure the header is secure before proceeding.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

The header float must be set before leveling the ContourMax™. For instructions refer to *Checking and Adjusting Header Float, page 190*.

NOTE:

The wing balance must be set before leveling the ContourMax™. For instructions refer to *3.9.4 Checking and Adjusting Wing Balance, page 213*.

1. Unlock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
2. Unlock the header float. For instructions refer to *Locking/Unlocking Header Float, page 205*.
3. Start the engine. For instructions, refer to the combine operator's manual.
4. Park the combine on a level surface.
5. Lower the reel fully.

6. Set ContourMax™ wheel height indicator (A) to number 2 (B).

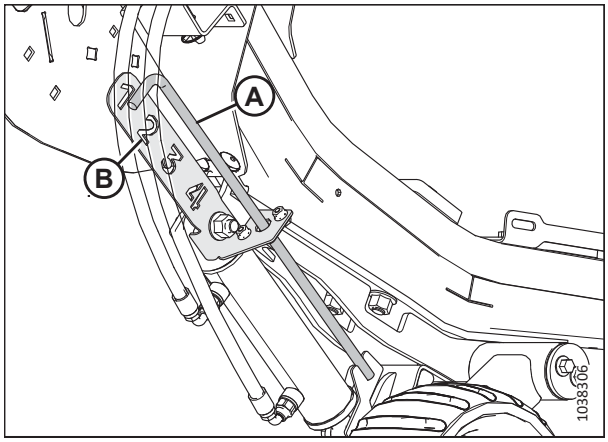


Figure 3.262: Height Indicator

7. Lower the header until the auto header height indicator (A) is at number 2 (B).
8. Shut down the engine, and remove the key from the ignition.

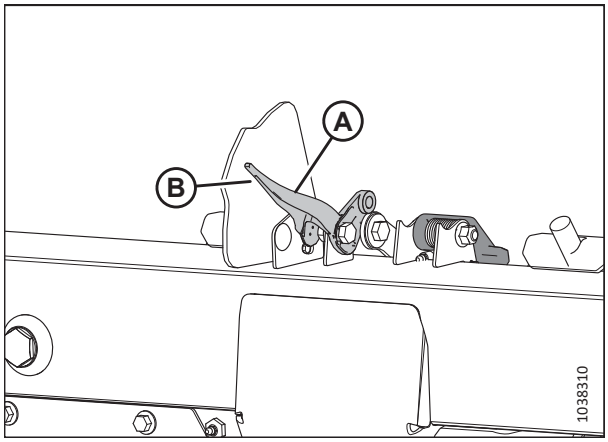


Figure 3.263: Float Setting Indicator

9. At the center of the header, measure distance (A) from the ground to the tip of the center guard and record the measurement.
10. At each end of the header, measure the distance (A) from the ground to the tip of the end guard and record both of the measurements.
    - If the difference between the end measurements and the center measurement is less than 25 mm (1 in.), no adjustment is required.
    - If the difference between the end measurements and the center measurement is greater than 25 mm (1 in.), adjustment is required. Continue to the next step.
11. Start the engine.
12. Raise the header fully.
13. Engage the header's safety props. For instructions, refer to the combine operator's manual.

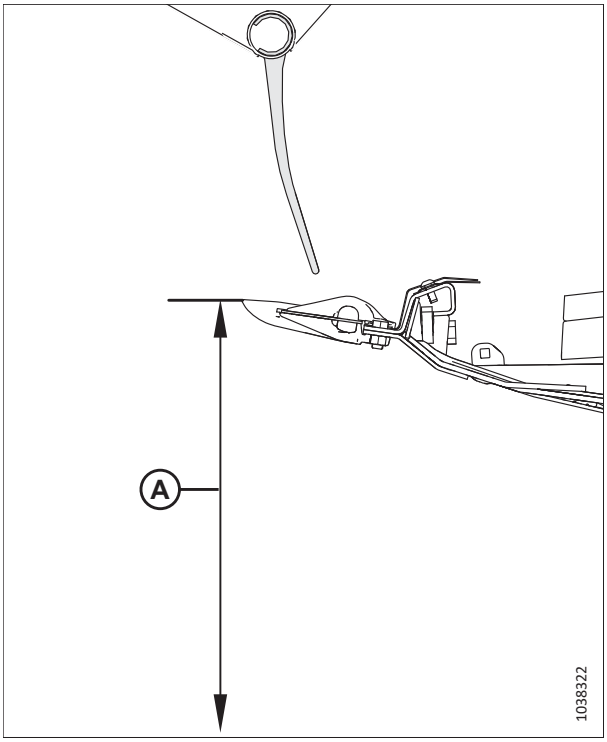


Figure 3.264: Float Setting Indicator

14. Remove pin (A).
15. Reposition adjuster plate (B) in the slot to align with a different hole. There is approximately 24 mm (1/2 in) difference between each of the holes.
    - If the measurement is less than the measurement at the center of the header. The adjuster plate needs to move **TOWARD** the cutterbar.
    - If the measurement is more than the measurement at the center of the header. The adjuster plate needs to move **AWAY** the cutterbar.
16. On the opposite end on the header, repeat Step *14, page 187* and Step *15, page 187*.
17. Disengage the header safety props. Refer to the combine operator's manual for instructions.
18. Lower the header until the auto header height indicator is at number 2.
19. Shut down the engine, and remove the key from the ignition.
20. Measure the guard to ground distance again. Verify that the three measurements are the same. If more adjustment is required. Repeat Step *14, page 187*.

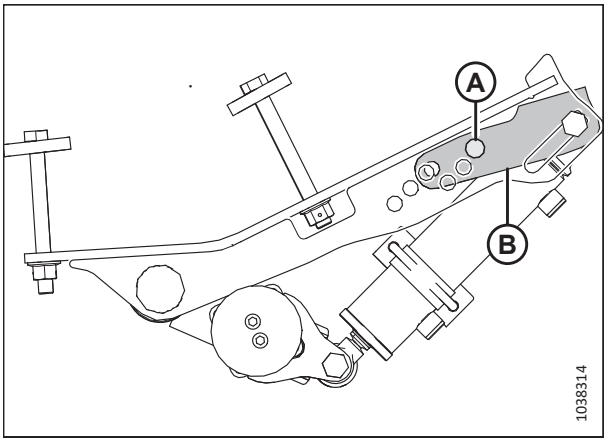


Figure 3.265: Pin Location – Left Outer Wheel

3.9.2 Cutting on Ground Level

Cutting height will vary depending on crop type, crop conditions, cutting conditions, etc.

Cutting on the ground is performed with the flexible cutterbar unlocked, header fully lowered, and the cutterbar on the ground. The orientation of the knife and knife guards relative to the ground (header angle) is controlled by the skid shoes and the center-link—it is **NOT** controlled by the header lift cylinders. The skid shoes, center-link, and flex lockout allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

The flexible cutterbar and header float system floats the header over the surface to compensate for ridges, trenches, and other variations in ground contour to prevent the cutterbar from pushing into the ground or leaving uncut crop.

Refer to the following for additional information:

- *Adjusting Inner Skid Shoes, page 188*
- *Adjusting Outer Skid Shoes, page 189*
- *3.9.3 Header Float, page 190*
- *3.9.5 Header Angle, page 217*

Adjusting Inner Skid Shoes

The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header's safety props. For instructions, refer to the combine operator's manual.
4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting EasyMove™ Transport Wheels, page 179*
   - *Adjusting Stabilizer Wheels, page 179*
5. Remove lynch pin (A) from each skid shoe.
6. Hold shoe (B) and remove pin (C) by disengaging from the frame and pulling away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position using the holes in support (D) as a guide.
8. Install pin (C) in the desired position on support (D), engage in frame, and secure with lynch pin (A).
9. Check that all skid shoes are adjusted to the same position.

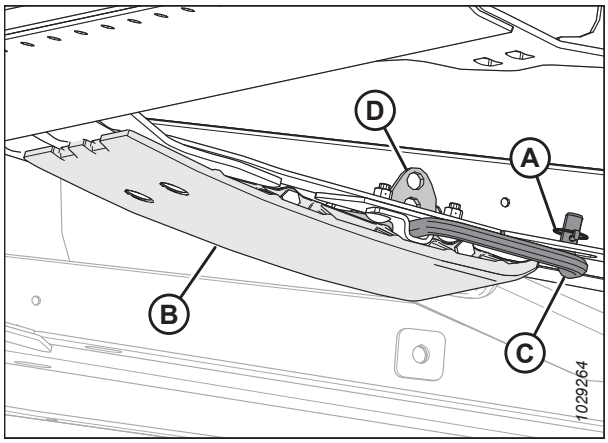


Figure 3.266: Inner Skid Shoe

10. Adjust the header angle to the desired working position using the machine's header angle controls. If the header angle is not critical, set it to the mid-position.
11. Check the header float. For instructions, refer to *3.9.3 Header Float, page 190*.

Adjusting Outer Skid Shoes

The skid shoes and center-link allow you to adjust to field conditions and maximize the amount of material cut while reducing damage to the knife caused by stones and debris.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header's safety props. For instructions, refer to the combine operator's manual.
4. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting EasyMove™ Transport Wheels, page 179*
   - *Adjusting Stabilizer Wheels, page 179*
5. Remove lynch pin (A) from each skid shoe pin (C).
6. Hold skid shoe (B) and remove pin (C) by disengaging from the bracket and pulling away from the shoe.
7. Raise or lower skid shoe (B) to achieve the desired position using the holes in the support plate as a guide.
8. Reinstall pin (C) in the desired position on the support plate, engage the pin into the bracket, and secure with lynch pin (A).
9. Ensure all skid shoes are adjusted to the same position.
10. Check the header float. For instructions, refer to *3.9.3 Header Float, page 190*.

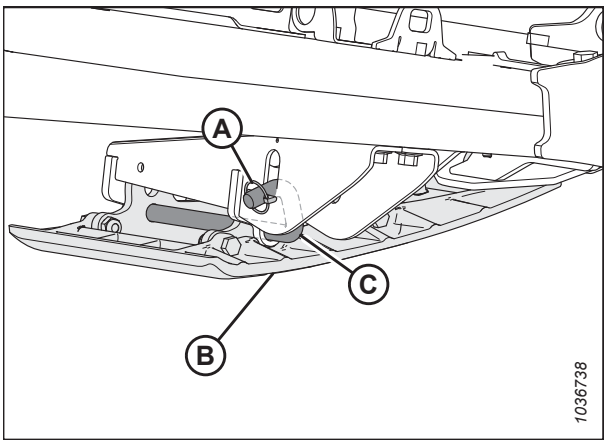


Figure 3.267: Outer Skid Shoe

3.9.3 Header Float

The header float system reduces the ground pressure at the cutterbar allowing the header to more easily follow the ground and quickly respond to sudden ground contour changes or obstacles.

Header float is indicated on the float indicator (A). Values 0 to 4 represent the force of the cutterbar on the ground with 0 being the minimum and 4 being the maximum. They also represent where the header is at in the float range, 0 being the bottom end of the float range and 4 being the top end of the float range.

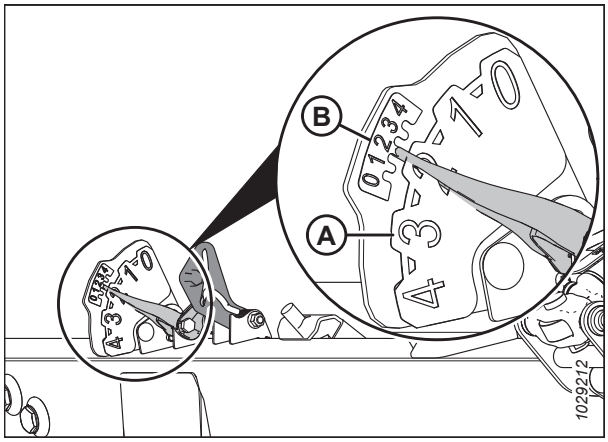


Figure 3.268: Float Indicator – Left Side

NOTE:

The indicator on the left side of the float module is for float indication and float settings; the indicator on the right side is for float settings only.

The maximum force is determined by the tension on the float module's adjustable float springs. Float can be changed to suit field and crop conditions and is dependent on what options have been installed on the header.

NOTE:

The small number set (B) at the top of the float indicator is used to check and adjust the float setting. For instructions, refer to *Checking and Adjusting Header Float, page 190*.

The FD2 Series FlexDraper® Header performs best with minimum ground pressure under normal conditions. Readjust the float if adding optional attachments to the header that affect header weight.

1. Set the float for cutting on the ground as follows:
   a. Ensure the header float locks are disengaged. For instructions, refer to *Locking/Unlocking Header Float, page 205*.
   b. Lower the feeder house using the combine header controls until float indicator (A) reaches the desired float value (cutterbar ground force). Set the float indicator initially to float value 2 and adjust as necessary.
2. Set the float for cutting off the ground as follows:
   a. Adjust the contour wheels. For instructions, refer to *3.9.1 Cutting above Ground Level, page 178*.
   b. Note the float value on the float indicator and maintain this value during operation (disregard minor fluctuations on the indicator).

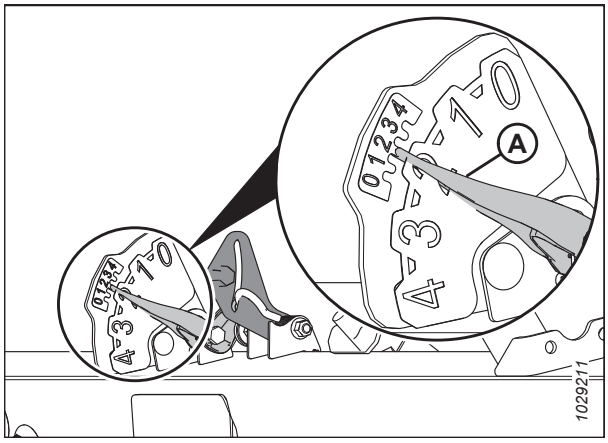


Figure 3.269: Cutting on the Ground

Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for ridges, trenches, and other variations in ground contour. If the header float is not set properly, it may cause the cutterbar to push into the ground or leave uncut crop. This procedure describes how to check the header float and adjust to the factory-recommended settings.

IMPORTANT:

Do **NOT** use the float module springs to level the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Use the following guidelines when adjusting the float:

- Set the header float as light as possible (without causing excessive bouncing) to prevent knife component breakage, pushing soil, soil build-up at the cutterbar in wet conditions, and excessive wear to the poly skid plates.
- To avoid excessive bouncing and an uneven cut with a light float setting, use a slower ground speed.
- When cutting off the ground, use the stabilizer wheels in conjunction with the header float to minimize bouncing at the header ends and to control cut height. For instructions, refer to *Adjusting Stabilizer Wheels, page 179*.

NOTE:

If adequate header float cannot be achieved using all of the available adjustments, change the float spring configuration. For instructions, refer to *Changing Float Spring Configuration – Confirming Type of Float Lever, page 195*.

1. Park the combine on a level surface.
2. Locate spirit level (A) on top of the float module frame. Check that the bubble is in the center. If adjustment is required, refer to *3.11 Leveling Header, page 446*.
3. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.

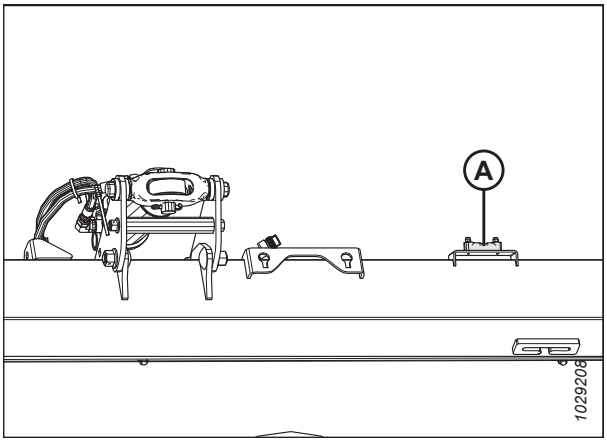


Figure 3.270: Spirit Level

4. Adjust the reel fore-aft to position 6 on indicator bracket (A) located on the left arm.

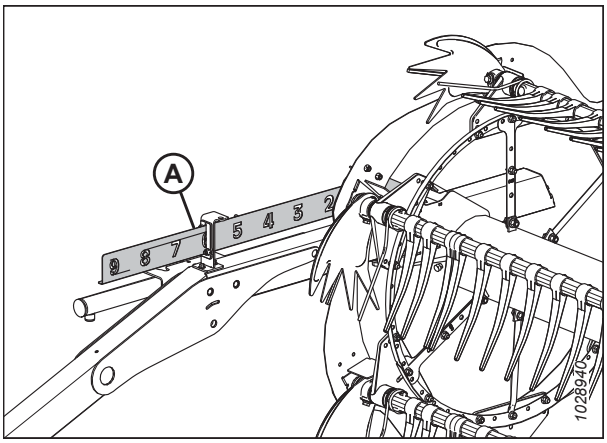


Figure 3.271: Fore-Aft Position

5. Adjust center-link (A) so that indicator (B) is at position **D** on the gauge.
6. Lower the reel fully.
7. Shut down the engine, and remove the key from the ignition.
8. Lock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
9. If installed, move the transport wheels (A) so that they are supported by the header.

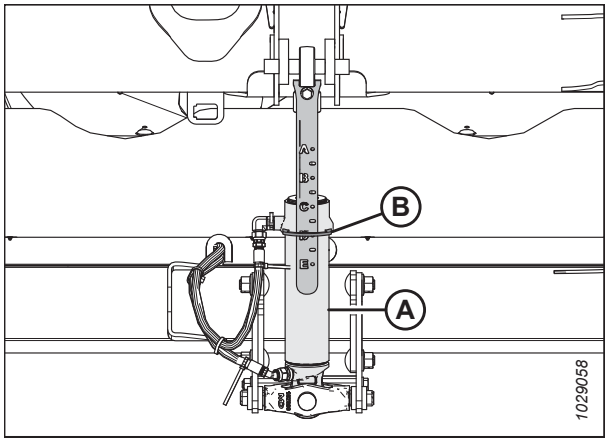


Figure 3.272: Center-Link

10. Disengage both header float locks by pulling float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (**UNLOCK**).

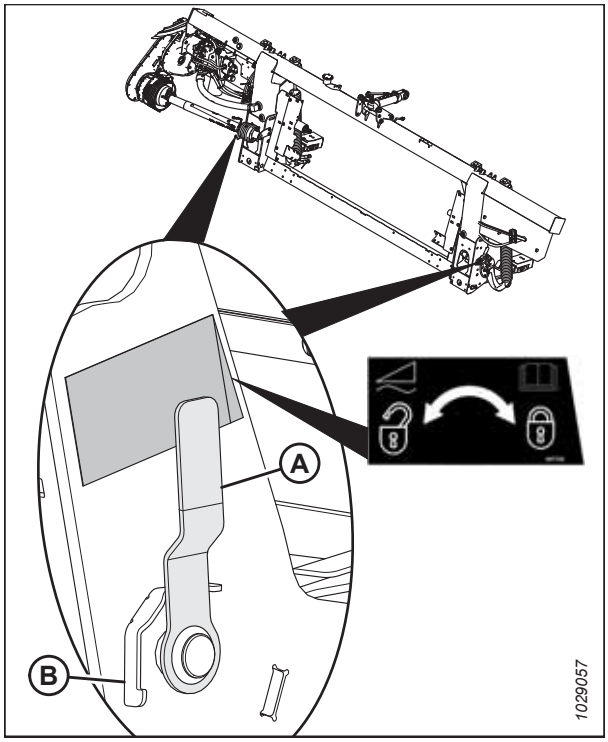


Figure 3.273: Header Float Lock in Locked Position

11. Open the left endshield. For instructions, refer to *Opening Header Endshields, page 47*.

12. Remove hairpin (A) securing multi-tool (B) to the holder bracket on the left endsheet.

13. Remove multi-tool (B), and reinstall the hairpin to the tool holder.

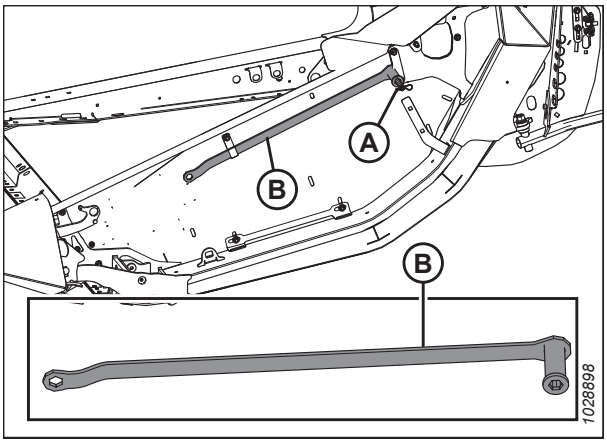


Figure 3.274: Multi-Tool Location

14. Lift float setting lever (A) by hand to remove any slack.

15. Place multi-tool (B) on the float setting lever. The multi-tool should be slightly angled towards the front of the header.

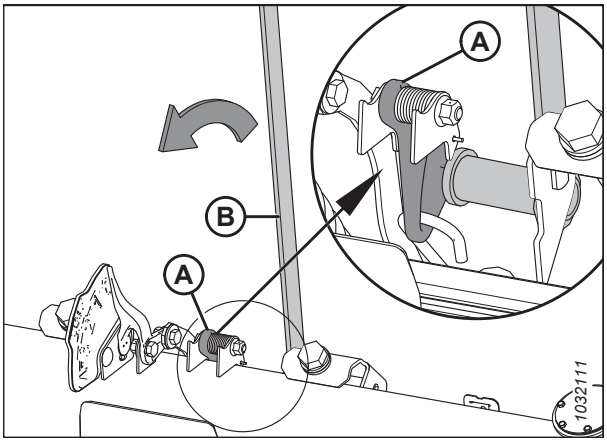


Figure 3.275: Float Setting Assembly – Left

16. Pull down on multi-tool (B) towards the back of the header until lever (A) is over center and will not return to its original position. Remove the multi-tool and repeat on the opposite side.

17. On the same side that you are adjusting, push header down 76 mm (3 in.) and then let go, and recheck the float setting. If the setting remains out of range, proceed with adjustment.

    NOTE:

    Pushing down on (shaking) the header releases friction and prevents gauge errors.

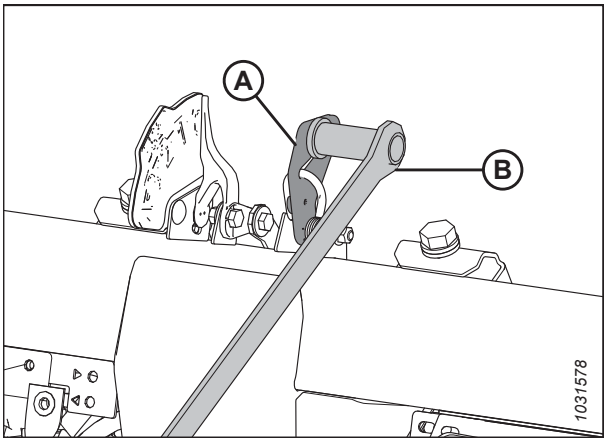


Figure 3.276: Float Setting Assembly – Left

18. Check smaller float setting indicator (FSI) (B) for the current float value. The arm on the FSI should be pointed at the 2.
    - If arm (A) on FSI (B) is higher than 2, the header is heavy.
    - If the reading on FSI (B) is lower than 2, the header is light.

    NOTE:

    The larger numbers are for the float height indicator and used when operating the header in the field.

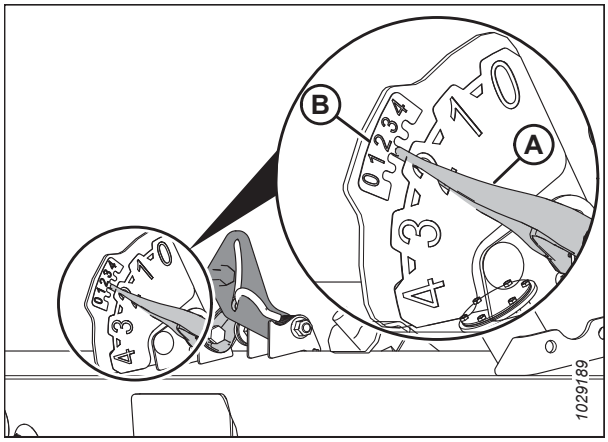


Figure 3.277: Float Setting Indicator – Left

19. To access float spring adjustment bolts (A), loosen bolts (C) and rotate spring locks (B).

    NOTE:

    For the following step, each pair of bolts (A) must be adjusted equally.

20. To increase float and (decrease ground force), turn both adjustment bolts (A) on the left side of the header clockwise. Repeat the adjustment on the opposite side.

    To decrease the float and (increase ground force), turn left adjustment bolts (A) counterclockwise. Repeat the adjustment on the opposite side.

21. Repeat the sequence of shaking the header, and then checking the FSI reading between adjustments (Steps *17, page 193* to *20, page 194*) until both FSI gauges read 2, or until the desired value is achieved on both sides of the header.

22. Lock adjustment bolts (A) with spring locks (B). Ensure bolt heads (A) are engaged in the spring lock cutouts. Tighten bolts (C) to secure the spring locks in place.

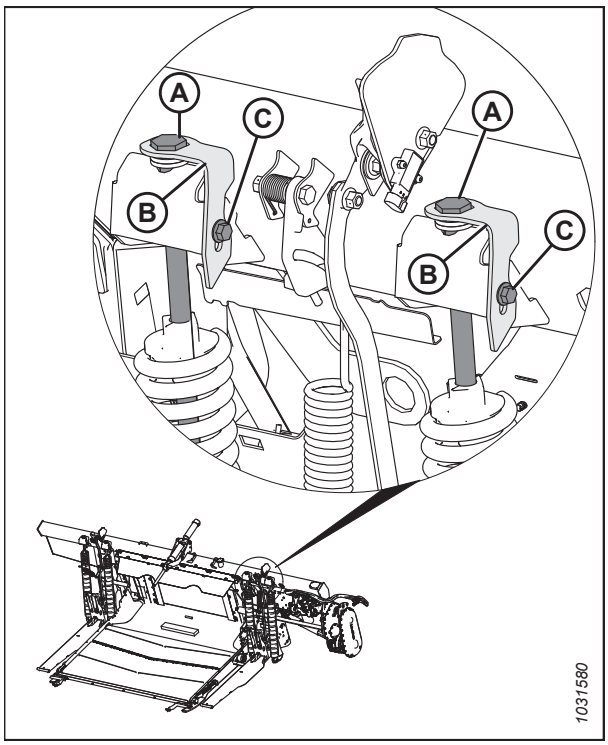


Figure 3.278: Float Adjustment – Left

23. Once the float adjustment is complete, use the tubular portion of multi-tool (A) to push float setting lever (B) over. Repeat this step on the opposite side.

    NOTE:

    Do **NOT** use the box end of the multi-tool, as the float setting lever will snap over and could pull the multi-tool out of the operator's hands.

24. Proceed to *3.9.4 Checking and Adjusting Wing Balance, page 213*.

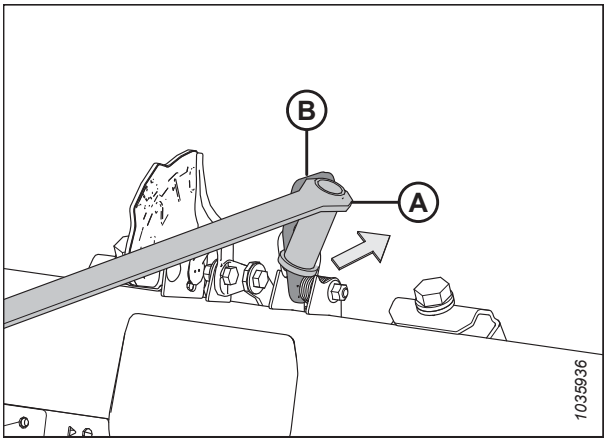


Figure 3.279: Float Adjustment – Left

Changing Float Spring Configuration – Confirming Type of Float Lever

Float springs are configured according to the weight of the header. You may have to change the float spring configuration if optional equipment is added or removed from the header.

NOTE:

The following procedures are only intended for when the weight of the header has changed significantly due to the removal or addition of optional equipment.

Check if the float levers attached to the float springs have two holes (A) or one hole (B).

- If the float levers have two holes (A), refer to *Changing Float Spring Configuration – Float Levers with Two Holes, page 196*.
- If the float levers have one hole (B), refer to *Changing Float Spring Configuration – Float Levers with One Hole, page 201*.

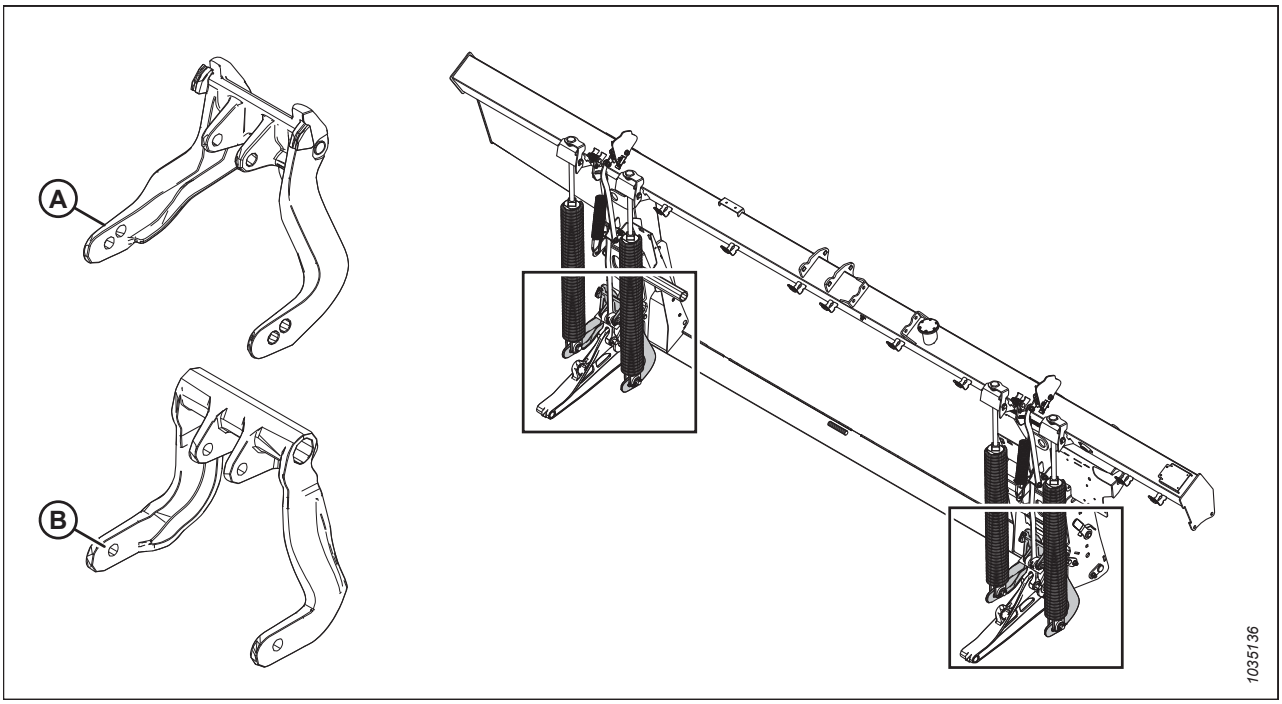


Figure 3.280: Float Lever With One Hole Versus Two Holes

Changing Float Spring Configuration – Float Levers with Two Holes

Float springs are configured according to the weight of the header. You may have to change the float spring configuration if optional equipment is added or removed from the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

FD240 **double knife** uses one type of float spring configuration. This procedure is not required. The spring should be placed in the front hole.

NOTE:

FD241 uses one type of float spring configuration. This procedure should not be required. The spring should be placed in the front hole.

1. Shut down the engine, and remove the key from the ignition.
2. Calculate the float spring configuration as follows:
   a. Determine the total header weight based on Table *3.18, page 196*.
      - **Example:** FD235 single knife base header weight [2600 kg (5750 lb.)]+ vertical knives [70 kg (150 lb.)] + no options = 2670 kg (5900 lb.)
   b. Compare the total weight to Table *3.19, page 197* and determine if the float springs should be installed in front hole (A) or back hole (B) in the float lever.
      - **Example:**
        FD235 base header [2600 kg (5750 lb.)] + vertical knives [70 kg (150 lb.)] + no options = 2670 kg (5900 lb.)
        This FD235 is in the "Lighter Weight Range," and therefore the float springs must be installed in the back hole of the float levers.

        If you add the optional upper cross auger [180 kg (400 lb.)] and the slow speed transport [360 kg (800 lb.)], the total weight will increase to 3210 kg (7100 lb.), and you will have to move the float springs to the front hole in the float levers because the header is now in the "Heavier Weight Range."

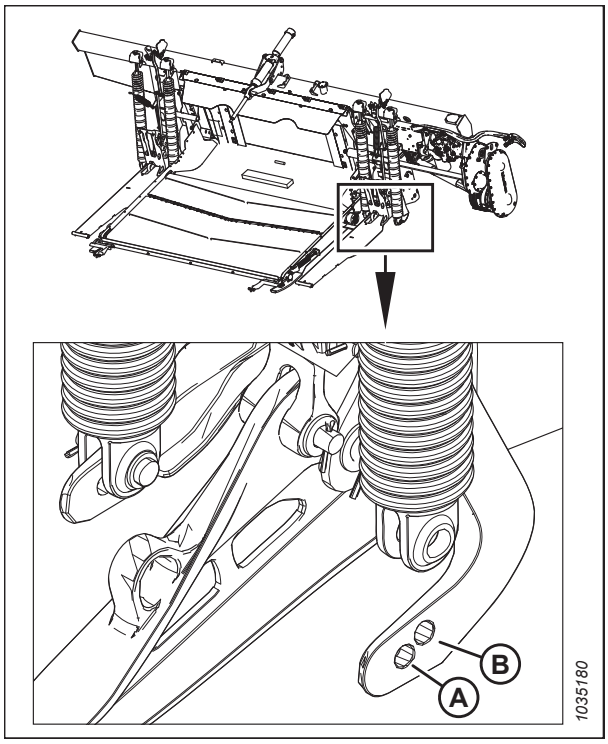


Figure 3.281: Left Float Spring – Installed in Rear Float Lever Hole

Table 3.18 Header Weight Calculator

Total weight = Header weight **without** dividers and options (A) + **one** divider option (B) + sum of optional equipment (C).		
Category	**Description**	**Weight**
(A) Base Header – select **one**	FD230 single knife	2400 kg (5300 lb.)
	FD235 single knife	2600 kg (5750 lb.)
	FD235 double knife	2700 kg (5950 lb.)
	FD240 single knife	2800 kg (6150 lb.)

Table 3.18 Header Weight Calculator (continued)

	FD240 double knife	Use the front hole on the float lever.
	FD241 double knife	Use the front hole on the float lever.
	FD245 double knife	3225 kg (7100 lb.)
	FD250 double knife	3400 kg (7500 lb.)
(B) Dividers – select **one**, if installed	Rice divider rods	20 kg (50 lb.)
	Vertical knives	70 kg (150 lb.)
(C) Other Options – add any installed options	Full-length upper cross auger	180 kg (400 lb.)
	Slow speed transport	360 kg (800 lb.)
	Contour wheels	205 kg (450 lb.)
	Stabilizer wheels	160 kg (350 lb.)

Table 3.19 Float Spring Installation Location in Float Lever

Header	Lighter Weight Range	Float Lever Hole	Heavier Weight Range	Float Lever Hole
FD230 single knife	2400–2675 kg (5300–5900 lb.)	Back	2676–3215 kg 5901–7100 lb.	Front
FD235 single knife	2600–3050 kg (5750–6700 lb.)	Back	3051–3415 kg 6701–7550 lb.	Front
FD235 double knife	2700–3150 kg (5950–6900 lb.)	Back	3151–3515 kg (6901–7750 lb.)	Front
FD240 single knife	2800–3200 kg (6150–7000 lb.)	Back	3201–3615 kg (7001–7950 lb.)	Front
FD240 double knife	Use the front hole on the float lever.			
FD241 double knife	Use the front hole on the float lever.			
FD245 double knife	3225–3475 kg (7100–7650 lb.)	Back	3476–4050 kg (7651–8900 lb.)	Front
FD250 double knife	3400–3800 kg (7500–8350 lb.)	Back	3801–4215 kg (8351–9300 lb.)	Front

3. Lock the header float by pulling the float lock handle into position (A) on both sides of the float module.

   NOTE:

   The float is unlocked when the handle is in position (B).

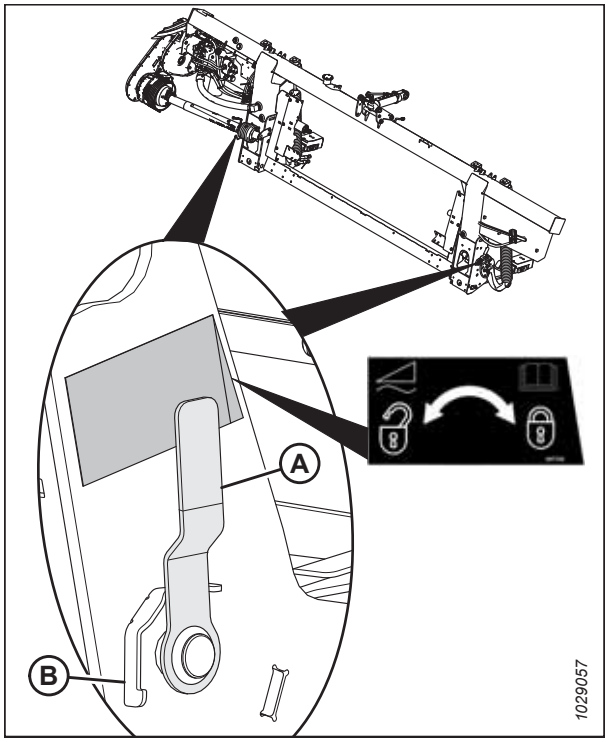


Figure 3.282: Header Float Lock in Locked Position

4. Access float spring adjustment bolts (A) by loosening bolts (C) and rotating spring locks (B) forward.

5. Loosen adjustment bolts (A) equally until the springs are loose.

   NOTE:

   The adjustment bolts will rise slightly above the washers when the springs are loose.

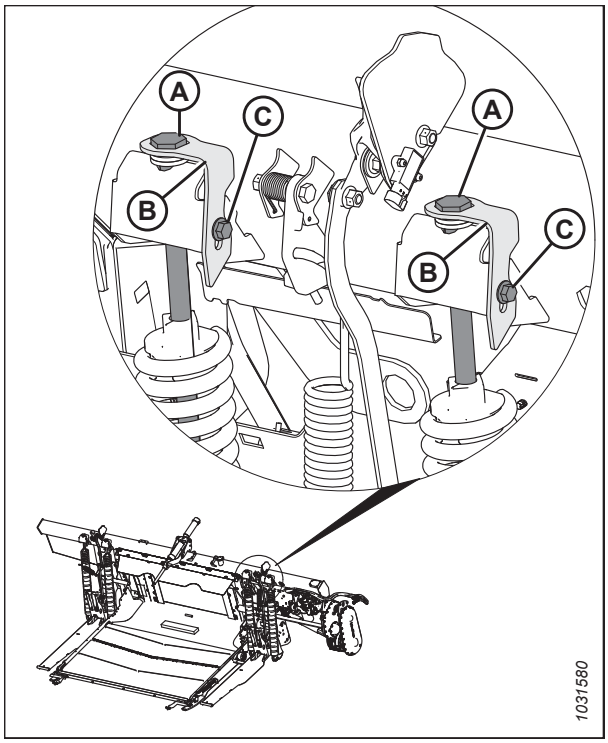


Figure 3.283: Float Adjustment – Left

6. Remove cotter pin (C) from pin (A).
7. Remove pin (A) and washers (B).

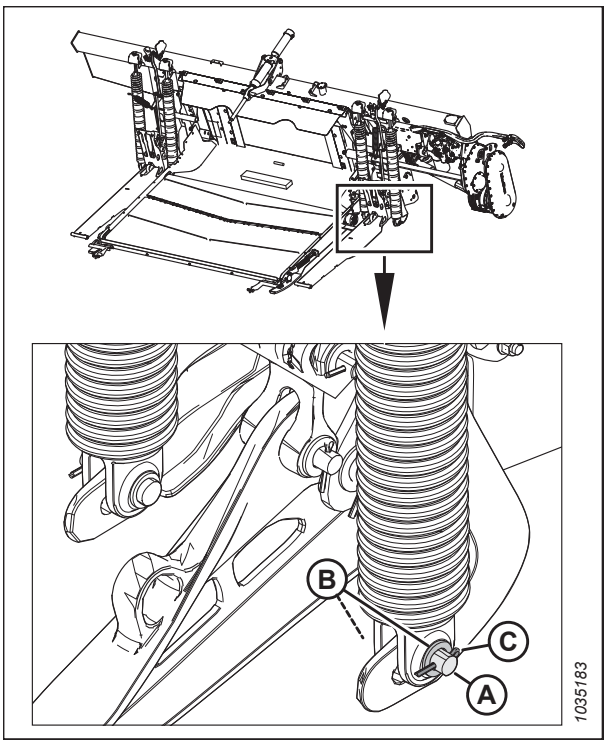


Figure 3.284: Left Float Spring – Installed in Rear Float Lever Hole

8. Align spring to the front (A) or back (B) float lever hole according to the float requirements in Table *3.19, page 197*.

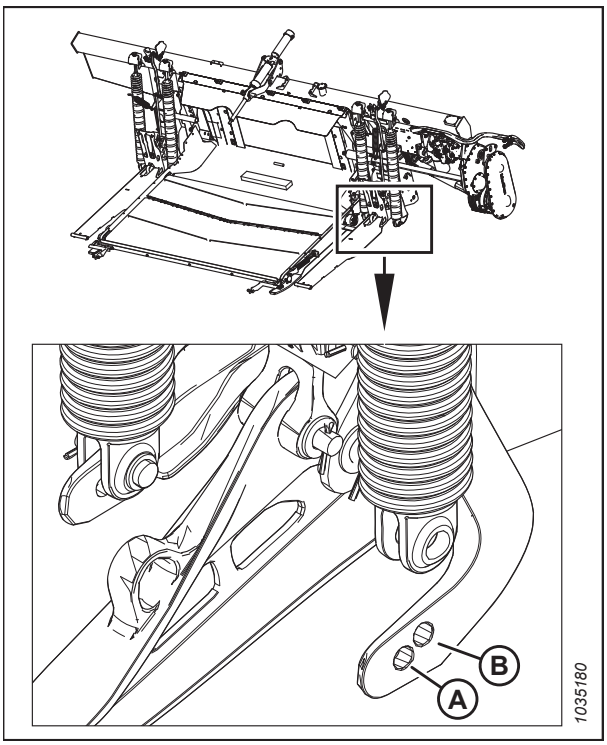


Figure 3.285: Left Float Spring – Installed in Rear Float Lever Hole

9. Install pin (A) with two washers (B) into the new hole.
10. Secure pin with cotter pin (C).
11. Repeat Step *6, page 199* to Step *10, page 200* for other spring (D).

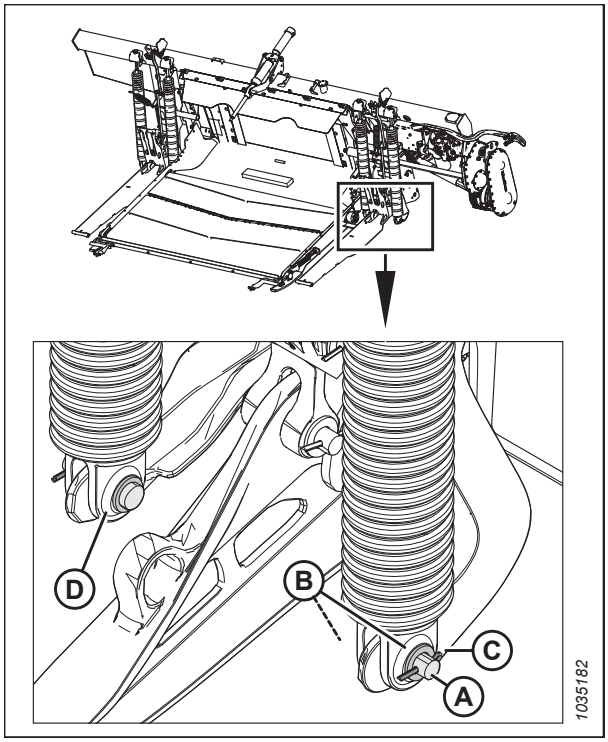


Figure 3.286: Left Float Spring – Installed in Rear Float Lever Hole

12. Retighten adjustment bolts (A) an equal amount to ensure the float springs are the same length.
13. Repeat Step *4, page 198* to Step *12, page 200* on the pair of float springs (B) on the opposite side of the float module.
14. Check the float. For instructions, refer to *Checking and Adjusting Header Float, page 190*.

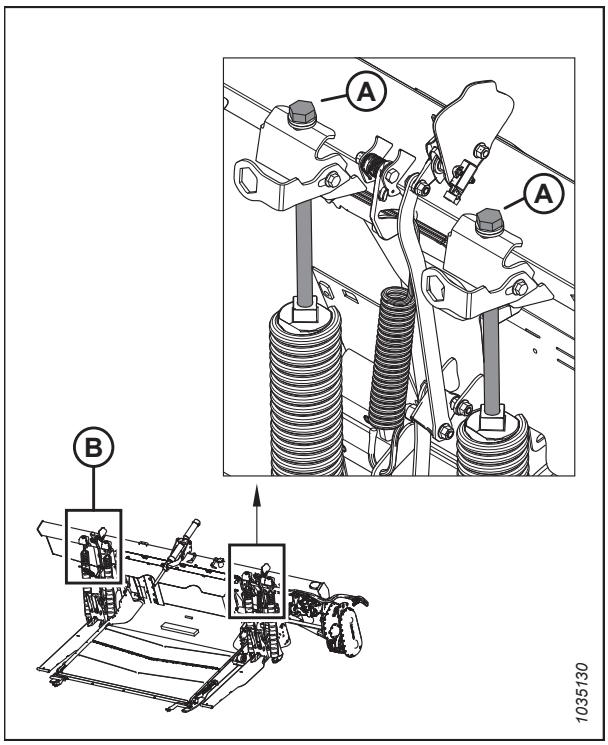


Figure 3.287: Float Adjustment – Left

Changing Float Spring Configuration – Float Levers with One Hole

Float springs are configured according to the weight of the header. You may have to change the float spring configuration if optional equipment is added or removed from the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

FD230 uses one type of float spring configuration. This procedure is not required.

NOTE:

FD240 **DOUBLE KNIFE** uses one type of float spring configuration. This procedure should not be required. Changing the float spring configuration on a float lever with one hole will require you to change the type of spring(s). Part numbers are included in *3.22, page 202*.

NOTE:

FD241 uses one type of float spring configuration. This procedure should not be required. Changing the float spring configuration on a float lever with one hole will require you to change the type of spring(s). Part numbers are included in *3.22, page 202*.

1. Shut down the engine, and remove the key from the ignition.
2. Calculate the float spring configuration as follows:
   a. Determine the total header weight based on Table *3.20, page 201*.
   b. Determine which configuration "1" to "5" to use for the total header weight according to Table *3.21, page 202*.
   c. If the header is in a different configuration than in Substep 2b then refer to Table *3.22, page 202*. Change the float spring(s) according to the table.

Table 3.20 Header Weight Calculator

Category	Description	Weight
Total weight = Header weight **without** dividers and options (A) + **one** divider option (B) + sum of optional equipment (C).		
(A) Base Header – select **one**	FD230 single knife	Only configuration "1" is used. For configuration details, refer to Table *3.22, page 202*.
	FD235 single knife	2600 kg (5750 lb.)
	FD235 double knife	2700 kg (5950 lb.)
	FD240 single knife	2800 kg (6150 lb.)
	FD240 double knife	Only configuration "2" is used. For configuration details, refer to Table *3.22, page 202*.
	FD241 double knife	Only configuration "2" is used. For configuration details, refer to Table *3.22, page 202*.
	FD245 double knife	3225 kg (7100 lb.)
	FD250 double knife	3400 kg (7500 lb.)
(B) Dividers – select **one**, if installed	Rice divider rods	20 kg (50 lb.)
	Vertical knives	70 kg (150 lb.)

Table 3.20 Header Weight Calculator (continued)

Category	Description	Weight
(C) Other Options – add any installed options	Full-length upper cross auger	180 kg (400 lb.)
	Slow speed transport	360 kg (800 lb.)
	Contour wheels	205 kg (450 lb.)
	Stabilizer wheels	160 kg (350 lb.)

Table 3.21 Float Spring Configuration According to Total Header Weight

Header	Lighter Weight Range	Configuration	Heavier Weight Range	Configuration
FD230 single knife	1			
FD235 single knife	2600–3050 kg (5750–6700 lb.)	1	3051–3415 kg 6701–7550 lb.	3
FD235 double knife	2700–3150 kg (5950–6900 lb.)	1	3151–3515 kg (6901–7750 lb.)	2
FD240 Single Knife	2800–3200 kg (6150–7000 lb.)	1	3201–3615 kg (7001–7950 lb.)	3
FD240 double knife	2			
FD241 double knife	2			
FD245 double knife	3225–3475 kg (7100–7650 lb.)	2	3476–4050 kg (7651–8900 lb.)	4
FD250 double knife	3400–3800 kg (7500–8350 lb.)	2	3801–4215 kg (8351–9300 lb.)	5

Table 3.22 Float Spring Configuration

Configuration	Outer Left Spring	Inner Left Spring	Outer Right Spring	Inner Right Spring
1	Single (MD #308878)	Single	Single	Single
2	Single	Single	Single	Double
3	Double (MD #308879)	Single	Single	Single
4	Double	Single	Single	Double
5	Double	Single	Double	Double

3. Lock the header float by pulling the float lock handle into position (A) on both sides of the float module.

   NOTE:

   The float is unlocked when the handle is in position (B).

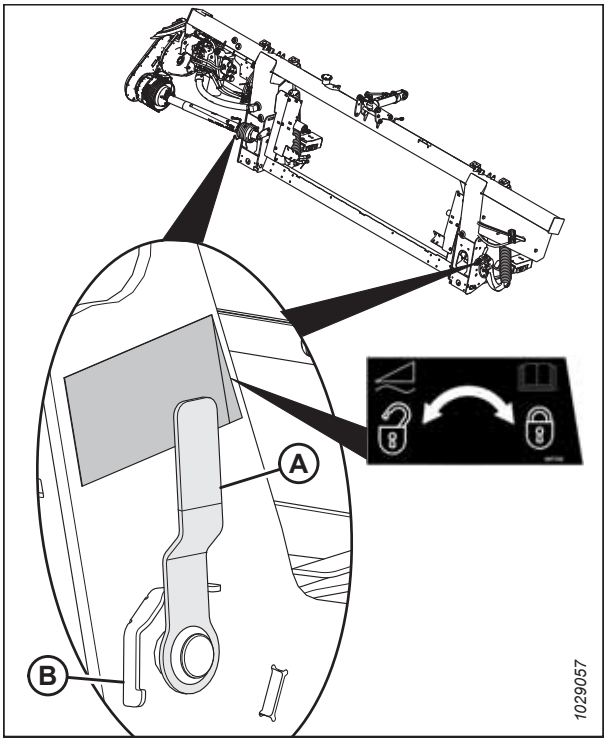


Figure 3.288: Header Float Lock in Locked Position

4. Determine which float spring you are changing. The outer left spring is changed in this procedure as an example. Access the corresponding adjustment bolt (C) by loosening bolt (A) and rotating spring lock (B).

5. Unscrew and remove the adjustment bolt (C) and washers (D) from the spring.

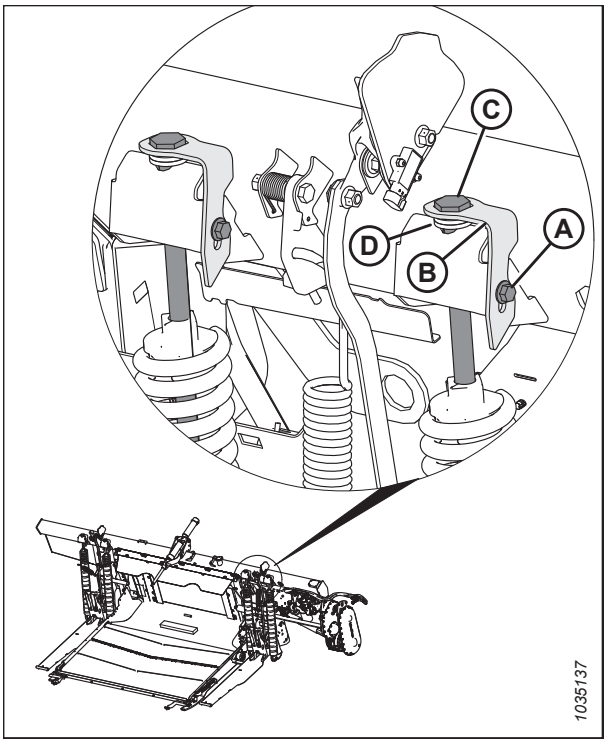


Figure 3.289: Float Adjustment Bolts – Left Shown, Right is Similar

6. Remove cotter pin (A) from pin (B).
7. Remove pin (B) and two washers (C).
8. Change spring (D).
9. Reinstall pin (B) and two washers (C).
10. Reinstall cotter pin (A).

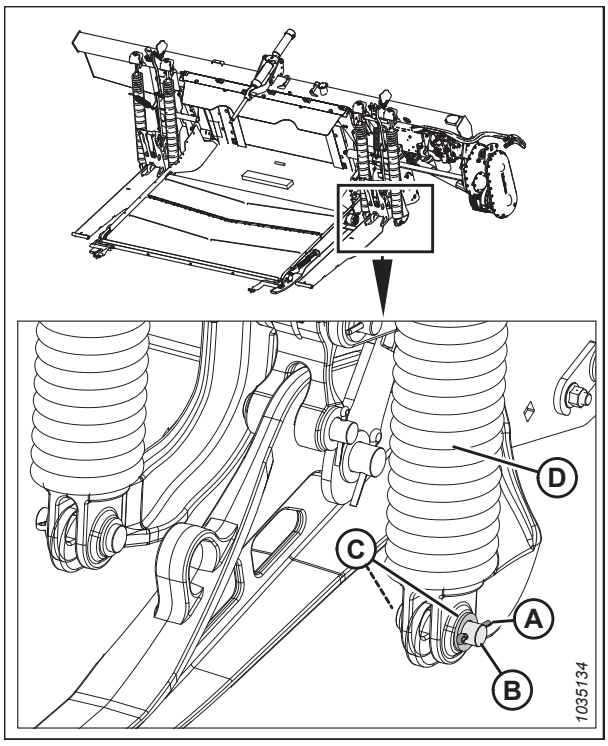


Figure 3.290: Outer Left Float Spring Shown

11. Reinstall bolt (A) and washers (B) into spring (C). Make sure **BOTH** float springs are of equal length (D) (even if you only changed one spring).
12. Repeat Step *4, page 203* to Step *11, page 204* for remaining springs.
13. Check the float. For instructions, refer to *Checking and Adjusting Header Float, page 190*.

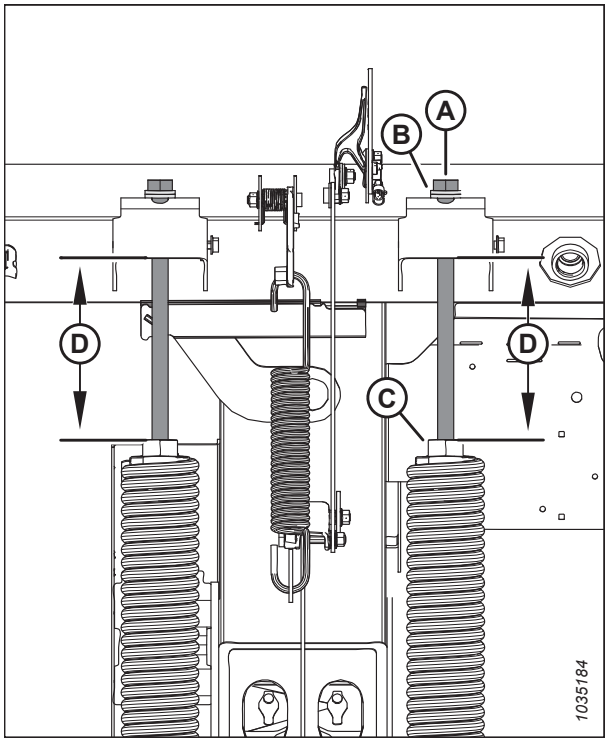


Figure 3.291: Left Float Springs

Locking/Unlocking Header Float

Two header float locks—one on each side of the float module—lock and unlock the header float system.

IMPORTANT:

The float locks must be engaged when the header is being transported with the float module attached so there is no relative movement between the float module and the header. The float locks also must be locked when detaching from the combine to enable the feeder house to release the float module.

To disengage (unlock) float locks, pull float lock handle (A) into position (B). In this position, the header is unlocked, and can float with respect to the float module.

To engage (lock) float locks, push float lock handle (A) into position (C). In this position, the header cannot move with respect to the float module.

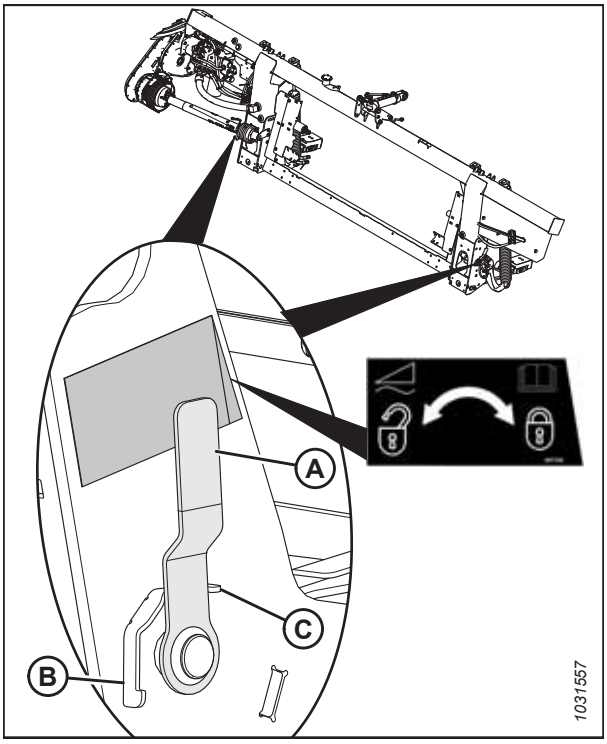


Figure 3.292: Float Lock – in Locked Position

Locking/Unlocking Header Wings

Locking the wings allows the header to be operated as a rigid header with the cutterbar straight. Unlocking the wings allows the three sections to move independently to follow the ground contours.

1. **Locking:** Lock the wing by moving spring handle (A) to the top of the slot as shown.

   NOTE:

   There should be an audible click when you move the spring handle indicating that the internal mechanism engaged or disengaged. If the lock mechanism does not engage, proceed to Step *2, page 206*.

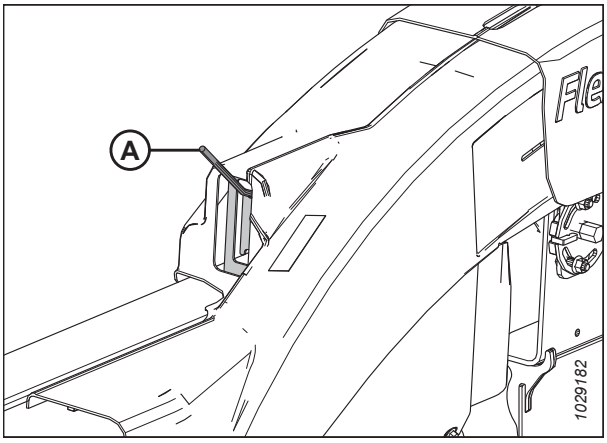


Figure 3.293: Wing in Locked Position

Unlocking: Unlock the wing by moving spring handle (A) to the bottom of the slot as shown.

NOTE:

There should be an audible click when you move the spring handle indicating that the internal mechanism engaged or disengaged. If the lock mechanism does not disengage, proceed to Step *2, page 206*.

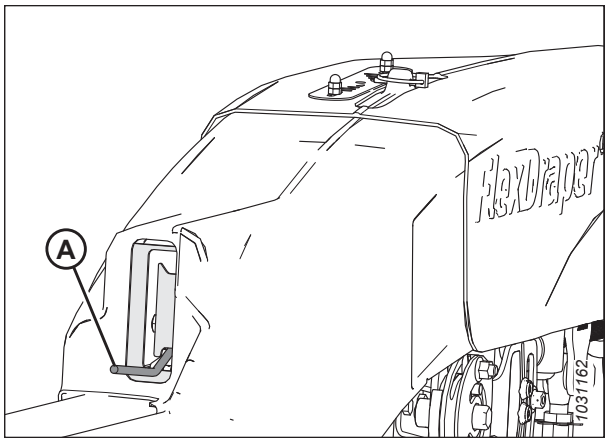


Figure 3.294: Wing in Unlocked Position

2. Remove hairpin (A) securing the multi-tool to the holder bracket on the left endsheet.
3. Remove multi-tool (B) and reinstall the hairpin to the tool holder.

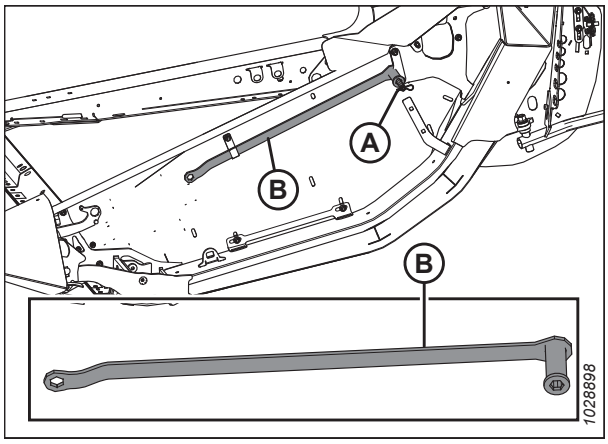


Figure 3.295: Left Endsheet

NOTE:

Parts hidden in the illustration for clarity.

4. Attach flex checker cable (A) to flex checker cable lock (B).

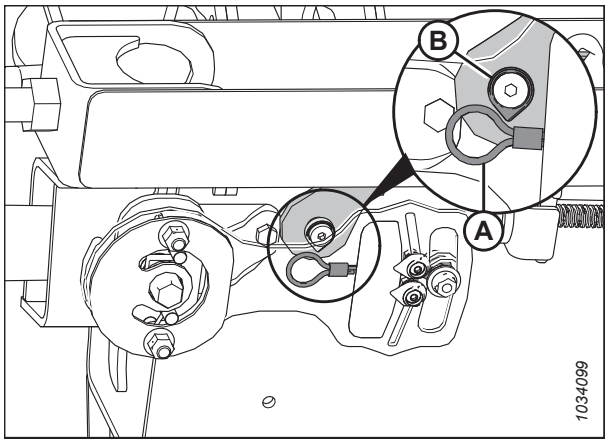


Figure 3.296: Flex Checker Cable Lock – Left Side

5. Use multi-tool (A) on wing balance plate (B) to move wing up/down until you hear the lock click.

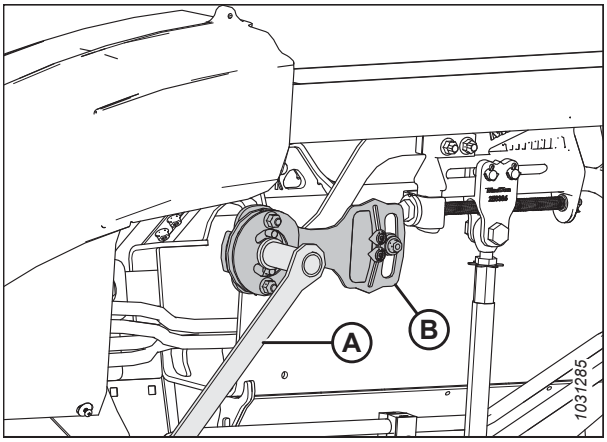


Figure 3.297: Wing Lock Mechanism

NOTE:

Parts hidden in the illustration for clarity.

6. Detach flex checker cable (A) from flex checker cable lock (B).

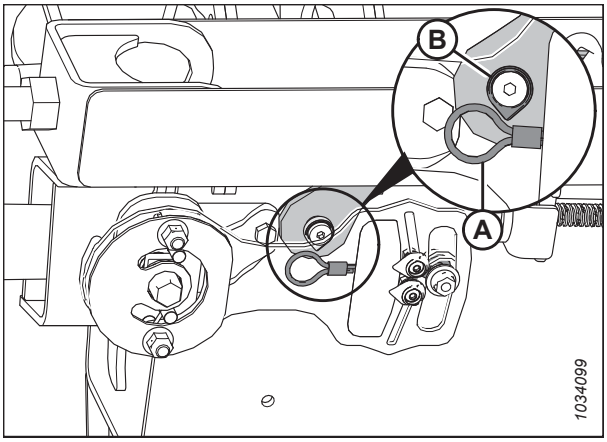


Figure 3.298: Flex Checker Cable Lock – Left Side

7. Return multi-tool (B) to its storage position, and secure with hairpin (A).

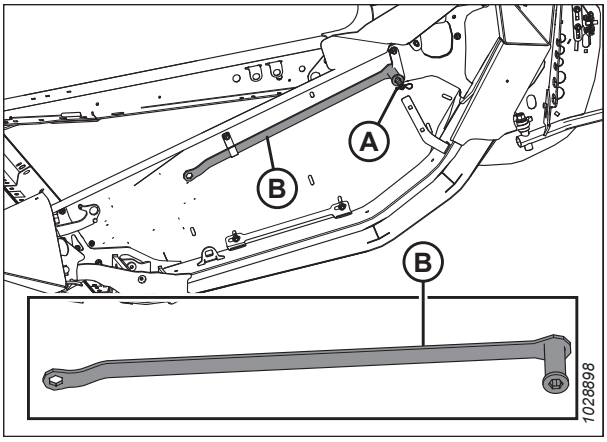


Figure 3.299: Left Endsheet

Operating in Flex Mode

The header is designed to operate with the cutterbar on the ground. The three sections move independently to follow the ground contours. When the wings are unlocked, they are free to move up and down.

Unlock the wings as follows:

1. Move spring handle (A) in the lower slot to unlock the wing. You should hear the lock disengaged.
2. If the lock link does not disengage, move the wing by raising and lowering the header, changing the header angle, or driving the combine until it disengages.
3. If the lock still does not disengage, continue to next step.

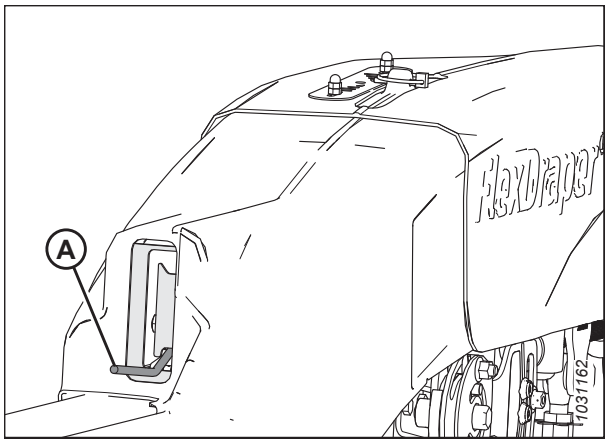


Figure 3.300: Wing in Unlocked Position

4. Remove hairpin (A) securing multi-tool to bracket on left endsheet.
5. Remove multi-tool (B), and reinstall hairpin to bracket.

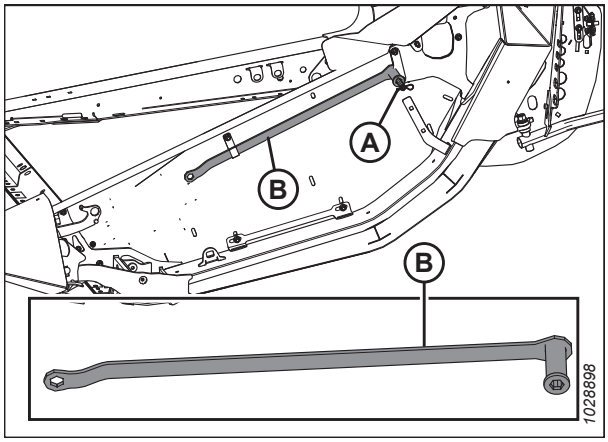


Figure 3.301: Left Endsheet

NOTE:

Parts hidden for clarity.

6. Attach flex checker cable (A) to flex checker cable lock (B).

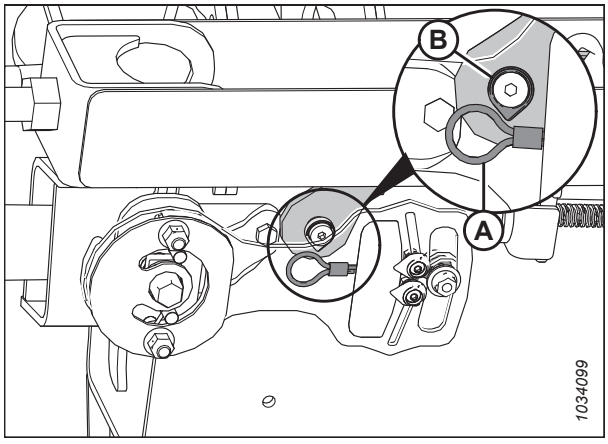


Figure 3.302: Flex Checker Cable Lock – Left Side

7. Use multi-tool (A) on plate (B) to move the wing up and down until the lock disengages.

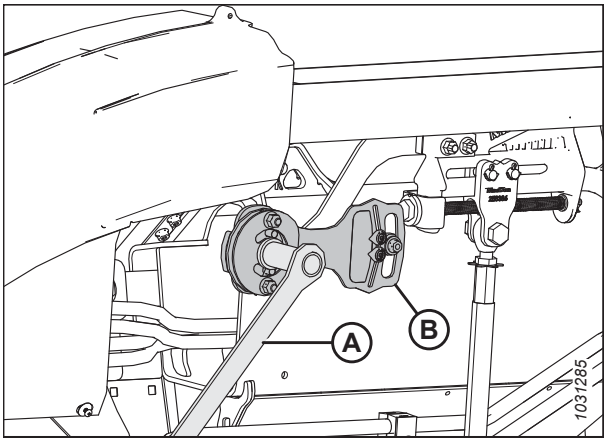


Figure 3.303: Wing Lock in Unlocked Position

NOTE:

Parts hidden for clarity.

8. Detach flex checker cable (A) to flex checker cable lock (B).
9. Return multi-tool (A) to storage position and reinstall the linkage cover.
10. If necessary, balance the wing. For instructions, refer to *3.9.4 Checking and Adjusting Wing Balance, page 213*.

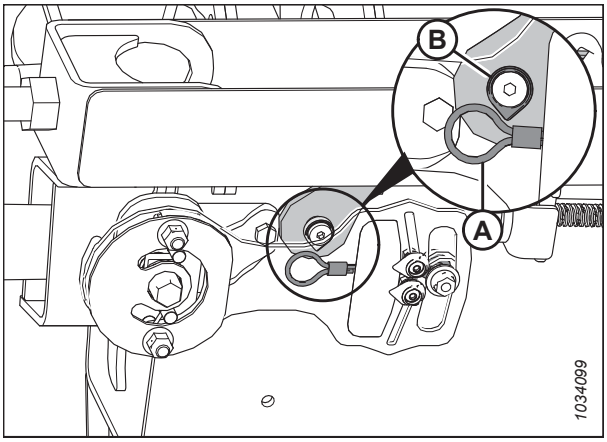


Figure 3.304: Flex Checker Cable Lock – Left Side

NOTE:

With the header attached to a combine, wings locked and straight, lynch pin (A) should point to the center of indicator (B). If not, calibrate the indicator by loosening bolts (C) that fasten to the shield and adjust its position. While harvesting with the wings unlocked, the indicator should periodically move through the range. If the indicator remains stuck at either end of the range, refer to *Checking and Adjusting Header Float, page 190* and *3.9.4 Checking and Adjusting Wing Balance, page 213*.

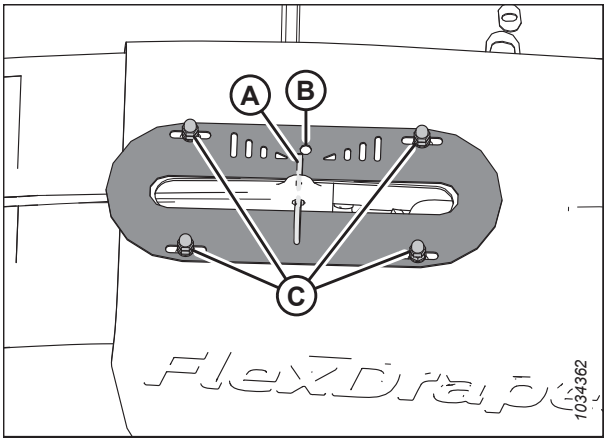


Figure 3.305: Wing Movement Indicator on Top of Flex Linkage Cover – Left Side Shown

Operating in Rigid Mode

The header is designed to operate with the cutterbar on the ground. When the three sections of the header are locked, the cutterbar is rigid and moves up and down at the same time.

Locking the wings allows the header to be operated as a rigid header with the cutterbar straight.

Lock the wings as follows:

1. Move spring handle (A) in the upper slot to lock the wing. The locking should be audible.
2. If the lock link does not engage, move the wing by raising and lowering the header, changing the header angle, or driving the combine until it engages.
3. If the lock still does not engage, continue to Step *4, page 210*.
4. Remove the flex linkage cover. For instructions, refer to *Removing Inboard Flex Linkage Covers, page 55*.

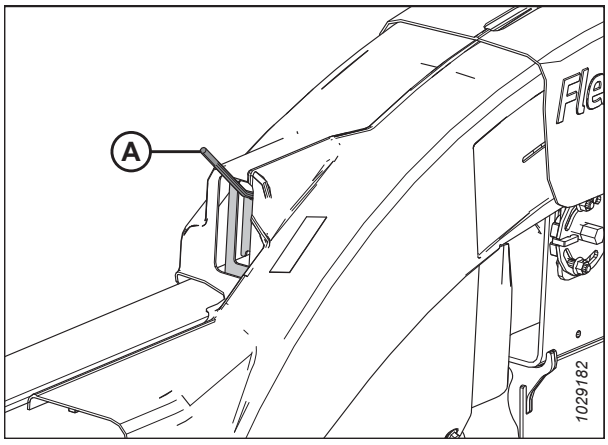


Figure 3.306: Wing in Locked Position

5. Remove hairpin (A) securing multi-tool to holder bracket on left endsheet.
6. Remove multi-tool (B) from storage location, and reinstall hairpin to multi-tool holder.

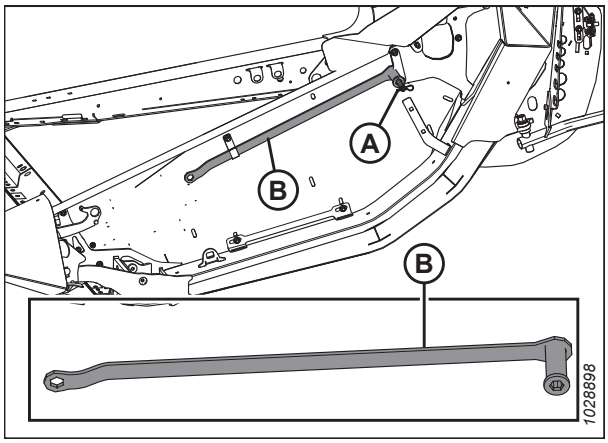


Figure 3.307: Left Endsheet

7. Use multi-tool (A) on plate (B) to move the wing up and down until the lock engages.
8. Return multi-tool (A) to storage position, and reinstall the linkage cover.
9. Reinstall flex linkage cover. For instructions, refer to *Installing Inboard Flex Linkage Covers, page 56*.

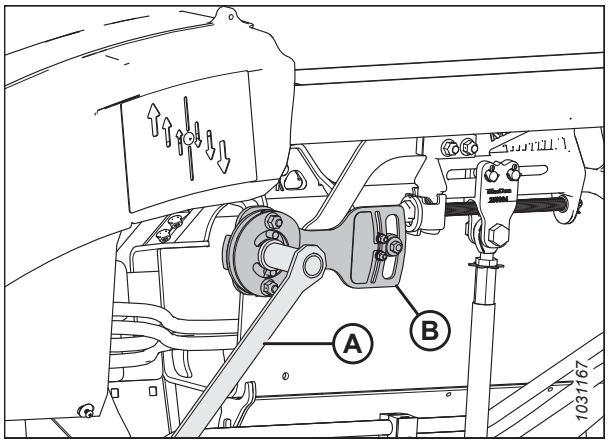


Figure 3.308: Wing in Locked Position

Disabling Flex Frown Limiter

Disabling the flex frown limiter increases the flex range which can help the header follow ground contours on uneven terrain, and may be preferred when a close reel to cutterbar relationship is not critical, such as when harvesting tall crops like standing cereals or canola.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

NOTE:

When the flex frown limiter plate is removed, the reel to cutterbar clearance will not be able to be as close, and will require adjustment. Refer to *4.13.1 Reel Clearance to Cutterbar, page 622* for specifications.

1. Park the combine on a level surface.
2. Lock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
3. Extend the hydraulic center-link fully.
4. Lower the header fully.
5. Shut down the engine, and remove the key from the ignition.
6. Remove two bolts (A).
7. Remove flex frown limiter plate (B).

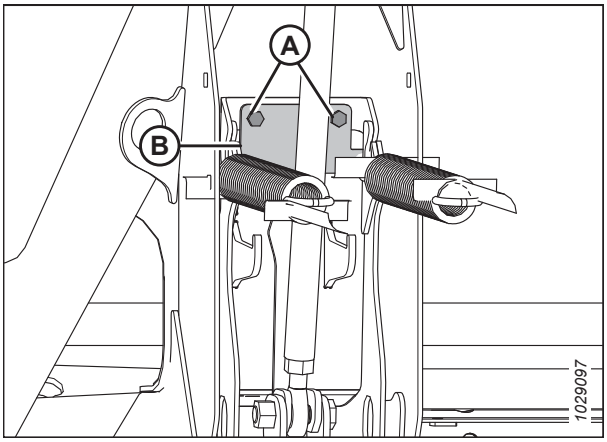


Figure 3.309: Flex Frown Limiter Plate

8. Flip limiter plate (B) upside down.
9. Install flex frown limiter plate (B).
10. Reinstall two bolts (A).
11. Repeat on the opposite side.
12. To avoid cutting off reel fingers when the header forms a frown shape, adjust the reel finger clearance, refer to *4.13.1 Reel Clearance to Cutterbar, page 622* for specifications.

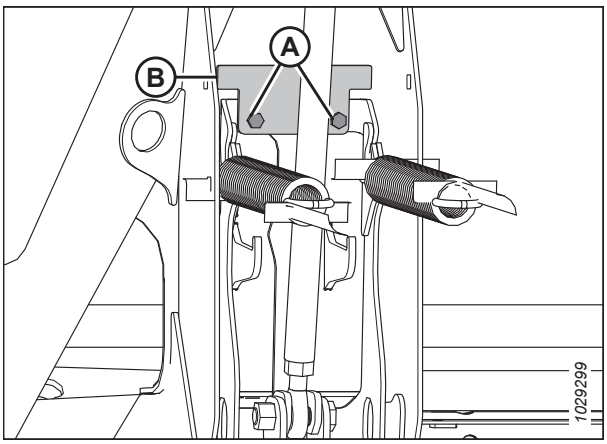


Figure 3.310: Flex Frown Limiter Plate

Enabling Flex Frown Limiter

Enabling the flex frown limiter limits the header's ability to frown, allowing the reel to be very close to the cutterbar, which is ideal for harvesting short crops such as lentils, lodged peas, or short soybeans.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

NOTE:

When installing the flex float limiter plate, the reel to cutterbar clearance will be to closer and should be adjusted. Refer to *4.13.1 Reel Clearance to Cutterbar, page 622* for specifications.

1. Park the combine on a level surface.
2. Lock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
3. Lower the header fully.
4. Extend the hydraulic center-link fully.
5. Shut down the engine, and remove the key from the ignition.
6. Remove two bolts (A).
7. Remove flex frown limiter plate (B).

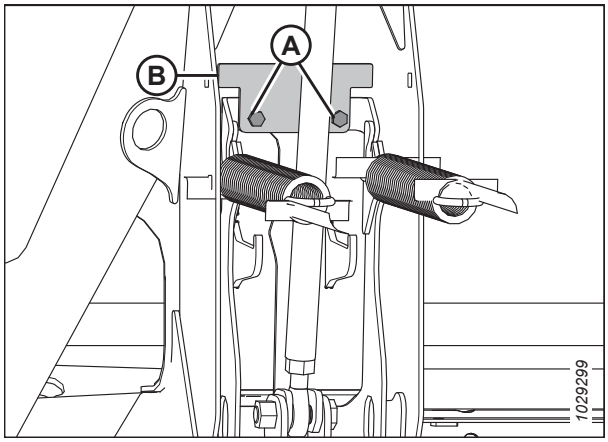


Figure 3.311: Flex Frown Limiter Plate

8. Flip limiter plate (B) upside down.
9. Install flex frown limiter plate (B).
10. Reinstall two bolts (A).
11. Repeat on the opposite side.
12. Adjust the reel finger clearance, refer to *Adjusting Clearance between Reel and Cutterbar, page 625* for specifications.

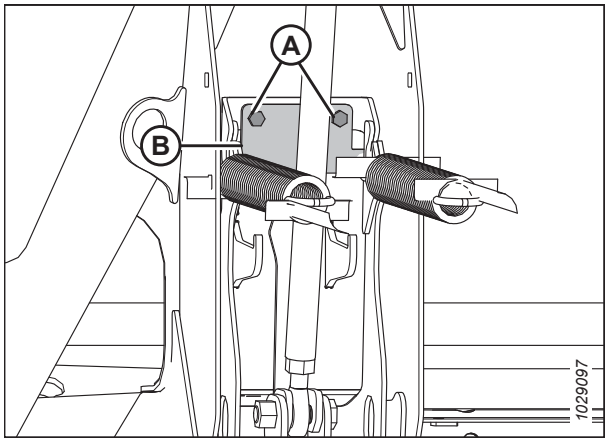


Figure 3.312: Flex Frown Limiter Plate

3.9.4 Checking and Adjusting Wing Balance

Wing balance is important for ground following. Operators should adjust the balance of each wing if the header is not following the ground contours properly.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

DANGER

Check to be sure all bystanders have cleared the area.

IMPORTANT:

To ensure correct wing balance readings, make sure the header float is set properly before proceeding. For instructions, refer to *Checking and Adjusting Header Float, page 190*. The float module must be sitting level before performing any adjustments.

NOTE:

The header wings are balanced when it takes an equal amount of force to move a wing up or down.

If a header wing has a tendency to be in a smile (A) or a frown (B) position, and the header is missing crop or pushing dirt, the wing balance may require adjusting.

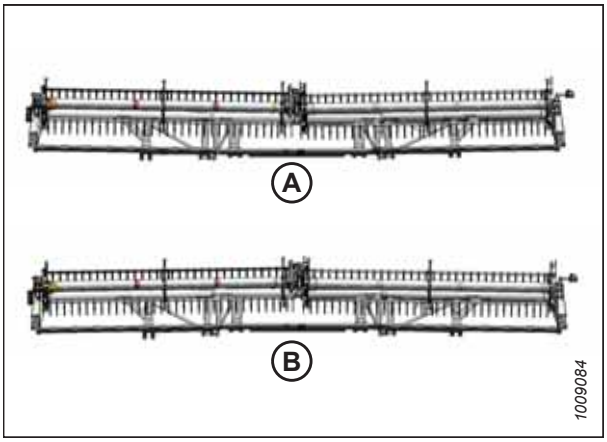


Figure 3.313: Wing Imbalance

1. Adjust the reel fore-aft to position 6 on indicator bracket (A) located on the left arm.
2. Lower the reel fully.

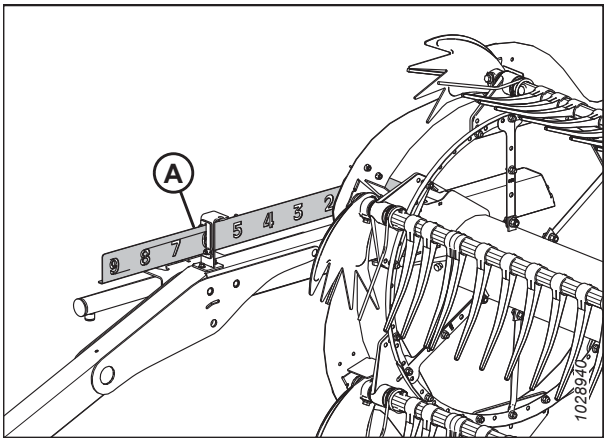


Figure 3.314: Fore-Aft Position

3. Adjust center-link (A) so that indicator (B) is at position **D** on the gauge.
4. If installed, move the transport wheels or contour wheels so that they are supported by the header. For instructions, refer to *Adjusting EasyMove™ Transport Wheels, page 179* or *Adjusting ContourMax™ Wheels with Foot Switch, page 180*.
5. Park the combine on a level surface.
6. Position the header until it is 254–356 mm (10–14 in.) off the ground.

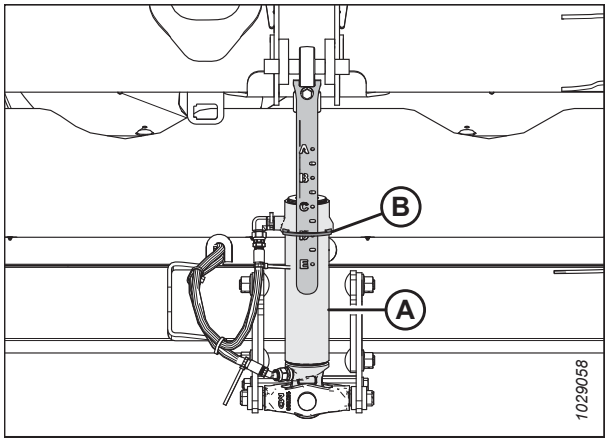


Figure 3.315: Center-Link

7. Locate spirit level (A) on top of the float module frame. Check that the bubble is in the center. If adjustment is required, refer to *3.11 Leveling Header, page 446*.
8. Shut down the engine, and remove the key from the ignition.
9. Remove the linkage cover. For instructions, refer to *Removing Inboard Flex Linkage Covers, page 55*.

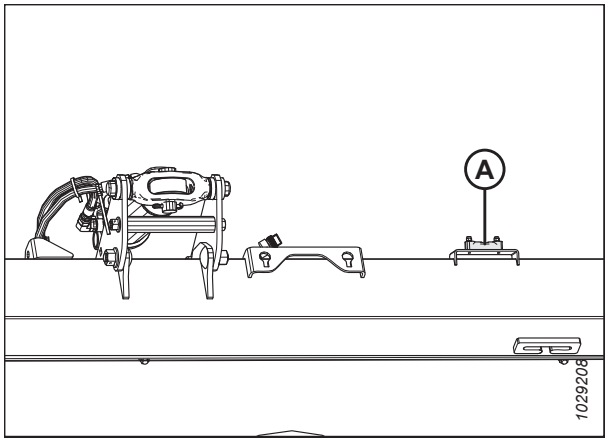


Figure 3.316: Spirit Level

NOTE:

Parts illustrated hidden for clarity.

10. Attach flex checker cable (A) to flex checker cable lock (B).
11. Open the left header endshield. For instructions, refer to *Opening Header Endshields, page 47*.

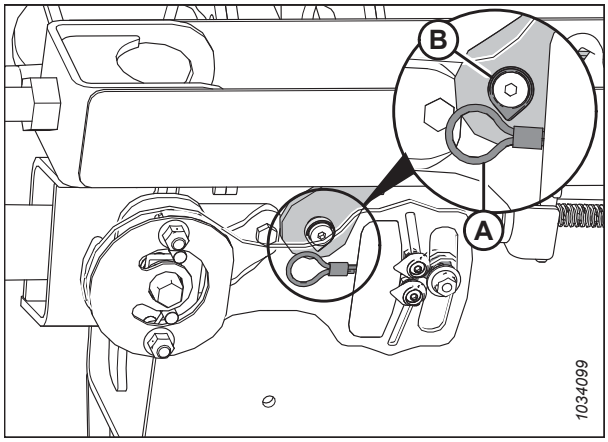


Figure 3.317: Flex Checker Cable Lock – Left Side

12. Remove hairpin (A) securing the multi-tool to tool holder bracket on the left endsheet.
13. Remove multi-tool (B), and reinstall the hairpin to the tool holder.

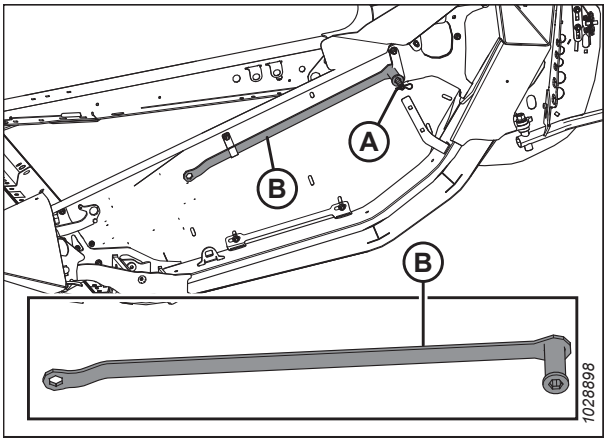


Figure 3.318: Left Endsheet

14. Unlock the wing you are checking by moving spring handle (A) to the lower **(UNLOCK)** position. Unlock **ONLY** the wing you are checking. Ensure the opposite wing is locked.

    NOTE:

    There should be an audible click when you move the spring handle indicating that the internal mechanism engaged or disengaged.

15. If the internal lock mechanism does not engage, move the wing with multi-tool (B) until you hear an audible click.

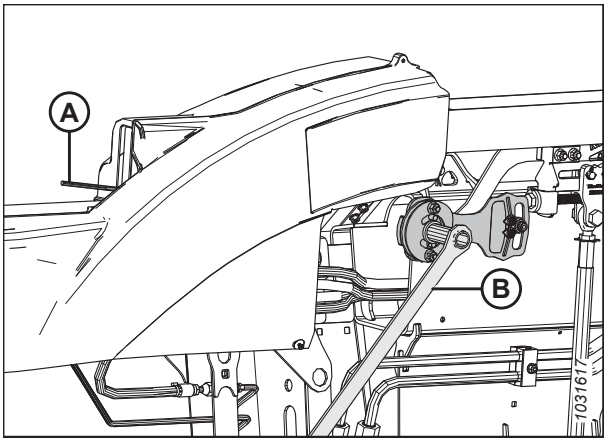


Figure 3.319: Wing Unlocked Position

16. Ensure float checking toggles (A) are disengaged (down) on both sides of the float module.
17. Ensure float locks (B) are engaged (up) on both sides of the float module.

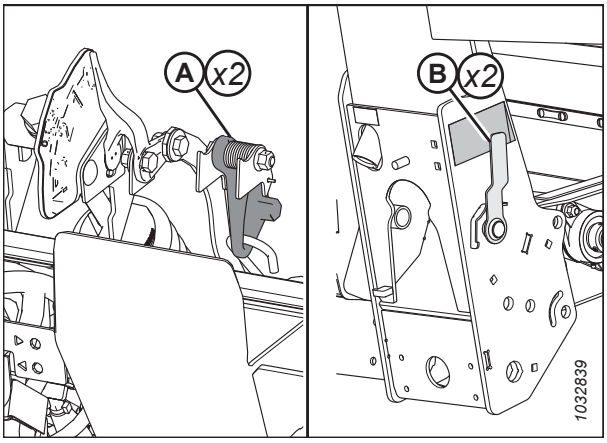


Figure 3.320: Checker Plate Assembly

18. On the flex checker plate, pinch indicators (A) and (B) together with your fingers.
19. Use multi-tool (C) to rotate the flex checker plate up until the pin reaches the end of the slot. Lower indicator (B) will move down to give the first reading.
20. Use multi-tool (C) to rotate the flex checker plate down until pin reaches the end of the slot. Upper indicator (A) will move up to give the second reading.

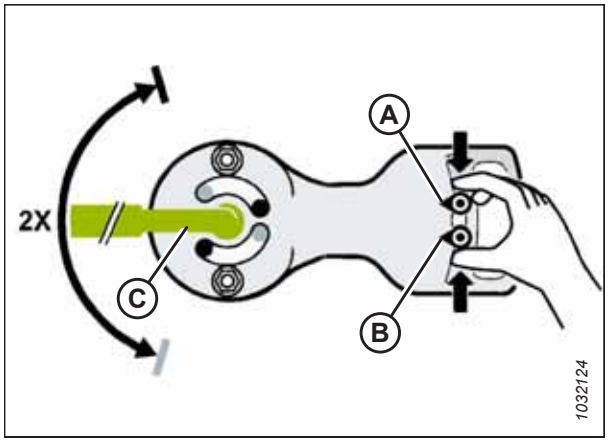


Figure 3.321: Wing Balance Adjustment – Left Side Shown

21. Interpret the reading on the flex checker plate as follows:
    - If the wing is too light (A), make it heavier by turning adjuster bolt (D) to move clevis (E) in direction (F). Recheck the wing balance. Adjust as required until wing is balanced (C), and then proceed to the next step.
    - If the wing is too heavy (B), make it lighter by turning adjuster bolt (D) to move clevis (E) in direction (G). Recheck the wing balance. Adjust as required until wing is balanced (C), and then proceed to the next step.
    - If the wing is balanced (C), no action is required. Proceed to the next step.
22. Move the spring handle to the upper **(LOCK)** position.
23. If the lock does not engage, move the wing up and down with multi-tool until it locks.

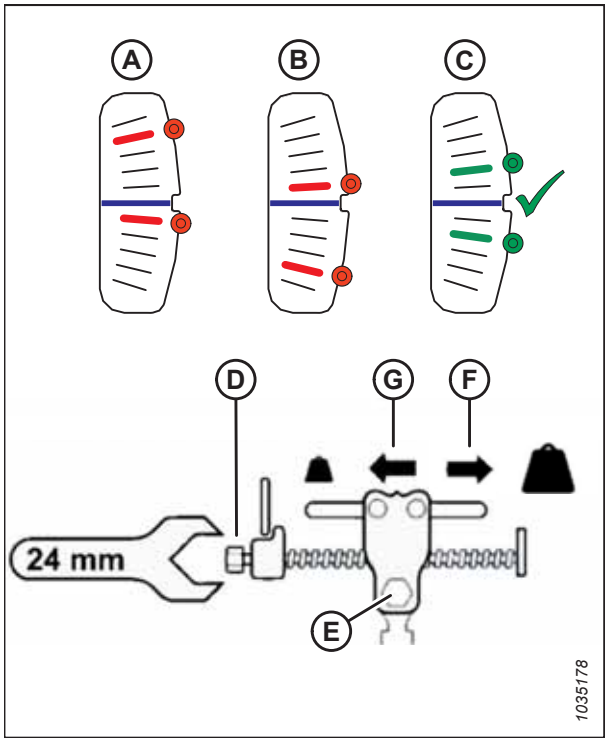


Figure 3.322: Wing Balance Adjustment – Left Side Shown

NOTE:

Some parts hidden in the illustration for clarity.

24. Remove flex checker cable (A) from flex checker cable lock (B).

IMPORTANT:

Damage to the checker cable may occur if it is left attached.

25. Repeat the procedure on the opposite side.

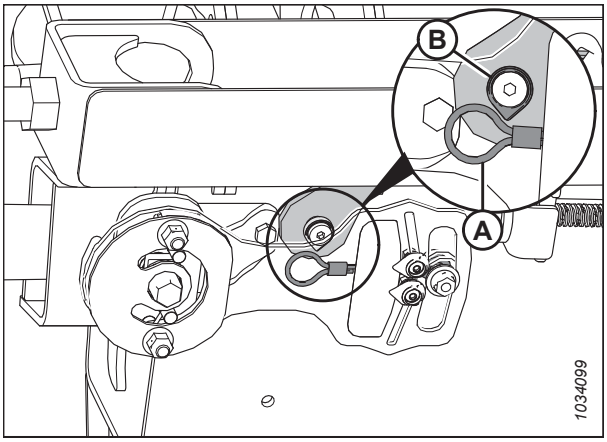


Figure 3.323: Flex Checker Cable Lock – Left Side

26. Return multi-tool (B) to its storage position, and secure it with hairpin (A).

27. Reinstall the linkage covers. For instructions, refer to *Installing Outboard Flex Linkage Covers, page 60* or *Installing Inboard Flex Linkage Covers, page 56*.

NOTE:

Adjustment to the main float may be required to maintain good wing balance when operating in the field. For instructions, refer to *Checking and Adjusting Header Float, page 190*.

28. If the cutterbar is not straight when the wings are in lock mode, then further adjustments are required. Contact your MacDon Dealer.

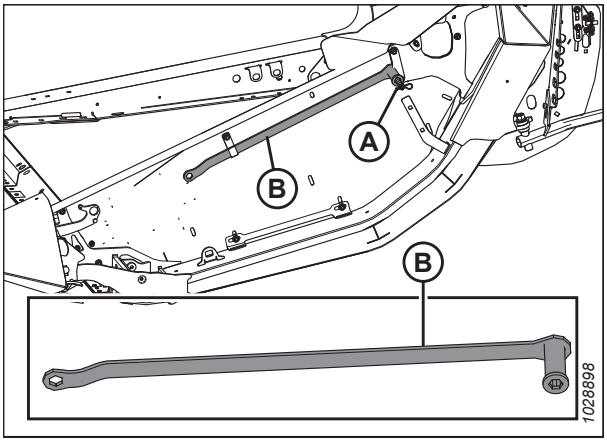


Figure 3.324: Left Endsheet

3.9.5 Header Angle

Header angle is adjustable to accommodate different crop conditions and/or soil types and can be adjusted using the center-link between the combine and the header.

Refer to *Adjusting Header Angle from Combine, page 219* for combine-specific adjustment details.

Header angle (A) is the angle between the header and the ground.

The header angle controls distance (B) between the cutterbar knife and the ground and is critical when cutting crop at ground level.

Adjusting the header angle pivots the header at the point of skid shoe/ground contact (C).

Guard angle (D) is the angle between the upper surface of the cutterbar guards and the ground.

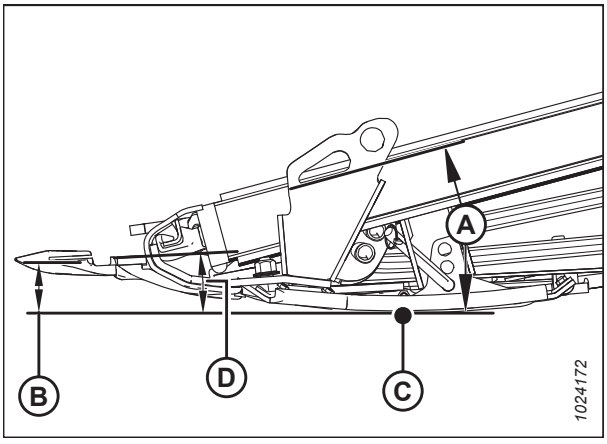


Figure 3.325: Header Angle

1. Set the header angle according to the type and condition of crop and soil as follows:

   a. Use shallower settings (A) (position **A** on the indicator) for normal cutting conditions and wet soil to reduce soil buildup at the cutterbar. Shallow angle settings also minimize damage to the knife in stony fields.

   b. Use steeper settings (E) (position **E** on the indicator) for lodged crops and crops that are close to the ground such as soybeans.

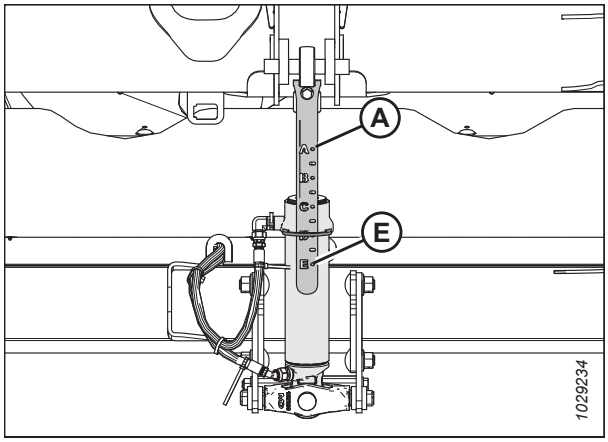


Figure 3.326: Center-Link

Shallowest angle (A) (center-link fully retracted) is at 1.7°, and produces the highest stubble when cutting on the ground.

Steepest angle (E) (center-link fully extended) is at 8.9°, and produces the lowest stubble when cutting on the ground.

Choose an angle that maximizes performance for your crop and field conditions.

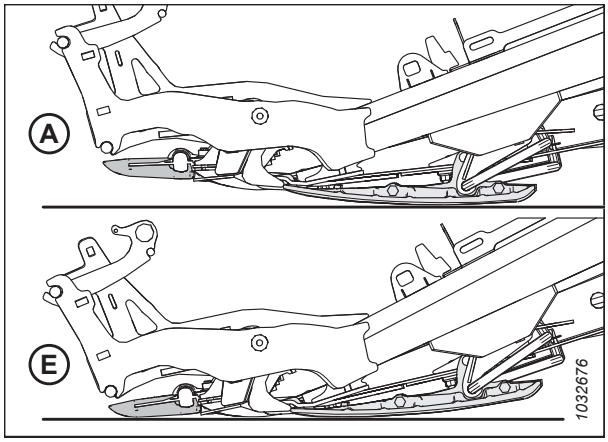


Figure 3.327: Guard Angles

Adjusting Header Angle from Combine

The header angle is adjusted from the combine cab using a switch on the operator's control handle and an indicator on the center-link or on the monitor in the cab. The header angle is determined by the length of the center-link between the combine float module and the header, or by the degree of feeder house tilt on certain combine models.

Case combines:

Case combines use control handle switches to adjust the center-link to change the header angle.

1. Press and hold SHIFT button (A) on the backside of the control handle and press switch (B) to tilt the header forward or press switch (C) to tilt the header back.

Figure 3.328: Case Combine Controls

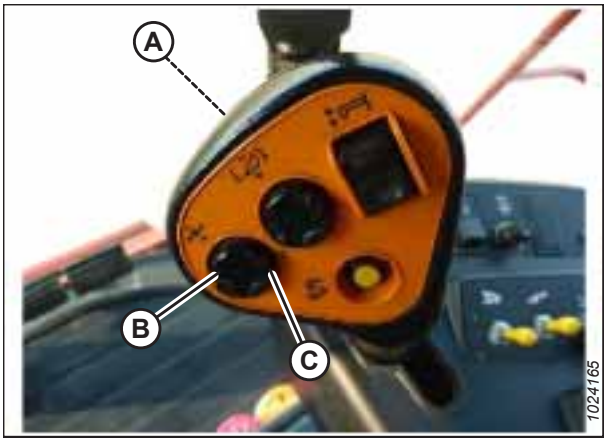


Figure 3.329: Case Combine Controls

Challenger, Gleaner, and Massey Ferguson combines:

Challenger, Gleaner, and Massey Ferguson combines use a combination of the reel fore-aft switches on the control handle and a Dealer-installed auxiliary rocker switch, which toggles between reel fore-aft and header tilt functionality. The location of the rocker switch varies with the combine model.

1. **Gleaner A only:** Open armrest cover (A) to expose a row of switches.
2. Press Dealer-installed rocker switch (B) to HEADER TILT position.

   NOTE:

   Gleaner A shown in the image, other Challenger® and Massey Ferguson® combine models have rocker switch on the console (not shown).

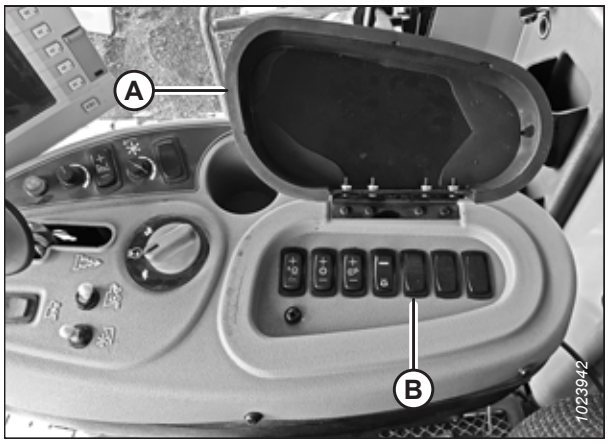


Figure 3.330: Gleaner A Console

3. To tilt the header forward (steeper angle), press button (A) on the control handle. To tilt the header back (shallower angle), press button (B) on the control handle.

Figure 3.331: Gleaner Controls

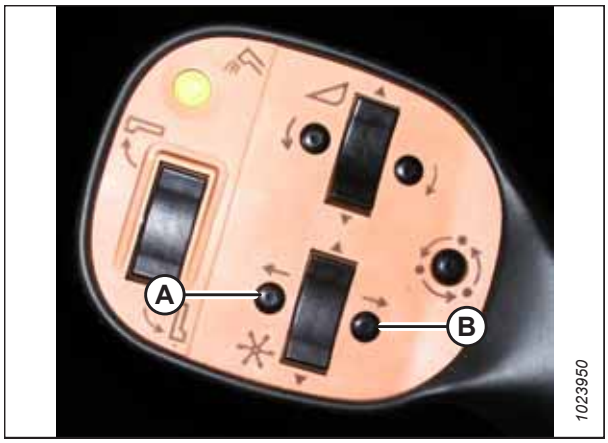


Figure 3.332: Gleaner Controls

Figure 3.333: Challenger®/Massey Ferguson® Controls

CLAAS combines:

CLAAS (with factory-installed fore-aft / header tilt switch): Newer CLAAS combines use a combination of the reel fore-aft switches on the control handle and a factory-installed auxiliary rocker switch which toggles between reel fore-aft and header tilt functionality.

1. Press HOTKEY switch (A) on the operator's console to deck plate position (the header icon [B] with the arrows pointing to each other).

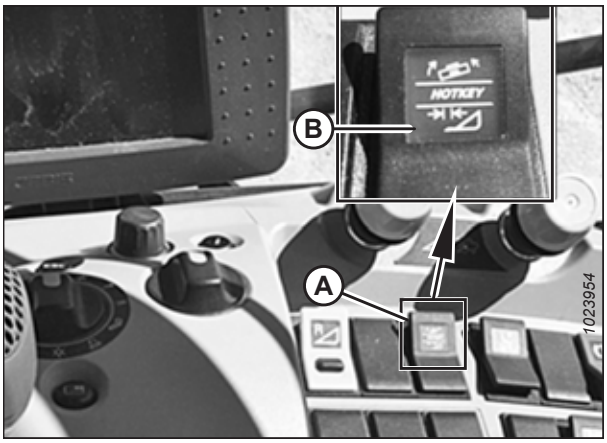


Figure 3.334: CLAAS 700 Console

2. Press and hold switch (A) on the rear of the control handle.
3. To tilt the header forward (steeper angle), press switch (C). To tilt the header back (shallower angle), press switch (B).

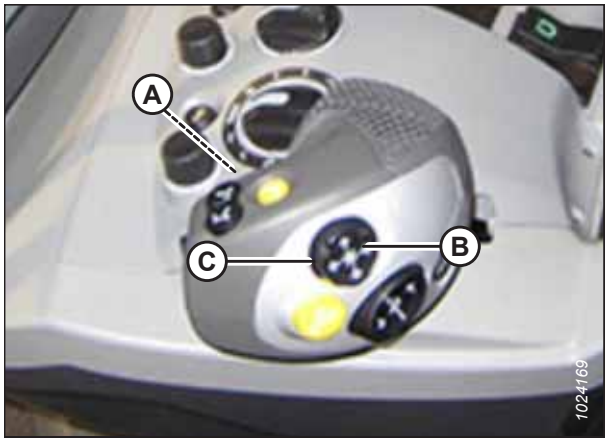


Figure 3.335: CLAAS 600/700 Control Handle

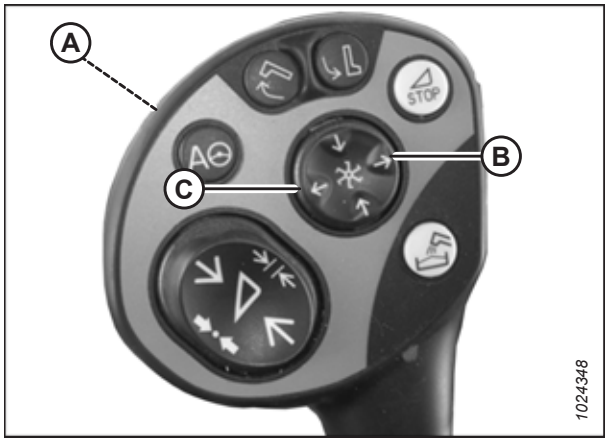


Figure 3.336: CLAAS 500 Control Handle

John Deere combines:

John Deere S700: S700 Series combines can use a feeder house deckplate tilting system for header fore-aft adjustment. Set the deckplate at a mid-point position, and use the MacDon fore-aft and header tilt system for tilt functionality.

IMPORTANT:

Damage to equipment may occur if both the deckplate and MacDon header tilt are adjusted to their maximum range.

1. To tilt the header forward (steeper angle), press switch (A). To tilt the header back (shallower angle), press switch (B).

Figure 3.337: John Deere 700 Controls

John Deere (except S700 Series): Other John Deere combines use a combination of the reel fore-aft switches on the control handle and a Dealer-installed auxiliary rocker switch which toggles between reel fore-aft and header tilt functionality.

1. Press reel fore-aft / header tilt switch (A) on the console into HEADER TILT position.

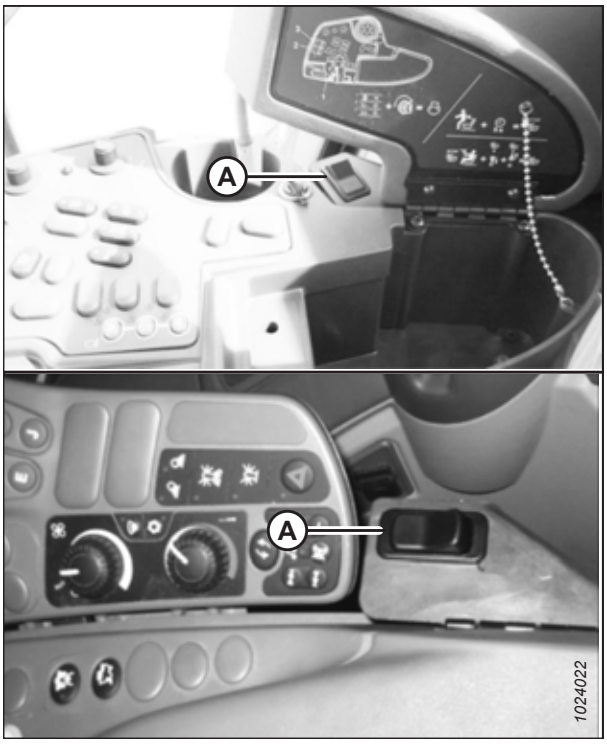


Figure 3.338: John Deere Consoles

2. To tilt the header forward (steeper angle), press switch (A). To tilt the header back (shallower angle), press switch (B).

Figure 3.339: John Deere Control Handle

New Holland combines:

New Holland combines use control handle switches to adjust the center-link to change the header angle.

1. Press and hold SHIFT button (A) on the backside of the control handle and press switch (B) to tilt the header forward (steeper angle) or switch (C) to tilt the header back (shallower angle).

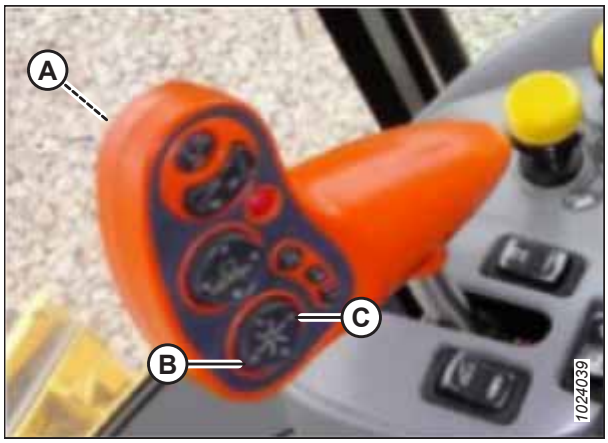


Figure 3.340: New Holland CR/CX Controls

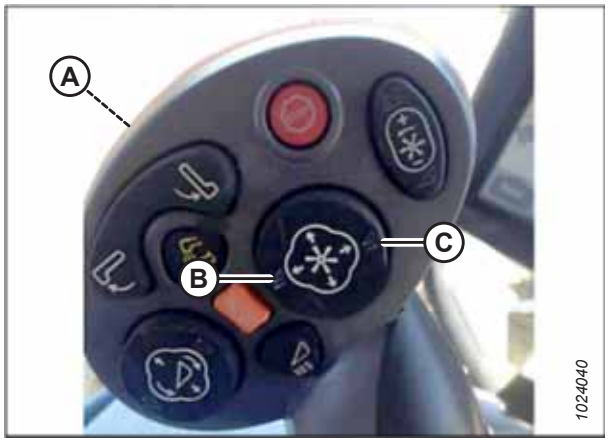


Figure 3.341: New Holland CR/CX Controls

Versatile combines:

Versatile combines use a combination of reel fore-aft switches on the control handle and a factory-installed auxiliary rocker switch on the combine control console that toggles between reel fore-aft and header tilt functionality.

1. Press ON switch (A) on console to place controls in HEADER TILT mode.
2. To tilt the header forward (steeper angle), press button (B) on control handle. To tilt the header back (shallower angle), press button (C) on control handle.

Figure 3.342: Versatile Control Handle and Console

3.9.6 Reel Speed

Reel speed is one of the factors that determines how crop is moved from the cutterbar onto the drapers.

The reel performs best when it appears to be driven by the ground. It should move the cut crop evenly through the cutterbar and onto the drapers without bunching and with minimal disturbance.

In standing crop, reel speed should be slightly higher than, or equal to, the ground speed.

In flattened crop or crop that is leaning away from the cutterbar, the reel speed needs to be higher than the ground speed. To achieve this, either increase the reel speed or decrease the ground speed.

Excessive shattering of grain heads or crop loss over the header backtube may indicate that the reel speed is too high. Excessive reel speed also increases reel component wear and overloads the reel drive.

NOTE:

Excessive reel speed will also cause the reel circuit to go over relief. The reel will speed up and slow down at each bat when operating in heavy, tough, and lodged crops. Reducing the reel speed, so it is closer to the ground speed, will still allow the reel to lift the crop while not trying to pull it out of the ground. This will also reduce seed loss from the reel trying to comb through the crop, instead of just lifting it.

Slower reel speeds can be used with nine-bat reels, which is advantageous in shatter-prone crops.

For recommended reel speeds in specific crops and conditions, refer to *3.7.2 Header Settings, page 130*.

The reel speed is adjustable using the controls in the combine cab. For instructions, refer to the combine operator's manual for adjustment details.

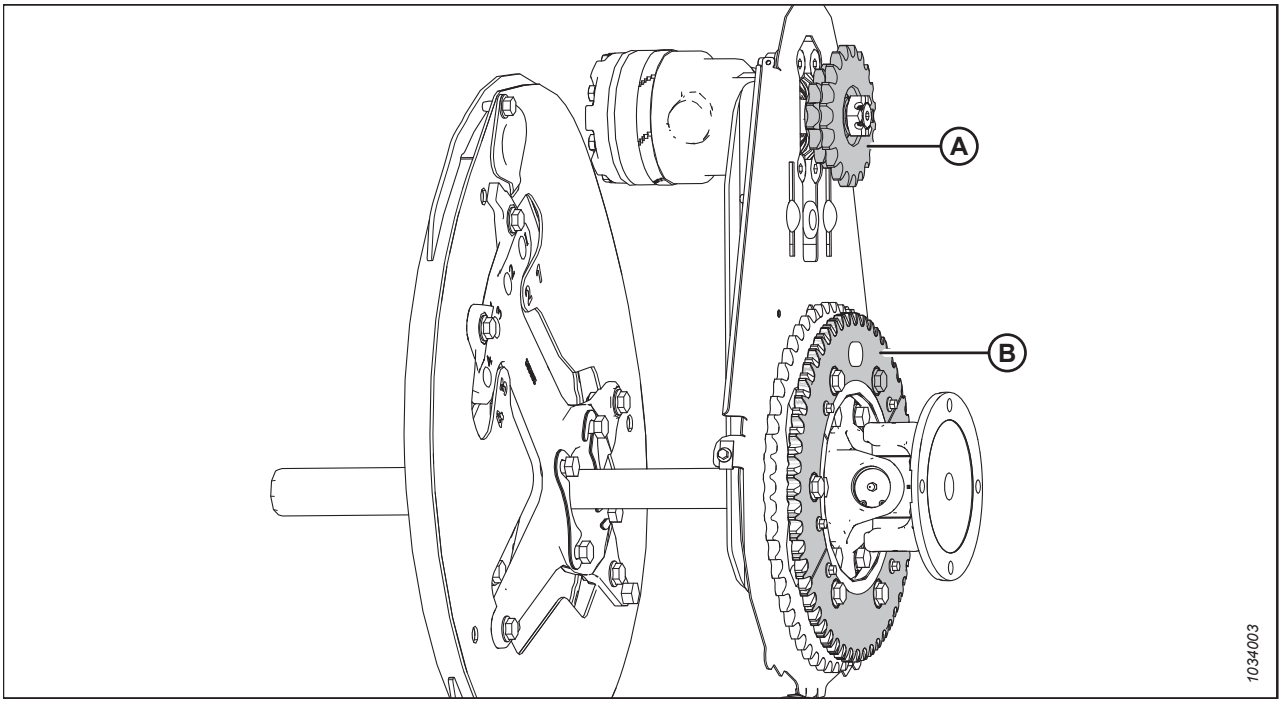
Optional Reel Drive Sprockets

Optional sprockets for use in special crop conditions are available as an alternative to the factory-installed single sprocket.

The header is factory-equipped with a 19-tooth reel drive single sprocket, which is suitable for most crops. Replacing the 19-tooth reel drive single sprocket with optional dual reel drive sprocket (A) will provide more torque to the reel in heavy cutting conditions. With the optional dual reel drive sprocket installed, an optional 52-tooth sprocket (B) can also be added on top of the existing 56-tooth lower sprocket that will allow for higher reel speed in light crops when operating at increased ground speed. With these two optional sprockets installed, switching from high-torque to high-speed and vice

versa will be quick and easy. For sprocket information, refer to Table *3.23, page 226*, and contact your MacDon Dealer for ordering information.

Figure 3.343: Reel Drive with Optional Sprockets



A - Dual Reel Drive Sprocket (MD #273451, MD #273452, or MD #273453)[54] B - 52-Tooth Sprocket (MD #273689)[55]

Table 3.23 Optional Sprockets

Sprocket	Machine Hydraulics	Combine	Application	Optional Drive Sprocket
Dual reel drive sprocket (A)	13.79 MPa (2000 psi)	Gleaner Transverse Rotary, Case IH 7010, 8010, 7120, 8120, 88 Series	Combining down rice	10/20 tooth
Dual reel drive sprocket (A)	17.24 MPa (2500 psi)	CLAAS 500, 700 Series, Challenger® Axial Rotary	Combining down rice	12/20 tooth
Dual reel drive sprocket (A)	20.68 MPa (3000 psi)	New Holland CR, CX	Combining down rice	14/20 tooth
Lower sprocket (B)	—	All	Light crops	52 tooth

3.9.7 Ground Speed

Operating the header at the appropriate ground speed for the conditions results in cleanly cut crop and even feeding.

Reduce the vehicle's ground speed in difficult cutting conditions to reduce equipment wear.

Use lower ground speeds when harvesting very light crops (for example, short soybeans) to allow the reel to pull in short plants. Start at 4.8–5.8 km/h (3.0–3.5 mph) and adjust the speed as needed.

Higher ground speeds may require heavier float settings to prevent excessive bouncing, which can result in uneven cutting and possible damage to the cutting components. If ground speed is increased, draper and reel speeds should generally be increased to handle the extra material.

54. These sprockets are sold separately (individual parts).
55. This sprocket is included in kit MD #311882.

Figure *3.344, page 227* illustrates the relationship between ground speed and area cut for the various sized headers.

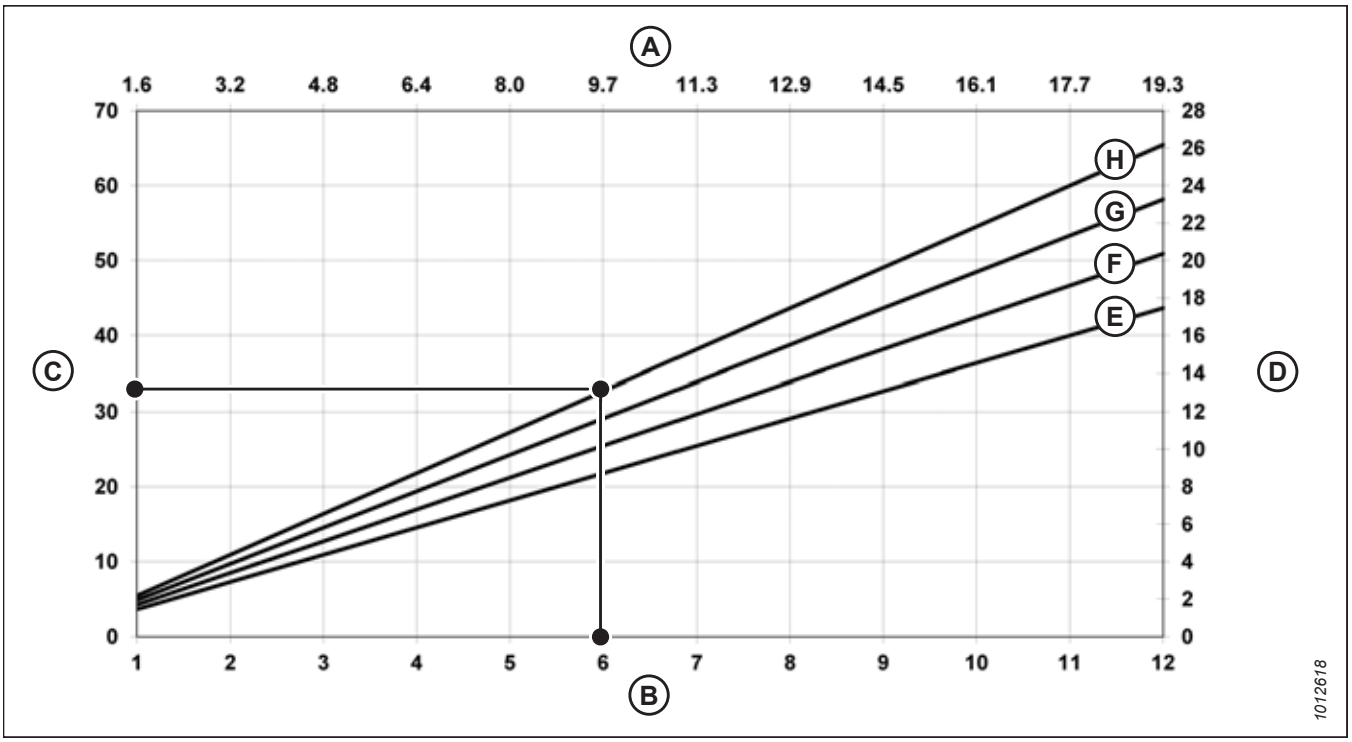


Figure 3.344: Ground Speed versus Acres

A - Kilometers/Hour
B - Miles/Hour
C - Acres/Hour
D - Hectares/Hour
E - 9.1 m (30 ft.)
F - 10.7 m (35 ft.)
G - 12.2 m (40 ft.)
H - 13.7 m (45 ft.)

Example: A 12.2 m (40 ft.) header operating at a ground speed of 9.7 km/h (6 mph) would produce a cut area of approximately 11.3 hectares (28 acres) in one hour.

3.9.8 Side Draper Speed

Operating with the correct draper speed is an important factor for achieving good flow of cut crop away from the cutterbar.

Side draper speed must be optimized for crop density, ground speed, and feeder house capacity. Side drapers that run too fast, will pull crop off the cutterbar, and can result in crop bunches at the feed draper Side drapers that run too slow, will allow the feed draper to pull crop off of the side drapers, and can result in uneven feeding also.

Adjust the side draper speed to achieve efficient crop feeding onto the float module feed draper. For instructions, refer to *Adjusting Side Draper Speed, page 228*.

Adjusting Side Draper Speed

The side drapers carry the cut crop to the float module feed draper, which then feeds it into the combine. The speed is adjustable to suit a variety of crops and crop conditions.

Side drapers (A) are driven by hydraulic motors and a pump that is powered by the combine feeder house drive through a gearbox on the float module. Side draper speed is adjustable in cab on the side draper speed control, which regulates the flow to the draper hydraulic motors.

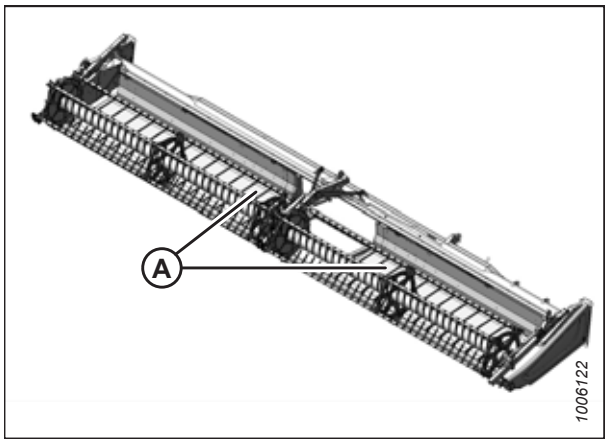


Figure 3.345: Side Drapers

1. Rotate knob (A) to setting 6 as a starting point.

   NOTE:

   Switch (B) activates the header tilt or reel fore-aft controls. For instructions on header tilt or reel fore-aft controls, refer to *Adjusting Header Angle from Combine, page 219*.

   NOTE:

   For CNH combines the switch to activate the header tilt or reel fore-aft controls is on the back of the ground speed lever (GSL).

2. For recommended draper settings, refer to one of the following:

   - *3.7.2 Header Settings, page 130*
   - *3.7.3 Optimizing Header for Straight-Combining Canola, page 141*

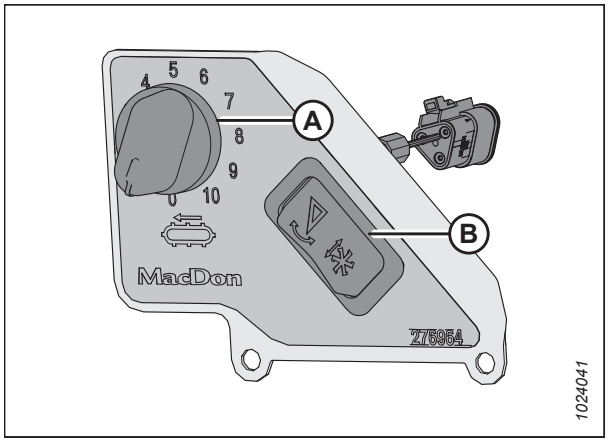


Figure 3.346: In-Cab Side Draper Speed Control

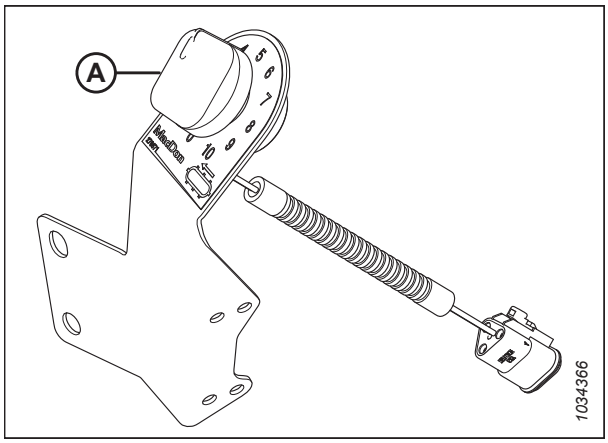


Figure 3.347: CNH In-Cab Side Draper Speed Control

Feed Draper Speed

The feed draper moves the cut crop from the side drapers into the float module feed auger.

The float module feed draper (A) is driven by a hydraulic motor and a pump that is powered by the combine feeder house drive through a gearbox on the float module.

The feed draper speed is determined by the combine feeder house speed and cannot be independently adjusted.

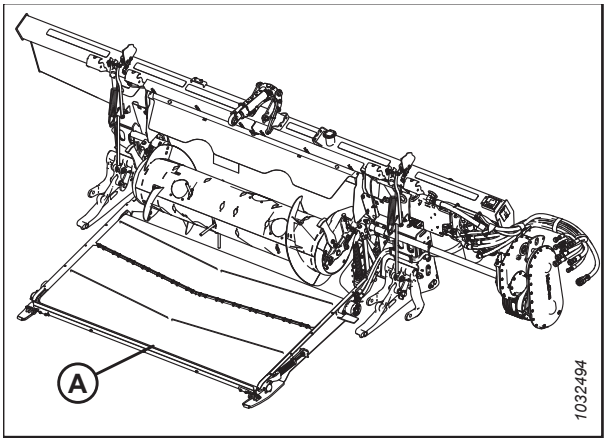


Figure 3.348: FM200 Float Module

3.9.9 Knife Speed Information

The float module is driven by a driveline that is attached to the combine feeder house. The driveline attaches to a gearbox that drives the knife drive pump.

Table 3.24 Feeder House Speed

Combine	Feeder House Speed (rpm)
Case IH	580
Challenger®	625
CLAAS[56,57]	420
Gleaner®	625
IDEAL™	620
John Deere	490
Massey Ferguson®	625
New Holland	580

56. For CLAAS 600/700 combines, the value on the display reflects the top shaft speed, not the output shaft speed. When the display value is 420 rpm, the actual output shaft speed is 750 rpm.
57. For CLAAS 8000/7000 combines, the value on the display reflects the bottom shaft speed. The actual output shaft speed is 750 rpm.

NOTE:

All sizes of headers are set to 650 rpm. This knife speed will work fine in normal cutting conditions.

IMPORTANT:

Ensure the knife speed is within the range of rpm values in Table *3.25, page 230*. For instructions, refer to *Checking Knife Speed, page 230*.

IMPORTANT:

To avoid causing the knife to overspeed, set the knife speed while the feeder house speed is to set maximum speed.

Table 3.25 FD2 Series Header Knife Speed

Header	Recommended Knife Drive Speed Range (rpm)	
	Single-Knife Drive	Double-Knife Drive
FD230	600–750	—
FD235	600–700	600–750
FD240	600–650	600–750
FD241	—	600–750
FD245	—	600–750
FD250	—	600–750

Checking Knife Speed

Knife speed is important to proper operation of the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.

WARNING

Check to be sure all bystanders have cleared the area.

3. Start the engine. For instructions, refer to the combine operator's manual.
4. Engage the header drive, and run the feeder house at the maximum speed.

   IMPORTANT:

   Before checking and adjusting knife speed, make sure the feeder house is set to maximum speed. This will prevent the knife from overspeeding when making further adjustments.

5. Run the float module and header for 10 minutes to warm up oil to 38°C (100°F).
6. Measure the rpm of flywheel (A) with a hand-held photo tachometer.

   NOTE:

   One revolution (rpm) is equivalent to two knife strokes (spm) (1 rpm = 2 spm).

7. Shut down the engine, and remove the key from the ignition.
8. Compare flywheel rpm measurement with the rpm values in the knife speed chart. For more information, refer to *3.9.9 Knife Speed Information, page 229*.
9. Contact your MacDon Dealer if the pulley rpm measurement exceeds the specified rpm range for your header.

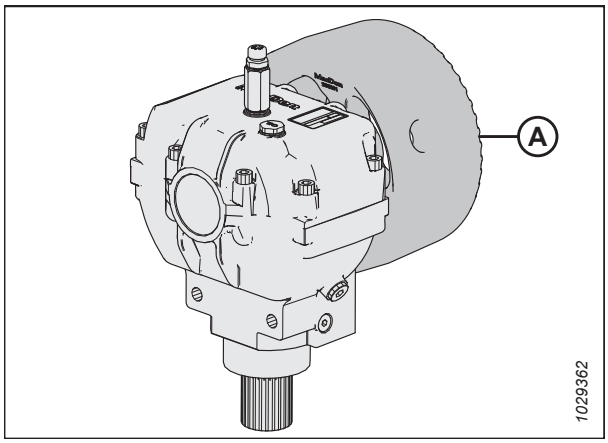


Figure 3.349: Flywheel

3.9.10 Reel Height

The reel operating position depends on the type of crop and cutting conditions.

Set the reel height and fore-aft position to carry material past the knife and onto the drapers with minimal damage to the crop.

The reel height is controlled manually or with button presets on the ground speed lever (GSL) in the combine cab. Refer to your combine operator's manual for instructions on controlling reel height or setting up auto reel height presets. Where applicable, this manual contains instructions for presetting reel height on selected combines. Refer to *3.10 Auto Header Height Control, page 270* for more information.

For more information on fore-aft positioning, refer to *3.9.11 Reel Fore-Aft Position, page 236*.

Table 3.26 Reel Position

Crop Condition	Reel Position
Lodged rice	• Lower the reel • Change reel speed and/or cam setting • Change fore-aft position by extending the reel
Bushy or heavy standing (all)	Raised

The following conditions might result if the reel is set too low:

- Crop loss over the header backtube
- Crop disturbance on the drapers caused by the reel fingers
- Crop pushed down by the tine tubes
- Tall crop wrapped around the reel drive and ends

The following conditions might result if the reel is set too high:

- Cutterbar plugging
- Crop lodging and being left uncut
- Grain stalks dropping ahead of the cutterbar

For recommended reel heights for specific crops and crop conditions, refer to *3.7.2 Header Settings, page 130*.

IMPORTANT:

Maintain adequate clearance to prevent fingers contacting the knife or the ground. For instructions, refer to *4.13.1 Reel Clearance to Cutterbar, page 622*.

Checking and Adjusting Reel Height Sensor

The orientation of the reel height sensor arm must be checked manually at the sensor, and the output voltage range of the sensor can be checked either from inside the cab or manually at the sensor.

IMPORTANT:

Ensure the minimum reel height is properly set before adjusting the reel height sensor. For instructions, refer to *4.13.1 Reel Clearance to Cutterbar, page 622*.

NOTE:

For in-cab instructions, refer to the combine operator's manual.

To check and adjust the reel height sensor, follow these steps:

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Checking and adjusting sensor arm orientation

1. Park the combine on a level surface.
2. Shut down the engine, and remove the key from the ignition.
3. On the right endsheet, locate reel height sensor (A). It connects to the right reel arm.

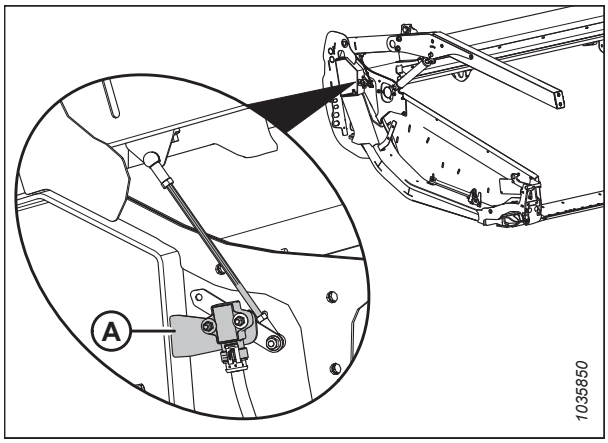


Figure 3.350: Reel Height Sensor Location

4. Check that sensor arm (C) and pointer (D) are configured properly for your machine, refer to Figure *3.351, page 233*.

   NOTE:

   In configuration **A**, the arrow indicates that the pointed end of the sensor arm is pointed toward the back of the header.

   In configuration **B**, the arrow indicates that the pointed end of the sensor arm is pointed toward the front of the header.

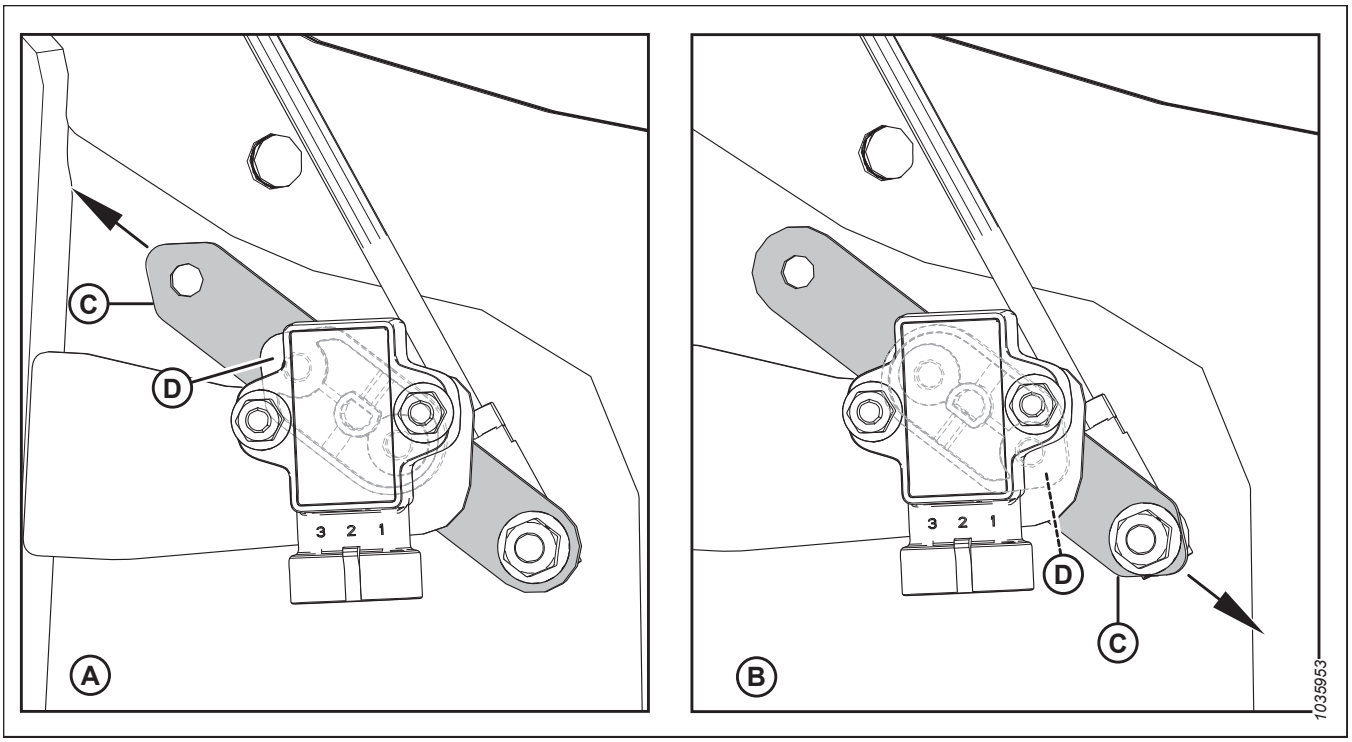


Figure 3.351: Sensor Arm/Pointer Configurations

A - John Deere, CLAAS, IDEAL™ Configuration

B - Case/New Holland Configuration

C - Sensor Arm

D - Sensor Pointer (Located Between Sensor and Sensor Arm)

5. If the sensor arm orientation is incorrect, remove sensor arm (C) and reposition it in the correct orientation. Torque the nut to 8.2 Nm (6 lbf·ft).

Checking and adjusting sensor output voltage when the reel is lowered

WARNING

Check to be sure all bystanders have cleared the area.

1. Engage the parking brake.
2. Start the engine. For instructions, refer to the combine operator's manual.
3. Lower the reel fully.
4. Use the combine display or a voltmeter (if measuring the sensor manually) to measure the voltage range when the reel is lowered. Refer to Table *3.27, page 233* for range requirements.

Table 3.27 Reel Height Sensor Voltage Limits

Combine Type	Recommended Voltage Range	
	Voltage with Reel Raised	Voltage with Reel Lowered
IDEAL™	3.9–4.3 V	0.7–1.1 V
Case/New Holland	0.7–1.1 V	3.9–4.3 V
CLAAS	3.9–4.3 V	0.7–1.1 V
John Deere	3.9–4.3 V	0.7–1.1 V

NOTE:

For CLAAS combines: To avoid a collision of the reel with the cab, the machine is equipped with an automatic reel height limitation. Some CLAAS combines have an automatic shutoff feature that engages when the automatic reel height limitation is reached. When raising the header by more than 80%, the reel is automatically lowered. The automatic lowering of the reel can be manually overridden, and a warning will appear on the CEBIS terminal.

1. Shut down the engine, and remove the key from the ignition.
2. Using a voltmeter, measure the voltage between the ground (pin 2 wire) and the signal (pin 3 wire) at reel height sensor (B).
3. Check if the voltage is within the recommended voltage range. If the voltage is not within range, loosen jam nuts (D) and adjust the rod length.
4. If the two jam nuts were loosened in Step *2, page 234*, hand-tighten them, and then tighten them another quarter turn.

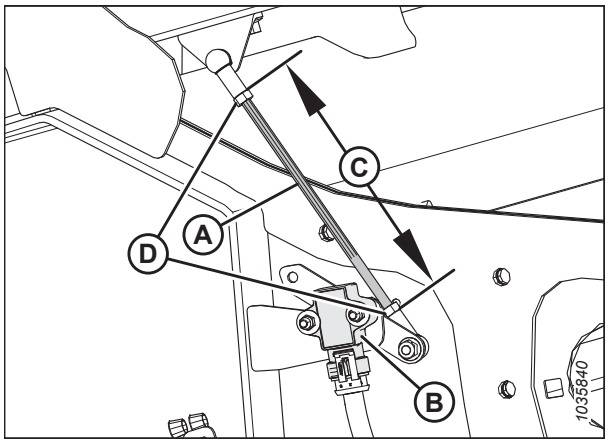


Figure 3.352: Reel Height Sensor – Right Reel Arm with Reel Down

Checking and adjusting sensor output voltage when the reel is raised

5. Start the engine, and fully raise the reel.
6. Use the combine display or a voltmeter (if measuring the sensor manually) to measure the voltage range when the reel is raised. Refer to Table *3.27, page 233* for range requirements.
7. Shut down the engine, and remove the key from the ignition.
8. Using a voltmeter, measure the voltage between the ground (pin 2 wire) and the signal (pin 3 wire) at the reel height sensor (A).
9. If the voltage is not within the recommended range, loosen two M5 hex nuts (B) and rotate sensor (A) to achieve the recommended voltage range.
10. Repeat checking and adjusting until the voltage range is within the range specified.
11. Start the engine.
12. Lower the reel fully.
13. Recheck the voltage range and ensure it is still within the range specified. Adjust if required.
14. If the two jam nuts were loosened in Step *8, page 234*, hand-tighten them, and then tighten them another quarter turn.

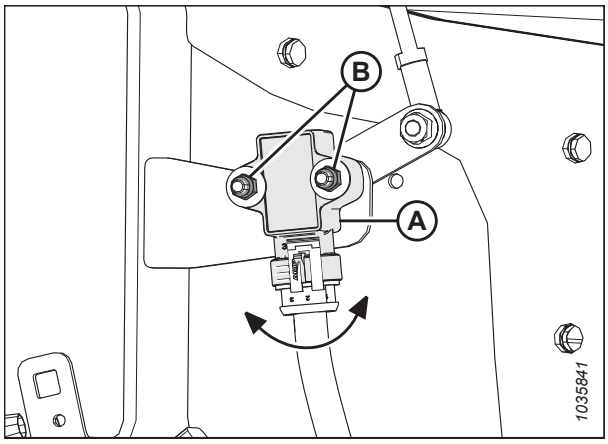


Figure 3.353: Reel Height Sensor – Right Reel Arm with Reel Up

Replacing Reel Height Sensor

The reel height sensor is used to reference where the reel is positioned above from the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Start the engine.
2. Lower the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Disconnect the harness from sensor (A).
5. Remove two hex head bolts (B) from sensor arm (C). Retain the hardware for reinstallation.

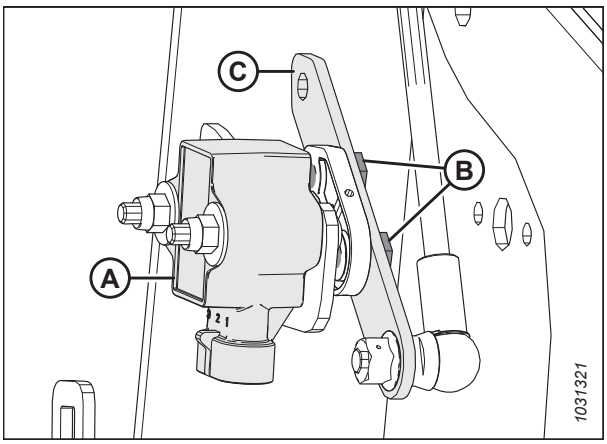


Figure 3.354: Reel Height Sensor – Right Reel Arm

6. Remove two nyloc nuts, washers, and bolts (A) securing sensor (B) to the header frame. Remove the sensor.
7. Install new sensor (B) onto bracket (C) on the header frame. Attach it using retained bolts (A), washers, and nyloc nuts. Torque bolts (A) to 2–3 Nm (17–27 lbf·in).

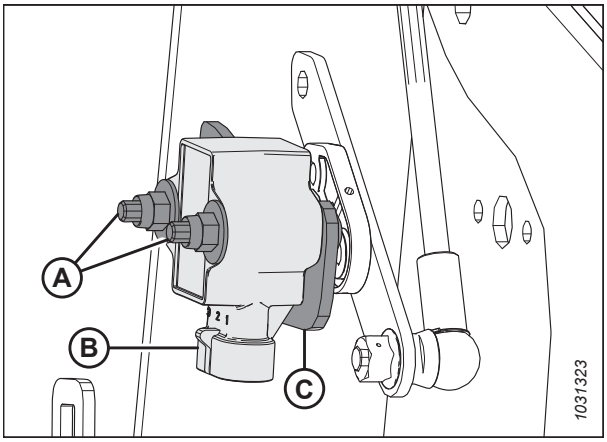


Figure 3.355: Reel Height Sensor – Right Reel Arm

8. Secure sensor arm (B) using retained hex head bolts (A). Ensure sensor pointer (C) is installed in the same direction as the pointed end of sensor arm (B).
9. Torque bolts (A) to 4 Nm (35 lbf·in).
10. Connect the harness to the sensor.
11. Check the sensor voltage range. For instructions, refer to *Checking and Adjusting Reel Height Sensor, page 231*.

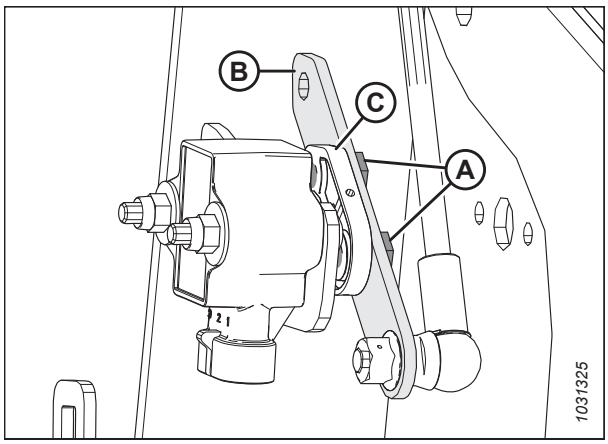


Figure 3.356: Reel Height Sensor – Right Reel Arm

3.9.11 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for achieving the best results in adverse conditions. The factory-recommended reel position has the position marker centered over numbers (4–5 on the indicator). This suits normal conditions, but the fore-aft position can be adjusted as required using the controls inside the cab.

The reel can be moved approximately 155 mm (6 in) farther aft by repositioning the fore-aft cylinders on the header's reel arms to accommodate certain crop conditions.

- For double-reel headers, refer to *Repositioning Fore-Aft Cylinders – Double Reel, page 237*.
- For triple-reel headers, refer to *Repositioning Fore-Aft Cylinders – Triple Reel, page 241*.

The reel position indicator (A) is located at the left reel arm. Bracket (B) is the reel fore-aft position marker.

For straight standing crop, center the reel over the cutterbar (4–5 on indicator).

For crops that are down, tangled, or leaning, it may be necessary to move the reel ahead of the cutterbar (lower number on indicator).

NOTE:

If experiencing difficulty picking up flattened crop, adjust to a steeper header angle. Refer to *3.9.5 Header Angle, page 217* for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

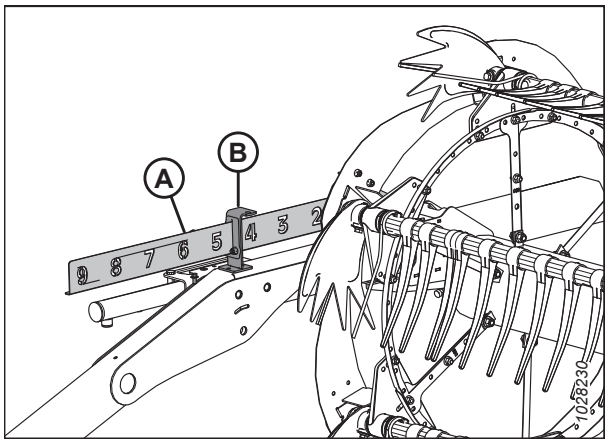


Figure 3.357: Fore-Aft Indicator

NOTE:

In crops that are difficult to pick up such as rice, or severely lodged crops that require full forward positioning of the reel, set the reel tine pitch to provide proper placement of the crop onto the drapers. Refer to *3.9.12 Reel Tine Pitch, page 246* for adjustment details.

Adjusting Reel Fore-Aft Position

The factory-set reel position suits many conditions, but the fore-aft position can be adjusted as required using the controls inside the cab.

To adjust the reel fore-aft position, follow these steps:

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position while using fore-aft indicator (A) as a reference. Bracket (B) is the position marker.
3. Check the reel clearance to cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
   - *4.13.1 Reel Clearance to Cutterbar, page 622*
   - *4.13.2 Reel Frown, page 628*

   IMPORTANT:

   Operating with the reel too far forward can result in the fingers contacting the ground. When operating with the reel in this position, lower the skid shoes or adjust the header tilt as required to prevent damaging the fingers.

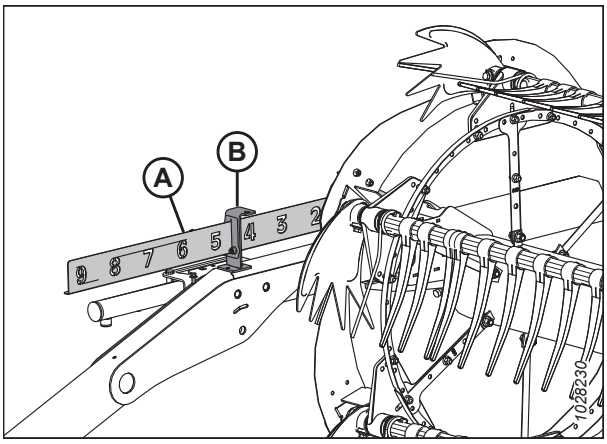


Figure 3.358: Fore-Aft Indicator

Repositioning Fore-Aft Cylinders – Double Reel

The reel can be moved approximately 155 mm (6 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

IMPORTANT:

Ensure all fore-aft cylinders are set to the same position.

1. Position reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.

3. Remove hairpin (A) securing multi-tool to holder bracket on left endsheet.
4. Remove multi-tool (B), and reinstall hairpin to holder.

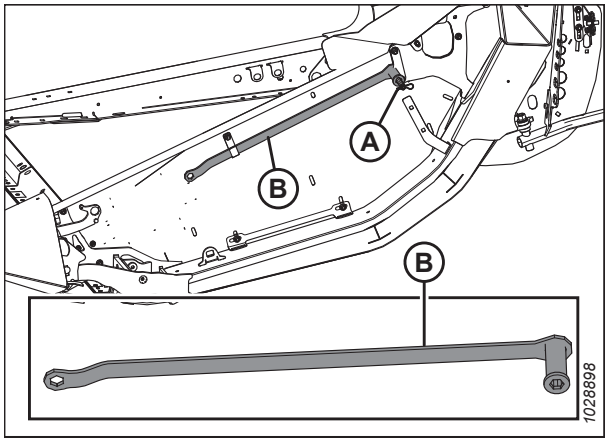


Figure 3.359: Left Endsheet

Reposition the center cylinder as follows:

NOTE:

There are two center cylinders on triple reel headers.

5. Remove split ring (A), clevis pin (B), and washer securing the center fore-aft cylinder in the forward position.

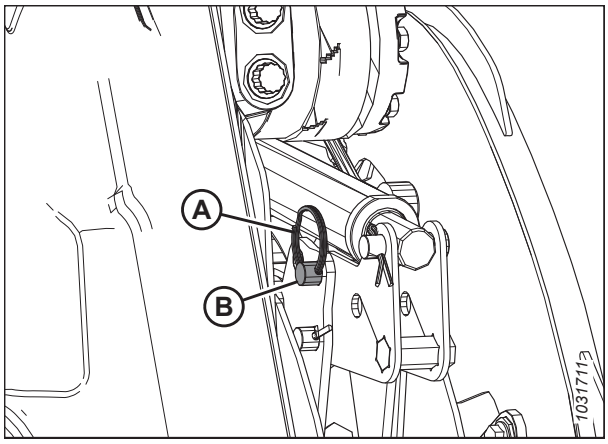


Figure 3.360: Center Arm Cylinder – Forward Position

6. Use multi-tool (A) to push bracket (B) rearward until hole (C) aligns with hole (D). The reel will move rearward as bracket (B) rotates on bottom pin (E).

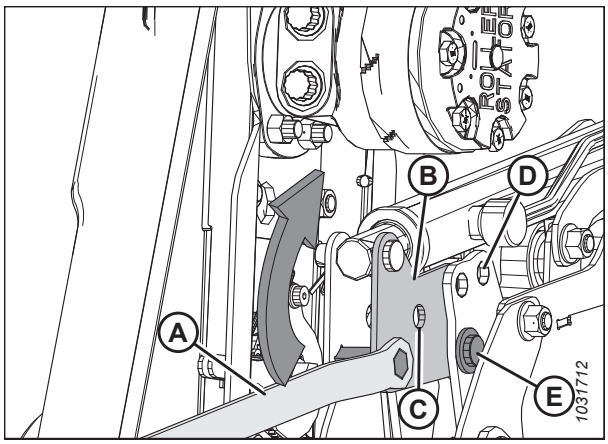


Figure 3.361: Center Arm Cylinder – Forward Position

7. When the bracket holes are lined up, secure in aft position with clevis pin (A), washer, and split ring (B).

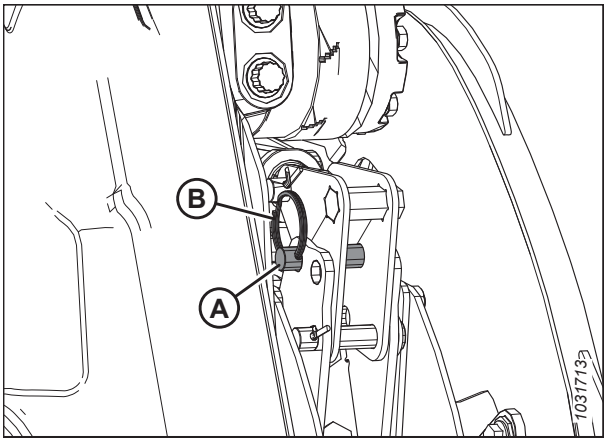


Figure 3.362: Center Arm Cylinder – Aft Position

Reposition the outer right cylinder as follows:

1. Remove split ring (A), clevis pin (B), and flat washer securing the right fore-aft cylinder in the forward position.

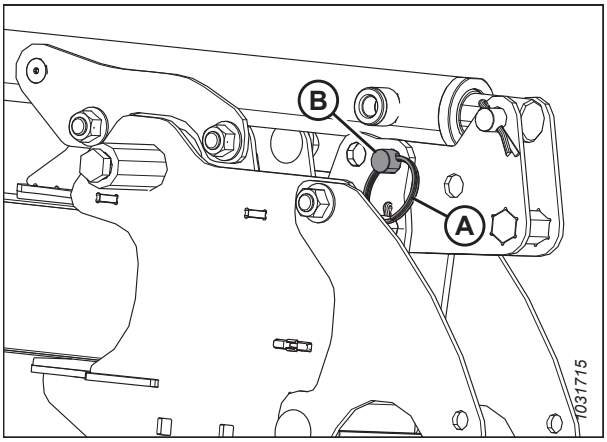


Figure 3.363: Right Arm Cylinder – Forward Position

2. Use multi-tool (A) to push bracket (B) rearward until hole (C) aligns with hole (D). The reel will move rearward as bracket (B) rotates on bottom pin (E).

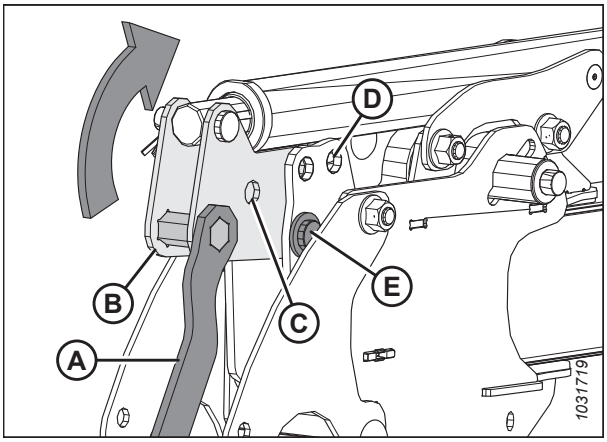


Figure 3.364: Right Arm Cylinder – Forward Position

3. When the bracket holes are lined up, secure in aft position with clevis pin (A), washer, and split ring (B).

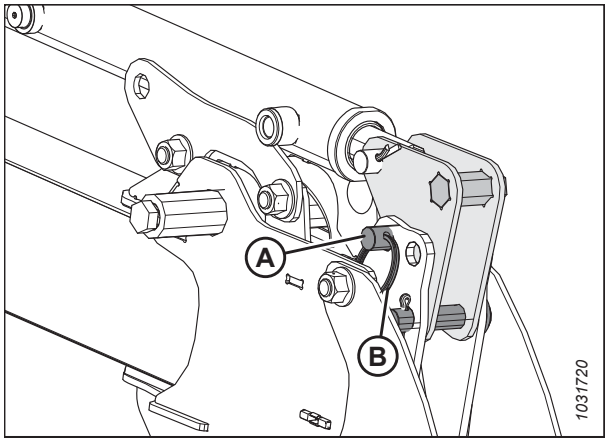


Figure 3.365: Right Arm Cylinder – Aft Position

Reposition the outer left cylinder as follows:

1. Remove split ring (A) and clevis pin (B) securing the left cylinder in forward position on cylinder bracket (C).

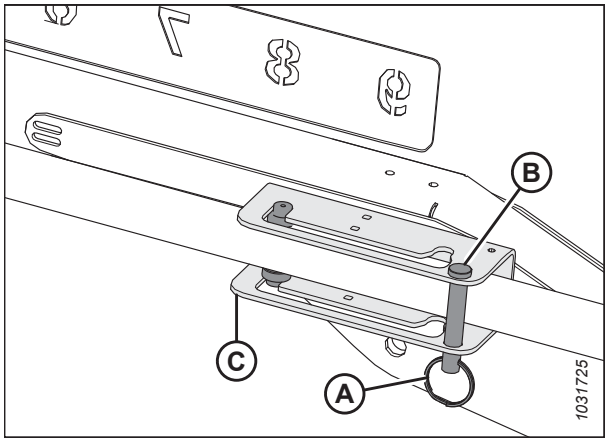


Figure 3.366: Left Arm Cylinder – Forward Position

2. Grab hold of the cylinder, and use guides (A) to slide the cylinder along the bracket slot and into aft position (B).

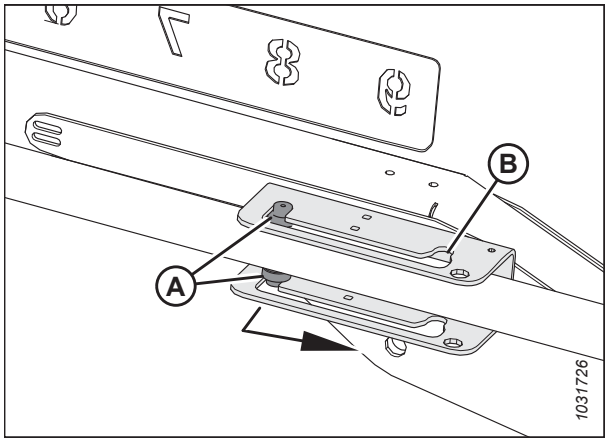


Figure 3.367: Left Arm Cylinder – Forward Position

3. Reinstall clevis pin (A) and split ring (B) to secure the cylinder in aft position (C) on the bracket.

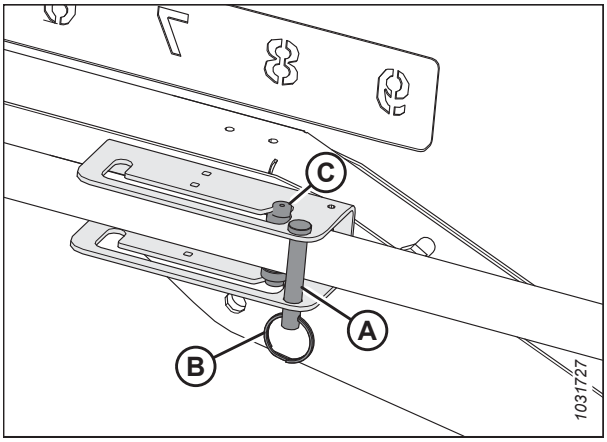


Figure 3.368: Left Arm Cylinder – Aft Position

4. Check reel clearance to backsheet, upper cross auger (if installed), and reel braces.
5. Adjust reel tine pitch (if required). For adjustment procedures, refer to *3.9.12 Reel Tine Pitch, page 246*.

Repositioning Fore-Aft Cylinders – Triple Reel

The reel can be moved approximately 155 mm (6 in.) farther aft by repositioning the fore-aft cylinders on the reel arms This may be desirable when straight-combining canola.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

IMPORTANT:

Ensure all fore-aft cylinders are set to the same position.

1. Position reel fully aft with support arms horizontal.
2. Shut down the engine, and remove the key from the ignition.
3. Remove hairpin (A) securing multi-tool to holder bracket on left endsheet.
4. Remove multi-tool (B), and reinstall hairpin to holder.

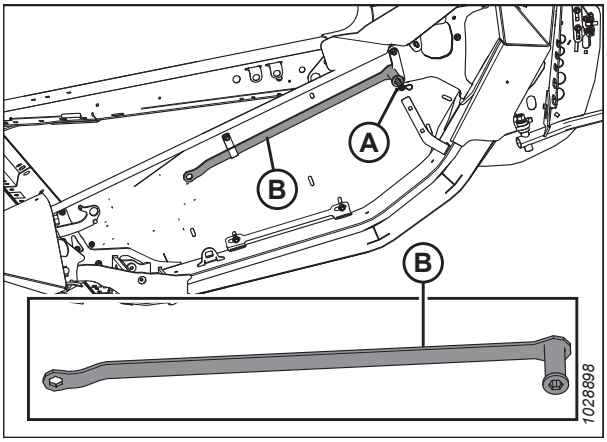


Figure 3.369: Left Endsheet

Reposition the center left and center right fore-aft cylinders as follows:

5. Remove split ring (A) and clevis pin (B) securing the center fore-aft cylinder in the forward position.

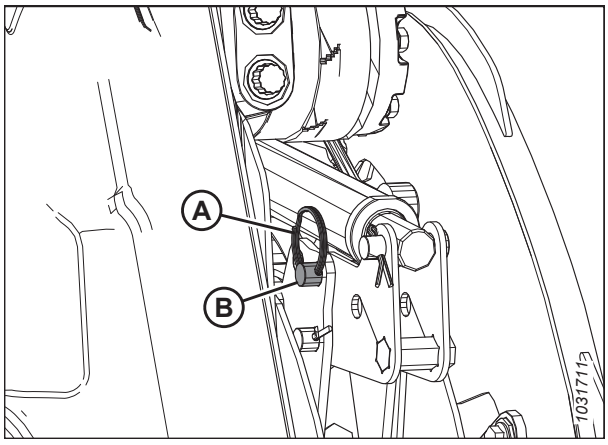


Figure 3.370: Center Left Arm Cylinder – Forward Position

6. Use multi-tool (A) to push bracket (B) rearward until hole (C) aligns with hole (D). The reel will move rearward as bracket (B) rotates on bottom pin (E).

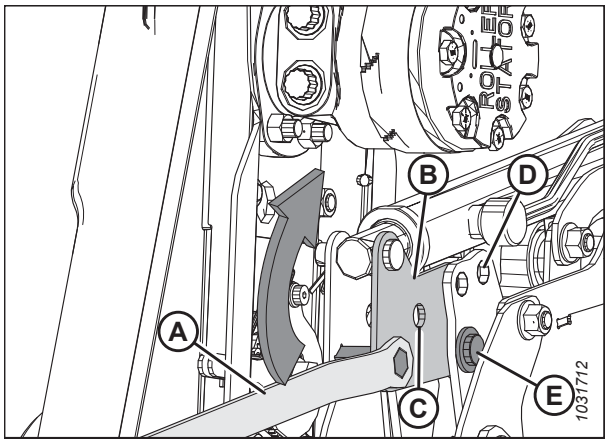


Figure 3.371: Center Left Arm Cylinder – Forward Position

7. When the bracket holes are lined up, secure in aft position with clevis pin (A) and split ring (B).

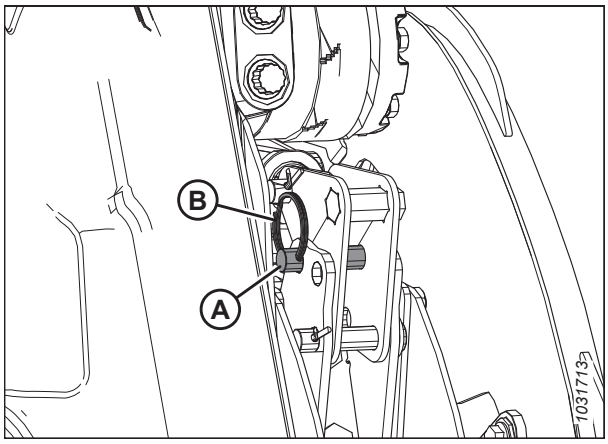


Figure 3.372: Center Left Arm Cylinder – Aft Position

Reposition the outer left and outer right fore-aft cylinders as follows:

1. Remove split ring (A) and clevis pin (B) securing the left cylinder in forward position on cylinder bracket (C).

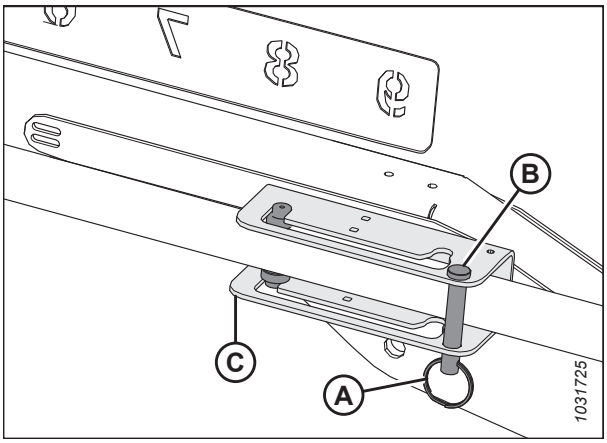


Figure 3.373: Outer Left Arm Cylinder – Forward Position

2. Grab hold of the cylinder, and use guides (A) to slide the cylinder along the bracket slot and into aft position (B).

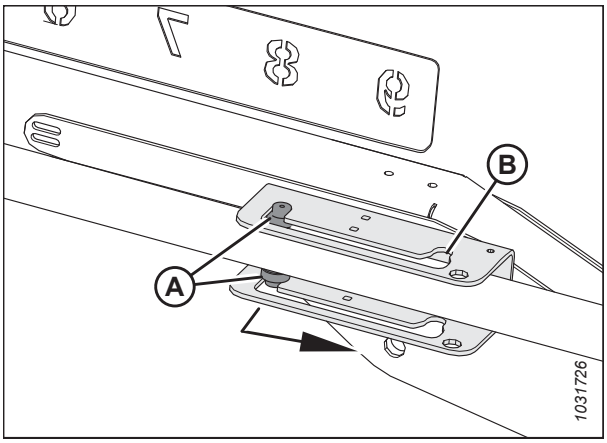


Figure 3.374: Outer Left Arm Cylinder – Forward Position

3. Reinstall clevis pin (A) and split ring (B) to secure the cylinder in aft position (C) on the bracket.

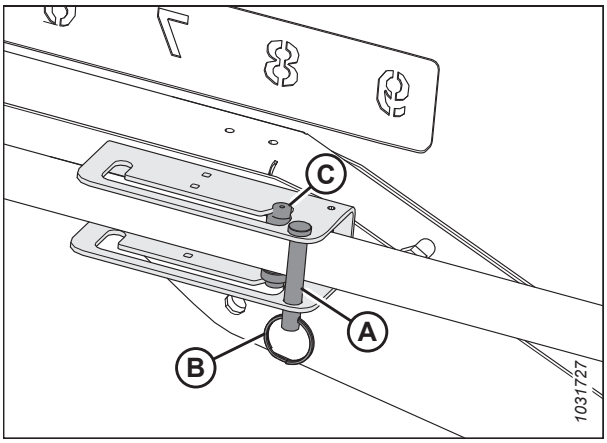


Figure 3.375: Outer Left Arm Cylinder – Aft Position

4. Check reel clearance to backsheet, upper cross auger (if installed), and reel braces.

5. Adjust reel tine pitch (if required). For adjustment procedures, refer to *3.9.12 Reel Tine Pitch, page 246*.

Checking and Adjusting Fore-Aft Position Sensor

There is a sensor that informs the combine where the reel is positioned when adjusted in the fore and aft directions, and displays that information for the operator. The sensor arm's orientation and the sensor's output voltage range must be set correctly for your machine.

Checking and adjusting the orientation of the sensor arm

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Park the combine on a level surface.
2. Shut down the engine, and remove the key from the ignition.
3. Check the orientation of sensor arm (C) and hardware (D). Ensure that the sensor arm is configured properly for your machine; refer to Figure *3.376, page 244*.

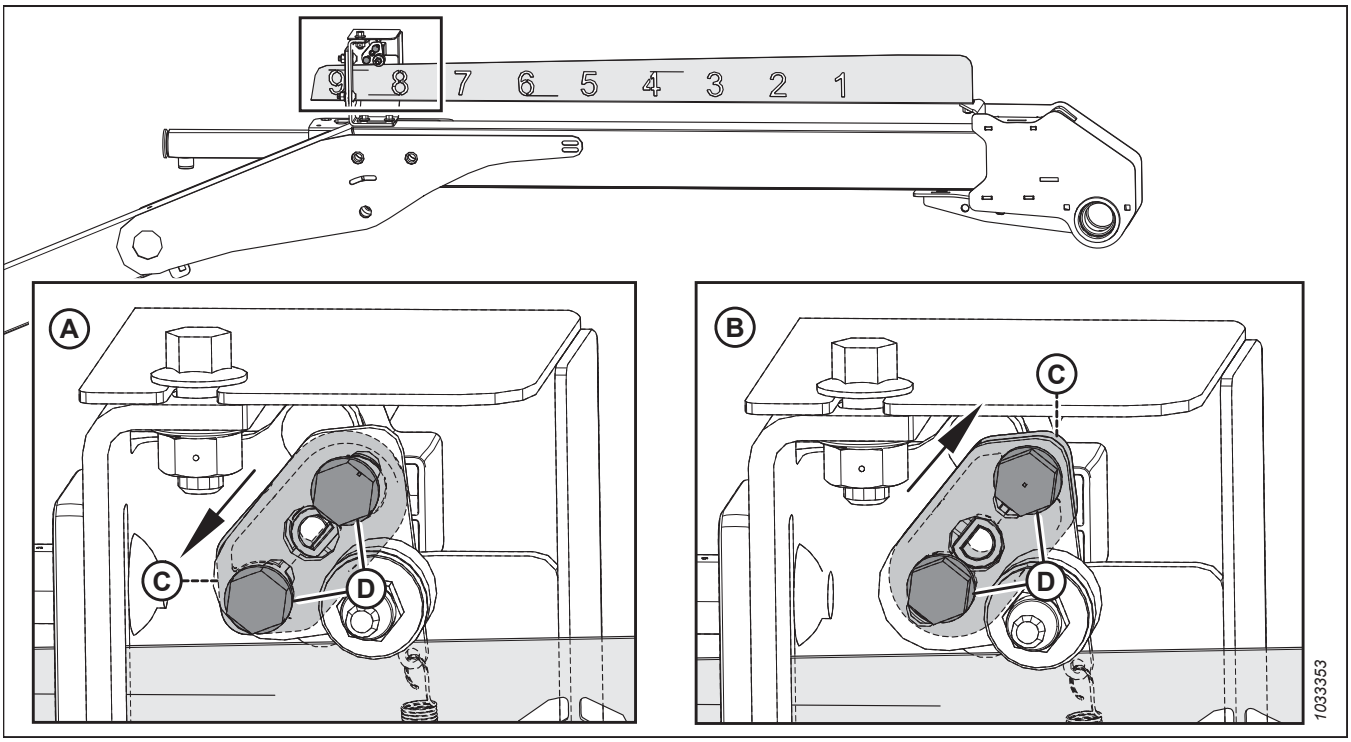


Figure 3.376: Sensor Arm Configurations

A - John Deere, CLAAS, IDEAL™ Configuration

B - Case/New Holland Configuration

C - Sensor Arm

D - Mounting Hardware

4. If sensor arm (C) is not oriented correctly, remove it and then reinstall it in the correct orientation.

Checking and adjusting the sensor's output voltage

WARNING

Check to be sure all bystanders have cleared the area.

5. Engage the parking brake.

   IMPORTANT:

   To measure the output voltage of the fore-aft sensor, the engine needs to be running and supplying power to the sensor. Always engage the parking brake and stay away from the reel.

6. Start the engine.

7. Adjust the reel to the fully forward position. Dimension (B) (from the sensor bracket to the end of the indicator) should be 62–72 mm (2.4–2.8 in.).

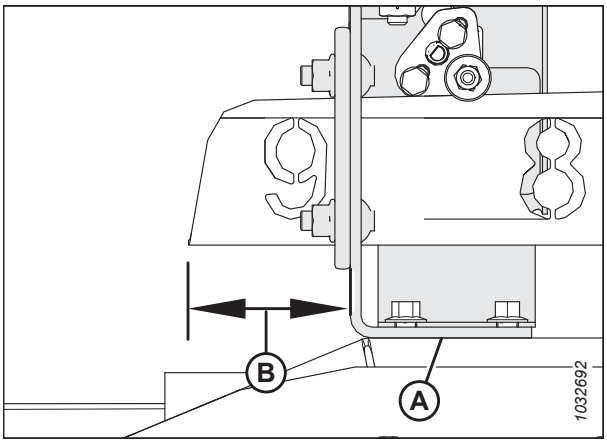


Figure 3.377: Fore-Aft Bracket

8. Use the combine display or a voltmeter (if measuring the sensor manually) to measure the voltage range. If using a voltmeter, check sensor (A) voltage between pin 2 (ground) and pin 3 (signal). The range should be

   - For Case and New Holland combines: 0.7–1.1 V
   - For AGCO, CLAAS, and John Deere combines: 3.9–4.3 V

9. Shut down the engine, and remove the key from the ignition.

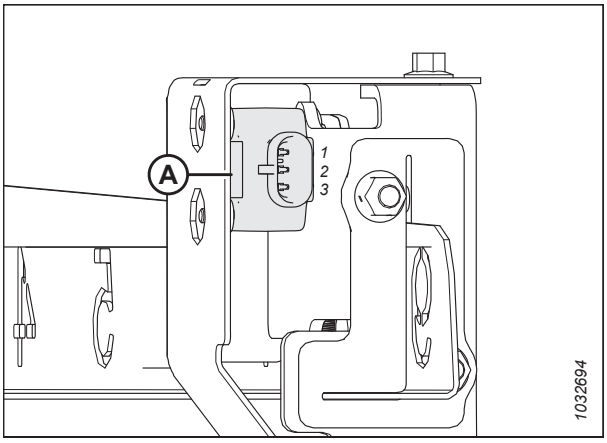


Figure 3.378: Fore-Aft Sensor

10. If adjustment is required, loosen hardware (A) and rotate sensor (B) until the voltage is in the correct range.
11. Once sensor adjustment is complete, torque the hardware to 2.1 Nm (22 lbf·in).

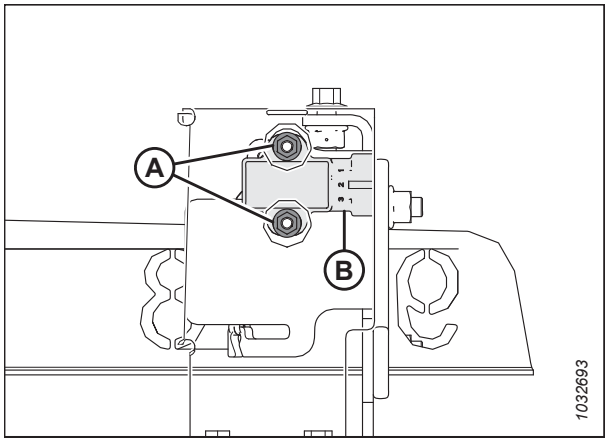


Figure 3.379: Fore-Aft Sensor

3.9.12 Reel Tine Pitch

Reel tine pitch is a term used to describe the position of the reel fingers in relation to the cutterbar. The reel tine pitch cab be changed by changing the reel fore-aft position and the reel cam setting. The Operator may wish to change the reel tine pitch to suit different harvesting conditions.

Changing the reel position has the largest impact on the reel tine pitch. Changing the cam setting, on the other hand, has a smaller impact on reel tine pitch. For example, with the cam position range at 33°, the corresponding finger pitch range is only 5° at the lowest point of the reel's rotation.

For the best results, use the minimum cam setting that delivers the crop past the rear edge of the cutterbar and onto the drapers. For more information, refer to *3.7.2 Header Settings, page 130*.

Reel Cam Settings

Changing the cam position allows the Operator to adjust the point at which the reel fingers release gathered crop to the drapers. Recommendations are provided for reel cam settings in various harvesting conditions.

The setting numbers are visible above the slots on the cam disc. For instructions, refer to *Adjusting Reel Cam, page 248*.

NOTE:

For the recommended reel tine pitch setting to use in various harvesting conditions, refer to *3.7.2 Header Settings, page 130*.

Cam Position 1, Reel Position 6 or 7 delivers the most even crop flow onto the drapers without fluffing or disturbing the material.

- This setting will release crop close to the cutterbar. Use this setting when the cutterbar is on the ground while harvesting.
- Some crops will not be delivered past the cutterbar when the cutterbar is raised off tof he ground while the reel is far forward. Therefore, set the initial reel speed so that it close to the ground speed.

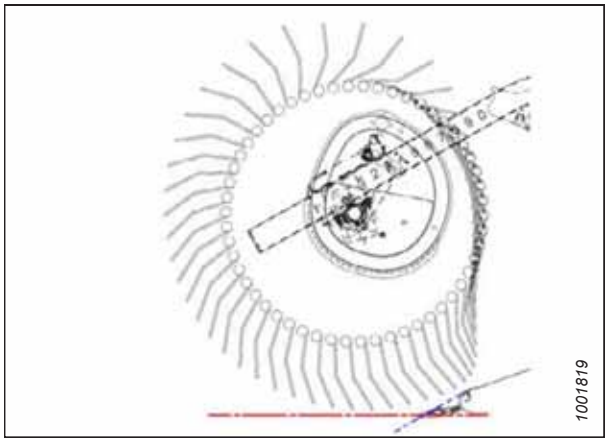


Figure 3.380: Finger Profile – Position 1

Cam Position 2, Reel Position 3 or 4 is the recommended starting position for most crops and conditions.

- If the crop is stalling on the cutterbar when the reel is in the forward position, increase the cam setting to push the crop past the rear edge of the cutterbar.
- If the crop is getting fluffed or if there is a disruption to the flow across the drapers, decrease the cam setting.
- This setting results in the reel fingertip speed being approximately 20% faster than the reel speed.

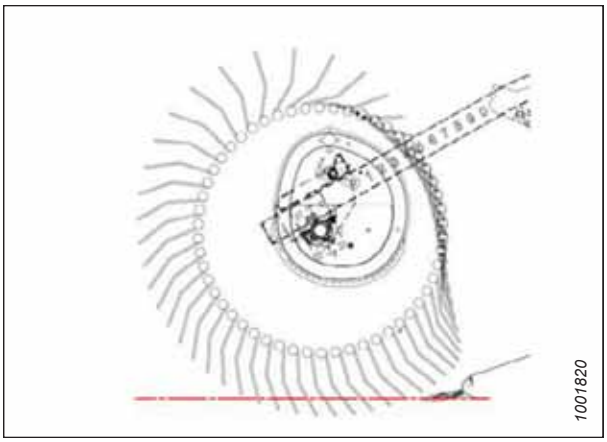


Figure 3.381: Finger Profile – Position 2

Cam Position 3, Reel Position 6 or 7 is mainly used to leave long stubble.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting results in the reel fingertip speed being approximately 30% faster than the reel speed.

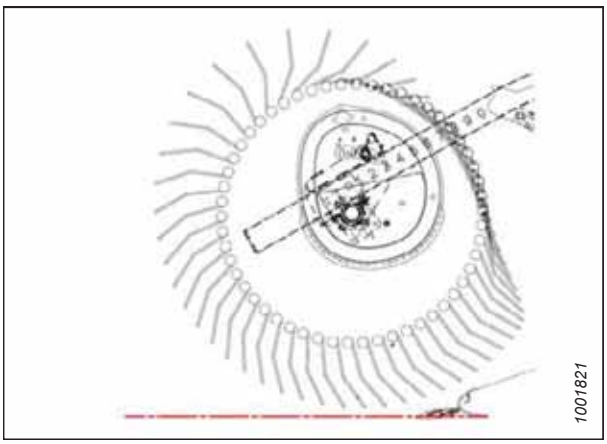


Figure 3.382: Finger Profile – Position 3

Cam Position 4, Reel Position 2 or 3 is used with the reel is fully forward. Using this setting results in the header leaving the maximum amount of stubble when harvesting in lodged crops.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting results in the reel fingertip speed being approximately 35% faster than the reel speed.

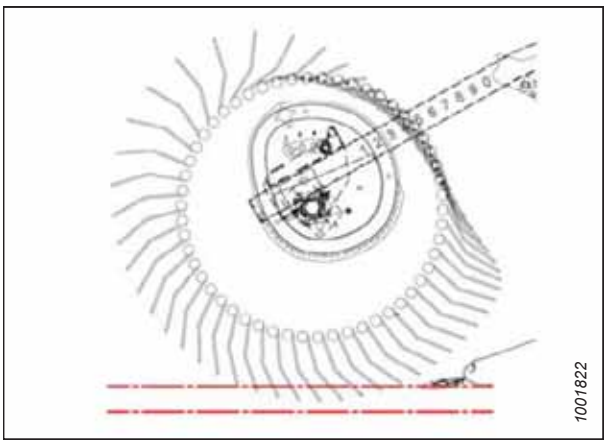


Figure 3.383: Finger Profile – Position 4

Cam Position 4, Header Angle at Maximum, and Reel Fully Forward provides the maximum amount of reel reach below the cutterbar to pick up lodged crops.

- This position leaves a significant amount of stubble when the cutting height is set to approximately 203 mm (8 in.). In damp materials such as rice, it is possible to double the combine's ground speed because of the reduction of cut material.
- This setting results in a the reel fingertip speed being approximately 35% faster than the reel speed.

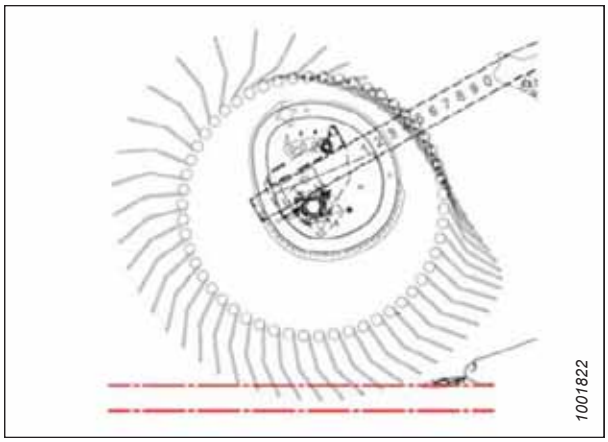


Figure 3.384: Finger Profile – Position 4

NOTE:

Using higher cam settings when the reel's fore-aft position is set between 4 and 5 results in drastically decreased draper capacity. This happens because the reel fingers continually engage with crop that is already moving on the drapers, resulting in disrupted flow into the combine feeder house. Higher cam settings are recommended only when the reel is at or close to the fully forward setting.

Adjusting Reel Cam

The reel cam can be adjusted to change the reel tine pitch.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

IMPORTANT:

The reel-to-cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft positions. For information, refer to *4.13.1 Reel Clearance to Cutterbar, page 622*.

NOTE:

If there are multiple reel cams, the adjustments need to be made on all of the reel cams.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (A) securing multi-tool (B) to bracket on the left endsheet.

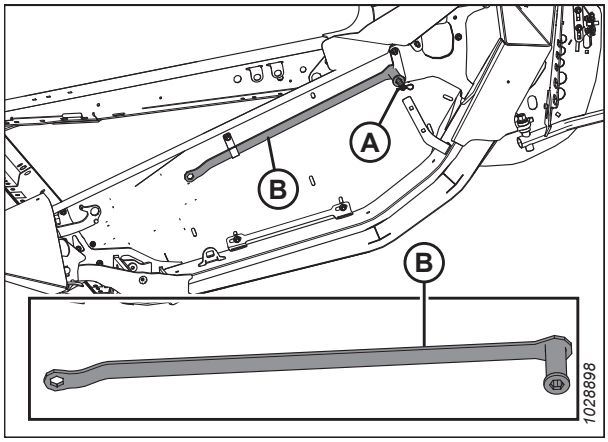


Figure 3.385: Left Endsheet

3. Turn latch pin (A) **COUNTERCLOCKWISE** using multi-tool to release the cam disc.

   IMPORTANT:

   Refer to the cam latch decal for the locking/unlocking rotation direction. Forcing the cam latch in the wrong direction can damage the roll pins.

4. Use the multi-tool on bolt (B) to rotate the cam disc and align latch pin (A) with the desired cam disc hole position (C) (1 to 4).

   NOTE:

   Bolt (B) is welded to the cam support.

5. Turn latch pin (A) **CLOCKWISE** to engage and lock the cam disc.

   IMPORTANT:

   Ensure the cam is secured into position before operating the machine.

6. Repeat the above procedure for all reels.

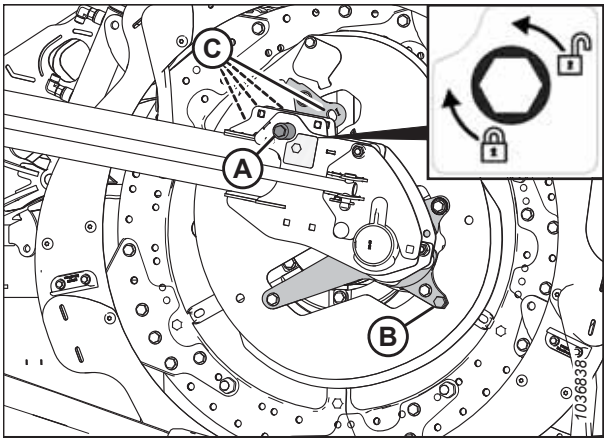


Figure 3.386: Cam Disc Positions

3.9.13 Upper Cross Auger

The Upper Cross Auger (UCA) improves crop feeding into the center of the header in heavy crop conditions. It is ideal for high-volume harvesting forages, oats, canola, mustard, and other tall, bushy, hard-to-convey crops.

The Operator can use shutoff valve (A) to turn off the UCA when it is not needed.

NOTE:

Even though UCA is shut off it still needs to be greased at the regular intervals because of the movement of the wings.

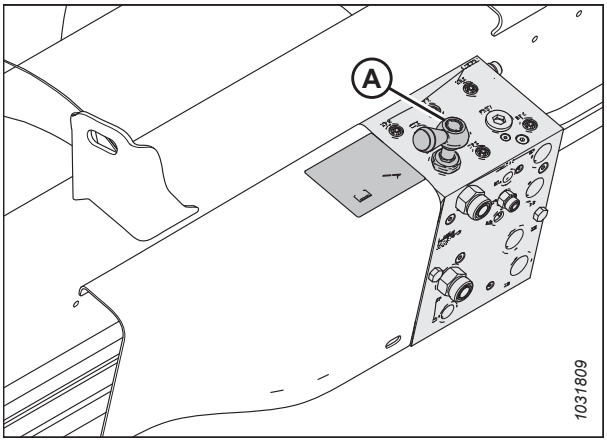


Figure 3.387: Shutoff Valve

Adjusting Upper Cross Auger Position

The upper cross auger (UCA) has an adjustable mount that enables you to adjust the auger position for specific harvesting conditions. Headers with three-piece augers have two adjustable mounts—one on each end of the center auger.

NOTE:

For primary and secondary front bolt position details, refer to Figure *3.390, page 250*.

The mount(s) are initially installed in the rear-most position, with front bolt (A) in the primary position. This is the recommended position for most conditions.

With front bolt (A) in the primary position, the auger and reel are safe to run in any position. The auger position can be adjusted to a limited extent by changing the position of the mount with respect to rear bolt (B).

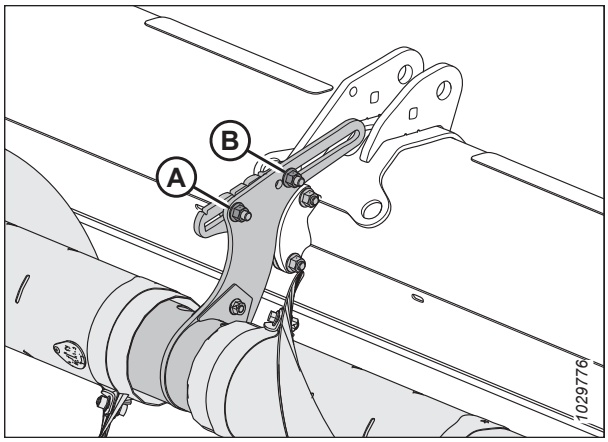


Figure 3.388: Initial Position of Adjustable Mounts – Two-Piece Auger

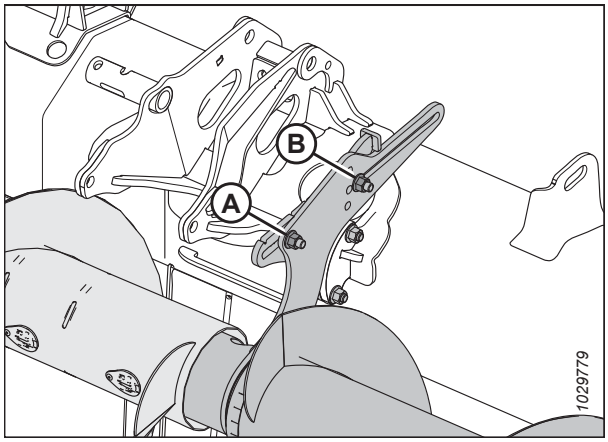


Figure 3.389: Initial Position of Adjustable Mounts – Three-Piece Auger

When the front bolt is moved to secondary position (B), the auger position can be adjusted to a greater extent. For three-piece augers, additional secondary positions (B) are available to raise and lower the auger if desired. When the front bolt is in one of these positions, the fore-aft adjustment is limited to prevent interference with the feed auger and header frame.

IMPORTANT:

When the front bolt is in one of secondary positions (B), and the reel is in its rear-most position, the reel fingers and cam arms may contact the upper cross auger, damaging it. When you move the reel all the way back (for example, when harvesting canola), you must also move the upper cross auger all the way back to allow sufficient clearance between the reel fingers and the auger.

Move the auger forward to:

- Help convey light crops, especially on side hills
- Improve feeding of light crops
- Reduce reel carry over or crop flow disruption caused by the reel

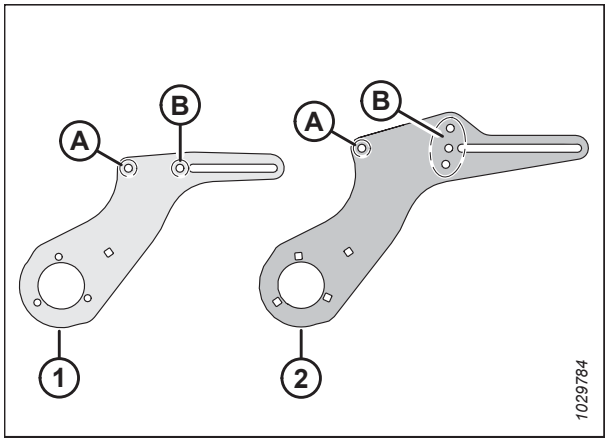


Figure 3.390: Adjustable Mount Details

1 - Two-Piece Auger Mount

2 - Three-Piece Auger Mount

A - Primary Position for Front Bolt

B - Secondary Position(s) for Front Bolt

Move the auger rearward to:

- Increase the available volume for conveying heavy crop
- Keep the auger close to the deflectors to prevent crop from getting behind the auger and wrapping

To adjust the auger position, follow these steps:

1. Locate the adjustable mount, sticking up out of the center support assembly on two-piece augers, and out of the ends of the center auger on three-piece augers.

   NOTE:

   The illustration at right shows the left adjustable mount on a three-piece auger. The adjustable mount on a two-piece auger is similar, but has only one secondary position for the front bolt instead of three. Refer to Figure *3.390, page 250* for more details.

2. If desired, relocate front bolt and nut (A). They have two possible locations on two-piece augers (one primary and one secondary), and four possible locations on three-piece augers (one primary and three secondary).

3. Loosen front nut (A) and rear nut (B) just enough to allow the adjustable mount to slide.

4. Move the mount to the desired position.

5. Retighten nuts (A) and (B). Torque the nuts to 69 Nm (51 lbf·ft).

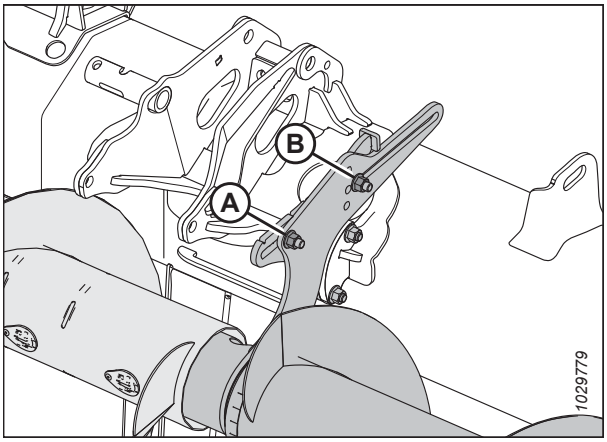


Figure 3.391: Initial Position of Adjustable Mounts – Three-Piece Auger

6. If a three-piece upper cross auger is installed, repeat these steps on the second adjustable mount.

   NOTE:

   On headers with three-piece augers, make sure both mounts are in the same position.

7. After adjusting the auger position, check for interference between the reel fingers and the upper cross auger and between the cam arms and the upper cross auger throughout the entire hydraulic fore-aft range of the reel. For instructions, refer to *Checking Upper Cross Auger for Interference, page 251*.

Checking Upper Cross Auger for Interference

A poorly-adjusted upper cross auger (UCA) can make contact with header components. The UCA center support(s) provide the necessary range to avoid contact.

⚠ WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine.

2. Fully retract the reel fore/aft fully to bring the reel as close as possible to the UCA.

   NOTE:

   The reel cam adjustment can remain in the desired position, but UCA clearance should be rechecked if adjusted.

3. Place 254–356 mm (10–14 in) blocks under the cutterbar at both ends of the header, and lower the reel onto the blocks to form a smile shape.

4. Shut down the engine, and remove the key from the ignition.

5. Manually rotate the UCA (A) and ensure a minimum of 10 mm (13/32 in.) clearance between UCA and the following locations:

   - Reel cam arms (B)
   - Reel fingers (C)
   - Reel cylinder supports (D)
   - **FD241 and larger:** Split frame joint (E)

   If adjustment is required, refer to *Adjusting Upper Cross Auger Position, page 249*.

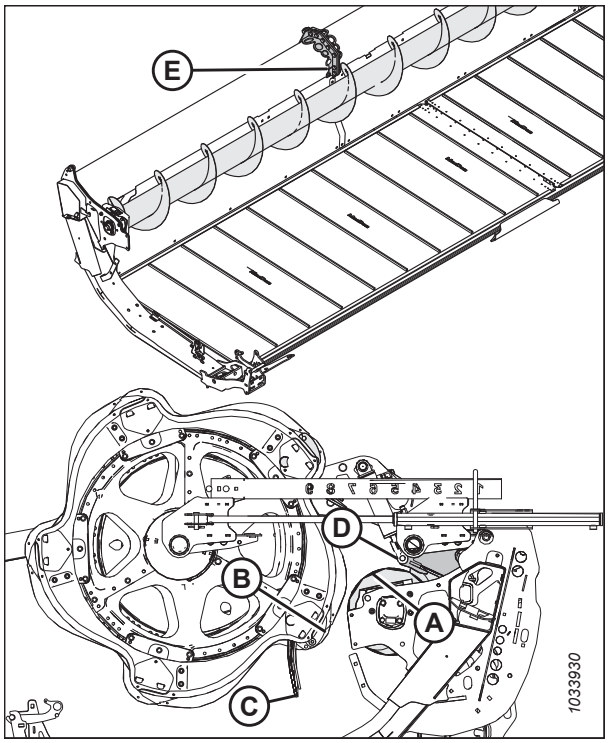


Figure 3.392: UCA Clearance Check Locations

3.9.14 Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to allow the installation of the vertical knives and to decrease transport width.

Removing Crop Dividers

Crop dividers can be removed to allow installation of vertical knives or to decrease transport width.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Lower reel and raise header. For instructions, refer to your combine operator's manual for instructions.
2. Stop the engine and remove the key from the ignition.
3. Engage safety props. For instructions, refer to your combine operator's manual for instructions.
4. Open endshields. For instructions, refer to *Opening Header Endshields, page 47*.

5. Remove lynch pin (A).
6. Hold onto crop divider (E).
7. Rotate nut (B) on divider latch (C) forward to disengage it from bolt (D).

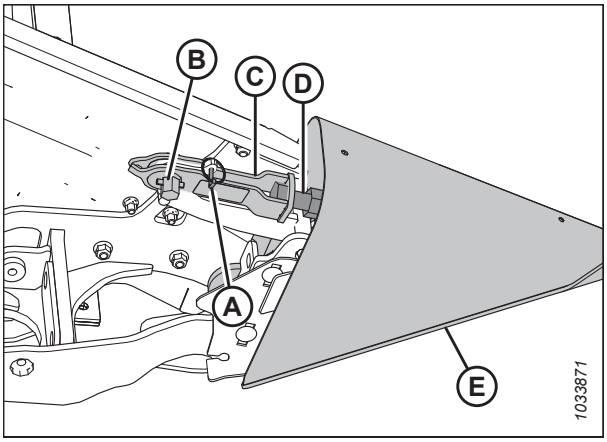


Figure 3.393: Crop Divider with Latch

8. Lower crop divider (A), and remove from endsheet.
9. Close endshield. For instructions, refer to *Closing Header Endshields, page 48*.

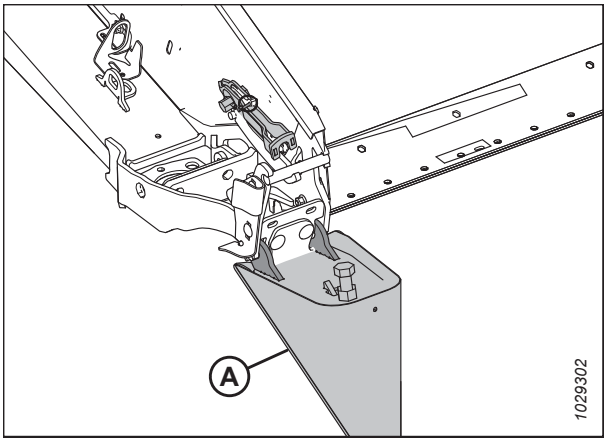


Figure 3.394: Crop Divider with Latch

10. If installed, place crop divider (A) onto optional storage position on bracket (B).
11. If not installed, place crop dividers in a safe location.

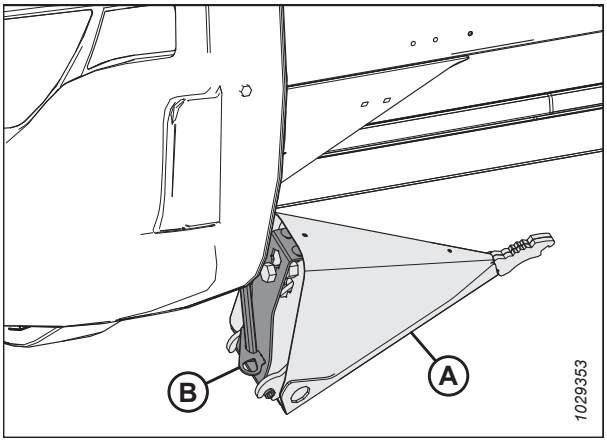


Figure 3.395: Optional Crop Divider Storage

Installing Crop Dividers

Follow these instructions to properly instal the crop dividers.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Start the engine.
2. Lower the reel fully.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. Refer to the combine operator's manual for instructions.
6. If optional storage bracket is installed. Remove crop divider (A) from storage position by lifting the crop divider so that bolt (B) clears the slot in storage bracket (C).
7. If not installed, retrieve crop dividers from where they were stored.
8. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.

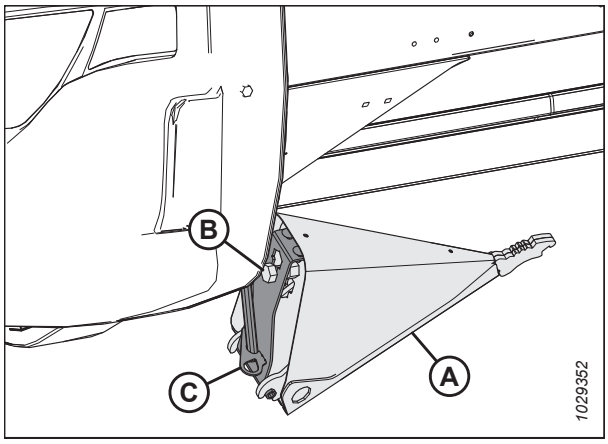


Figure 3.396: Optional Crop Divider

9. Insert crop divider lugs (A) into holes in the endsheet as shown.
10. Remove lynch pin (B) from latch (C).

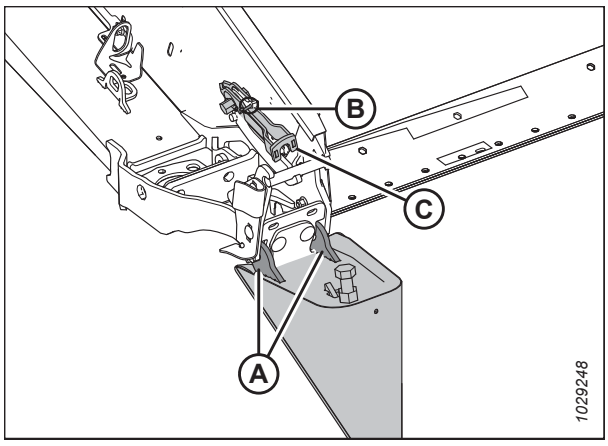


Figure 3.397: Crop Divider with Latch

11. Lift forward end of latch (A) and crop divider (B).

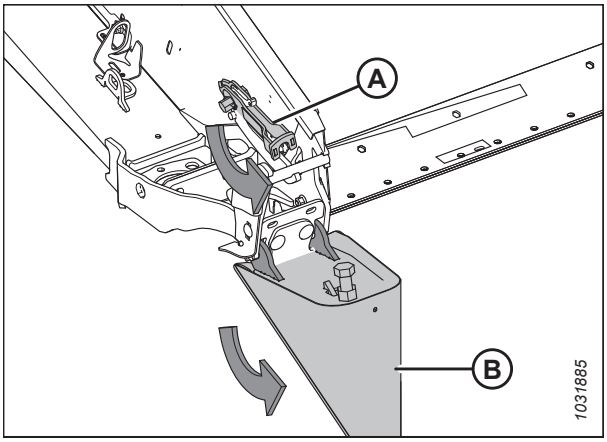


Figure 3.398: Crop Divider with Latch

12. Engage latch (A) onto crop divider bolt (B).
13. Rotate nut (D) on latch (A) counter-clockwise to engage lock.

    NOTE:

    Nut (D) requires a torque of 40–54 Nm (30–40 lbf·ft) to close the latch. If adjustment is required, loosen latch (A) and adjust bolt (B) to correct the amount of torque required.

14. Secure with lynch pin (C).
15. Close the endshield. For instructions, refer to *Closing Header Endshields, page 48*.

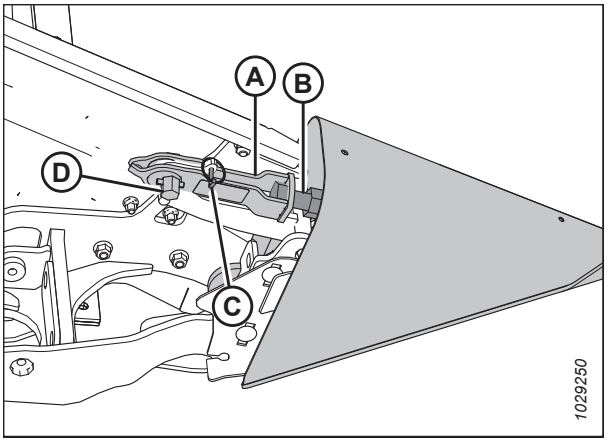


Figure 3.399: Crop Divider with Latch

Removing Floating Crop Dividers

Floating crop dividers can be removed to allow installation of vertical knives or standard crop dividers.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. If it is impossible to engage safety props and impractical to block the header, NEVER climb onto or go underneath an unsupported header.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the reel fully.
3. Raise the header 60–90 cm (2–3 ft.) off the ground.
4. Shut down the engine, and remove the key from the ignition.
5. Open the endshield.

6. Retrieve multi-tool (A) from the left endsheet.
7. Remove lynch pin (B).
8. Install multi-tool (A) onto hex shaft (C).
9. Rotate the multi-tool downwards until latch (D) releases from bolt (E).
10. Lift latch (D) up and off bolt (E).

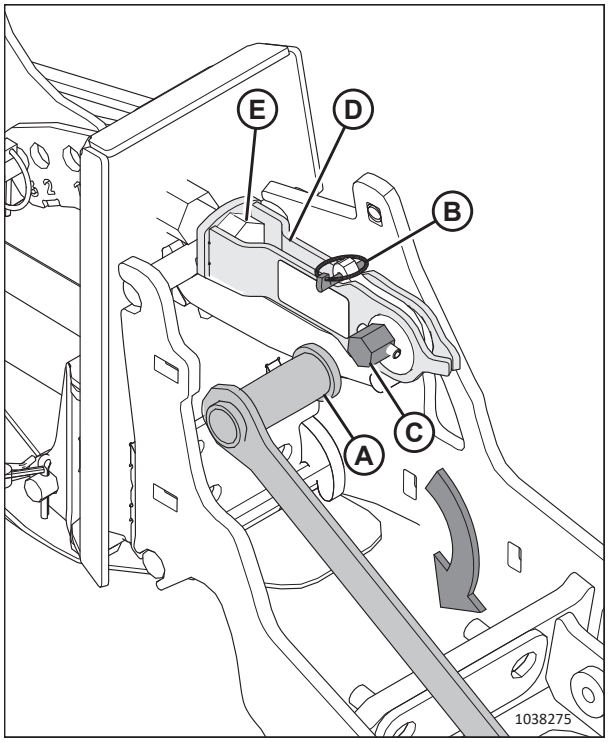


Figure 3.400: Floating Crop Divider Installed

11. Tilt the crop divider forward and pull it out of the header.
12. Reinstall lynch pin (A).
13. Close the endshield.

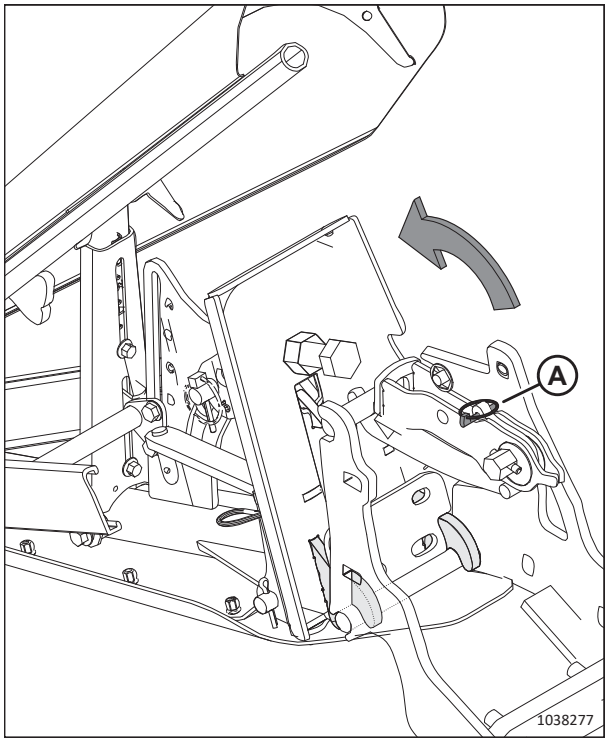


Figure 3.401: Latch Released

Installing Floating Crop Dividers

Follow these instructions to properly install the floating crop dividers.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. If it is impossible to engage safety props and impractical to block the header, NEVER climb onto or go underneath an unsupported header.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the reel fully.
3. Raise the header 60–90 cm (2–3 ft.) off the ground.
4. Shut down the engine, and remove the key from the ignition.
5. Open the endshield.
6. Remove lynch pin (A) from quick latch (B).
7. Attach multi-tool (C) (stored on the left endsheet) to hex shaft (D) and rotate to release latch (B).
8. If crop dividers (E) are installed, lift latch (B) off of bolt (F) and set the crop dividers aside.

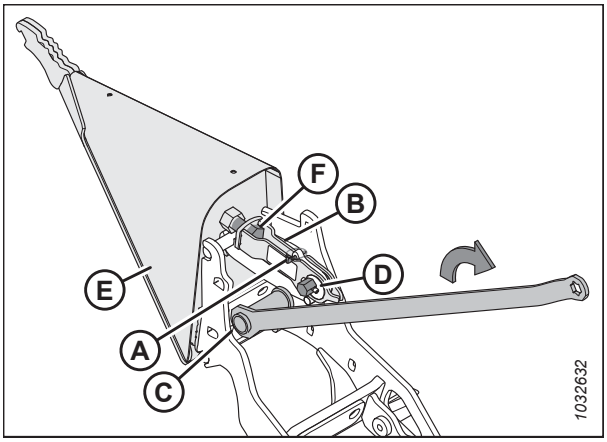


Figure 3.402: Crop Divider Installed

9. Insert crop divider lugs (A) into the slots in the header frame.

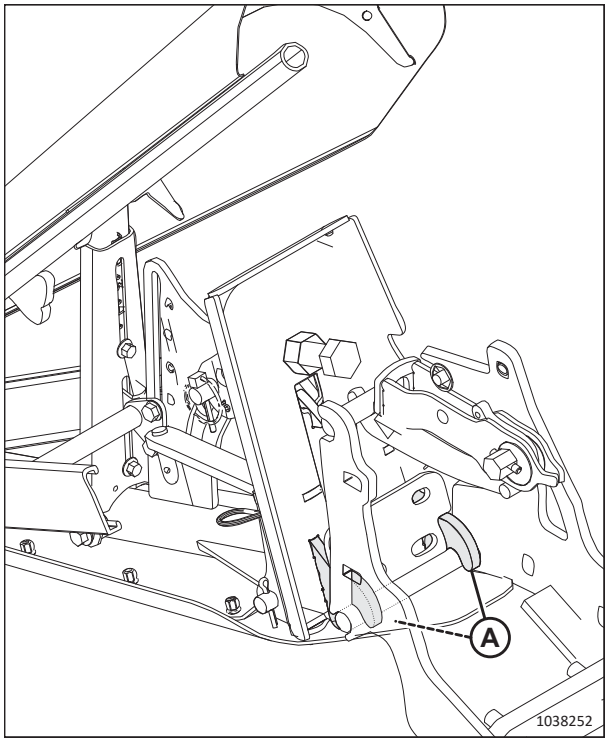


Figure 3.403: Crop Divider Installation

10. Lift the forward end of quick latch (A), and rotate crop divider (B) up into position.

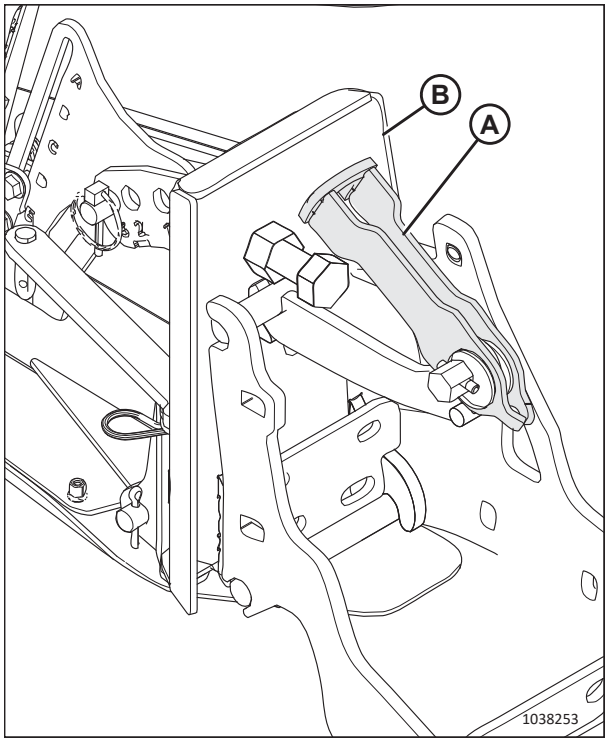


Figure 3.404: Quick Latch

11. Engage quick latch (A) onto the bolt.
12. Make sure the latch closes tightly and crop divider stop (B) contacts header stop (C).

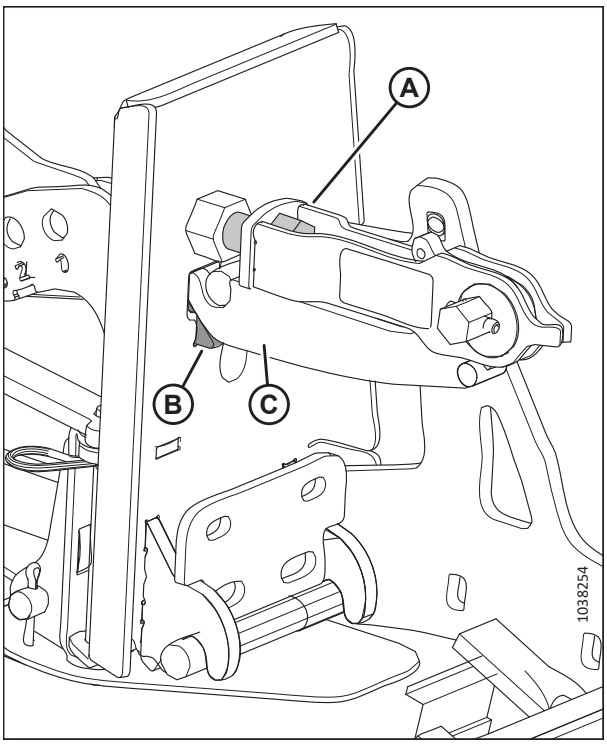


Figure 3.405: Crop Divider Latched to Header

13. If the latch requires adjustment, loosen nut (A), and adjust the length of bolt (B) until it takes 40–54 Nm (30–40 lbf·ft) of torque on hex shaft (C) to close the latch.
14. Retighten nut (A).
15. Attach multi-tool (D) onto hex shaft (C) and rotate the multi-tool to lock the latch.
16. Install lynch pin (E) to secure the quick latch in place.
17. Repeat Step *6, page 257* to Step *16, page 259* at the opposite end of the header to install the opposite crop divider.
18. Close the endshield.
19. Check the float.
20. Check the wing balance.

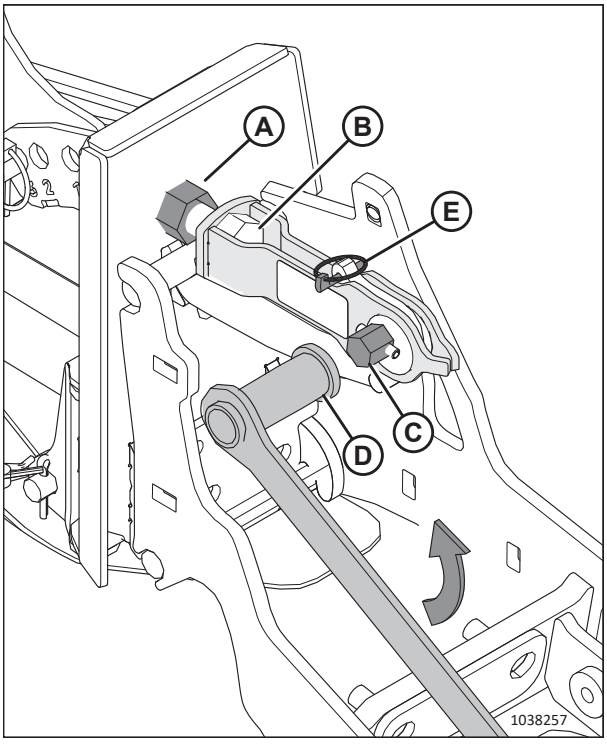


Figure 3.406: Latch Adjustment

Adjusting Crop Dividers

Crop dividers can be adjusted for different crop conditions.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before making adjustments to the machine. If it is impossible to engage safety props and impractical to block the header, NEVER climb onto or go underneath an unsupported header.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the reel fully.
3. Raise the header 60–90 cm (2–3 ft.) off the ground.
4. Shut down the engine, and remove the key from the ignition.
5. Refer to the chart according to the stubble height range and reel configuration:
   - Double or triple reel header, field with a stubble height of 50–125 mm (2–5 in.): Refer to Step *6, page 261*.
   - Double or triple reel header, field with a stubble height of 20–100 mm (3/4–4 in.): Refer to Step *7, page 262*.
   - Double or triple reel header, cutterbar on the ground, field with a stubble height of 16–50 mm (5/8–2 in.): Refer to Step *8, page 263*.

Table 3.28 Floating Crop Divider Settings – Double or Triple Reel Header, Field with a Stubble Height of 50–125 mm (2–5 in.)

6. Adjust the header according to the settings in the table row that describes the crop condition and the stubble height:
   a. Adjust the header angle.
   b. Adjust the header skid shoes.
   c. Adjust the floating crop divider (Down Stop to Top Deflector Side Rod) and confirm the range of motion set by the down stop does **NOT** contact the reel supports or the reel. For instructions, refer to Step *9, page 264* to Step *14, page 266*.

	Stubble Height	Header Angle[58]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing Crop	125 mm (5 in.)	A	Down	2	1 or 3	1	C	In
	50 mm (2 in.)	E	Down	1	1 or 3	1.5	C	In
Lodged	125 mm (5 in.)	A	Down	2	3 or 4	1	C	Out
	50 mm (2 in.)	E	Down	1	3 or 4	2	D	Out
Severely Lodged[59]	125 mm (5 in.)	A	Down	2	4	3	D	Out
	125 mm (5 in.)	A	Down	2	5	4	D	Out
	50 mm (2 in.)	E	Down	1	4	3	C	Out
	50 mm (2 in.)	E	Down	1	5	4	C	Out

58. A (min) – E (max)
59. Crop canopy lower than 150 mm (6 in)

Table 3.29 Floating Crop Divider Settings – Double or Triple Reel Header, Field with a Stubble Height of 20–100 mm (3/4–4 in.)

7. Adjust the header according to the settings in the table row that describes the crop condition and the stubble height:
   a. Adjust the header angle.
   b. Adjust the header skid shoes.
   c. Adjust the floating crop divider (Down Stop to Top Deflector Side Rod) and confirm the range of motion set by the down stop does **NOT** contact the reel supports or the reel. For instructions, refer to Step *9, page 264* to Step *14, page 266*.

	Stubble Height	Header Angle[60]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing Crop	100 mm (4 in.)	A	Middle	2	1 or 3	1	C	In
	20 mm (3/4 in.)	E	Middle	1	1 or 3	1	C	In
Lodged	100 mm (4 in.)	A	Middle	2	3	1	C	Out
	100 mm (4 in.)	A	Middle	2	4	2	C	Out
	20 mm (3/4 in.)	E	Middle	1	3	1	D	Out
	20 mm (3/4 in.)	E	Middle	1	4	2	D	Out
Severely Lodged[61]	100 mm (4 in.)	A	Middle	2 or 3	4	3	D	Out
	100 mm (4 in.)	A	Middle	2 or 3	5	4	D	Out
	20 mm (3/4 in.)	E	Middle	1	4	3	C	Out
	20 mm (3/4 in.)	E	Middle	1	5	4	C	Out

60. A (min) – E (max)
61. Crop canopy lower than 150 mm (6 in)

Table 3.30 Floating Crop Divider Settings – Double or Triple Reel Header, Cutterbar on the Ground, Field with a Stubble Height of 16–50 mm (5/8–2 in.)

8. Adjust the header according to the settings in the table row that describes the crop condition and the stubble height:
   a. Adjust the header angle.
   b. Adjust the header skid shoes.
   c. Adjust the floating crop divider (Down Stop to Top Deflector Side Rod) and confirm the range of motion set by the down stop does **NOT** contact the reel supports or the reel. For instructions, refer to Step *9, page 264* to Step *14, page 266*.

	Stubble Height	Header Angle[62]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing Crop	50 mm (2 in.)	A	Up	2	1 or 3	1	C	In
	16 mm (5/8 in.)	E	Up	1	1	2	C	In
	16 mm (5/8 in.)	E	Up	1	3	1	C	In
Lodged	50 mm (2 in.)	A	Up	2	3	1	C	Out
	50 mm (2 in.)	A	Up	3	4	1	C	Out
	16 mm (5/8 in.)	E	Up	1	3 or 4	2	D	Out
Severely Lodged[63]	50 mm (2 in.)	A	Up	2 or 3	4	3	D	Out
	50 mm (2 in.)	A	Up	2 or 3	5	4	D	Out
	16 mm (5/8 in.)	E	Up	1	4	2.5	C	Out
	16 mm (5/8 in.)	E	Up	1	5	4	C	Out

62. A (min) – E (max)
63. Crop canopy lower than 150 mm (6 in)

9. **Down Stop:** Remove lynch pin (A) from clevis pin. Remove clevis pin, tilt the divider, and install clevis pin into the numbered hole “1” to “3”. Secure clevis pin with lynch pin.

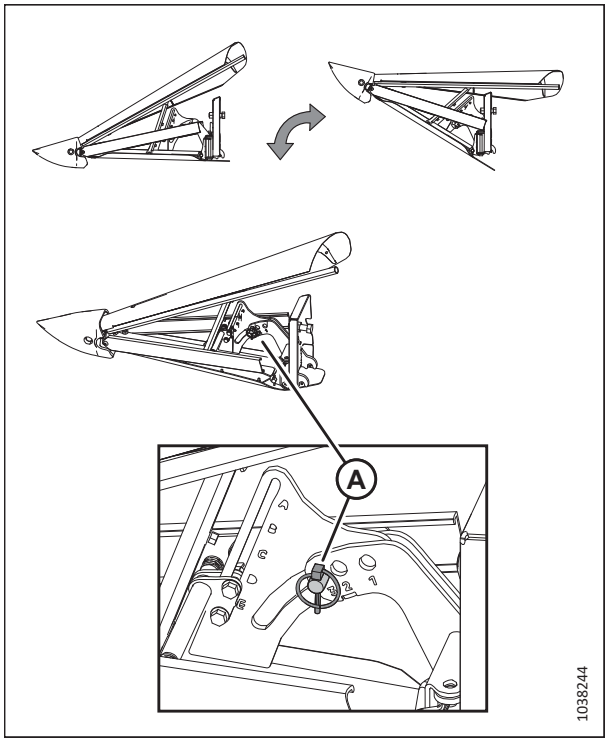


Figure 3.407: Down Stop Adjustment

10. **Nose Cone Fore-aft:** Remove bolt (A), move the tube in or out, and install the bolt into one of the five tube holes.

    NOTE:

    In example (B), the bolt is installed in tube hole “1”. In example (C), the bolt is installed in tube hole “5”.

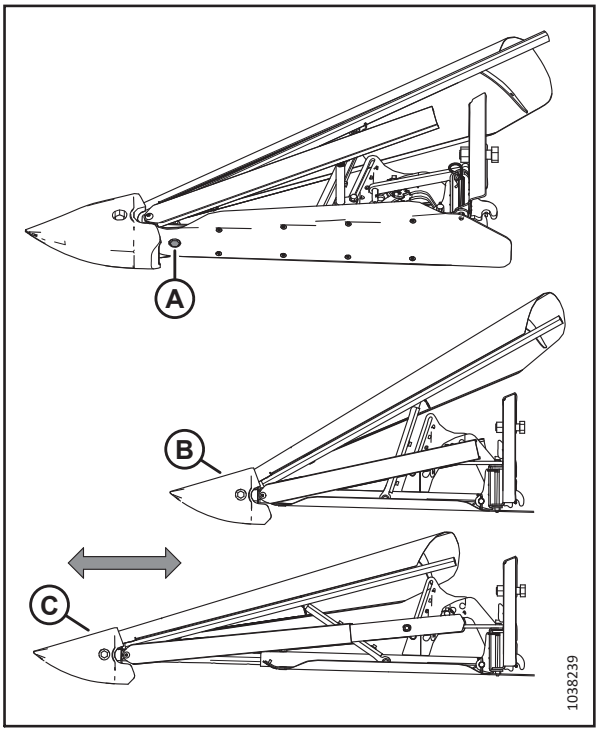


Figure 3.408: Nose Cone Fore-aft Adjustment

11. **Top Deflector Height:** Loosen nuts on bolts (A), slide the center support to the desired setting (1 to 4.5), and tighten the nuts.

    - Align the dots with the support to set half-increments. Example (B) is 2.5.
    - Align the number with the support to set full increments. Example (C) is 2.

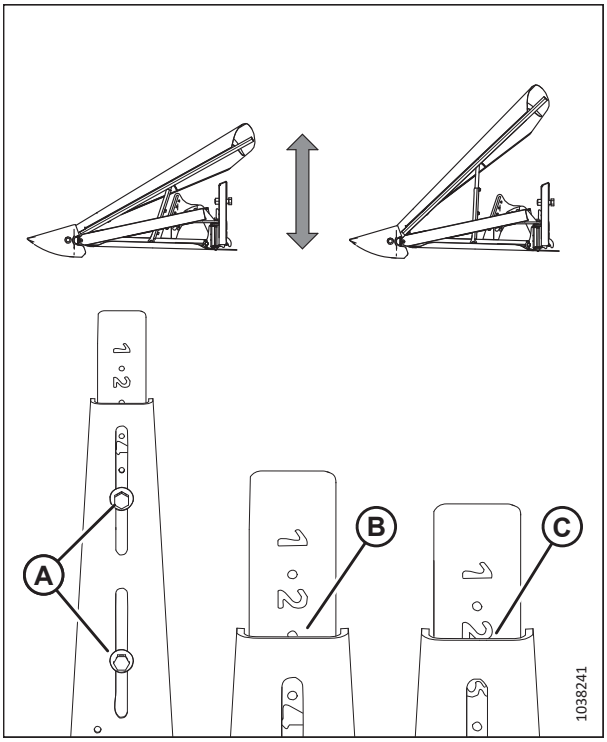


Figure 3.409: Top Deflector Height Adjustment

12. **Side Deflector Height:** Loose nuts on bolts (A), slide deflectors until notch (B) is at the desired setting “A” to “E”, and tighten nuts.

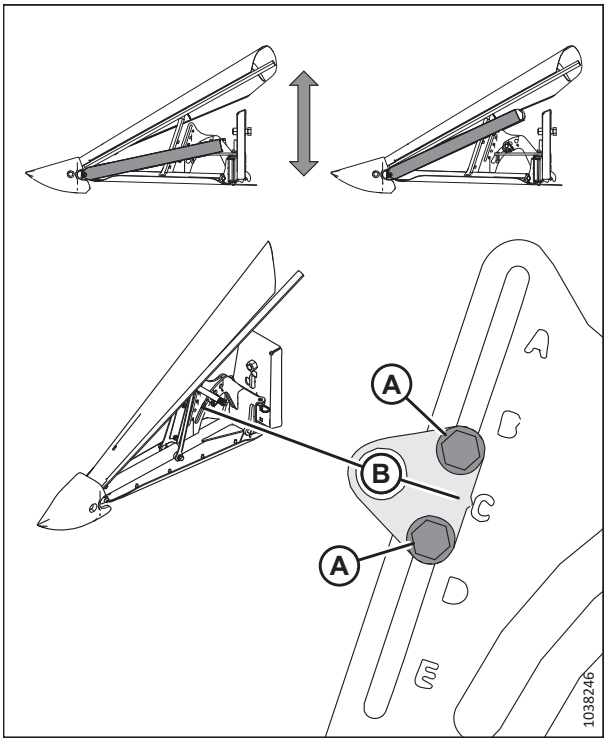


Figure 3.410: Side Deflector Height Adjustment

13. **Top Deflector Side Rod:** Loosen nut (A) and bolt (B), and swing rod (C) outward or inward. Tighten nut (A) to 39 Nm (29 lbf·ft). Tighten bolt (B) to 52 Nm (38 lbf·ft).

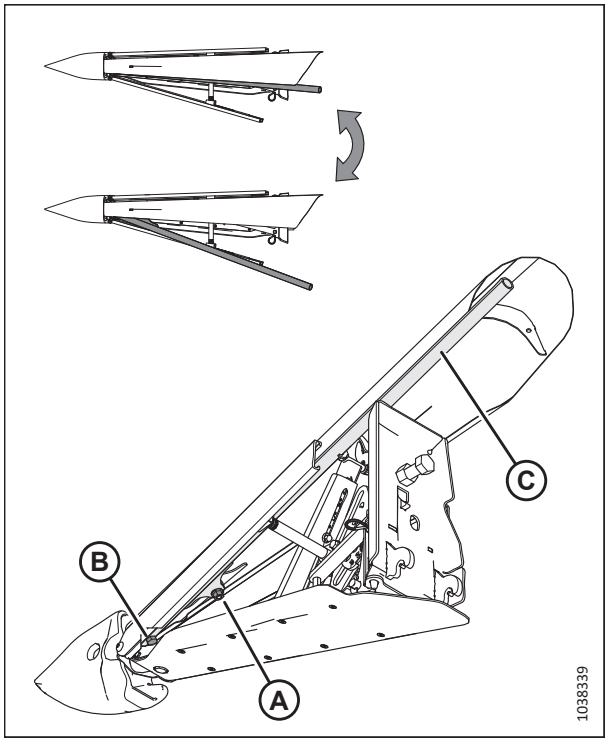
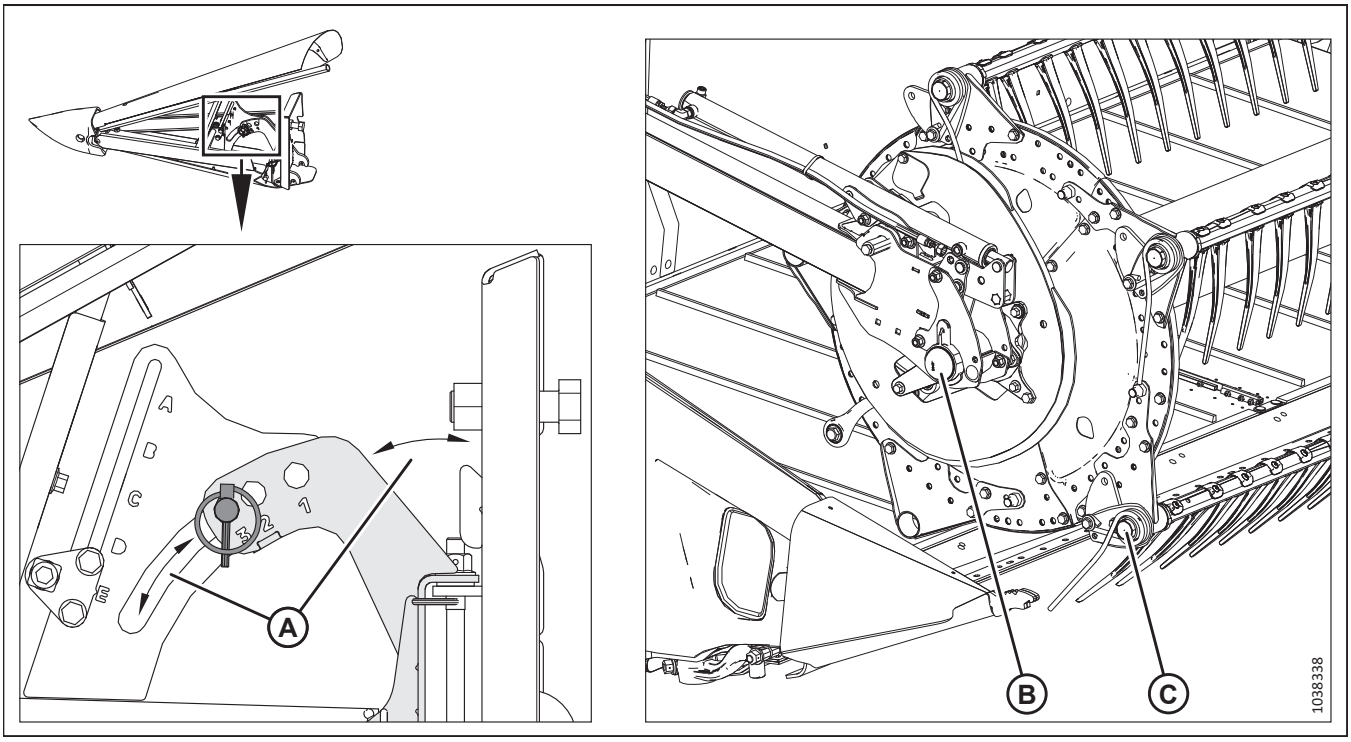


Figure 3.411: Top Deflector Side Rod Adjustment

Figure 3.412: Floating Crop Divider Range of Motion



14. **Range of Motion Check:** Lift and lower the floating crop divider through the range of motion (A) set by the down stop. Confirm the floating divider does **NOT** contact reel supports (B) or reel (C).

3.9.15 Crop Divider Rods

Removable crop divider rods are used in conjunction with crop dividers to help divide the crop when harvesting. The rods are most useful when crop is bushy or down. In standing crops, using only crop dividers is recommended.

Table 3.31 Crop Divider Rods Recommended Use

With Divider Rods		Without Divider Rods
Alfalfa	Lodged cereal	Edible beans
Canola	Peas	Milo
Flax	Soybeans	Rice
Grass seed	Sudan grass	Soybeans
Lentils	Winter forage	Standing cereal

Removing Crop Divider Rods

The crop divider rods are used assist with separate tall standing crop from the crop being cut. They can be removed from the ends of the crop dividers.

1. Loosen bolt (B) and remove crop divider rod (A) from both sides of the header.

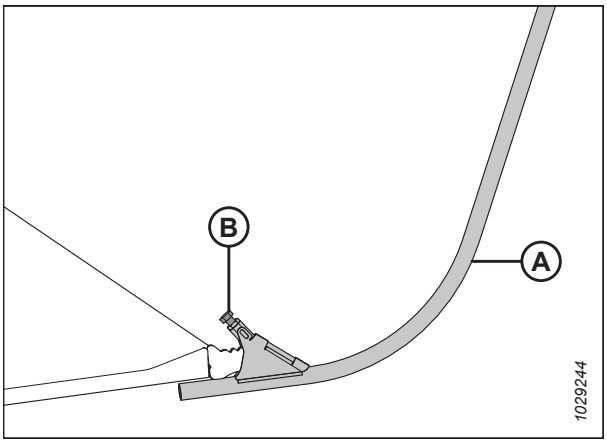


Figure 3.413: Crop Divider Rod

2. Store both crop divider rods (B) on the right endsheet, and secure with lynch pin (A).

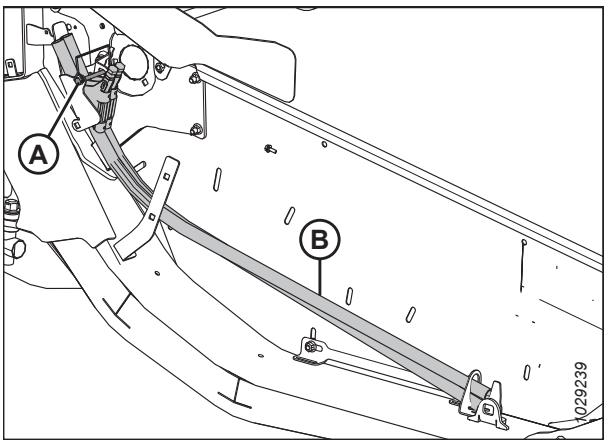


Figure 3.414: Right Endsheet

Installing Crop Divider Rods

The crop divider rods are used assist with separate tall standing crop from the crop being cut. They can be installed on the ends of the crop dividers.

1. Open the right endshield. For instructions, refer to *Opening Header Endshields, page 47*.
2. Undo lynch pin (A) securing divider rods (B) to the header endsheet, and remove the divider rods from the storage location.
3. Reinstall lynch pin (A).

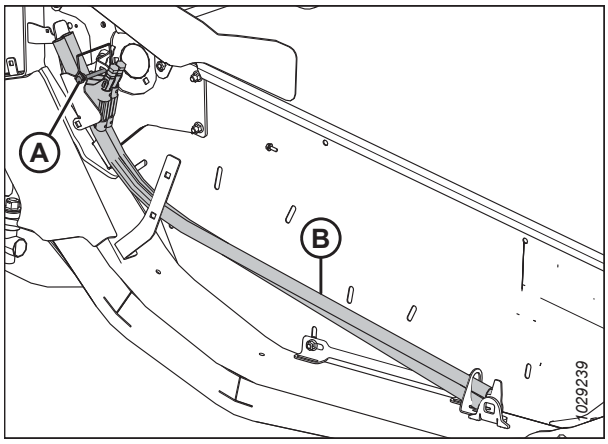


Figure 3.415: Divider Rods in Storage Location at Right Header Endsheet

4. Position crop divider rod (A) on the tip of the crop divider as shown and tighten bolt (B).
5. Repeat the procedure at the opposite end of the header.
6. Close the right endshield. For instructions, refer to *Closing Header Endshields, page 48*.

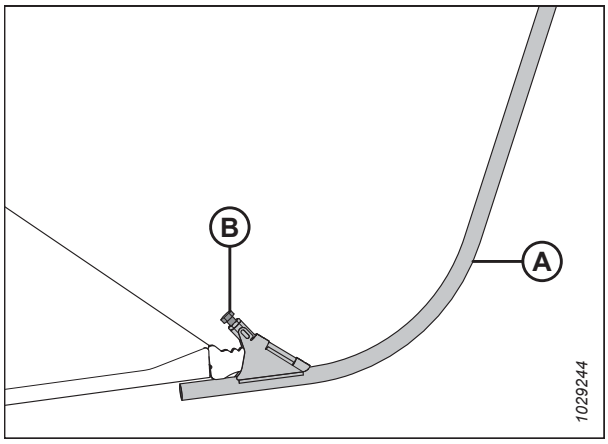


Figure 3.416: Divider Rod on Crop Divider

Optional Rice Divider Rods

The optional rice divider rods are used assist with tall and tangled rice crops. They can be installed on the ends of the crop dividers.

Optional rice divider rods provide improved performance in tall and tangled rice crops.

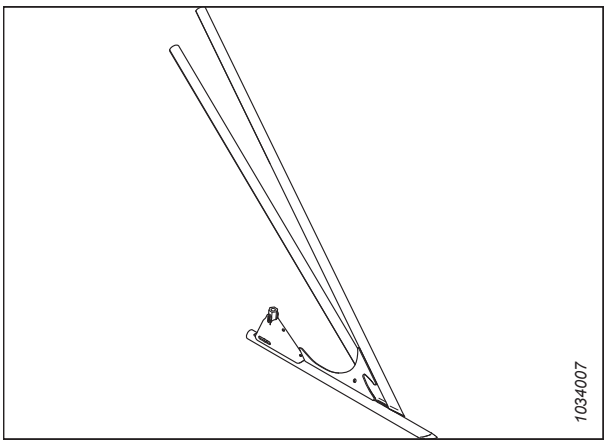


Figure 3.417: Optional Divider Rod for Rice

Rice divider rods are stored at the rear of both endsheets on storage bracket (A) and secured in place with pin (B). The installation and removal of these rods are the same as the procedures for standard crop divider rods.

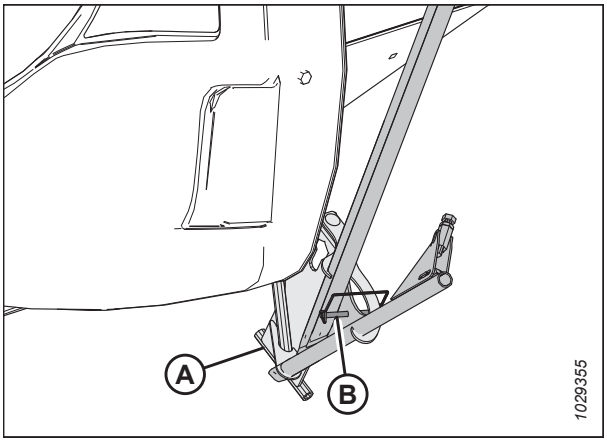


Figure 3.418: Rice Divider Rod Storage

3.10 Auto Header Height Control

MacDon's auto header height control (AHHC) feature works in conjunction with the AHHC option available on certain combine models.

There are two float height sensors (A) installed on the float setting indicators on the float module. These sensors send signals to the combine allowing it to maintain a consistent cutting height and an optimum float as the header follows ground contours.

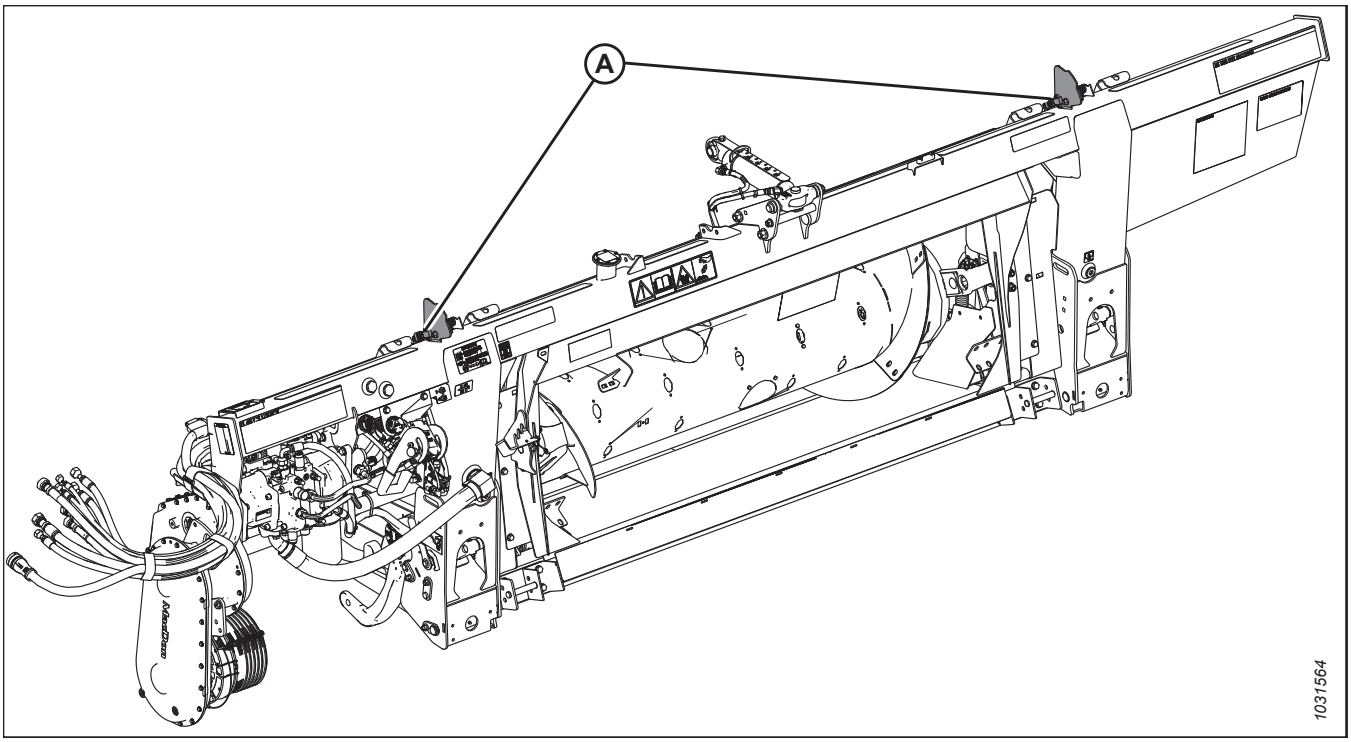


Figure 3.419: FM200 Float Module

To configure the AHHC system for your specific combine model, refer to the relevant procedure:

- *3.10.6 Case IH 130 and 140 Series Mid-Range Combines, page 278*
- *3.10.7 Case IH 120, 230, 240, and 250 Series Combines, page 287*
- *3.10.8 Challenger® and Massey Ferguson® 6 and 7 Series Combines, page 302*
- *3.10.9 CLAAS 500 Series Combines, page 310*
- *3.10.10 CLAAS 600 and 700 Series Combines, page 319*
- *3.10.11 CLAAS 7000 and 8000 Series Combines, page 330*
- *3.10.12 Gleaner R65/R66/R75/R76 and S Series Combines, page 340*
- *3.10.13 Gleaner S9 Series Combines, page 350*
- *3.10.14 IDEAL™ Series Combines, page 365*
- *3.10.15 John Deere 70 Series Combines, page 378*
- *3.10.16 John Deere S and T Series Combines, page 385*
- *3.10.17 John Deere S7 Series Combines, page 404*
- *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*
- *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*

3.10.1 Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system are hall-effect sensors. Normal operating signal voltages for the sensors fall between 10% (0.5 VDC) and 90% (4.5 VDC). An increase in sensor voltage correlates to a decrease in ground pressure, or if you are cutting off the ground on gauge wheels an increase in the header cut height.

Sensor errors result in a 0 V signal, indicating a faulty sensor, incorrect supply voltage, or a damaged wiring harness.

Sensors

Two magnetic sensors are installed on float setting indicators (A). As the header follows ground contours, the sensors communicate with the combine causing it to raise and lower the feeder house to maintain a consistent cutting height and optimum float.

Normal operating signal voltages for the sensors fall between 10% (0.5 VDC) and 90% (4.5 VDC). An increase in sensor voltage correlates to an increase in header height. Any sensor error results in a 0 V signal, which indicates either a faulty sensor or lack of supply voltage.

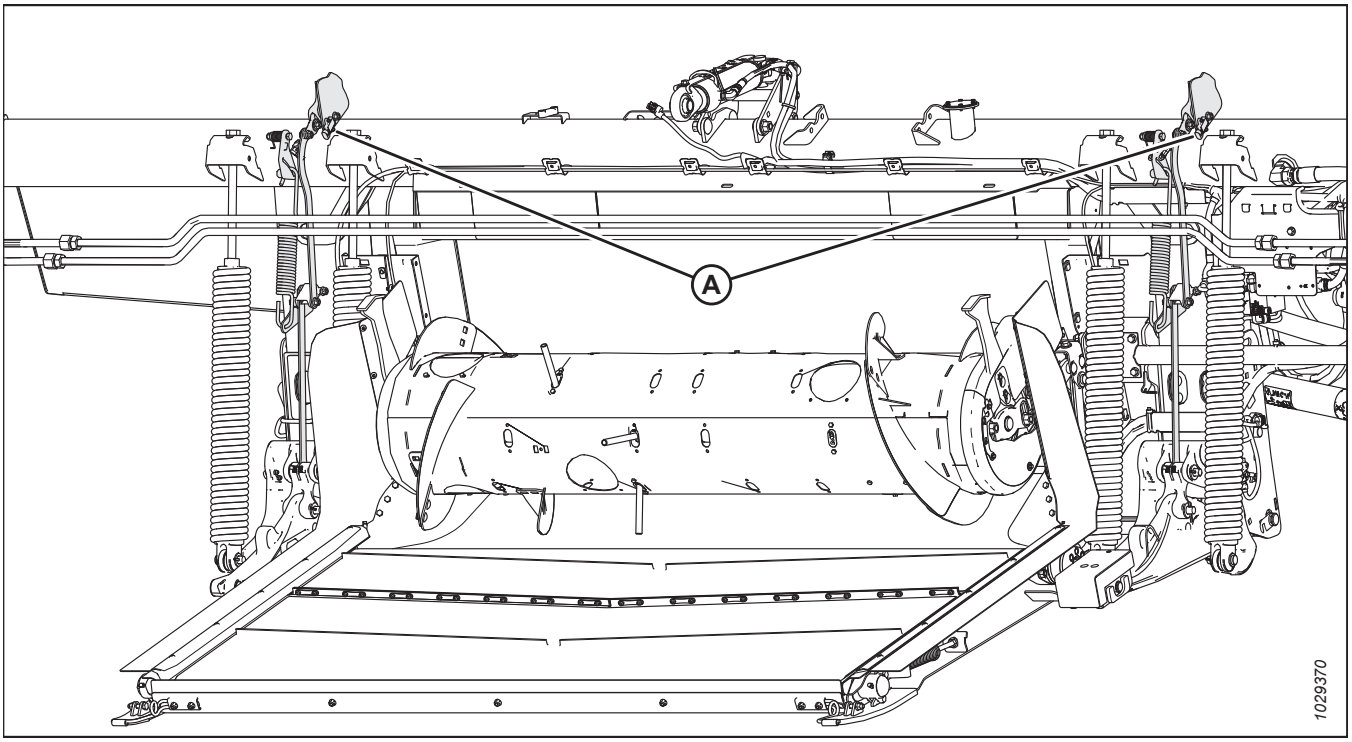


Figure 3.420: FM200 Float Module

Before using the AHHC feature, you must do the following:

1. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the following instructions for your combine).
2. Calibrate the AHHC system so that the combine can correctly interpret data from the height sensor on the float module (refer to the following instructions for your combine).

   NOTE:

   Once calibration is complete, you are ready to use the AHHC feature in the field. Individual combine settings can improve AHHC performance (refer to your combine operators manual).

The AHHC sensor(s) voltage must be between 0.5–4.5 V. If the voltage is too close to either end of the voltage range, there will be difficulty with calibration and operation of the AHHC. A properly set AHHC sensor will have room on both ends of the voltage range.

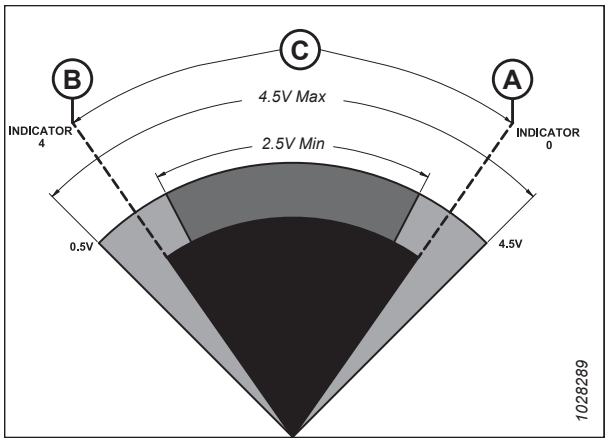


Figure 3.421: AHHC – Properly Set

A - High Voltage **B - Low Voltage**

C - Sensor Operating Range

A sensor that is adjusted too close to the high voltage or low voltage limit will have difficulty staying within the sensor's operating range of 0.5–4.5 V. If the sensor moves out of range, the AHHC will stop functioning correctly.

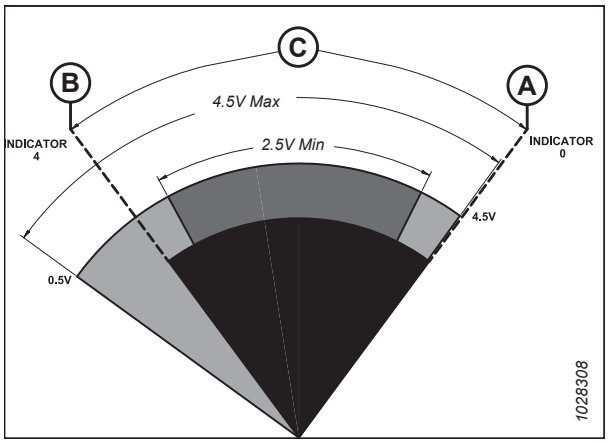


Figure 3.422: AHHC – Sensor Range to Close to the High Voltage Limit

A - High Voltage **B - Low Voltage**

C - Sensor Operating Range

A sensor with a voltage range that is too narrow will have difficulty staying within the set range. The combine will continually seek to keep the sensor within the set range.

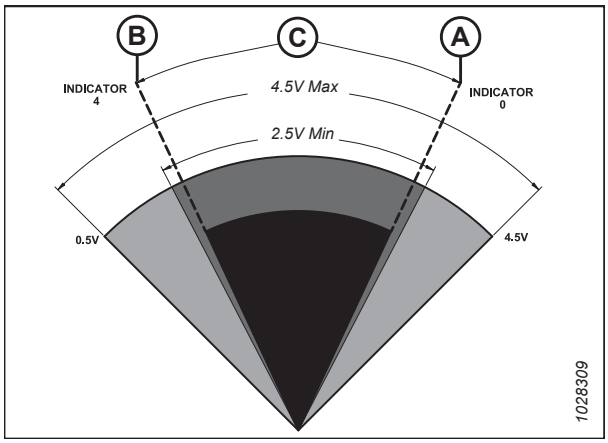


Figure 3.423: AHHC – Sensor Range to Narrow

A - High Voltage **B - Low Voltage**

C - Sensor Operating Range

3.10.2 Sensor Output Voltage Range – Combine Requirements

The auto header height control (AHHC) sensor output must be within a specific voltage range for each combine, or the AHHC feature will not work properly.

Table 3.32 Combine Voltage Limits

Combine	Lower Voltage Limit	Upper Voltage Limit	Range
Case IH 5088/6088/7088, 5130/6130/7130, 7120/8120/9120, 7230/8230/9230, and 7240/8240/9240	0.5 V	4.5 V	2.5 V
Challenger® B, C, and IDEAL™ Series	0.5 V	4.5 V	2.5 V
CLAAS 500/600/700 Series, 7000/8000 Series, and Tucano Series	0.5 V	4.5 V	2.5 V
Fendt IDEAL™ Series	0.5 V	4.5 V	2.5 V
Gleaner A6, R, and S Series	0.5 V	4.5 V	2.5 V
John Deere 70, S, and T Series	0.5 V	4.5 V	2.5 V
Massey Ferguson® 9005, 9500, and IDEAL™ Series	0.5 V	4.5 V	2.5 V
New Holland CR/CX - 5 V system	0.7 V	4.3 V	2.5 V
New Holland CR/CX - 10 V system	2.8 V	7.2 V	4.1–4.4 V
Rostelmash Torum and RSM161 Series	0.5 V	4.5 V	2.5 V
Versatile RT490	0.5 V	4.5 V	2.5 V

3.10.3 Manually Checking Voltage Limits

In order for the auto header height to function properly the voltage needs to be set properly.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Park the combine on a level surface.
3. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.

Checking sensor high voltage limit

4. Extend the guard angle until header angle indicator (A) is at **E**.

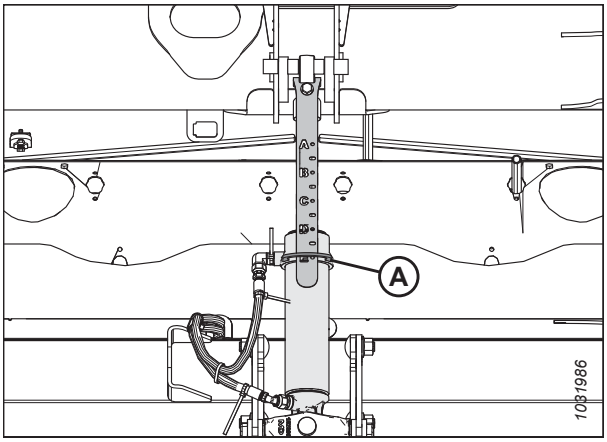


Figure 3.424: Center-Link

5. Float indicator pointer (A) should be at 0 (B).

6. Shut down the engine, and remove the key from the ignition.

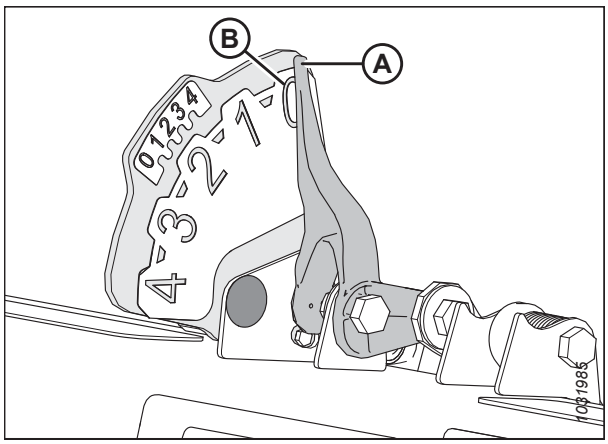


Figure 3.425: Left Float Indicator – View from Rear

7. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is **NOT** on its down stops, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on down stops, refer to *3.11 Leveling Header, page 446* for instructions.

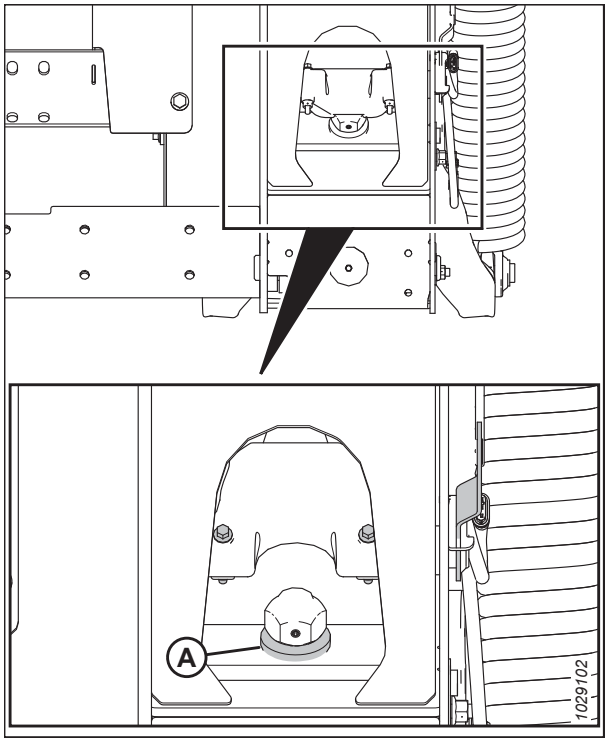


Figure 3.426: Down Stop Washer

8. Locate connector P600 (A) at the left front of the float module.
9. Remove plug cap (B).
10. Turn the key to the run position.
11. Check P600 for power from the combine. There should be 5V at pin 7.
    - Pin 7 - FM2215E – power
    - Pin 8 - FM2515E – ground
12. On connector P600, confirm voltage of 3.8–4.3 V from left sensor (pins 1 and 8), and right sensor (pins 3 and 8).
    - Pin 1 - FM3326A – left sensor signal
    - Pin 3 - FM3328A – right sensor signal
    - Pin 8 - FM2515E – ground

    NOTE:

    If the standard plug is installed in P600, the plug sends the average of both sensors to the combine. If the optional lateral tilt plug is installed, then the plug sends separate voltage signals from both sensors to the combine.

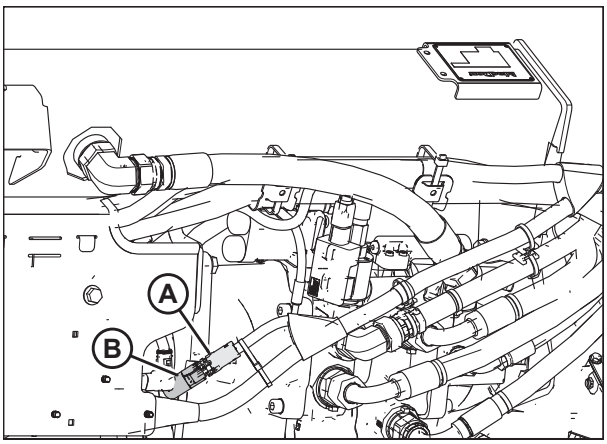


Figure 3.427: Left Float Indicator – View from Rear

Checking sensor low voltage limit

13. Extend the guard angle until header angle indicator (A) is at **E**.

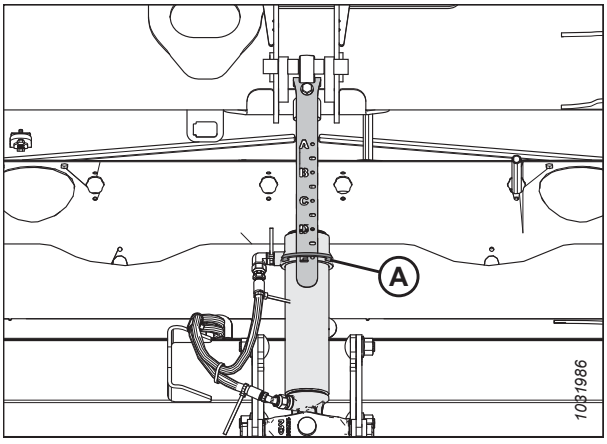


Figure 3.428: Center-Link

14. Fully lower header on the ground, float indicator pointer (A) should be at **4** (B).

15. Turn the key to the run position.

16. On connector P600, confirm voltage of 0.7–1.2 V from left sensor (pins 1 and 8), and right sensor (pins 3 and 8).

    - Pin 1 - FM3326A – left sensor signal
    - Pin 3 - FM3328A – right sensor signal
    - Pin 8 - FM2515E – ground

    NOTE:

    If the standard plug is installed in P600, the plug sends the average of both sensors to the combine. If the optional lateral tilt plug is installed, then the plug sends separate voltage signals from both sensors to the combine.

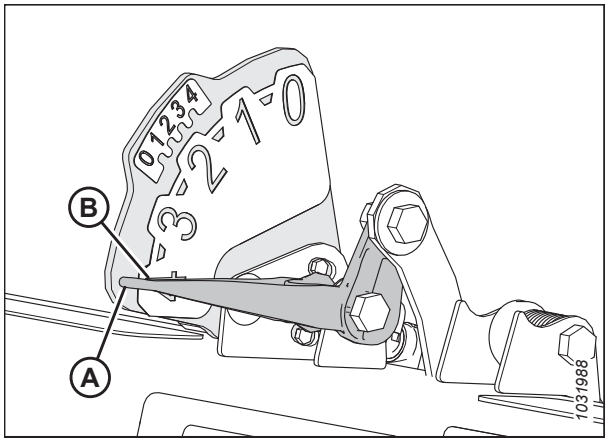


Figure 3.429: Left Float Indicator – View from Rear

3.10.4 Replacing Float Height Sensor

Two magnetic sensors are installed on the float setting indicators. As the header follows ground contours, the sensors communicate with the combine causing it to raise and lower the feeder house to maintain a consistent cutting height and optimum float.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

This procedure can be completed on either side of the float module.

1. Park the combine on a level surface.
2. Lower the header fully.
3. Lower the reel fully.
4. Shut down the engine, and remove the key from the ignition.
5. Disconnect harness plug P537 (C) from the sensor on the left side of the float module.

   NOTE:

   If replacing the float height indicator sensor on the right side of the float module, disconnect plug P539.

6. Remove bolt (A).
7. Remove indicator plate (B) complete with the sensor.

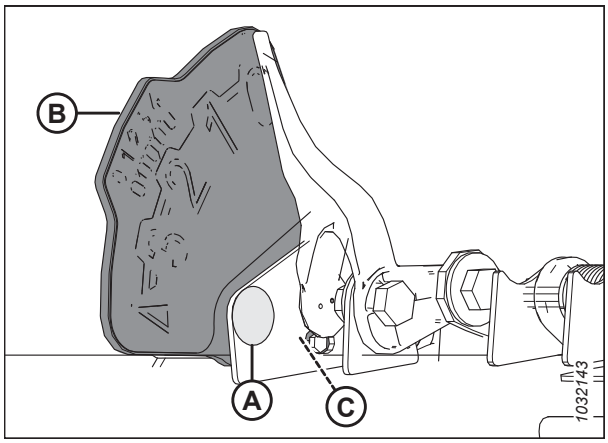


Figure 3.430: Float Setting Indicator – Left

8. Remove two bolts and nuts (A).
9. Remove and discard old sensor (B).
10. Install new sensor (B), with the plug facing down.
11. Install two bolts and nuts (A).

    NOTE:
    Bolt heads should be on the same side as the decal.

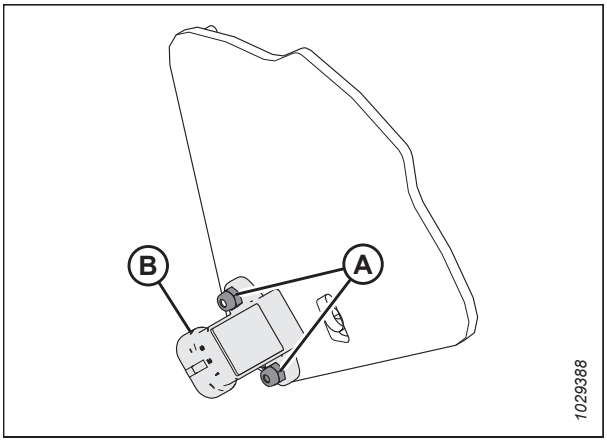


Figure 3.431: Float Height Sensor

12. Install indicator plate (B) complete with the sensor.
13. Install bolt (A).
14. Connect harness plug (C).

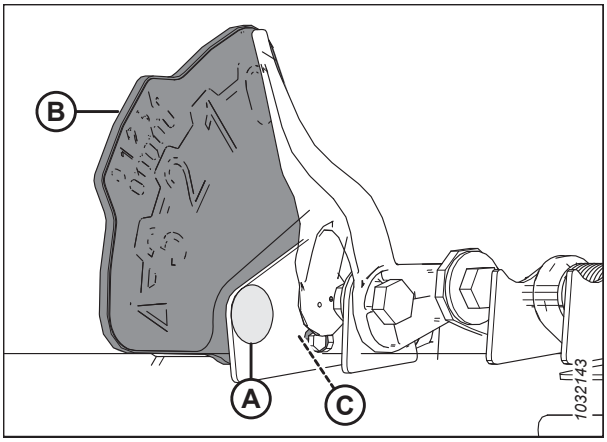


Figure 3.432: Float Setting Indicator – Left

3.10.5 10 Volt Adapter (MD #B7241) – New Holland Combines Only

New Holland combines with a 10 V system require the 10 V adapter (MD #B7241) for calibration of the auto header height control (AHHC) feature.

If a 10 V New Holland combine does not have adapter (A) installed, the AHHC output will always read 0 V regardless of the sensor position.

To check sensor voltages, refer to *3.10.3 Manually Checking Voltage Limits, page 273*.

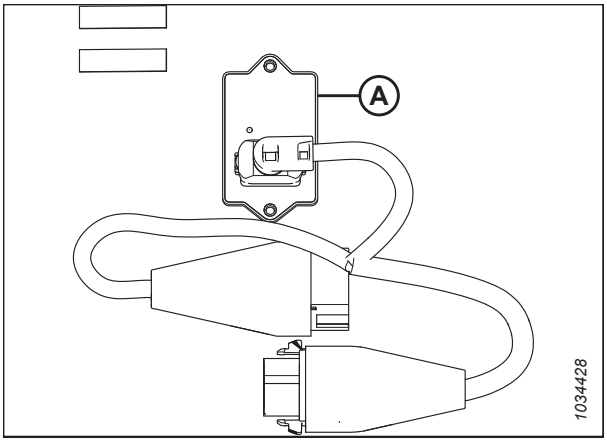


Figure 3.433: 10 V Adapter (MD #B7241)

3.10.6 Case IH 130 and 140 Series Mid-Range Combines

To make your header's auto header height control (AHHC) system compatible with Case IH 130 and 140 Series mid-range combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from Combine Cab – Case IH 5130/6130/7130; 5140/6140/7140

The auto header height control sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

WARNING

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground, and unlock the float.
2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

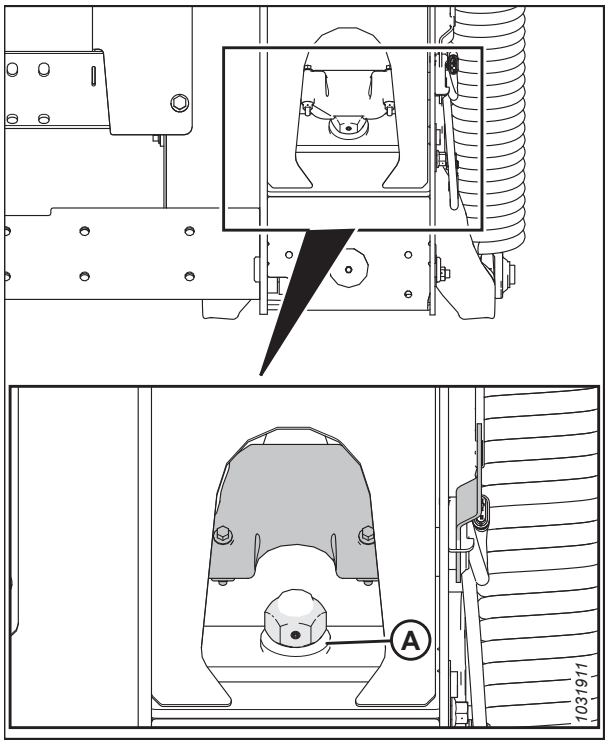


Figure 3.434: Float Lock

3. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).
4. Tighten bolt (A).

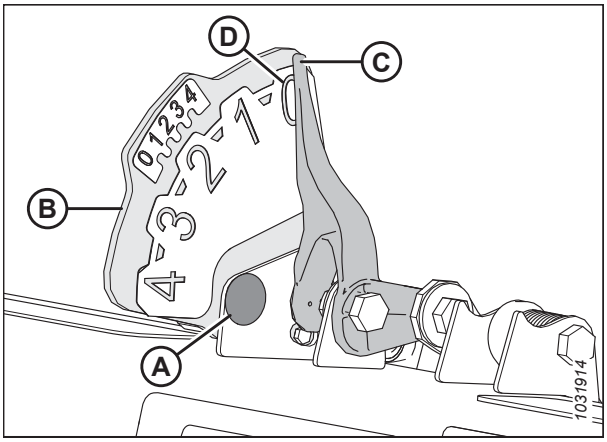


Figure 3.435: Float Indicator

5. Ensure the header float is unlocked.
6. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page appears.

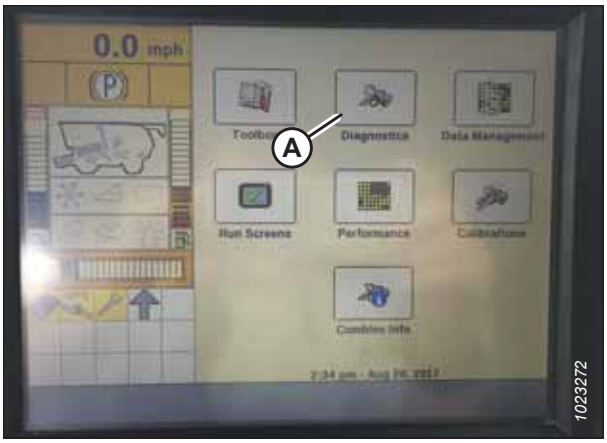


Figure 3.436: Case IH Combine Display

7. Select SETTINGS (A). The SETTINGS page appears.
8. From the GROUP menu, select HEADER (B).

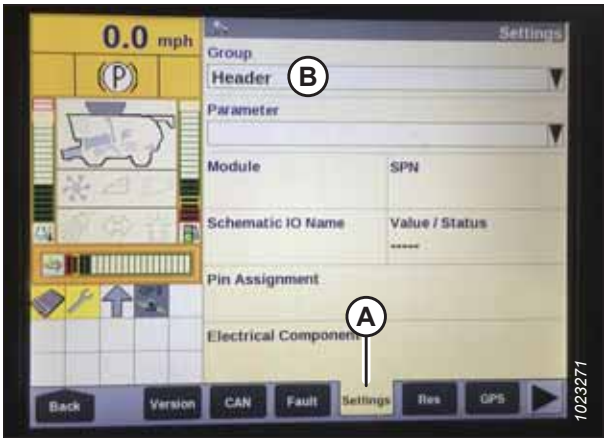


Figure 3.437: Case IH Combine Display

9. From the PARAMETER menu, select LEFT HEIGHT/TILT SENSOR (A).

Figure 3.438: Case IH Combine Display

10. The SETTINGS page updates to display the voltage in VALUE/STATUS field (A). Lower the feeder house fully, and then raise it 254–356 mm (10–14 in.) off the ground to view the full range of voltage readings.

Figure 3.439: Case IH Combine Display

Header Settings Quick Reference – Case IH 130 and 140 Series

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

For detailed instructions, proceed to the Case IH 130 and 140 Series combine header setup and calibration procedures.

Table 3.33 Header Settings – Case IH 130 and 140 Series

Setup Parameter	Suggested Setting	
Cutting Type	Platform	
Header Pressure Float	Not installed	
HHC Height Sensitivity[64]	Two sensor system	250
	One sensor system	180
HHC Tilt Sensitivity	150	
Reel Drive Type	Standard 19-tooth drive sprocket	4
	Optional high-torque 14-tooth drive sprocket	5
	Optional high-torque 10-tooth drive sprocket	6
Reel Height Sensor	Yes	

64. If hunting occurs during operation, decrease the HUNTING setting by 20 points at a time until hunting no longer occurs.

Table 3.33 Header Settings – Case IH 130 and 140 Series (continued)

Setup Parameter	Suggested Setting	
Autotilt	Two sensor system	YES
	One sensor system	NO

Setting up Header on Combine Display – Case IH 5130/6130/7130; 5140/6140/7140

To set up the header to work with a Case IH 5130/6130/7130 or 5140/6140/7140 combine, you will need to access the HEADER SETUP page on the combine display.

1. On the main page of the combine display, select TOOLBOX (A).

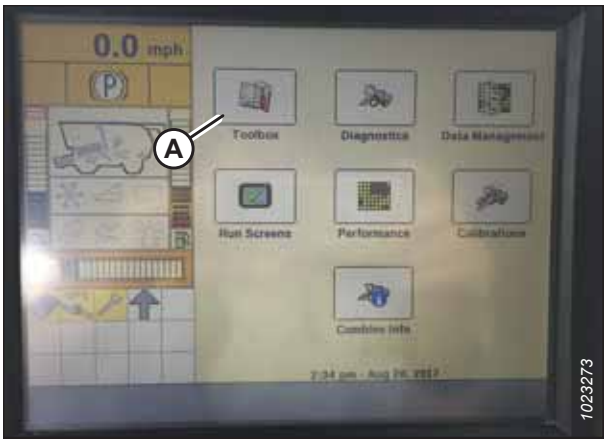


Figure 3.440: Case IH Combine Display

2. Select HEAD 1 tab (A). The HEADER SETUP page appears.

   NOTE:

   To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (C).

3. From CUTTING TYPE menu (B), select PLATFORM.

Figure 3.441: Case IH Combine Display

4. Select HEAD 2 tab (A). The HEADER SETUP 2 page appears.
5. From HEADER PRESSURE FLOAT menu (B), select NOT INSTALLED.
6. From DRAPER GRAIN HEADER STYLE menu (C), select FLEX 2000 SERIES.

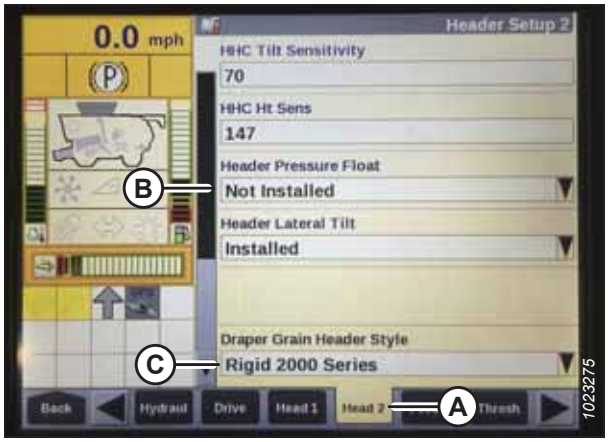


Figure 3.442: Case IH Combine Display

7. Locate HHC HEIGHT SENSITIVITY field (A). Enter the following settings:
   - **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.
   - **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.

   NOTE:

   If hunting occurs during operation, decrease the HUNTING setting by 20 points at a time until hunting no longer occurs.
8. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.

Figure 3.443: Case IH Combine Display

9. From REEL DRIVE TYPE menu (A), select one of the following:
   - 4 if you are using a standard 19-tooth drive sprocket.
   - 5 if you are using an optional high-torque 14-tooth drive sprocket.
   - 6 if you are using an optional high-torque 10-tooth drive sprocket.

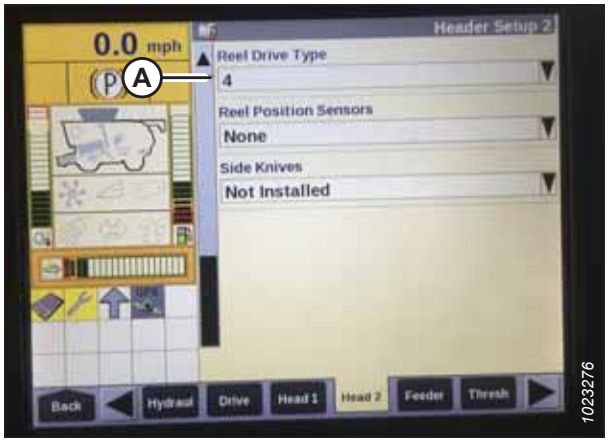


Figure 3.444: Case IH Combine Display

10. From REEL HEIGHT SENSOR menu (A), select YES.

Figure 3.445: Case IH Combine Display

11. Locate AUTOTILT field (A).
    - **If using a two-sensor system:** Select YES in the AUTOTILT field.
    - **If using a single-sensor system:** Select NO in the AUTOTILT field.

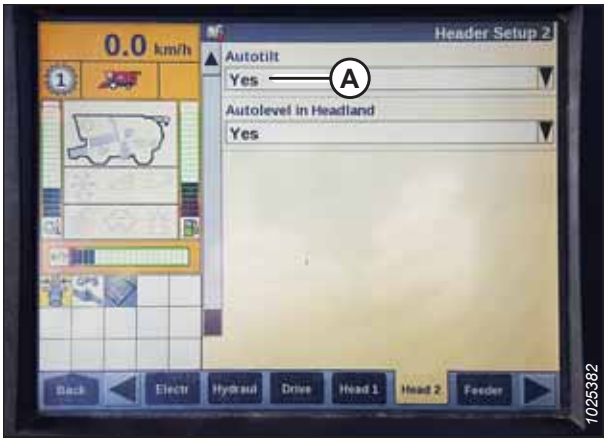


Figure 3.446: Case IH Combine Display

Calibrating Auto Header Height Control – Case IH 5130/6130/7130, 5140/6140/7140

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with a software version 28.00 or above, refer to *Calibrating Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software, page 295*.

1. To view the software version, select the DIAGNOSTICS button from the Home Screen, then select VERSION tab (A).

Figure 3.447: Case IH Combine Display

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. In order to prevent the header from separating from the float module, it may be necessary to change the float to a heavier setting during the calibration procedure.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

2. Ensure that the center-link is set to **D**.
3. Confirm that all electrical and hydraulic connections between the header and float module are functional.
4. Start the combine engine, but do **NOT** engage the separator or the feeder house.
5. Locate the HEADER CONTROL switch on the right console, and set to HT (this is AHHC mode).
6. Hold the DOWN button for 10 seconds, or until the combine feeder house has been lowered all the way down (the feeder house will stop moving).
7. Push the RAISE button and hold it until the feeder house travels all the way up. It will stop 61 cm (2 ft.) above the ground for 5 seconds, then it will resume traveling upward. This is an indication that calibration is successful.

   NOTE:

   If the float was changed to a heavier setting to complete the AHHC calibration procedure, adjust it to the recommended operating float weight after the calibration is complete.

Setting Preset Cutting Height – Case 5130/6130/7130, 5140/6140/7140

Once the cab combine display has been configured, the preset cutting heights can be used.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

Indicator (A) should be at position 0 (B) with the header 254–356 mm (10–14 in.) off the ground. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

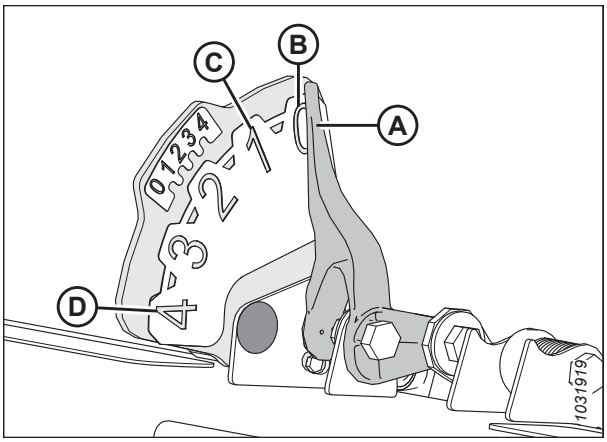


Figure 3.448: Float Indicator

1. Engage the separator and header.
2. Manually raise or lower the header to the desired cutting height.
3. Press 1 on button (A). A yellow light next to the button will illuminate.

   NOTE:

   When setting presets, always set the header position before setting the reel position. If the header and the reel are set at the same time, the reel setting will not be saved.
4. Manually raise or lower the reel to the desired working position.
5. Press 1 on button (A). A yellow light next to the button will illuminate.
6. Manually raise or lower the header to a second desired cutting height.
7. Press 2 on button (A). A yellow light next to the button will illuminate.
8. Manually raise or lower the reel to the desired working position.
9. Press 2 on button (A). A yellow light next to the button will illuminate.

Figure 3.449: Case Combine Console

Figure 3.450: Case Combine Console

Up and down arrows should now appear in MANUAL HEIGHT box (A) on the RUN 1 page on the combine display. This indicates that the auto header height control (AHHC) is functioning.

Figure 3.451: Case Combine Display – Run 1 Page

10. To enable the presets, activate AHHC button (A) to place the header on the ground. To enable the first preset, tap the button once. To enable the second preset, tap the button twice.

    To lift the header to maximum working height, hold the SHIFT button on the back of the control handle while tapping AHHC button (A).

Figure 3.452: Case Combine Control Handle

11. The maximum working height can be adjusted on the HEADER SETUP page on the combine display. Enter the desired height in MAXIMUM WORKING HEIGHT field (A).

Figure 3.453: Case Combine Display – Header Setup Page

12. If you need to change the position of one of the presets, you can fine-tune this setting with button (A) on the combine console.

Figure 3.454: Case Combine Console

3.10.7 Case IH 120, 230, 240, and 250 Series Combines

To make your header's auto header height control (AHHC) system compatible with Case IH 120, 230, 240, and 250 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from Combine Cab – Case IH, 120, 230, 240, and 250 Series Combines

In order for the auto header height control (AHHC) system to work correctly, the header height sensors must be sending the correct voltage readings. The sensor outputs can be viewed using the combine display.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

DANGER

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground, and unlock the float.

2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

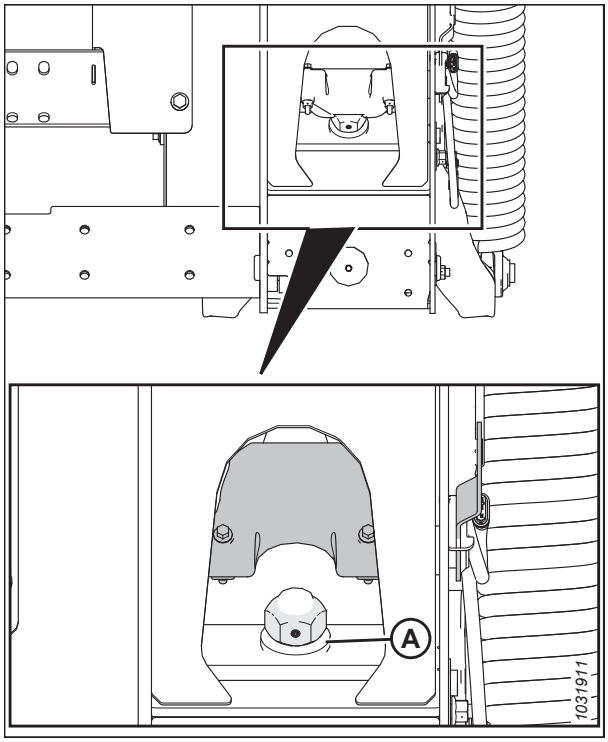


Figure 3.455: Float Lock

3. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).

4. Tighten bolt (A).

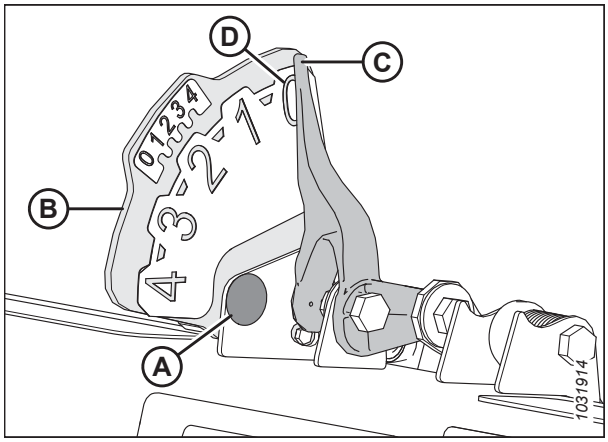


Figure 3.456: Float Indicator

5. Ensure the header float is unlocked.
6. Select DIAGNOSTICS (A) on the MAIN page. The DIAGNOSTICS page opens.
7. Select SETTINGS. The SETTINGS page opens.

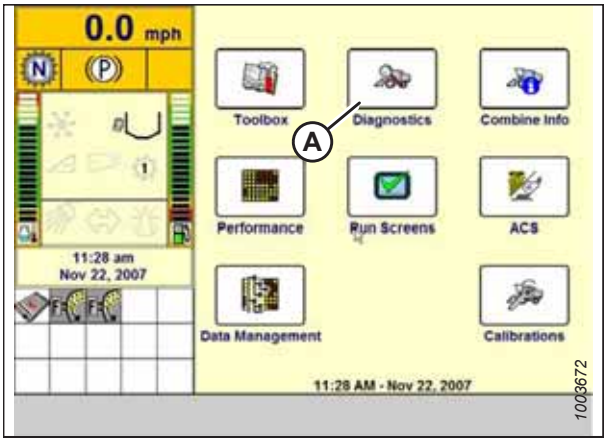


Figure 3.457: Case IH Combine Display

8. Select GROUP drop-down menu (A). The GROUP dialog box opens.

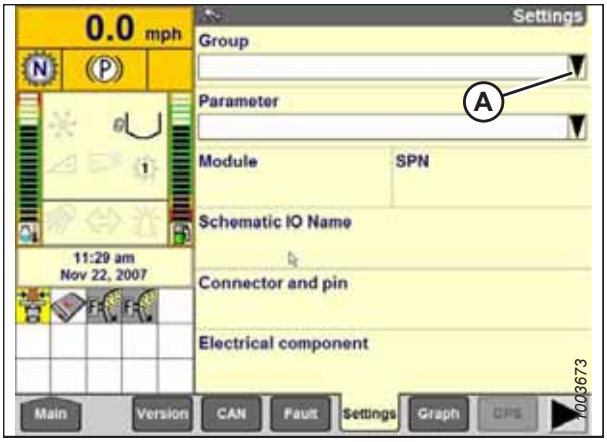


Figure 3.458: Case IH Combine Display

9. Select HEADER HEIGHT/TILT (A). The PARAMETER page opens.

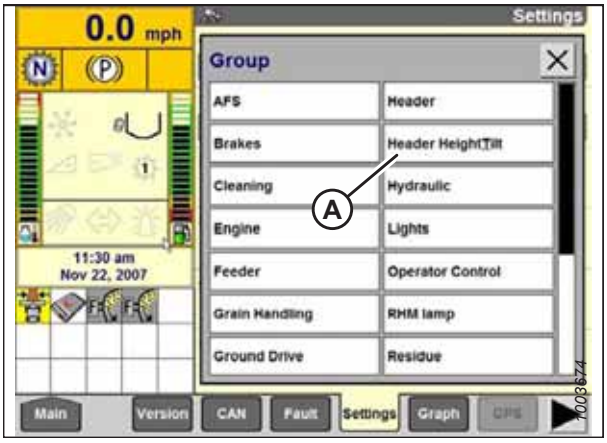


Figure 3.459: Case IH Combine Display

10. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at top of page. Raise and lower the header to see the full range of voltage readings.

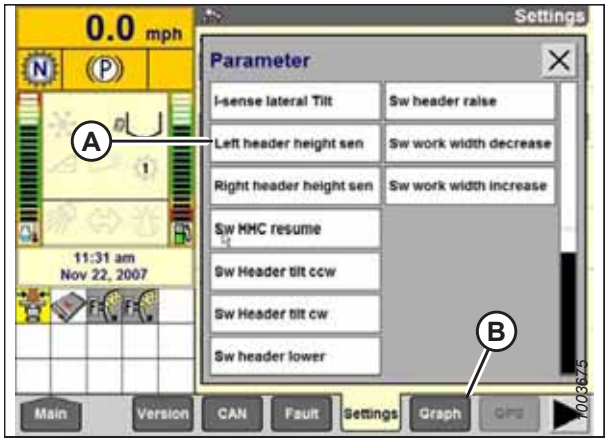


Figure 3.460: Case IH Combine Display

Header Settings Quick Reference – Case IH 120, 230, 240, and 250 Series

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

NOTE:

The setting options vary based on the combine software version. For version 28.00 or higher, refer to Table*3.34, page 290*; for lower versions, refer to Table*3.35, page 291*.

For detailed instructions, proceed to the Case IH 120, 230, 240, and 250 Series combine header setup and calibration procedures.

Table 3.34 Header Settings – Case IH 120, 230, 240, and 250 Series (Software Version 28.00 or Higher)

Setup Parameter	Suggested Setting	
Header Sub Type	2000	
Frame Type	Flex	
Header Sensors	Enable	
Header Pressure Float	No	
Height/Tilt Response	Fast	
Auto Height Override	Yes	
HHC Height Sensitivity[65]	Two sensor system	250
	One sensor system	180
HHC Tilt Sensitivity	150	
Reel Height Sensor	Yes	
Autotilt	Two sensor system	YES
	One sensor system	NO

65. If hunting occurs during operation, decrease the HUNTING setting by 20 points at a time until hunting no longer occurs.

Table 3.35 Header Settings – Case IH 120, 230, 240, and 250 Series (Below Software Version 28.00)

Setup Parameter	Suggested Setting	
Header Style	Flexhead	
Auto Reel Speed Slope	133	
Header Pressure Float	No	
Reel Drive	Hydraulic	
Reel Fore-Back	Yes	
HHC Height Sensitivity[66]	Two sensor system	250
	One sensor system	180
HHC Tilt Sensitivity	150	
Fore/Aft Control	Yes	
Hdr Fore/Aft Tilt	Yes	
Header Type (Head2 Tab)	Draper	
Cutting Type	Platform	
Header Width	Set according to header specification	
Header Usage	Set according to header specification	
Reel Height Sensor	Yes	
Autotilt	Two sensor system	YES
	One sensor system	NO

Calibrating Auto Header Height Control – Case IH120, 230, 240, and 250 Series Combines

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to *Calibrating Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software, page 295*.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for calibration procedure so the header does not separate from the float module.

NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

66. If hunting occurs during operation, decrease the HUNTING setting by 20 points at a time until hunting no longer occurs.

1. Ensure the center-link is set to **D**.
2. Confirm that all electrical and hydraulic connections between the header and float module are functional.
3. Select TOOLBOX (A) on the MAIN page.

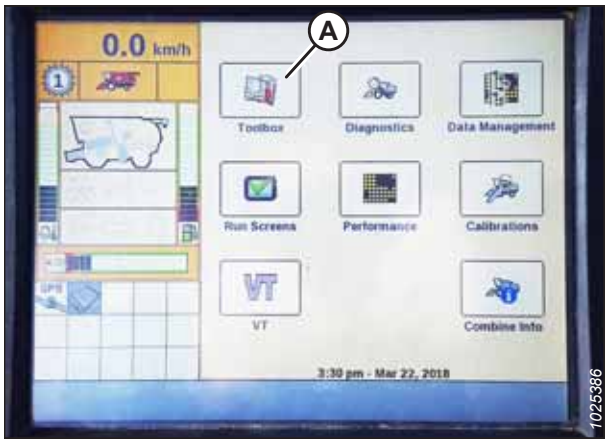


Figure 3.461: Case IH Combine Display

4. Select HEADER tab (A).

   NOTE:

   To locate the HEADER tab, you may need to scroll to the right using side arrows (C).

5. Set HEADER STYLE (B).

Figure 3.462: Case IH Combine Display

6. Set AUTO REEL SPEED SLOPE.

   NOTE:

   The AUTO REEL SPEED SLOPE value automatically maintains the speed of the reel relative to ground speed. For example, if the value is set to 133, then the reel will turn faster than the ground speed. The reel's speed should be faster than the combine's ground speed; however, adjust the value according to crop conditions.

7. Set HEADER PRESSURE FLOAT to NO if equipped, and ensure REEL DRIVE is set to HYDRAULIC.

Figure 3.463: Case IH Combine Display

8. Set REEL FORE-BACK to YES (if applicable).

Figure 3.464: Case IH Combine Display

9. Locate HHC HEIGHT SENSITIVITY field (A), and set it as follows:

   - **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.
   - **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.

   NOTE:

   If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

10. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease sensitivity as desired.

Figure 3.465: Case IH Combine Display

11. Set FORE/AFT CONTROL and HDR FORE/AFT TILT to YES (if applicable).

Figure 3.466: Case IH Combine Display

12. Press HEAD2 (A) at the bottom of the page.
13. Ensure HEADER TYPE (B) is set to DRAPER.

    NOTE:

    If the recognition resistor is plugged in to the header harness, you will not be able to change this.

14. Set CUTTING TYPE (C) to PLATFORM.
15. Set HEADER WIDTH (D) and HEADER USAGE (E) to the appropriate values.

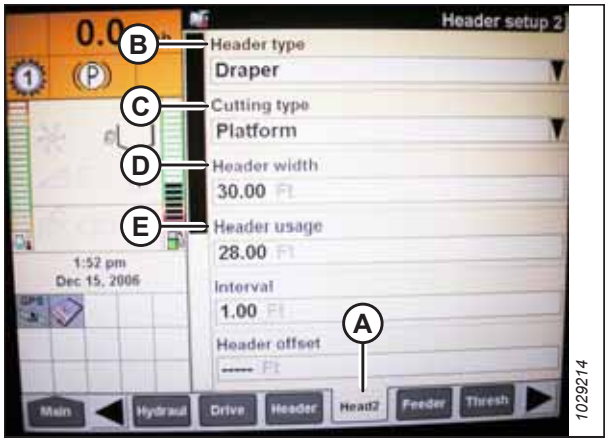


Figure 3.467: Case IH Combine Display

16. From the REEL HEIGHT SENSOR menu, select YES (A).

Figure 3.468: Case IH Combine Display

17. Locate AUTOTILT field (A) and set it as follows:

    - **If using a two-sensor system:** Select YES in the AUTOTILT field.
    - **If using a single-sensor system:** Select NO in the AUTOTILT field.

    NOTE:

    If the float was changed to a heavier setting to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

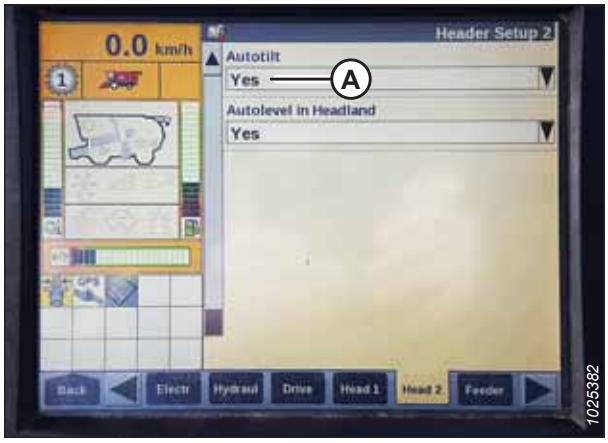


Figure 3.469: Case IH Combine Display

Calibrating Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software

Calibrate the auto header height control (AHHC) sensor output for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. To view the software version, select the DIAGNOSTICS button from the Home Screen, then select VERSION tab (A).

Figure 3.470: Case IH Combine Display

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

2. Set the header center-link to **D**.
3. Raise the header onto the down stops and unlock the float.
4. Place the wings in the locked position.

Adjusting settings in the combine display

5. Select TOOLBOX (A) on the MAIN page.

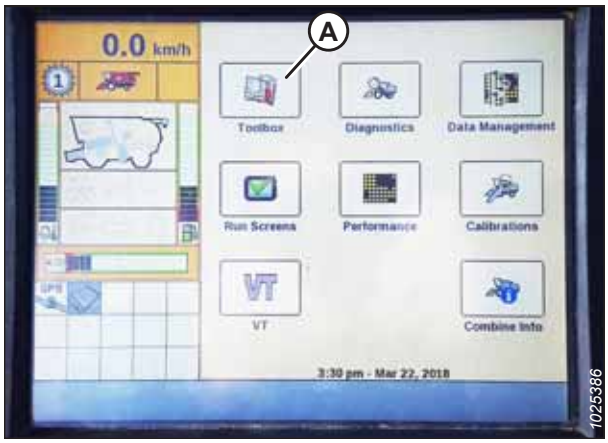


Figure 3.471: Case IH Combine Display

6. Select HEAD 1 tab (A).

   NOTE:

   To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (B).

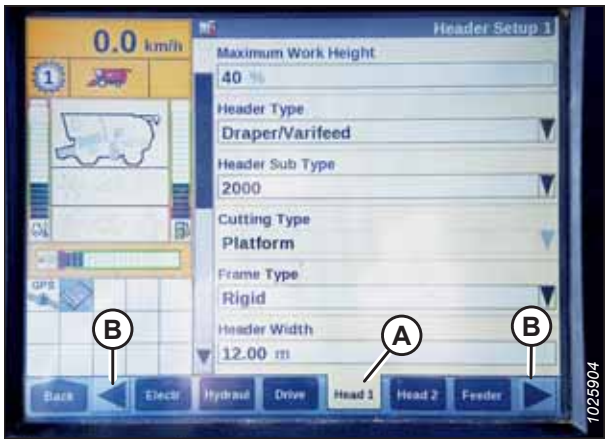


Figure 3.472: Case IH Combine Display

7. Locate the HEADER SUB TYPE field.
8. Select 2000 (A).

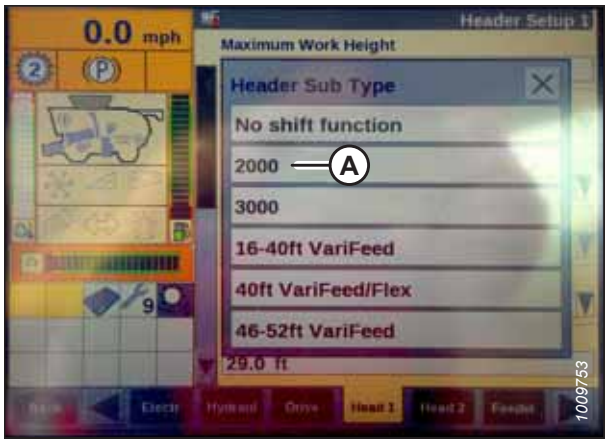


Figure 3.473: Case IH Combine Display

9. Return to the Head 1 page and choose FLEX from FRAME TYPE drop-down menu (A).

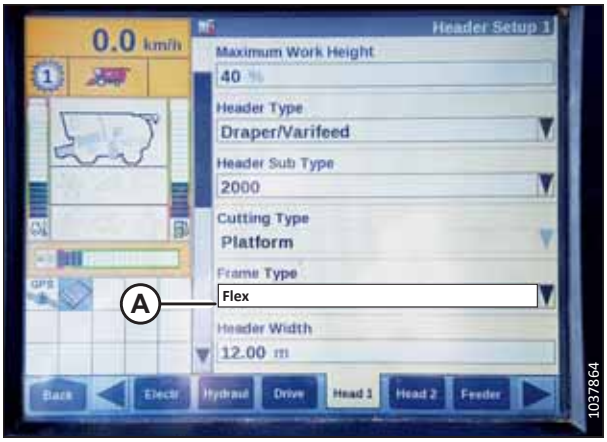


Figure 3.474: Case IH Combine Display

10. Select HEAD 2 tab (A).
11. In HEADER SENSORS field (B), select ENABLE.
12. In HEADER PRESSURE FLOAT field (C), select NO.
13. In HEIGHT/TILT RESPONSE field (D), select FAST.
14. In AUTO HEIGHT OVERRIDE field (E), select YES.
15. Press down arrow (F) to go to the next page.

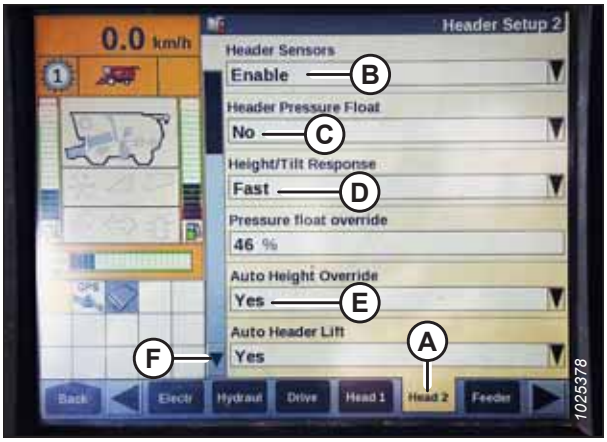


Figure 3.475: Case IH Combine Display

16. Locate HHC HEIGHT SENSITIVITY field (A), and set it as follows:
    - **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.
    - **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.

    NOTE:

    If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.
17. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease the sensitivity as desired.

Figure 3.476: Case IH Combine Display

18. From the REEL HEIGHT SENSOR menu, select YES (A).

Figure 3.477: Case IH Combine Display

19. Scroll to the AUTOTILT field (A), and set it as follows:

    - **If using a two-sensor system:** Select YES in the AUTOTILT field.
    - **If using a single-sensor system:** Select NO in the AUTOTILT field.

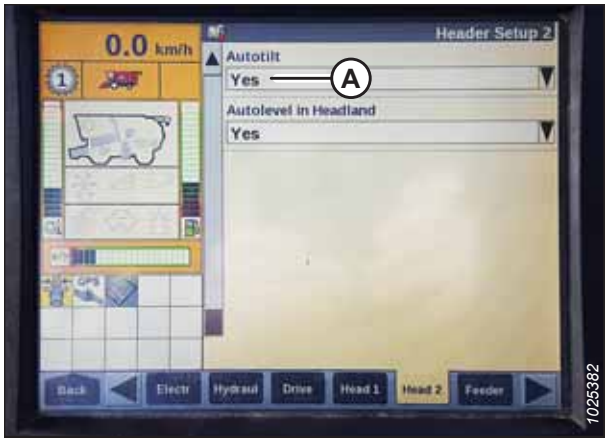


Figure 3.478: Case IH Combine Display

Calibrating Auto Header Height Control

20. Select CALIBRATION on the combine display and press the right arrow navigation key to enter the information box.
21. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

    NOTE:

    Use the UP and DOWN navigation keys to move between options.

Figure 3.479: Case IH Combine Display

22. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

    NOTE:

    Pressing the ESC key during any of the steps or letting the system sit idle for over 3 minutes will stop the calibration procedure.

    NOTE:

    Refer to your combine operator's manual for an explanation of any error codes.

Figure 3.480: Case IH Combine Display

23. When all steps have been completed, CALIBRATION SUCCESSFUL message displays on the page. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

    NOTE:

    If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

24. Ensure AUTO HEIGHT icon (A) appears on the monitor as shown at location (B). When the header is set for cutting on the ground, this verifies that the combine is correctly using the sensor on the header to sense ground pressure.

    NOTE:

    Icons (A) and (B) appear on the monitor only after engaging the separator and header, and then pressing HEADER RESUME button on the control panel.

    NOTE:

    AUTO HEIGHT field (B) may appear on any of the RUN tabs and not necessarily on the RUN 1 tab.

Figure 3.481: Case IH Combine Display

Checking Reel Height Sensor Voltages – Case IH Combines

The voltage output of the reel height sensors can be inspected using the combine display in the cab.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page appears.

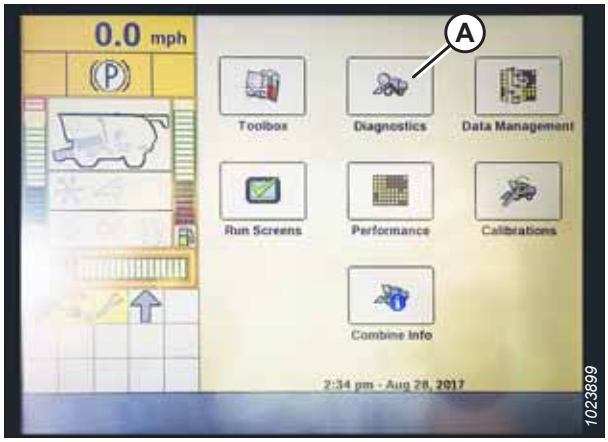


Figure 3.482: Case IH Combine Display

2. Select SETTINGS tab (A). The SETTINGS page appears.
3. From the GROUP menu, select HEADER (B).
4. From the PARAMETER menu, select REEL VERTICAL POSITION (C).

Figure 3.483: Case IH Combine Display

5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph appears.
6. Lower the reel to view upper voltage (B). The voltage should be 4.1–4.5 V.
7. Raise the reel to view lower voltage (C). The voltage should be 0.5–0.9 V.
8. If either voltage is out of range, refer to *Checking and Adjusting Reel Height Sensor, page 231*.

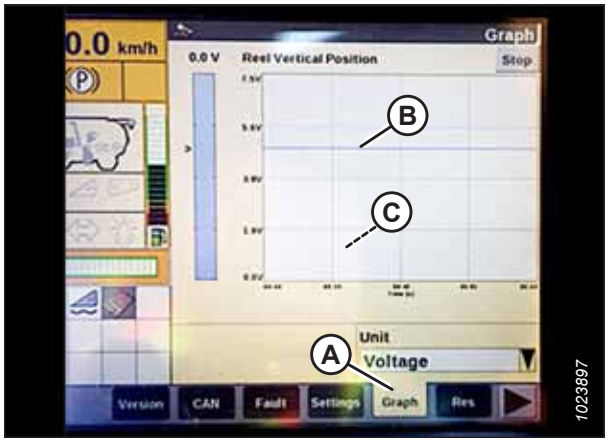


Figure 3.484: Case IH Combine Display

Setting Preset Cutting Height – Case IH, 120, 230, 240, and 250 Series Combines

Once the auto header height control (AHHC) system has been configured to work with the header, the preset cutting height can be set.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

Indicator (A) should be at position 0 (B) with the header 254–356 mm (10–14 in.) off the ground. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

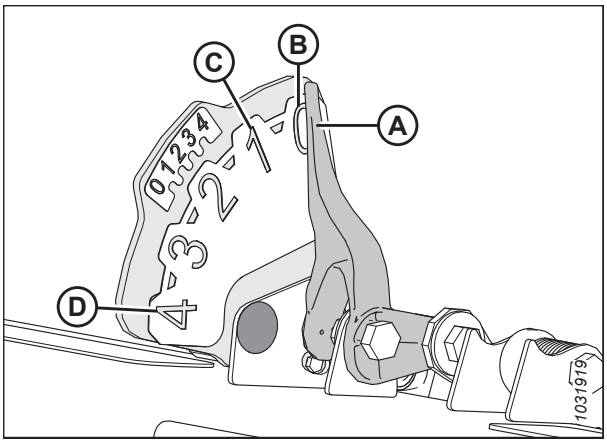


Figure 3.485: Float Indicator

1. Engage the separator and the header.
2. Manually raise or lower the header to a desired cutting height.
3. Press SET #1 switch (A). The light beside switch (A) will illuminate.

   NOTE:

   Use switch (C) for fine adjustments.

   NOTE:

   When setting the presets, always set the header position before setting the reel position. If the header and the reel are set at the same time, the reel setting will not be saved.
4. Manually raise or lower the reel to the desired position.
5. Press SET #1 switch (A). The light beside switch (A) will light up.
6. Manually raise or lower the header to a second desired cutting height.
7. Press SET #2 switch (B). The light beside switch (B) will light up.

Figure 3.486: Case Combine Controls

8. Manually raise or lower the reel to a second desired working position.
9. Press SET #2 switch (B). The light beside switch (B) will light up.
10. To swap between the set points, press HEADER RESUME (A).
11. To raise the header, press and hold SHIFT button (B) at the back of the control handle and press HEADER RESUME switch (A). To lower the header, press HEADER RESUME switch (A) once to return to the header preset height.

    NOTE:

    Pressing HEADER RAISE/LOWER switches (C) and (D) disengages AUTO HEIGHT mode. Press HEADER RESUME (A) to re-engage AUTO HEIGHT mode.

Figure 3.487: Case Combine Controls

3.10.8 Challenger® and Massey Ferguson® 6 and 7 Series Combines

To make your header's auto header height control (AHHC) system compatible with Challenger® and Massey Ferguson® 6 and 7 Series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from Combine Cab – Challenger® and Massey Ferguson®

The auto header height control sensor needs to operate in a specific voltage range in order to work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Position the header 254–356 mm (10–14 in.) above the ground, and unlock the float.

2. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation, causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

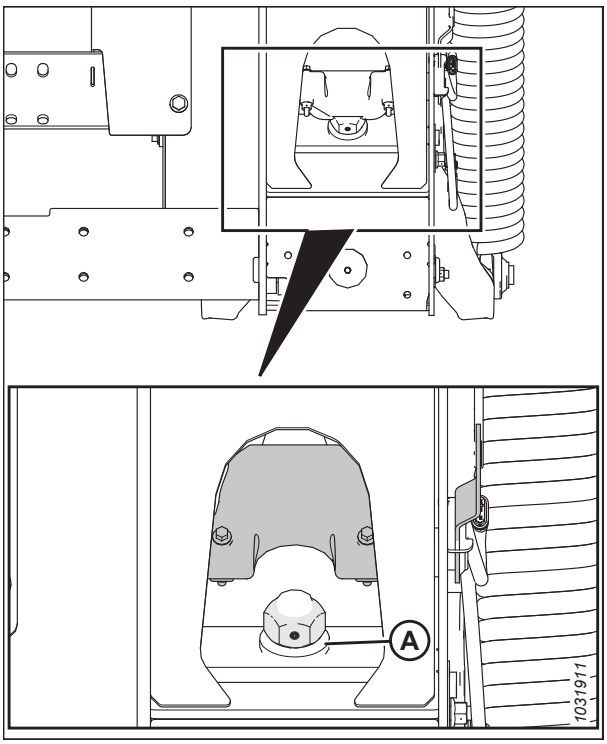


Figure 3.488: Float Lock

3. Loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on 0 (D).

4. Tighten bolt (A).

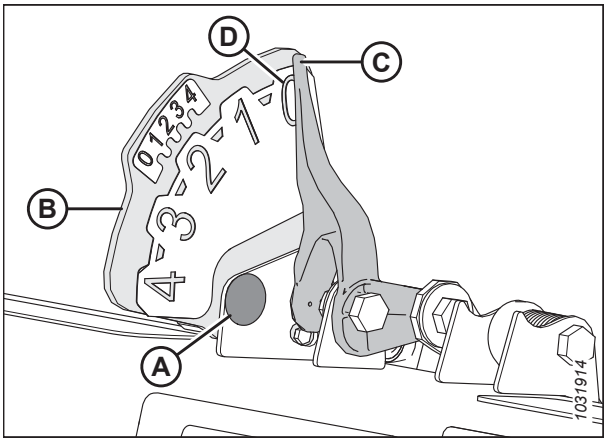


Figure 3.489: Float Indicator

5. Go to the FIELD page on the combine monitor, and then press the diagnostics icon. The MISCELLANEOUS page displays.

6. Press VMM DIAGNOSTIC button (A). The VMM DIAGNOSTIC page displays.

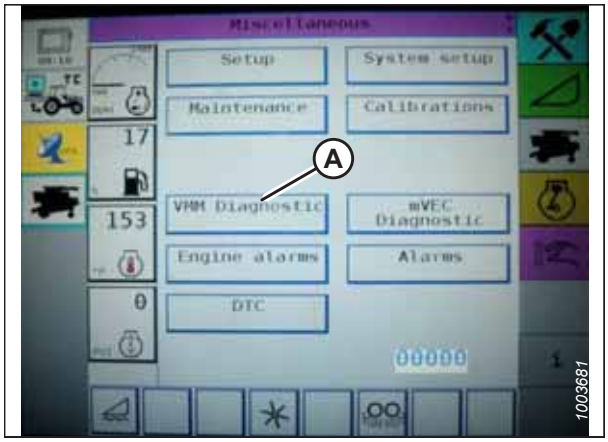


Figure 3.490: Challenger® Combine Display

7. Go to ANALOG IN tab (A), and then select VMM MODULE 3 by pressing the text box below the four tabs. The voltage from the AHHC sensor is now displayed on page as HEADER HEIGHT RIGHT POT and HEADER HEIGHT LEFT POT. The readings may be slightly different.

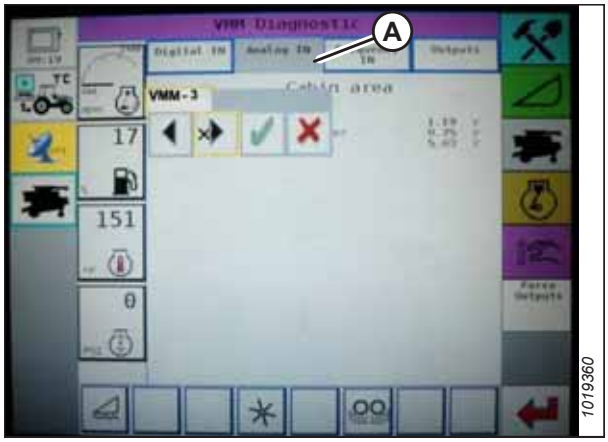


Figure 3.491: Challenger® Combine Display

8. Fully lower the combine feeder house (the float module should be fully separated from the header).

   NOTE:

   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

9. Read the voltage.

10. Raise the header 254–356 mm (10–14 in.) above the ground, and unlock the float.

11. Read the voltage.

12. If the sensor voltage is not within the lower and upper limits, or if the range between the lower and upper limits is insufficient, adjust the voltage limits. For instructions, refer to *3.10.3 Manually Checking Voltage Limits, page 273*.

Figure 3.492: Challenger® Combine Display

Engaging Auto Header Height Control – Challenger® and Massey Ferguson®

The auto header height control (AHHC) system must be engaged before its features can be configured.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module (PCB board) and header driver module (PCB board) mounted in the card box in the fuse panel module (FP)
- Multifunction control handle operator inputs
- Operator inputs mounted in the control console module (CC) panel
- The electrohydraulic header lift control valve

To engage the auto header height control, follow these steps:

1. Scroll through the header control options on the combine display using the header control switch until AHHC icon (A) is displayed in the first message box. The AHHC will adjust the header height in relation to the ground according to the height setting and sensitivity setting.

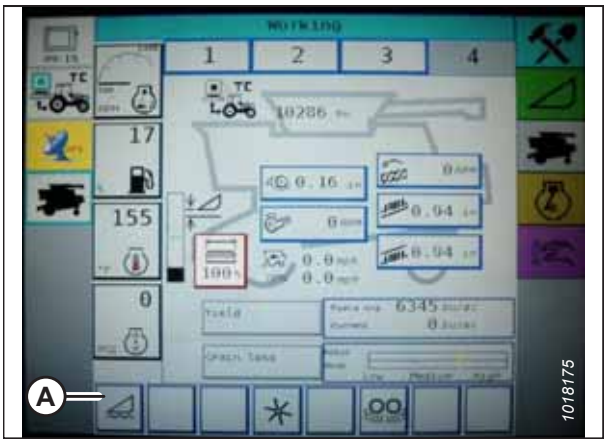


Figure 3.493: Challenger® Combine Display

Calibrating Auto Header Height Control – Challenger® and Massey Ferguson®

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the AHHC calibration. You may need to set the float heavier for the calibration procedure so the header doesn't separate from the float module.

NOTE:

For best performance of the auto header height control (AHHC) system, perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. On the FIELD page, press DIAGNOSTICS icon (A). The MISCELLANEOUS page appears.

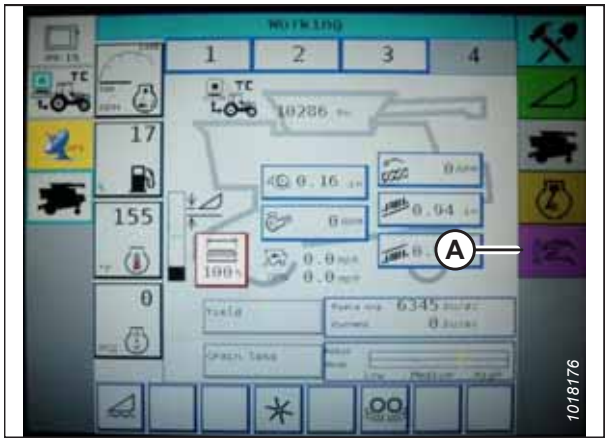


Figure 3.494: Challenger® Combine Display

3. Press CALIBRATIONS button (A). The CALIBRATIONS page appears.

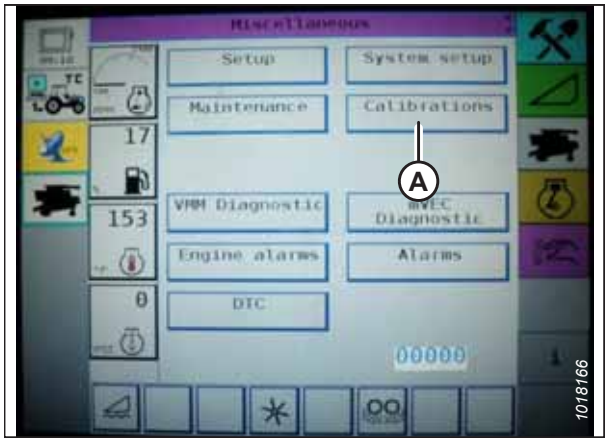


Figure 3.495: Challenger® Combine Display

4. Press HEADER button (A). The HEADER CALIBRATION page displays a warning.

Figure 3.496: Challenger® Combine Display

5. Read the warning message, and then press the green check mark button.

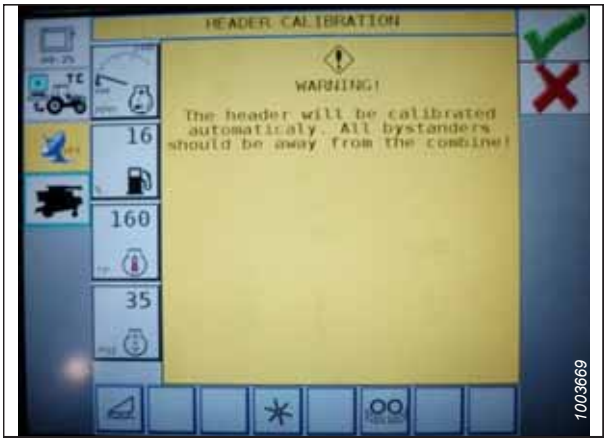


Figure 3.497: Challenger® Combine Display

6. Follow the on-screen prompts to complete calibration.

   NOTE:

   The calibration procedure can be canceled at any time by pressing the CANCEL button on the screen. While the header calibration is running, the calibration can also be canceled by using the UP, DOWN, TILT RIGHT, or TILT LEFT buttons on the control handle.

   NOTE:

   If the combine does not have HEADER TILT installed or if it is inoperable, you may receive warnings during calibration. Press the green check mark if these warnings appear. This will not affect the AHHC calibration.

   NOTE:

   If the float was set heavier to complete the AHHC calibration procedure, adjust to the recommended operating float after the calibration is complete.

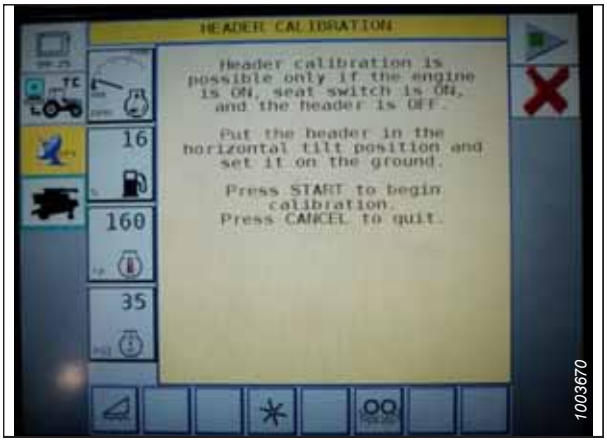


Figure 3.498: Challenger® Combine Display

Adjusting Header Height – Challenger® and Massey Ferguson®

The auto header height control (AHHC) feature allows the operator to set specific header heights.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

Once the auto header height control (AHHC) is activated, press and release the HEADER LOWER button on the control handle. The AHHC will automatically lower the header to the selected height setting.

You can adjust the selected AHHC height using HEIGHT ADJUSTMENT knob (A) on the control console. Turning the knob clockwise increases the selected height, and turning the knob counterclockwise decreases the selected height.

Figure 3.499: Height Adjustment Knob on the Combine Control Console

Adjusting Header Raise/Lower Rate – Challenger® and Massey Ferguson®

The rate at which the header rises and falls can be configured by accessing the HEADER CONTROL menu on the combine display.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press HEADER icon (A) on the FIELD page. The HEADER page displays.

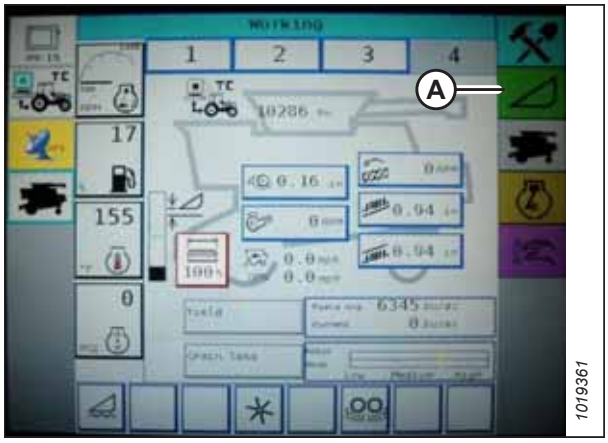


Figure 3.500: Challenger® Combine Display

2. Press HEADER CONTROL (A). The HEADER CONTROL page displays.

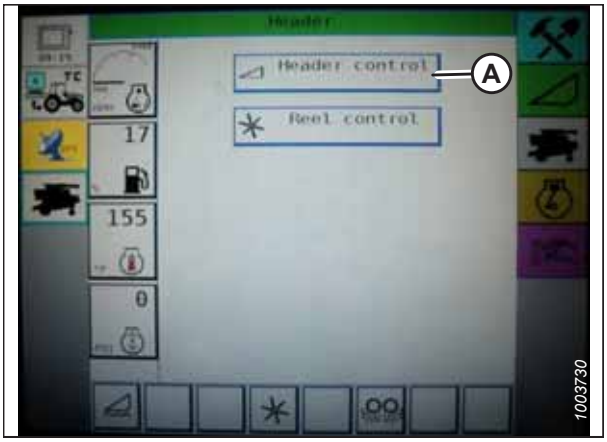


Figure 3.501: Challenger® Combine Display

3. Go to the TABLE SETTINGS tab.
4. Press the up arrow on MAX UP PWM to increase the percentage number and increase the raise speed. Press the down arrow on MAX UP PWM to decrease the percentage number and decrease the raise speed.
5. Press the up arrow on MAX DOWN PWM to increase the percentage number and increase the lower speed. Press the down arrow on MAX DOWN PWM to decrease the percentage number and decrease the lower speed.

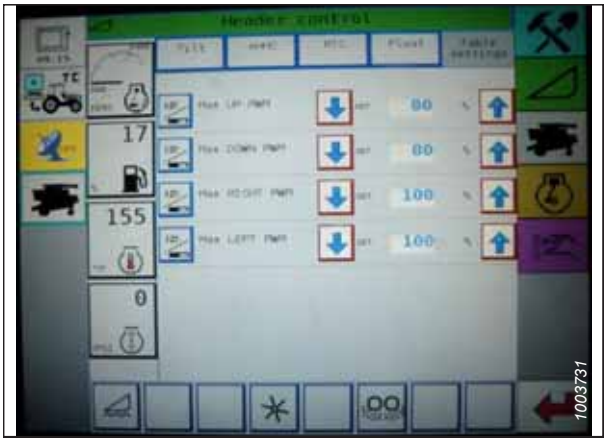


Figure 3.502: Challenger® Combine Display

Setting Auto Header Height Control Sensitivity – Challenger® and Massey Ferguson®

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press the HEADER icon on the FIELD page. The HEADER page appears.

2. Press HEADER CONTROL button (A). The HEADER CONTROL page appears. You can adjust sensitivity on this page using the up and down arrows.

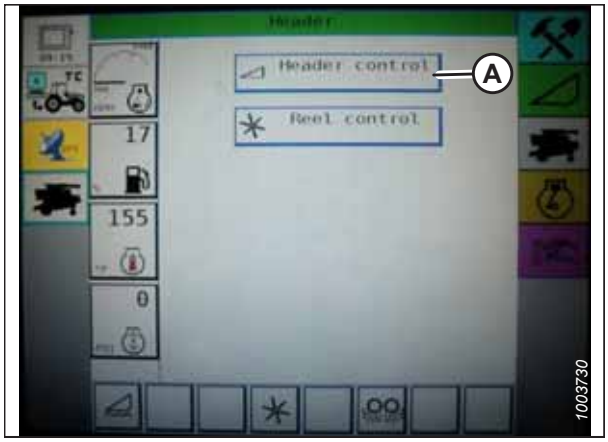


Figure 3.503: Challenger® Combine Display

3. Adjust the sensitivity to the maximum setting.
4. Activate the AHHC, and press the HEADER LOWER button on the control handle.
5. Decrease the sensitivity until the feeder house remains steady and does not bounce up and down.

NOTE:

This is the maximum sensitivity and is only an initial setting. The final setting must be made in the field, as the system reaction will vary with changing surfaces and operating conditions.

NOTE:

If maximum sensitivity is not needed, a less sensitive setting will reduce the frequency of header height corrections and component wear. Partially opening the accumulator valve will cushion the action of the header lift cylinders and reduce header hunting.

Figure 3.504: Challenger® Combine Display

3.10.9 CLAAS 500 Series Combines

To make your header's auto header height control (AHHC) system compatible with CLAAS 500 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Calibrating Auto Header Height Control – CLAAS 500 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. Use < key (A) or > key (B) to select AUTO HEADER, and press OK key (C). The E5 page indicates whether the automatic header height is on or off.

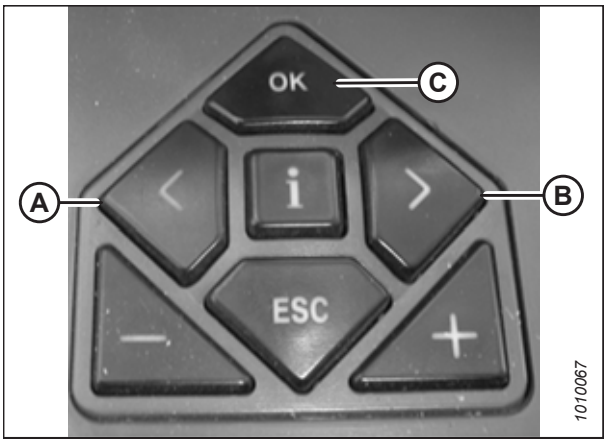


Figure 3.505: CLAAS Combine Controls

3. Use **–** key (A) or **+** key (B) to turn the AHHC on, and press OK key (C).
4. Engage the threshing mechanism and the header.

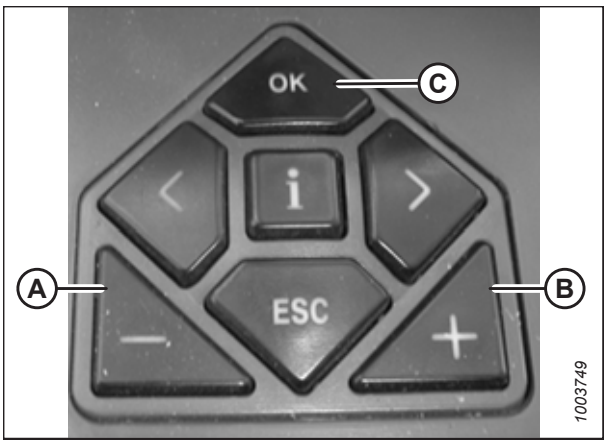


Figure 3.506: CLAAS Combine Controls

5. Use the < or > key to select CUTT. HEIGHT LIMITS, and press the combine control's OK key.
6. Follow the procedure displayed on the screen to program the upper and lower limits of the header into the CEBIS.

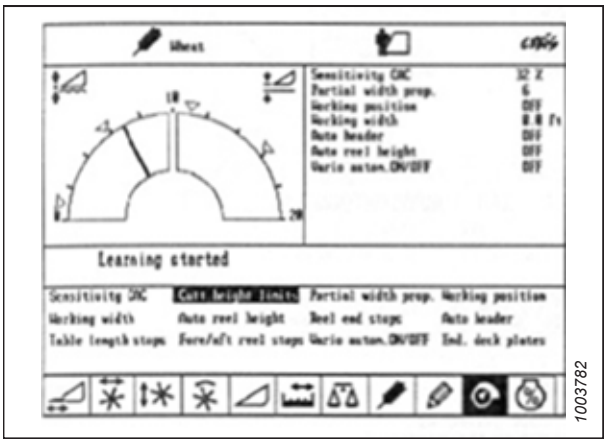


Figure 3.507: CLAAS Combine Display

7. Use the **<** or **>** key to select SENSITIVITY CAC, and press the combine control's OK key.

   NOTE:

   Setting the sensitivity of the AHHC system affects the reaction speed of the AHHC on the header.

8. Use the **–** key or the **+** key to change the reaction speed setting, and press the combine control's OK key.

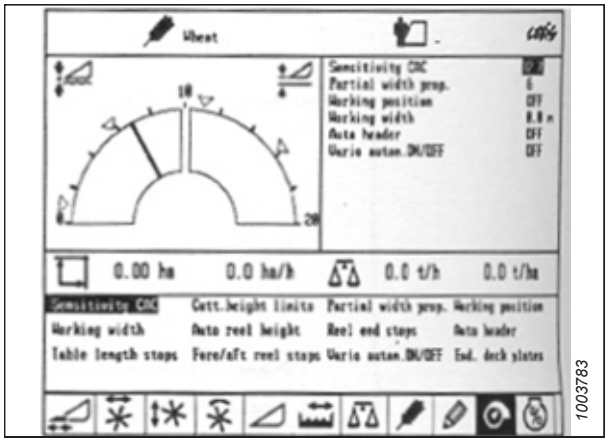


Figure 3.508: CLAAS Combine Display

9. Use line (A) or value (B) to determine the sensitivity setting.

   NOTE:

   The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

   NOTE:

   If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

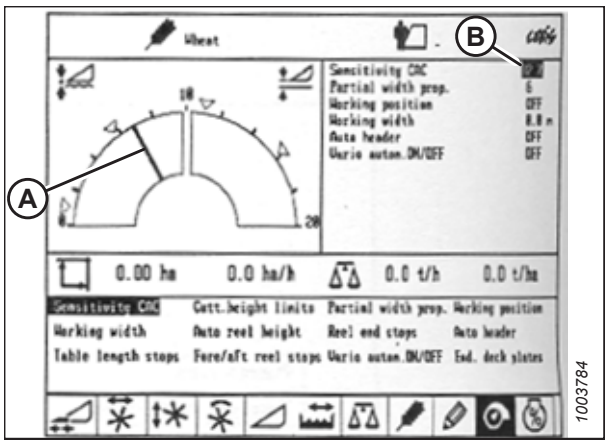


Figure 3.509: CLAAS Combine Display

Cutting Height – CLAAS 500 Series

Cutting heights can be programmed into the preset cutting height and auto contour systems. Use the preset cutting height system for cutting heights above 150 mm (6 in.), and use the auto contour system for cutting heights below 150 mm (6 in.).

Setting Preset Cutting Height – CLAAS 500 Series

Once the auto header height control (AHHC) system has been configured and activated, the preset cutting height can be set.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Start the engine.
2. Activate the machine enable switch.
3. Engage the threshing mechanism.
4. Engage the header.

5. Briefly press button (A) in order to activate the auto contour system, or briefly press button (B) in order to activate the preset cutting height system.

   NOTE:

   Button (A) is used only with auto header height control (AHHC) function. Button (B) is used only with the return to cut function.

Figure 3.510: Control Handle Buttons

6. Use < key (C) or > key (D) to select the CUTTING HEIGHT page, and press OK key (E).

7. Use – key (A) or + key (B) to set the desired cutting height. An arrow indicates the selected cutting height on the scale.

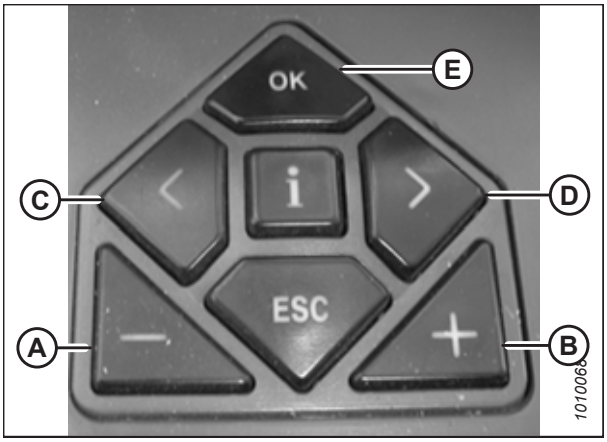


Figure 3.511: CLAAS Combine Controls

8. Briefly press button (A) or button (B) in order to select the set point.

9. Repeat Step *7, page 313* for the set point.

Figure 3.512: Control Handle Buttons

Setting Cutting Height Manually – CLAAS 500 Series

Once the auto header height control (AHHC) system has been configured and activated, the preset cutting height can be manually configured.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use button (A) to raise the header, or button (B) to lower the header to the desired cutting height.
2. Press and hold button (C) for 3 seconds to store the cutting height (an alarm will sound when the new setting has been stored).
3. Program a second set point, if desired, by using button (A) to raise the header, or button (B) to lower the header to the desired cutting height, and briefly press button (C) to store the second set point (an alarm will sound when the new setting has been stored).

   NOTE:

   For above-the-ground cutting, repeat Step *1, page 314*, and use button (D) instead of button (C) while repeating Step *2, page 314*.

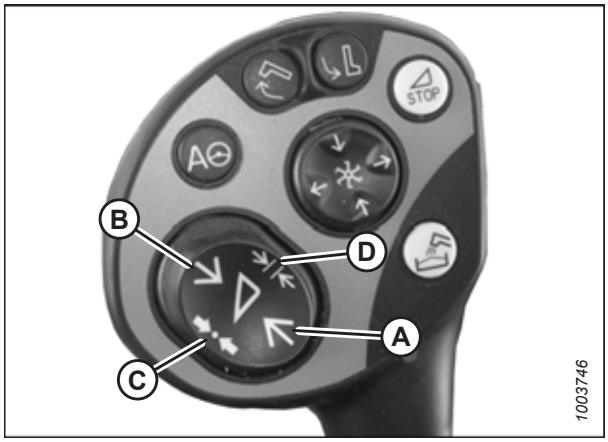


Figure 3.513: Control Handle Buttons

Setting Auto Header Height Control Sensitivity – CLAAS 500 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

NOTE:

The upper and lower limits of the header must be set before adjusting the sensitivity of the AHHC system. The setting can be adjusted from 0–100%. When the sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When the sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use **<** key (C) or **>** key (D) to select SENSITIVITY CAC, and press OK key (E).
2. Use **–** key (A) or **+** (B) key to change the reaction speed setting, and press OK key (E).

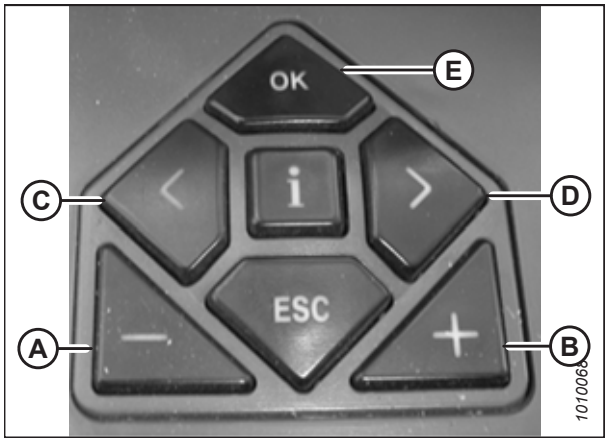


Figure 3.514: CLAAS Combine Controls

3. Use line (A) or value (B) to determine the sensitivity setting.

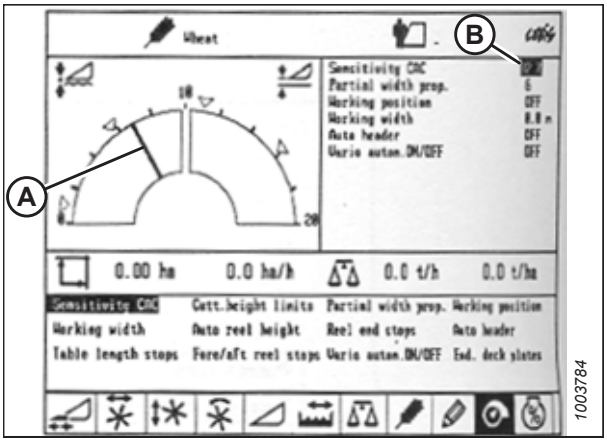


Figure 3.515: CLAAS Combine Display

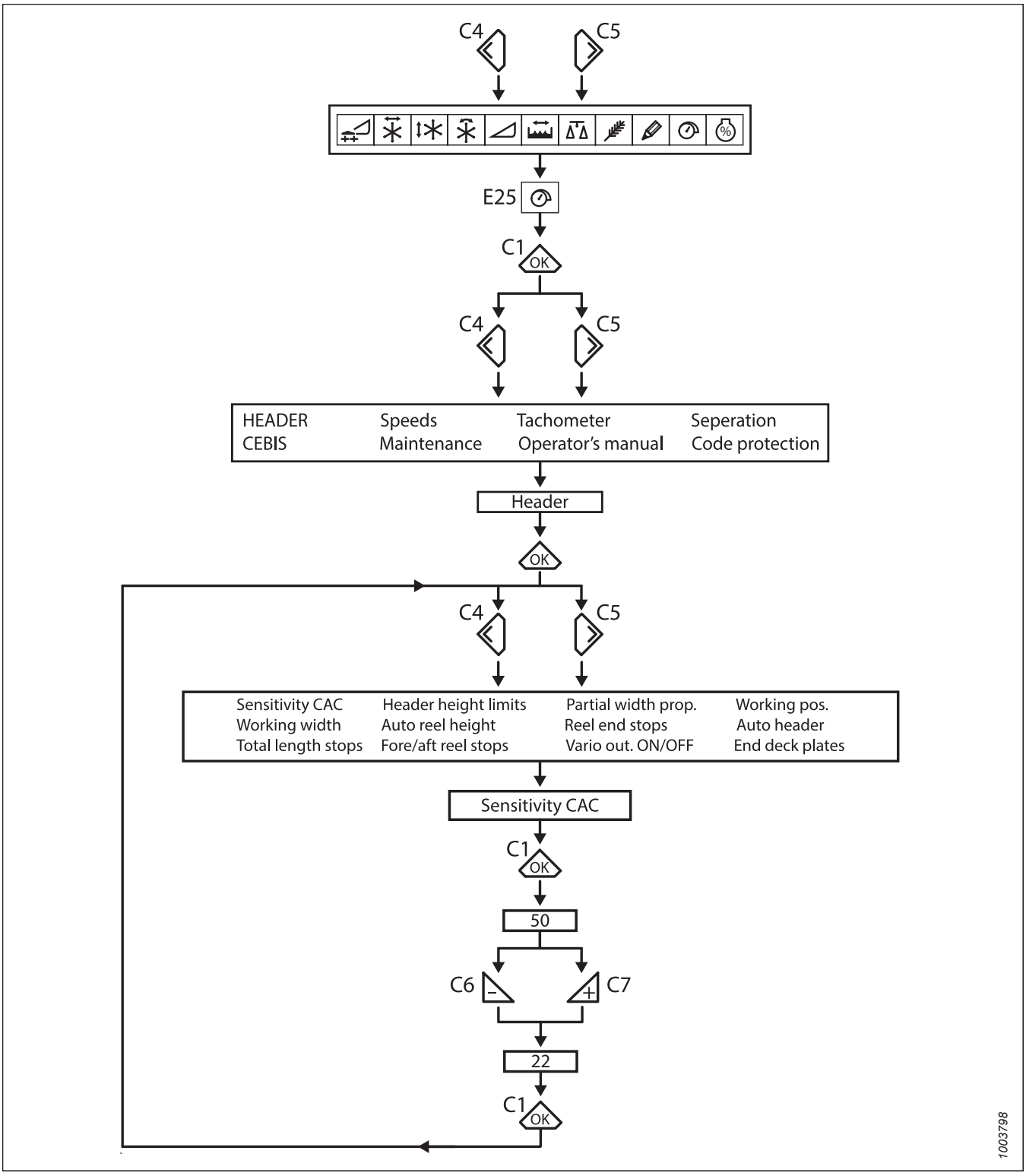


Figure 3.516: Flow Chart for Setting the Sensitivity of the Float Optimizer

Adjusting Auto Reel Speed – CLAAS 500 Series

The preset reel speed can be set when the automatic header functions are activated.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use the **<** or **>** key to select REEL WINDOW. Window E15 displays the current advance or retard speed of the reel in relation to the ground speed.

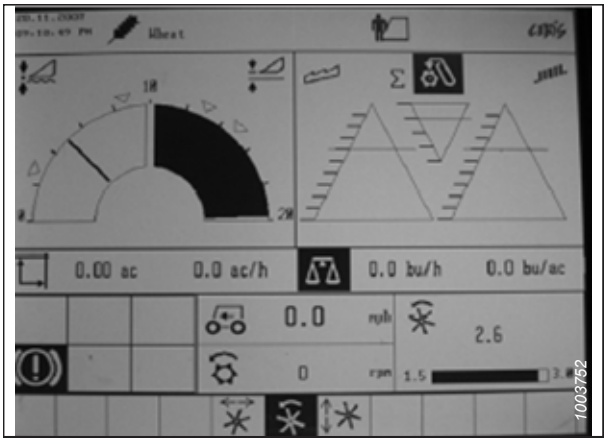


Figure 3.517: CLAAS Combine Display

2. Press OK key (C) to open the REEL SPEED window.
3. Use **–** key (A) or **+** key (B) to set the reel speed in relation to the current ground speed. Window E15 displays the selected reel speed.

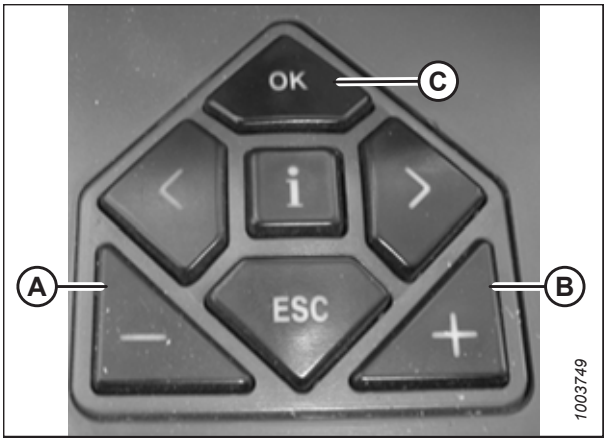


Figure 3.518: CLAAS Combine Controls

4. Manually adjust the reel speed by rotating the rotary switch to reel position (A), and then use the **–** or **+** key to set the reel speed.

Figure 3.519: CLAAS Combine Rotary Switch

5. Press and hold button (A) or button (B) for 3 seconds to store the setting (an alarm sounds when the new setting has been stored).

   NOTE:

   Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

Figure 3.520: CLAAS Control Handle Buttons

6. Use the **<** or **>** key to select the REEL WINDOW. Window E15 displays the current advance or retard speed of the reel in relation to the ground speed.

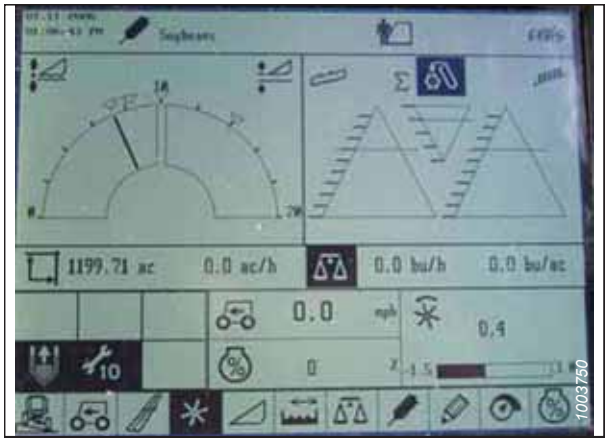


Figure 3.521: CLAAS Combine Display

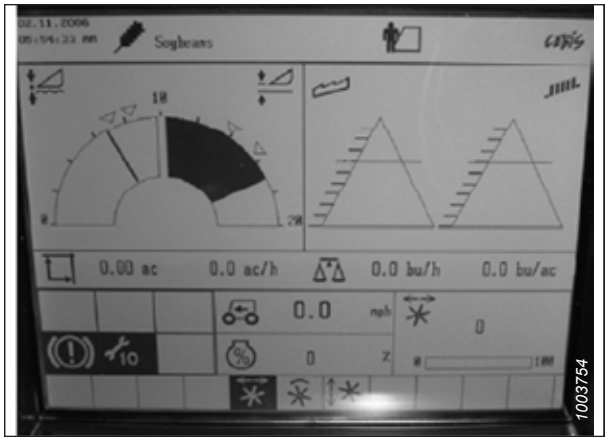


Figure 3.522: CLAAS Combine Display

7. Press OK key (E), and use < key (C) or > key (D) to select the REEL FORE AND AFT window.
8. Use **–** key (A) or **+** key (B) to set the reel fore-aft position.

   NOTE:

   Control handle button (A) or button (B) (as shown in Figure *3.524, page 319*) can also be used to set the reel fore-aft position.

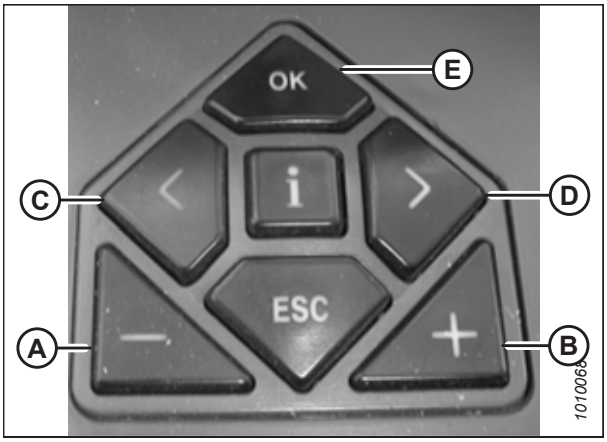


Figure 3.523: CLAAS Combine Controls

9. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm sounds when the new setting has been stored).

   NOTE:

   Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

Figure 3.524: CLAAS Control Handle Buttons

3.10.10 CLAAS 600 and 700 Series Combines

To make your header's auto header height control (AHHC) system compatible with CLAAS 600 and 700 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Calibrating Auto Header Height Control – CLAAS 600 and 700 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the AHHC calibration. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. Ensure that the header float is unlocked.
3. Place the wings in the locked position.
4. Use control knob (A) to highlight AUTO CONTOUR icon (B) and press control knob (A) to select it.

Figure 3.525: CLAAS Combine Display, Console, and Control Handle

5. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (not shown). Press control knob (A) to select it. Highlighted header icon (B) displays on the screen.

Figure 3.526: CLAAS Combine Display, Console, and Control Handle

6. Use control knob (A) to highlight header icon (B) with the up and down arrows. Press control knob (A) to select it.

Figure 3.527: CLAAS Combine Display, Console, and Control Handle

7. Use control knob (A) to highlight screwdriver icon (B).
8. Engage the combine separator and feeder house.
9. Press control knob (A). A progress bar appears.

Figure 3.528: CLAAS Combine Display, Console, and Control Handle

10. Fully raise the feeder house. Progress bar (A) advances to 25%.
11. Fully lower the feeder house. Progress bar (A) advances to 50%.
12. Fully raise the feeder house. Progress bar (A) advances to 75%.
13. Fully lower the feeder house. Progress bar (A) advances to 100%.

Figure 3.529: CLAAS Combine Display, Console, and Control Handle

14. Ensure progress bar (A) displays 100%. The calibration procedure is now complete.

    NOTE:

    If the voltage is not within the range of 0.5–4.5 V at any time throughout the calibration process, the monitor will indicate learning procedure not concluded.

    NOTE:

    If the float was set heavier to complete the ground calibration procedure, adjust it to the recommended operating float after the calibration is complete.

Figure 3.530: CLAAS Combine Display, Console, and Control Handle

Setting Cutting Height – CLAAS 600 and 700 Series

The Operator can configure two different cutting height presets. The height presets can be selected using the combine's control handle.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Lower the header to the desired cutting height or to the ground pressure setting. The float indicator box should be set to 1.5.
2. Hold the left side of header raise and lower switch (A) until you hear a ping sound.

Figure 3.531: CLAAS Combine Display, Console, and Control Handle

Setting Auto Header Height Control Sensitivity – CLAAS 600 and 700 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use control knob (A) to highlight HEADER/REEL icon (B). Press control knob (A) to select it. The HEADER/REEL dialog box opens.
2. Select the HEADER icon.

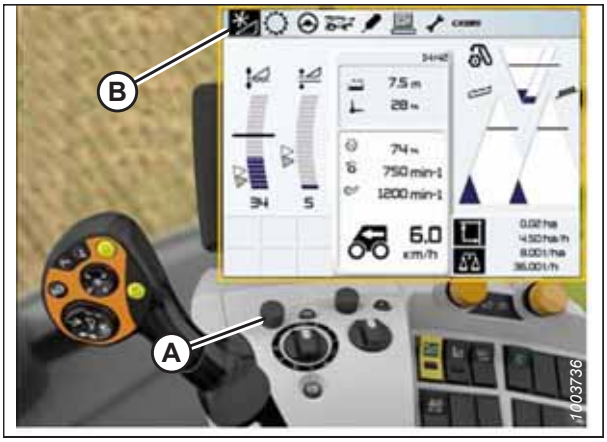


Figure 3.532: CLAAS Combine Display, Console, and Control Handle

3. Select FRONT ATTACHMENT PARAMETER SETTINGS icon (A). A list of settings appears.
4. Select SENSITIVITY CAC (B) from the list.

Figure 3.533: CLAAS Combine Display, Console, and Control Handle

5. Select SENSITIVITY CAC icon (A).

   NOTE:

   To set the sensitivity, change CUTTING HEIGHT ADJUSTMENT (B) from the 0 default. The settings from 1–50 provide a faster response, whereas the settings from -1 to -50 provide a slower response. For best results, make adjustments in increments of 5.

6. If the reaction time between the header and the float module is too slow while cutting on the ground, increase the CUTTING HEIGHT ADJUSTMENT setting. If the reaction time between the header and the float module is too fast, decrease the CUTTING HEIGHT ADJUSTMENT setting.
7. If the header is lowered too slowly, increase the sensitivity. If the header hits the ground too hard or is lowered too quickly, decrease the sensitivity.

Figure 3.534: CLAAS Combine Display

Adjusting Auto Reel Speed – CLAAS 600 and 700 Series

The preset reel speed can be set when the automatic header functions are activated.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use control knob (A) to highlight HEADER/REEL icon (B). Press control knob (A) to select it. The HEADER/REEL dialog box opens.

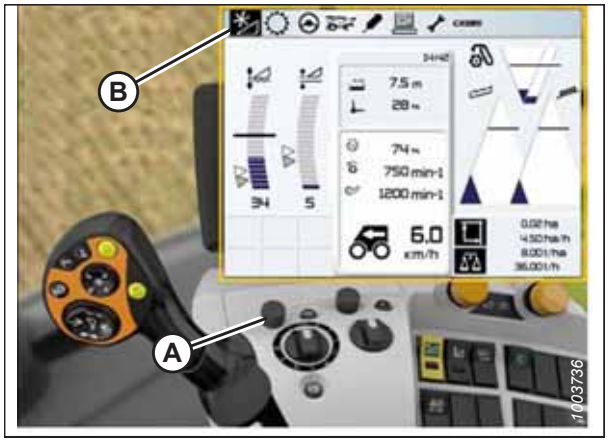


Figure 3.535: CLAAS Combine Display, Console, and Control Handle

2. Use control knob (A) to select REEL SPEED (B), and adjust the reel speed (if you are **NOT** using Auto Reel Speed). A graph appears in the dialog box.

Figure 3.536: CLAAS Combine Display, Console, and Control Handle

3. Select ACTUAL VALUE (A) from the AUTO REEL SPEED dialog box (if you are using Auto Reel Speed). The ACTUAL VALUE dialog box indicates the auto reel speed.

Figure 3.537: CLAAS Combine Display, Console, and Control Handle

4. Use control knob (A) to raise or lower the reel speed.

   NOTE:

   This option is only available with the engine at full throttle.

Figure 3.538: CLAAS Combine Display, Console, and Control Handle

Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – CLAAS 600 and 700 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

Calibrating the reel fore-aft sensor is only possible if the optional CLAAS integration kit (MD #B7231) is installed.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

DANGER

Check to be sure all bystanders have cleared the area.

1. Start the engine.
2. Position the header 254–356 mm (10–14 in.) off the ground. Keep the engine running.

   IMPORTANT:

   Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

3. Use control knob (A) to highlight FRONT ATTACHMENT icon (B). Press control knob (A) to select it.

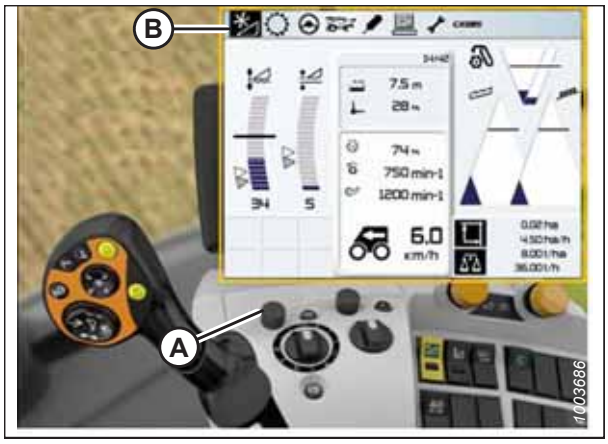


Figure 3.539: CLAAS Combine Display, Console, and Control Handle

4. Use control knob (A) to highlight REEL icon (B). Press control knob (A) to select it.

Figure 3.540: CLAAS Combine Display and Console

5. Highlight REEL HEIGHT icon (A). Press the control knob to select it.
6. Select LEARNING END STOPS (B) from the list.

Figure 3.541: CLAAS Combine Display and Console

7. Use control knob (A) to highlight screwdriver icon (B).
8. Press the control knob.

Figure 3.542: CLAAS Combine Display, Console, and Control Handle

WARNING

Check to be sure all bystanders have cleared the area.

9. Progress bar chart (A) appears on the screen.
10. Follow the prompts on the screen to raise and lower the reel.

Figure 3.543: CLAAS Combine Display, Console, and Control Handle

11. Ensure progress bar chart (A) displays 100%. When the progress bar chart displays 100%, the calibration procedure is complete.

Figure 3.544: CLAAS Combine Display, Console, and Control Handle

12. **If equipped with CLAAS integration kit (MD #B7231):** Calibrate the reel fore-aft sensor by selecting REEL HORIZONTAL POSITION (A), then LEARNING END STOPS (B). Then repeat Step *7, page 327* to Step *11, page 328*.

Figure 3.545: CLAAS Combine Display and Console

Adjusting Auto Reel Height – CLAAS 600 and 700 Series

The auto reel height setting can be configured by accessing the REEL menu on the combine display.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Use HOTKEY rotary dial (A) to select REEL icon (B).

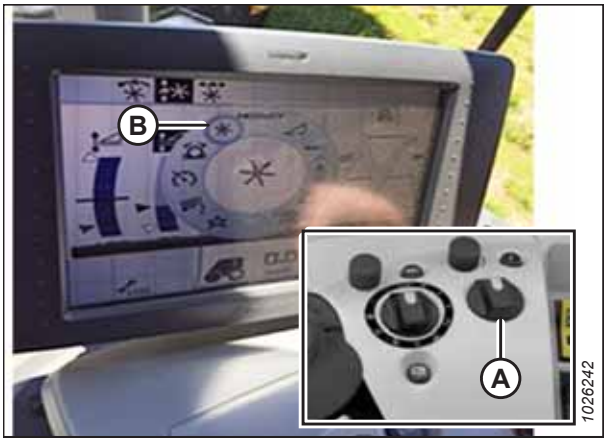


Figure 3.546: CLAAS Combine Display and Console

2. Use control knob (A) to select AUTO REEL HEIGHT icon (B) at the top of the page.

   NOTE:

   AUTO REEL HEIGHT icon (C) at the center of the page should be highlighted black. If it is not black, either the end stops have not been set or the auto header height control (AHHC) is not active. For instructions, refer to *Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – CLAAS 600 and 700 Series, page 325*.

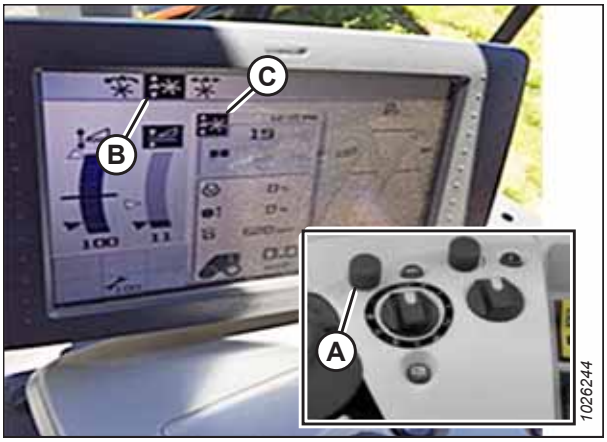


Figure 3.547: CLAAS Combine Display and Console

3. Adjust the auto reel height position for the current AHHC position using outer scroll knob (A). To lower the preset reel position, turn the scroll knob counterclockwise; to raise the preset reel position, turn the scroll knob clockwise. The display will update current setting (B).

   NOTE:

   If the AUTO REEL HEIGHT icon in the center of the page is not black, an AHHC position is not currently active.

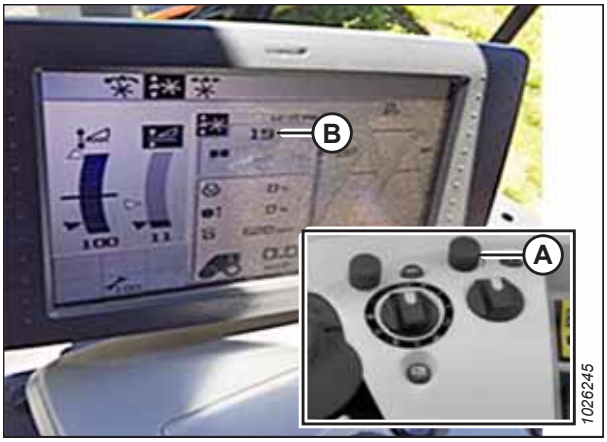


Figure 3.548: CLAAS Combine Display and Console

3.10.11 CLAAS 7000 and 8000 Series Combines

To make your header's auto header height control (AHHC) system compatible with CLAAS 7000 and 8000 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Header Settings Quick Reference – Claas 7000 and 8000 Series

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

For detailed instructions, proceed to the Claas 7000 and 8000 Series combine header setup and calibration procedures.

Table 3.36 Header Settings – Claas Claas 7000 and 8000 Series

Setup Parameter	Suggested Setting
Front Attachment Type	Flex cutterbar product by other manufacturer
Working Width	Set header width
Drop rate with auto contour	Adjust to preference
Reel Speed Adjust	Adjust to preference

Setting up Header – CLAAS 7000 and 8000 Series

To set up a header to work with the auto header height control (AHHC) system, you will need to access the FRONT ATTACHMENT menu using the CEBIS terminal.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. From the main page, select FRONT ATTACHMENT (A).

Figure 3.549: CEBIS Main Page

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).

Figure 3.550: Front Attachment Page

3. From the FRONT ATTACHMENT PARAMETERS page, select FRONT ATTACHMENT TYPE (A).
4. From the drop down list, select FLEX CUTTERBAR PRODUCT BY OTHER MANUFACTURER (B).

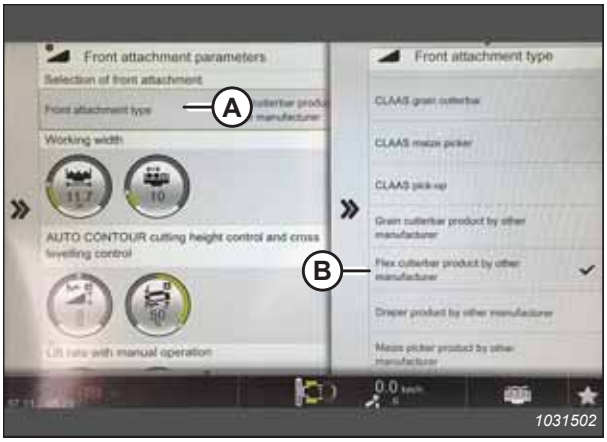


Figure 3.551: Attachment Parameters Page

5. From the FRONT ATTACHMENT PARAMETERS page, select WORKING WIDTH (A).
6. Set the header width by sliding adjuster arrow (B) up or down.
7. Select check mark (C) to save the settings.

Figure 3.552: Attachment Parameters Page

Calibrating Auto Header Height Control – CLAAS 7000 and 8000 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. From the MAIN page, select FRONT ATTACHMENT (A).

Figure 3.553: CEBIS Main Page

2. Select LEARNING PROCEDURES (A) from the menu.
3. SELECT FRONT ATTACHMENT HEIGHT (B).

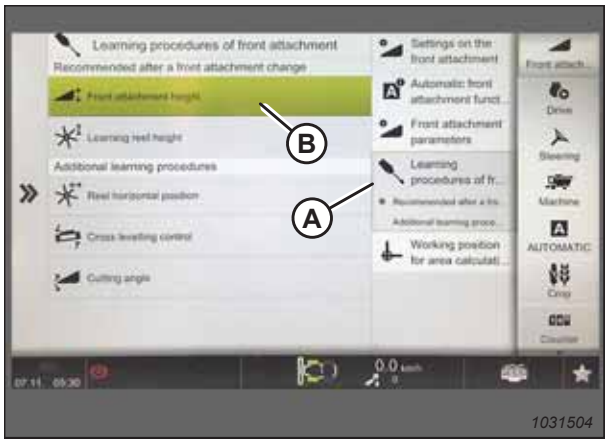


Figure 3.554: Learning Procedures Page

4. Follow the prompts that appear in DESCRIPTION and NOTES fields (A).

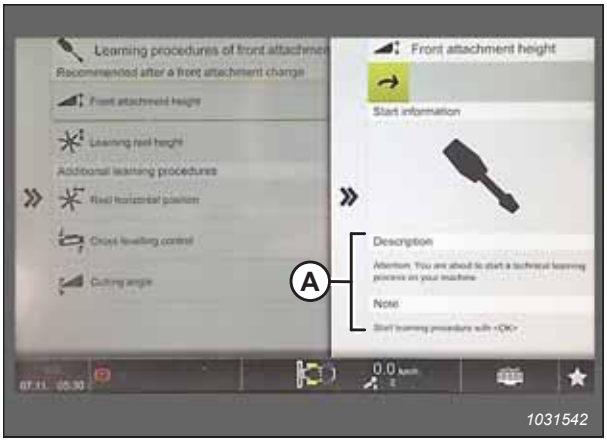


Figure 3.555: Front Attachment Height Page

5. When prompted, select OK button (A) to start the learning procedure.

Figure 3.556: Operator Controls

6. When prompted, raise the front attachment with button (A) on the multifunction lever.
7. When prompted, lower the front attachment with button (B) on the multifunction lever.
8. Repeat the previous steps as prompted until calibration is complete.

Figure 3.557: Multifunction Lever

Setting Cut and Reel Height Preset – CLAAS 7000 and 8000 Series

The reel and cut height setting can be stored in the combine. When harvesting, the setting can be selected from the control handle.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Set the desired cutting height with feeder house raise/ lower buttons (A) on the multifunction lever.
2. Set the desired reel position with buttons (B).
3. Press and hold AUTO HEIGHT PRESET button (C) to store the settings.

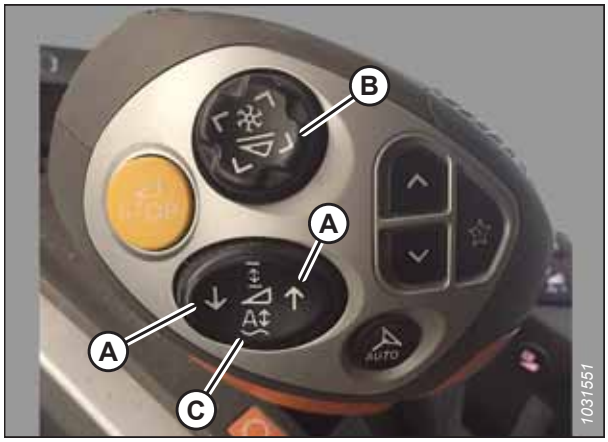


Figure 3.558: Multifunction Lever

Triangle (A) appears on the header height gauge indicating the preset level.

Figure 3.559: CEBIS Main Page

Setting Auto Header Height Control Sensitivity – CLAAS 7000 and 8000 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the system to raise or lower the feeder house. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the system to raise or lower the feeder house.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. From the main page, select FRONT ATTACHMENT (A).

Figure 3.560: CEBIS Main Page

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).

Figure 3.561: Front Attachment Parameters Page

3. Scroll through the list and select DROP RATE WITH AUTO CONTOUR icon (A).
4. Adjust the drop rate by sliding adjuster arrow (B) up or down.
5. Select check mark (C) to confirm the settings.

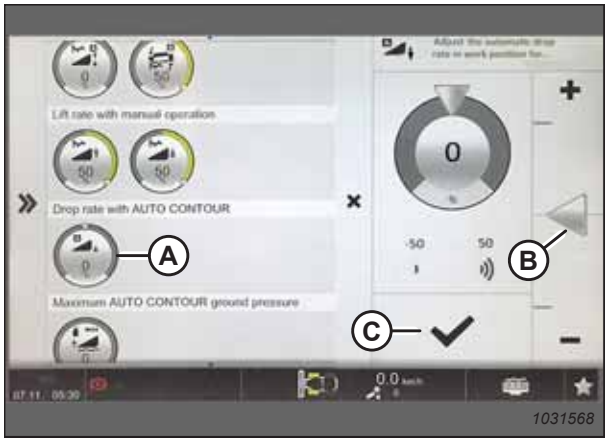


Figure 3.562: Drop Rate with Auto Contour Page

Adjusting Auto Reel Speed – CLAAS 7000 and 8000 Series

The preset reel speed can be set when the automatic header functions are activated.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. From the main page, select FRONT ATTACHMENT (A).

Figure 3.563: CEBIS Main Page

2. From the list, select SETTINGS ON FRONT ATTACHMENT (A).
3. Select REEL TARGET VALUES (B).
4. Select REEL SPEED ADJUST icon (C).

Figure 3.564: Settings on Front Attachment Page

5. Adjust the reel speed target value by sliding adjuster arrow (A) up or down.
6. Select check mark (B) to save the setting.

Figure 3.565: Reel Speed Target Value Page

Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – CLAAS 7000 and 8000 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Calibrating the reel fore-aft sensor is only possible if the optional CLAAS integration kit (MD #B7231) is installed.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Position the header 254–356 mm (10–14 in.) off the ground.

   NOTE:

   Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. From the main page, select FRONT ATTACHMENT (A).

Figure 3.566: CEBIS Main Page

3. Select LEARNING PROCEDURES FOR FRONT ATTACHMENT (A).
4. Select LEARNING REEL HEIGHT (B).

Figure 3.567: Front Attachment Page

5. Follow the prompts that appear in DESCRIPTION and NOTES fields (A).

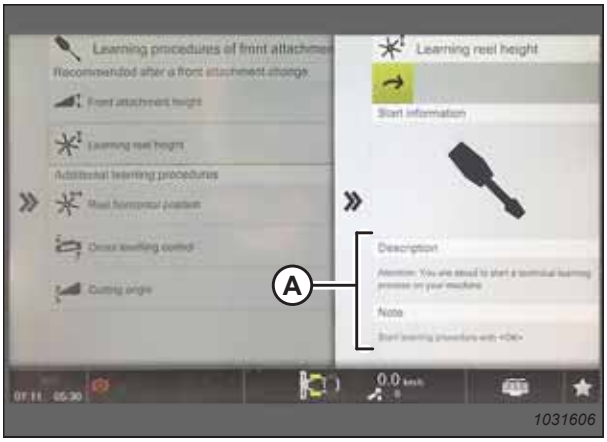


Figure 3.568: Learning Reel Height Page

6. When prompted, select OK button (A) to start the learning procedure.

Figure 3.569: Operator Controls

7. **If equipped with CLAAS integration kit (MD #B7231):** Calibrate the reel fore-aft sensor by selecting REEL HORIZONTAL POSITION (A) as the learning procedure and follow the prompts.

Figure 3.570: Front Attachment Page

3.10.12 Gleaner R65/R66/R75/R76 and S Series Combines

To make your header's auto header height control (AHHC) system compatible with Gleaner R65/R66/R75/R76 and S series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from the Combine Cab – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

The auto header height control sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Position the header 254–356 mm (10–14 in.) above the ground.
2. Unlock the float.

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

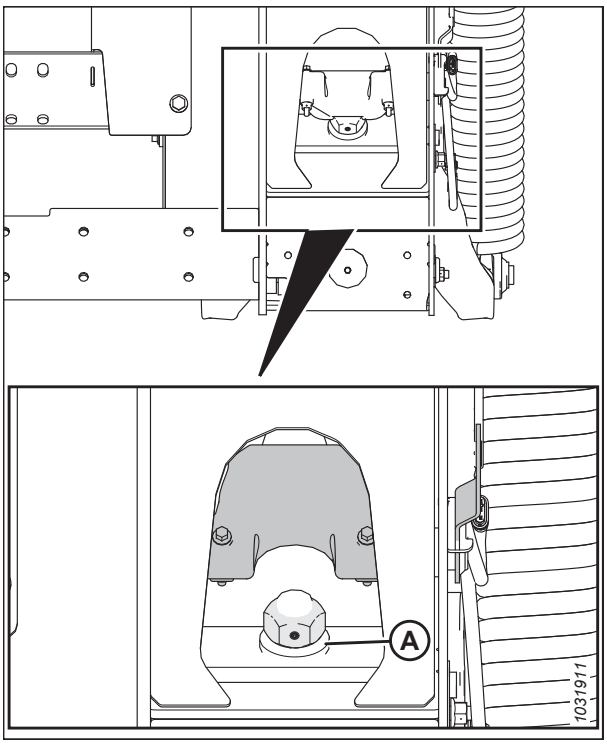


Figure 3.571: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).

5. Tighten bolt (A).

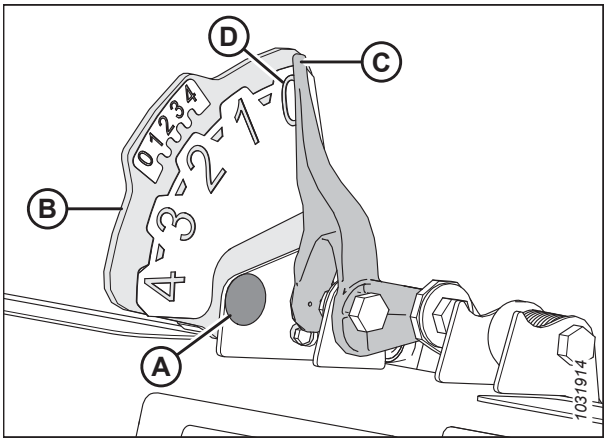


Figure 3.572: Float Indicator

Figure 3.573: Combine Heads-Up Display

6. Ensure the header float is unlocked.
7. Press and hold button (A) on the heads-up display for 3 seconds to enter diagnostic mode.
8. Scroll down using button (B) until LEFT is displayed on the LCD screen.
9. Press OK button (C). The number indicated on the LCD screen is the voltage reading from the sensor of the auto header height control (AHHC). Raise and lower the header to see the full range of the voltage readings.

Header Settings Quick Reference – Gleaner S9 Series Combines

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

For detailed instructions, proceed to the Gleaner S9 series combine header setup and calibration procedures.

Table 3.37 Header Settings – Gleaner S9 Series

Setup Parameter	Suggested Setting
Header Type	Power Flow
Header Has Reel Attached Check Box	Checked
Reel Diameter	40
Reel PPR[67]	30
Sensitivity (RTC)	50
Sensitivity (AHHC)	60
Header Control Speed[68]	Slow: Up 45/Down 40 Fast: Up 100/Down 100

67. Pulses per revolution
68. A two-stage button with slow speed on the first detent and fast on the second.

Table 3.37 Header Settings – Gleaner S9 Series (continued)

Setup Parameter	Suggested Setting
Header Lateral Offset	0
Feeder House to Cutter	68

Engaging Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

Engage the auto header height control (AHHC) before adjusting it for height and sensitivity.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module and header driver module mounted in card box in fuse panel (FP) module.
- Multifunction control handle operator inputs.
- Operator inputs mounted in the control console (CC) module panel.
- Electrohydraulic header lift control valve.

Figure 3.574: Combine Auto Header Height Controls

1. Press AUTO MODE button (A) until AHHC LED light (B) begins flashing. If the RTC light is flashing, press AUTO MODE button (A) again until it switches to the AHHC.

WARNING

Check to be sure all bystanders have cleared the area.

2. Briefly press button (A) on the control handle. The AHHC light should change from flashing to solid. The header should drop to the ground. The AHHC is now engaged and can be adjusted for height and sensitivity.

3. Use the controls to adjust the height and sensitivity to the constant changing ground conditions such as shallow gullies and field drainage trenches.

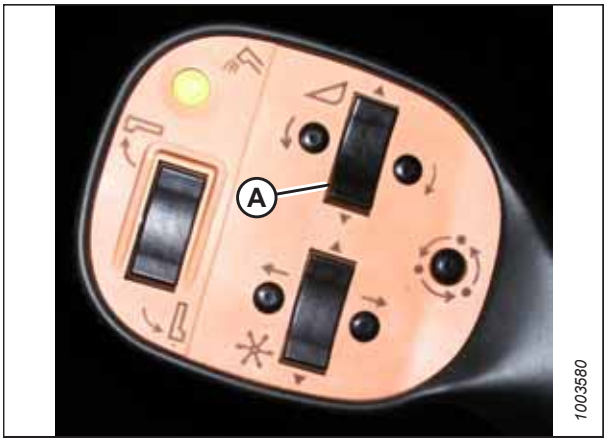


Figure 3.575: Control Handle

Calibrating Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for calibration procedure so the header does not separate from the float module.

Figure 3.576: Combine Auto Header Height Controls

A - AUTO MODE Button
B - AHHC Light
C - CAL1 Button
D - Raise Header Light
E - Lower Header Light
F - AUTO Mode
G - CAL2 Button

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

NOTE:

Calibration should be done on flat, level ground without the header engaged. The header height and header tilt functions must not be in auto or standby modes. The engine rpm must be above 2000 rpm. The header tilt option on 2004 and earlier model combines does not work with MacDon headers. This system will have to be removed and disabled in order to calibrate the AHHC. For instructions, refer to the combine operator's manual.

1. Ensure the center-link is set to **D**.
2. Press AUTO MODE button (A) until AHHC light (B) lights up.
3. Press and hold CAL1 button (C) until you see the following lights flash: raise header (D), lower header (E), tilt auto mode (F), and AHHC (B).
4. Fully lower the header, and continue to hold the HEADER LOWER button for 5–8 seconds to ensure the float module has separated from the header.
5. Press CAL2 button (G) until lower header light (E) stops flashing, and release it when raise header light (D) begins flashing.
6. Raise the header to its maximum height, and ensure the header is resting on the down-stop pads.
7. Press CAL2 button (G) until raise header light (D) turns off.

   NOTE:

   The following steps are applicable only to 2005 and newer combines with the Smartrac feeder house.

8. Wait for the HEADER TILT LEFT light (not shown) to start flashing, and then tilt the header to the maximum left position.
9. Press CAL2 button (G) until the HEADER TILT LEFT light (not shown) stops flashing, and release the button when the HEADER TILT RIGHT light (not shown) begins flashing.
10. Tilt the header to the maximum right position.
11. Press CAL2 button (G) until all of the following lights flash: raise header (D), lower header (E), height auto mode (A), right header and left header (not shown), and tilt auto mode (F).
12. Center the header.
13. Press CAL1 button (C) to exit calibration and save all values. All lights should stop flashing.

    NOTE:

    If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

Turning off Accumulator – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

The accumulator being on will affect the combine's height adjustment reaction time, which can affect the auto header height control (AHHC) system's performance.

Refer to the combine operator's manual for the procedure for turning the accumulator off and on. For best performance, turn the feeder house accumulator off.

NOTE:

The accumulator is located in front of the front left axle beam.

Figure 3.577: Combine Accumulator ON/OFF Switch

A - Accumulator Lever (Off Position)

Adjusting Header Raise/Lower Rate – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

The auto header height control (AHHC) system's stability is affected by hydraulic flow rates. Adjust the header raise/lower rate to ensure the stability of the auto header height control system.

Ensure that header raise restrictor (A) and header lower restrictor (B) in the hydraulic manifold are adjusted so that it takes approximately 6 seconds to raise the header from ground level to maximum height (that is, to the point at which the hydraulic cylinders are fully extended), and approximately 6 seconds to lower the header from maximum height to ground level.

If there is excessive header movement (for example, hunting) when the header is on the ground, adjust the lower rate so that it takes 7 or 8 seconds for the header to drop down to ground level.

NOTE:

Make this adjustment with the hydraulic system at its normal operating temperature (54.4°C [130°F]) and the engine running at full throttle.

Figure 3.578: Header Raise and Lower Adjustable Restrictor's

Adjusting Ground Pressure – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

Adjust the header ground pressure setting so that the pressure is as light as possible, but sufficiently heavy that the header does not bounce while in operation.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Ensure indicator (A) is at position 0 (B) with the header is 254–356 mm (10–14 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to *Checking Voltage Range from the Combine Cab – Gleaner R65/R66/R75/R76 and Pre-2016 S Series, page 340*.

   NOTE:

   When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

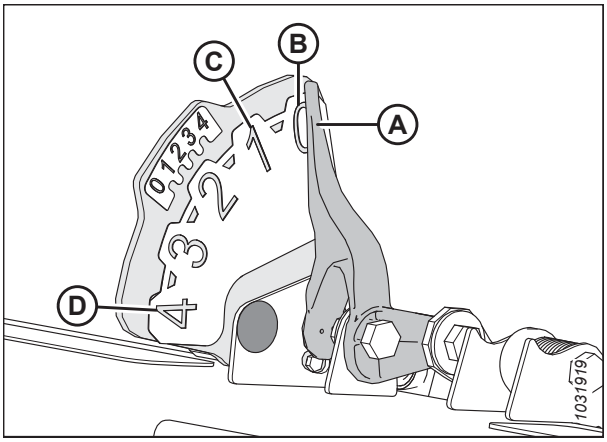


Figure 3.579: Float Indicator

2. Ensure the header is in auto header height control (AHHC) mode. This is indicated by AUTO MODE LED light (A) displaying a continuous, solid light.

3. The header will lower to the height (ground pressure) corresponding to the position selected with height control knob (B). Turn the knob counterclockwise for minimum ground pressure, and clockwise for maximum ground pressure.

Figure 3.580: AHHC Console

Adjusting Auto Header Height Control Sensitivity – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

Auto header height control (AHHC) sensitivity refers to the distance that the cutterbar must travel up or down before the AHHC reacts and raises or lowers the feeder house.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

Figure 3.581: Auto Header Height Control Console

SENSITIVITY ADJUSTMENT dial (A) controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When SENSITIVITY ADJUSTMENT dial (A) is set to maximum (turned completely clockwise), only small changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 19 mm (3/4 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

When SENSITIVITY ADJUSTMENT dial (A) is set to minimum (turned completely counterclockwise), large changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 51 mm (2 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

The HEADER SENSE LINE input also changes the range of the sensitivity. When connected to a draper, the counterclockwise position (least sensitive) allows for approximately 102 mm (4 in.) of vertical travel before correction is made.

Troubleshooting Alarms and Diagnostic Faults – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

Refer to this section to learn the meaning of the alarms and faults related to the auto header height control (AHHC) system. Alarms and diagnostic faults are displayed on the combine's electronic instrument panel (EIP).

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

Display type:

Displayed on tachometer (A) as XX or XXX.

Figure 3.582: Tachometer

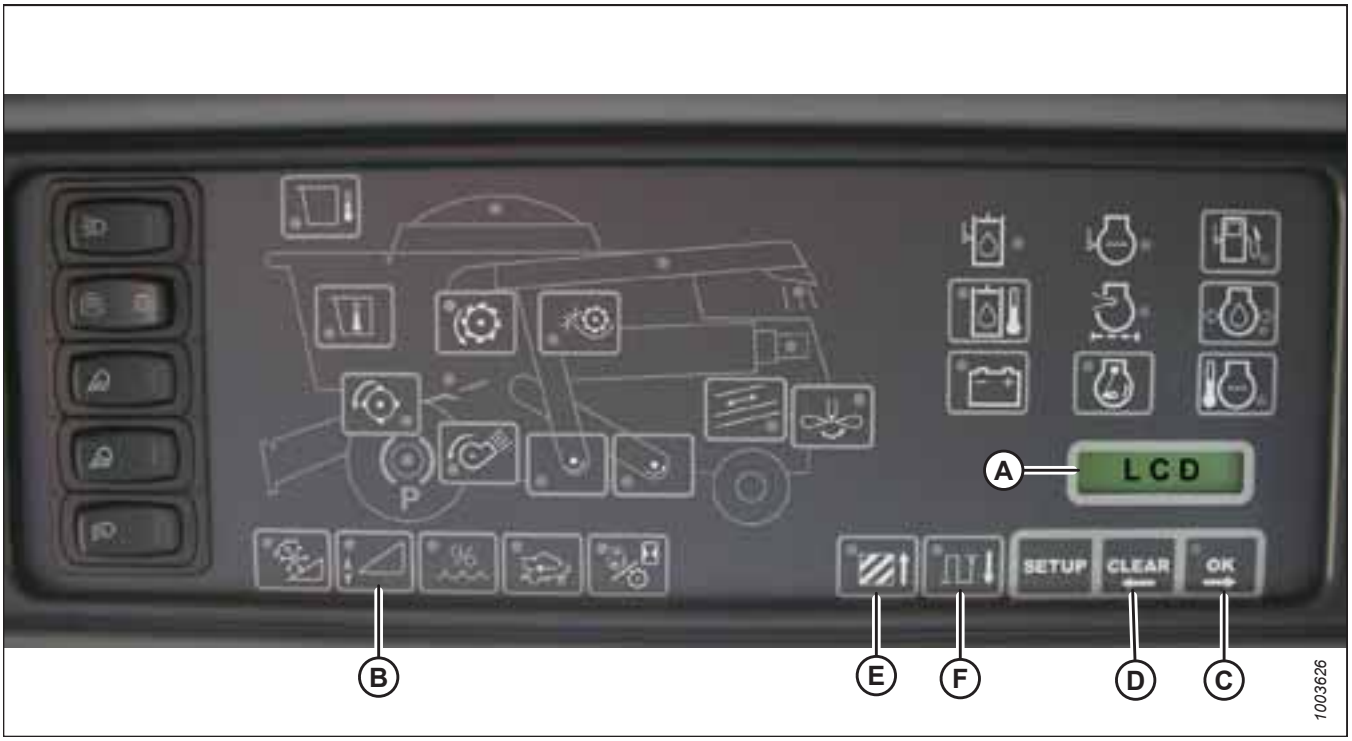


Figure 3.583: Combine Electronic Instrument Panel (EIP)

NOTE:

Displayed on LCD (A) as XX in. or XXX cm.

Alarm conditions:

If an error message is received from the fuse panel, an alarm sounds. The alarm buzzer sounds five times every 10 seconds. The LCD (A) on the electronic instrument panel (EIP) indicates the header system in error as HDR CTRL followed by HGT ERR for height, and HDR CTRL followed by TILT ERR for tilt. The header height LED flashes yellow two times every second.

When an alarm condition occurs, a green LED flashes (green, yellow, or red depending on the input). In addition, a message is displayed on the LCD to identify the nature of the alarm. For example, HYD TEMP, OPEN, SHRT will be flashed alternately.

Diagnostic fault failures:

Refer to Figure *3.583, page 349*.

Pressing header height switch (B) for a minimum of 5 seconds will put the EIP in header diagnostic mode. The LCD (shown on previous screen) will display the message HDR DIAG when the EIP has entered header diagnostic mode.

In this mode, after 3 seconds, header fault parameter labels are displayed on the EIP LCD. All the information displayed is read-only.

OK (C) and CLEAR (D) buttons allow you to scroll through the list of parameters. If there are no active fault codes, the EIP LCD will display NO CODE.

When a parameter is displayed, its label is displayed for 3 seconds, after which its value is automatically displayed.

Pressing OK button (C) while the value is displayed will advance to the next parameter and display its label.

When a parameter label is displayed and OK button (C) is pressed before 3 seconds, the parameter's value will be displayed.

Pressing AREA (E) will cycle through the options. When LEFT is displayed on the LCD, press OK button (C), and the auto header height control (AHHC) voltage will be shown on the display.

Press DIST button (F) to cycle back through the table.

Press CLEAR button (D) to exit header diagnostics and return to normal mode.

3.10.13 Gleaner S9 Series Combines

To make your header's auto header height control (AHHC) system compatible with Gleaner S9 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Setting up Header – Gleaner S9 Series

To set up a header to work with the auto header height control (AHHC) system, you will need to access the HEADER SETTINGS menu using the Tyton terminal.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

AGCO Tyton terminal (A) is used to set up and manage a MacDon draper header on a Gleaner S9 Series combine. Use the touch screen display to select the desired item on the screen.

Figure 3.584: Gleaner S9

A - Tyton Terminal **B - Control Handle**
C - Throttle **D - Header Control Cluster**

1. On the top right quadrant of the home page, touch COMBINE icon (A). The COMBINE MAIN MENU opens.

Figure 3.585: Combine Icon on Home Page

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.

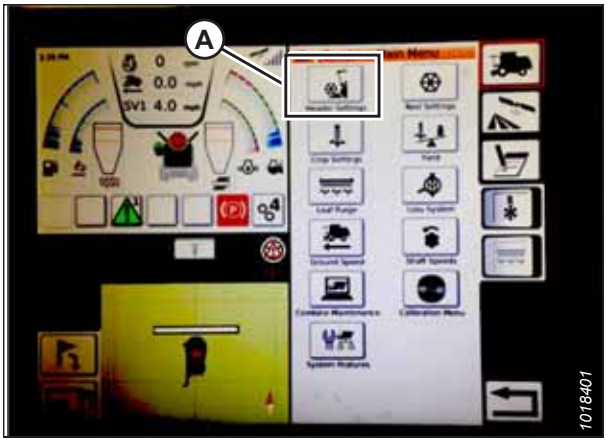


Figure 3.586: Header Settings in Combine Main Menu

3. Touch HEADER CONFIGURATION field (A). A dialog box showing predefined headers opens.
   - If your MacDon header is already set up, it appears on the header list. Touch MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.
   - If only default header (D) is shown, touch ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS page:
     – Green check mark (E) saves the settings
     – Garbage can icon (F) deletes the highlighted header from the list
     – Red X (G) cancels the change(s)

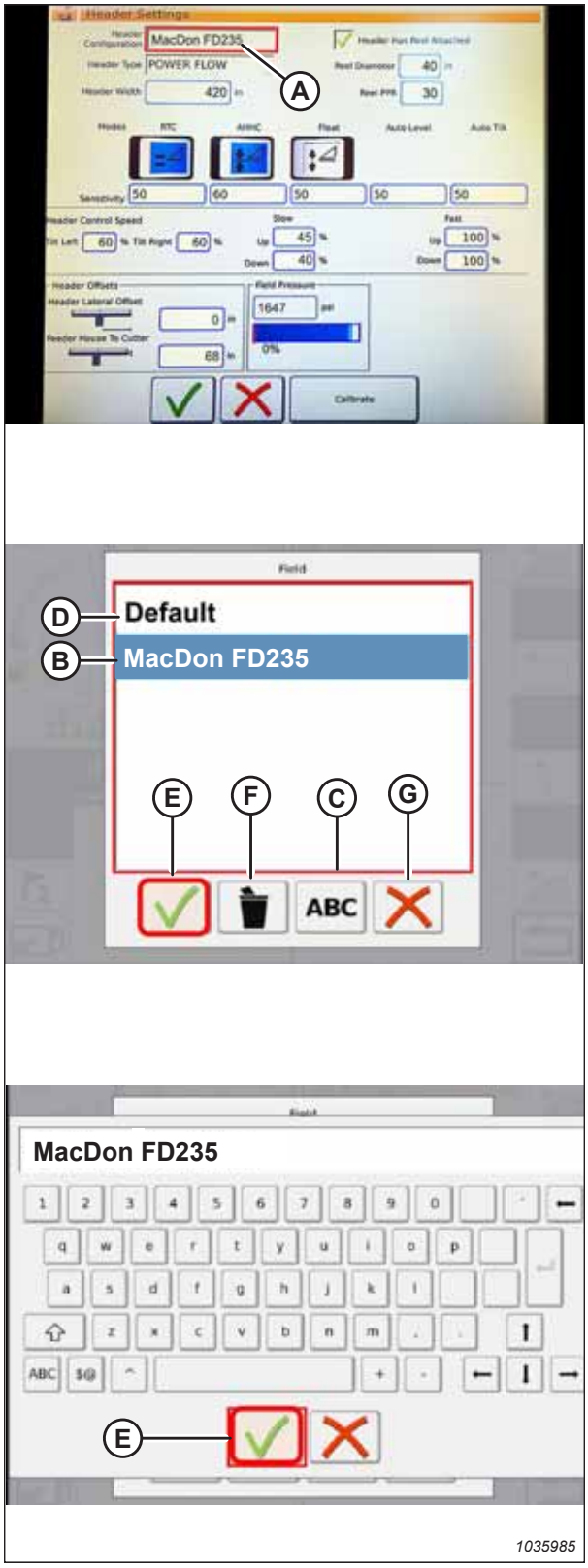


Figure 3.587: Header Configuration Menu on Header Settings Page

4. To specify the type of header installed on the machine, touch HEADER TYPE field (A).

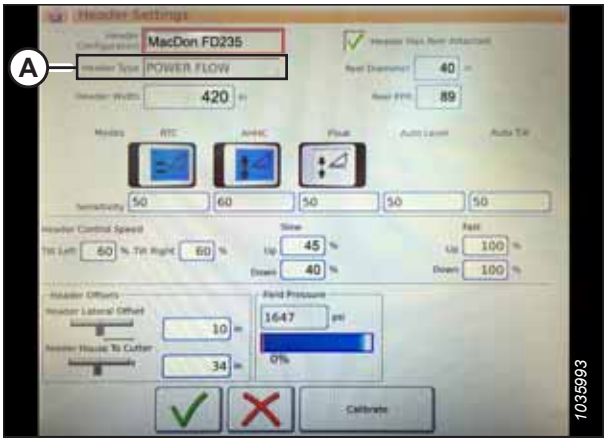


Figure 3.588: Header Settings

5. A list of predefined header types appears.
   - For MacDon FD2 Series FlexDraper® headers, touch POWER FLOW (A)
   - Touch green check mark (B) to save the selection and continue

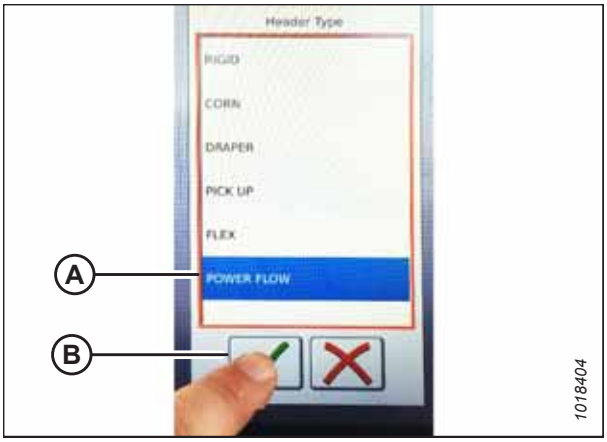


Figure 3.589: Header Type

6. Make sure that HEADER HAS REEL ATTACHED check box (A) is checked.

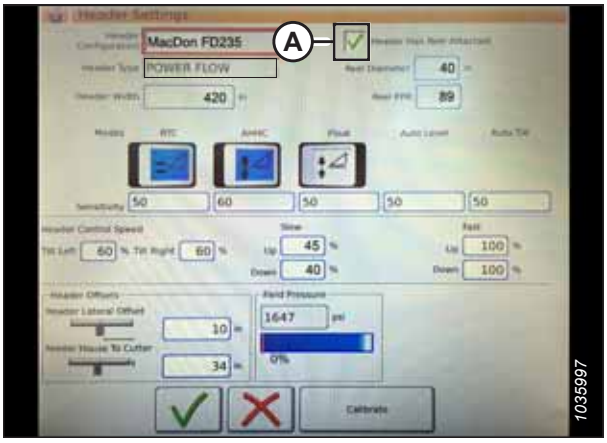


Figure 3.590: Header Settings

7. Touch REEL DIAMETER field (A) and a numeric keypad displays. Enter **40** for a MacDon reel.

8. Touch REEL PPR (Pulses Per Revolution) field (B) and enter **30** as the value for your MacDon header.

   NOTE:

   PPR is determined by the number of teeth on the reel speed sprocket.

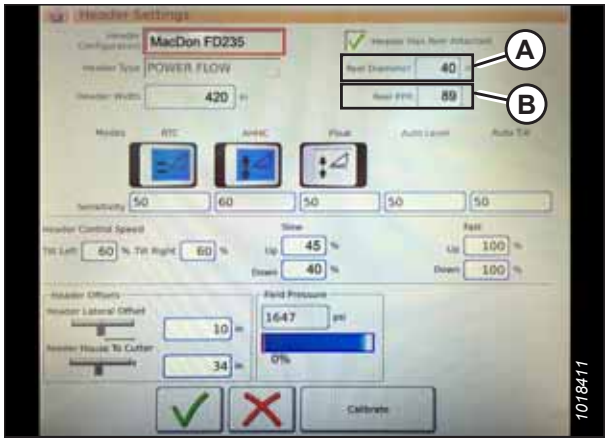


Figure 3.591: Header Settings

9. Touch green check mark (B) at the bottom of numeric keypad (A) when complete, or the red X to cancel.

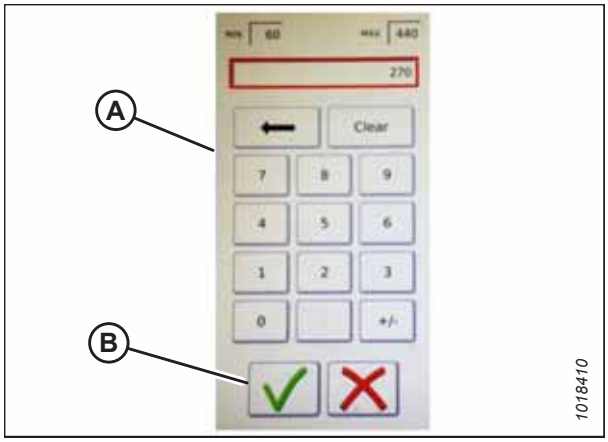


Figure 3.592: Numeric Keypad

10. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.

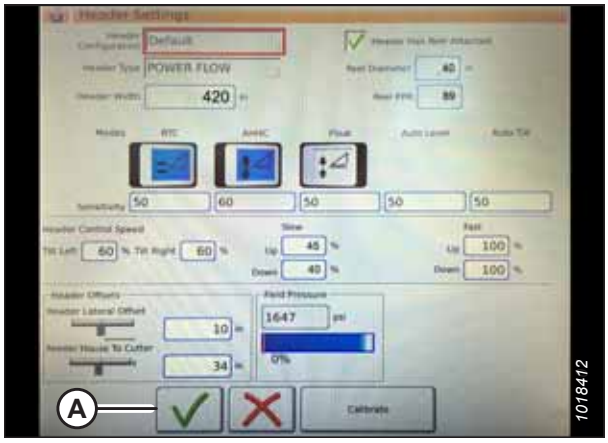


Figure 3.593: Header Settings Page

Setting Minimum Reel Speed and Calibrating Reel – Gleaner S9 Series

To set up the header's minimum reel speed to work with the auto header height control (AHHC) system, and to calibrate the reel, the REEL SETTINGS menu will need to be accessed.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.

Figure 3.594: Reel Settings on Combine Main Menu

2. To set the minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard appears. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in mph and rpm.

   NOTE:

   At the bottom of the REEL SETTINGS page, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS page.

3. The reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) in the top right of the page.

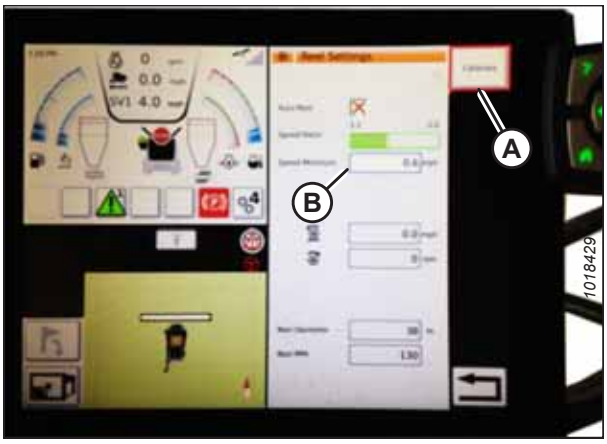


Figure 3.595: Reel Settings Calibration

4. The CALIBRATION WIZARD opens and displays a hazard warning.

5. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press green check mark (A) to accept and start the reel calibration. Pressing red X (B) will cancel the calibration procedure.

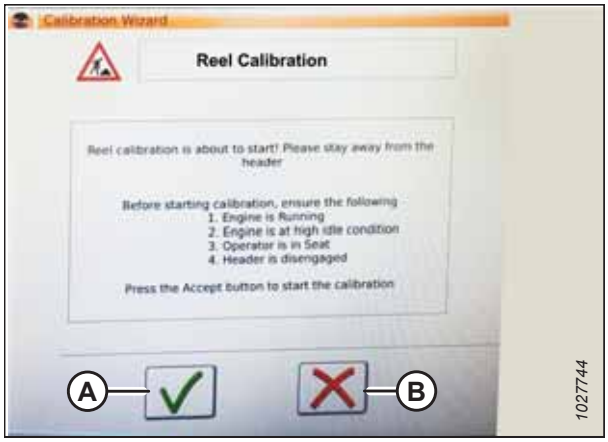


Figure 3.596: Calibration Wizard

6. A message appears in the CALIBRATION WIZARD stating that the reel calibration has started. The reel will begin turning slowly and the reel speed will increase to high speed. A progress bar is provided. If necessary, touch the red X to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.

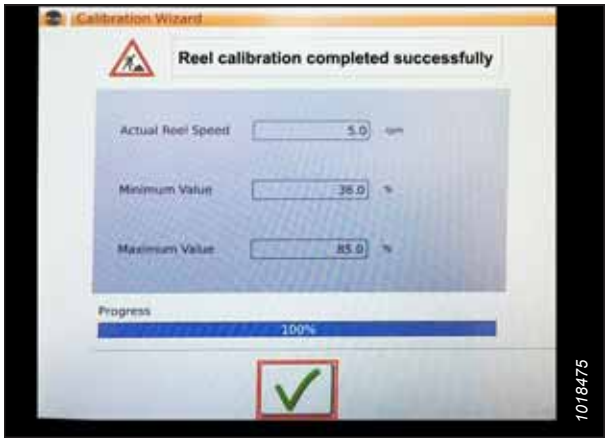


Figure 3.597: Calibration Progress

Setting up Automatic Header Controls – Gleaner S9 Series

Automatic header functions are configured on the HEADER SETTINGS page.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. **Automatic control functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:

   - RTC (return to cut) (A)
   - AHHC (automatic header height control) (B)

   All other switches are disabled (not highlighted).

2. **Sensitivity:** Setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.

   - Increase the sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
   - Decrease the sensitivity if the combine hunts for a position in Auto Mode.

   NOTE:

   The sensitivity starting points for MacDon headers are as follows:

   - **50** for RTC (A)
   - **60** for AHHC (B)

3. **Header speed:** HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:

   - Tilt left and right is the lateral tilt of the combine faceplate
   - Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

   NOTE:

   The control speed starting points for MacDon headers are as follows:

   - Slow: 45 up / 40 down
   - Fast: 100 up / 100 down

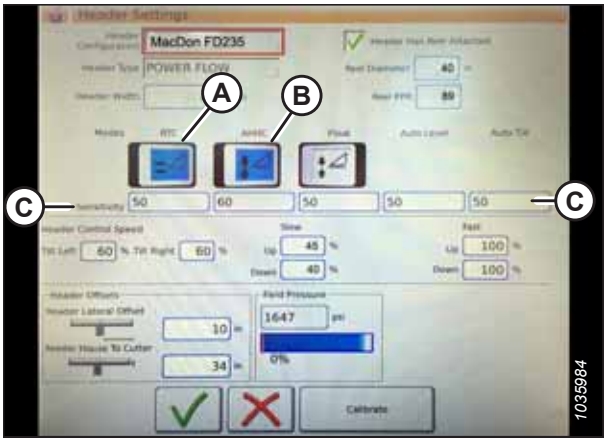


Figure 3.598: Automatic Controls and Sensitivity Settings

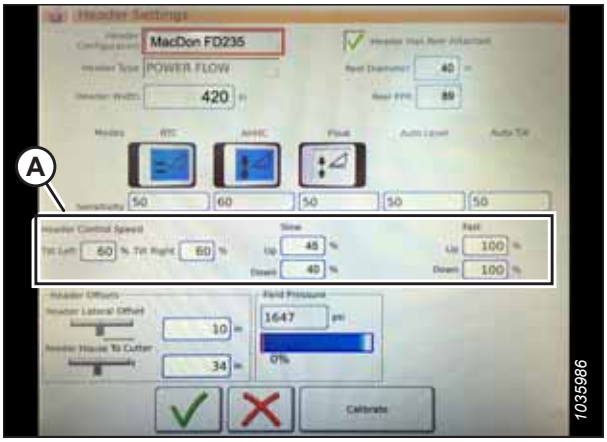


Figure 3.599: Header Speed Control Settings

4. **Header offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:
   - Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. Set to **0** for a MacDon header.
   - Feeder House to Cutter: the distance from the machine interface to the cutterbar. Set to **68** for a MacDon header.

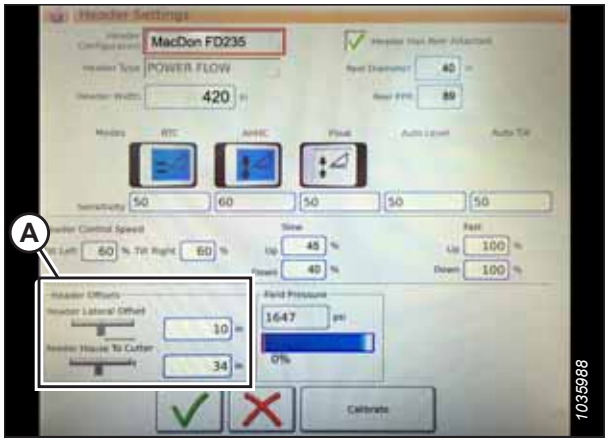


Figure 3.600: Header Offset Settings

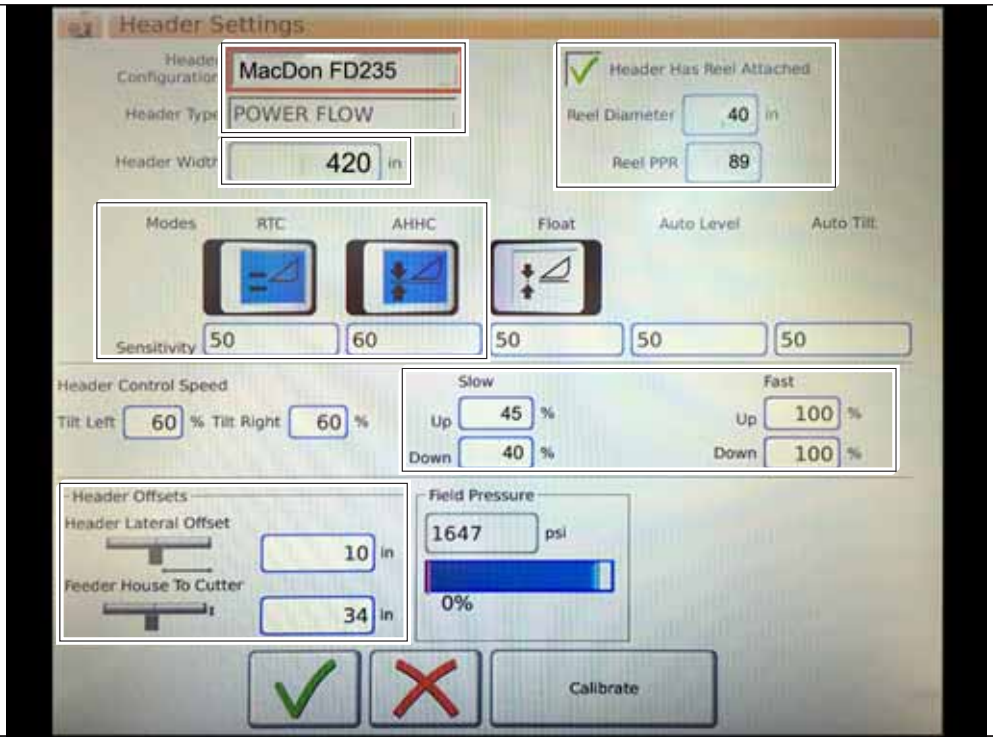


Figure 3.601: MacDon Header Settings Inputs

Calibrating Auto Header Height Control – Gleaner S9 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

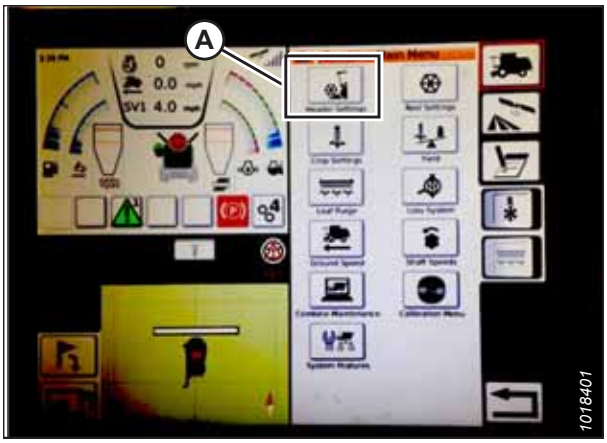


Figure 3.602: Combine Main Menu

2. Touch CALIBRATE (A) at the bottom right of the page. The HEADER CALIBRATION page appears.

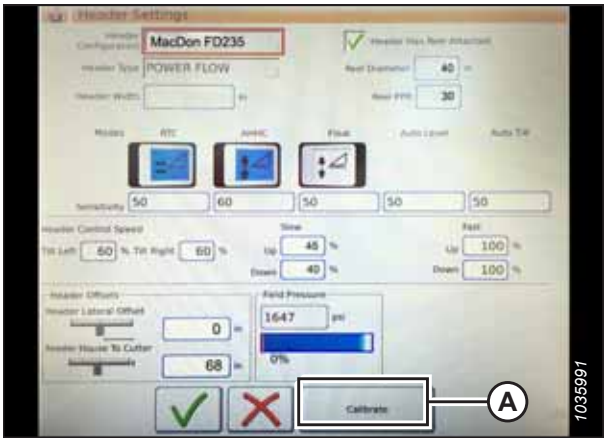


Figure 3.603: Header Settings Page

The right side of the page shows header calibration information (A). The results are shown for a variety of sensors (B):

- Left and right header sensor (voltage) (values will be the same with MacDon headers)
- Header height sensor (mA)
- Tilt position sensor (mA)

The following valid modes are shown with check marks (C) below sensor values (B):

- Return to cut
- Automatic header height control

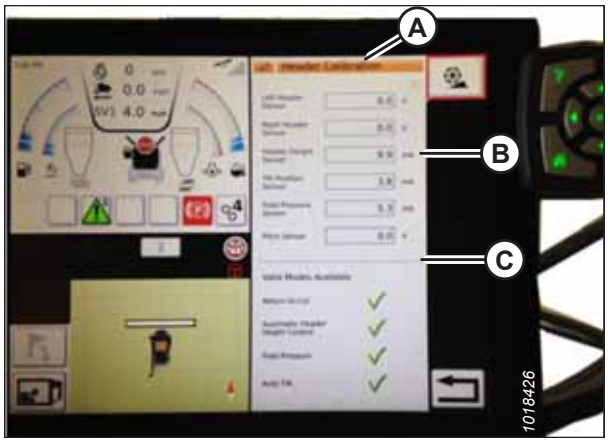


Figure 3.604: Header Calibration Page

3. On the control handle, touch HEADER DOWN button (A). Sensor values start changing on the HEADER CALIBRATION page as the header lowers.

Figure 3.605: Header Down Switch

4. When the sensor values are stable, touch CALIBRATE icon (A).

Figure 3.606: Header Calibration

5. The hazard warning for HEADER CALIBRATION appears. Make sure that all conditions are met.

6. Touch the green check mark at the bottom of the page to start the CALIBRATION WIZARD.

Figure 3.607: Header Calibration Warning

A calibration progress bar displays at the bottom of the screen. The process can be stopped at any time by touching the red X. The header moves automatically and erratically during this process.

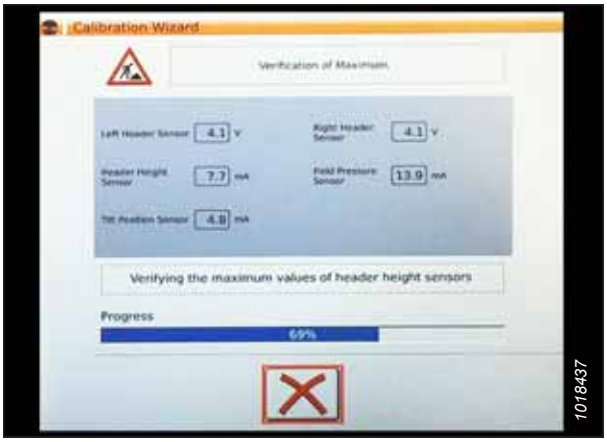


Figure 3.608: Calibration in Progress

7. When the calibration is complete, a message displays, and summary information (A) is shown. Green check marks confirm the functions have been calibrated (B). Touch bottom green check mark (C) to save.

Figure 3.609: Completed Calibration Page

NOTE:

Touch CALIBRATION icon (A) on the COMBINE MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

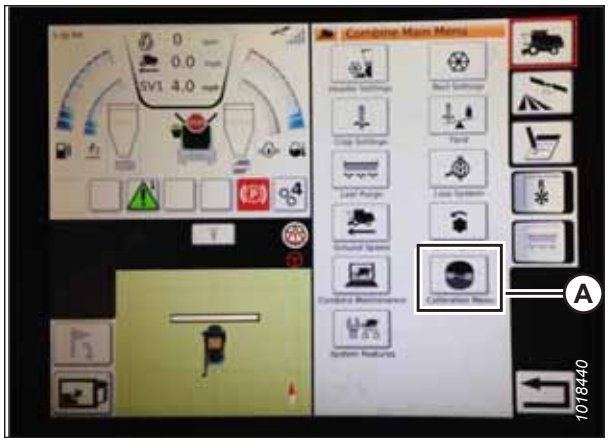


Figure 3.610: Direct Calibration Menu

Operating Auto Header Height Control – Gleaner S9 Series

Once the auto header height control (AHHC) system has been set up, follow these instructions to take advantage of its functions.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

Use the combine operator's manual to familiarize yourself with the controls.

Figure 3.611: Gleaner S9 Operator Controls

1. With the header running, set lateral tilt switch (A) to MANUAL.
2. Engage the AHHC by pressing switch (B) upward to the **I** position.

Figure 3.612: Header Control Cluster

3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the current set point position.

Figure 3.613: AHHC on Control Handle

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.

Figure 3.614: Header Control Cluster

Reviewing Header In-Field Settings – Gleaner S9 Series

The auto header height control (AHHC) settings can be reviewed at a glance by pressing the HEADER icon on the Tyton terminal's home page.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. To view the following header group settings, touch HEADER icon (A) on the right side of the home page:
   - CURRENT POSITION of header (B).
   - SETPOINT cut-off position (C) (indicated by the red line)
   - HEADER symbol (D) – touch to adjust the set point cut-off position using the scroll wheel on the right side of the Tyton terminal.
   - CUT HEIGHT for AHHC (E) – fine-tune with the header height set point control dial on the header control cluster.
   - HEADER WORKING WIDTH (F)
   - HEADER PITCH (G)

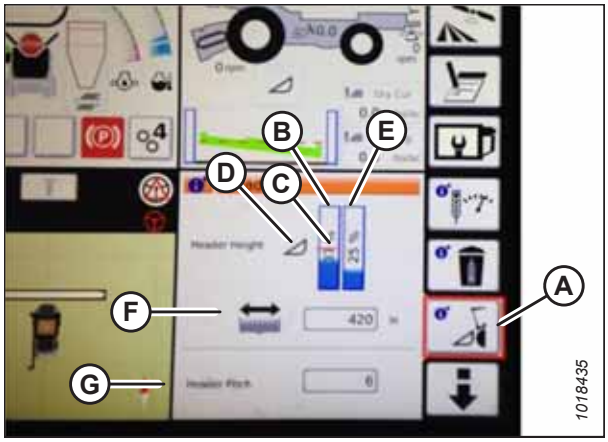


Figure 3.615: Header Groups

2. Touching a field opens the on-screen keyboard, so that the values can be adjusted. Enter the new value and touch the green check mark when complete.

   NOTE:

   Scroll wheel (A) is located on the right side of the Tyton terminal.

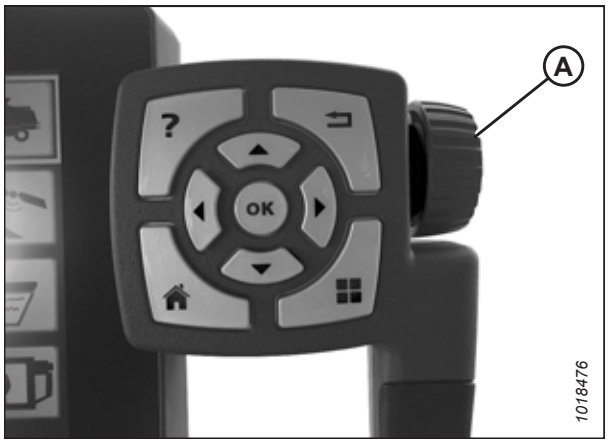


Figure 3.616: Adjustment Wheel on Right Side of Tyton Terminal

NOTE:

HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.

Figure 3.617: Header Control Cluster

3.10.14 IDEAL™ Series Combines

To make your header's auto header height control (AHHC) system compatible with IDEAL™ Series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Header Settings Quick Reference – IDEAL™

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

For detailed instructions, proceed to the IDEAL™ combine header setup and calibration procedures.

Table 3.38 Header Settings – IDEAL™

Setup Parameter	Suggested Setting		
Header Type	Power Flow		
Reel Check Box	Checked		
Reel Diameter	102 cm (40 in.)[69]		
Reel PPR[70]	Standard - 38	High torque sprocket - 68	High speed sprocket - 34
Sensitivity (RTC)	50		
Sensitivity (AHHC)	60		
Header Control Speed[71]	Slow: Up 45/Down 40 Fast: Up 100/Down 100		
Header Lateral Offset	0		
Feeder House to Cutter	68		

Setting up Header – IDEAL™ Series

Set these initial configuration options on your IDEAL™ Series combine when setting up the auto header height control (AHHC) system.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

69. If the reel speed does not index correctly, then the reel diameter can be increased to 112 cm (44 in.).
70. Pulses per revolution
71. A two-stage button with slow speed on the first detent and fast on the second.

Tyton terminal (A) is used to set up and manage a MacDon header on an IDEAL™ Series combine. Use the touch screen display to select the desired item on the page.

Figure 3.618: IDEAL™ Series Operator Station

A - Tyton Terminal **B - Control Handle**
C - Throttle **D - Header Control Cluster**

1. On the top right of the home page, touch COMBINE icon (A). The COMBINE MAIN MENU opens.

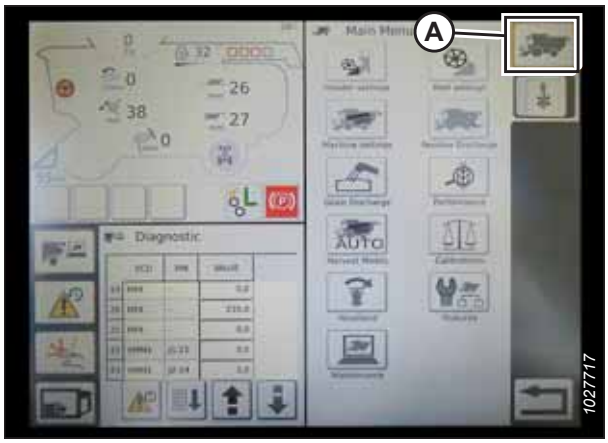


Figure 3.619: Combine Icon on Home Page

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.

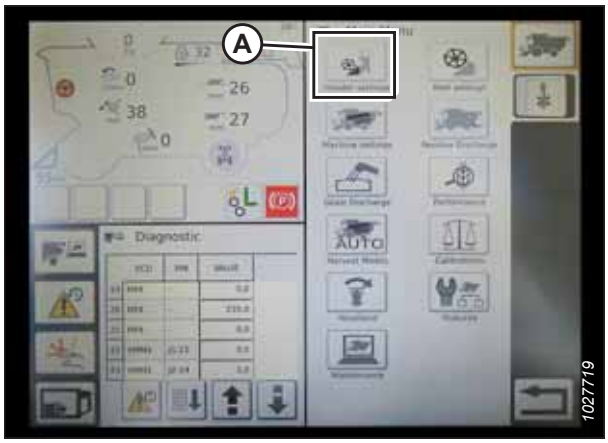


Figure 3.620: Header Settings in Combine Main Menu

3. Touch HEADER CONFIGURATION field (A). A dialog box showing a list of predefined header configuration profiles opens.
   - If your MacDon header is already set up, it appears on the header list. Touch MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.
   - If only default header (D) is shown, touch ABC button (C) and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS page:
     – Green check mark (E) saves the settings
     – Garbage can icon (F) deletes the highlighted header from the list
     – Red X (G) cancels the change(s)

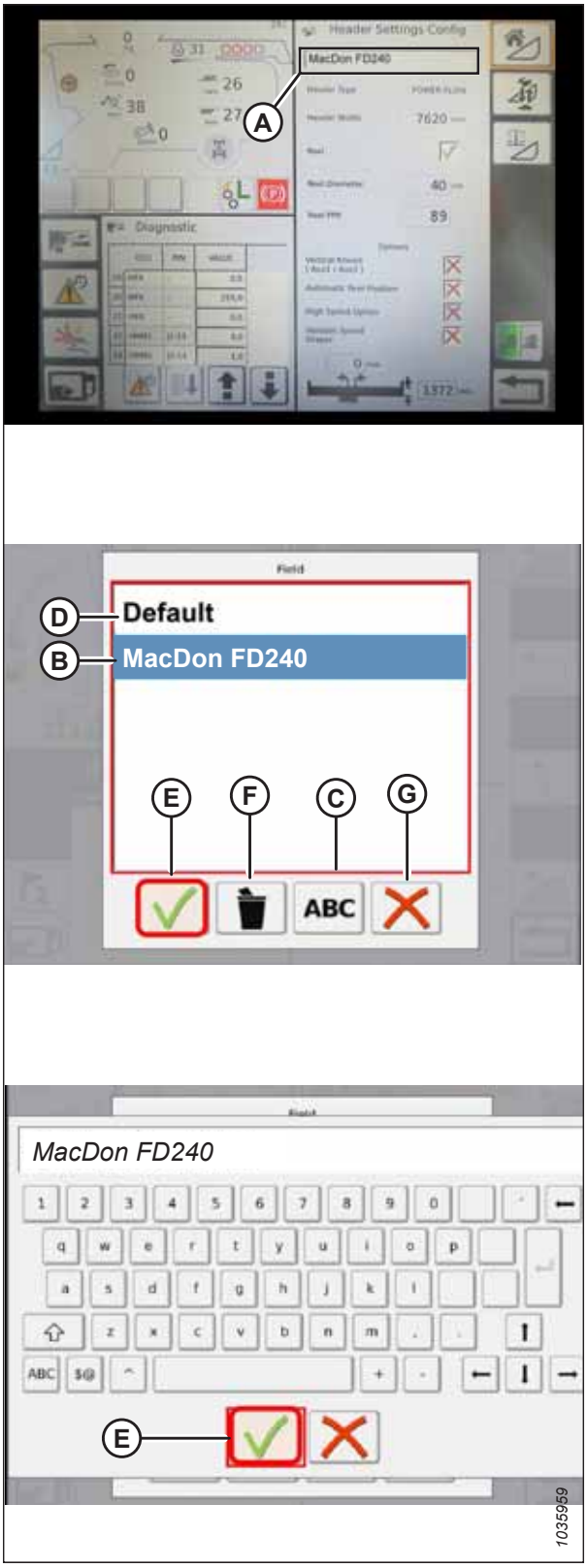


Figure 3.621: Header Configuration Menu on Header Settings Page

4. To specify the type of header installed on the machine, touch HEADER TYPE field (A).

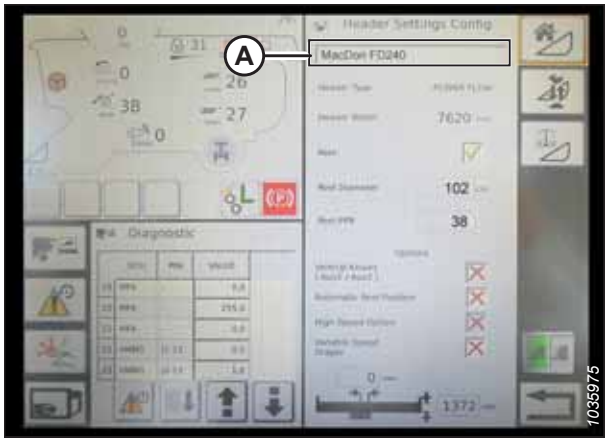


Figure 3.622: Header Settings

5. From the list of predefined header types, touch POWER FLOW (A).
6. Touch green check mark (B) to save the selection and continue.

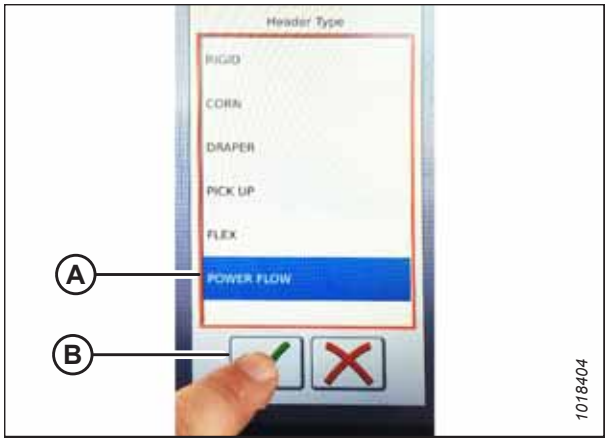


Figure 3.623: Header Type

7. Make sure that REEL check box (A) is checked.

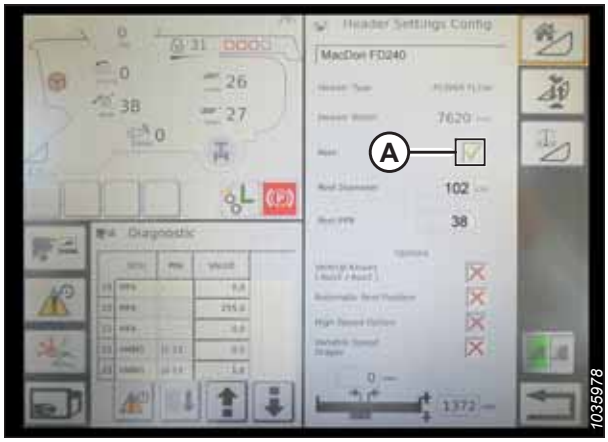


Figure 3.624: Header Settings

8. Touch REEL DIAMETER field (A) and a numeric keypad appears. Enter the following value for a MacDon reel:

   - 102 cm (40 in.)

   NOTE:

   If the reel speed does not index correctly, then the reel diameter can be increased to 112 cm (44 in.).

9. Touch REEL PPR (Pulses Per Revolution) field (B) and enter the following as the value for your MacDon header:

   - **Standard:** 38
   - **Two-speed, high torque:** 68
   - **Two-speed, high speed:** 34

10. Touch green check mark (B) at the bottom of numeric keypad (A) when complete, or the red X to cancel.

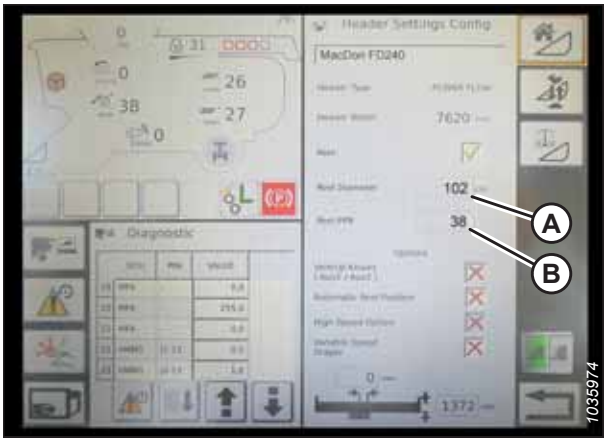


Figure 3.625: Header Settings

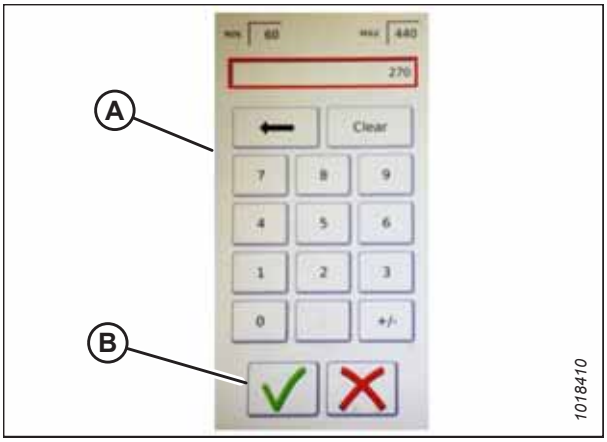


Figure 3.626: Numeric Keypad

11. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.

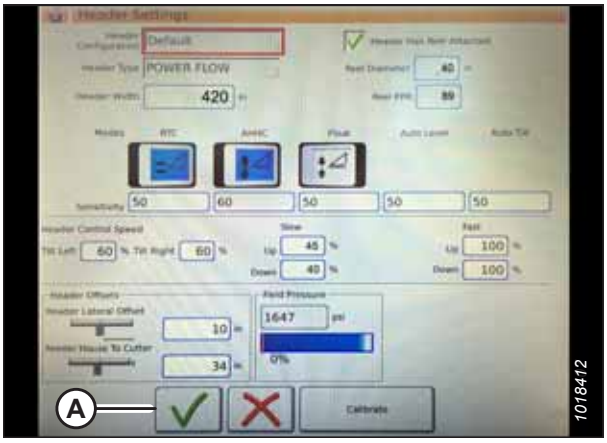


Figure 3.627: Header Settings Page

Setting Minimum Reel Speed and Calibrating Reel – IDEAL™ Series

To configure the reel speed on the header to work with the auto header height control system (AHHC) on an IDEAL™ Series combine, the reel operation parameters must be configured and the combine must run an automatic reel calibration procedure.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. For instructions, refer to the combine operator's manual for updated information.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.

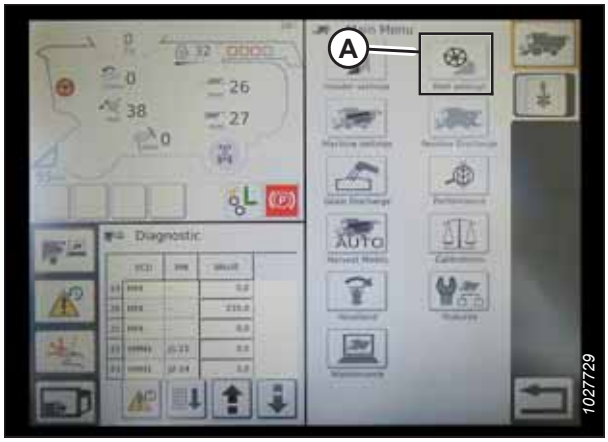


Figure 3.628: Reel Settings on Combine Main Menu

2. To set the minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard appears. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in miles per hour (mph) and rotations per minute (rpm).

   NOTE:

   The reel diameter and reel pulses per revolution (PPR) are displayed at the bottom of the REEL SETTINGS page. These values have already been set in the HEADER SETTINGS page.

3. Reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) at the top right corner of the page.

   NOTE:

   The CALIBRATION WIZARD opens and displays a hazard warning.

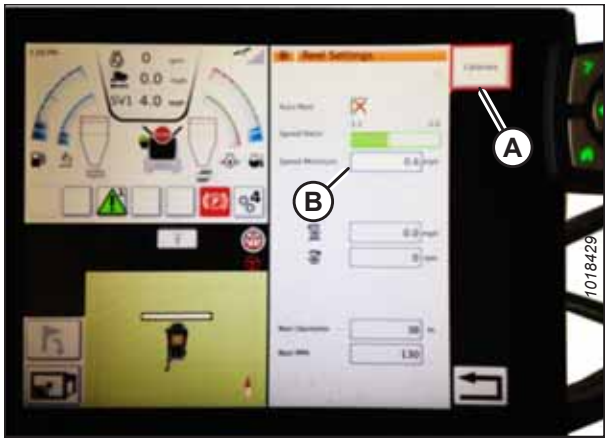


Figure 3.629: Reel Settings Calibration

4. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press the green check mark to accept and start the reel calibration procedure. Pressing the red X will cancel the calibration procedure.

Figure 3.630: Calibration Wizard

5. A message appears in the CALIBRATION WIZARD stating that the reel calibration procedure has started. The reel will begin turning slowly and its speed will gradually increase. If necessary, touch the red X (not shown) to cancel. Otherwise, wait for the message that the reel calibration procedure has completed successfully. Touch the green check mark to save the calibrated settings.

Figure 3.631: Calibration Progress

Setting up Automatic Header Controls – IDEAL™ Series

To configure the automatic header height control (AHHC) functions on an IDEAL™ Series combine to work with your header, navigate to the HEADER SETTINGS page on the combine's computer.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. **Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure that the following two functions are enabled as shown:

   - RTC (return to cut) (A)
   - AHHC (automatic header height control) (B)

   All other switches should be disabled (not highlighted).

2. **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.

   - Increase the sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
   - Decrease the sensitivity if the combine continually hunts for a position in Auto Mode.

   NOTE:

   The following sensitivity settings are recommended for MacDon headers:

   - **50** for RTC (A)
   - **60** for AHHC (B)

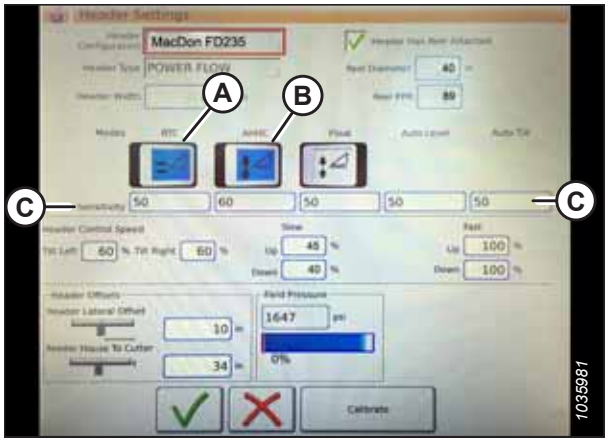


Figure 3.632: Automatic Controls and Sensitivity Settings

3. **Header Speed:** HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:

   - Tilt left and right is the lateral tilt of the combine faceplate
   - Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

   NOTE:

   The recommended header control speed settings are:

   - Slow: Up 45/Down 40
   - Fast: Up 100/Down 100

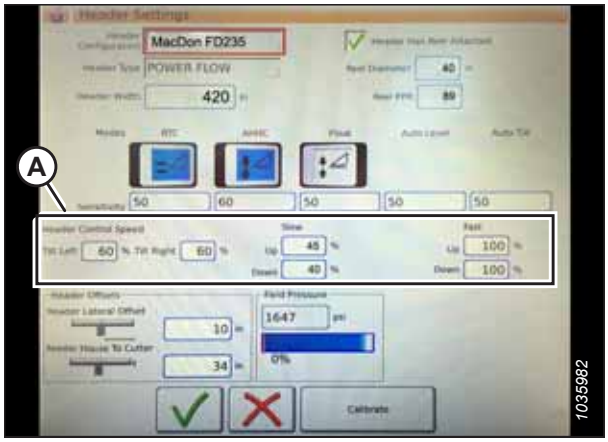


Figure 3.633: Header Speed Control Settings

4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:
   - Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. This should be set at **0** for a MacDon header.
   - Feeder House to Cutter: the distance from the machine interface to the cutterbar. This should be set at **68** for a MacDon header.

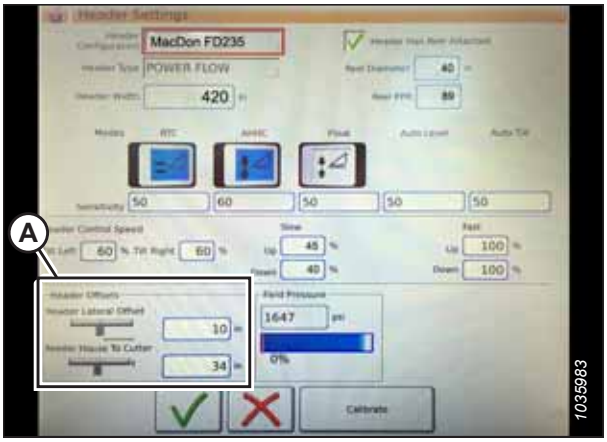


Figure 3.634: Header Offset Settings

Calibrating Header – IDEAL™ Series

The auto header height control (AHHC) sensor output must be calibrated for IDEAL™ Series combines, or the AHHC feature will not work properly.

DANGER

Clear the area of bystanders. Keep children away from the machinery. Walk around the machine to be sure that no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

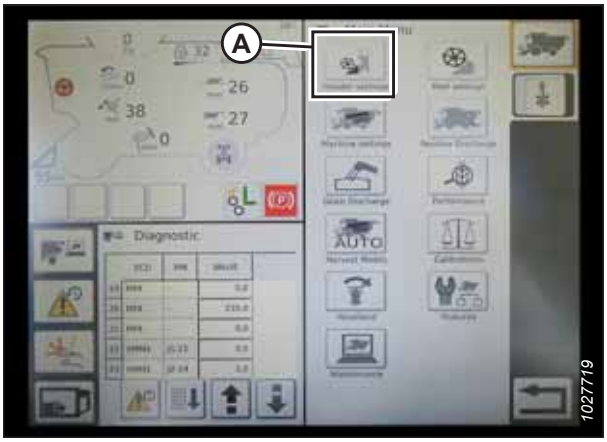


Figure 3.635: Combine Main Menu

2. Touch HEADER CALIBRATE (A) at the right side of the HEADER SETTINGS CONFIG page.

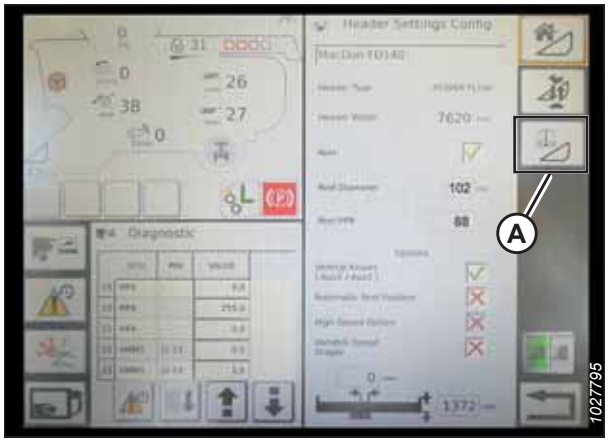


Figure 3.636: Header Settings Page

3. The hazard warning for HEADER CALIBRATION appears. Ensure that all conditions are met.

4. Touch the green check mark at the bottom of the page to start the calibration procedure and follow the on-screen commands.

Figure 3.637: Header Calibration Warning

A progress bar is provided and the calibration can be stopped by touching the red X. The header moves automatically and erratically during this process.

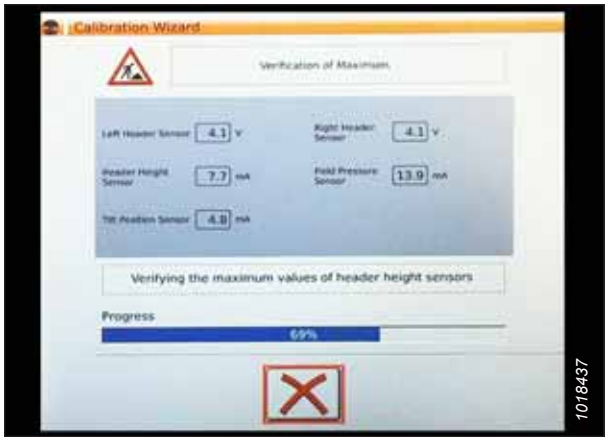


Figure 3.638: Calibration in Progress

5. When the calibration procedure is complete:
   - Review summary information (A)
   - Review green check marks confirming calibrated functions (B)
   - Touch check mark (C) to save

Figure 3.639: Completed Calibration Page

NOTE:

Touch CALIBRATIONS icon (A) on the MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

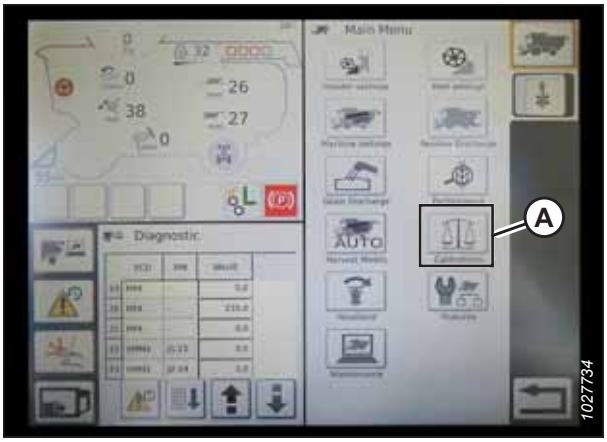


Figure 3.640: Direct Calibration Menu

Operating Header – IDEAL™ Series

Once the auto header height control (AHHC) system has been configured on your IDEAL™ Series combine, the AHHC system can be controlled from the combine cab.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

The following are used to operate the auto header height control (AHHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

Refer to the combine operator's manual to familiarize yourself with the combine's controls.

Figure 3.641: Operator Station

1. With the header running, set the lateral tilt to MANUAL by pressing switch (A). The light above the switch should be off.
2. Engage the AHHC by pressing switch (B). The light above the switch should be on.

Figure 3.642: Header Control Cluster

3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the configured set point position.

Figure 3.643: AHHC on Control Handle

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the header position.

Figure 3.644: Header Control Cluster

Reviewing Header In-Field Settings – IDEAL™ Series

Once the auto header height control (AHHC) system is working correctly with your IDEAL™ Series combine, you can fine-tune these AHHC settings to your liking.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Touch HEADER icon (A) on the right side of the home page to view the following header group settings:
   - CURRENT POSITION of header (B).
   - SETPOINT cut-off position (C) (indicated by the red line)
   - HEADER symbol (D) – touch this to adjust the set point cut-off position using the adjustment wheel on the right side of the Tyton terminal.
   - CUT HEIGHT for AHHC (E) – fine-tune this setting with the header height set point control dial on the header control cluster.
   - HEADER WORKING WIDTH (F)
   - HEADER PITCH (G)

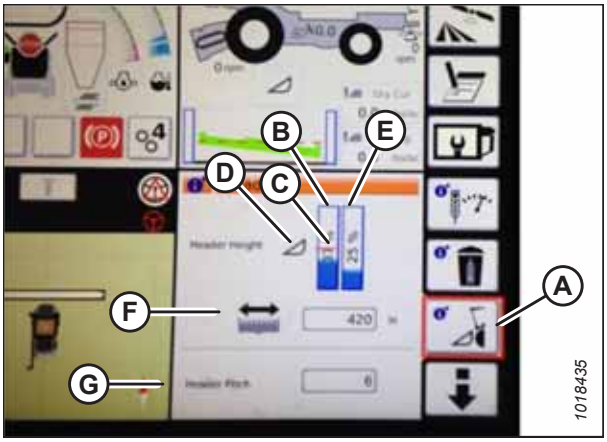


Figure 3.645: Header Groups

2. Touching a field opens the on-screen keyboard so that the values can be adjusted. Enter the new value and touch the green check mark.

   NOTE:

   Adjustment wheel (A) is located on the right of the Tyton terminal.

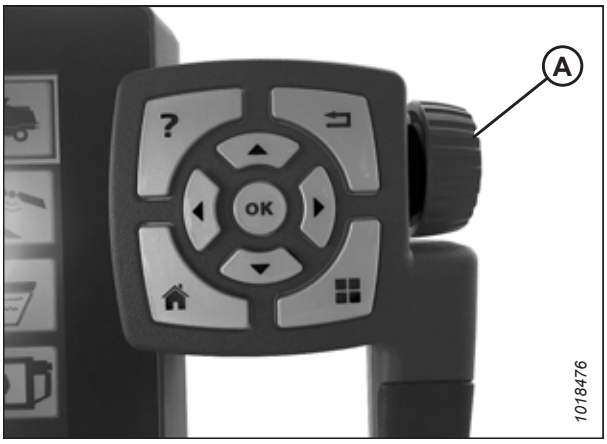


Figure 3.646: Adjustment Wheel on Right of Tyton Terminal

NOTE:

HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.

Figure 3.647: Header Control Cluster

3.10.15 John Deere 70 Series Combines

To make your header's auto header height control (AHHC) system compatible with John Deere 70 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from Combine Cab – John Deere 70 Series

The auto header height control (AHHC) sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

DANGER

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground.
2. Unlock the float.

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

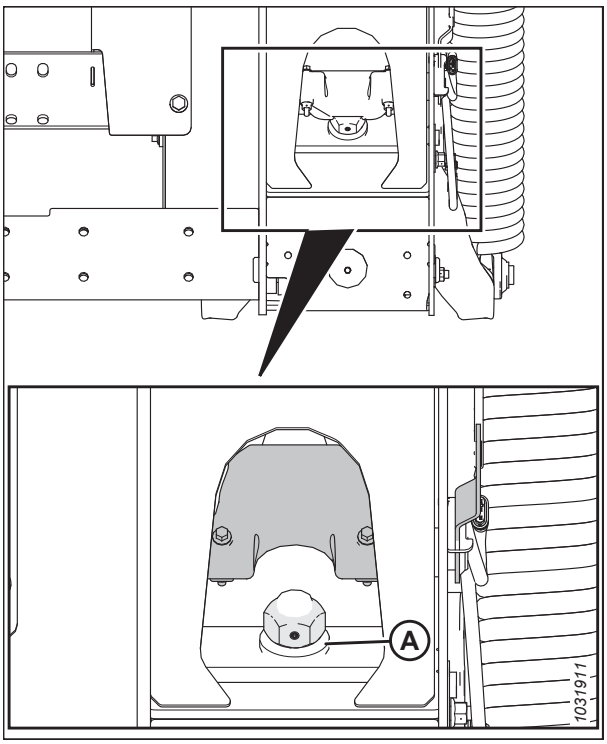


Figure 3.648: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).

5. Tighten bolt (A).

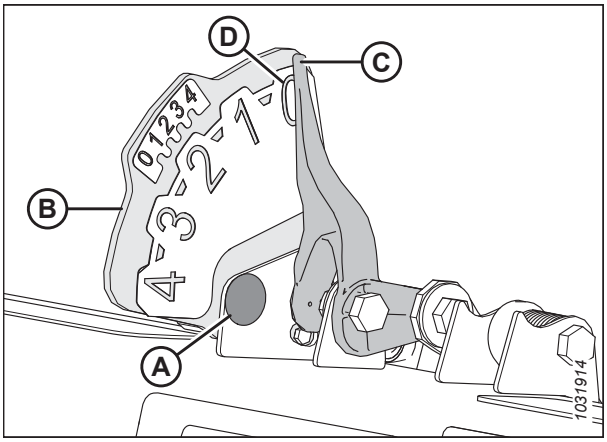


Figure 3.649: Float Indicator

6. Press HOME PAGE button (A) on the main page of the display.

Figure 3.650: John Deere Combine Display

7. Ensure three icons (A) shown in the illustration at right appear on the display.

Figure 3.651: John Deere Combine Display

8. Use scroll knob (A) to highlight the middle icon (the green i) and press check mark button (B) to select it. The Message Center appears.

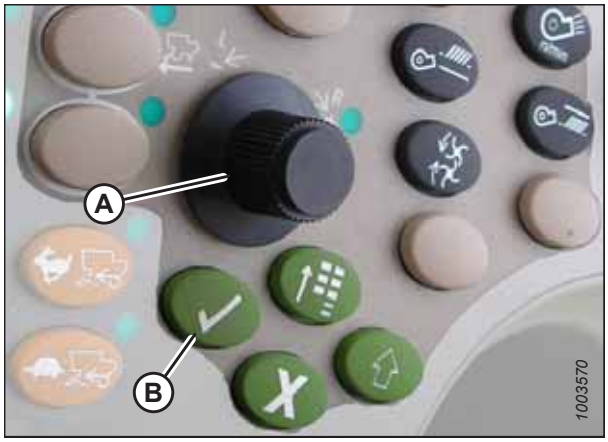


Figure 3.652: John Deere Combine Control Console

9. Use the scroll knob to highlight DIAGNOSTIC ADDRESSES (A) from the right column and select it by pressing the check mark button.
10. Use the scroll knob to highlight drop-down box (B) and press the check mark button to select it.

Figure 3.653: John Deere Combine Display

11. Use the scroll knob to highlight LC 1.001 VEHICLE (A) and press the check mark button to select it.

Figure 3.654: John Deere Combine Display

12. Use the scroll knob to highlight down arrow (A) and press the check mark button to scroll through the list until 029 DATA (B) is displayed and voltage reading (C) appears on the display.

Figure 3.655: John Deere Combine Display

13. Ensure the header float is unlocked.
14. Start the combine and fully lower the feeder house to the ground.

    NOTE:

    You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

15. Check the sensor reading on the display.

16. Raise the header so it is just off the ground and recheck the sensor reading.

Calibrating Feeder House Speed – John Deere 70 Series

The feeder house speed must be calibrated before you calibrate the auto header height control (AHHC) system.

For instructions, refer to the combine operator's manual.

Adjusting Manual Header Raise/Lower Rate – John Deere 70 Series

The weight of the header will dictate the rate at which the header can be raised or lowered during operation.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press button (A) and the current raise/lower rate setting will appear on the display (the lower the reading, the slower the rate).
2. Use scroll knob (B) to adjust the rate. The adjustment will be saved automatically.

   NOTE:

   If the display remains idle for a short period of time, it will automatically return to the previous page. Pressing check mark button (C) will also return the display to the previous page.

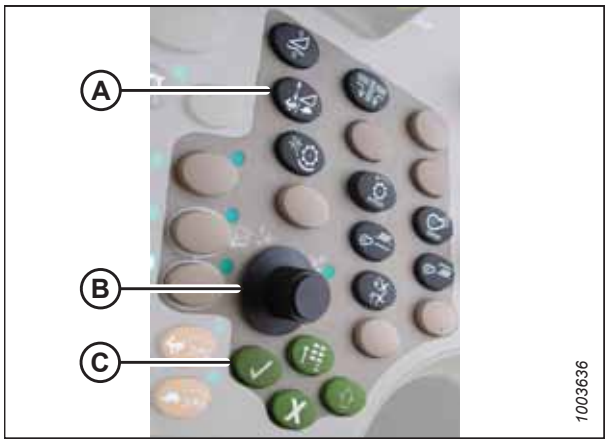


Figure 3.656: John Deere Combine Control Console

NOTE:

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 3.657: John Deere Combine Display

Calibrating Auto Header Height Control – John Deere 70 Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops.
3. Put the wings in the locked position.
4. Unlock the float.
5. Start the combine.
6. Press the button located fourth from the left along the top of display (A) to select the icon that resembles an open book with a wrench on it (B).
7. Press top button (A) a second time to enter diagnostics and calibration mode.

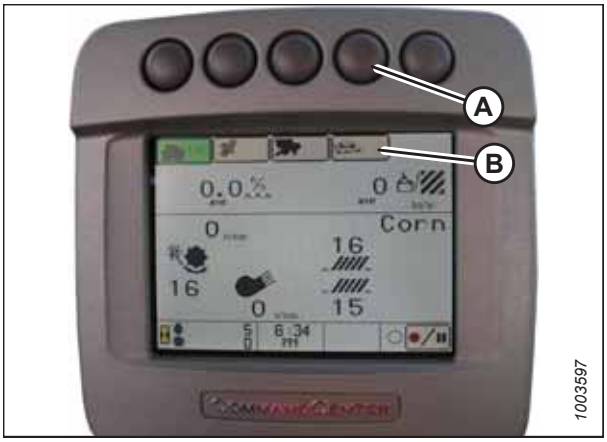


Figure 3.658: John Deere Combine Display

8. Select HEADER in box (A) by scrolling down to the box using the scroll knob, and then pressing the check mark button (knob and button are shown in Figure *3.660, page 384*).
9. Scroll down to the lower right icon that resembles an arrow in a diamond (B) and press the check mark button to select it.
10. Follow the steps listed on the page to perform the calibration.

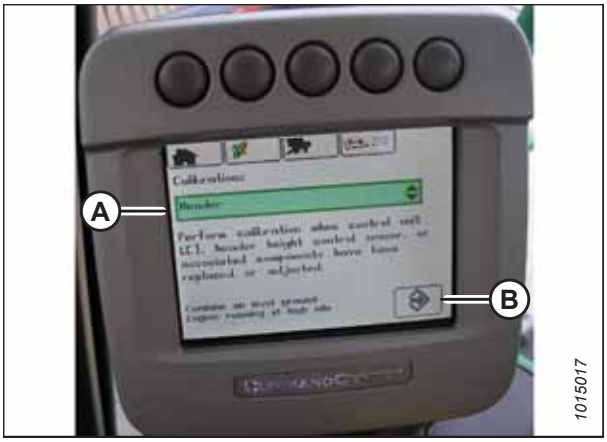


Figure 3.659: John Deere Combine Display

NOTE:

If an error code appears on the display, the sensor is not in the correct working range. Check and adjust the range. For instructions, refer to *Checking Voltage Range from Combine Cab – John Deere S and T Series, page 385*.

NOTE:

If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

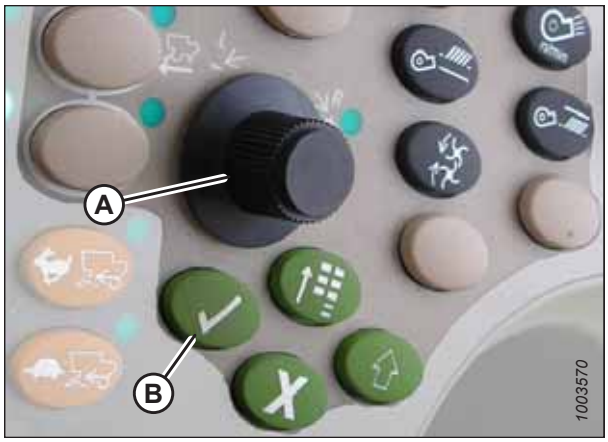


Figure 3.660: John Deere Combine Control Console

A - Scroll Knob **B - Check Mark Button**

Setting Auto Header Height Control Sensitivity – John Deere 70 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press button (A) twice. The current sensitivity setting will appear on the display (the lower the reading, the lower the sensitivity).
2. Use scroll knob (B) to adjust the sensitivity setting. The adjustment will be saved automatically.

   NOTE:

   If the page remains idle for a short period of time, it will automatically return to the previous page. Pressing check mark button (C) also will return the display to the previous page.

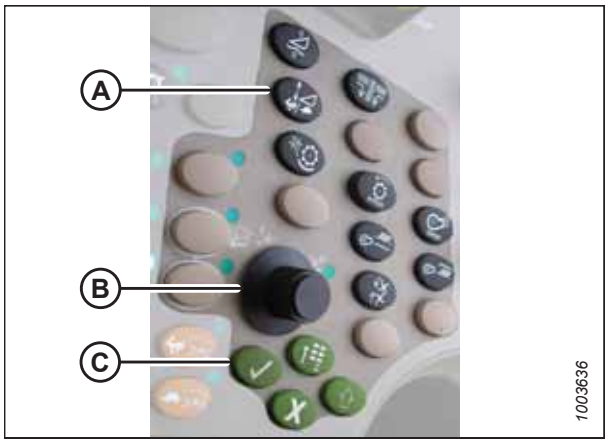


Figure 3.661: John Deere Combine Control Console

NOTE:

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 3.662: John Deere Combine Display

3.10.16 John Deere S and T Series Combines

To make your header's auto header height control (AHHC) system compatible with John Deere S and T series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Checking Voltage Range from Combine Cab – John Deere S and T Series

The auto header height control (AHHC) sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

DANGER

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground.
2. Unlock the float.

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

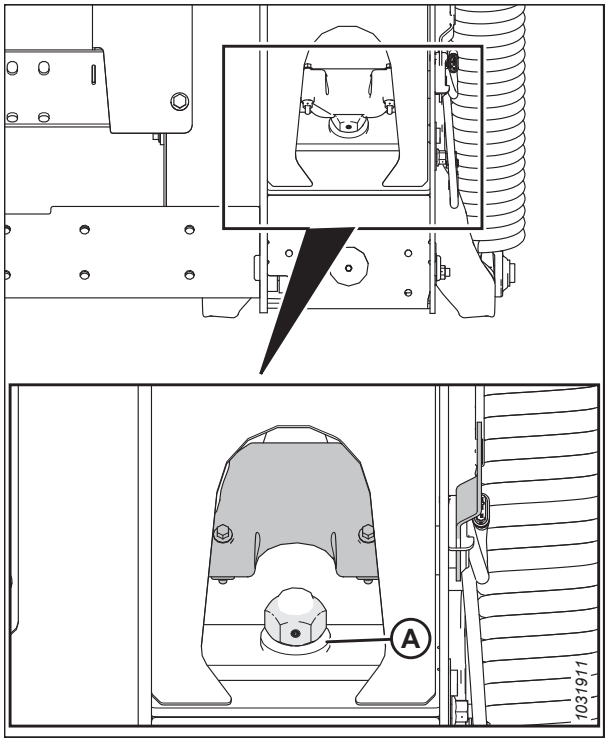


Figure 3.663: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).

5. Tighten bolt (A).

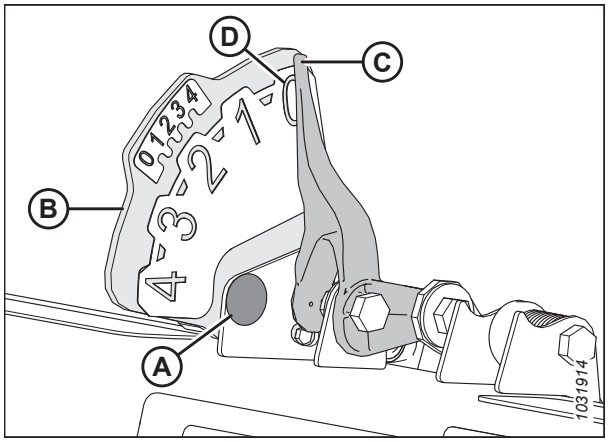


Figure 3.664: Float Indicator

6. Press CALIBRATION icon (A) on the main page of the display. The CALIBRATION page appears.

Figure 3.665: John Deere Combine Display

7. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION page. The DIAGNOSTIC READINGS page appears. This page provides access to calibrations, header options, and diagnostic information.

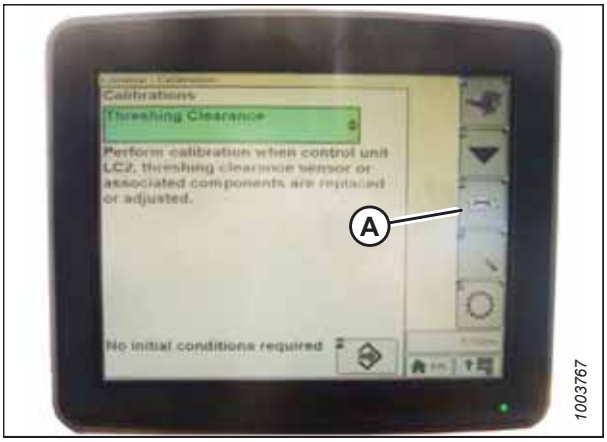


Figure 3.666: John Deere Combine Display

8. Select AHHC RESUME (A) and a list of calibration options appears.

Figure 3.667: John Deere Combine Display

9. Select the AHHC SENSING option.
10. Press icon (A). The AHHC SENSING menu appears and five pages of information appear.

Figure 3.668: John Deere Combine Display

11. Press icon (A) until it reads Page 5 near the top of the page and the following sensor readings appear:
    - LEFT HEADER HEIGHT
    - CENTER HEADER HEIGHT
    - RIGHT HEADER HEIGHT

    A reading is displayed for both the left and right sensors. On the MacDon header, there may be one sensor located in the float indicator box (standard) or two sensors located at the back of the float module side frame (optional).

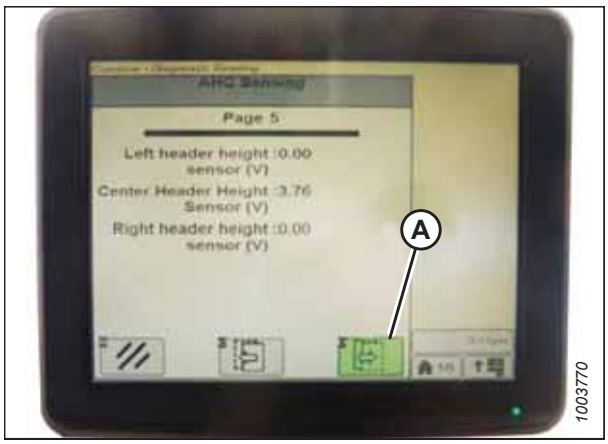


Figure 3.669: John Deere Combine Display

12. Ensure the header float is unlocked.
13. Start the combine and fully lower the feeder house to the ground.

    NOTE:

    You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

14. Check the sensor reading on the display.

Adjusting Manual Header Raise/Lower Rate – John Deere S and T Series

The rate at which the header can be raised or lowered using the combine controls can be changed from the height sensitivity screen in the combine command center.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Put the wings in the locked position.

NOTE:

Indicator (A) should be at position 0 (B) with the header 254–356 mm (10–14 in.) off the ground. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

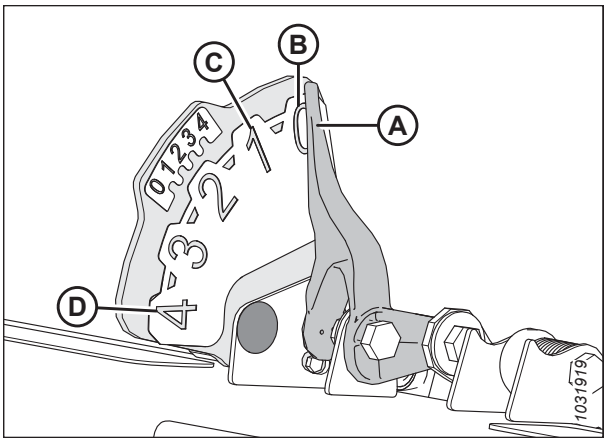


Figure 3.670: Float Indicator

2. Press button (A) and the current sensitivity setting will appear on the display.

Figure 3.671: John Deere Combine Command Center

3. Press **–** or **+** icons (A) to adjust the rates.

   NOTE:

   The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 3.672: John Deere Combine Display

Calibrating Auto Header Height Control – John Deere S and T Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

If header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so header does not physically separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops.
3. Unlock the float.
4. Put the wings in the locked position.
5. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION page appears.

Figure 3.673: John Deere Combine Display

6. Select THRESHING CLEARANCE (A) and a list of calibration options appears.

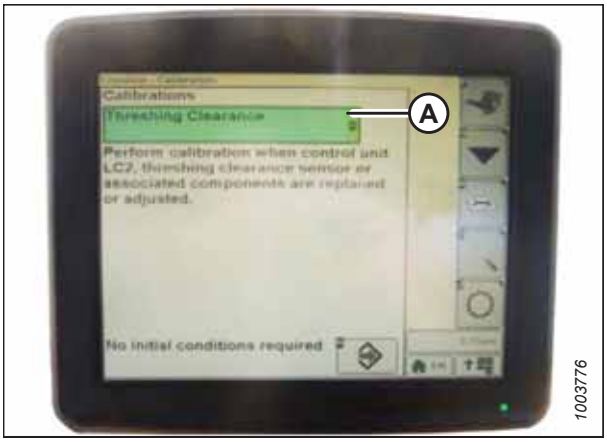


Figure 3.674: John Deere Combine Display

7. Select FEEDER HOUSE SPEED (A) from the list of calibration options.

   NOTE:

   Feeder house speed calibration must be done before header calibration.

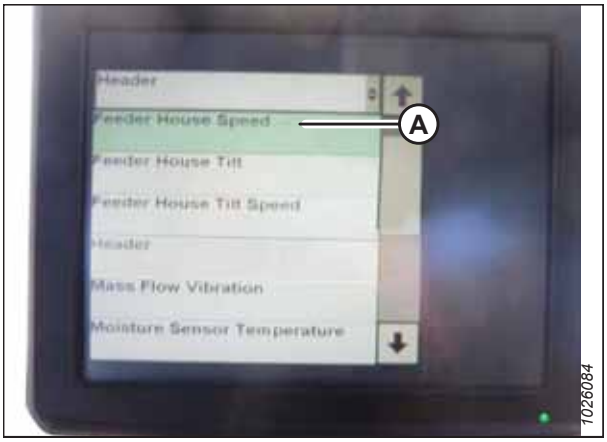


Figure 3.675: John Deere Combine Display

8. With FEEDER HOUSE SPEED selected, press icon (A). The icon turns green.

Figure 3.676: John Deere Combine Display

9. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.

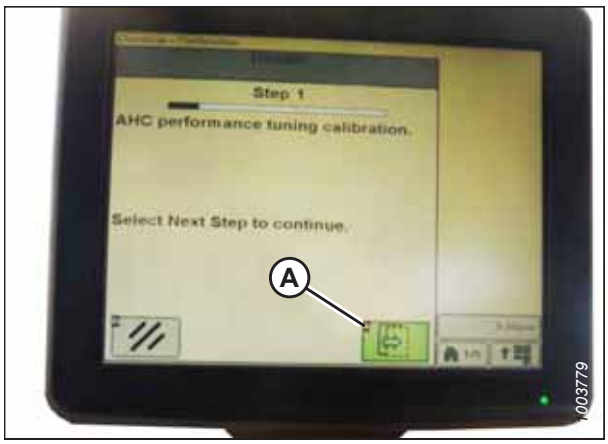


Figure 3.677: John Deere Combine Display

10. Select HEADER (A) from the list of calibration options.

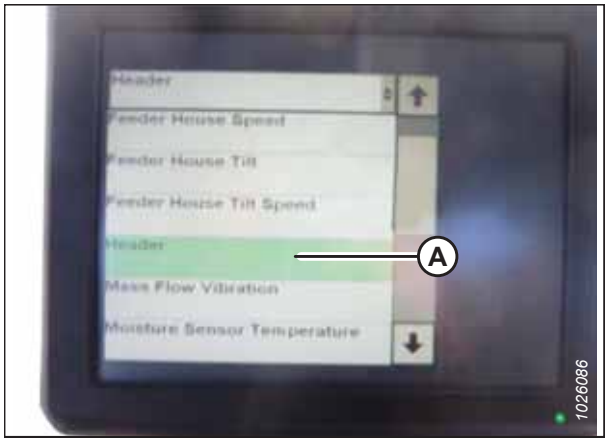


Figure 3.678: John Deere Combine Display

11. With HEADER selected, press icon (A). The icon turns green.

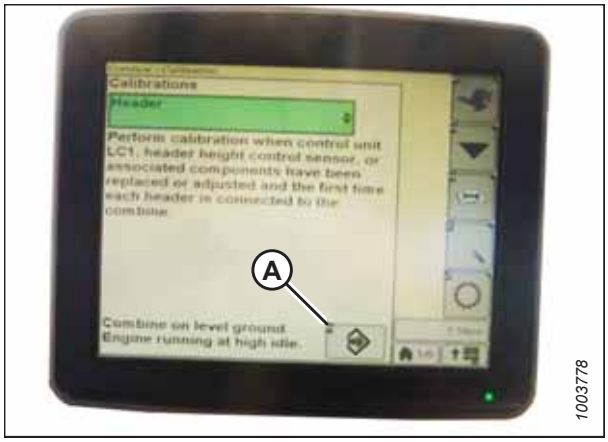


Figure 3.679: John Deere Combine Display

12. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.

    NOTE:

    If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Voltage Range from Combine Cab – John Deere S and T Series, page 385*.

    NOTE:

    If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

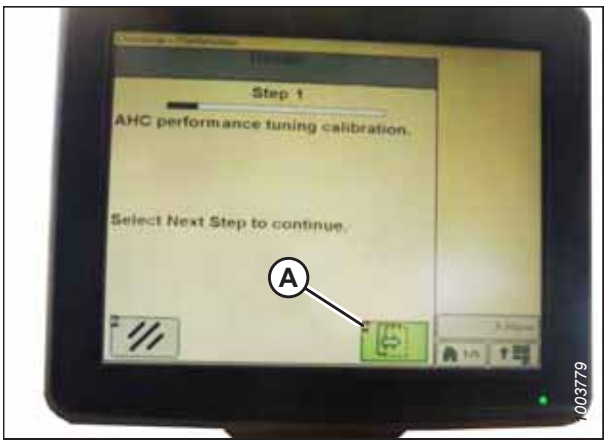


Figure 3.680: John Deere Combine Display

Setting Auto Header Height Control Sensitivity – John Deere S and T Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press button (A) twice and the current sensitivity setting will appear on the display.

Figure 3.681: John Deere Combine Command Center

2. Press **–** or **+** icons (A) to adjust the rates.

   NOTE:

   The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.

Figure 3.682: John Deere Combine Display

Setting Preset Cutting Height – John Deere S and T Series

The reel and cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Ensure indicator (A) is at position 0 (B) with the header 254–356 mm (10–14 in.) off the ground.

   NOTE:

   When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

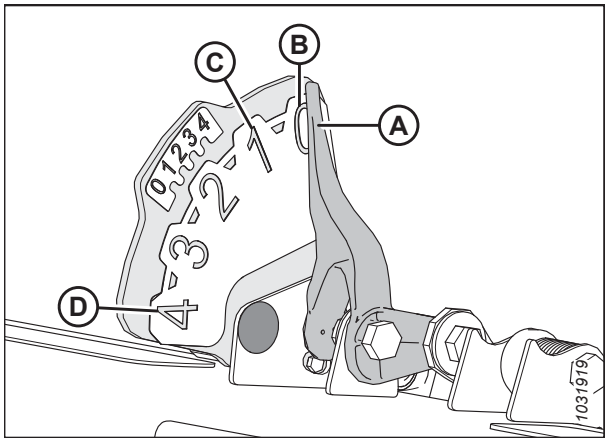


Figure 3.683: Float Indicator

2. Press COMBINE – HEADER SETUP icon (A) on the main page. The COMBINE – HEADER SETUP page appears. This page is used to set various header settings such as reel speed, header width, and height of feeder house for acre counter engagement.

Figure 3.684: Combine Display

3. Select COMBINE – HEADER SETUP AHC icon (A). The COMBINE – HEADER SETUP AHC page appears.

Figure 3.685: Combine Display

4. Select AUTO HEIGHT SENSING (A), RETURN TO CUT (B), and REEL POSITION (C) icons.

   NOTE:

   If REEL POSITION icon (C) cannot be selected (no check mark), the reel height sensor requires calibration. For instructions, refer to *Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – John Deere S and T Series, page 402*.

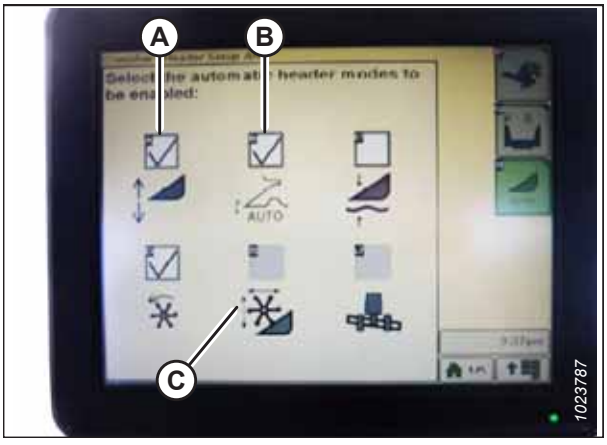


Figure 3.686: Combine Display

5. Engage the header.
6. Move the header to the desired position and use knob (A) to fine tune the position.
7. Move the reel to the desired position.

Figure 3.687: Combine Control Console

8. Press and hold preset switch 2 (B) until the reel height icon flashes on display.
9. Repeat the previous three steps for preset switch 3 (C).
10. Select an appropriate ground pressure setting. Use preset button 2 (B) on the control handle for a low ground pressure setting in muddy or soft soil conditions, and preset 3 (C) for a high ground pressure setting in firm soil conditions and a higher ground speed.

    NOTE:

    Preset button 1 (A) is reserved for header lift on the headland and is not used for cutting on the ground.

Figure 3.688: Control Handle Buttons

NOTE:

When the AHHC is engaged, AHHC icon (A) appears on the display and the number indicating which button was pressed (B) is shown on the page.

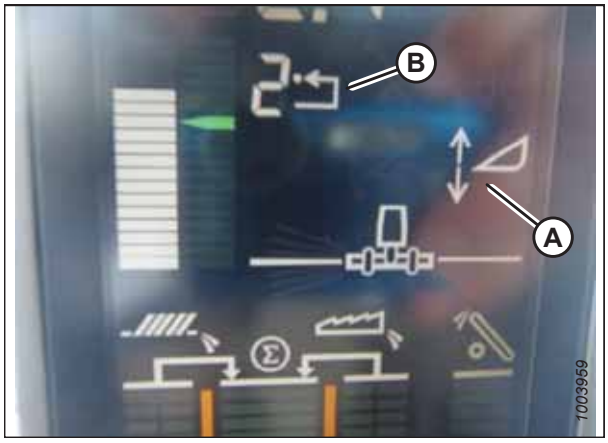


Figure 3.689: Combine Display

Calibrating Feeder House Fore-Aft Tilt Range – John Deere S and T Series

Follow this procedure to properly calibrate the combine feeder house fore-aft tilt range. This procedure applies only to model year 2015 and later John Deere S and T Series combines.

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

The feeder house fore/aft tilt is controlled by buttons (C) and (D) at the back of the control handle.

Figure 3.690: John Deere Control Handle

NOTE:

The feeder house fore/aft tilt controls can be changed to work with buttons E and F by pressing control handle icon (A) and then selecting FEEDER HOUSE FORE/AFT TILT from drop-down menu (B).

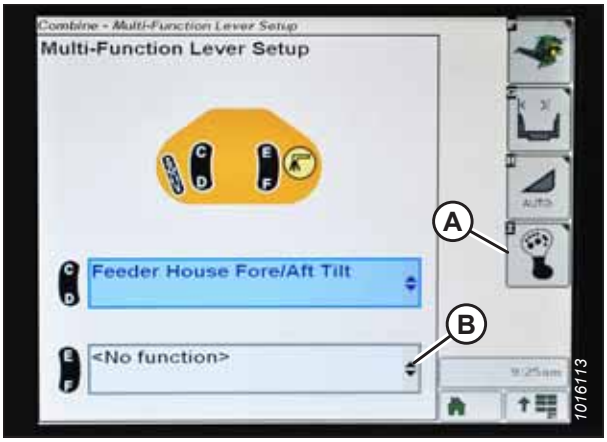


Figure 3.691: John Deere Combine Display

To calibrate the feeder house fore-aft tilt range, follow these steps:

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops and unlock the float.

3. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION page displays.

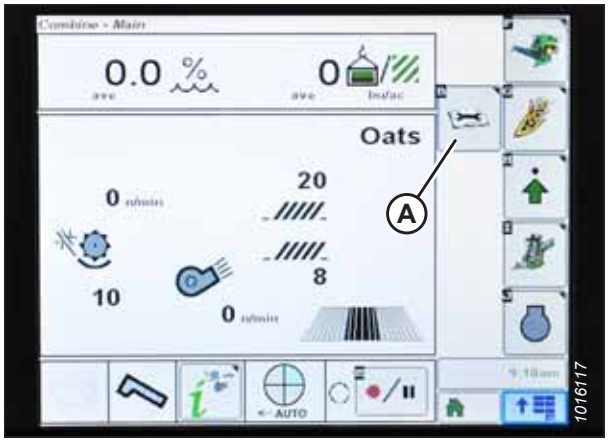


Figure 3.692: John Deere Combine Display

4. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.

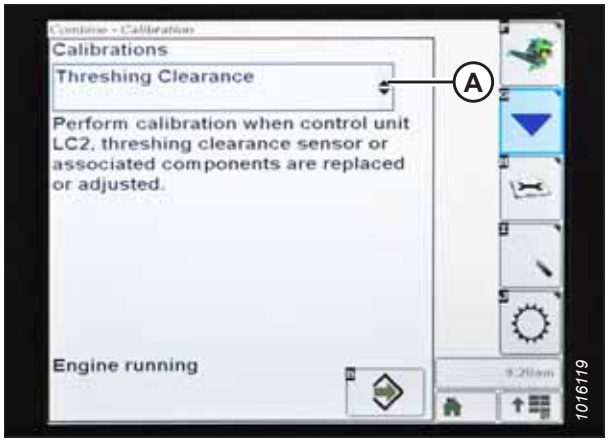


Figure 3.693: John Deere Combine Display

5. Press arrow (A) to cycle up through the calibration options and select FEEDER HOUSE FORE/AFT TILT RANGE.

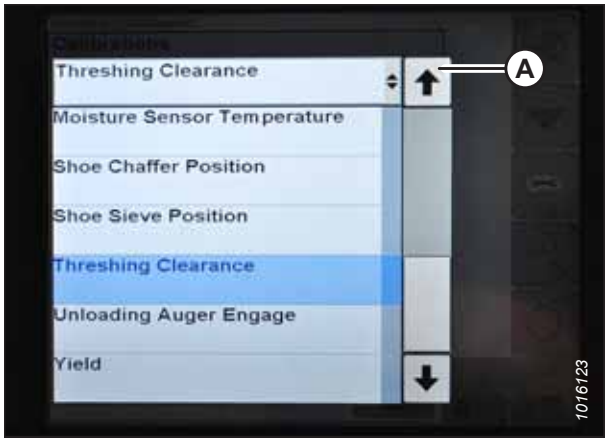


Figure 3.694: John Deere Combine Display

6. Press ENTER icon (A).

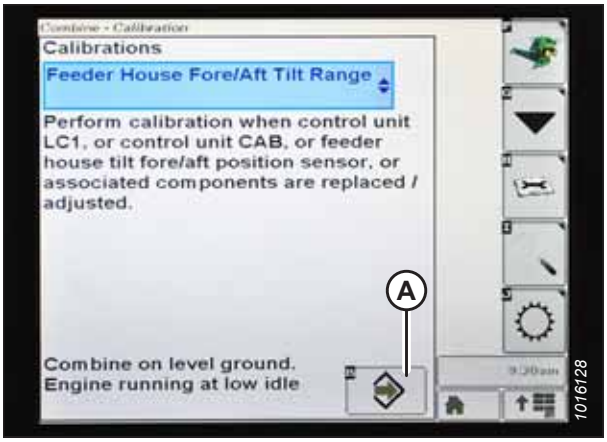


Figure 3.695: John Deere Combine Display

7. Follow the instructions that appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:

   If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Voltage Range from Combine Cab – John Deere S and T Series, page 385*.

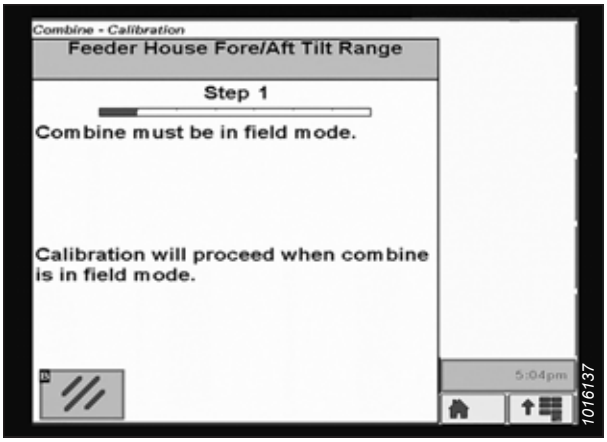


Figure 3.696: John Deere Combine Display

Checking Reel Height Sensor Voltages – John Deere S and T Series

Check the reel height sensor voltages to ensure they are within the prescribed range.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press CALIBRATION icon (A) on the main page of the display. The CALIBRATION page appears.

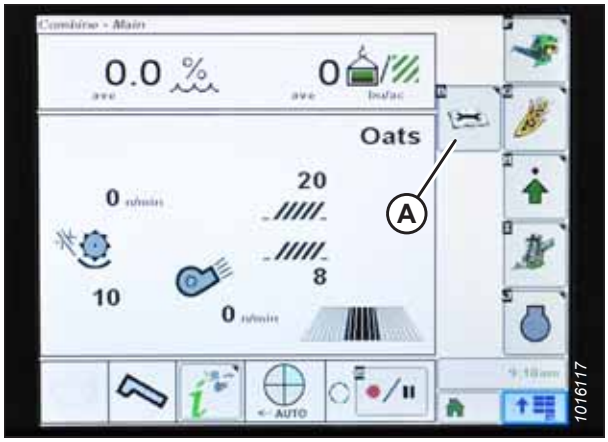


Figure 3.697: John Deere Combine Display

2. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION page. The DIAGNOSTIC READINGS page appears. This page provides access to calibrations, header options, and diagnostic information.

Figure 3.698: John Deere Combine Display

3. Select drop-down menu (A) to view the list of calibration options.

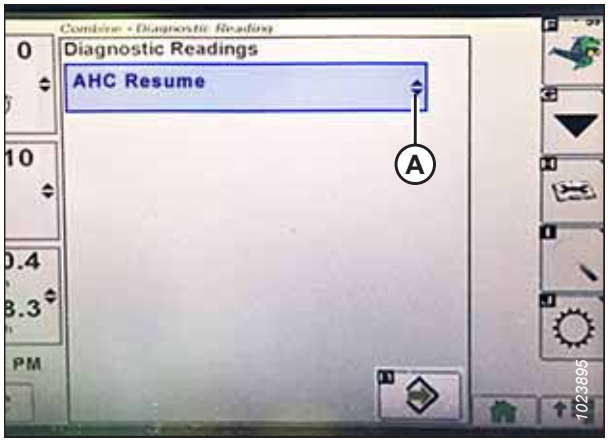


Figure 3.699: John Deere Combine Display

4. Scroll down and select REEL RESUME (A).

Figure 3.700: John Deere Combine Display

5. Press ENTER icon (A). The REEL RESUME page appears.

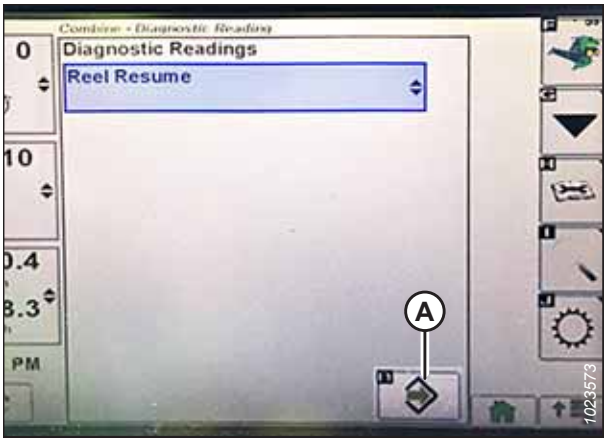


Figure 3.701: John Deere Combine Display

6. Press NEXT PAGE icon (A) to cycle to page 3.
7. Lower the reel to view lower voltage limit (B). The voltage should be 0.5–0.9 V.

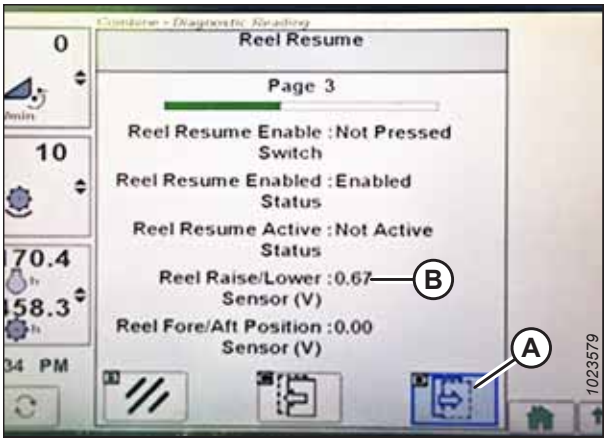


Figure 3.702: John Deere Combine Display

8. Raise the reel to view upper voltage limit (A). The voltage should be 4.1–4.5 V.
9. If either voltage is not within the correct range, refer to *Checking and Adjusting Reel Height Sensor, page 231*.

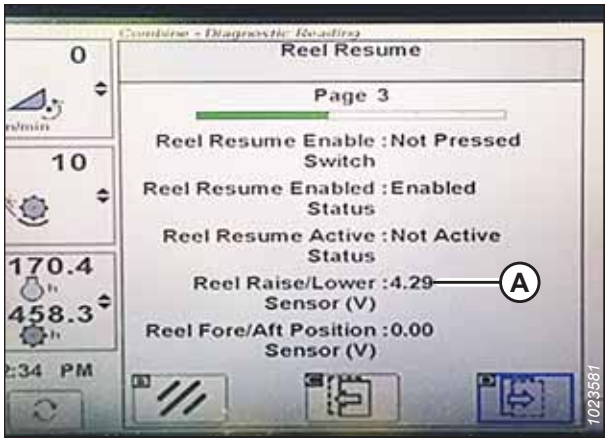


Figure 3.703: John Deere Combine Display

Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – John Deere S and T Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly. The following procedure applies only to model year 2015 and later John Deere S and T Series combines.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Position the header 254–356 mm (10–14 in.) off the ground.

   IMPORTANT:

   Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. Press DIAGNOSTIC icon (A) on the main page of the display. The CALIBRATION page is shown.

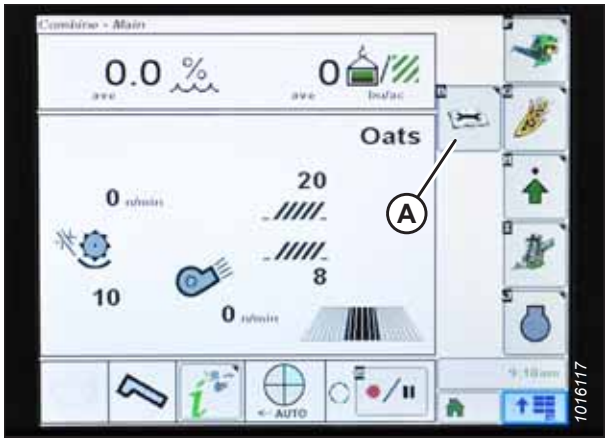


Figure 3.704: John Deere Combine Display

3. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.
4. Scroll through the list of options and select REEL POSITION.
5. Press ENTER icon (B).

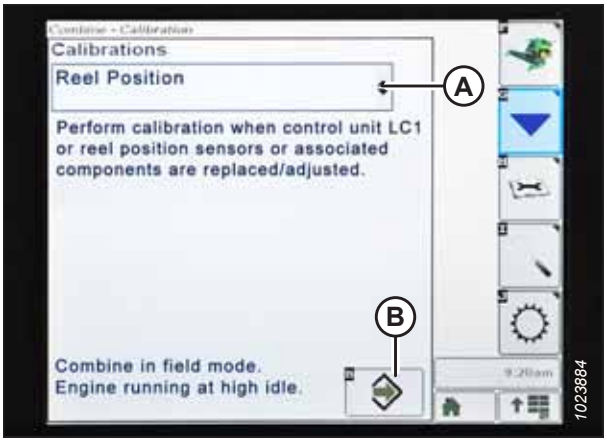


Figure 3.705: John Deere Combine Display

6. Follow the instructions that appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step. This calibration requires you to use reel raise (A) and reel lower (B) switches on the control handle.

Figure 3.706: John Deere Control Handle

7. Press and hold REEL LOWER switch until the reel is fully lowered. Continue holding REEL LOWER switch until prompted by the display.

Figure 3.707: John Deere Combine Display

8. Press and hold the REEL RAISE switch until the reel is fully raised. Continue holding the REEL RAISE switch until prompted by the display.

Figure 3.708: John Deere Combine Display

9. When all steps have been completed, CALIBRATION COMPLETE message is displayed on the page. Exit the CALIBRATION menu by pressing ENTER icon (A).

   NOTE:

   If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Reel Height Sensor Voltages – John Deere S and T Series, page 399*.

Figure 3.709: John Deere Combine Display

3.10.17 John Deere S7 Series Combines

To make your header's auto header height control (AHHC) system compatible with John Deere S7 series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

Setting up Header – John Deere S7 Series

Set these initial configuration options on your combine when setting up the auto header height control (AHHC) system.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Press header button (A) on the panel below the display. The HEADER page opens.

Figure 3.710: John Deere S7 Display

2. Select HEADER TYPE field (A). The HEADER DETAILS dialog box opens.

Figure 3.711: John Deere S7 Display – Header Page

3. Verify correct header width is displayed under WIDTH.
4. To change header width, select field (A). The WIDTH dialog box opens.

Figure 3.712: John Deere S7 Display – Header Details Window

5. Use the on-screen keypad to enter the correct header width, and then press OK.

Figure 3.713: John Deere S7 Display – Setting Header Width

6. Press close button (A) in the top right corner to return to the HEADER page.

Figure 3.714: John Deere S7 Display – Header Details Dialog Box

7. Raise/lower speed (A), tilt speed (B), height sensitivity (C), and tilt sensitivity (D) can all be adjusted from this page. Select the option you would like to adjust. The following example shows the raise/lower speed adjustment.

Figure 3.715: John Deere S7 Display – Header Page

8. Use **+** and **–** buttons (A) to adjust the setting.

9. Press the close button in top right corner of the window to return to the HEADER page.

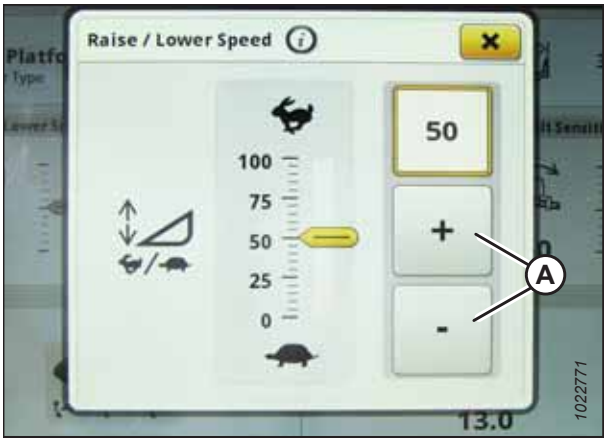


Figure 3.716: John Deere S7 Display – Raise/Lower Speed Adjustment

10. Select AUTO CONTROL icons (A). The AUTO HEADER CONTROLS page opens.

Figure 3.717: John Deere S7 Display – Header Page

11. If the header has not been calibrated yet, an error icon will appear on HEIGHT SENSING button (A). Select button (A) to view the error message.

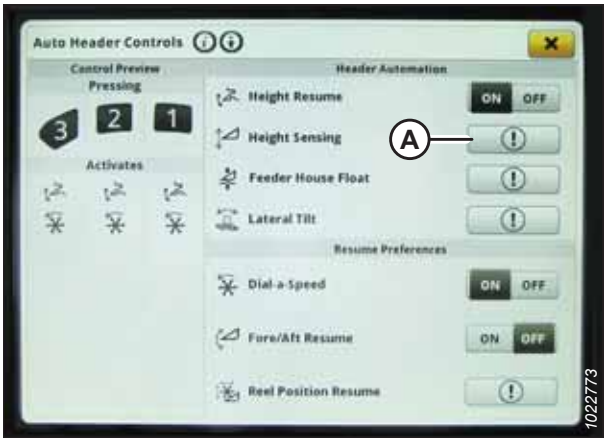


Figure 3.718: John Deere S7 Display – Auto Header Controls

12. Read the error message and then press OK.
13. Proceed to *Checking Voltage Range from Combine Cab – John Deere S7 Series, page 408*.

Figure 3.719: John Deere S7 Display – Height Sensing Error Message

Checking Voltage Range from Combine Cab – John Deere S7 Series

The auto header height sensor output must be within a specific range, or the feature will not work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

WARNING

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground.
2. Unlock the float.

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of auto header height control (AHHC) system.

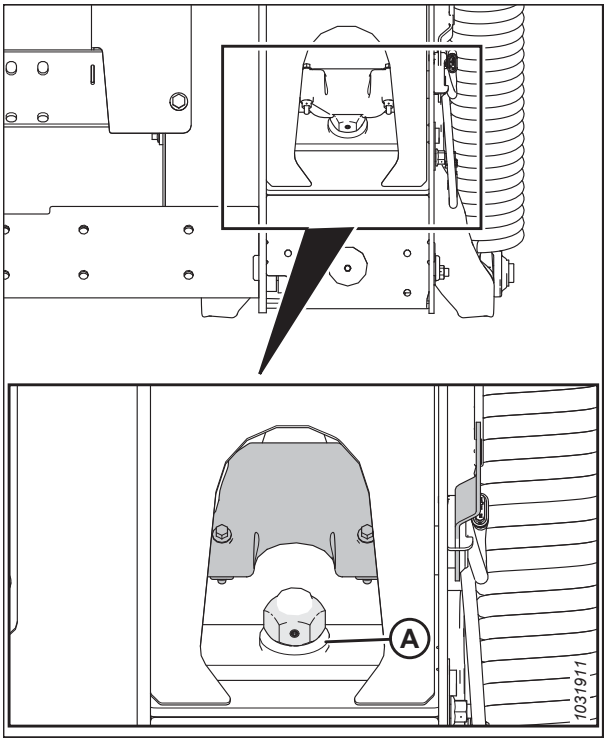


Figure 3.720: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).

5. Tighten bolt (A).

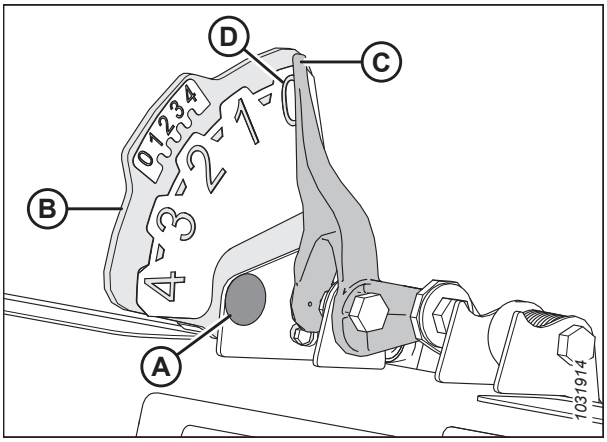


Figure 3.721: Float Indicator

6. On the HARVESTING page, select MENU icon (A) in the bottom right corner of the page.

Figure 3.722: John Deere S7 Display – Harvesting Page

7. On the MENU page, select SYSTEM tab (A). The MENU opens.
8. Select DIAGNOSTICS CENTER icon (B). The DIAGNOSTICS CENTER page opens.

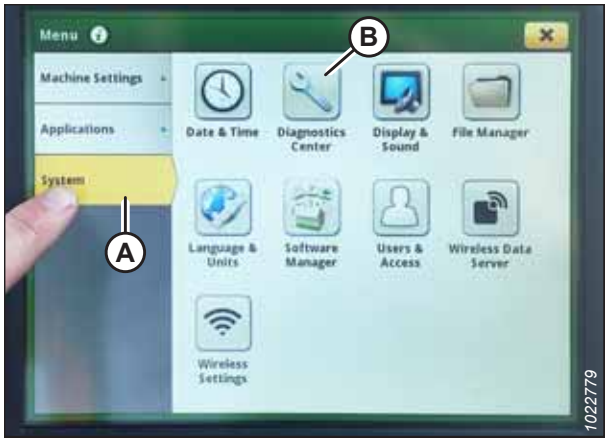


Figure 3.723: John Deere S7 Display – Menu

9. Select AHC - SENSING (A). The AHC - SENSING\DIAGNOSTICS page appears.

Figure 3.724: John Deere S7 Display – Diagnostics Center

10. Select SENSOR tab (A) to view the sensor voltages. Center header height sensor voltage (B) must be between 0.5 and 4.5 V, with at least 3 V of variation between 0 and 4 on the float indicator box.

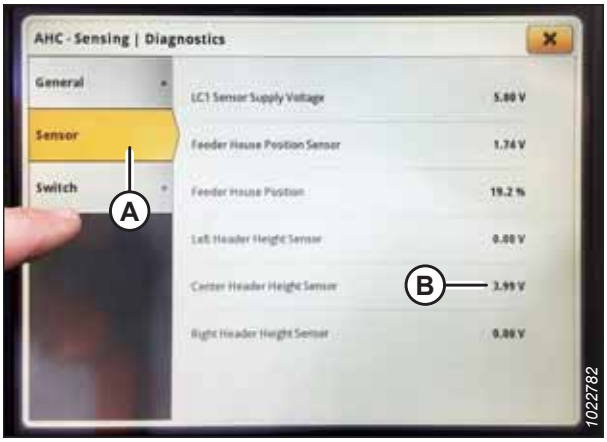


Figure 3.725: John Deere S7 Display – Checking Sensor Voltage

Calibrating Feeder House – John Deere S7 Series

Feeder house calibration must be done before header calibration.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops and unlock the float.
3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of page. The MENU opens.

Figure 3.726: John Deere S7 Display – Harvesting Page

4. Select MACHINE SETTINGS tab (A).
5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page appears.

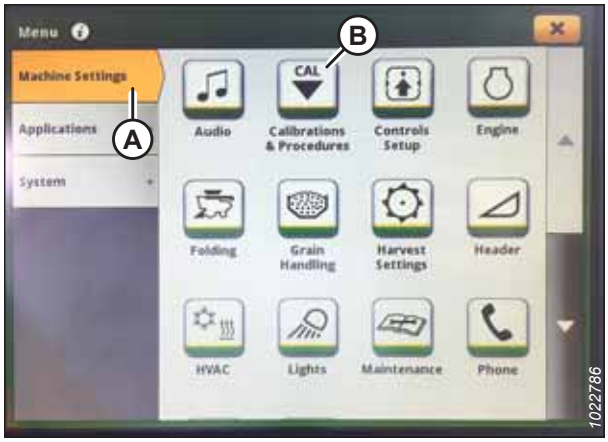


Figure 3.727: John Deere S7 Display – Machine Settings

6. Select HEADER tab (A).
7. Select FEEDER HOUSE RAISE SPEED CALIBRATION (B). The FH RAISE SPEED CALIBRATION page appears.

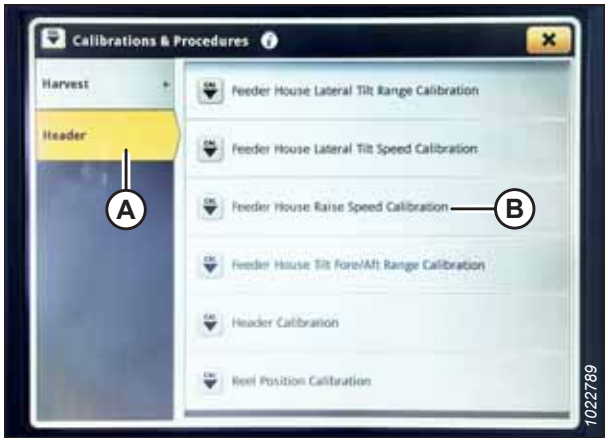


Figure 3.728: John Deere S7 Display – Calibrations and Procedures

8. Select CALIBRATE (A) at the bottom of the page. A calibration overview appears.

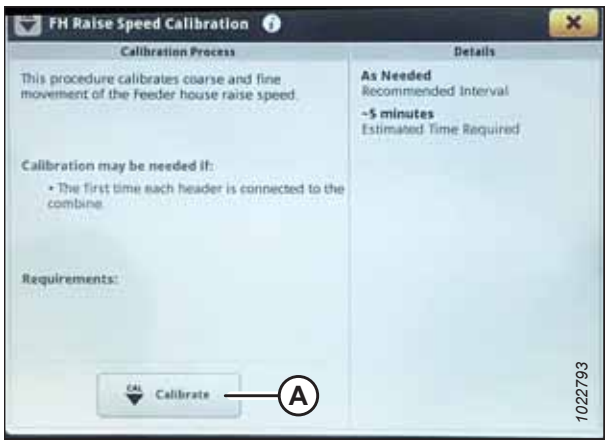


Figure 3.729: John Deere S7 Display – Feeder House Calibration

9. Read the calibration overview, and then press START.

Figure 3.730: John Deere S7 Display – Feeder House Calibration

10. Follow the instructions on the page. As you proceed through the calibration process, the display will automatically update to show the next step.

Figure 3.731: John Deere S7 Display – Feeder House Calibration

11. When calibration is complete, select SAVE to confirm the calibration.

Figure 3.732: John Deere S7 Display – Feeder House Calibration

Calibrating Header – John Deere S7 Series

Before the auto header height control (AHHC) system can be used, it must be calibrated.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

Feeder house calibration must be done before header calibration. If feeder house has not yet been calibrated, refer to *Calibrating Feeder House – John Deere S7 Series, page 411*.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Ensure the center-link is set to **D**.
2. Rest the header on the down stops and unlock the float module float.
3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of screen. The MENU opens.

Figure 3.733: John Deere S7 Display – Harvesting Page

4. Select MACHINE SETTINGS tab (A).
5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page appears.

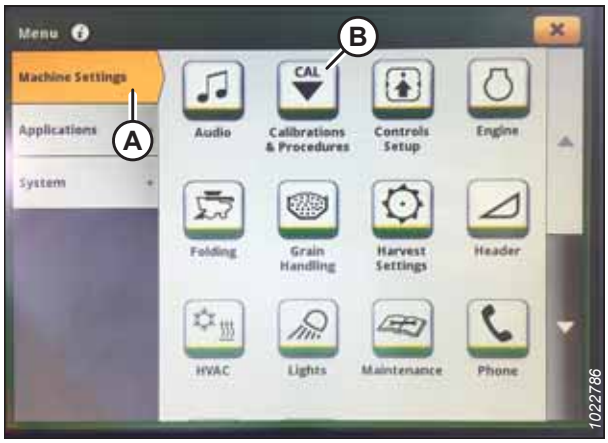


Figure 3.734: John Deere S7 Display – Machine Settings

6. Select HEADER tab (A).

7. Select HEADER CALIBRATION (B). The HEADER CALIBRATION page appears.

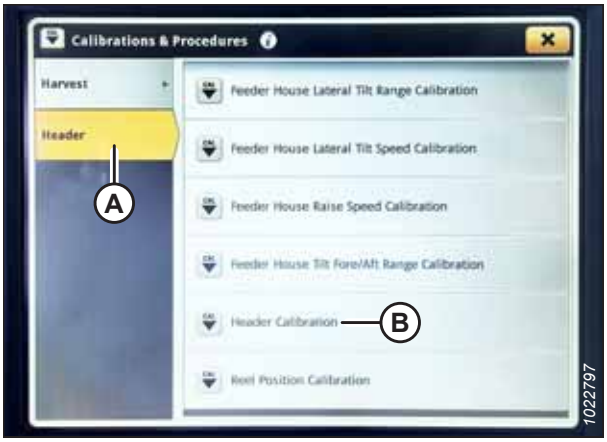


Figure 3.735: John Deere S7 Display – Calibrations and Procedures

8. Select CALIBRATE (A) at the bottom of the page. The calibration overview window opens.

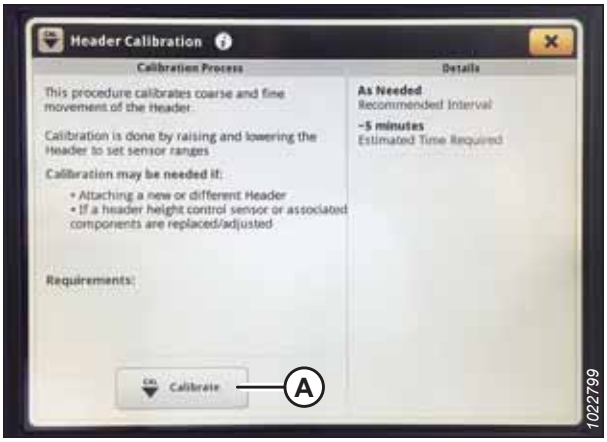


Figure 3.736: John Deere S7 Display – Header Calibration

9. Press button (A) on the console to set the engine to high idle.

Figure 3.737: John Deere S7 Console

10. Select START on the CALIBRATION OVERVIEW page.

11. Follow the instructions that appear on the combine display. As you proceed through the calibration process, the display will automatically update to show the next step.

Figure 3.738: John Deere S7 Display – Header Calibration

12. When the calibration is complete, select SAVE to confirm the calibration.

Figure 3.739: John Deere S7 Display – Header Calibration

3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior

To make your header's auto header height control (AHHC) system compatible with New Holland CR/CX Series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

This section applies only to pre-2015 CR/CX models.

Checking Voltage Range from Combine Cab – New Holland CR/CX Series

The auto header height control (AHHC) sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

DANGER

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground.
2. Unlock the float.
3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

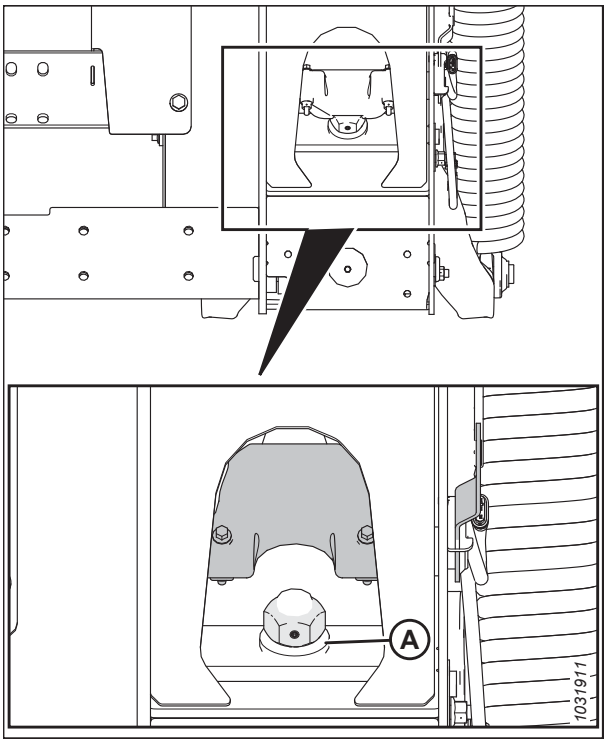


Figure 3.740: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).
5. Tighten bolt (A).

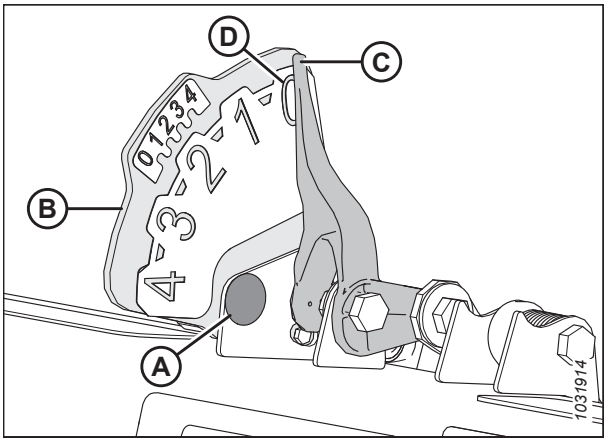


Figure 3.741: Float Indicator

6. Ensure the header float is unlocked.
7. Select DIAGNOSTICS (A) on the main page. The DIAGNOSTICS page appears.
8. Select SETTINGS. The SETTINGS page appears.

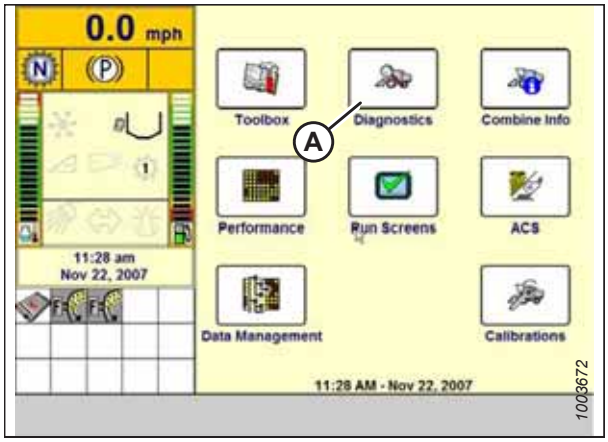


Figure 3.742: New Holland Combine Display

9. Select GROUP drop-down menu (A). The GROUP dialog box appears.

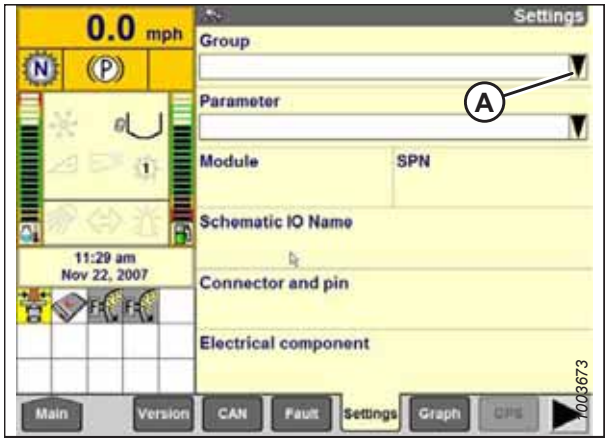


Figure 3.743: New Holland Combine Display

10. Select HEADER HEIGHT/TILT (A). The PARAMETER page appears.

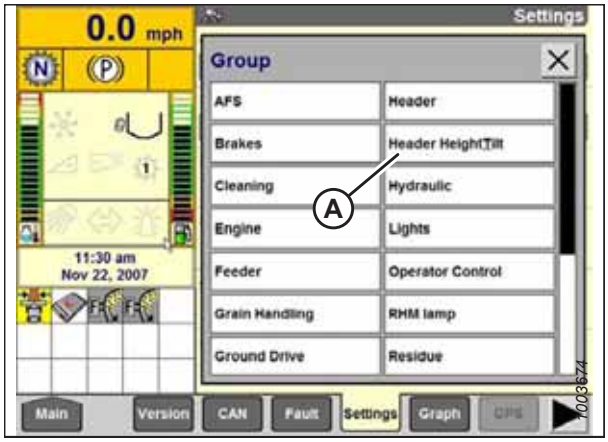


Figure 3.744: New Holland Combine Display

11. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage appears at the top of the page.

12. Raise and lower the header to see the full range of voltage readings.

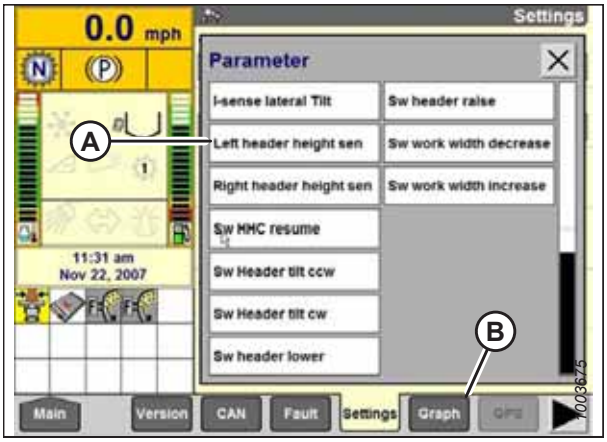


Figure 3.745: New Holland Combine Display

Header Settings Quick Reference – New Holland CR Series

Use the information in the following table to quickly reference the recommended settings for a 2 Series draper header.

For detailed instructions, proceed to the New Holland CR series combine header setup and calibration procedures.

Table 3.39 Header Settings – New Holland CR Series

Setup Parameter	Suggested Setting
Cutting Type	Platform
Header Sub Type	80/90
Autofloat	Installed
Auto Header Lift	Installed
Manual HHC Raise/Lower Rate	Set for best performance
HHC Height Sensitivity	Set for best performance
HHC Tilt Sensitivity	Set for best performance
Reel Height Sensor	Yes

Setting up Auto Header Height Control – New Holland CR/CX Series

Auto header height control (AHHC) is set up using the combine display.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

1. Select HEADER LATERAL FLOAT on the combine display, and press ENTER.
2. Use the up and down navigation keys to move between options, and select INSTALLED.

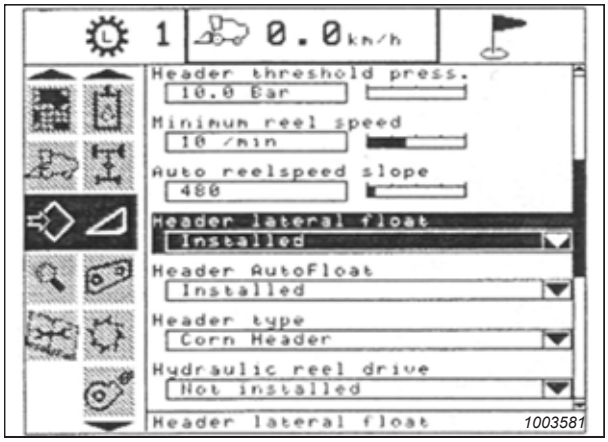


Figure 3.746: New Holland Combine Display

3. Select HEADER AUTOFLOAT, and press ENTER.
4. Use the up and down navigation keys to move between options, and select INSTALLED.

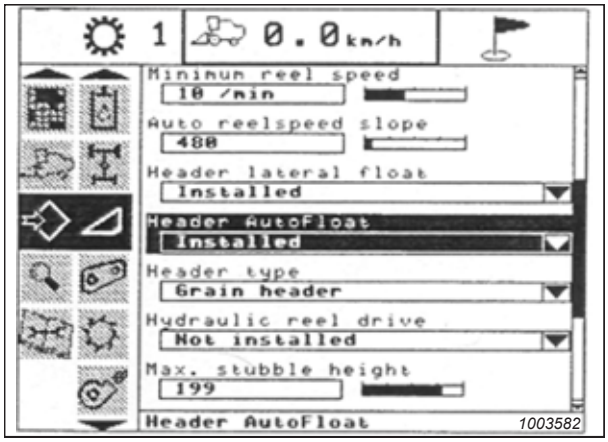


Figure 3.747: New Holland Combine Display

Calibrating Auto Header Height Control – New Holland CR/CX Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to **D**.
- The engine is running.
- The combine is not moving.
- No faults have been received from the Header Height Controller (HHC) module.
- The header/feeder is disengaged.
- The lateral float buttons are **NOT** pressed.
- The ESC key is **NOT** pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATION on the combine display, and press the RIGHT ARROW navigation key to enter the information box.
2. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

   NOTE:

   You can use the up and down navigation keys to move between the options.

Figure 3.748: New Holland Combine Display

3. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:

   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

   NOTE:

   Refer to your combine operator's manual for an explanation of any error codes.

Figure 3.749: New Holland Combine Display

4. When all steps have been completed, a CALIBRATION SUCCESSFUL message will appear on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

   NOTE:

   If the float was set heavier to complete the AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

5. If the unit does not function properly, conduct the maximum stubble height calibration. For instructions, refer to *Calibrating Maximum Stubble Height – New Holland CR/CX Series, page 422*.

Calibrating Maximum Stubble Height – New Holland CR/CX Series

This procedure details how to set the height at which the harvest area counter will start and stop counting harvested area.

IMPORTANT:

- If the value is set too low, the area counter may **NOT** be accurate since the header is sometimes raised above this threshold although the combine is still cutting.
- If the value is set too high, the area counter will keep counting even when the header is raised (but below this threshold) and the combine is no longer cutting crop.

DANGER

Check to be sure all bystanders have cleared the area.

1. Select the MAXIMUM STUBBLE HEIGHT calibration dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

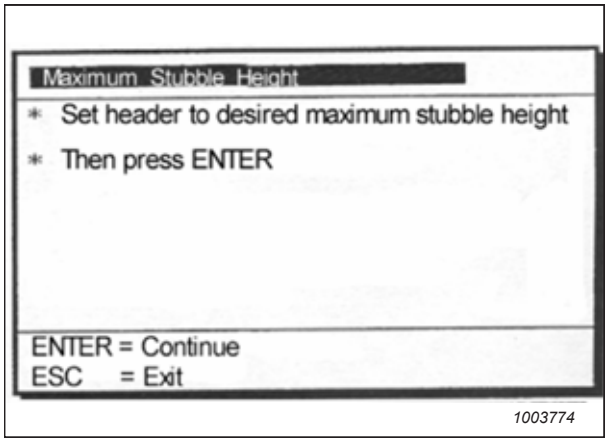


Figure 3.750: New Holland Calibration Dialog Box

2. Move the header to the desired maximum stubble height using the header up or down control switch on the multifunction handle.

   NOTE:

   Set the header to a height which will never be attained while harvesting. This will ensure that the harvest area counter never stops recording harvesting data while the auto header height control (AHHC) system is active.

3. Press ENTER to continue. As you proceed through the calibration process, the display will automatically update to show the next step.

4. Press ENTER or ESC to close the calibration screen. The calibration is now complete.

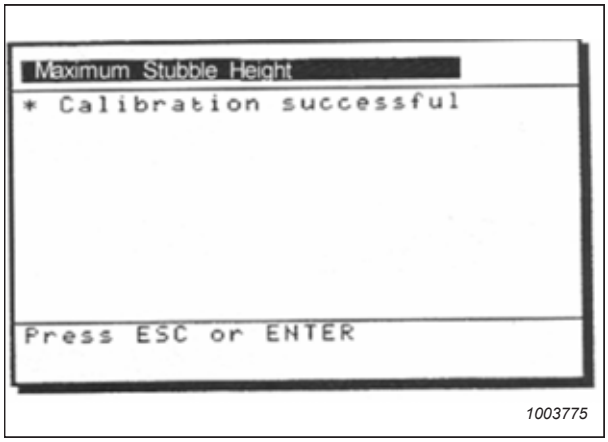


Figure 3.751: New Holland Calibration Dialog Box

Adjusting Header Raise Rate – New Holland CR/CX Series

If necessary, the header raise rate (the first speed on the HEADER HEIGHT rocker switch of the multifunctional handle) can be adjusted.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

1. Select HEADER RAISE RATE on the combine display.
2. Use the + or – buttons to change the setting.
3. Press ENTER to save the new setting.

   NOTE:

   The raise rate can be changed from 32–236 in increments of 34. The factory setting is 100.

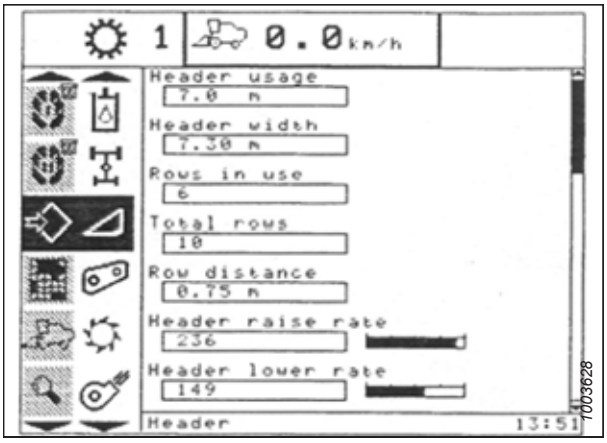


Figure 3.752: New Holland Combine Display

Setting Header Lower Rate – New Holland CR/CX Series

If necessary, the header lower rate (the automatic header height control button or second speed on the header height rocker switch of the multifunction handle) can be adjusted.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

1. Select HEADER LOWER RATE on the combine display.
2. Use the + or – buttons to change the setting to 50.
3. Press ENTER to save the new setting.

   NOTE:

   The header lower rate can be changed from 2–247 in increments of 7. It is factory-set to 100.

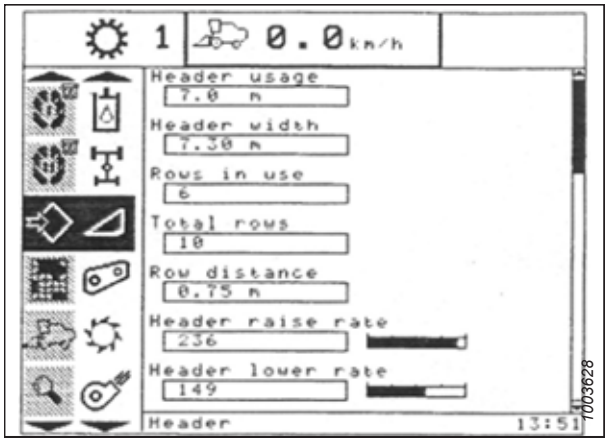


Figure 3.753: New Holland Combine Display

Setting Auto Header Height Control Sensitivity – New Holland CR/CX Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

DANGER

Check to be sure all bystanders have cleared the area.

1. Engage the threshing mechanism and the feeder house.
2. Select HEIGHT SENSITIVITY on the combine display.
3. Use the + or – buttons to change the setting to 200.
4. Press ENTER to save the new setting.

   NOTE:

   The sensitivity can be changed from 10–250 in increments of 10. It is factory-set to 100.

Figure 3.754: New Holland Combine Display

Setting Preset Cutting Height – New Holland CR/CX Series

The cut height setting can be stored in the combine. When harvesting the setting can be selected from the control handle.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to *3.10.19 New Holland Combines – CR Series – 2015 and Later, page 426*.

NOTE:

Indicator (A) should be at position 0 (B) with the header 254–356 mm (10–14 in.) off the ground. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

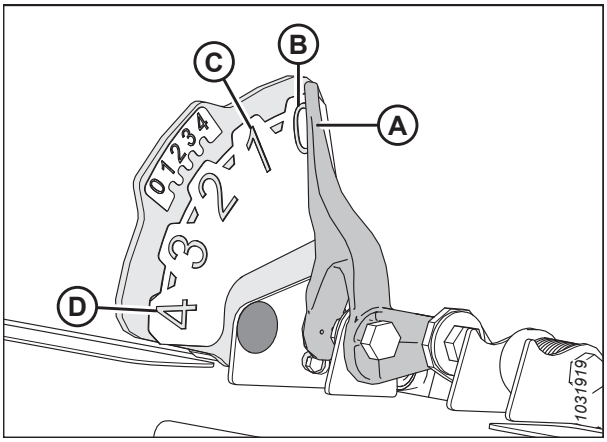


Figure 3.755: Float Indicator

1. Engage the threshing mechanism and the feeder house with switches (A) and (B).
2. Set HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).
3. Raise or lower the header to the desired cutting height using HEADER HEIGHT and HEADER LATERAL FLOAT momentary switch (C).
4. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep confirms the setting.

   NOTE:

   It is possible to store two different header height values by using HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).
5. Raise or lower the reel to the desired working height using REEL HEIGHT momentary switch (E).
6. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep confirms the setting.

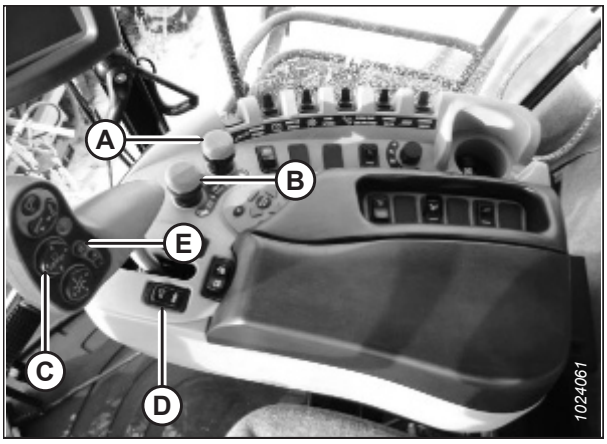


Figure 3.756: New Holland Combine Controls

7. To change one of the memorized header height set points while the combine is in use, use HEADER HEIGHT AND HEADER LATERAL FLOAT rocker switch (A) (slow up/down) to raise or lower header to the desired value. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (B) for a minimum of 2 seconds to store the new height position. A beep confirms setting.

   NOTE:

   Fully pressing AUTOMATIC HEADER HEIGHT CONTROL button (B) will disengage float mode.

   NOTE:

   It is not necessary to press rocker switch (C) again after changing header height set point.

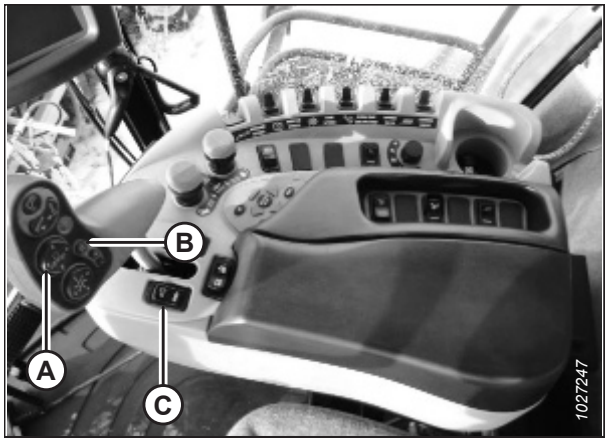


Figure 3.757: New Holland Combine Controls

3.10.19 New Holland Combines – CR Series – 2015 and Later

To make your header's auto header height control (AHHC) system compatible with model year 2015 and newer New Holland CR Series combines, you must set your combine's header configuration options for the particular model of header, configure the reel speed settings, set up the AHHC controls, and calibrate the AHHC system to ensure that it is working correctly.

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90).

Setting up Auto Header Height Control – New Holland CR Series

Auto header height control (AHHC) is set up using the combine display and control handle.

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to **D**. When setup and calibration are complete, adjust the center-link back to desired header angle.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*.

1. Ensure the center-link is set to **D**.
2. Shut down the engine.
3. Turn the key to the run position.

4. Select TOOLBOX (A) on the main page. The TOOLBOX page appears.

Figure 3.758: New Holland Combine Display

5. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

   NOTE:

   Software in some New Holland combines may not allow you to change the header from FLEX to PLATFORM or the header type from DEFAULT to 80/90 at the main menu. This is now a dealer setting. If you need to change the dealer setting, contact your MacDon Dealer.

Figure 3.759: New Holland Combine Controls

6. Select HEAD 1 (A). The HEADER SETUP 1 page displays.
7. Select CUTTING TYPE drop-down arrow (B) and change the CUTTING TYPE to PLATFORM (C).

Figure 3.760: New Holland Combine Display

8. Select HEADER SUB TYPE drop-down arrow (A). The HEADER SUB TYPE dialog box displays.

Figure 3.761: New Holland Combine Display

9. Set HEADER SUB TYPE to 80/90 (A) for a New Holland combine.

Figure 3.762: New Holland Combine Display

10. Select HEAD 2 (A). The HEADER SETUP 2 page displays.

Figure 3.763: New Holland Combine Display

11. Select the AUTOFLOAT drop-down menu and set AUTOFLOAT to INSTALLED (A).
12. Select the AUTO HEADER LIFT drop-down menu and set AUTO HEADER LIFT to INSTALLED (B).

    NOTE:

    With AUTO HEADER LIFT installed and AHHC engaged, the header will lift up automatically when you pull back on the control handle.
13. Set the values for MANUAL HHC RAISE RATE (C) and MANUAL HHC LOWER RATE (D) for best performance according to ground conditions.

Figure 3.764: New Holland Combine Display

14. Set the values for HHC HEIGHT SENSITIVITY (A) and HHC TILT SENSITIVITY (B) for best performance according to ground conditions.

Figure 3.765: New Holland Combine Display

15. From REEL HEIGHT SENSOR menu (A), select YES.

Figure 3.766: New Holland Combine Display

Setting up Reel Speed – New Holland CR Series

You must record the reel diameter and reel displacement into the combine software before operating the reel speed.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90).

1. Shut down the engine.
2. Turn the key to the run position.
3. Make sure the combine display software is updated to these versions or later:
   - Model year 2015–2018: UCM v38.10.0.0
   - Model year 2019: UCM v1.4.0.0
4. Ensure the center-link is set to **D**.
5. Select TOOLBOX (A) on the main page. The TOOLBOX page appears.

Figure 3.767: New Holland Combine Display

6. Access dealer mode by simultaneously pressing UNLOAD (A) and RESUME (B) buttons on the control handle for approximately 10 seconds. The DEALER SETTING page should appear and is required to change the REEL DIAMETER and REEL DISPLACEMENT PER REVOLUTION settings.

Figure 3.768: New Holland Combine Controls

7. Select HEAD 2 (A). The HEADER SETUP 2 page appears.
8. Select REEL DIAMETER (B) and enter 102 cm (40.16 in).
9. Select REEL DISPLACEMENT PER REVOLUTION (C) and enter the appropriate value according to the reel drive configuration according to Table *3.40, page 431*.

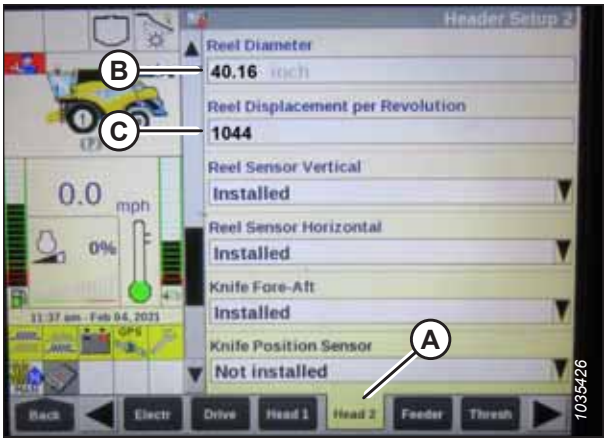


Figure 3.769: New Holland Combine Display

Table 3.40 Reel Displacement per Revolution Chart

Drive sprocket Size (Number of Teeth)	Driven Sprocket Size (Number of Teeth)	Reel Displacement per Revolution
19 (Factory Standard)	56	769
14 (High torque option)	56	1044
21[72]	56	696
13[72]	56	1124
12	56	1218
10	56	1461
21	48	597
19	48[73]	659
14[72]	48[73]	895
13[72]	48[73]	964
12[72]	48[73]	1044
10[72]	48[73]	1253

Calibrating Auto Header Height Control – New Holland CR Series

The auto header height control (AHHC) sensor output must be calibrated for each combine, or the AHHC feature will not work properly.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*.

72. High-torque only. Required on combines that have low reel drive pressures. Refer to your header's parts catalog to ensure proper gearset ratios are used for your combine to prevent reel damage.
73. Non-European configured double-reel, high-torque, high-speed reels only.

NOTE:

If the header float is set too light, it can prevent the calibration of the AHHC. You may need to set the float heavier for the calibration procedure so the header does not separate from the float module.

NOTE:

For the best performance of the auto header height control (AHHC) system, perform the ground calibration with the center-link set to **D**. When calibration is complete, adjust the center-link back to the desired header angle. For instructions, refer to *3.9.5 Header Angle, page 217*.

Check the following conditions before starting the header calibration procedure:

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to **D**.
- The engine is running.
- The combine is not moving.
- No faults have been received from the header height controller (HHC) module.
- The header/feeder is disengaged.
- The lateral float buttons are **NOT** pressed.
- The ESC key is **NOT** pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATIONS (A) on the main page. The CALIBRATION page appears.

Figure 3.770: New Holland Combine Display

2. Select CALIBRATION drop-down menu (A).

Figure 3.771: New Holland Combine Display

3. Select HEADER (A) from the list of calibration options.

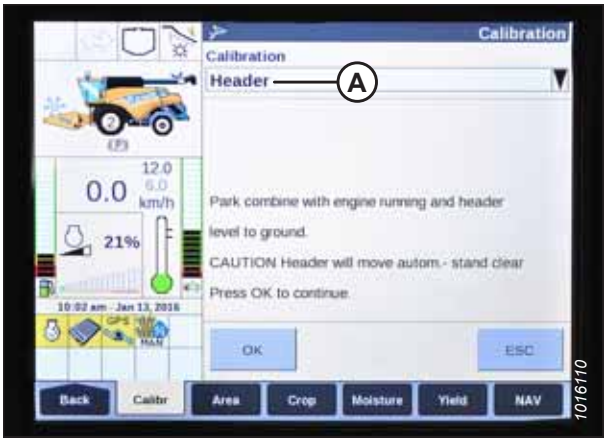


Figure 3.772: New Holland Combine Display

4. Follow the calibration steps in the order in which they appear on the page. As you proceed through the calibration process, the display updates to show the next step.

   NOTE:

   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes stops the calibration procedure.

   NOTE:

   Refer to your combine operator's manual for an explanation of any error codes.

Figure 3.773: New Holland Combine Display

5. When all steps have been completed, the CALIBRATION COMPLETED message appears on the page.

   NOTE:

   If the float was set heavier to complete AHHC calibration procedure, adjust it to the recommended operating float after the calibration is complete.

Figure 3.774: New Holland Combine Display

Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – New Holland CR Series

You must calibrate the reel position before operating the header for the first time. Calibrating the reel position calibrates the reel height sensor and the reel fore-aft sensor.

DANGER

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90).

To calibrate the reel position, follow these steps:

1. Position the header 254–356 mm (10–14 in.) off the ground.

   IMPORTANT:

   Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. Select CALIBRATIONS (A) on the main page. The CALIBRATION page is shown.

Figure 3.775: New Holland Combine Display

3. Select CALIBRATION drop-down menu (A).

Figure 3.776: New Holland Combine Display

4. Select REEL POSITION (A) from the list of calibration options.

Figure 3.777: New Holland Combine Display

5. A CAUTION statement (A) will appear. Press ENTER.

Figure 3.778: New Holland Combine Display

6. If the statement “Confirm varifeed knife is completely retracted”(A) appears, press ENTER. The varifeed knife is not applicable to MacDon headers.

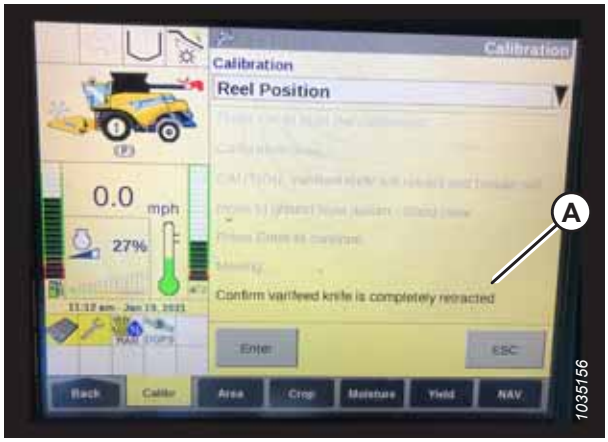


Figure 3.779: New Holland Combine Display

7. Follow the calibration steps (A) in the order in which they appear on the page. As you proceed through the calibration process, the display will automatically update to show the next step.

   NOTE:

   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

   NOTE:

   Refer to your combine operator’s manual for an explanation of any error codes.

8. When all steps have been completed, CALIBRATION COMPLETED message is displayed on the page.

Figure 3.780: New Holland Combine Display

Checking Voltage Range from Combine Cab – New Holland CR Series

The auto header height control (AHHC) sensor needs to operate in a specific voltage range in order to work properly.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator’s manual for the most up-to-date information.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*.

DANGER

Check to be sure all bystanders have cleared the area.

1. Position the header 254–356 mm (10–14 in.) above the ground.

2. Unlock the float.

3. Check that the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

   NOTE:

   If the header is not on the down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system. If the header is not on the down stops, refer to *3.11 Leveling Header, page 446* for instructions.

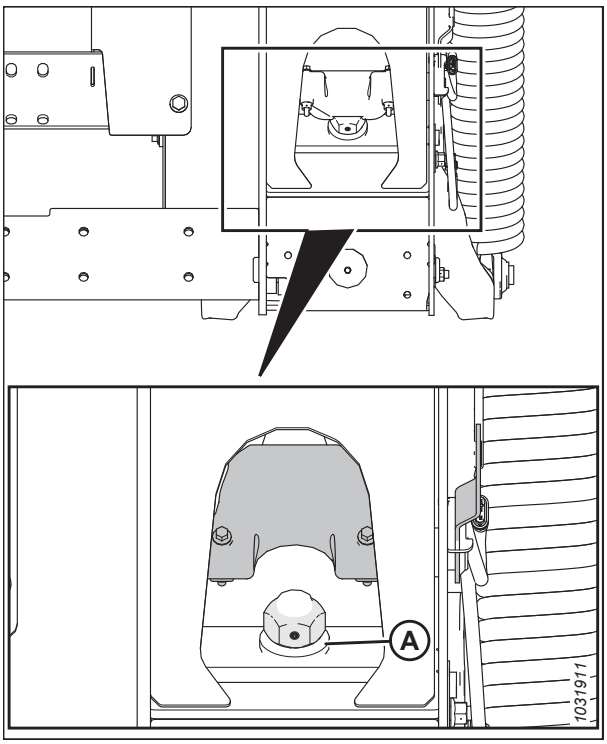


Figure 3.781: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D).
5. Tighten bolt (A).
6. Ensure the header float is unlocked.

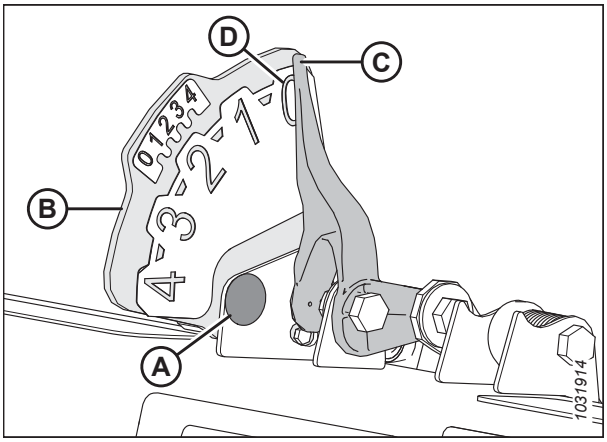


Figure 3.782: Float Indicator

7. Select DIAGNOSTICS (A) on the main page. The DIAGNOSTICS page appears.

Figure 3.783: New Holland Combine Display

8. Select SETTINGS (A). The SETTINGS page appears.

Figure 3.784: New Holland Combine Display

9. Select HEADER HEIGHT/TILT (A) from the GROUP drop-down menu.
10. Select HEADER HEIGHT SENS. L (B) from the PARAMETER drop-down menu.

Figure 3.785: New Holland Combine Display

11. Select GRAPH (A). The exact voltage (B) is displayed at the top of the page.
12. Raise and lower the header to see the full range of voltage readings.

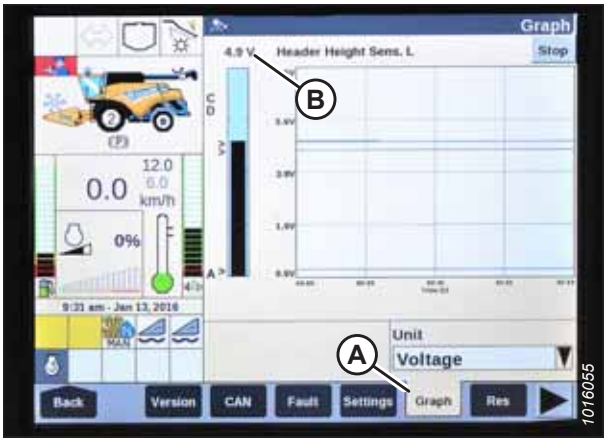


Figure 3.786: New Holland Combine Display

Checking Reel Height Sensor Voltages – New Holland CR Series

Check the reel height sensor voltages to ensure they are within the prescribed range.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page opens.

Figure 3.787: New Holland Combine Display

2. Select SETTINGS tab (A). The SETTINGS page opens.
3. From GROUP menu (B), select HEADER.
4. From PARAMETER menu (C), select REEL VERTICAL POSITION.

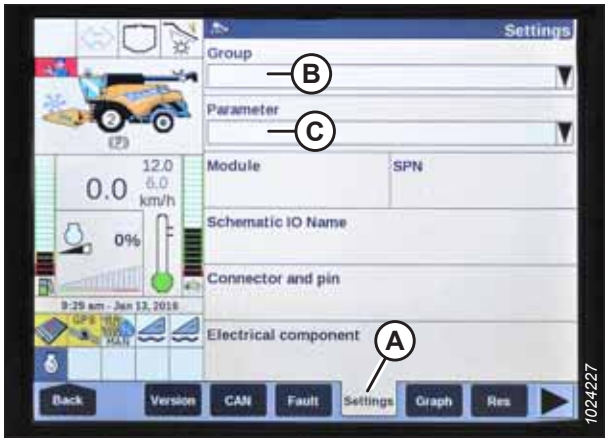


Figure 3.788: New Holland Combine Display

5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph displays.
6. Raise the reel to view high voltage (B). The voltage should be 4.1–4.5 V.
7. Lower the reel to view low voltage (C). The voltage should be 0.5–0.9 V.

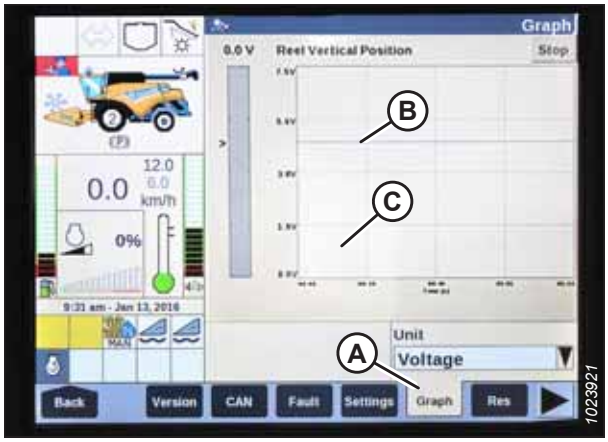


Figure 3.789: New Holland Combine Display

Setting Preset Cutting Height – New Holland CR Series

The cut height setting can be stored in the combine. When harvesting, the setting can be selected from the control handle.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*.

The console has two buttons used for auto height presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button (C) is not configured.

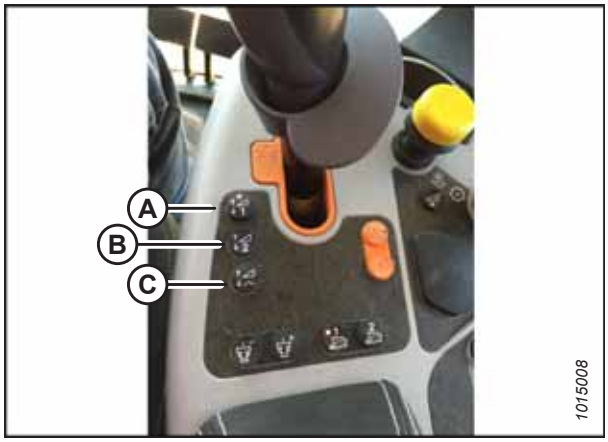


Figure 3.790: New Holland Combine Controls

DANGER

Check to be sure all bystanders have cleared the area.

To set preset cutting height, follow these steps:

1. Engage the separator and the header.
2. Select preset button 1 (A). A yellow light on the button lights up.
3. Raise or lower the header to the desired cutting height.

Figure 3.791: New Holland Combine Controls

4. Hold RESUME button (C) on the multifunction handle to set the preset, until the monitor beeps.

   NOTE:

   When setting presets, always set the header position before setting the reel position. If the header and reel are set at the same time, the reel setting will not save.

5. Raise or lower the reel to the desired working position.
6. Hold RESUME button (C) on the multifunction handle to set the preset.
7. Repeat Step *2, page 441* to Step *6, page 441*, using preset button 2.

Figure 3.792: New Holland Combine Multifunction Handle

8. Lower the header to the ground.
9. Select RUN SCREENS (A) on the main page.

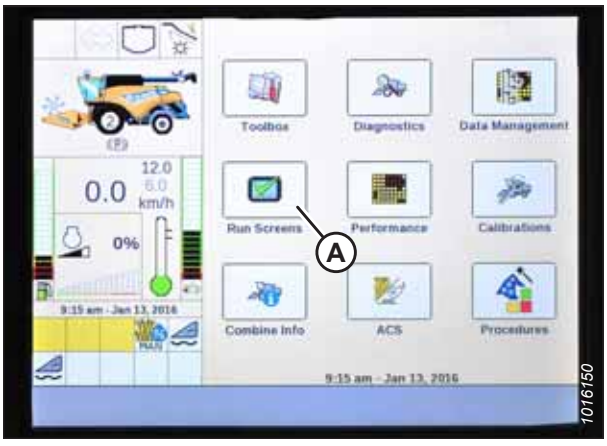


Figure 3.793: New Holland Combine Display

10. Select the RUN tab that shows MANUAL HEIGHT.

    NOTE:

    The MANUAL HEIGHT field may appear on any of the RUN tabs. When an auto height preset button is pressed, the display changes to AUTO HEIGHT (A).

11. Press one of the auto height preset buttons to select a preset cutting height.

Figure 3.794: New Holland Combine Display

Setting Maximum Work Height – New Holland CR Series

The maximum work height can be set using the combine display.

NOTE:

This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to *3.10.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 416*.

1. Select TOOLBOX (A) on the main page. The TOOLBOX page appears.

Figure 3.795: New Holland Combine Display

2. Select FEEDER (A). The FEEDER SETUP page appears.
3. Select MAXIMUM WORK HEIGHT field (B).

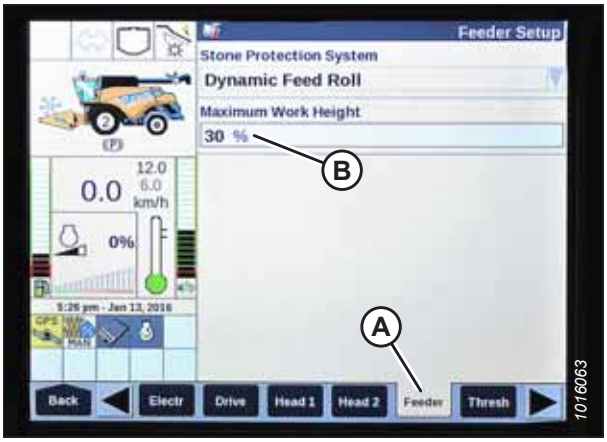


Figure 3.796: New Holland Combine Display

4. Set MAXIMUM WORK HEIGHT to the desired value.
5. Press SET and then press ENTER.

Figure 3.797: New Holland Combine Display

Configuring Reel Fore-Aft, Header Tilt, and Header Type – New Holland CR Series

The reel fore-aft, header tilt, and header type settings for the auto header height control (AHHC) system can be changed by accessing the HEAD menus.

NOTE:

This procedure applies only to 2016 New Holland CR models 6.90, 7.90, 8.90, and 9.90.

NOTE:

Changes may have been made to the combine controls or the display since this document was published. Refer to the combine operator's manual for the most up-to-date information.

1. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

Figure 3.798: New Holland Combine Controls

2. On the HEAD 1 page, change the CUTTING TYPE from FLEX to PLATFORM as shown at location (A).

Figure 3.799: New Holland Combine Display

3. On the HEAD 2 page, change HEADER SUB TYPE from DEFAULT to 80/90 as shown at location (A).

Figure 3.800: New Holland Combine Display

There are now two different buttons for the ON GROUND presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button down (C) is not configured.

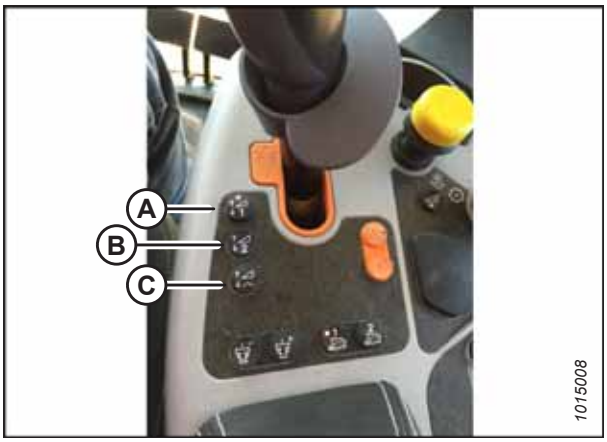


Figure 3.801: New Holland Combine Controls

3.11 Leveling Header

The float module is factory-set to provide the proper level for the header. It should not normally require adjustment.

If the header is not level, perform the following checks prior to adjusting the leveling linkages:

- Check the combine tire pressures.
- Check that the combine feeder house is level. Refer to your combine operator's manual for instructions.
- Check that the top of the float module is level and parallel with the feeder house.

NOTE:

The float springs are **NOT** used to level the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Park the combine on a level surface.
2. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Lock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
5. Check, and if necessary adjust the float. For instructions, refer to *Checking and Adjusting Header Float, page 190*.
6. Disengage both header float locks by pulling float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (**UNLOCK**).

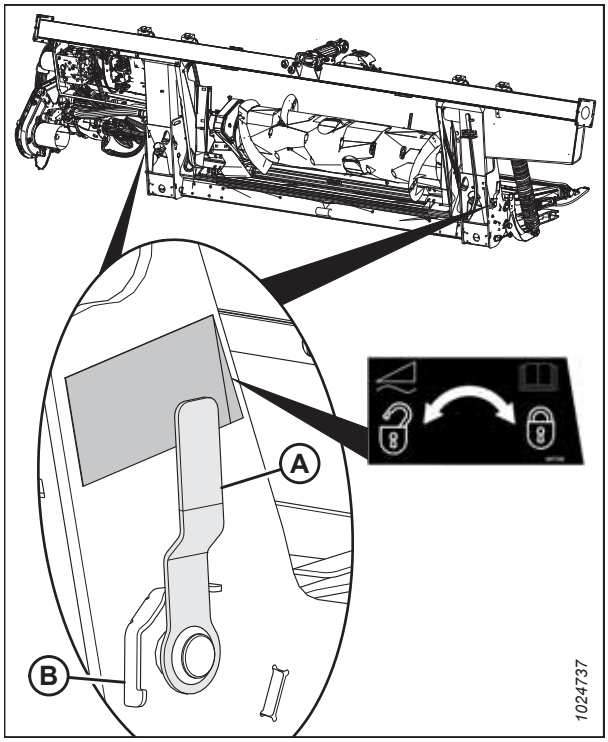


Figure 3.802: Header Float Lock in Locked Position

7. On the high side of the header, make small (1/4–1/2 turn) counterclockwise adjustments to nut (A) to level the header.

   NOTE:

   Set screw (B) does not require loosening for adjustments up to one-half turn of nut (A).

   IMPORTANT:

   Adjustment of more than two turns in either direction may adversely affect header float.

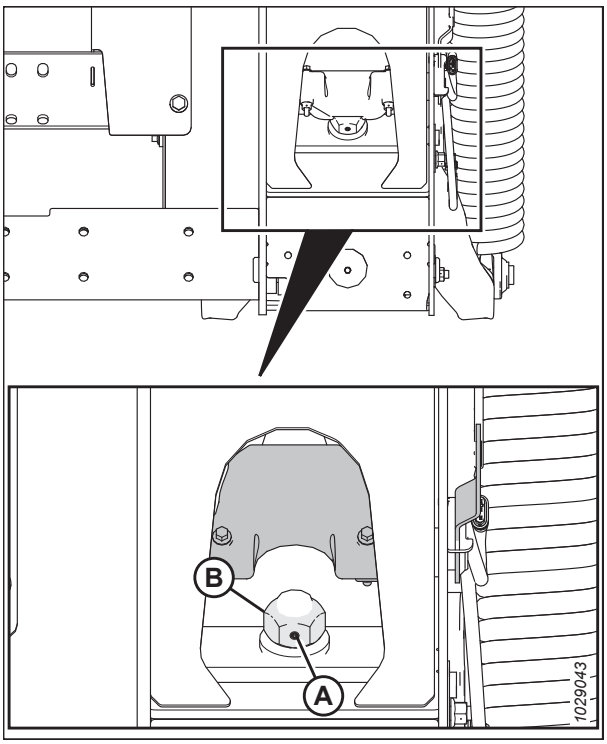


Figure 3.803: Float Lock – Right

8. After adjusting the high side of the header, reset float indicator needle (A) to zero by loosening the nut that secures bolt (B), and center the indicator needle on zero.

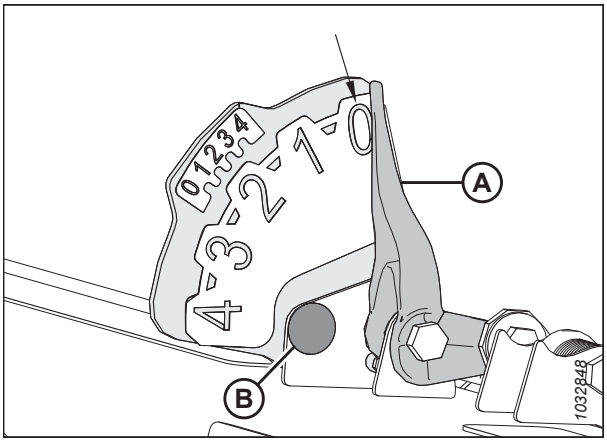


Figure 3.804: Left Float Indicator

NOTE:

Ensure a minimum clearance of 2–3 mm (1/8 in.) (A) between the frame and the back of the bell crank lever.

NOTE:

Check the float after leveling header. For instructions, refer to *Checking and Adjusting Header Float, page 190*.

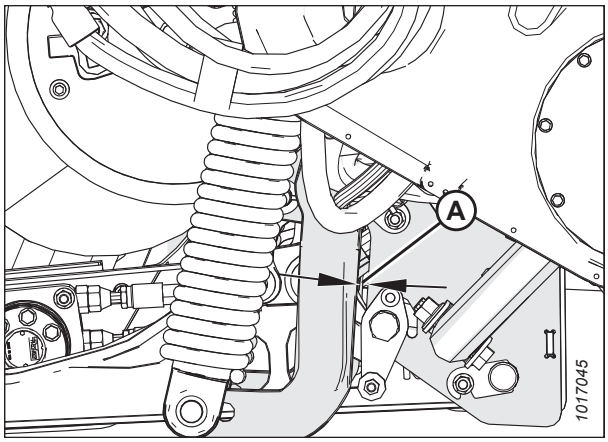


Figure 3.805: Bell Crank

3.12 Unplugging Cutterbar

Follow this procedure if an obstruction prevents the cutterbar from working correctly.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

IMPORTANT:

Lowering a rotating reel on a plugged cutterbar will damage the reel components.

To unplug the cutterbar, reverse the combine feeder house. If the cutterbar is still plugged, do the following:

1. Stop the forward movement of the machine and disengage the header drives.
2. Raise the header to prevent it from filling with dirt, and engage the header drive clutch.
3. If the plug does **NOT** clear, disengage the header drive clutch and fully raise the header.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header's safety props. For instructions, refer to the combine operator's manual.
6. Clean off the cutterbar by hand.

3.13 Unplugging Float Module Feed Draper

Crop sometimes gets wedged between the feed draper and the feed deck. Follow this procedure to safely clear any obstructions in the float module's feed draper.

1. Stop the forward movement of the machine and disengage the header drives.
2. Raise the header slightly off the ground, and raise the reel.
3. Reverse the combine feed according to the manufacturer specifications (reverse feed varies among different combine models).
4. Turn the side draper speed down to 0.
5. Engage the header drive.
6. Slowly increase the side draper speed to the previous settings once the plug has been cleared.

3.14 Transport

There are two ways to transport the header: attached to a combine and towed behind a combine or an agricultural tractor.

For more information, refer to

- *3.14.1 Transporting Header on Combine, page 451*
- *3.14.2 Towing, page 451*

3.14.1 Transporting Header on Combine

In conditions with good visibility, you can transport the header while it is attached to a combine.

WARNING

Do NOT drive the combine with the header attached on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the header may not be apparent under these conditions.

CAUTION

- **Check local laws for width regulations and lighting or marking requirements before transporting on roads.**
- **Follow all recommended procedures in your combine operator's manual for transporting, towing, etc.**
- **Disengage the header drive clutch when travelling to and from the field.**
- **Before driving on a roadway, be sure flashing amber lamps, red tail lamps, and head lamps are clean and working properly. Pivot amber lamps for best visibility by approaching traffic. Always use lamps when travelling on roads to provide adequate warning to other vehicles.**
- **Do NOT use field lamps on roads—they may confuse other drivers.**
- **Before driving on a roadway, clean slow moving vehicle signs and reflectors, adjust rear view mirrors, and clean windows.**
- **Lower the reel fully and raise the header unless transporting in hills.**
- **Maintain adequate visibility and be alert for roadside obstructions, oncoming traffic, and bridges.**
- **When travelling downhill, reduce speed and keep the header at a minimum height to provide maximum stability if forward momentum is stopped for any reason. Raise the header completely at the bottom of the grade to avoid contacting the ground.**
- **Travel at safe speeds to ensure complete machine control and stability at all times.**

3.14.2 Towing

Headers with the EasyMove™ Transport option can be towed behind a combine or an agricultural tractor at a maximum speed of 32 km/h (20 mph).

For instructions, refer to the towing vehicle's operator's manual.

Attaching Header to Towing Vehicle

The header can be towed to multiple locations using a towing vehicle. Follow the instructions below to prevent loss of control leading to bodily injury and/or machine damage.

CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- **Weight of towing vehicle must exceed header weight to ensure adequate control and braking performance.**
- **Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.**
- **Ensure reel is fully lowered and back on support arms to increase header stability during transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other or the circuit will be complete and the reel could creep forward during transport.**
- **Check that all pins are properly secured in transport position at wheel supports, cutterbar support, and hitch.**
- **Check tire condition and pressure prior to transporting.**
- **Connect hitch to towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.**
- **Attach hitch safety chain to towing vehicle. Adjust safety chain length to provide only enough slack to permit turning.**
- **Connect header seven-pole plug wiring harness to mating receptacle on towing vehicle. (The seven-pole receptacle is available from your MacDon Dealer parts department.)**
- **Ensure lights are functioning properly and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.**

Precautions for Towing Header

Review this list of cautions before attaching and towing a header behind a combine or an agricultural tractor.

CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- **Do NOT exceed 32 km/h (20 mph).**
- **Reduce transport speed to less than 8 km/h (5 mph) for slippery or rough conditions.**
- **Turn corners at only very low speeds (8 km/h [5 mph] or less) as header stability is reduced while cornering. Do NOT accelerate when making or coming out of a turn.**
- **Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law.**

3.14.3 Converting from Transport to Field Position (Option)

The header needs to be converted back to field position if it was towed to a new location.

Moving Left Outboard Wheel From Transport to Working Position – ContourMax™ Option

The left outboard wheel need to be repositioned to the working position after being in the transport position.

DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.
5. Remove lynch pin (A).
6. Remove locking pin (B).
7. Slide wheel assembly (C) out of storage bracket (D).

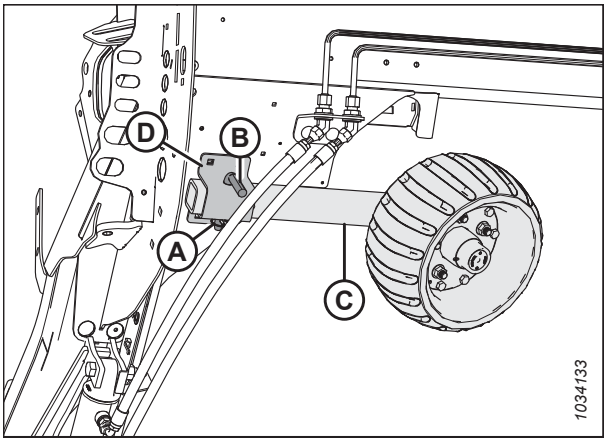


Figure 3.806: Left Wheel Assembly

8. With the wheel facing inboard, align wheel assembly (C) with the isolator assembly and slide it towards the front of the header until the pin holes line up.
9. Install locking pin (B).
10. Install lynch pin (A).

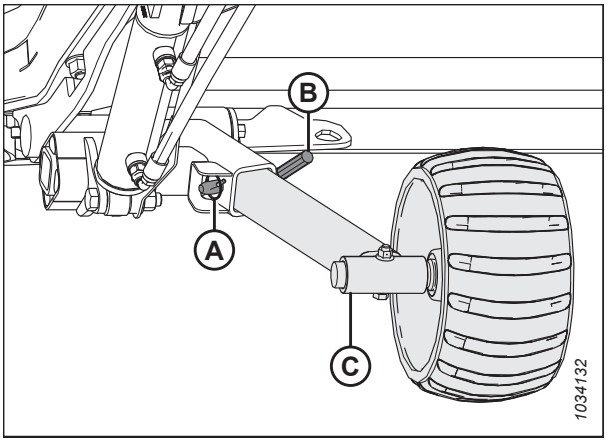


Figure 3.807: Left Wheel Assembly

Removing Tow-Bar

Remove the tow bar from the transport location when converting from the transport position.

1. Block the header tires with wheel chocks (A) to prevent header from rolling.

Figure 3.808: Tire Blocking

2. Disconnect electrical connector (A) and safety chain (B) from towing vehicle and store as shown.
3. If removing a tow-bar with an extension, proceed to Step *4, page 454*. If removing a tow-bar without an extension, proceed to Step *16, page 456*.

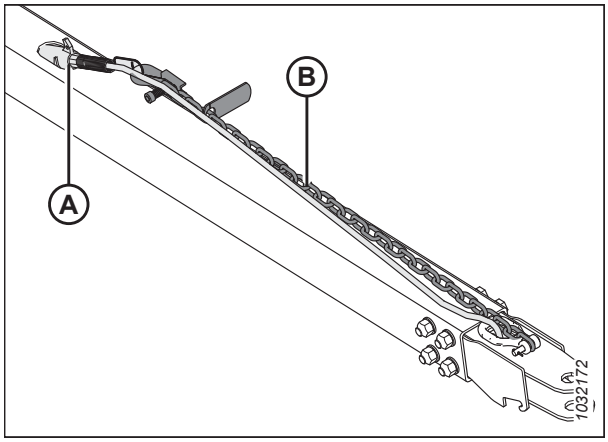


Figure 3.809: Tow-Bar Assembly

Removing tow-bar installed with an extension:

4. Disconnect tow-bar harness (A) from extension harness (B).
5. Remove lynch pin (C) from latch.

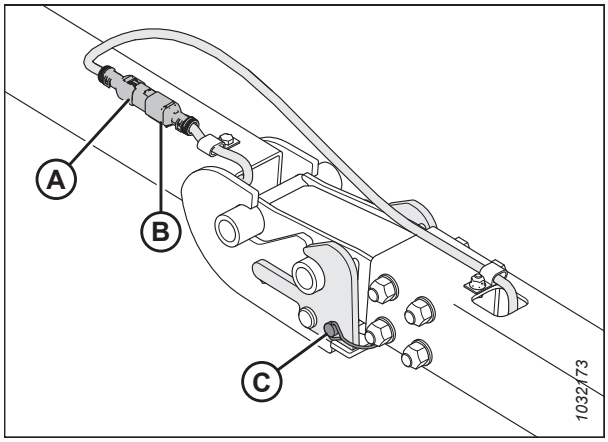


Figure 3.810: Tow-Bar / Extension Harness

6. Secure tow-bar harness (A) in storage location.

7. Lift up on hitch near latch connection to take weight off of latch. While lifting, pull up on latch handle (B) to clear tow-bar lug, and then slowly lower assembly to the ground.

8. Lift end of tow-bar (C) and pull away from extension (D).

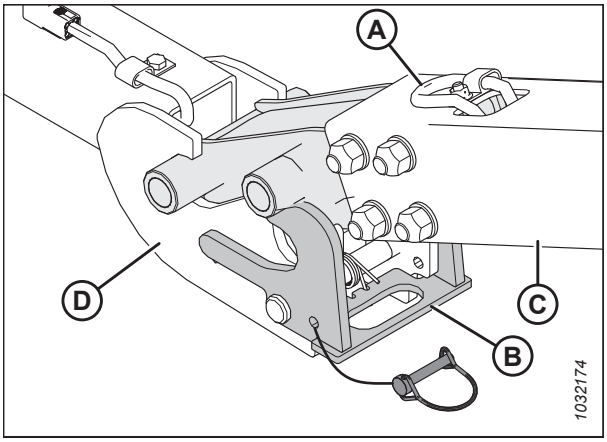


Figure 3.811: Tow-Bar / Extension Joint

9. Unplug tow-bar extension electrical harness (A) from left transport pivot harness (B).

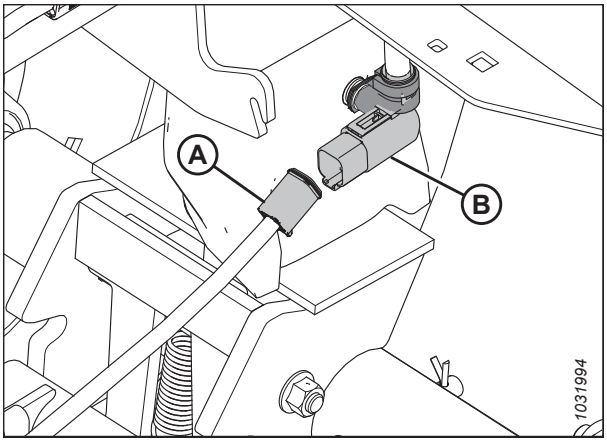


Figure 3.812: Tow-Bar Electrical Connection

10. Remove lynch pin (A) from transport pivot (B).

11. Push back on latch (C) to free extension (D).

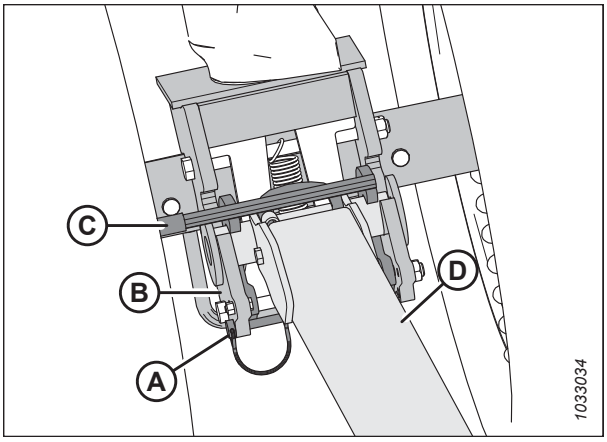


Figure 3.813: Tow-Bar Extension and Transport Pivot

12. Lift extension (A) and pull away from transport pivot (B).
13. Secure extension harness (C) inside the tow-bar extension (A) tube.
14. Reinstall lynch pin in left transport pivot for safe keeping.
15. For tow-bar storage, refer to *Storing Tow-Bar, page 457*.

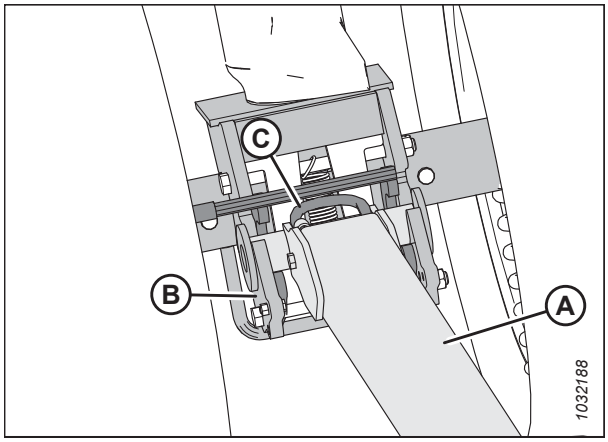


Figure 3.814: Latch Disengaged from Extension

Removing tow-bar installed without an extension:

16. Unplug tow-bar extension electrical harness (A) from left transport pivot harness (B).

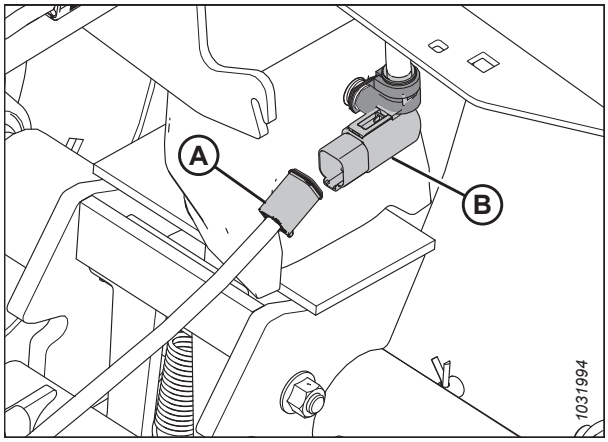


Figure 3.815: Tow-Bar Electrical Connection

17. Remove lynch pin (A), then push back on latch (B) to free the tow-bar.

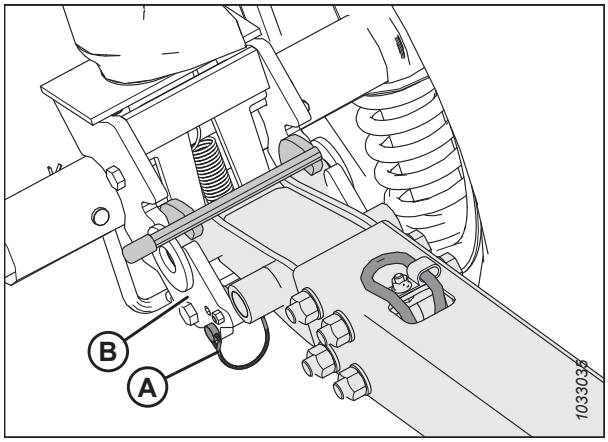


Figure 3.816: Tow-Bar and Left Transport Pivot

18. Lift tow-bar (A) and pull away from transport pivot (B).
19. Reinstall lynch pin in left transport pivot for safe keeping.
20. For tow-bar storage, refer to *Storing Tow-Bar, page 457*.

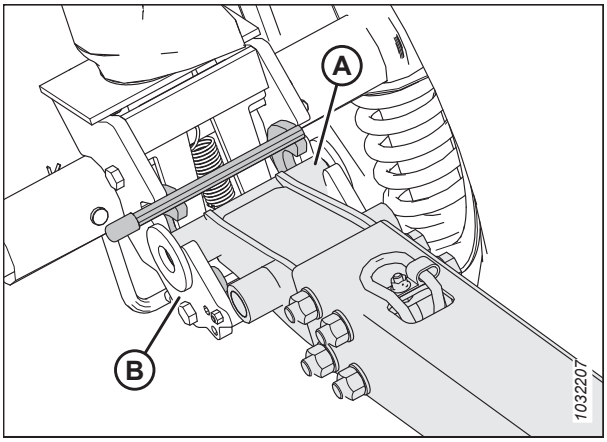


Figure 3.817: Tow-Bar and Left Transport Pivot

Storing Tow-Bar

Store the tow bar in the back tube when not in use.

Tow-bar Extension

1. Insert tube end (B) of tow-bar extension (A) onto pin (C).
2. Rotate tow-bar extension to cradle (D).

   NOTE:

   To prevent tow-bar extension from shaking loose, ensure extension bar engages groove in bracket (E).

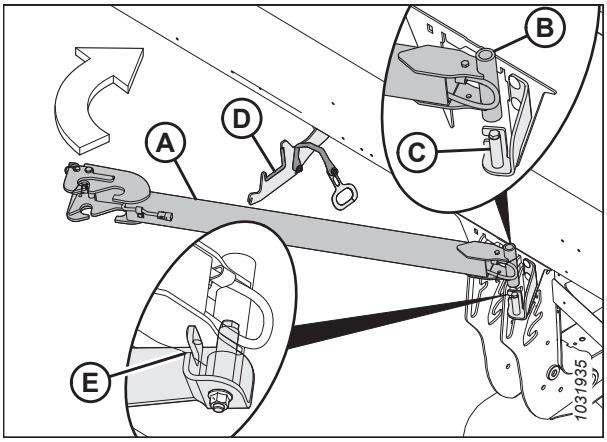


Figure 3.818: Tow-Bar Extension Storage

3. Secure tow-bar extension by hooking strap handle (A) onto notch in cradle (B).

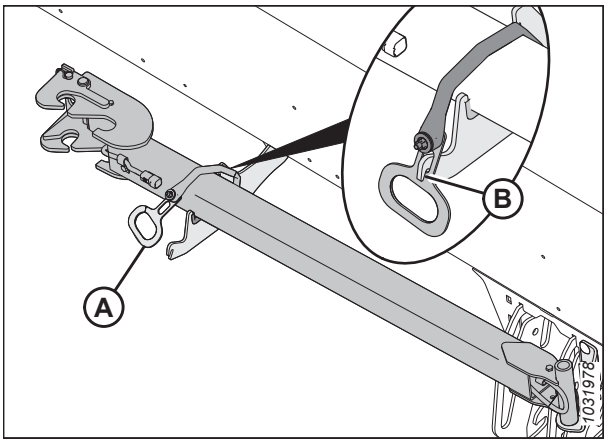


Figure 3.819: Tow-Bar Extension Storage

Tow-bar

4. Open left endshield. For instructions, refer to *Opening Header Endshields, page 47*.
5. With tow chain and harness (A) facing up, insert hitch end (B) of tow bar into left backtube.

   IMPORTANT:

   Header endshield removed from illustration for clarity.

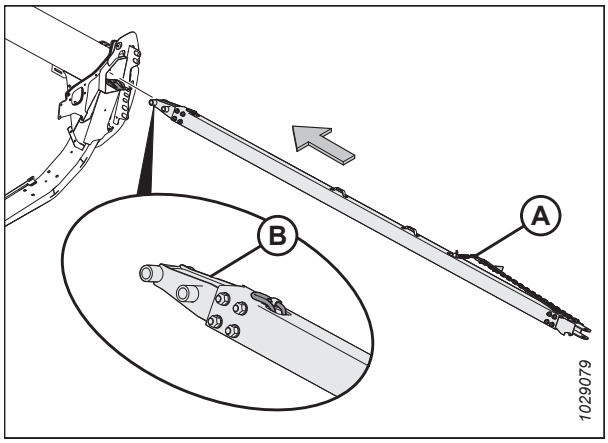


Figure 3.820: Hitch End

6. Slide tow-bar inside the backtube until hooks (A) engage the slots of support angle (B).
7. Close header endshield. For instructions, refer to *Closing Header Endshields, page 48*.

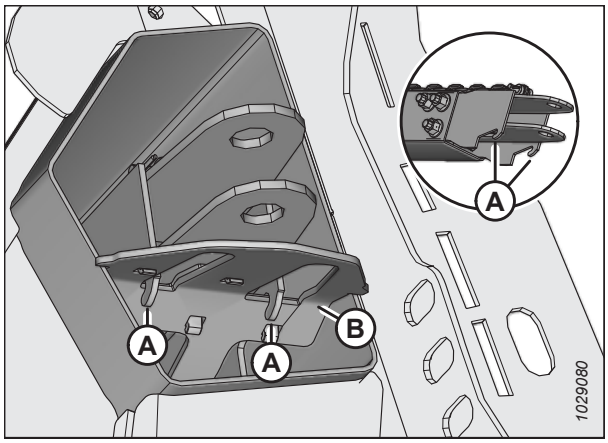


Figure 3.821: Clevis End Retainer Hooks

Moving Front (Left) Wheels into Field Position

This procedure explains how to move the wheels to the highest storage position, but you may wish to use a lower position, depending on whether or not you want the wheels to support the header during field operations. This procedure assumes that the towbar has been removed already.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. Start the engine.
2. Raise the header until the transport wheels are 51–102 mm (2–4 in.) off the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header's safety props. For instructions, refer to the combine operator's manual.

5. Turn left transport wheel assembly (A) 90° in the direction shown.

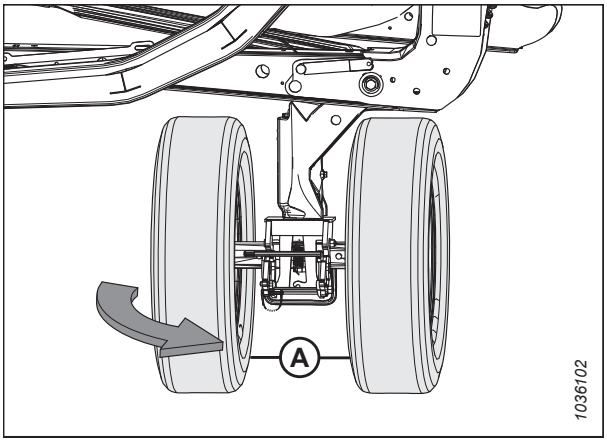


Figure 3.822: Left Transport Wheels in Transport Mode

6. Remove lynch pin (A). Pull handle (B) to engage latch (C)—this will prevent the transport wheel assembly from rotating.

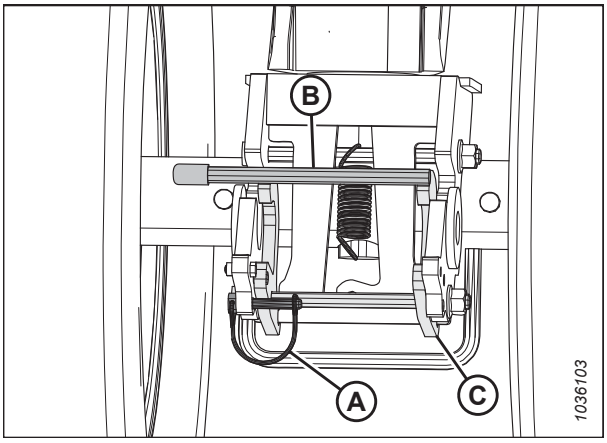


Figure 3.823: Left Transport Wheels – Rotation Lock Latch Disengaged

7. Secure latch (B) with lynch pin (A).

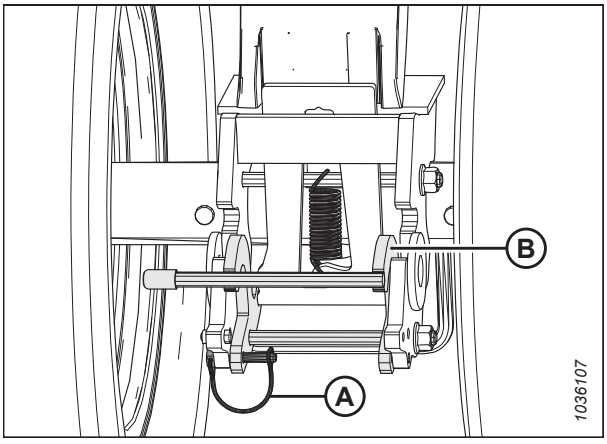


Figure 3.824: Left Transport Wheels – Rotation Lock Latch Engaged

8. To unlock the pivot, use your foot to apply pressure to bolt (B) while pushing handle (A) downward.

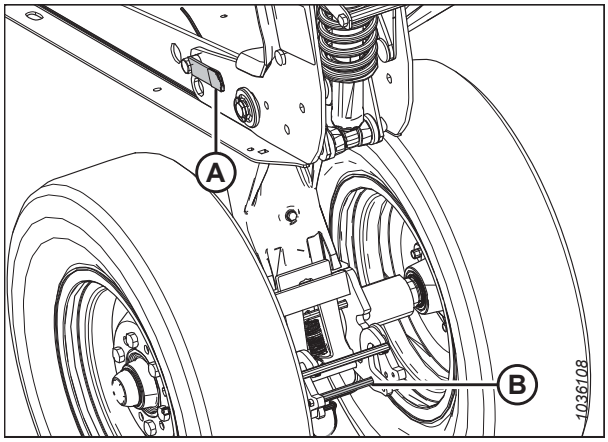


Figure 3.825: Left Transport Wheels – Pivot Released

9. Lift up on handle (A) while pulling back on handle (B) to lift the left wheel assembly into the highest storage position.

   NOTE:

   Parts have been removed from the illustration for clarity.

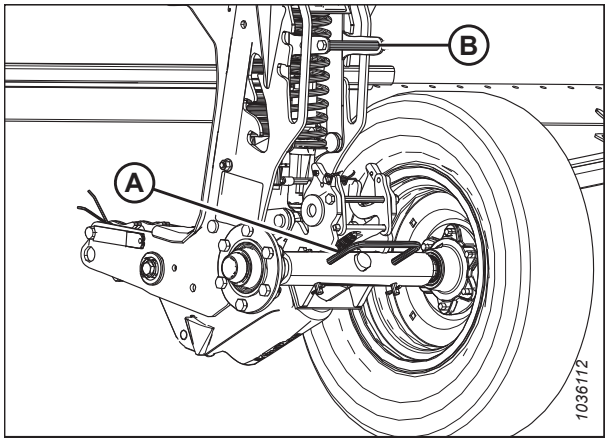


Figure 3.826: Left Transport Wheels in Highest Storage Position

10. Ensure that pin (A) is visible at the highest storage position in plate (B).

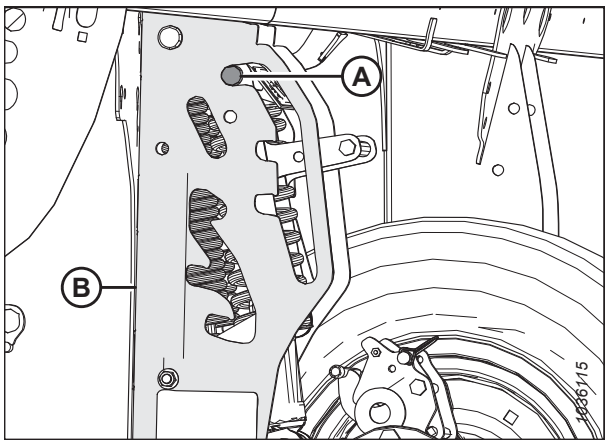


Figure 3.827: Left Transport Wheel Pivot Pin in Highest Storage Position

Moving Rear (Right) Wheels into Field Position

The rear (right) transport wheels can be converted from transport to field (storage) position with a few simple steps.

This procedure demonstrates how to move the wheels to the highest storage position, but you may wish to use a lower position, depending on whether or not you want the wheels to support the header during field operations.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Start the engine.
2. Raise the header until the transport wheels are 51–102 mm (2–4 in.) off the ground.

   NOTE:

   Raise the header high enough that the cylinder safety props can be engaged—you will need to work under the header to complete this procedure.

   NOTE:

   If engaging the safety props requires raising the header to a height where it is inconvenient to work on, use blocks to support the header so that the transport wheels are 51–102 mm (2–4 in.) off the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header's safety props. For instructions, refer to the combine operator's manual.
5. On the right transport axle, remove lynch pin (A) from the right transport axle latch.
6. Support the right transport axle using wheel handle (B), then push handle (C) to release the right transport axle from the header frame.
7. Lower the right transport axle to the ground using wheel handle (B).
8. Reinstall lynch pin (A) into the latch.

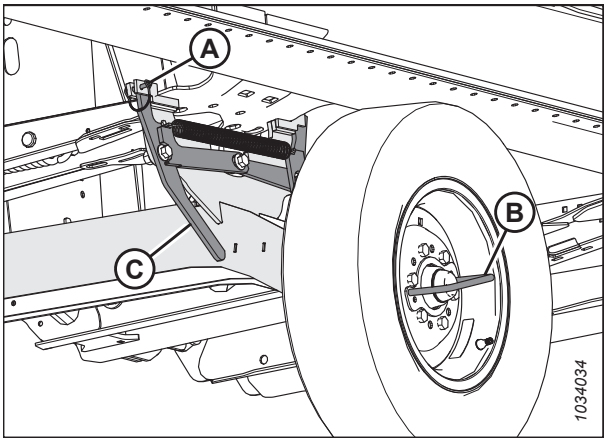


Figure 3.828: Right Transport Axle Latched in Transport Position

9. Lift and rotate right transport axle (A) in the direction shown using the wheel handle.

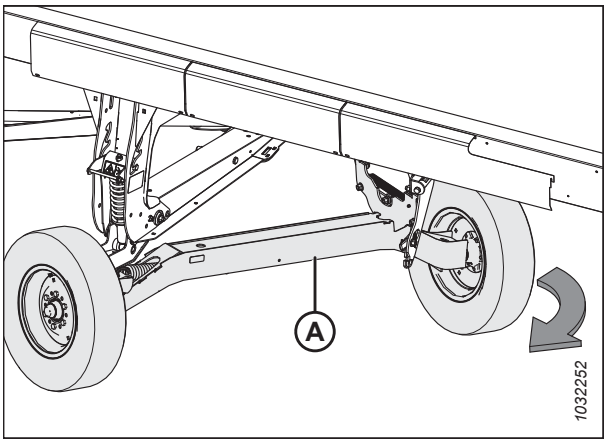


Figure 3.829: Right Transport Axle Rotation

10. Using wheel handle (A), lift and position right transport axle (B) to field support (C) to engage the latch.

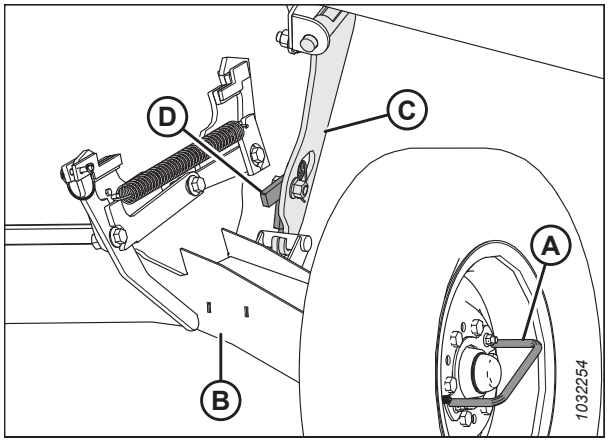


Figure 3.830: Right Transport Axle Latched in Field Position

11. Pull transport height adjustment handle (A) and lift axle pivot handle (B) to move the axle to the highest storage position. Ensure that pin (C) is visible at the highest storage position as shown.

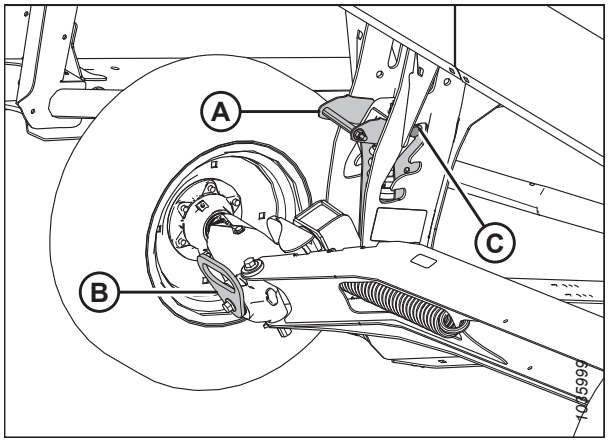


Figure 3.831: Right Transport Wheels in Highest Storage Position

3.14.4 Converting from Field to Transport Position (Option)

The header needs to be converted to the transport when being towed to a new location.

Moving Left Outboard Wheel From Working to Transport Position

The left outboard wheel need to be moved to the transport position before the header can be towed.

DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.

5. Remove lynch pin (A).
6. Remove locking pins (B).
7. Slide left wheel assembly (C) towards the back of the header.

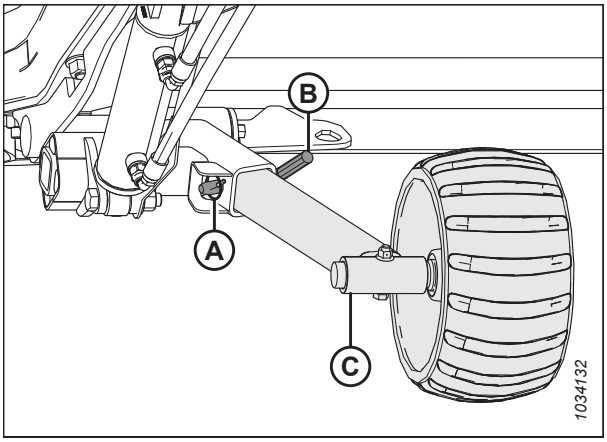


Figure 3.832: Left Wheel Assembly

8. With the wheel facing out, slide left wheel assembly (C) into storage bracket (D).
9. Install locking pin (B).
10. Install lynch pin (A).

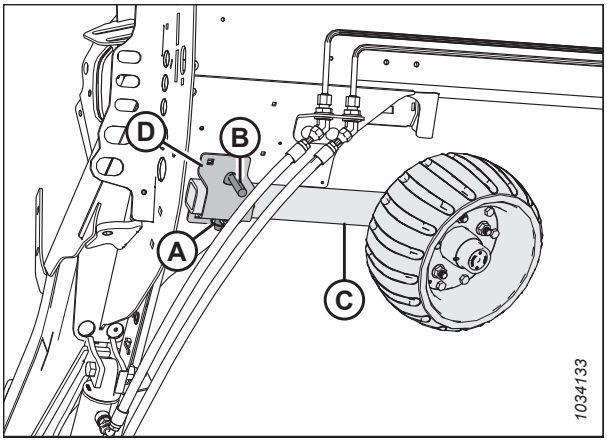


Figure 3.833: Left Wheel Assembly

Moving Front (Left) Wheels into Transport Position

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

CAUTION

Stand clear of the wheels and release the linkage carefully; the wheels will drop suddenly once the mechanism is released.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.

5. Adjust gauge wheel height to transport position (lowest slot). Pull suspension handle (A) outward and push down on axle pivot handle (B) until transport position is reached.

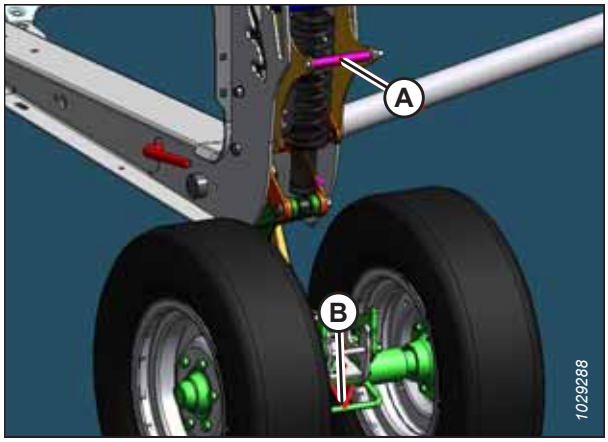


Figure 3.834: Gauge Wheel

6. Secure left transport pivot by pushing pivot handle (A) forward until latch is engaged.
7. Pull back on pivot handle to verify that latch is fully engaged.

Figure 3.835: Gauge Wheel

8. Remove clevis pin (A) securing latch.
9. Push pivot handle (B) up to unlock wheel assembly.

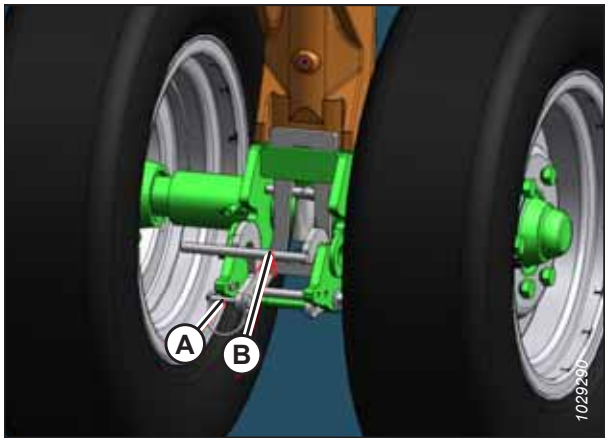


Figure 3.836: Gauge Wheel

10. Turn front wheel assembly clockwise, 90°.

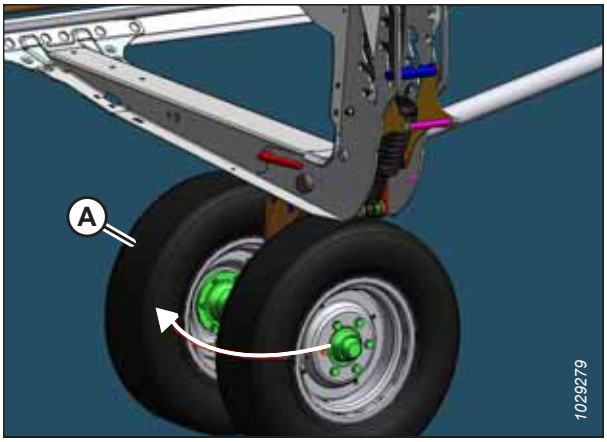


Figure 3.837: Gauge Wheel

Moving Rear (Right) Wheels into Transport Position

When towing the header it must be converted into the transport position.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

CAUTION

Stand clear of the wheels and release the linkage carefully; the wheels will drop suddenly once the mechanism is released.

1. Adjust gauge wheel height to transport position (lowest slot) as follows:
   - If in top slot, push on handle (A) to release.
   - If in mid slot, pull on handle (A) to release.
2. Pull suspension handle (A) outward and push down on axle pivot handle (B).

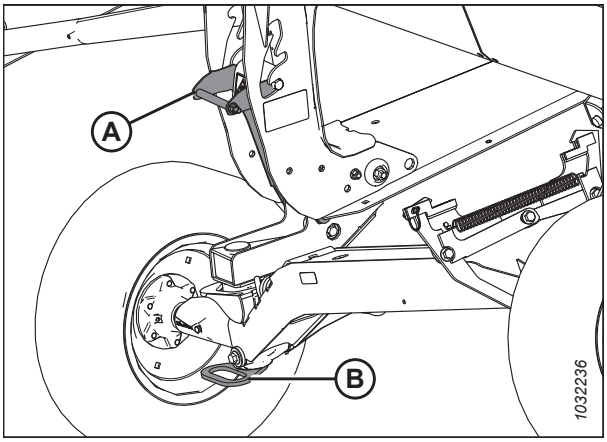


Figure 3.838: Gauge Wheels

3. Push down on latch (A) at right field support (B) to unlock.

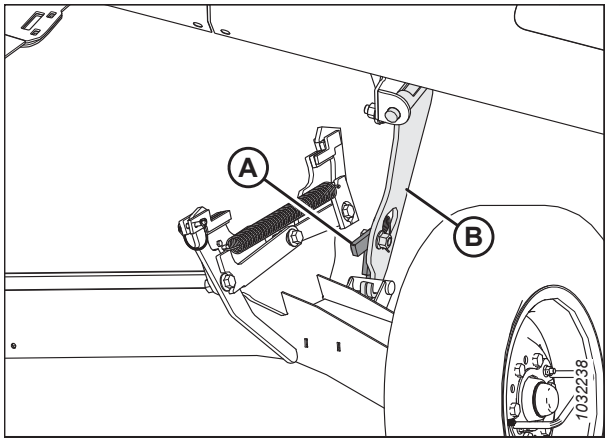


Figure 3.839: Right Field Support

4. Lift wheel handle (A) to remove right transport axle (B) from right field support (C), then lower right transport axle to the ground.

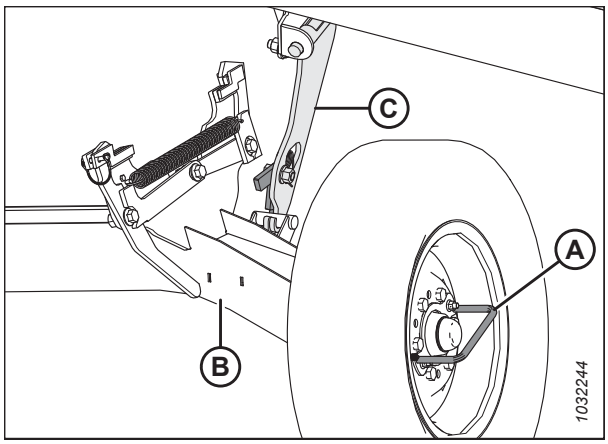


Figure 3.840: Right Field Support

5. Use wheel handle and rotate right transport axle (A) under the header frame.

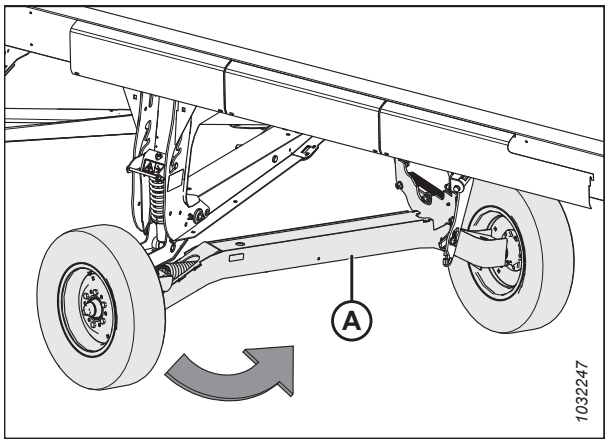


Figure 3.841: Right Transport Axle

6. Remove clevis pin (A) from right transport axle latch.
7. Lift right transport axle with wheel handle (B) until latch engages.
8. Push down on wheel handle (B) to verify latch is engaged.
9. Secure latch by reinstalling clevis pin (A).

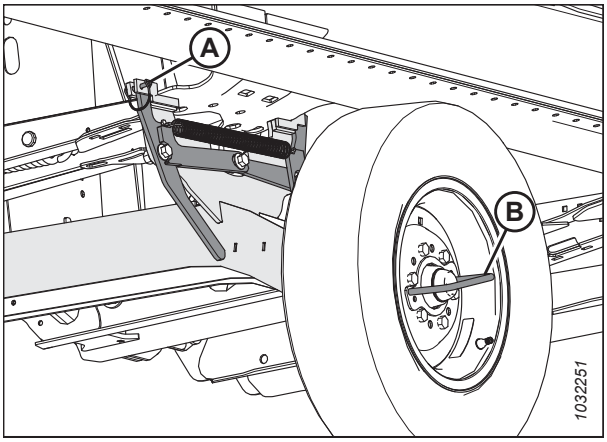


Figure 3.842: Right Transport Axle

Removing Tow-Bar from Storage

Remove the tow bar from the backtube storage location when converting to the transport position.

Tow-Bar Extension

1. Remove strap (A) from cradle (B) to free tow-bar extension (C).
2. Rotate tow-bar extension to unlock from pin (D).
3. Lift tow-bar extension away (C) from pin (D).

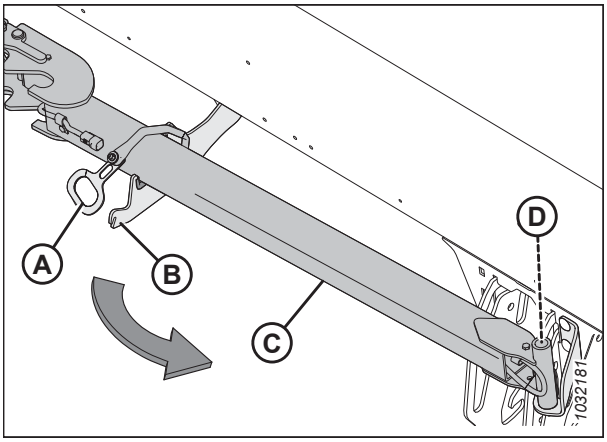


Figure 3.843: Tow-Bar Extension in Storage

Tow-Bar

4. Open left endshield. For instructions, refer to *Opening Header Endshields, page 47*.
5. Pull tow-bar forward until it hits the stop. Lift the tow bar to free clevis stop (C) and hook (A) from support angle (B), then pull it out of tube.

   NOTE:

   Backtube is shown transparent in illustration at right.
6. Slide tow bar out from header backtube.

   NOTE:

   Use caution to avoid contact with any nearby hydraulic or electrical hoses and lines.

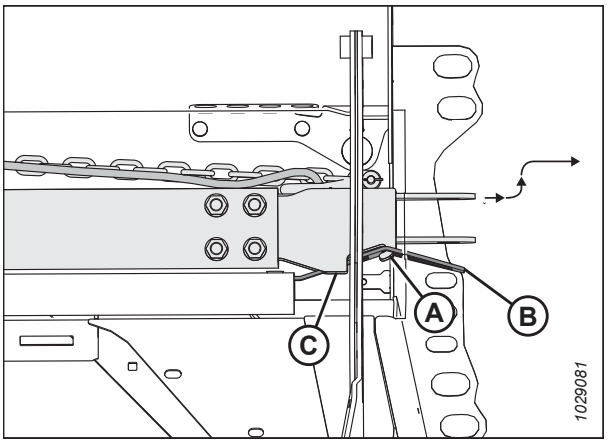


Figure 3.844: Tow-Bar in Storage

Attaching Tow-Bar

The tow-bar consists of two sections which make storage and handling easier.

1. Block the header tires with wheel chocks (A) to prevent header from rolling.
2. Remove tow-bar from storage. For instructions, refer to *Removing Tow-Bar from Storage, page 467*.
3. If installing a tow-bar and extension, proceed to Step *4, page 468*. If installing tow-bar only, proceed to Step *18, page 470*.

Figure 3.845: Tire Blocking

Installing tow-bar and extension:

4. Remove lynch pin (A) from left transport pivot (B).
5. Push extension (D) into lugs of left transport pivot until latch (C) engages.
6. Reinstall lynch pin (A) to transport pivot to secure extension.
7. Retrieve the end of extension harness (E) from inside the extension tube.

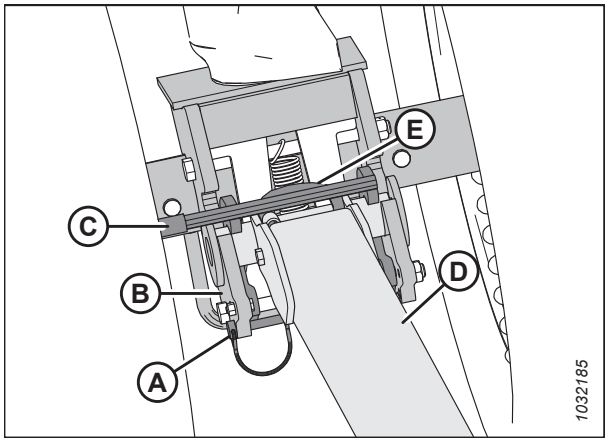


Figure 3.846: Tow-Bar Extension to Left Transport Pivot

8. Connect extension wiring harness (A) to left transport pivot harness (B).

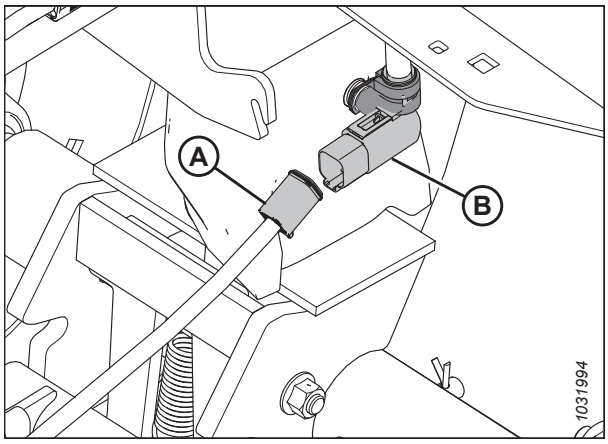


Figure 3.847: Tow-Bar Electrical Connection

9. Remove lynch pin (E) from latch (B).
10. Position end of tow-bar (C) on extension lugs then lower tow-bar to the ground.
11. Lift extension (D) for latch (B) to engage to tow-bar (C).
12. Retrieve the end of tow-bar harness (A) from storage location.

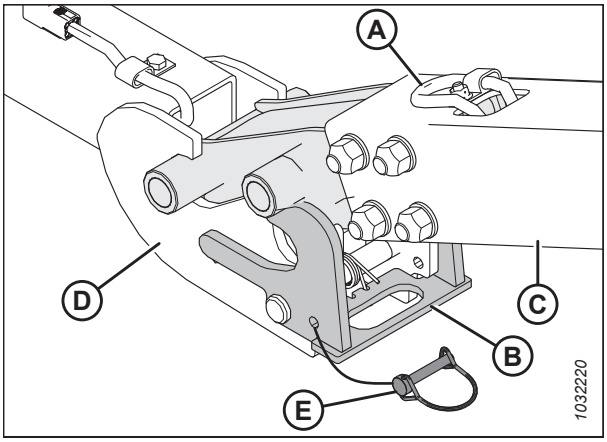


Figure 3.848: Tow-Bar to Extension

13. Connect tow-bar harness (A) to extension harness (B).
14. Reinstall lynch pin (C) to latch to secure tow-bar.

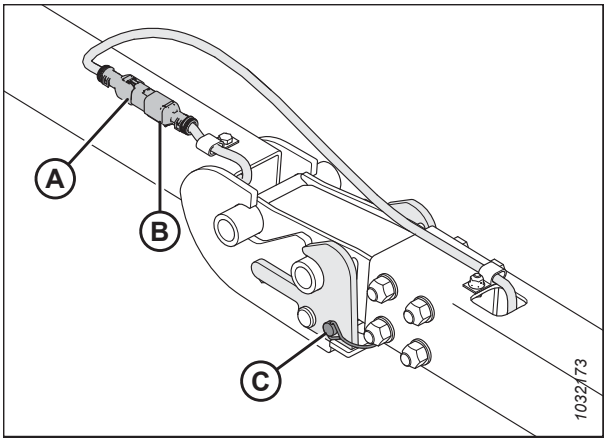


Figure 3.849: Tow-Bar / Extension Harness

15. Retrieve tow-bar wiring harness (A) and safety chain (B) from storage location.
16. Connect tow-bar wiring harness to vehicle, and secure safety chain from tow-bar to tow vehicle.
17. Turn on tow vehicle's 4-way flashers and check that all lights on header are working.

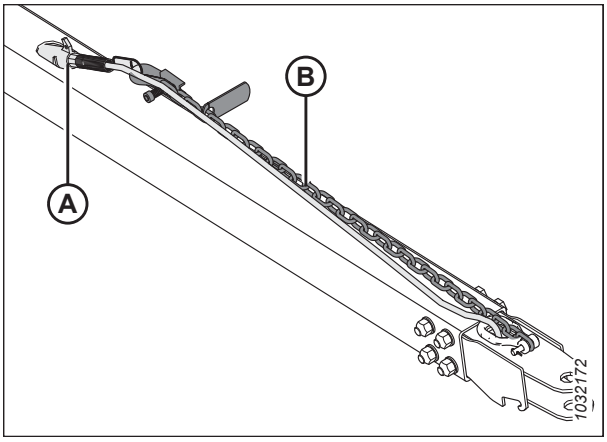


Figure 3.850: Tow-Bar Wiring Harness

Installing tow-bar only:

18. Remove lynch pin (A) from left transport pivot (B).
19. Push tow-bar (C) into lugs of left transport pivot until latch (D) engages.
20. Reinstall lynch pin (A) to transport pivot to secure tow-bar.
21. Retrieve the end of tow-bar harness (E).

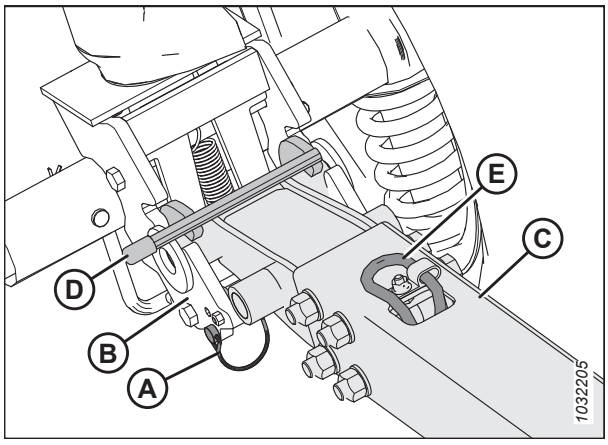


Figure 3.851: Tow-Bar and Left Transport Pivot

22. Connect extension wiring harness (A) to left transport pivot harness (B).

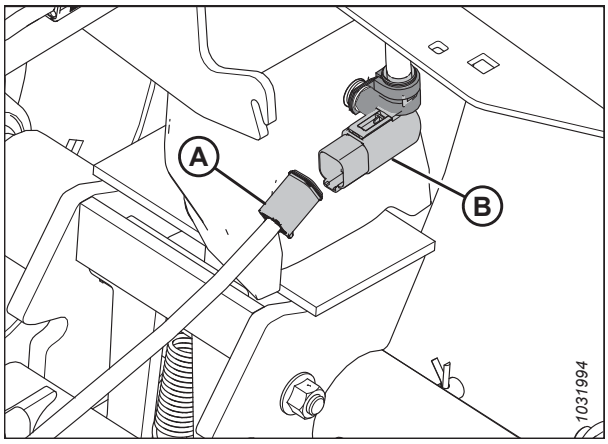


Figure 3.852: Tow-Bar Electrical Connection

23. Retrieve tow-bar wiring harness (A) and safety chain (B) from storage location.
24. Connect tow-bar wiring harness to vehicle, and secure safety chain from tow-bar to tow vehicle.
25. Turn on tow vehicle's 4-way flashers and check that all lights on header are working.

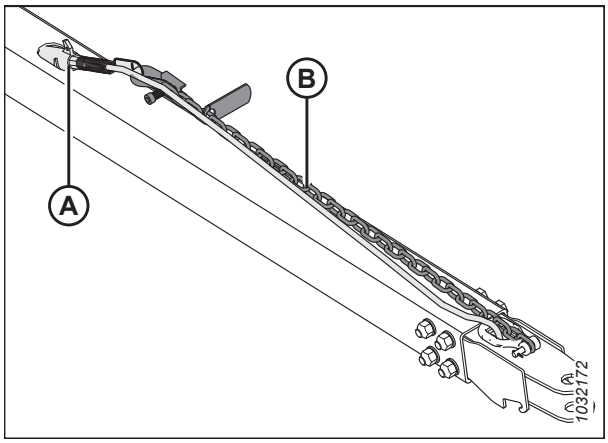


Figure 3.853: Tow-Bar Wiring Harness

3.15 Storing the Header

When putting the header into storage at the end of the season, perform this procedure. Storing the header properly helps to ensure its service life.

WARNING

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

CAUTION

Cover the cutterbar and the knife guards to prevent injury from accidental contact.

1. Clean the header thoroughly.
2. Store the header in a dry, protected place if possible. If storing the header outdoors, always cover it with a waterproof canvas or other protective material.

NOTE:

If storing the header outdoors, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so that water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts significant stress on the drapers and the header frame.

3. Lower the header onto blocks to keep the cutterbar off of the ground.
4. Lower the reel completely. If the header will be stored outdoors, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust from forming.
6. Loosen the drive belts.
7. Lubricate the header thoroughly, leaving excess grease on the fittings to keep moisture out of the bearings.
8. Apply grease to the exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair them as necessary.
10. Check for broken components and order the replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
11. Replace or tighten any missing or loose hardware. Ensure that loose hardware is tightened to the recommended torque value. For more information, refer to *7.1 Torque Specifications, page 711*.

Chapter 4: Maintenance and Servicing

This chapter contains the information necessary to perform routine maintenance and occasional servicing tasks on your machine. The word “maintenance” refers to scheduled tasks that help your machine operate safely and effectively; “Service” refers to tasks that must be performed when a part needs to be repaired or replaced. For advanced service procedures, contact your Dealer.

A parts catalog is provided in the plastic manual case at the rear by the right header leg.

Log hours of operation and use the maintenance record provided (refer to *4.2.1 Maintenance Schedule/Record, page 474*) to keep track of your scheduled maintenance.

4.1 Preparing Machine for Servicing

Observe all safety precautions before beginning service on the machine.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator’s seat, and always engage the safety props before going under the machine for any reason.

CAUTION

To avoid personal injury, follow all the safety precautions listed before servicing header or opening drive covers.

Before servicing the machine, follow these steps:

1. Lower the header fully. If it is necessary to service the header in the raised position, always engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the park brake.
4. Wait for all moving parts to stop.

4.2 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine's life. Log hours of operation, use the maintenance record, and keep copies of your maintenance records (refer to *4.2.1 Maintenance Schedule/Record, page 474*).

Periodic maintenance requirements are organized according to service intervals. If a service interval specifies more than one timeframe, e.g., 100 hours or annually, service the machine at whichever interval is reached first.

IMPORTANT:

Recommended intervals are for average conditions. Service the machine more often if operating under adverse conditions (severe dust, extra heavy loads, etc.).

When servicing the machine, refer to the appropriate section in this Maintenance and Servicing chapter and use only specified fluids and lubricants. Refer to inside back cover for recommended fluids and lubricants.

CAUTION

Carefully follow safety messages. For instructions, refer to *4.1 Preparing Machine for Servicing, page 473* and *1 Safety, page 1*.

4.2.1 Maintenance Schedule/Record

Recording maintenance allows the user to keep track of when maintenance is performed.

Action:	✓ – Check	♦ – Lubricate	▲ – Change
Hour meter reading			
Service date			
Serviced by			
First Use	Refer to *4.2.2 Break-In Inspection, page 476*.		
End of Season	Refer to *4.2.4 Equipment Servicing – End-of-Season, page 477*.		
10 Hours or Daily (Whichever Occurs First)			
✓	Hydraulic hoses and lines; refer to *4.2.5 Checking Hydraulic Hoses and Lines, page 478*[74]		
✓	Knife sections, guards, and hold-downs; refer to *4.8 Knife, page 536*[74]		
✓	Tire pressure; refer to *4.15.3 Checking Tire Pressure, page 673*[74]		
♦	Feed draper rollers; refer to *Every 10 Hours, page 480*		
✓	Link holder hooks; refer to *4.10.7 Checking Link Holder Hooks, page 597*[74]		
✓	Axle bolt torque; refer to *4.15.2 Checking Transport Assembly Bolt Torque, page 671*		
25 Hours			
✓	Hydraulic oil level at reservoir; refer to *4.4.1 Checking Oil Level in Hydraulic Reservoir, page 497*[74]		
♦	Knifeheads; refer to *Every 25 Hours, page 481*[74]		

74. MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine.

50 Hours or Annually																		
♦	Driveline and driveline universals; refer to *Every 50 Hours, page 481*																	
♦	Upper cross auger right bearing; refer to *Every 50 Hours, page 481*																	
♦	Upper cross auger sliding hubs; refer to *Every 50 Hours, page 481*																	
♦	Upper cross auger center support and U-joint; refer to *Every 50 Hours, page 481*																	
♦	Float module auger pivots; refer to *Every 50 Hours, page 481*																	
♦	Feed draper roller bearings, 3 locations; refer to *Every 50 Hours, page 481*																	
▲	Knife drive box lubricant (first 50 hours only); refer to *Changing Oil in Knife Drive Box, page 574*																	
▲	Header drive main gearbox lubricant (first 50 hours only); refer to *Changing Oil in Header Drive Main Gearbox, page 493*																	
▲	Header drive completion gearbox lubricant (first 50 hours only); refer to *Changing Oil in Header Drive Completion Gearbox, page 495*																	
100 Hours or Annually (Whichever Occurs First)																		
✓	Auger to pan and feed draper clearance; refer to *4.7.1 Adjusting Feed Auger to Pan Clearance, page 513*																	
✓	Main gearbox lubricant level; refer to *Checking Oil Level in Header Drive Main Gearbox, page 492*																	
✓	Completion gearbox lubricant level; refer to *Checking Oil Level in Header Drive Completion Gearbox, page 494*																	
✓	Reel drive chain tension; refer to *4.14.1 Reel Drive Chain, page 654*																	
✓	Reel finger/cutterbar clearance; refer to *4.13.1 Reel Clearance to Cutterbar, page 622*																	
✓	Wheel bolt torque; refer to *4.15.1 Checking Wheel Bolt Torque, page 671*																	
✓	Knife drive box lubricant level; refer to *Checking Oil Level in Knife Drive Box , page 573*																	
✓	Knife drive box mounting bolts; refer to *Checking Mounting Bolts, page 574*																	
♦	Auger drive chain; refer to *Every 100 Hours, page 485*																	
♦	Float pivots; refer to *Every 100 Hours, page 485*																	
♦	Float spring tensioners; refer to *Every 100 Hours, page 485*																	

♦	Reel drive chain; refer to *Every 100 Hours, page 485*																	
200 Hours or Annually (Whichever Occurs First)																		
✓	Draper roller bearings; refer to																	
250 Hours or Annually (Whichever Occurs First)																		
♦	Reel shaft bearings; refer to *Every 250 Hours, page 487*																	
♦	Reel drive U-joint; refer to *Every 250 Hours, page 487*																	
♦	Bell crank linkage; refer to *Every 250 Hours, page 487*																	
▲	Hydraulic oil filter; refer to *4.4.4 Changing Oil Filter, page 498*																	
500 Hours or Annually (Whichever Occurs First)																		
♦	Gauge wheel / slow speed transport wheel bearings; refer to *Every 500 Hours, page 488*																	
♦	Contour wheel hub; refer to *4.16.2 Lubricating Contour Wheel Axles, page 681*																	
✓	Header drive main gearbox chain tension; refer to *4.6.5 Adjusting Chain Tension – Main Gearbox, page 509*																	
✓	Header drive completion gearbox chain tension; refer to *4.6.6 Adjusting Chain Tension – Completion Gearbox, page 511*																	
1000 Hours or 3 Years (Whichever Occurs First)																		
▲	Knife drive box lubricant; refer to *Changing Oil in Knife Drive Box, page 574*																	
▲	Header drive main gearbox lubricant; refer to *Changing Oil in Header Drive Main Gearbox, page 493*																	
▲	Header drive completion gearbox lubricant; refer to *Changing Oil in Header Drive Completion Gearbox, page 495*																	
▲	Hydraulic oil; refer to *4.4.3 Changing Oil in the Hydraulic Reservoir, page 498*																	

4.2.2 Break-In Inspection

Break-in inspection involves checking belts, fluids, and performing general machine inspections for loose hardware or other areas of concern. Break-in inspections ensure that all components can operate for an extended period without requiring service or replacement. The break-in period is the first 50 hours of operation after the machine's initial start up.

Inspection Interval	Item	Refer to
5 Minutes	Check hydraulic oil level in reservoir (check after first run-up and after the hydraulic hoses have filled with oil).	*4.4.1 Checking Oil Level in Hydraulic Reservoir, page 497*
5 Hours	Check for loose hardware and tighten to required torque.	*7.1 Torque Specifications, page 711*

Inspection Interval	Item	Refer to
10 Hours	Check auger drive chain tension.	*Checking Feed Auger Drive Chain Tension – Thorough Method, page 517*
10 Hours	Check knife drive box mounting bolts.	*Checking Mounting Bolts, page 574*
10 Hours	Grease the feed draper bearings.	*Every 10 Hours, page 480*
50 Hours	Change float module gearbox oil.	*Changing Oil in Header Drive Main Gearbox, page 493*
50 Hours	Change float module hydraulic oil filter.	*4.4.4 Changing Oil Filter, page 498*
50 Hours	Change knife drive box lubricant.	*Changing Oil in Knife Drive Box, page 574*
50 Hours	Check gearbox chain tension.	*4.6.5 Adjusting Chain Tension – Main Gearbox, page 509* and *4.6.6 Adjusting Chain Tension – Completion Gearbox, page 511*

4.2.3 Equipment Servicing – Preseason

Equipment should be inspected and serviced at the beginning of each operating season.

CAUTION

- **Review this manual to refresh your memory on the safety and operating recommendations.**
- **Review all the safety decals and other decals on the header and note the hazard areas.**
- **Be sure all the shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Ensure you have a first aid kit and fire extinguisher. Know where they are and how to use them.**

1. Lubricate the machine completely. For instructions, refer to *4.3 Lubrication, page 480*.
2. Perform all annual maintenance tasks. For instructions, refer to *4.2.1 Maintenance Schedule/Record, page 474*.

4.2.4 Equipment Servicing – End-of-Season

Equipment should be inspected and serviced at the end of each operating season.

CAUTION

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

CAUTION

Cover the cutterbar and the knife guards to prevent injury from accidental contact.

1. Clean the header thoroughly.
2. Store the header in a dry, protected place, if possible. If storing the header outdoors, always cover the machine with a waterproof canvas or other protective material.

   NOTE:

   If storing the machine outdoors, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so that water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts significant stress on the drapers and header.
3. Lower the header onto blocks to keep the cutterbar off of the ground.
4. Lower the reel completely. If the header will be stored outdoors, tie the reel to the frame to prevent rotation caused by the wind.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen the drive belts.
7. Lubricate the header thoroughly, leaving excess grease on the fittings.
8. Apply grease to exposed threads, cylinder rods, and the sliding surfaces of components.
9. Lubricate the knife. Refer to the inside back cover for the recommended lubricants.
10. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of next season.
11. Tighten any loose hardware. For torque specifications, refer to *7.1 Torque Specifications, page 711*.

4.2.5 Checking Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure.**
- **If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.**

Figure 4.1: Hydraulic Pressure Hazard

- **Use a piece of cardboard or paper to search for leaks.**

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Allowing dust, dirt, water, or foreign material to enter the system is the major cause of hydraulic system damage. Do **NOT** attempt to service hydraulic systems in the field. Precision fits require a perfectly clean connection during overhaul.

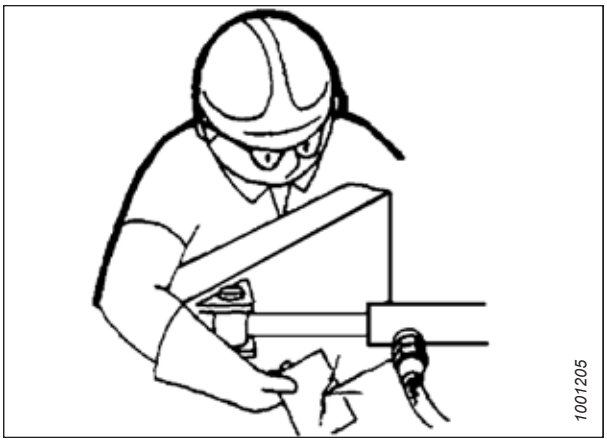


Figure 4.2: Testing for Hydraulic Leaks

1. Start the machine, and engage the header. While running, raise and lower the header and reel. Also extend and retract the reel. Run it for 10 minutes.
2. Shut down the engine, and remove the key from the ignition.
3. Once the machine has been sitting still for several hours, walk around it checking for hoses, lines, and fittings that are visibly leaking oil.

4.3 Lubrication

Grease zerk locations are marked on the machine by decals showing a grease gun and the greasing interval, which will be specified in terms of hours of header operation.

Refer to the inside back cover for information on the recommended lubricants.

Log the header's hours of operation. Use the maintenance record provided in this manual to keep track of what maintenance procedures have been performed on the header, and when. For more information, refer to *4.2.1 Maintenance Schedule/Record, page 474*.

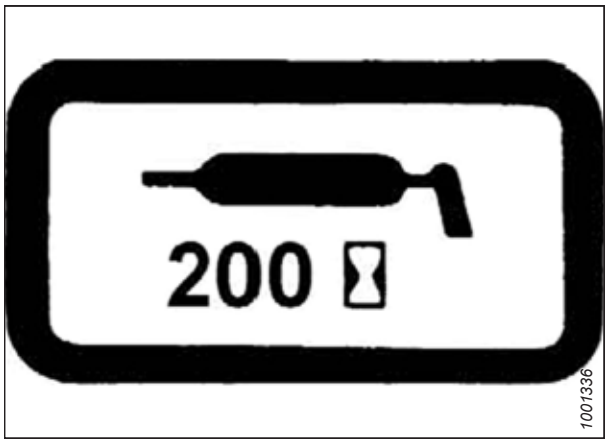


Figure 4.3: Grease Interval Decal

4.3.1 Lubrication Intervals

The lubrication intervals are specified in terms of hours of header operation. Maintaining accurate maintenance records is the best way to ensure these procedures are performed in a timely fashion.

Every 10 Hours

Daily maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

IMPORTANT:

When greasing, clear any debris and excess grease from around the bearing and bearing housing. Inspect the condition of the bearing and bearing housing. Grease the feed draper drive roller bearing until grease comes out of the seal. Wipe any excess grease from area after greasing.

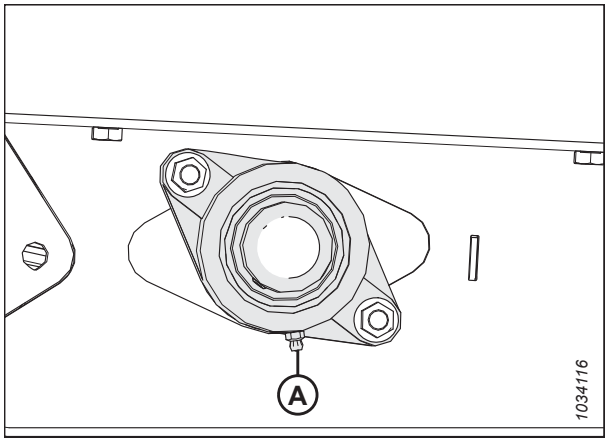


Figure 4.4: Feed Draper Drive Roller

IMPORTANT:

When greasing, clear any debris, and excess grease from around the bearing housing. Inspect the condition of the roller and bearing housing. Grease the feed draper idler roller bearing until grease comes out of the seal. Initial greasing on a new header may require additional grease (may require 5-10 pumps). Wipe any excess grease from area after greasing.

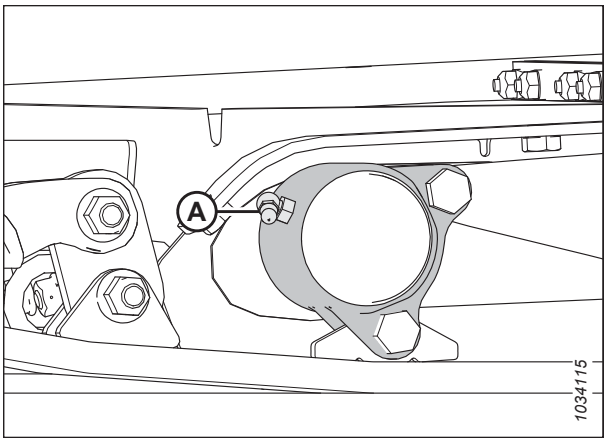


Figure 4.5: Feed Draper Idler Roller

Every 25 Hours

Regular maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

Lubricate knifehead (A) every 25 hours. Check for signs of excessive heating on the first few guards after greasing. If required, relieve the pressure by pressing the check-ball in the grease fitting.

IMPORTANT:

Overgreasing the knifehead puts pressure on the knife, causing it to rub against the guards, resulting in excessive wear from binding. Do **NOT** overgrease the knifehead. Apply only one to two pumps using a mechanical grease gun (do **NOT** use an electric grease gun). If more than six to eight pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead. For instructions, refer to *4.8.3 Removing Knifehead Bearing, page 539*.

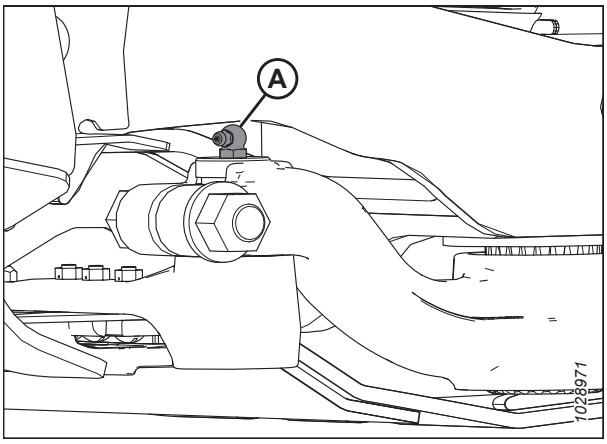


Figure 4.6: Knifehead

Every 50 Hours

Maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

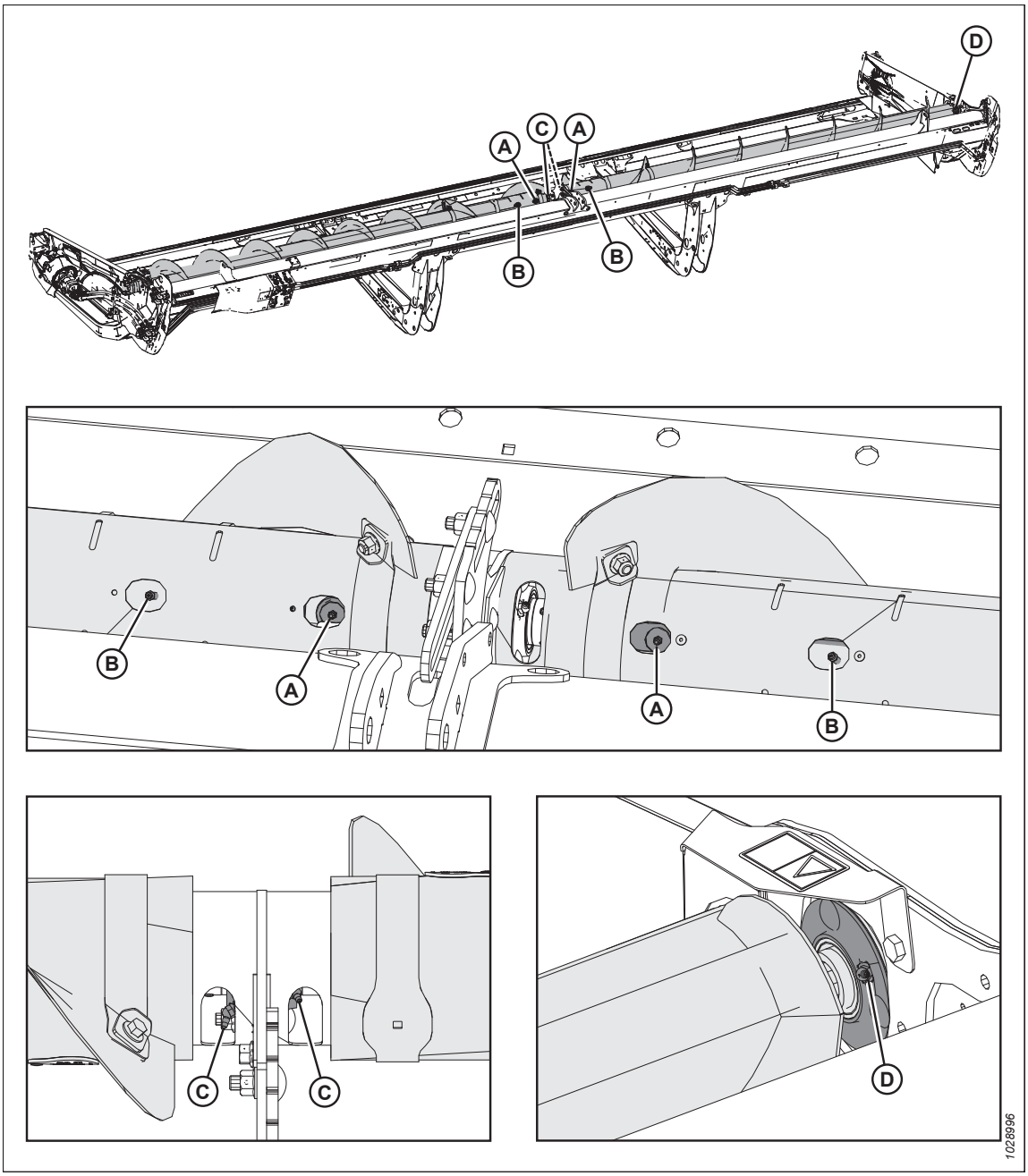


Figure 4.7: Two-Piece Upper Cross Auger

A - Upper Cross Auger U-joints (Two Places)
B - Upper Cross Auger Sliding Hubs (Two Places)
C - Upper Cross Auger Center Bearings (Two Places)
D - Right End Bearing

IMPORTANT:

The Upper Cross Auger must be greased regularly even when turned off as components of the UCA move when the header flexes, regardless of whether the auger is turning or not.

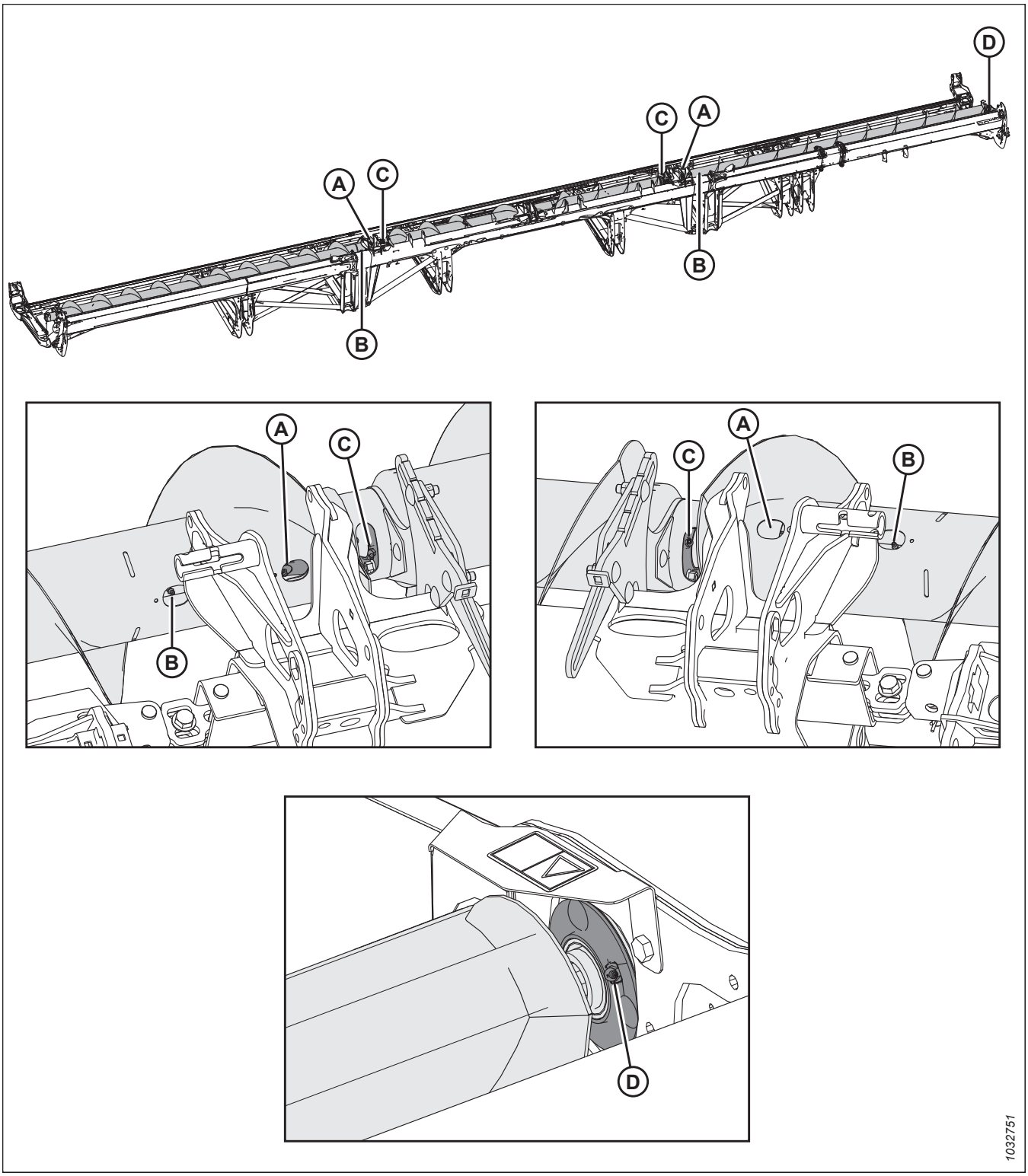


Figure 4.8: Three-Piece Upper Cross Auger

A - Upper Cross Auger U-joints (Two Places)
B - Upper Cross Auger Sliding Hubs (Two Places)
C - Upper Cross Auger Center Bearings (Two Places)
D - Right End Bearing

IMPORTANT:

The Upper Cross Auger must be greased regularly even when turned off as components of the UCA move when the header flexes, regardless of whether the auger is turning or not.

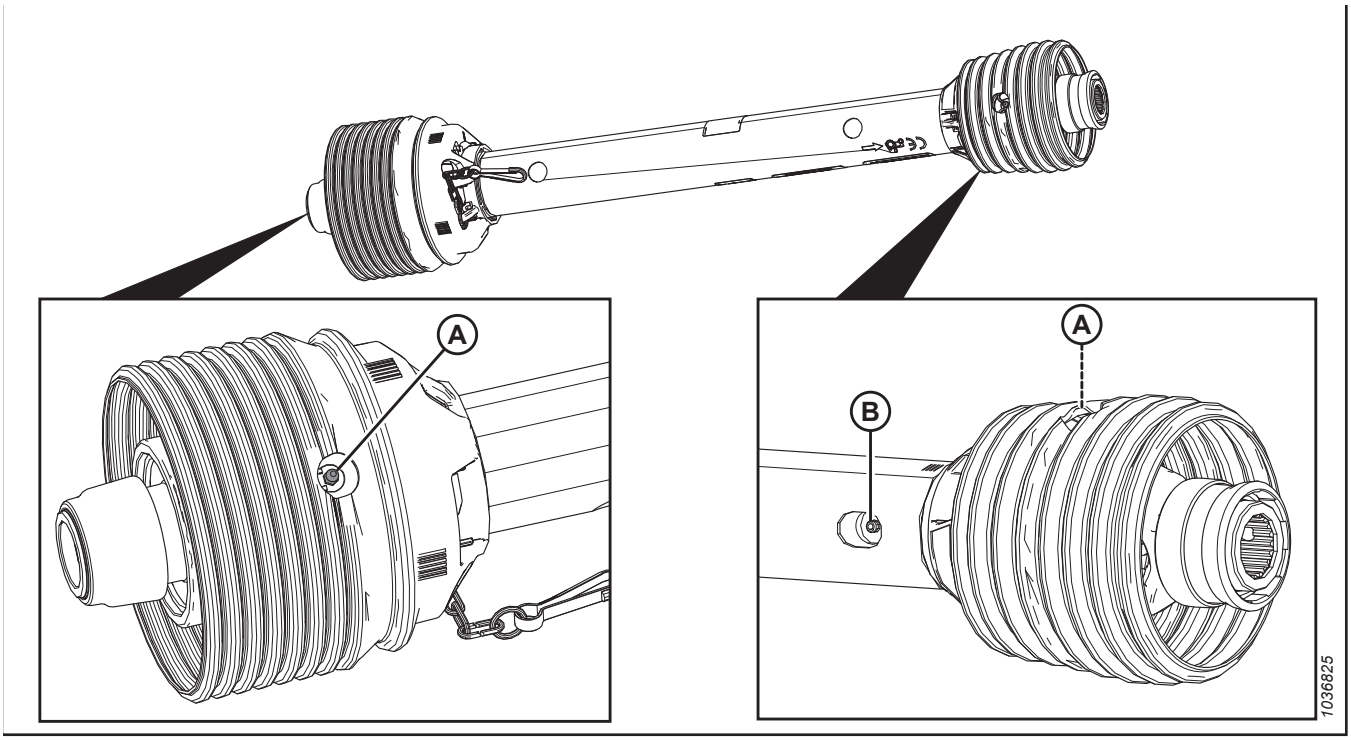


Figure 4.9: FM200

A - Driveline Universal (Two Places)

B - Driveline Slip Joint[75]

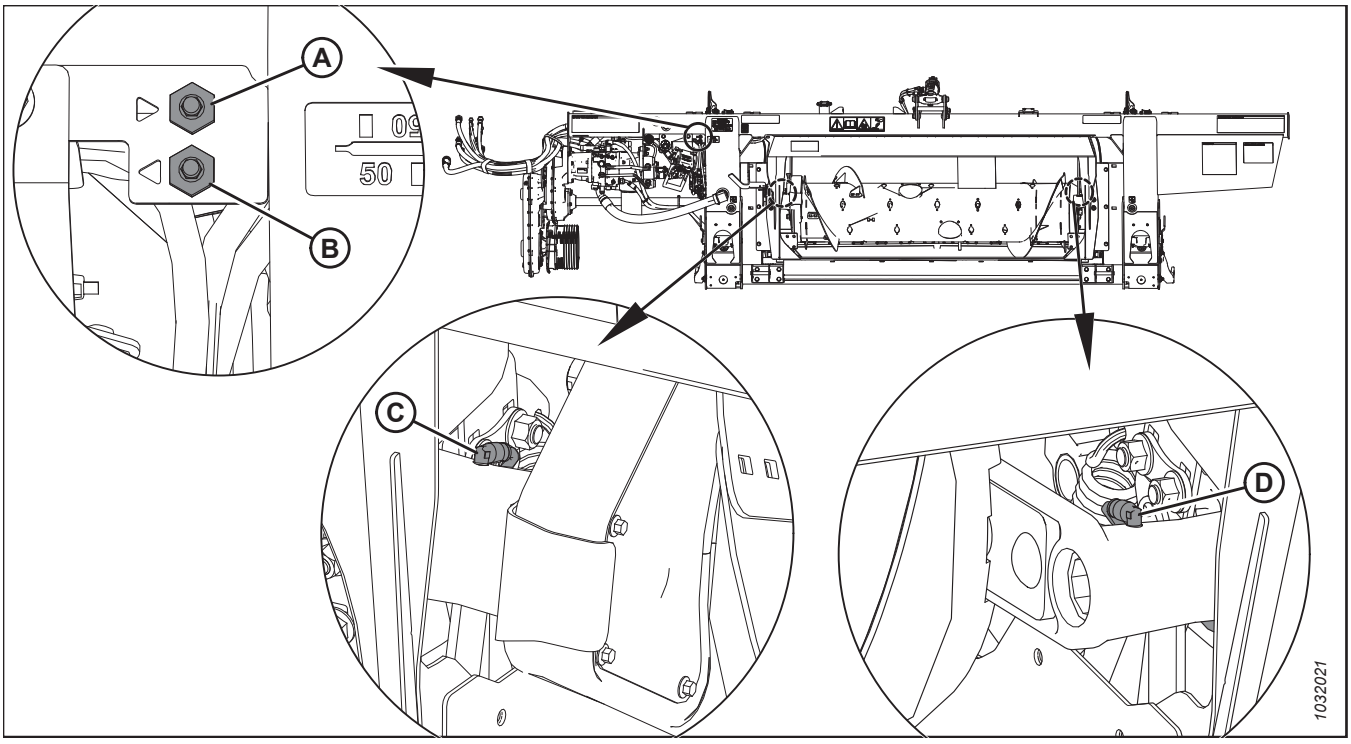


Figure 4.10: FM200

A - Remote Grease Line for Auger Pivot (Right Side)

B - Remote Grease Line for Auger Pivot (Left Side)

C - Auger Pivot (Left Side)

D - Auger Pivot (Right Side)

75. Use high temperature extreme pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI Grade 2) lithium base.

Every 100 Hours

Maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

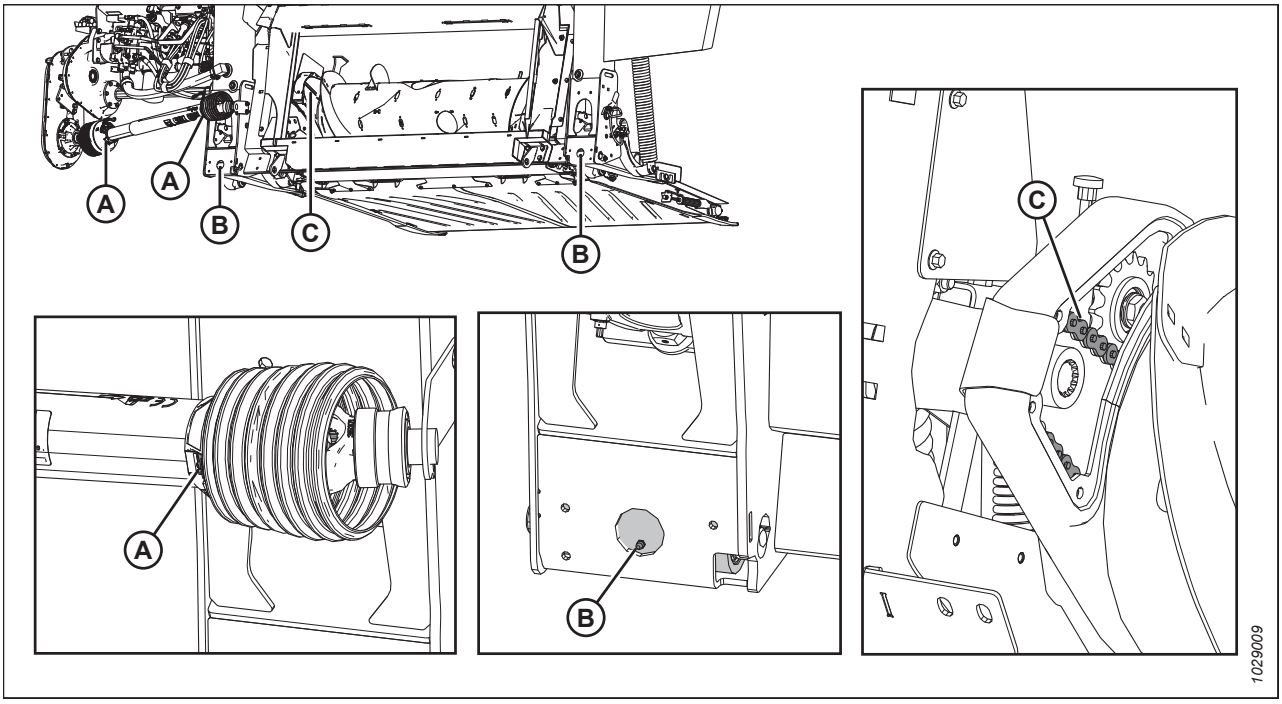


Figure 4.11: FM200

A- Driveline Guards (Both Ends)
B- Float Pivots (Right and Left)
C - Auger Drive Chain. To lubricate, refer to ***4.3.4 Lubricating Auger Drive Chain, page 490***

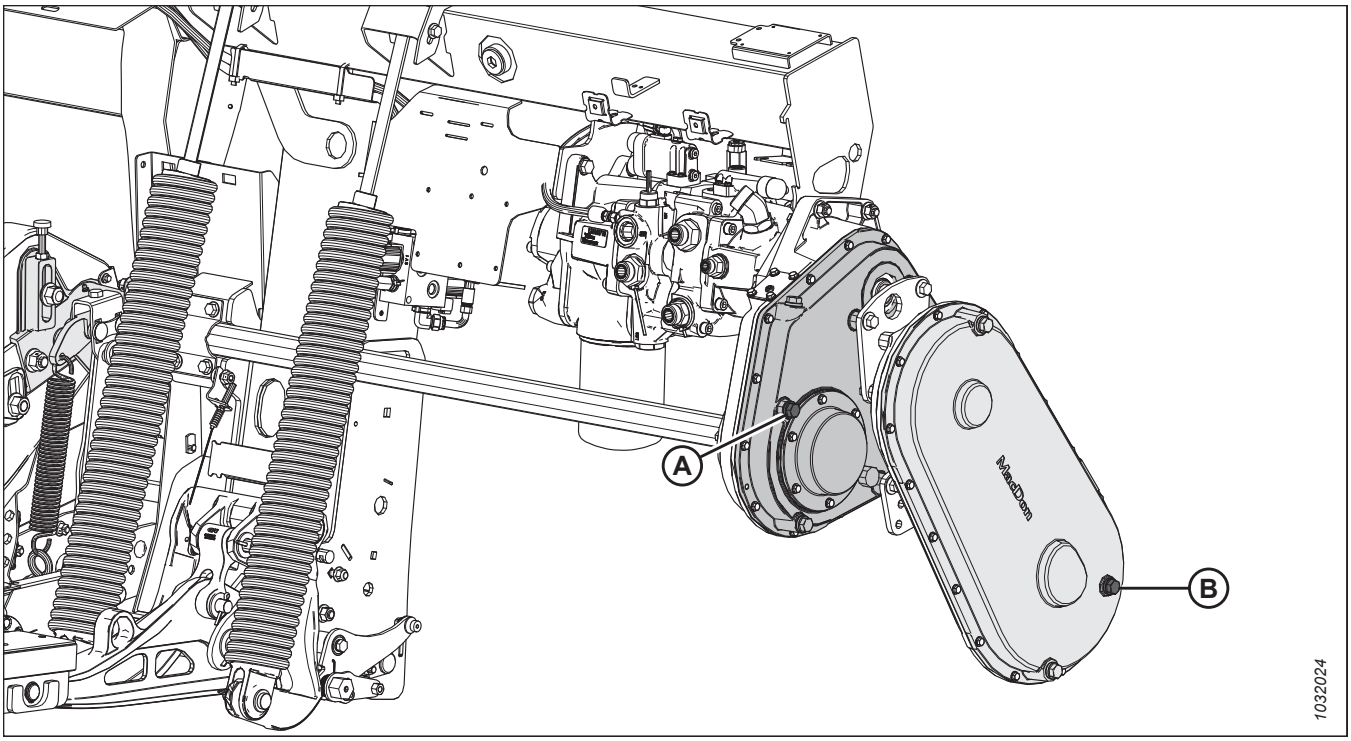


Figure 4.12: FM200

A - Main Gearbox Oil Level. To lubricate, refer to *4.3.5 Lubricating Header Drive Main Gearbox, page 492*
B - Completion Gearbox Oil Level. To lubricate, refer to *4.3.6 Lubricating Header Drive Completion Gearbox, page 494*

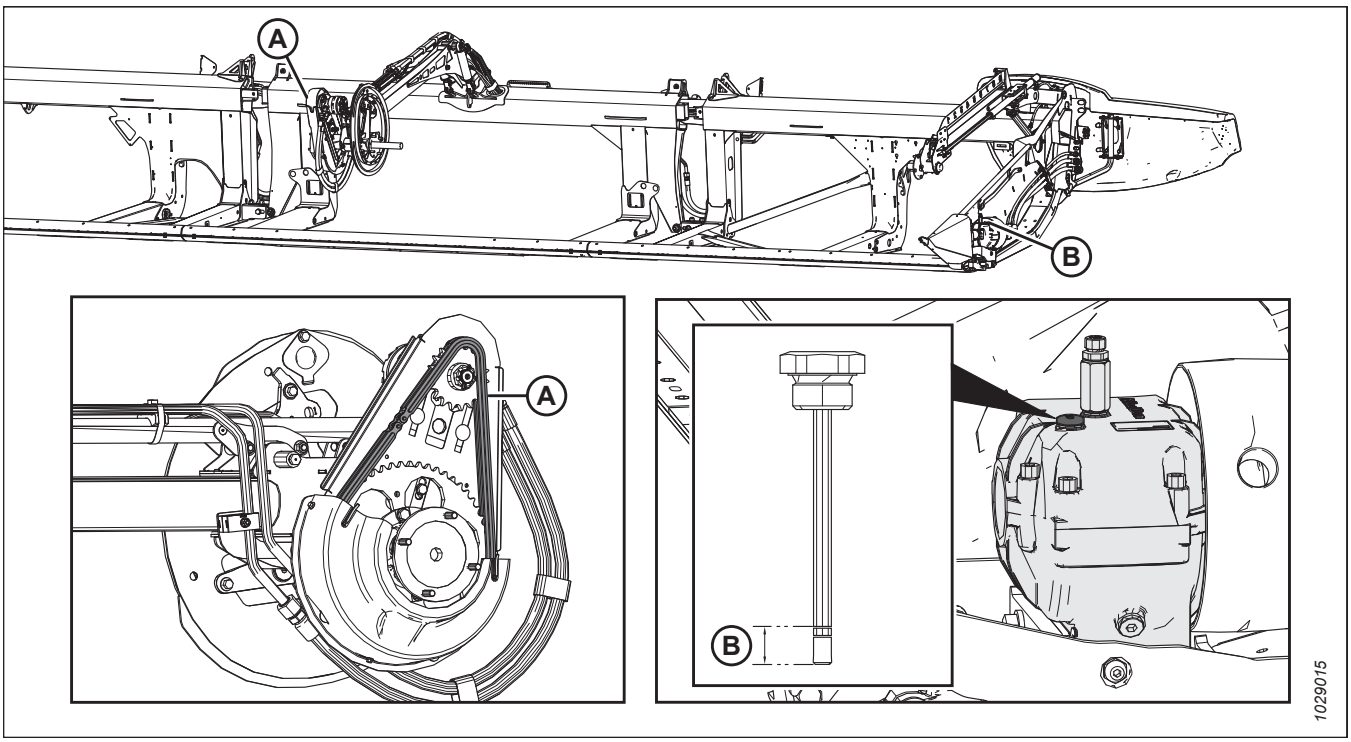


Figure 4.13: Reel and Cutterbar

A - Reel Drive Chain. To lubricate, refer to *4.3.3 Lubricating Reel Drive Chain, page 490*
B - Knife Drive Box Oil Level. To lubricate, refer to *Checking Oil Level in Knife Drive Box , page 573*

Every 250 Hours

Maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

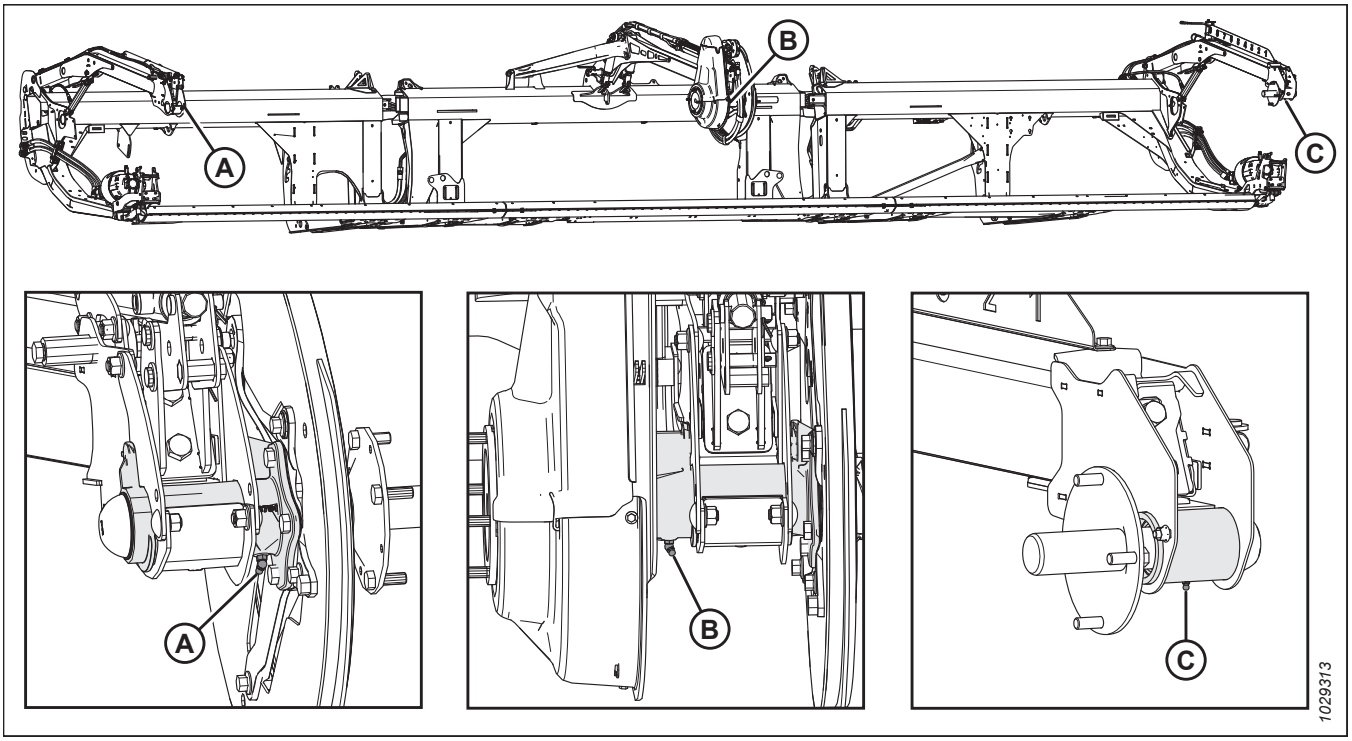


Figure 4.14: Reel

A - Reel Right Bearing (One Place) **B - Reel Center Bearing (One Place)** **C - Reel Left Bearing (One Place)**

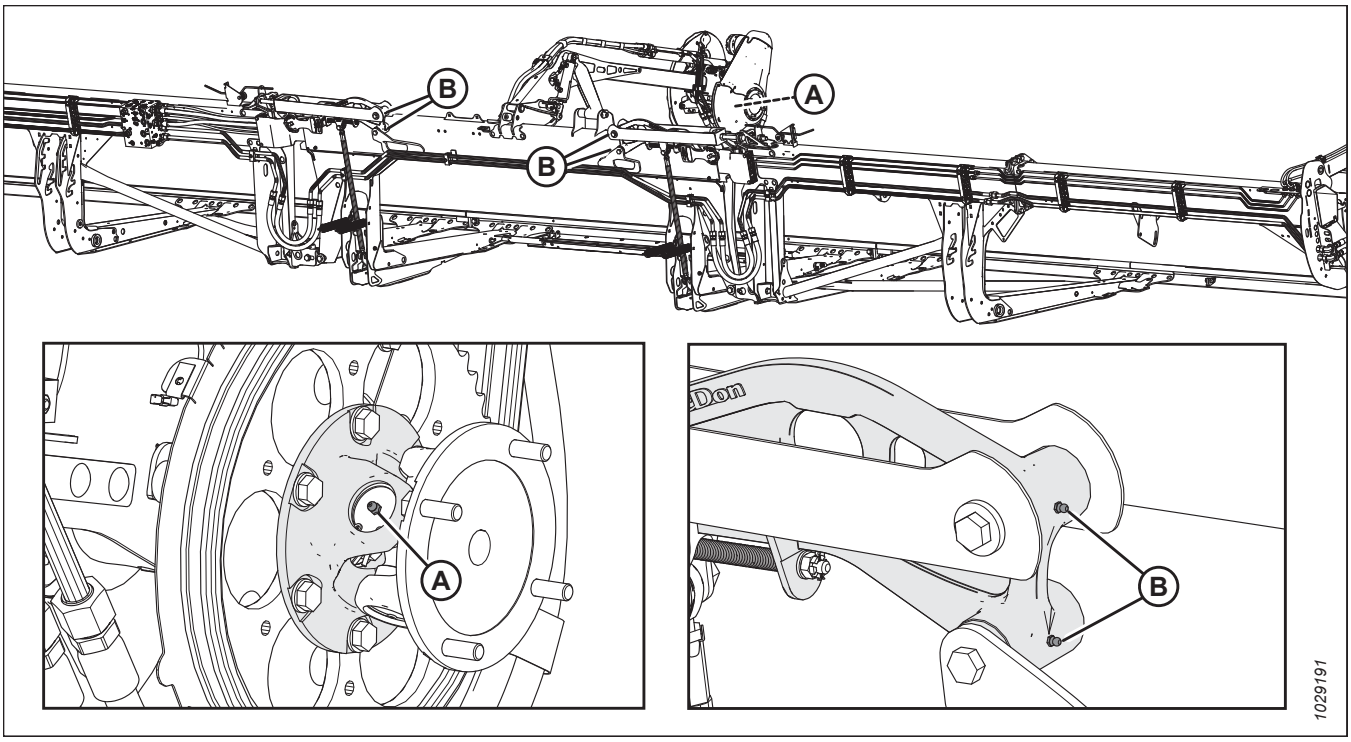


Figure 4.15: Reel

A - Reel U-joint (One Place)[76]

B - Flex Linkage (Two Places) – Both Sides

Every 500 Hours

Maintenance is required to keep your machine operating at peak performance. It also allows you to do a visual inspection of the machine that may help identify issues early.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

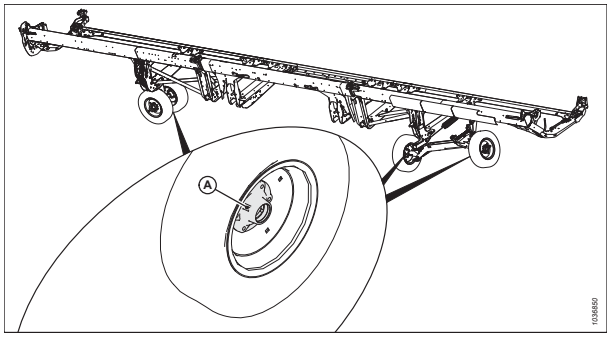


Figure 4.16: Every 500 Hours

A - Wheel Bearings (Four Places)

76. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. Six to eight pumps are sufficient at first grease (factory). Increase grease interval as U-joint wears and requires more than six pumps.

4.3.2 Greasing Procedure

Greasing points are identified on the machine by decals showing a grease gun and grease interval in hours of operation. Grease point layout decals are located on the header and on the right side of the float module.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Refer to inside back cover for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. Refer to *4.2.1 Maintenance Schedule/Record, page 474*.

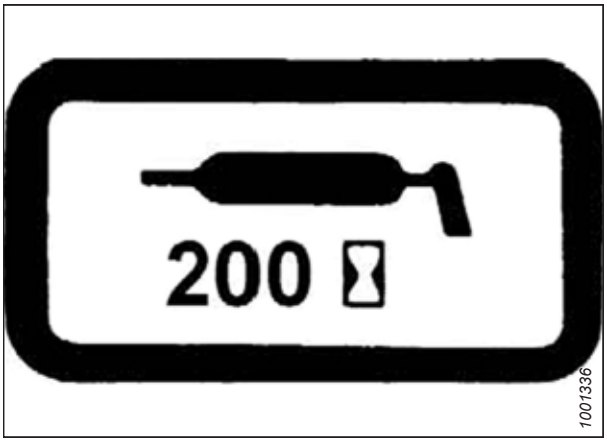


Figure 4.17: Greasing Interval Decal

1. Wipe the grease fitting with a clean cloth before greasing to avoid injecting it with dirt and grit.

   IMPORTANT:

   Use clean, high-temperature, extreme-pressure grease only.

2. Inject the grease through the fitting with a grease gun until grease overflows the fitting (except where noted).
3. Leave the excess grease on the fitting to keep the dirt out.
4. Replace any loose or broken grease fittings immediately.
5. Remove and thoroughly clean any fitting that will not take grease. Also clean the lubricant passageway. Replace the fitting if necessary.

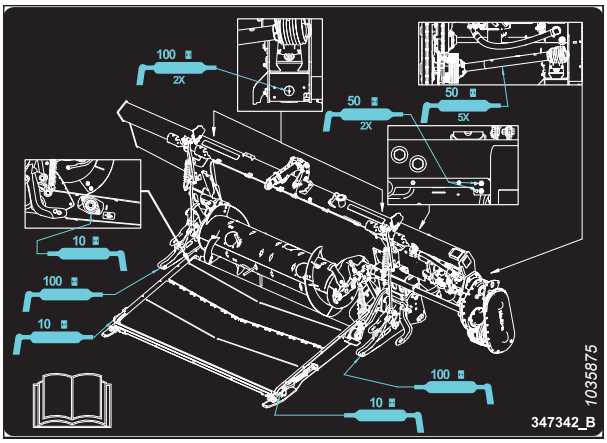


Figure 4.18: FM200 Grease Point Layout Decal

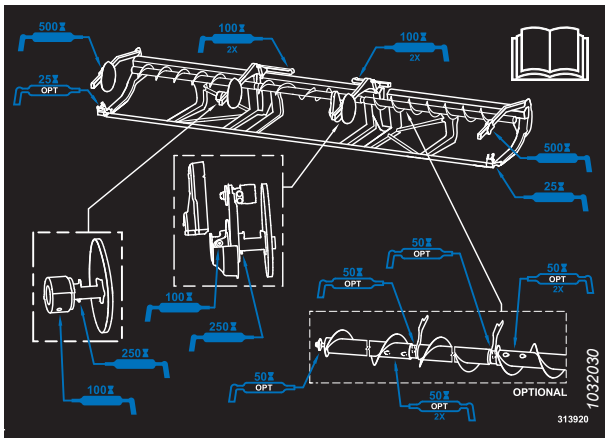


Figure 4.19: FD2 Series Grease Point Layout Decal

4.3.3 Lubricating Reel Drive Chain

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Remove the upper cover from the reel drive. For instructions, refer to *Removing Reel Drive Cover, page 53*.
2. Apply a liberal amount of grease to chain (A).
3. Reinstall the upper cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

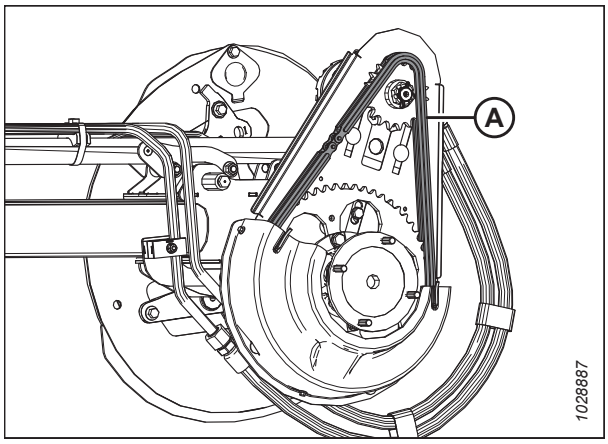


Figure 4.20: Drive Chain

4.3.4 Lubricating Auger Drive Chain

Lubricate the auger drive chain according to the interval specified in the maintenance schedule. The auger drive chain can be lubricated with the float module attached to the combine, but this procedure is easier to perform when the float module is detached from the header.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

The auger drive cover consists of an upper and lower cover and a metal inspection panel. Only the metal inspection panel needs to be removed to perform this procedure.

1. Remove four bolts (A) and metal inspection panel (B).

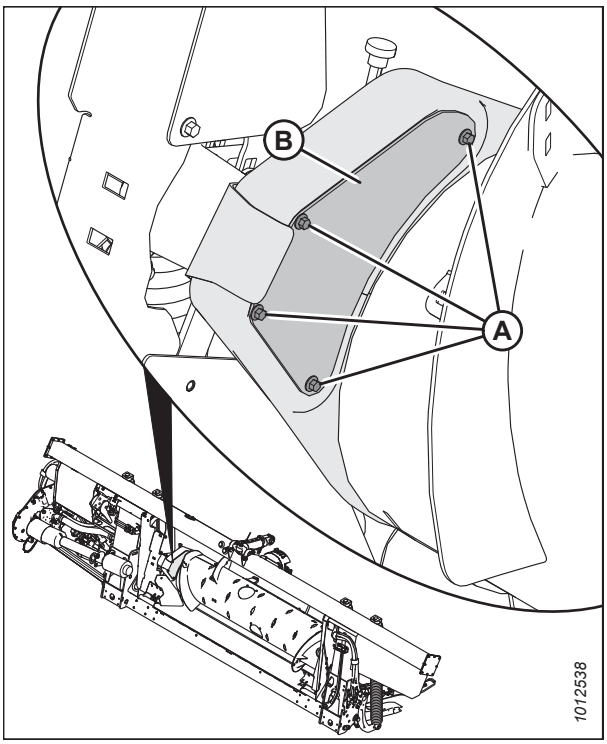


Figure 4.21: Auger Drive Inspection Panel

2. Apply a liberal amount of grease to chain (A), drive sprocket (B), and idler sprocket (C).

3. Rotate the auger and apply grease to more areas of the chain, if necessary.

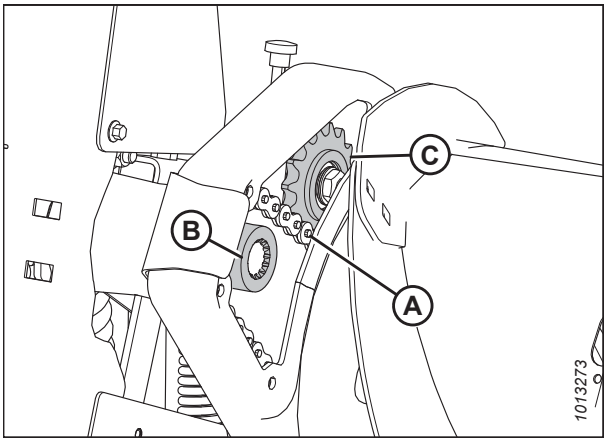


Figure 4.22: Auger Drive Chain

4. Reinstall metal inspection panel (B). Secure the panel with four bolts (A).

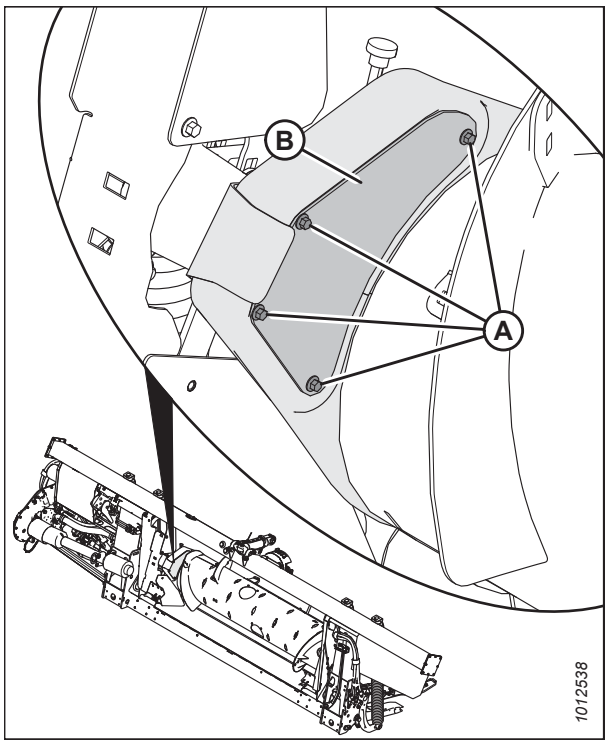


Figure 4.23: Auger Drive Inspection Panel

4.3.5 Lubricating Header Drive Main Gearbox

Checking Oil Level in Header Drive Main Gearbox

Check the header drive gearbox oil level every 100 hours.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove oil level plug (A) from main gearbox (B) and check that the oil level is up to the bottom of the hole.
4. Add oil if required. For instructions, refer to *Adding Oil to Header Drive Main Gearbox, page 493*.
5. Reinstall oil level plug (A).

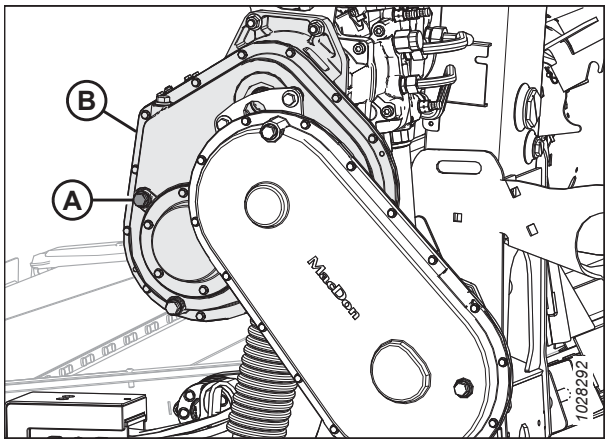


Figure 4.24: Header Drive Main Gearbox

Adding Oil to Header Drive Main Gearbox

The main gearbox includes fill, check, and drain plugs for quickly checking and servicing the gear lubricant while mounted to the float module.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Remove filler plug (B) and oil level plug (A) from the main gearbox.
2. Add oil into filler hole (B) until it runs out of oil level plug hole (A). Refer to the inside back cover for recommended fluids and lubricants.
3. Replace oil level plug (A) and filler plug (B).

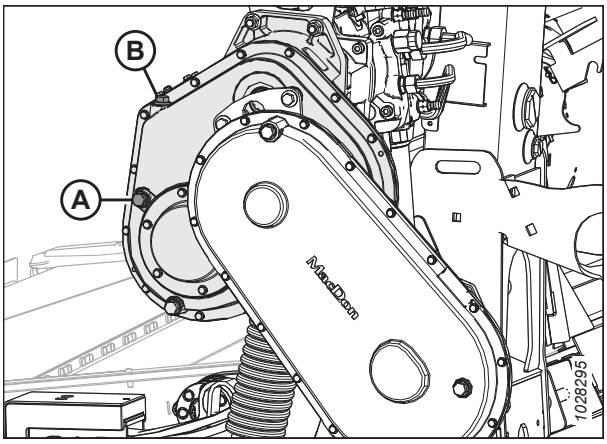


Figure 4.25: Header Drive Main Gearbox

Changing Oil in Header Drive Main Gearbox

Change the header drive gearbox oil after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Engage the header to warm up the oil.
3. Raise or lower the header to position oil drain plug (A) at its lowest point.
4. Shut down the engine, and remove the key from the ignition.
5. Place a suitably sized container (approximately 4 liters [1 US gal]) capacity underneath the gearbox drain to collect the oil.
6. Remove oil drain plug (A) and filler plug (C), and allow the oil to drain.
7. Replace oil drain plug (A) and remove oil level plug (B).

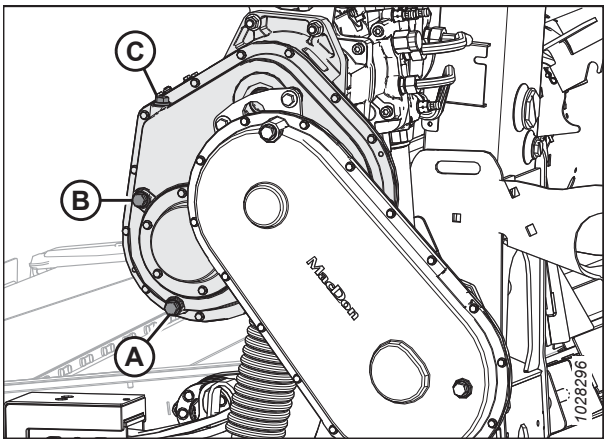


Figure 4.26: Header Drive Main Gearbox

8. Add oil through filler plug (C) until it runs out of oil level hole (B). Refer to this manual's inside back cover for recommended lubricants.

   NOTE:

   The main gearbox holds approximately 2.75 liters (2.9 quarts) of oil.

9. Replace oil level plug (B) and filler plug (C).

4.3.6 Lubricating Header Drive Completion Gearbox

Checking Oil Level in Header Drive Completion Gearbox

Check the header drive gearbox oil level every 100 hours.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove oil level plug (A) from completion gearbox (B) and check that the oil level is up to the bottom of the hole.
4. Add oil, if required. For instructions, refer to *Adding Oil to Header Drive Completion Gearbox, page 494*.
5. Reinstall oil level plug (A).

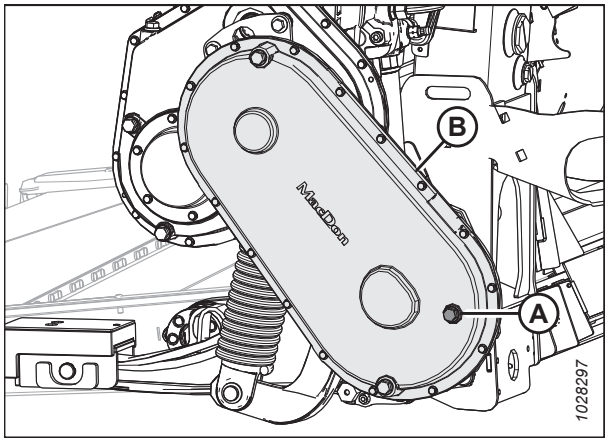


Figure 4.27: Header Drive Completion Gearbox

Adding Oil to Header Drive Completion Gearbox

The completion gearbox includes fill, check, and drain plugs for quickly checking and servicing the gear lubricant while mounted to the float module.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the cutterbar to the ground, and ensure the completion gearbox is in working position.
2. Shut down the engine, and remove the key from the ignition.

3. Remove filler plug (B) and oil level plug (A).
4. Add oil into filler hole (B) until it runs out of oil level plug hole (A). Refer to the inside back cover for recommended fluids and lubricants.
5. Replace oil level plug (A) and filler plug (B). Torque plugs to 30–40 Nm (22–30 lbf·ft).

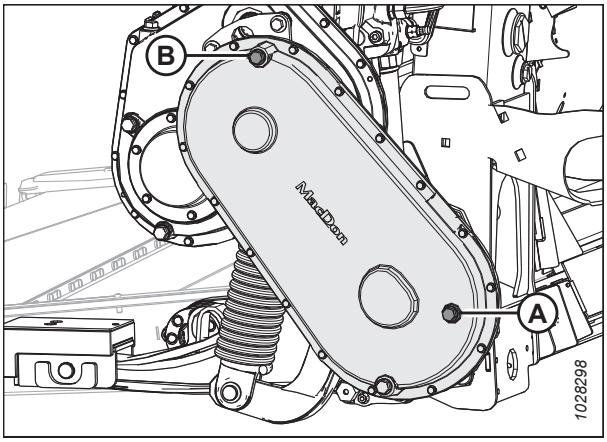


Figure 4.28: Header Drive Completion Gearbox

Changing Oil in Header Drive Completion Gearbox

Change the header drive gearbox oil after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Engage the header to warm up the oil.
3. Raise or lower the header to position oil drain plug (A) at its lowest point.
4. Shut down the engine, and remove the key from the ignition.
5. Place a suitably sized container (approximately 4 liters [1 US gal]) capacity underneath the gearbox drain to collect the oil.
6. Remove oil drain plug (A) and filler plug (C), and allow the oil to drain.
7. Replace oil drain plug (A).

   NOTE:

   The oil drain plug is magnetic. Ensure the magnetic plug is installed in oil drain position (A), not in oil level check position (B).
8. Remove oil level plug (B).

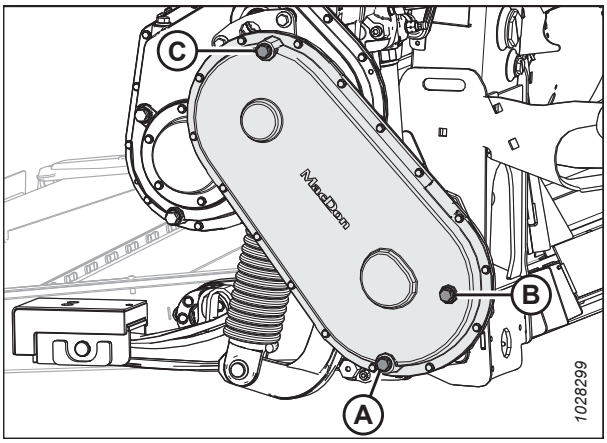


Figure 4.29: Header Drive Completion Gearbox

9. Add oil through filler plug (C) until it runs out of oil level hole (B). Refer to this manual's inside back cover for recommended lubricants.

   NOTE:

   The header drive gearbox holds approximately 2.25 liters (2.4 quarts) of oil.

10. Replace oil level plug (B) and filler plug (C).

4.4 Hydraulics

The float module frame acts as an oil reservoir. Refer to the inside back cover for information on the float module's oil requirements.

4.4.1 Checking Oil Level in Hydraulic Reservoir

Check the hydraulic oil level in the reservoir every 25 hours.

NOTE:

Check the level when the oil is cold.

1. Check the oil level using lower sight (A) and upper sight (B) with the cutterbar just touching the ground and with the center-link retracted.
2. Ensure the oil is at the appropriate level for the terrain as follows:
   - **Normal terrain (C):** Maintain level so lower sight (A) is full, and upper sight (B) is empty.
   - **Hilly terrain (D):** Maintain level so lower sight (A) is full, and upper sight (B) is up to one-half filled.

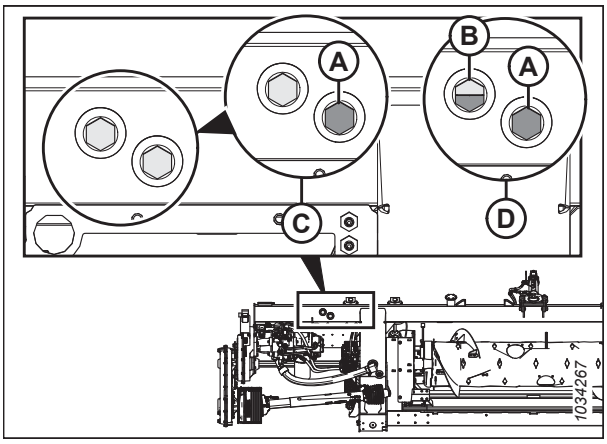


Figure 4.30: Oil Level Sight Glasses

NOTE:

It may be necessary to slightly reduce the oil level when ambient temperatures are above 35°C (95°F) to prevent overflow at the breather when normal operating temperatures are reached.

NOTE:

It is **OK** to use the hilly terrain oil level even in normal terrain as long as the fill neck extension is installed (MD #B6057).

4.4.2 Adding Oil to Hydraulic Reservoir

If the oil level in the hydraulic reservoir is low, or if the oil has been drained, oil will need to be added.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Clean any dirt or debris from filler cap (A).

CAUTION

The oil reservoir may be under pressure; remove the cap slowly.

3. Turn filler cap (A) clockwise to remove it.

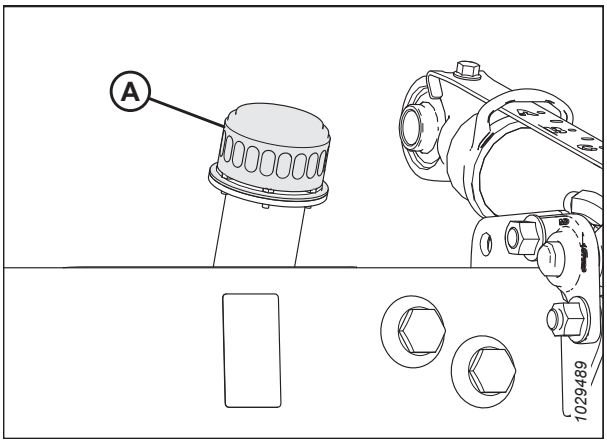


Figure 4.31: Oil Reservoir Filler Cap

4. Fill the hydraulic oil reservoir with warm oil (approximately 21°C [70°F]) until the appropriate fill level is reached. Refer to for information on how to check the hydraulic oil level. Refer to this manual's inside back cover for information on the capacity of the reservoir and the type of oil to use.

   IMPORTANT:

   Warm oil will flow through the mesh filler screen better than cold oil. Do **NOT** remove the screen.

5. Reinstall filler cap (A).

6. Recheck the oil level. For instructions, refer to *4.4.1 Checking Oil Level in Hydraulic Reservoir, page 497*.

4.4.3 Changing Oil in the Hydraulic Reservoir

Change the hydraulic oil in the reservoir every 1000 hours or 3 years (whichever comes first).

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start engine.

2. Engage the header to warm up the oil.

3. Shut down the engine, and remove the key from the ignition.

4. Place a suitably sized container (at least 50 liters [13 gallons]) under each of the two oil drain plugs (A) located at the back on each side of the frame.

5. Remove oil drain plugs (A) with a 7/8 in. hex socket and allow the oil to drain.

6. Replace oil drain plugs (A) when reservoir is empty.

7. Change the oil filter if required. For instructions, refer to *4.4.4 Changing Oil Filter, page 498*.

8. Add oil to the reservoir. For instructions, refer to *4.4.2 Adding Oil to Hydraulic Reservoir, page 497*.

   The hydraulic oil tank capacity is approximately 95 liters (25 gallons).

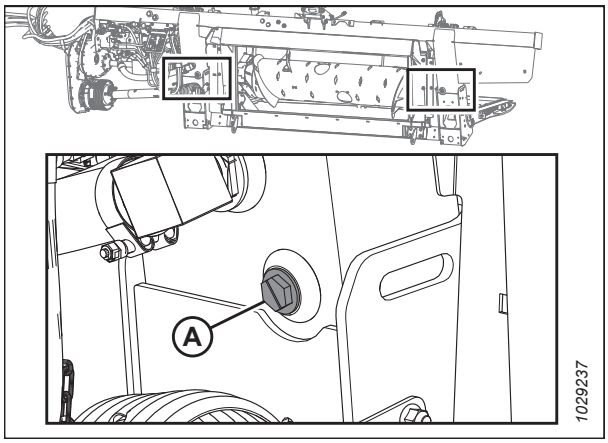


Figure 4.32: Reservoir Drain

4.4.4 Changing Oil Filter

Change the oil filter after the first 50 hours of operation and every 250 hours thereafter.

Obtain filter kit (MD #320360)[77] from your MacDon Dealer.

77. Part number 202986 is printed on the filter, but service the filter using kit MD #320360. The kit includes installation instructions.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Clean around the mating surfaces of filter (A) and integrated pump (B).
3. Place a suitably sized container (approximately 1 liter [0.26 gallons]) under the filter to collect oil runoff.
4. Twist-off filter (A) by hand and clean the exposed filter port in the integrated pump.
5. Apply a thin film of clean oil to the O-ring provided with the new filter.
6. Turn the new filter onto integrated pump (B) until the O-ring contacts the mating surface. Tighten the filter an additional 1/2 to 3/4 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the new filter. Overtightening can damage the O-ring and filter.

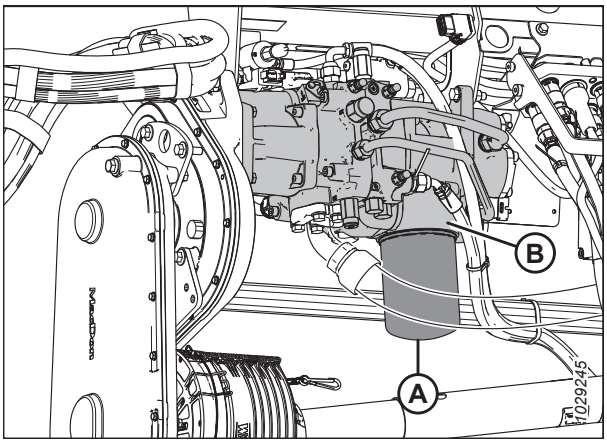


Figure 4.33: FM200 Integrated Pump

4.5 Electrical System

The electrical system for the header is powered by the combine. The header has various lights and sensors that require power.

4.5.1 Replacing Light Bulbs

Lights are an important safety feature. Replace damaged or malfunctioning bulbs or lamps immediately.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

Use bulb trade #1156 for amber transport lights and #1157 for the red tail light (Slow Speed Transport option).

Clearance Lights (North America Only)

1. Use a Phillips screwdriver to remove the three screws (A) from the fixture, and remove the plastic lens. Retain screws (A).
2. Replace the bulb, and reinstall the plastic lens and screws.

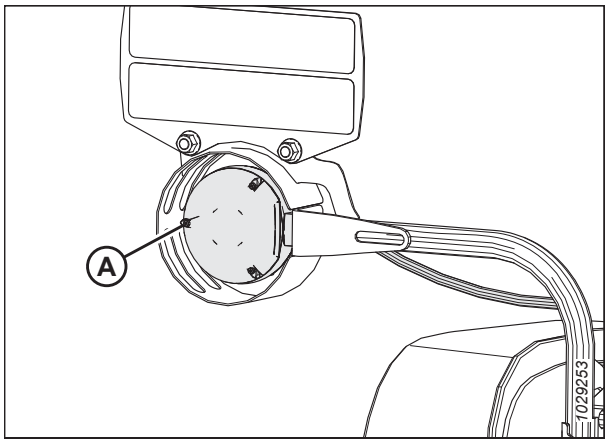


Figure 4.34: Left Clearance Light

Slow Speed Transport Lights

3. Use a Phillips screwdriver to remove screws (A) from the fixture, and remove the plastic lens. Retain screws (A).
4. Replace the bulb, and reinstall the plastic lens and screws.

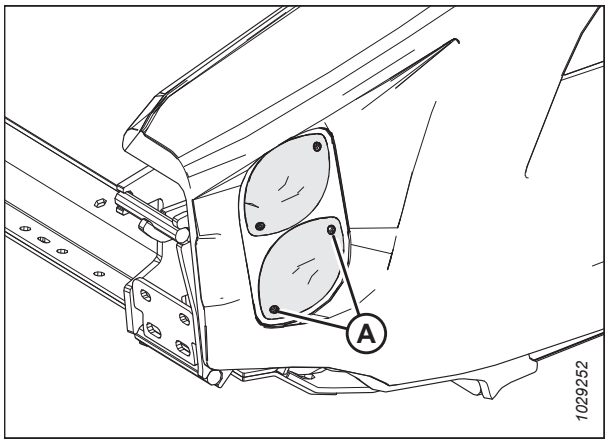


Figure 4.35: Optional Slow Speed Transport – Red and Amber Lights

4.6 Header Drive

The header drive consists of a driveline from the combine to the FM200 Float Module gearbox that drives the feed auger and hydraulic pumps. The pumps provide hydraulic power to the drapers, knives, and optional equipment.

4.6.1 Removing Driveline Connecting Float Module to Combine

The driveline transfers power from the combine PTO to the header float module completion gearbox. A quick release collar allows the driveline to be removed when disconnecting the header float module from the combine.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the reel fully.
3. Lower the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Disconnect driveline safety chain (A) from the slot on the aluminum plate.

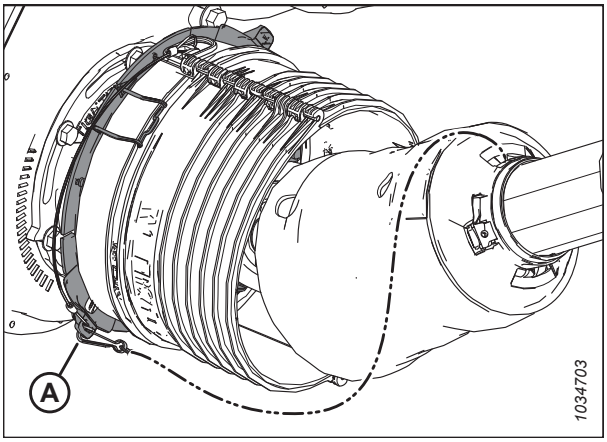


Figure 4.36: Driveline Shield

6. Pry clips (A) up to release shield (B).

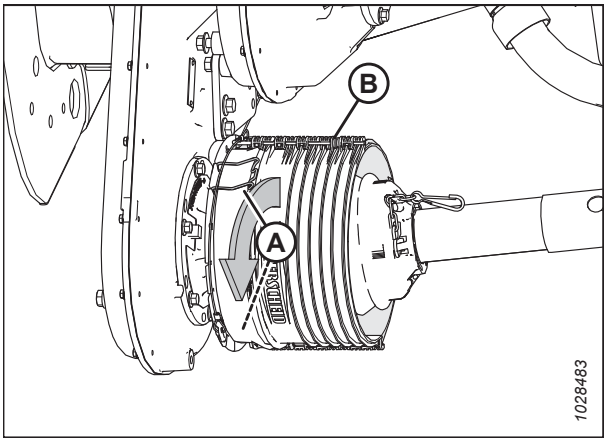


Figure 4.37: Driveline Shield

7. Slide shield (A) along driveline to access quick disconnect collar (B).

   NOTE:

   If the cover does not slide, use a prying tool.

8. Pull back quick disconnect collar (B) to release the driveline yoke. Slide the driveline off of the gearbox shaft.

9. Slide the driveline through the shield, then lower it to the ground.

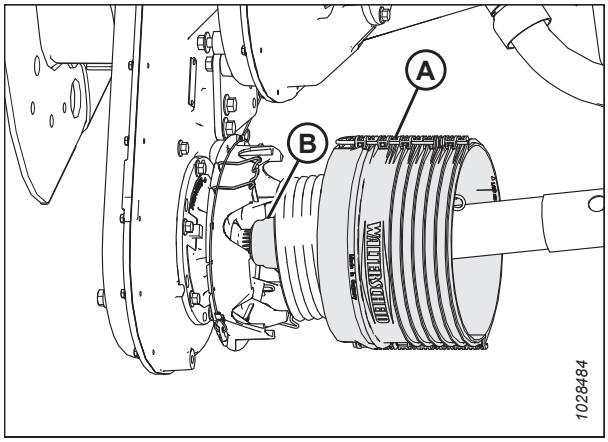


Figure 4.38: Driveline Shield

10. Disconnect chain (D) from support bracket (B).

11. On the opposite end of driveline (C), pull back quick disconnect collar (A) to release the driveline yoke.

12. Slide the yoke off of support bracket (B).

13. Remove driveline (C).

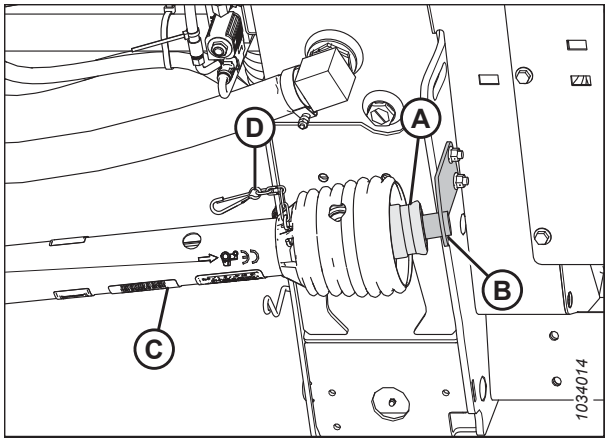


Figure 4.39: Driveline Shield

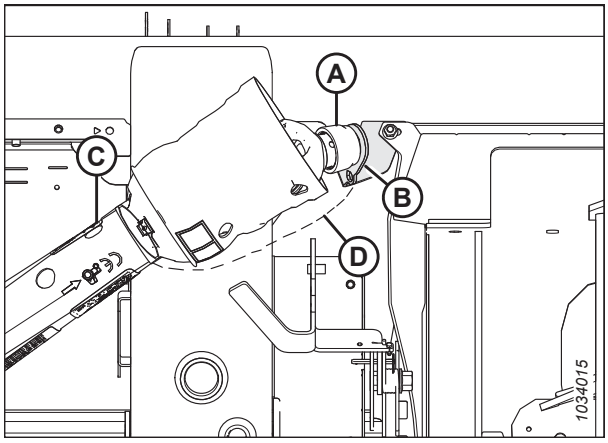


Figure 4.40: Optional Side-Hill Driveline Shield

4.6.2 Installing Driveline Connecting Float Module to Combine

The driveline transfers power from the combine PTO to the header float module completion gearbox.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the reel fully.
3. Lower the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Pry clips (A) up to release shield (B).

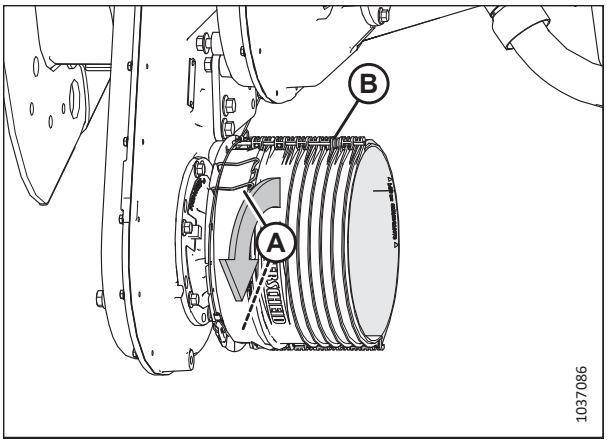


Figure 4.41: Driveline Shield

6. Slide the driveline through shield (A). Pull back the quick disconnect collar (B), to release the driveline yoke.
7. Slide the driveline onto the gearbox shaft until it locks onto the shaft.

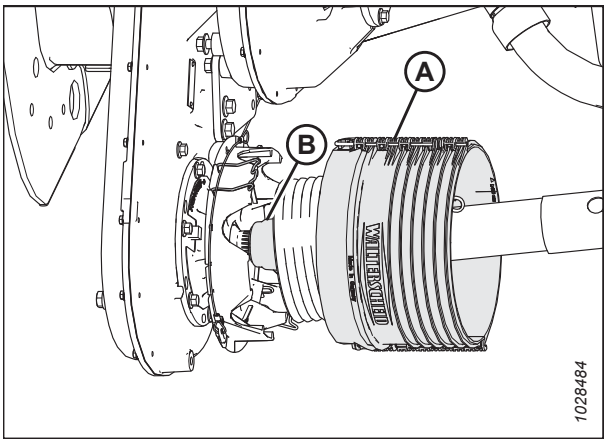


Figure 4.42: Driveline Shield

8. On the opposite end of driveline (D), pull back quick disconnect collar (A).

   NOTE:

   Ensure that arrow (C) is pointing towards collar (A) that connects to support bracket (B).

9. Slide the yoke onto support bracket (B).

10. Connect safety chain (E) to the support bracket.

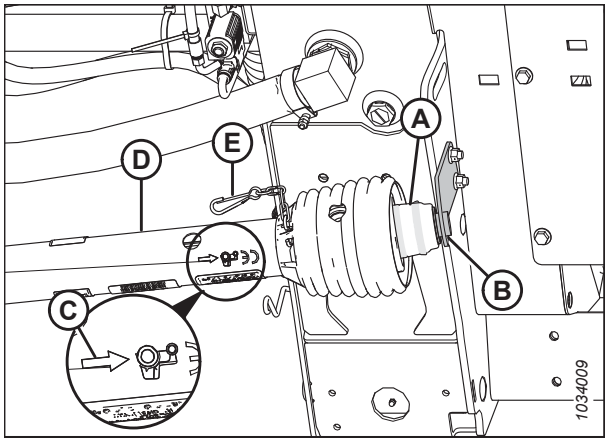


Figure 4.43: Driveline Shield

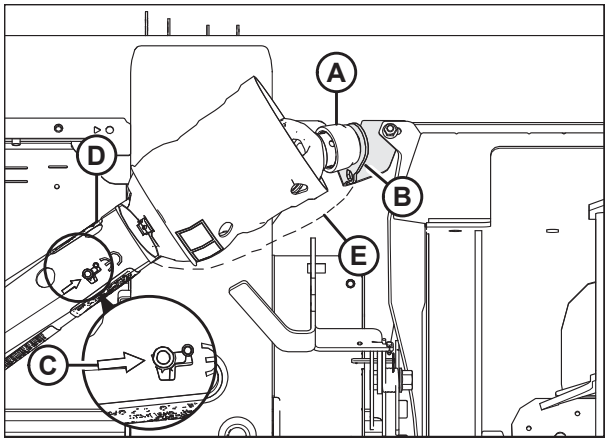


Figure 4.44: Optional Side-Hill Driveline Shield

11. Slide the shield towards the gearbox until clips (A) secure shield (B).

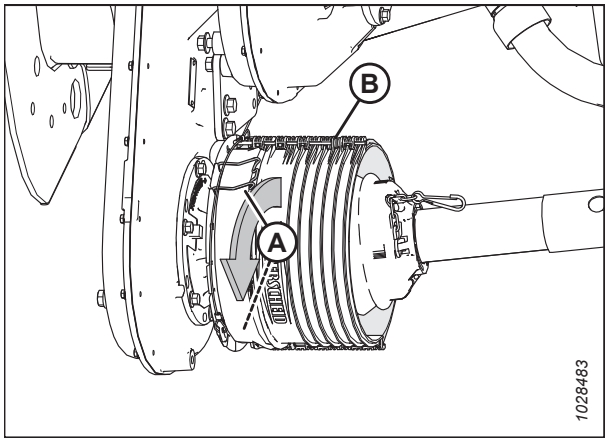


Figure 4.45: Driveline Shield

12. Attach driveline safety chain (A) to the slot on the aluminum plate.

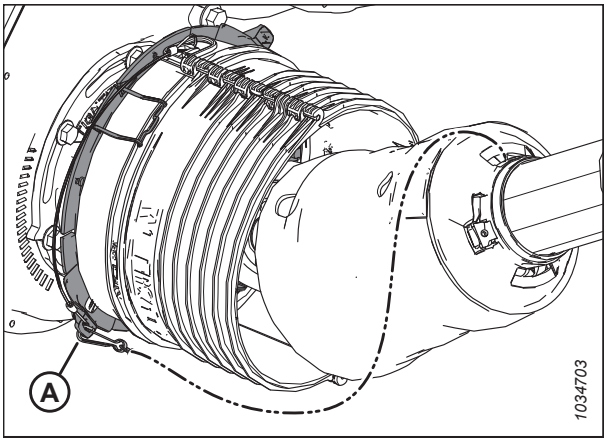


Figure 4.46: Driveline Shield

4.6.3 Removing Driveline Guard

The main driveline guard must remain attached to the driveline during operation, but it can be removed for maintenance purposes.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

The driveline does **NOT** need to be removed from the float module in order to remove the driveline guard.

1. Shut down the combine, and remove the key from the ignition.

2. Pull driveline collar (A) away from power take-off (PTO) support (B). Slide yoke (C) off support (B), and release collar (A).

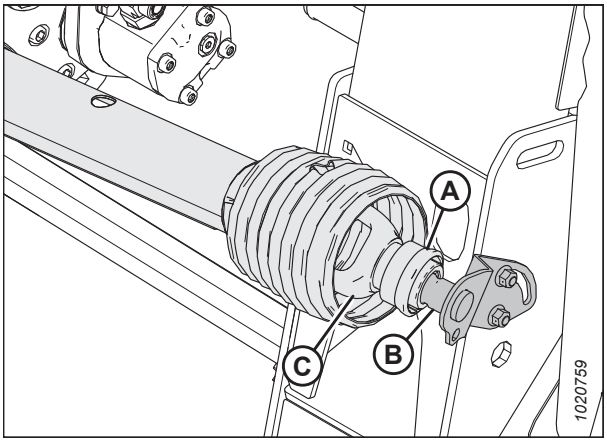


Figure 4.47: Combine End of Driveline

3. Lift the combine end of driveline (A) from the hook, and extend the driveline until it separates. Hold the float module end of driveline (B) to prevent it from dropping and hitting the ground.

Figure 4.48: Separated Driveline

4. Use a slotted screwdriver to release grease fitting/lock (A).

Figure 4.49: Driveline Guard

5. Rotate driveline guard locking ring (A) counterclockwise using a screwdriver until lugs (B) line up with the slots in the guard.
6. Pull the guard off the driveline.

Figure 4.50: Driveline Guard

4.6.4 Installing Driveline Guard

The driveline guard must be installed before the header can be safely operated.

1. Slide the guard onto the driveline, and line up the slotted lug on locking ring (A) with arrow (B) on the guard.

Figure 4.51: Driveline Guard

2. Push the guard onto the ring until the locking ring is visible in slots (A).

Figure 4.52: Driveline Guard

3. Use a slotted screwdriver to rotate ring (A) clockwise.

Figure 4.53: Driveline Guard

4. Push grease fitting (A) back into the guard.

Figure 4.54: Driveline Guard

5. Assemble the driveline.

   IMPORTANT:

   The splines are keyed to align the universals. Align weld (A) with missing spline (B) when assembling. Failure to align the halves of the shaft can cause excessive vibration and feed auger/gearbox failures.

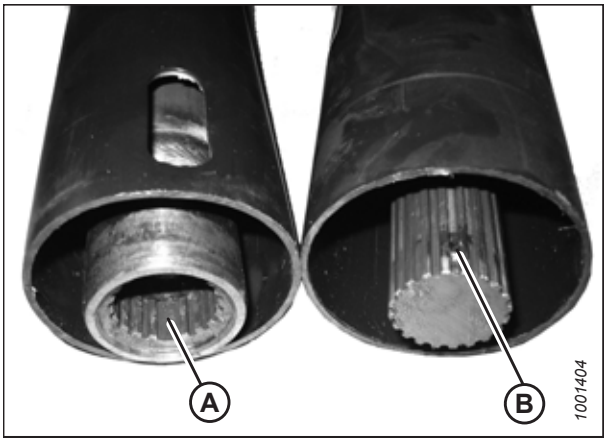


Figure 4.55: Driveline

6. Position the combine end of driveline (A) on power take-off (PTO) storage support (B). Pull back collar (C) on the driveline and slide the driveline onto the support until driveline yoke (D) locks onto the support. Release collar (C).

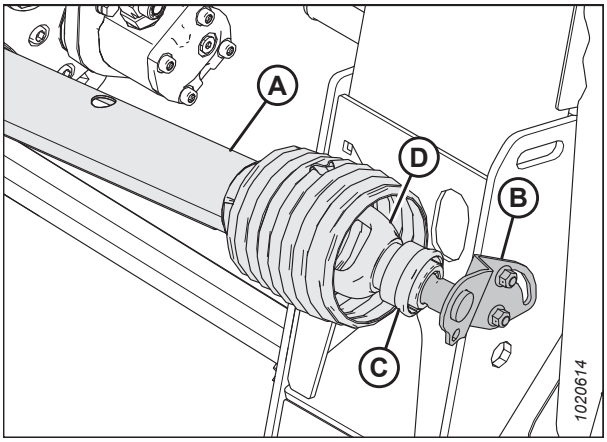


Figure 4.56: Combine End of Driveline

4.6.5 Adjusting Chain Tension – Main Gearbox

The gearbox drive chain tension is factory-set, but tension adjustments are required after the first 50 hours, then every 500 hours or annually (whichever comes first). With the exception of oil changes, the gearbox drive chain requires no other regular maintenance.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Remove four bolts (A), cover (B), and gasket (C) from the main gearbox.

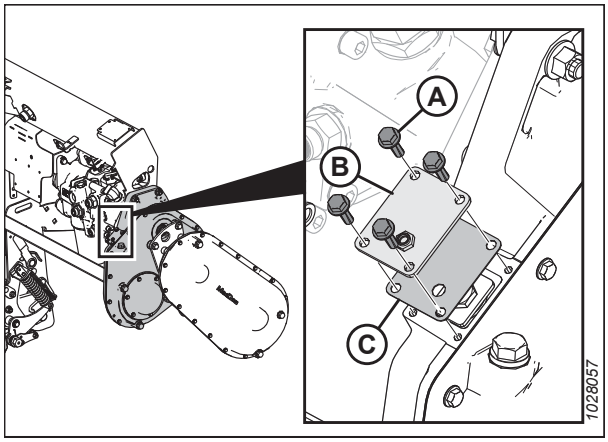


Figure 4.57: Main Gearbox Chain Tensioner Cover

2. Remove retainer plate (A).
3. Tighten bolt (B) to 250 Ncm (22 lbf·in).
4. Back off (loosen) bolt (B) 2 flats (2/6 turn).

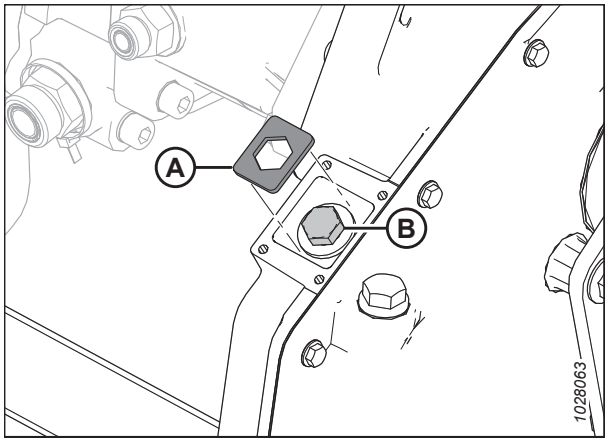


Figure 4.58: Main Gearbox Chain Tensioner

5. If required, turn bolt (B) slightly until retainer plate (A) can be installed.

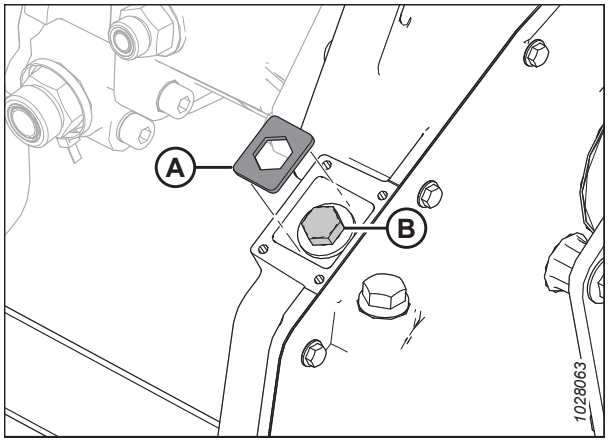


Figure 4.59: Main Gearbox Chain Tensioner

6. Reinstall chain adjusting cover (B) and gasket (C).
7. Install four bolts (A). Torque hardware to 9.5 Nm (84 lbf·in).

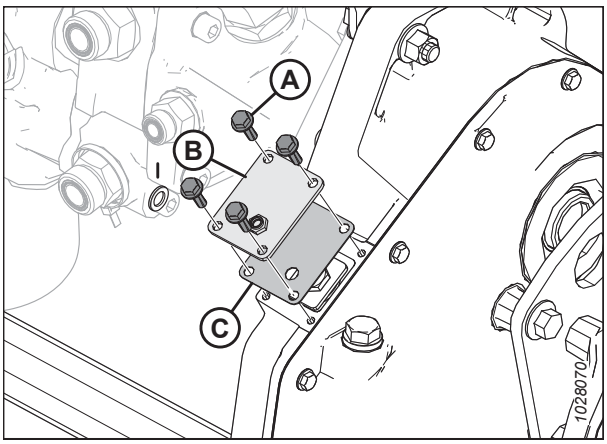


Figure 4.60: Main Gearbox Chain Tensioner Cover

4.6.6 Adjusting Chain Tension – Completion Gearbox

The gearbox drive chain tension is factory-set, but tension adjustments are required after the first 50 hours, then every 500 hours or annually (whichever comes first). With the exception of oil changes, the gearbox drive chain requires no other regular maintenance.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Remove the driveline. For instructions, refer to *4.6.1 Removing Driveline Connecting Float Module to Combine, page 501*.
5. Remove three bolts (A) that secure input driveline guard base (B).

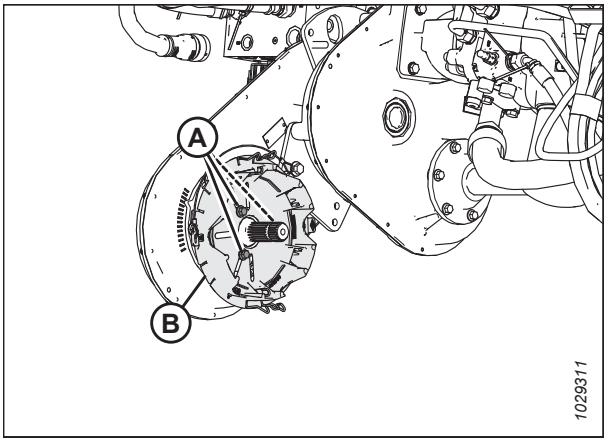


Figure 4.61: Completion Gearbox Chain Tensioner Cover

6. Loosen six bolts (B), that secure chain tension hub (A) to the gearbox.
7. Locate machined feature (C). Using a wrench, turn hub (A) clockwise to tighten the chain.
8. With light pressure on the wrench, determine which mark (D) on the gearbox housing aligns with the indicator pointer on the hub.
9. Set proper chain tension by slightly turning hub (A) back one mark.
10. Tighten six bolts (B), that secure cover (A). Torque bolts to 25 Nm (18 lbf·ft).

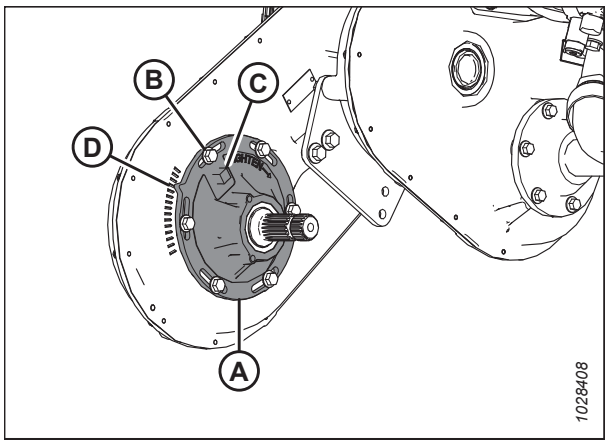


Figure 4.62: Completion Gearbox Chain Tensioner Cover

11. Install driveline guard base (B). Secure it with three bolts (A).
12. Install the driveline. For instructions, refer to *4.6.2 Installing Driveline Connecting Float Module to Combine, page 503*.

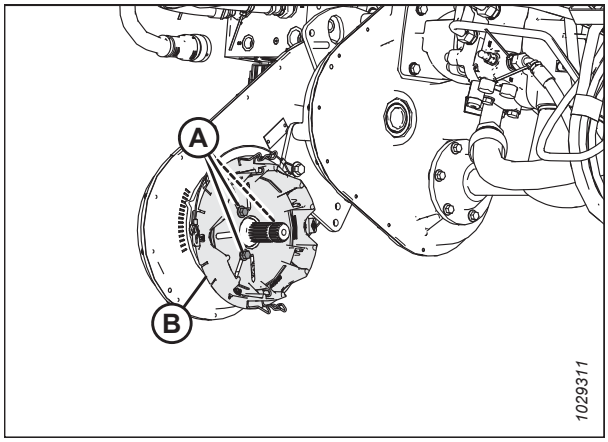


Figure 4.63: Completion Gearbox Chain Tensioner Cover

4.7 Auger

The FM200 Float Module auger feeds the cut crop from the draper decks into the combine feeder house.

4.7.1 Adjusting Feed Auger to Pan Clearance

Operators should maintain an appropriate distance between the feed auger and the feed auger pan.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

IMPORTANT:

Maintain an appropriate distance between the feed auger and the feed auger pan. Too little clearance may result in the fingers or flighting contacting and damaging the feed draper or pan when operating the header at certain angles. Look for evidence of contact when greasing the float module.

1. Extend the center-link to the steepest header angle (setting E), and position the header 254–356 mm (10–14 in.) off the ground.
2. Lock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
3. Shut down the engine, and remove the key from the ignition.
4. Check that the float lock linkage is on the down stops (washer [A] cannot be rotated) at both locations.

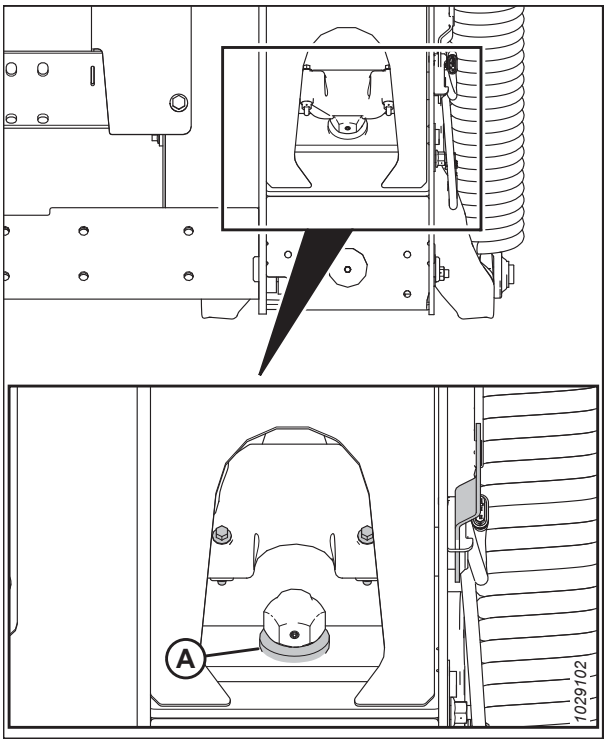


Figure 4.64: Down Stop Washer

5. Before adjusting the auger-to-pan clearance, check the auger float position to determine how much clearance is required:

   IMPORTANT:

   Make sure bolts (A) are set at the same location on both ends of the header to avoid damaging the machine during operation.

   - If bolt head (A) is closest to floating symbol (B), the auger is in the floating position.

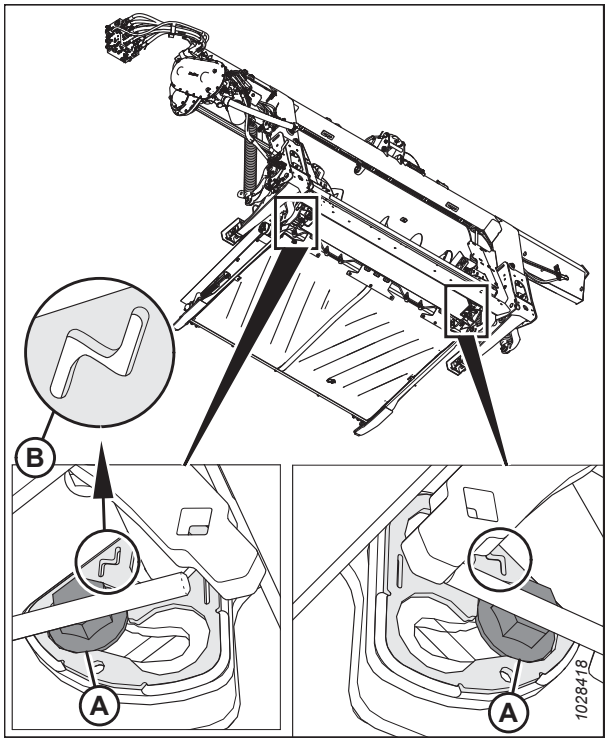


Figure 4.65: Floating Position

   - If bolt head (A) is closest to fixed symbol (B), the auger is in the fixed position.

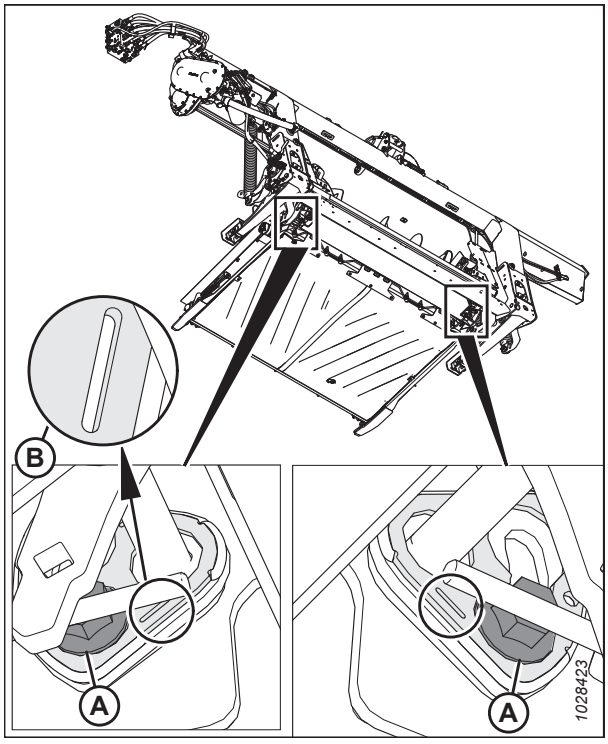


Figure 4.66: Fixed Position

6. Check clearance (C) between the feed auger flighting to the pan.
   - If the feed auger is in the fixed position, clearance should be between 24–28 mm (15/16–1 1/8 in.).
   - If the feed auger is in the floating position, clearance should be between 11.5–15.5 mm (7/16–5/8 in.).
7. If adjustment is required, loosen two nuts (B) and rotate the auger to position the flighting over the feed pan.
8. Turn bolt (A) clockwise to increase clearance (C); turn bolt (A) counterclockwise to decrease clearance (C).
   - If the feed auger is in the fixed position, set clearance to 24–28 mm (15/16–1 1/8 in.).
   - If the feed auger is in the floating position, set clearance to 11.5–15.5 mm (7/16–5/8 in.).

   NOTE:

   The clearance increases between 25–40 mm (1–1 1/2 in.) when the center-link is fully retracted.
9. Repeat Step *6, page 515* and Step *8, page 515* for the opposite end of the auger.

   IMPORTANT:

   Adjusting one side of the auger can affect the other side. Always double-check both sides of the auger after making final adjustments.
10. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 96 Nm (70 lbf·ft).
11. Rotate the feed auger and double-check clearances.

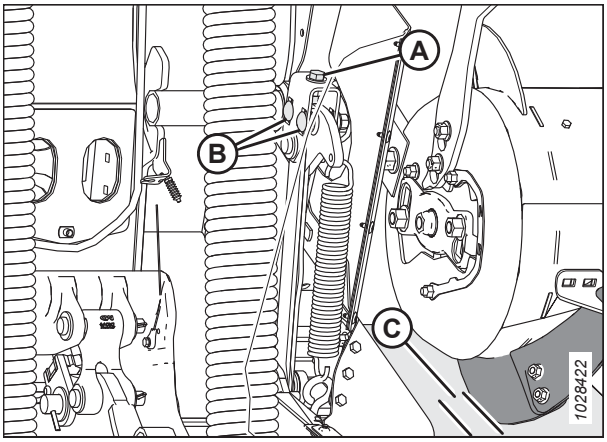


Figure 4.67: Auger Clearance

4.7.2 Check Feed Auger Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

There are two methods for checking the auger drive chain tension: the quick method is intended for frequent checks; the thorough method is more accurate and should be used when replacing or reinstalling the chain.

Refer to the appropriate procedure for check auger chain tension:

- *Checking Feed Auger Drive Chain Tension – Quick Method, page 515*
- *Checking Feed Auger Drive Chain Tension – Thorough Method, page 517*

Checking Feed Auger Drive Chain Tension – Quick Method

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

There are two methods for checking the auger drive chain tension: the quick method is intended for frequent checks; the thorough method (refer to *Checking Feed Auger Drive Chain Tension – Thorough Method, page 517*) is more accurate and should be used when the auger drive chain is reinstalled or replaced.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the header fully.
3. Raise the reel fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
6. Rotate auger (A) by hand in the reverse direction until it cannot turn anymore.
7. Mark a line (B) across the drum and bottom cover.

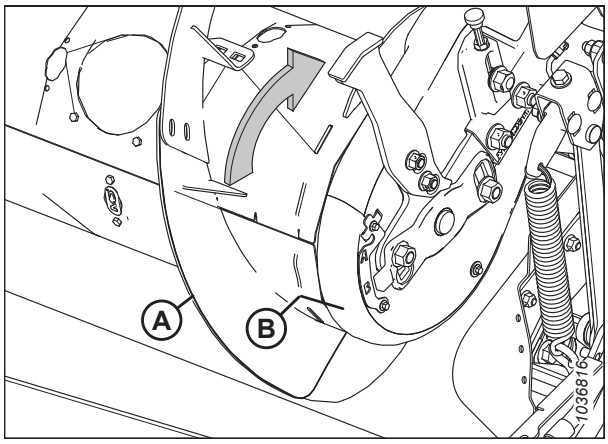


Figure 4.68: Feed Auger Drive

8. Rotate auger (A) by hand in the forward direction until it cannot turn anymore. The marked line will split.

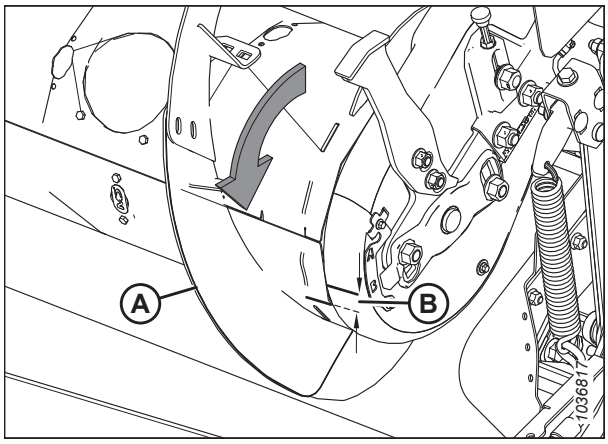


Figure 4.69: Feed Auger Drive

9. Measure the distance between two lines (B).

   For a new chain:

   - If distance (B) is 1–4 mm (0.04–0.16 in.), no adjustment is required.
   - If distance (B) is greater than 4 mm (0.16 in.), the auger drive chain tension needs adjusting. Refer to *4.7.5 Adjusting Feed Auger Drive Chain Tension, page 526*.

   For a used chain:

   - If distance (B) is 3–8 mm (0.12–0.31 in.), no adjustment is required.
   - If distance (B) is greater than 8 mm (0.31 in.), the auger drive chain tension needs adjusting. Refer to *4.7.5 Adjusting Feed Auger Drive Chain Tension, page 526*.

Checking Feed Auger Drive Chain Tension – Thorough Method

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

There are two methods for checking the auger drive chain tension: the thorough method is more accurate and should be used when reinstalling or replacing the chain; the quick method (refer to *Checking Feed Auger Drive Chain Tension – Quick Method, page 515*) is intended for frequent checks.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the header fully.
3. Raise the reel fully.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.
6. Shut down the engine, and remove the key from the ignition.

7. On the left side of the feed auger, remove four bolts (A) and inspection panel (B).
8. Remove bolts (C) and remove indicator/clamp (D) that holds the two covers together.
9. Remove bolt (E).
10. Remove bolt and washer (H) that secure that bottom cover.
11. Rotate bottom cover (F) forward to remove.

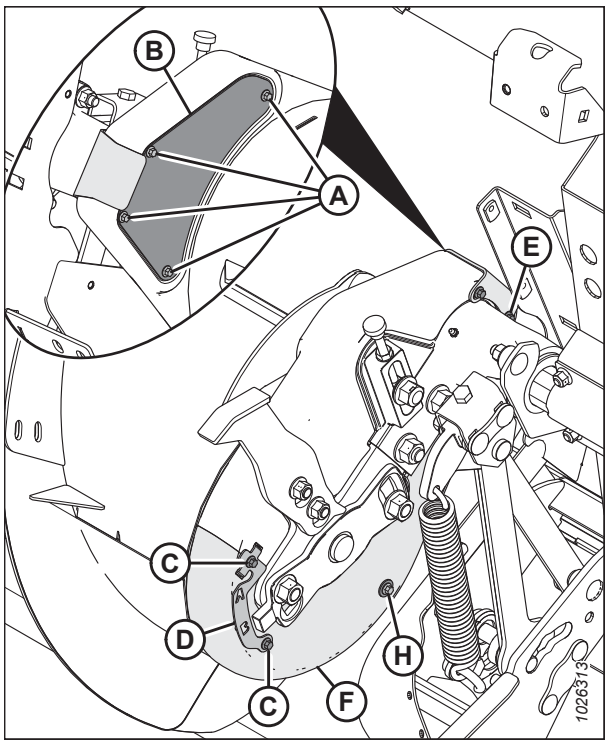


Figure 4.70: Feed Auger Drive – Rear View

12. Check chain at midspan (A). There should be 4 mm (0.16 in.) of deflection. If adjustment is required, refer to *4.7.5 Adjusting Feed Auger Drive Chain Tension, page 526*.

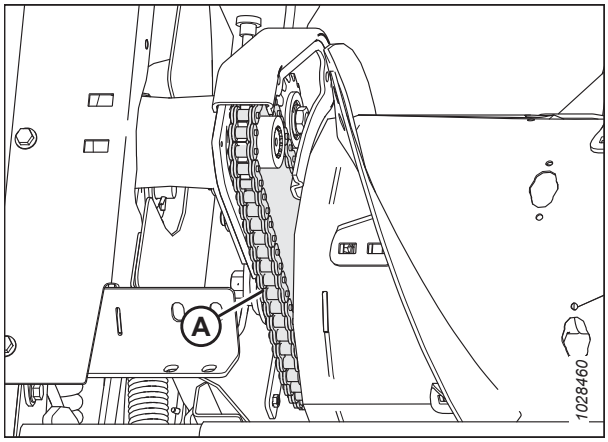


Figure 4.71: Feed Auger Chain – Rear View

13. Position bottom cover (F) and secure with bolt and washer (H).
14. Install bolt (E).
15. Secure the bottom cover to the top cover with clamp/ indicator (D) and bolts (C).
16. Install inspection panel (B) and secure with four bolts (A). Tighten bolts (A) and torque to 3.5 Nm (30 lbf·in).

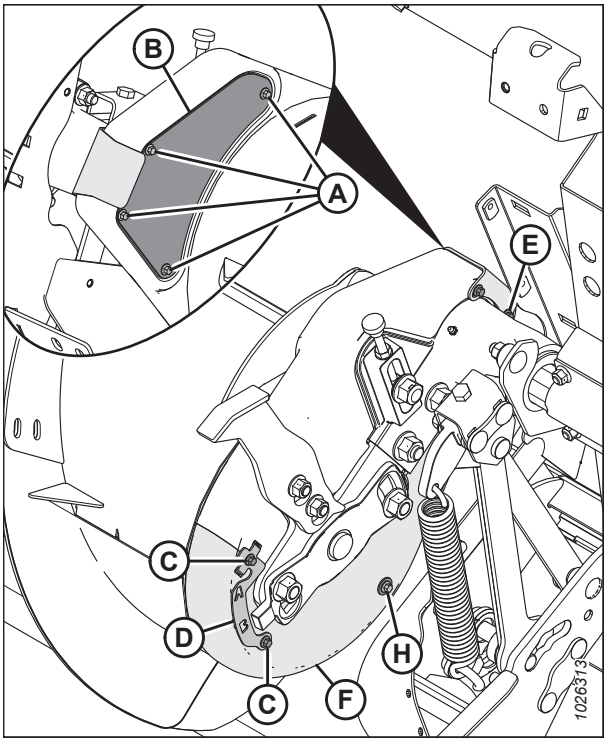


Figure 4.72: Feed Auger Drive – Rear View

4.7.3 Removing Auger Drive Chain

The chain tensioner can take up slack for only a single pitch. Replace the chain when the chain has worn or stretched beyond the limits of the tensioner.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

Replace the chain with endless chain (MD #220317).

NOTE:

Illustrations show the left side of the auger.

1. Tilt the header fully back to maximize space between the auger and the feed pan.
2. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.

3. Place wooden blocks (A) under the auger to prevent the auger from dropping onto the feed draper and damaging it.

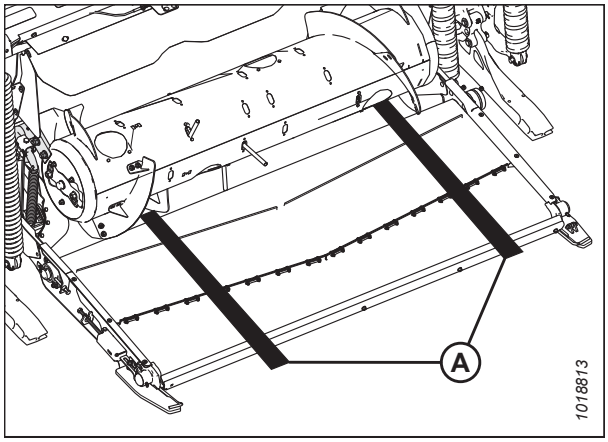


Figure 4.73: Blocks under the Auger

4. Loosen two bolts (A) and remove bumper (B). Repeat on the opposite side.

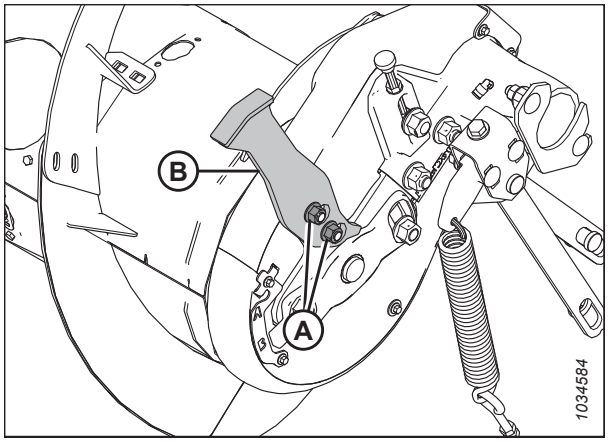


Figure 4.74: Auger Bumper – Left Side

5. On the left side of the auger, remove bolts (E) and remove cover retainer (F).
6. Remove four bolts (A) and inspection panel (B).
7. Remove bolts (C) and remove indicator/clamp (D) that holds top cover (G) and bottom cover (H) together.
8. Remove bolt and washer (J) that secure bottom cover (H).
9. Rotate top cover (G) and bottom cover (H) forward to remove from the auger.

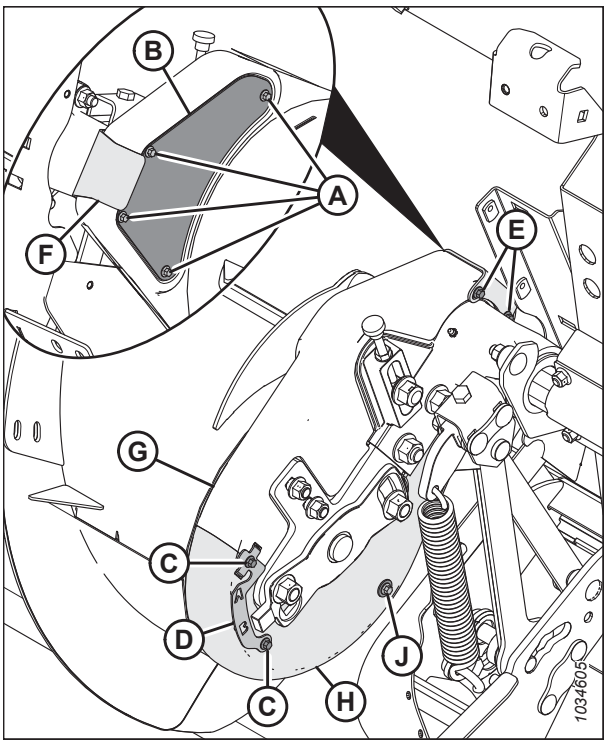


Figure 4.75: Auger Drive

10. To release the chain tension, loosen jam nut (C) and turn thumbscrew (D) counterclockwise to release the bolt holding sprocket (B) and preventing it from being raised up.

    IMPORTANT:

    Do **NOT** loosen thin nut (E) on the inboard side of the idler sprocket spindle.

11. Loosen idler sprocket nut (A), and raise sprocket (B) to the uppermost position to release the tension on the chain. Tighten nut (A) to hold sprocket in place.
12. Remove screw (F) and washer (G).

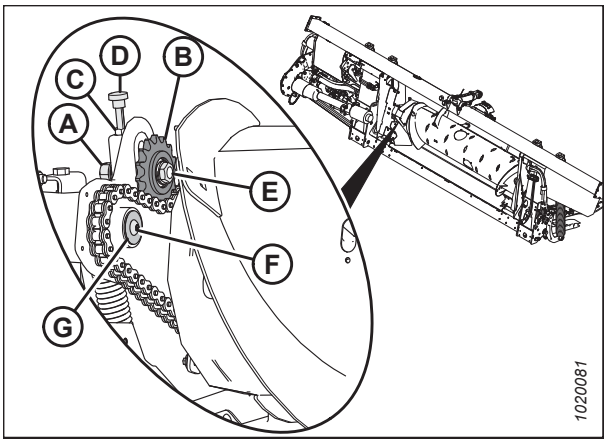


Figure 4.76: Auger Drive

13. Remove two bolts and nuts (A).

    NOTE:

    A second person may be needed to lift or support the auger to completely remove the bolts.

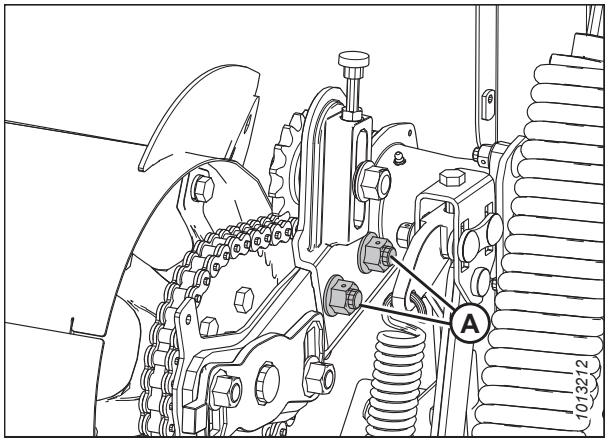


Figure 4.77: Auger Support Arm

14. Using a pry bar at location (A) between support arm (C) and auger pivot (B), pry the auger to the right.

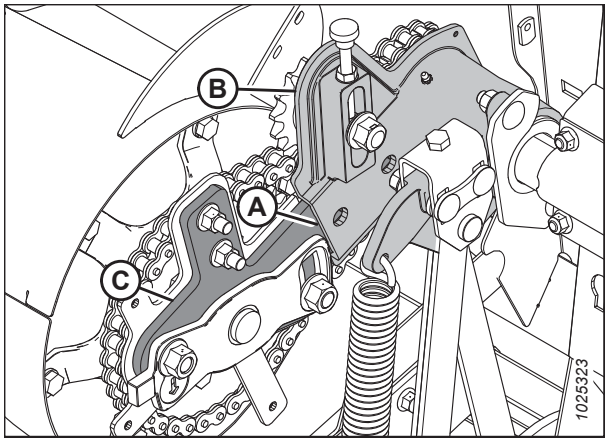


Figure 4.78: Auger

15. Remove drive sprocket (A) and chain (B) from spline shaft.

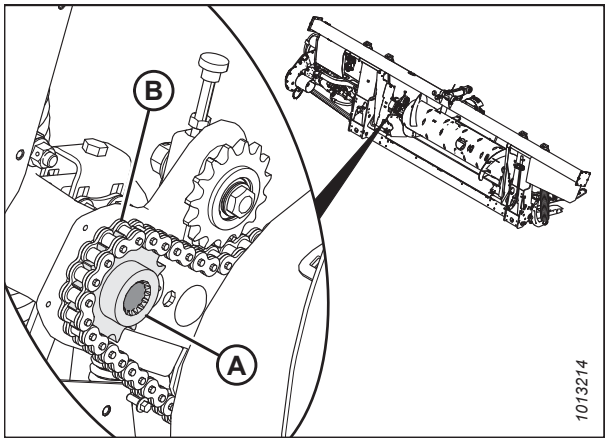


Figure 4.79: Auger Drive

16. Maneuver auger (A) sideways and forward so that endless chain (B) can be removed from the auger.

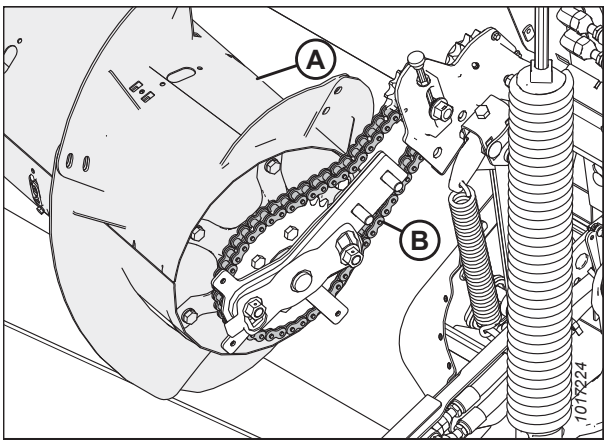


Figure 4.80: Auger Drive

4.7.4 Installing Auger Drive Chain

The auger drive chain transfers power from the main gearbox to the feed auger.

NOTE:

Illustrations show the left side of the auger.

1. Place drive chain (B) over the sprocket on the drive side of auger (A).

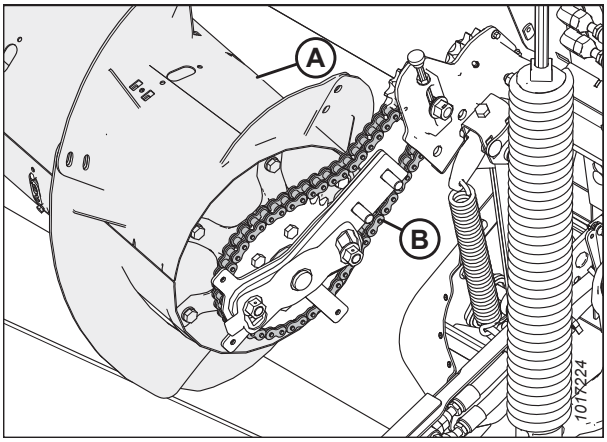


Figure 4.81: Auger Drive

2. Place drive sprocket (B) into chain (A) and align the sprocket onto the shaft.

   NOTE:

   The shoulder of drive sprocket (B) should face the auger.

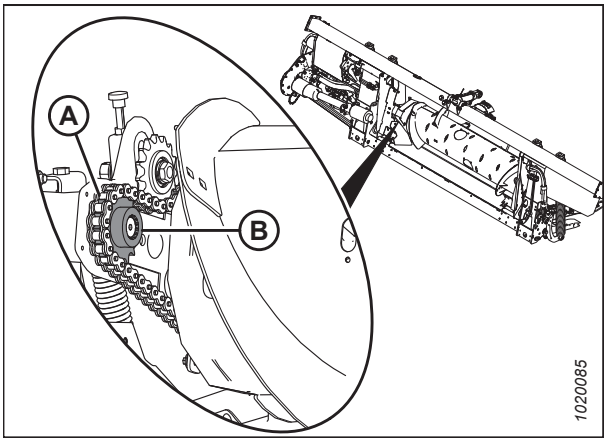


Figure 4.82: Auger Drive

3. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to threads of screw (A).
4. Install washer (B) and secure it with screw (A).

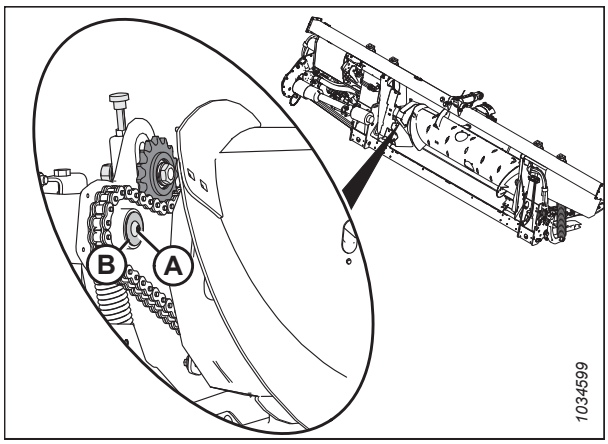


Figure 4.83: Auger Drive

5. Slide the auger drum assembly toward the casting, and then reinstall two bolts and nuts (A).

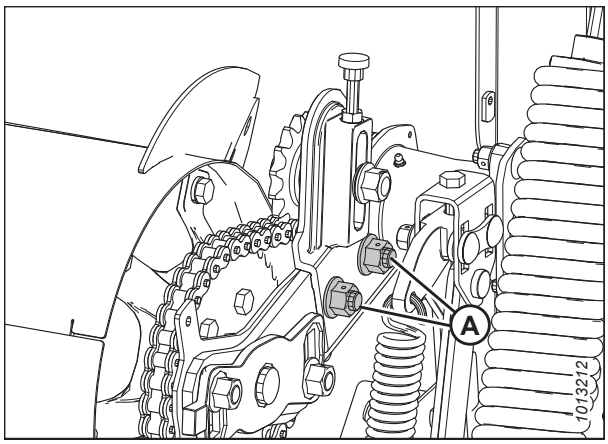


Figure 4.84: Auger Drive

6. Rotate the auger in reverse to take up the slack in the lower strand of the chain.

   IMPORTANT:

   Do **NOT** loosen thin nut (C) on the inboard side of the idler sprocket spindle.

7. Turn adjuster thumbscrew (D) clockwise to move idler sprocket (B) until it is **FINGER TIGHT ONLY.**

   IMPORTANT:

   Do **NOT** overtighten.

8. Tighten idler nut (A) and torque to 265 Nm (195 lbf·ft).

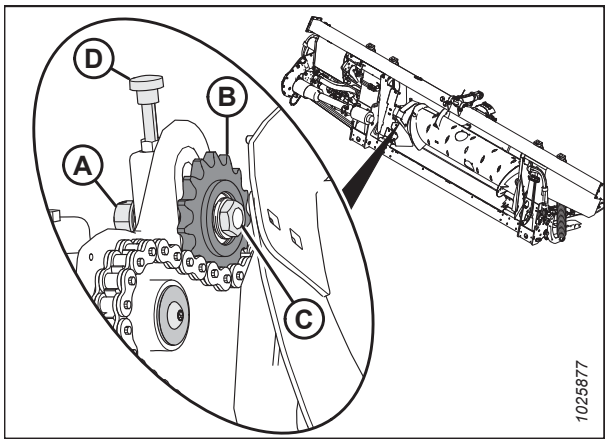


Figure 4.85: Auger Drive

9. Tighten jam nut (A).

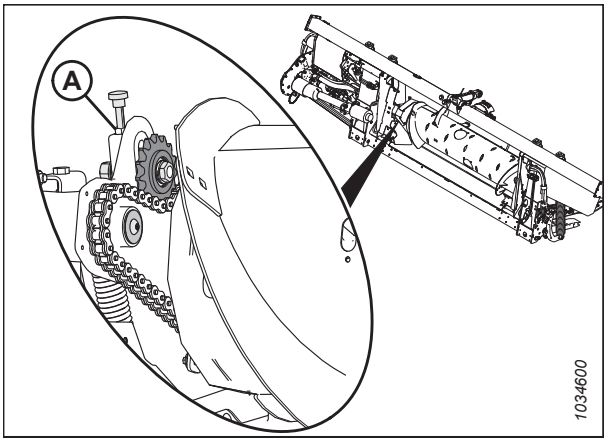


Figure 4.86: Auger Drive

10. Position bottom cover (H) and secure with bolt and washer (J).
11. Position top cover (G). Secure top and bottom covers with clamp/indicator (D) and bolts (C).
12. Install inspection panel (B) and secure with four bolts (A). Tighten bolts (A) and torque to 3.5 Nm (30 lbf·in).
13. Install cover retainer (F) and secure with two bolts (E).

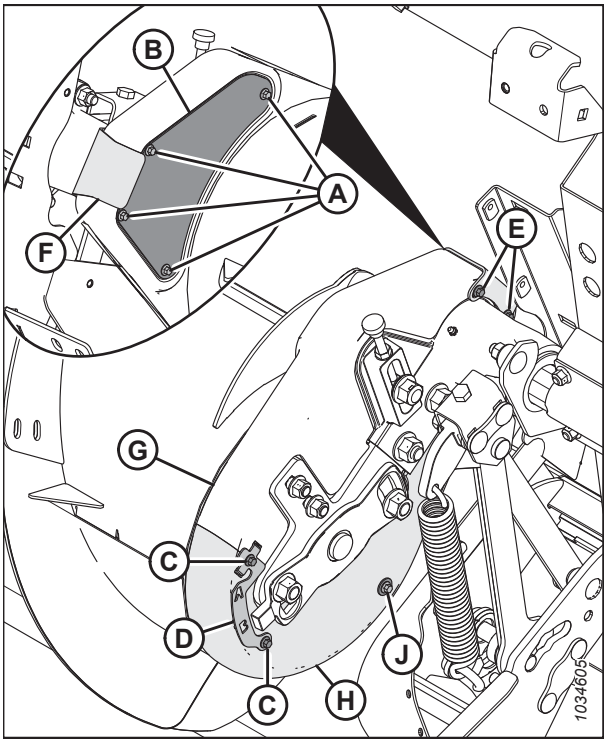


Figure 4.87: Auger

14. Remove wooden blocks (A) from the feed draper.

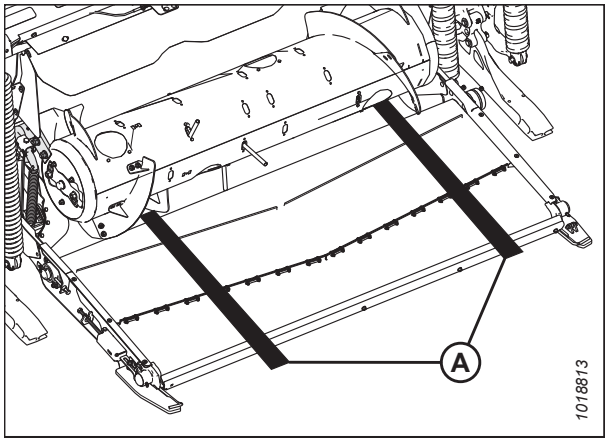


Figure 4.88: Blocks under the Auger

4.7.5 Adjusting Feed Auger Drive Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger. Insufficient chain tension can prematurely wear sprockets or damage the chain.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Lower the header fully.
3. Raise the reel fully.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.
6. Shut down the engine, and remove the key from the ignition.

7. Remove four bolts (A) and inspection panel (B) to view chain.

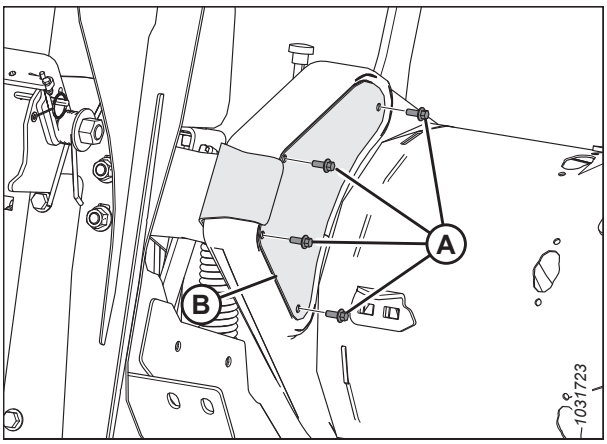


Figure 4.89: Left Side of Auger Drive – Rear View

8. Loosen jam nut (B).
9. Loosen idler nut (A) slightly to allow idler to move by turning adjuster (C).
10. Rotate the auger in reverse to take up slack in the upper strand of the chain.

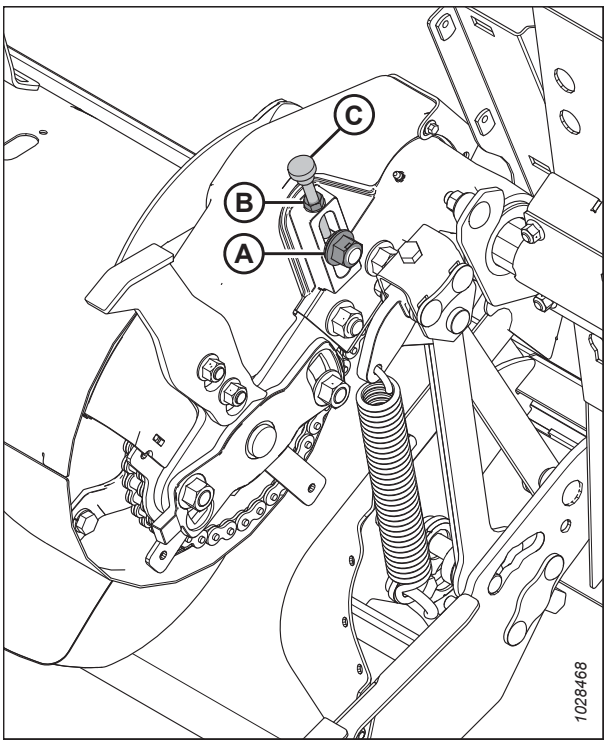


Figure 4.90: Left Side of Auger Drive – Front View

11. Turn adjuster thumbscrew (A) clockwise to increase tension until chain deflection (B) is 4 mm (0.16 in.) at midspan.

    IMPORTANT:

    Do **NOT** overtighten.

    NOTE:

    The covers have been removed from the illustration for clarity.

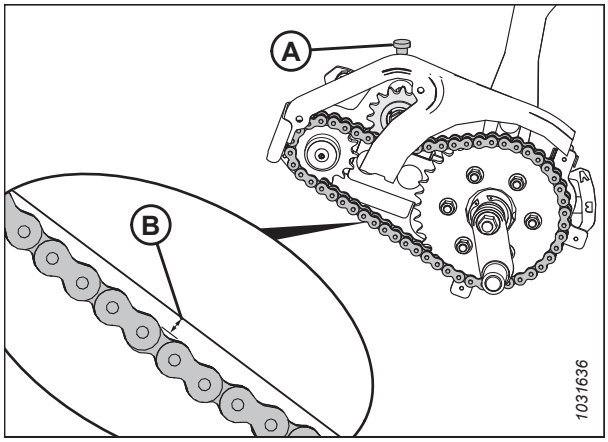


Figure 4.91: Feed Auger Chain Deflection

12. When adjustment is complete, tighten jam nut (A).
13. Tighten the idler nut (B) and torque to 265 Nm (195 lbf·ft).
14. Recheck midspan chain deflection after tightening the idler and jam nut.

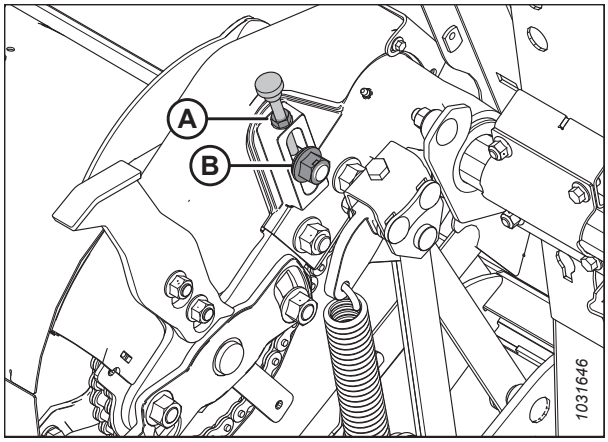


Figure 4.92: Feed Auger Chain – Front View

15. Install inspection panel (B) and secure with four bolts (A).
16. Torque bolts (A) to 3.5 Nm (30 lbf·in).

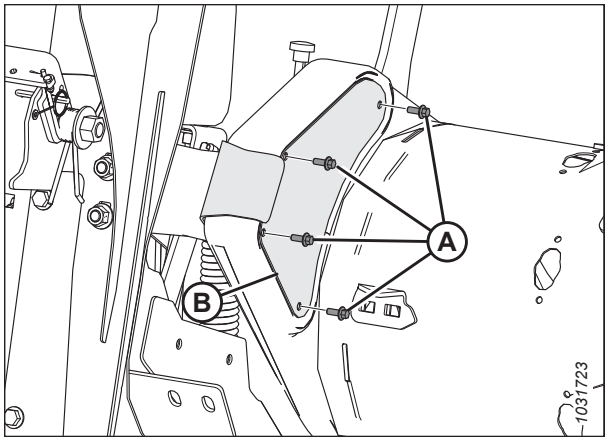


Figure 4.93: Left Side of Auger Drive – Rear View

4.7.6 Auger Flighting

The auger flighting on the FM200 can be configured for particular harvesting and crop conditions.

For instructions, refer to *3.8.1 FM200 Feed Auger Configurations, page 147* for combine/crop specific configurations.

4.7.7 Auger Fingers

The FM200 auger uses retracting tines to feed the crop into the combine feeder house. Some conditions may require the removal or installation of fingers for optimal crop feeding. Replace any worn or damaged fingers.

Removing Feed Auger Fingers

The feed auger has fingers that extend and retract to pull crop into the feeder house on the combine. Fingers may need to be removed from the auger drum to change its configuration profile.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

IMPORTANT:

When removing auger fingers, work from the outside inward. Make sure there is an equal number of fingers on both sides of the auger when complete.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain the parts for reinstallation.

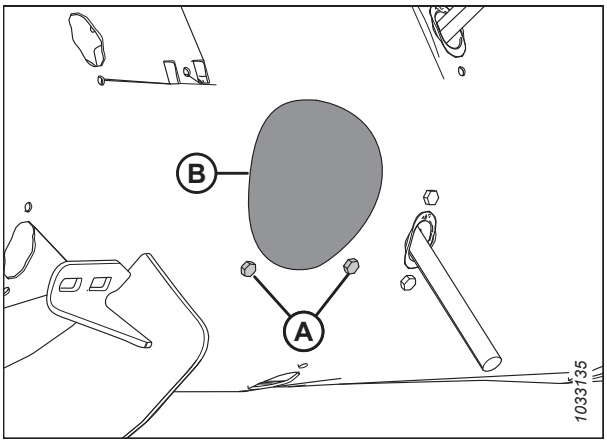


Figure 4.94: Auger Access Hole Cover

6. Remove hair pin (A). Pull finger (B) out of finger holder (C).

7. If the finger is broken, remove any remnants from holder (C) and from inside the drum.

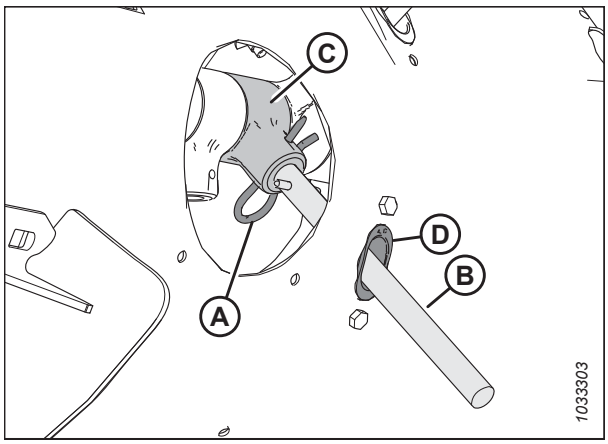


Figure 4.95: Auger Finger

8. Remove and retain two bolts (A) and tee nuts (not shown) securing finger guide (B) to the auger. Remove guide (B).

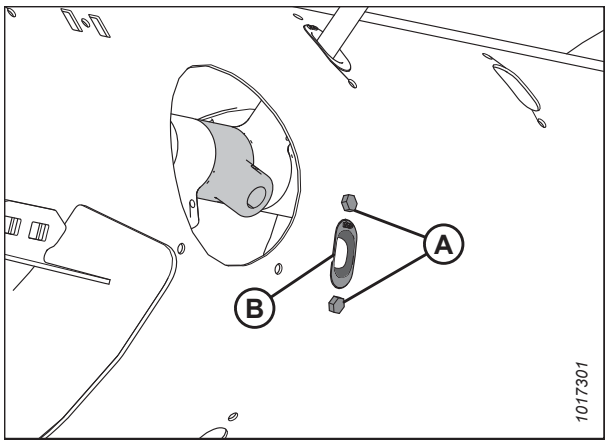


Figure 4.96: Auger Finger Hole

9. Position plug (A) into the hole from inside the auger. Secure the plug with two M6 hex head bolts (B) and tee nuts. Torque the bolts to 9 Nm (80 lbf·in).

   NOTE:

   Bolts (B) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (B), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

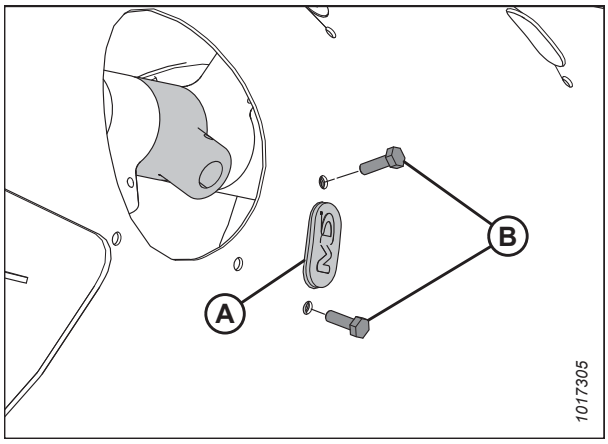


Figure 4.97: Plug

10. Secure access cover (B) in place with bolts (A). Torque the bolts to 9 Nm (80 lbf·in).

    NOTE:

    Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

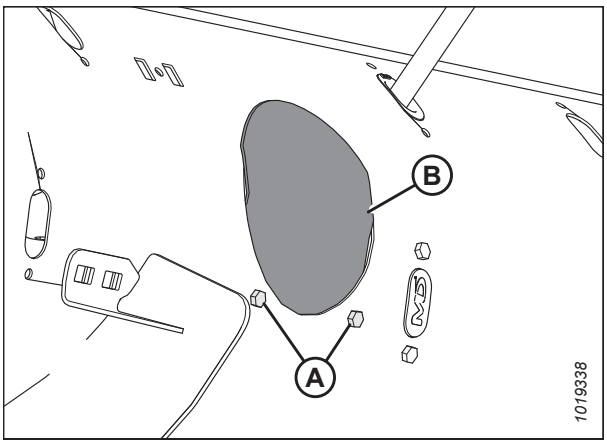


Figure 4.98: Auger Access Hole Cover

Installing Feed Auger Fingers

The feed auger has fingers that extend and retract to pull crop into the feeder house on the combine. Fingers may need to be installed onto the auger drum to change its configuration profile.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

IMPORTANT:

When installing additional fingers, ensure you install an equal number on each side of the auger.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain the parts for reinstallation.

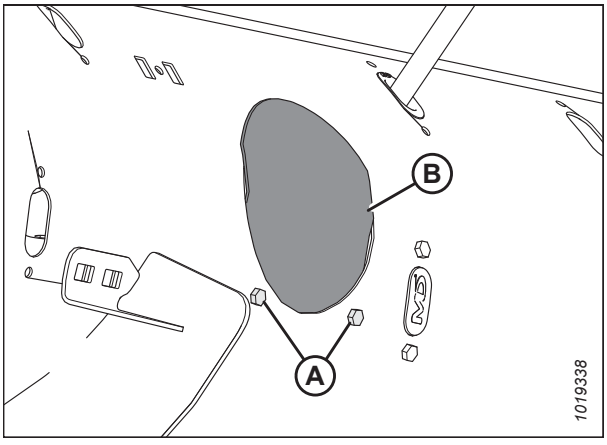


Figure 4.99: Auger Access Hole Cover

5. Remove two bolts (B), tee nuts (not shown), and plug (A).

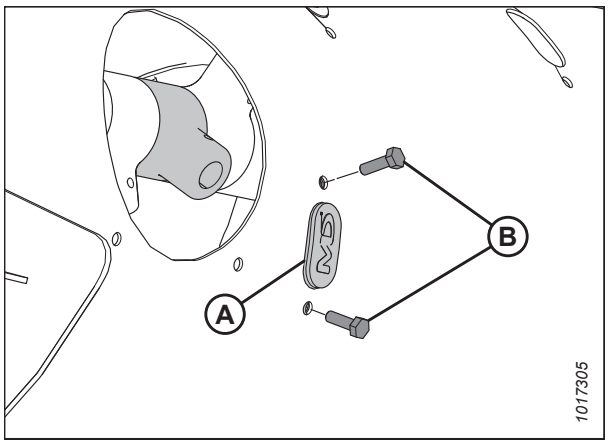


Figure 4.100: Auger Finger Hole

6. Insert guide (B) from inside the auger and secure it with bolts (A) and tee nuts (not shown).

   IMPORTANT:

   Always install a new guide when replacing a solid finger.

   NOTE:

   Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

7. Torque bolts (A) to 9 Nm (80 lbf·in).

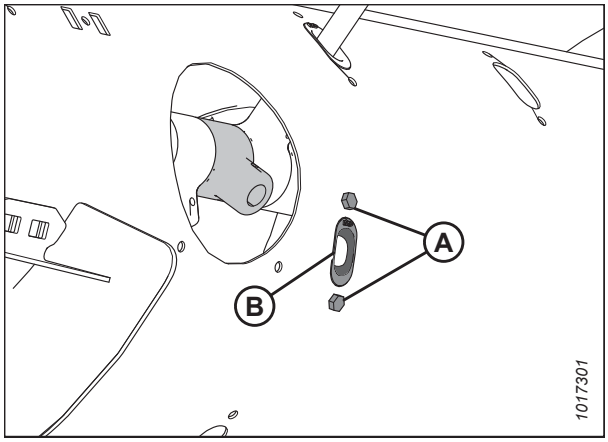


Figure 4.101: Auger Finger Hole

8. Place auger finger (A) inside the drum. Insert auger finger (A) up through the bottom of guide (B) and insert the other end into holder (C).

9. Secure the finger by inserting hairpin (D) into the holder. Ensure that the round end (S-shaped side) of the hairpin faces the chain drive side of the auger. Make sure the closed end of the hairpin points in the direction in which the auger rotates.

   IMPORTANT:

   Position the hairpin as described in this step to prevent the hairpin from falling out during operation. If fingers are lost, the header might not be able to feed crop into the combine properly. Fingers that fall into the drum might damage internal components.

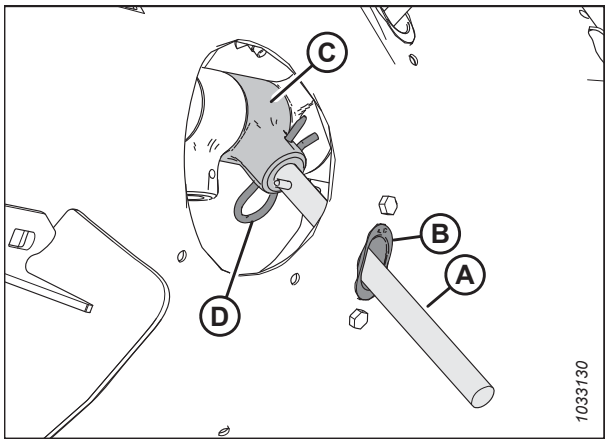


Figure 4.102: Auger Finger

10. Secure access cover (B) in place with bolts (A). Torque the bolts to 9 Nm (80 lbf·in).

    NOTE:

    Bolts (A) come with a threadlocker patch that will wear off if the bolts are removed. If reinstalling bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) before installation.

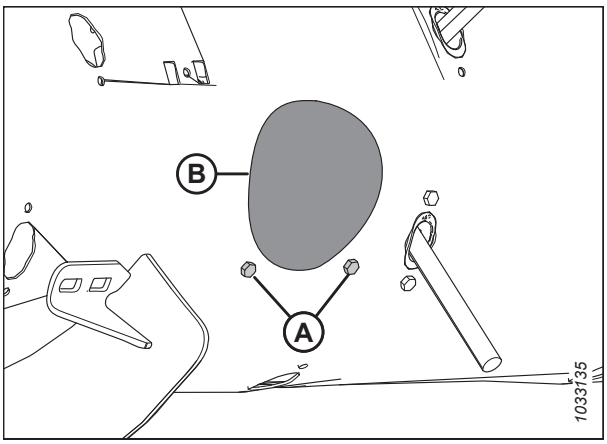


Figure 4.103: Auger Access Hole Cover

Checking Auger Finger Timing

The feed auger has fingers that extend and retract to pull crop into the feeder house on the combine. This procedure determines where the fingers are when they are fully extended from the auger.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Shut down the engine, and remove the key from the ignition.
5. Check that indicator (C) is set to the same position at each end of the auger.

    NOTE:

    There are two different auger tine extension positions: **A** and **B**. Position **A** is used for canola and position **B** is used for grains. The factory setting for the indicator is position **B**.

    IMPORTANT:

    To avoid damaging the auger beyond repair, it is extremely important that both sides are at the same setting.

6. To adjust the indicator position, refer to *Adjusting Auger Finger Timing, page 534*.
7. Disengage the reel safety props. For instructions, refer to *Disengaging Reel Safety Props, page 46*.

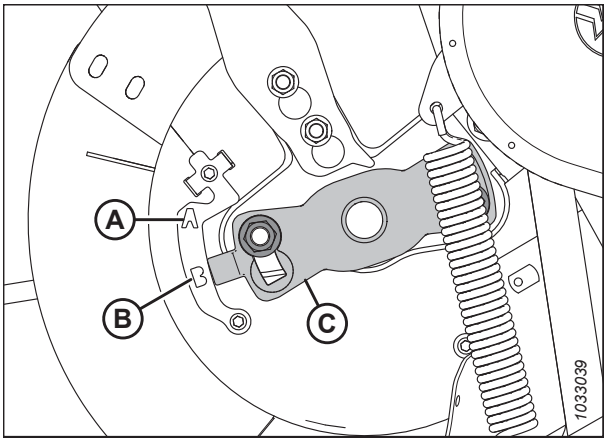


Figure 4.104: Auger Tine Timing – Left Side of Auger Shown

Adjusting Auger Finger Timing

The feed auger has fingers that extend and retract to pull crop into the feeder house on the combine. This procedure determines where the fingers are when they are fully extended from the auger.

NOTE:

The illustrations show only the left side of the auger, however the procedure applies to both sides.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Shut down the engine, and remove the key from the ignition.
5. Locate finger timing indicator (C) at the end of the auger. There are two auger tine extension positions: Position **A** and position **B**.
6. Loosen nuts (D) and adjust finger timing indicator (C) to the desired position.

   IMPORTANT:

   The timing indicator on both ends of the auger must be set at the same position; if not, the auger will be damaged beyond repair.

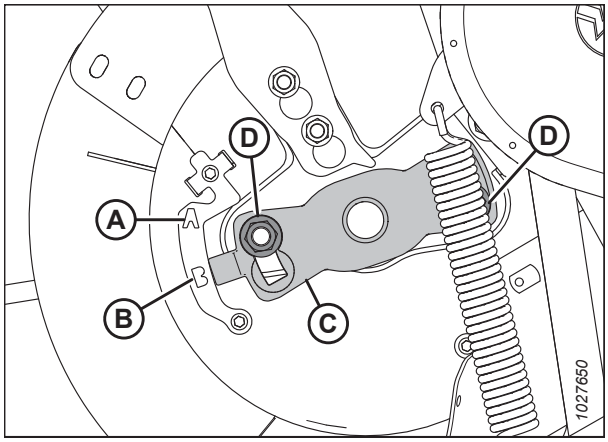


Figure 4.105: Auger Tine Timing Indicator

NOTE:

If the finger timing indicator is pointing at position **A**, it indicates that at that point the auger fingers will be fully extended. This allows the crop to be engaged and released earlier before entering the feeder house. This setting is best used for canola or bushy crops.

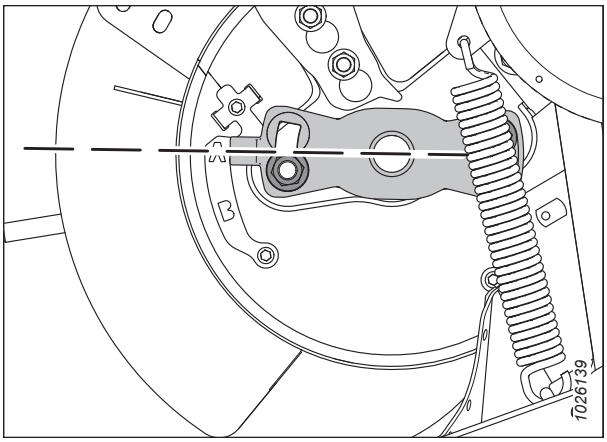


Figure 4.106: Auger Position A

NOTE:

If the indicator is pointing at position **B**, it indicates that at that point the auger fingers will be fully extended. This allows the crop to be engaged and released later before entering the feeder house. This setting is best used for grains or beans.

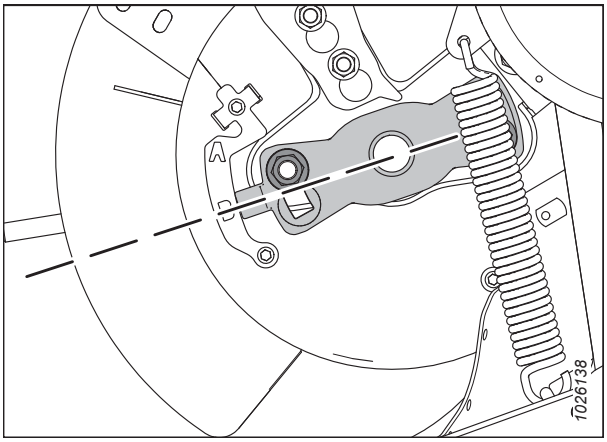


Figure 4.107: Auger Position B

7. Tighten nuts (A) once adjustment is complete. Torque nuts to 115 Nm (85 lbf·ft).
8. Disengage the reel safety props. For instructions, refer to *Disengaging Reel Safety Props, page 46*.

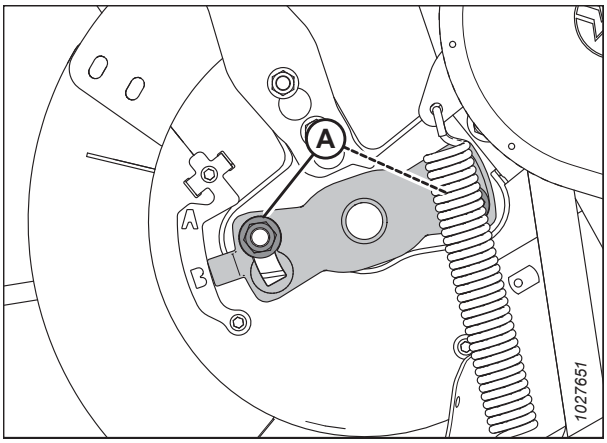


Figure 4.108: Auger Tine Timing Indicator

4.8 Knife

The knives on the cutterbar cut the crop. The knives, guards, and knifehead will require maintenance from time to time.

WARNING

Keep hands clear of the area between guards and knife at all times.

WARNING

Wear heavy gloves when working around or handling knives.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *4.1 Preparing Machine for Servicing, page 473*.

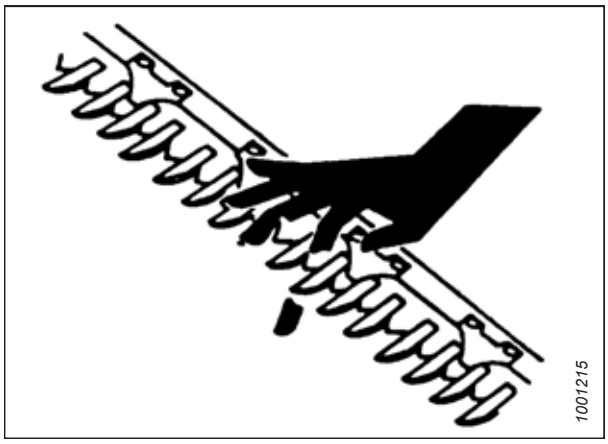


Figure 4.109: Cutterbar Hazard

4.8.1 Replacing Knife Section

Inspect the knife sections daily and ensure they are firmly bolted to the knife back and are not worn or damaged (worn and damaged sections leave behind uncut plants). Worn or damaged sections can be replaced without removing the knife from the cutterbar.

DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

Exercise caution when working around the cutterbar. Knife sections are sharp and can cause serious injury. Wear heavy gloves when working around or handling knife sections or the knife.

1. Raise the reel fully.
2. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
3. Shut down the engine, and remove the key from the ignition.

4. If a hold-down is present, remove nuts (A) and hold-down (B) to access the knife section that is being replaced.

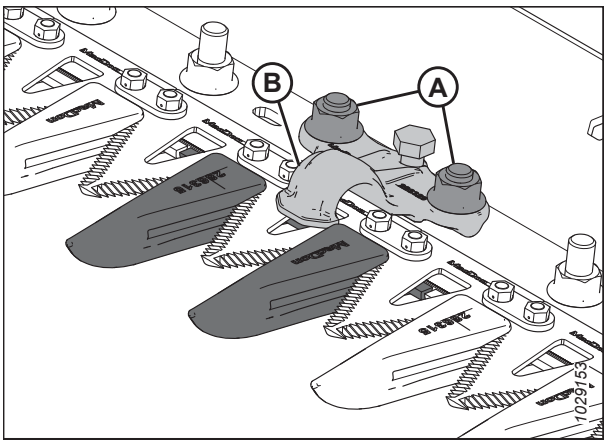


Figure 4.110: Cutterbar

5. Remove bolts and nuts (B). Retain hardware.

   NOTE:

   Stroke the knife as required to access the hardware.

6. For sections near the drive end, remove bars (C) and lift knife section (A) off the knife back bar.

7. Clean dirt off the knife back bar, and position the new knife section onto the knife back bar.

   IMPORTANT:

   Cut quality may be affected if fine and coarsely serrated knife sections are used on the same knife.

8. For sections near the drive end, reposition bars (C).

9. If a hold-down was removed earlier, install it along with bolts and nuts (B).

   NOTE:

   Ensure bolt heads fully engage into oblong holes on the knife back bar.

10. Torque nuts to 12 Nm (9 lbf·ft).

11. If necessary, replace hold-downs that were removed. To check hold-down adjustment, refer to *Checking Hold-Down – Pointed Knife Guards, page 553* or *Checking Hold-Down – Short Knife Guards, page 566*.

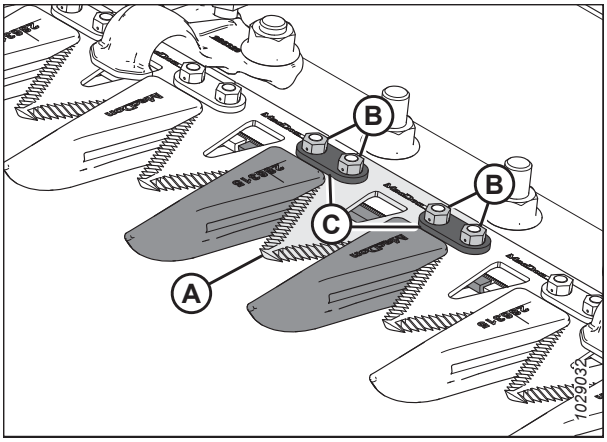


Figure 4.111: Cutterbar

4.8.2 Removing Knife

Inspect the knife daily and ensure it is not damaged. If it is damaged it will need to be removed and replaced.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

NOTE:

For single knife headers, the knifehead is located on the left side of the knife. For double knife headers, there are two knifeheads and they are located both right and left sides of the knife. Verify which knife needs to be removed before beginning.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
3. Manually move the knife to the middle of its stroke range.
4. Clean the area around the knifehead.
5. Remove grease fitting (A) from the pin.

   NOTE:

   Removing the grease fitting will make it easier to reinstall the knifehead pin later.
6. Remove bolt and nut (B).
7. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
8. Use a screwdriver or chisel to pry the knifehead pin upwards in the pin groove until the knifehead pin is clear of the knifehead.
9. Push knife assembly (A) inboard until it is clear of drive arm (B).

   NOTE:

   Frame and endshield parts have been removed from the illustration to reveal the knifehead components.
10. Unless it is being replaced, seal knifehead bearing (C) with plastic or tape to keep out dirt and debris.
11. Pull knife drive arm (B) to the outside position to give clearance for the knife.
12. Remove knife (A).

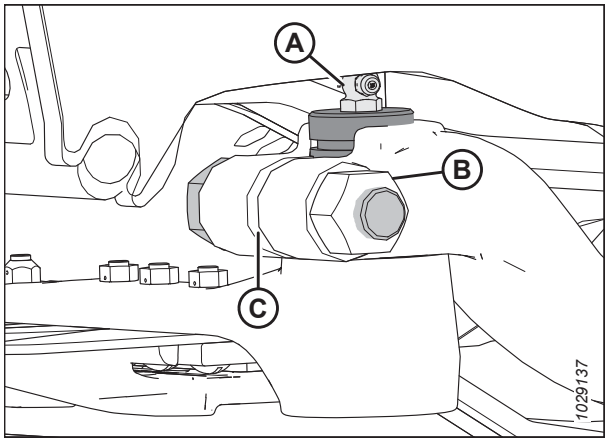


Figure 4.112: Knifehead

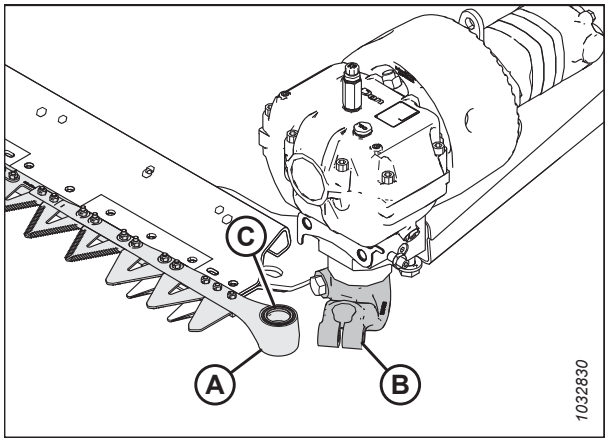


Figure 4.113: Left Knifehead

4.8.3 Removing Knifehead Bearing

The knifehead bearing allows the knifehead pin to rotate within the knifehead as the drive arm strokes the knife back and forth. If the bearing is worn or damaged, it will need to be replaced.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Remove the knife. For instructions, refer to *4.8.2 Removing Knife, page 537*.

   NOTE:

   Because the bearing is being replaced, it is not necessary to wrap the knifehead to protect the bearing.

5. Use a flat-ended tool with the same diameter as pin (A). Tap seal (B), bearing (C), plug (D), and O-ring (E) from the underside of the knifehead.

   NOTE:

   Seal (B) can be replaced without removing the bearing. When changing the seal, check the pin and needle bearing for wear and replace if necessary.

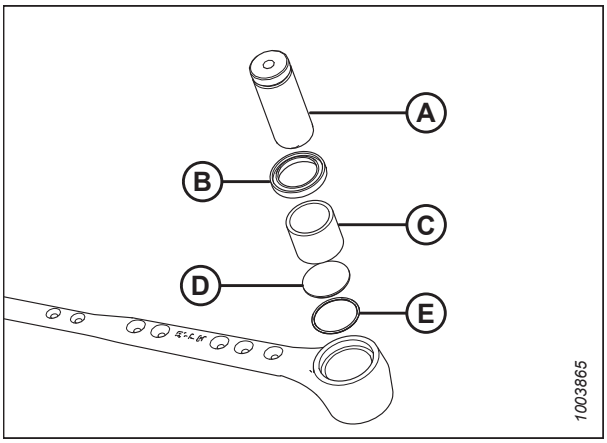


Figure 4.114: Knifehead Bearing Assembly

4.8.4 Installing Knifehead Bearing

The knifehead bearing allows the knifehead pin to rotate within the knifehead as the drive arm strokes the knife back and forth. Once the old bearing has been removed from the knifehead, a new one can be installed.

1. Place O-ring (E) and plug (D) into the knifehead.
2. Use a flat-ended tool (A) with the same approximate diameter as bearing (C), and push the bearing into the knifehead until the top of the bearing is flush with the step in the knifehead.

   IMPORTANT:

   Install the bearing with the stamped end (the end with the identification markings) facing up.
3. Install seal (B) into the knifehead with the lip facing outwards.

   IMPORTANT:

   To prevent premature knifehead or knife drive box failure, ensure there is a tight fit between the knifehead pin and the needle bearing, and between the knifehead pin and the output arm.

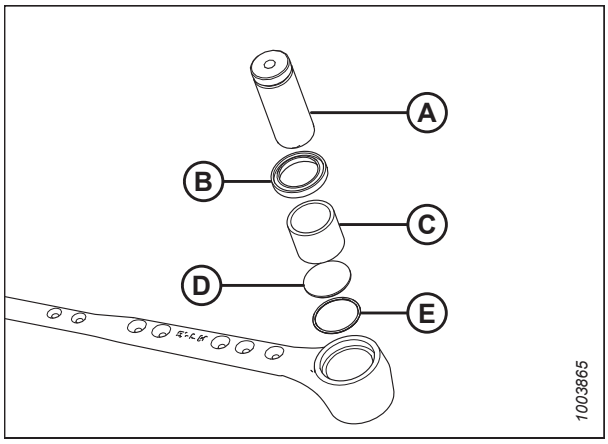


Figure 4.115: Knifehead Bearing Assembly

4. Install the knife. For instructions, refer to *4.8.5 Installing Knife, page 540*.

4.8.5 Installing Knife

Inspect the knife daily and ensure it is not damaged. If it is damaged it will need to be removed and replaced.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Shut down the engine, and remove the key from the ignition.
2. Grease the knife head bearing prior to assembly spread grease around bearing evenly.
3. Install knife assembly (A).

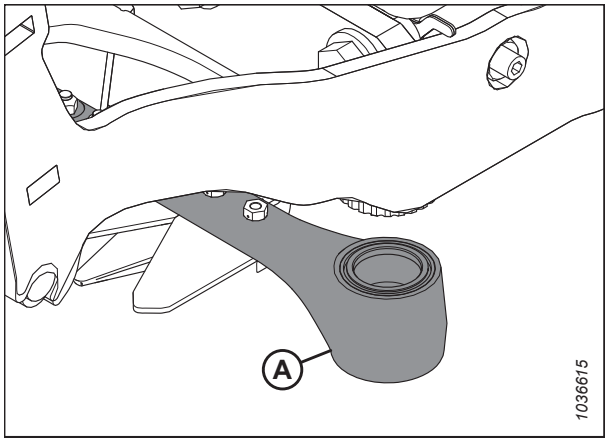


Figure 4.116: Knife Drive Box

4. Install knifehead pin (A) through the drive arm and into the knifehead.
5. Position knifehead pin (A), so that groove (B) is 2 mm (5/64 in.) above the drive arm.

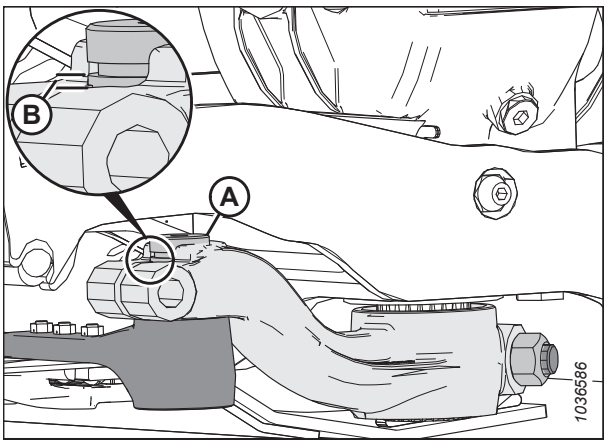


Figure 4.117: Knifehead

6. Secure the knifehead pin with M16 x 85 mm hex bolt (A) and hex nut (B). Install the bolt from the inboard side of the arm. Torque the bolt to 220 Nm (162 lbf·ft).
7. Manually stroke knife arm (A) to the inside limit of travel, and ensure there is still 0.2–1.2 mm (1/64–3/64 in.) clearance (C) between the drive arm and the knifehead.
8. If no adjustment is required, proceed to Step *9, page 541*. If drive arm adjustment is required, contact your MacDon Dealer.

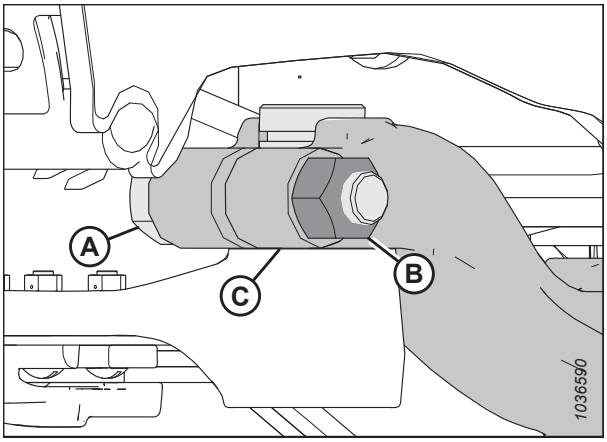


Figure 4.118: Knifehead

9. Reinstall grease fitting (A), and slowly apply grease. Apply grease until the knifehead has a **SLIGHT** downward movement, then stop.

   IMPORTANT:

   Do **NOT** overgrease the knifehead. Overgreasing leads to knife misalignment causing excessive heating of guards and overloading of drive systems. If overgreasing occurs, remove the grease fitting to release pressure.

   NOTE:

   If air is trapped in the bearing cavity, the knifehead will begin to move down before it has filled with grease.

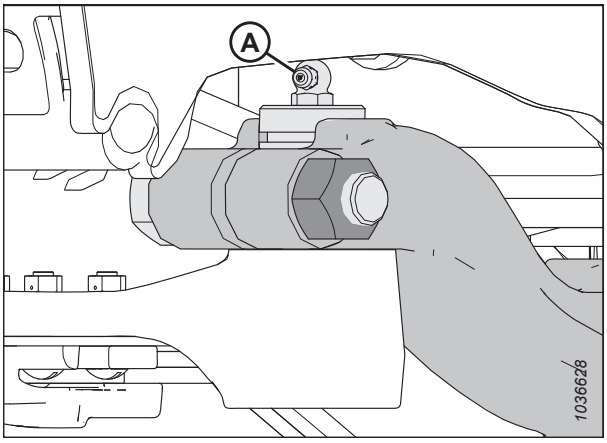


Figure 4.119: Knifehead

10. Move the knife drive arm to the mid-stroke position, and ensure the knife back bar doesn't contact the front of first guard (A).

11. If the knife back bar contacts the front of the first guard, remove bolts (B), reposition the guard forward, and reinstall the bolts. Torque bolts to 85 Nm (63 lbf·ft). If the necessary clearance (zero contact between back bar and front of first guard) is not achievable, then additional shims are required between the knife drive box and the mounting plate. Contact your MacDon Dealer.

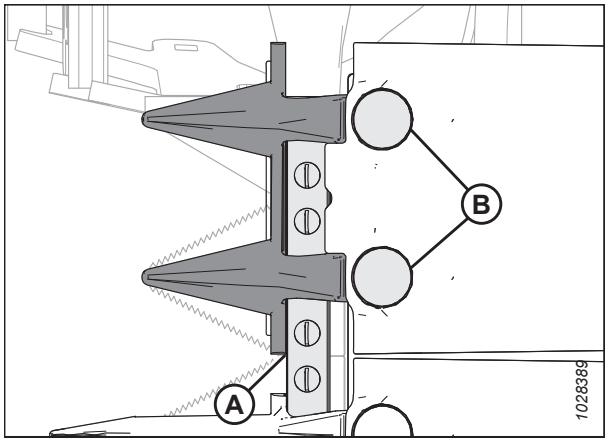


Figure 4.120: First Knife Guard – View from below Knife

4.8.6 Spare Knives

Two spare knives (A) can be stored in the header backtube at the right end. Ensure the spare knives are secured in place with latch (B) and hairpin (C).

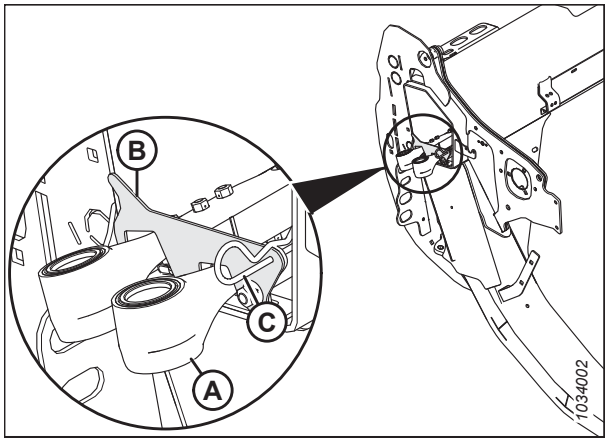


Figure 4.121: Spare Knives

4.8.7 Pointed Knife Guards and Hold-Downs

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

The following knife guards and hold-downs are used in pointed guard configurations:

NOTE:

Pointed knife guard configurations require two short knife guards; one at each end of the cutterbar.

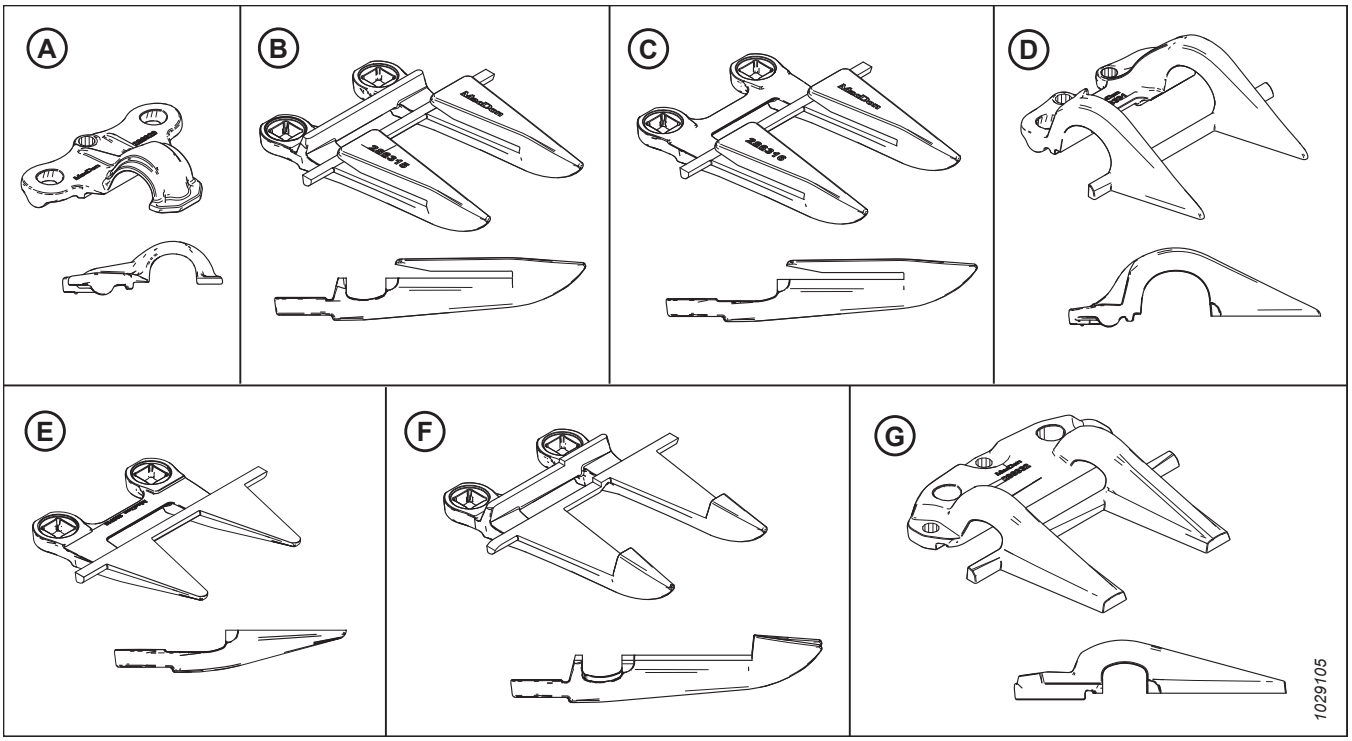


Figure 4.122: Guard and Hold-Down Types used in Pointed Knife Guard Configurations

A - Pointed Hold-Down (MD #286329)
B - Pointed Knife Guard (MD #286315)
C - Pointed End Knife Guard (without Wear Bar) (MD #286316)[78]
D - Short Knife Hold-Down (MD #286331)
E - Short Knife Guard (without Wear Bar) (MD #286319)[79]
F - Pointed Center Knife Guard (MD #286317)[80]
G - Pointed Center Hold-Down (MD #286332)[80]

Guards are configured differently on different headers. When replacing pointed guards and hold-downs, ensure you use the correct sequence for your header. The following will guide you to the different configurations:

- *Pointed Knife Guards on Single-Knife Headers, page 544*
- *Pointed Knife Guards on FD235 Double-Knife Header, page 545*
- *Pointed Knife Guards on FD240 Double-Knife Header, page 546*
- *Pointed Knife Guards on FD241 Double-Knife Header, page 547*
- *Pointed Knife Guards on FD245 Double-Knife Header, page 548*
- *Pointed Knife Guards on FD250 Double-Knife Header, page 549*

78. Installed in positions 2, 3, and 4 on drive side(s). Refer to *Replacing Pointed Knife Guards, page 552* for reference.
79. Installed in position 1 on drive side(s). Single-knife headers use standard guard (MD #286318) on the right end.
80. Double-knife headers only.

Pointed Knife Guards on Single-Knife Headers

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

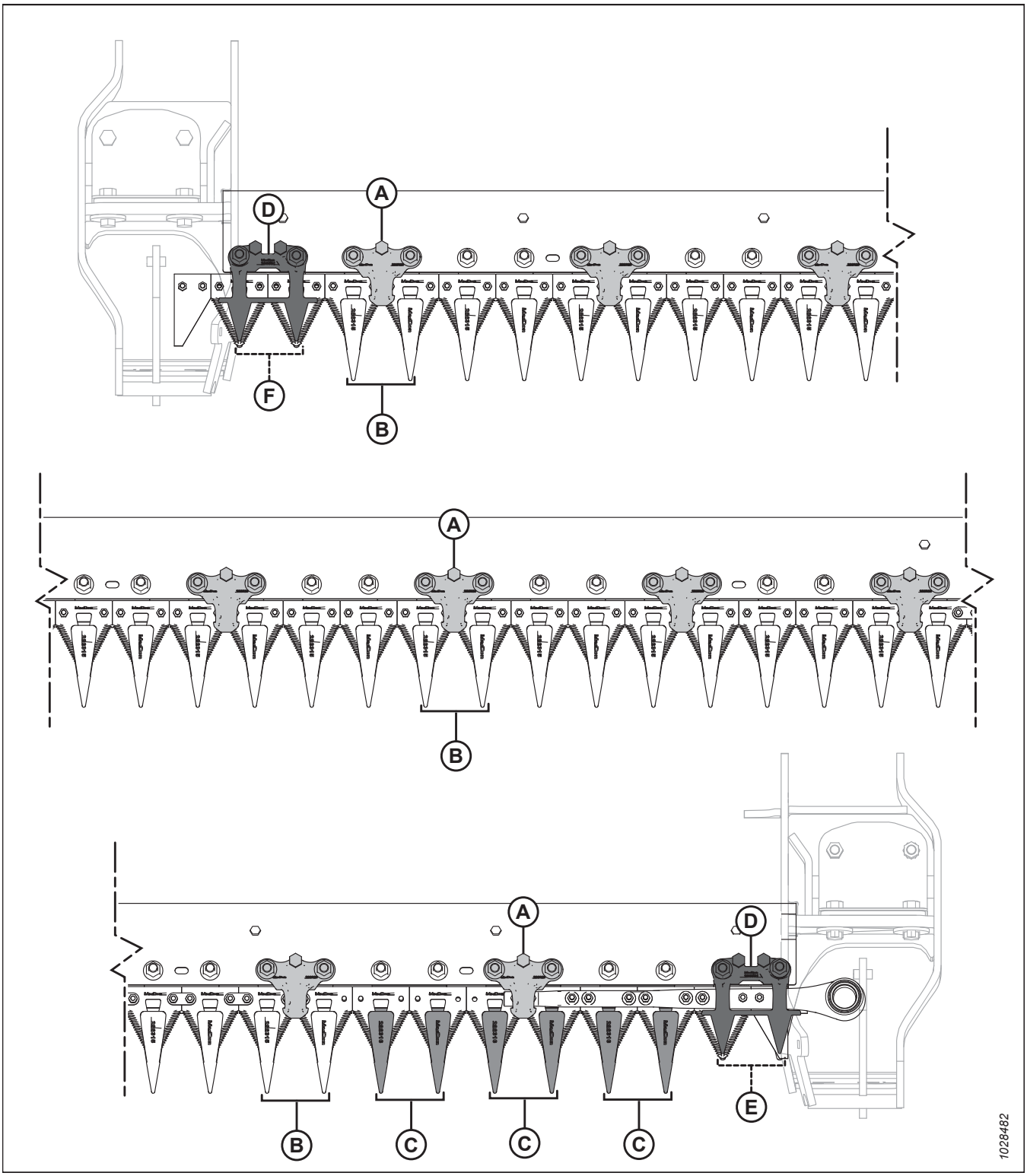


Figure 4.123: Pointed Knife Guard and Hold-Down Locations – Single-Knife Headers

A - Pointed Hold-Down (MD #286329)
B - Pointed Knife Guard (MD #286315)
C - Pointed End Knife Guard (without Wear Bar) (MD #286316)
D - Short Knife Hold-Down (MD #286331)
E - Short Knife Guard (without Wear Bar) (MD #286319)
F- Short Knife Guard (MD #286318)

Pointed Knife Guards on FD235 Double-Knife Header

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

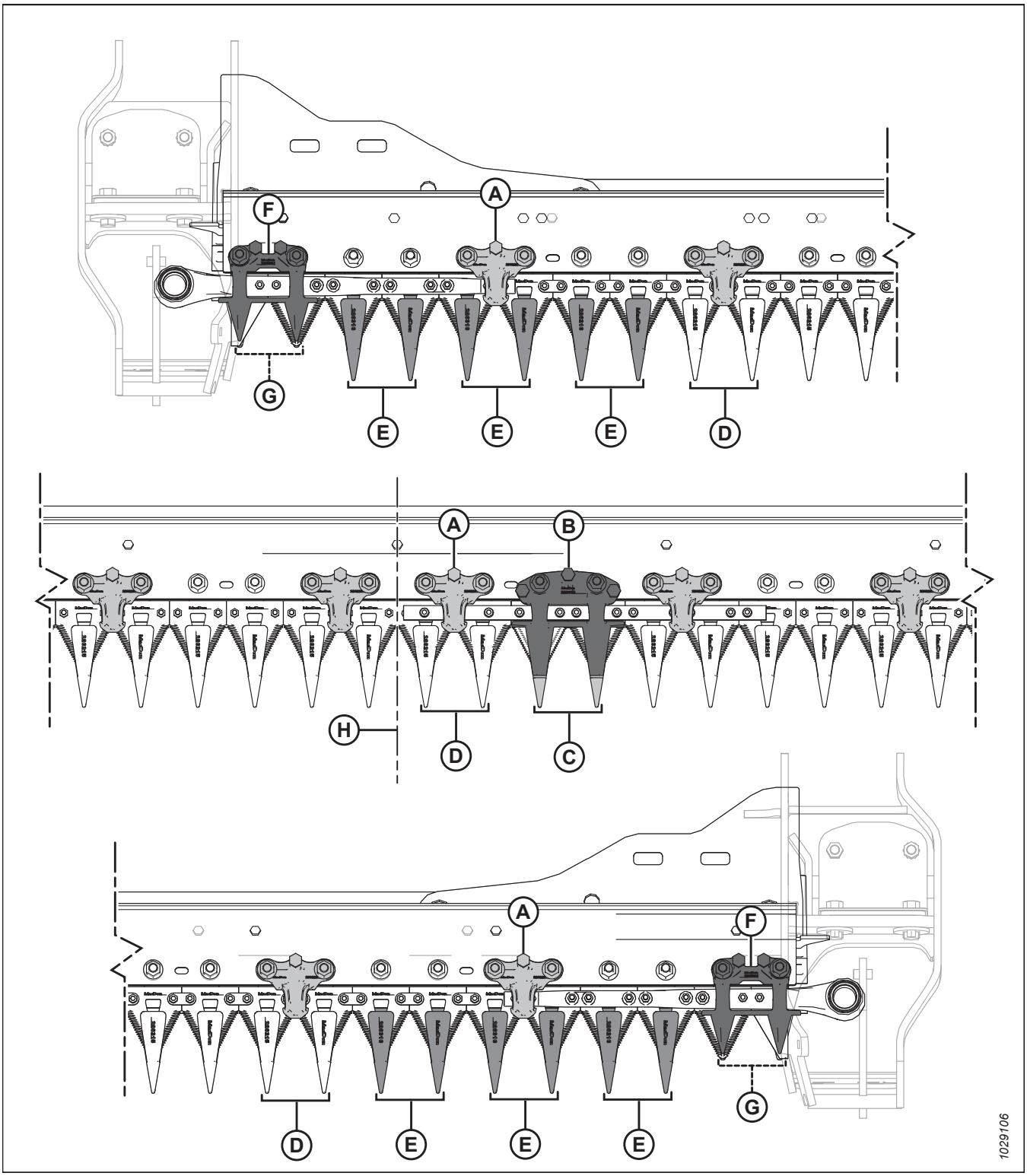


Figure 4.124: Pointed Guard and Hold-Down Locations

A - Pointed Hold-Down (MD #286329)
B - Pointed Center Hold-Down (MD #286332)
C - Pointed Center Knife Guard (MD #286317)
D - Pointed Knife Guard (MD #286315)
E - Pointed End Knife Guard (without Wear Bar) (MD #286316)
F - Short Knife Hold-Down (MD #286331)
G - Short Knife Guard (without Wear Bar) (MD #286319)
H - Center of Header

Pointed Knife Guards on FD240 Double-Knife Header

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

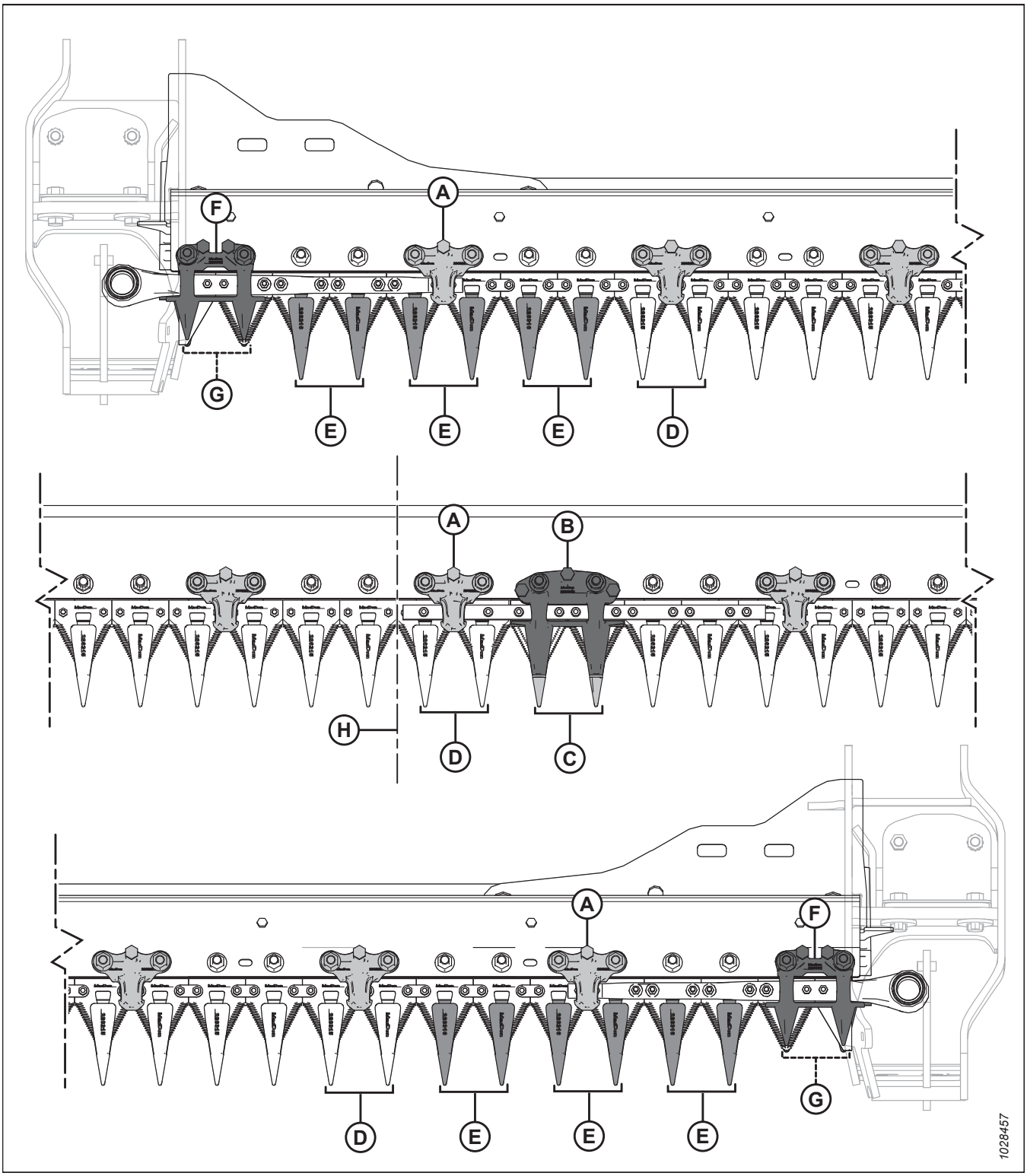


Figure 4.125: Pointed Knife Guard and Hold-Down Locations – FD240 Double-Knife Header

A - Pointed Hold-Down (MD #286329)
B - Pointed Center Hold-Down (MD #286332)
C - Pointed Center Knife Guard (MD #286317)
D - Pointed Knife Guard (MD #286315)
E - Pointed End Knife Guard (without Wear Bar) (MD #286316)
F - Short Knife Hold-Down (MD #286331)
G - Short Knife Guard (without Wear Bar) (MD #286319)
H - Center of Header

Pointed Knife Guards on FD241 Double-Knife Header

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

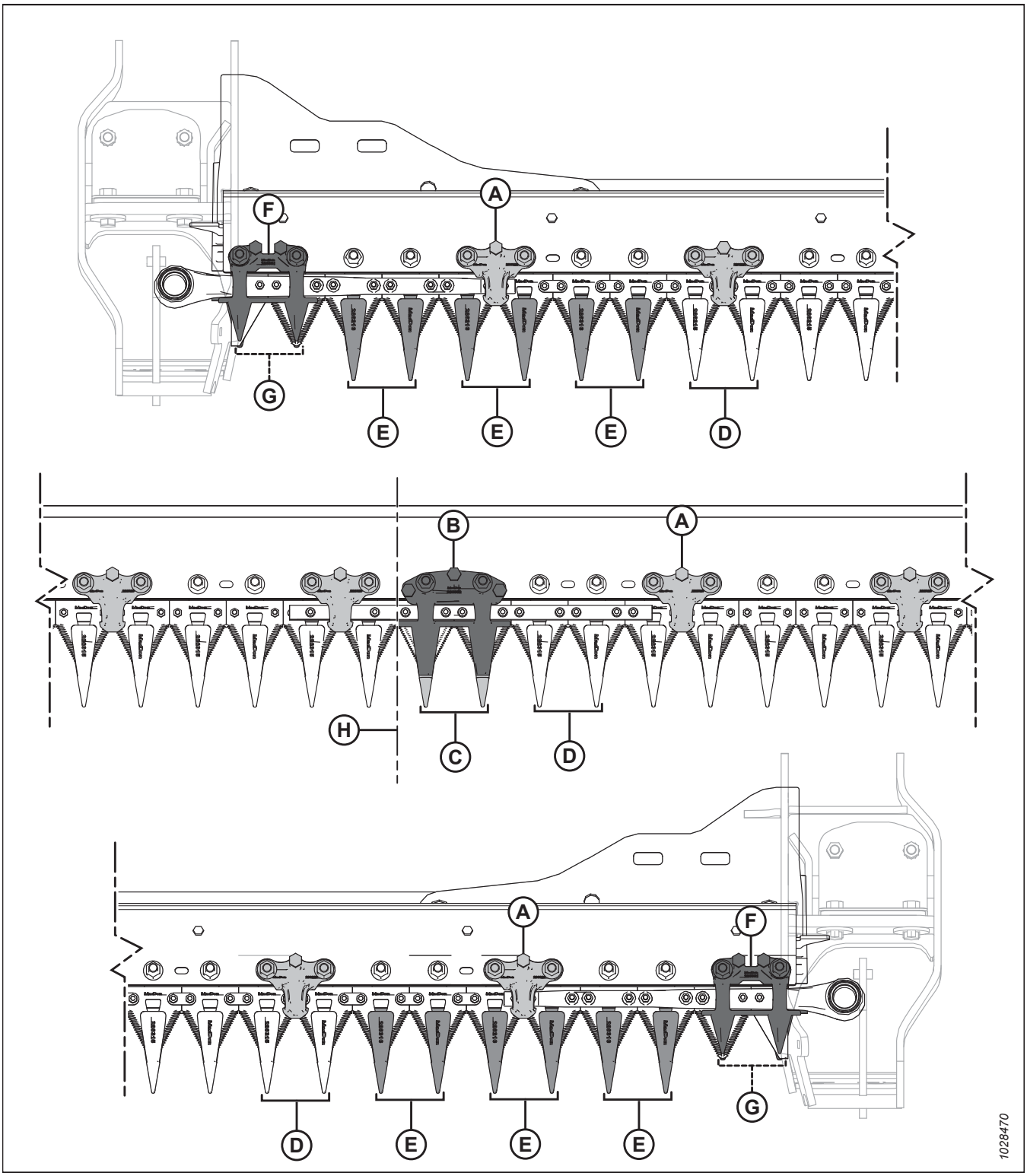


Figure 4.126: Pointed Knife Guard and Hold-Down Locations

A - Pointed Hold-Down (MD #286329)
B - Pointed Center Hold-Down (MD #286332)
C - Pointed Center Knife Guard (MD #286317)
D - Pointed Knife Guard (MD #286315)
E - Pointed End Knife Guard (without Wear Bar) (MD #286316)
F - Short Knife Hold-Down (MD 286331)
G - Short Knife Guard (without Wear Bar) (MD #286319)
H - Center of Header

Pointed Knife Guards on FD245 Double-Knife Header

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

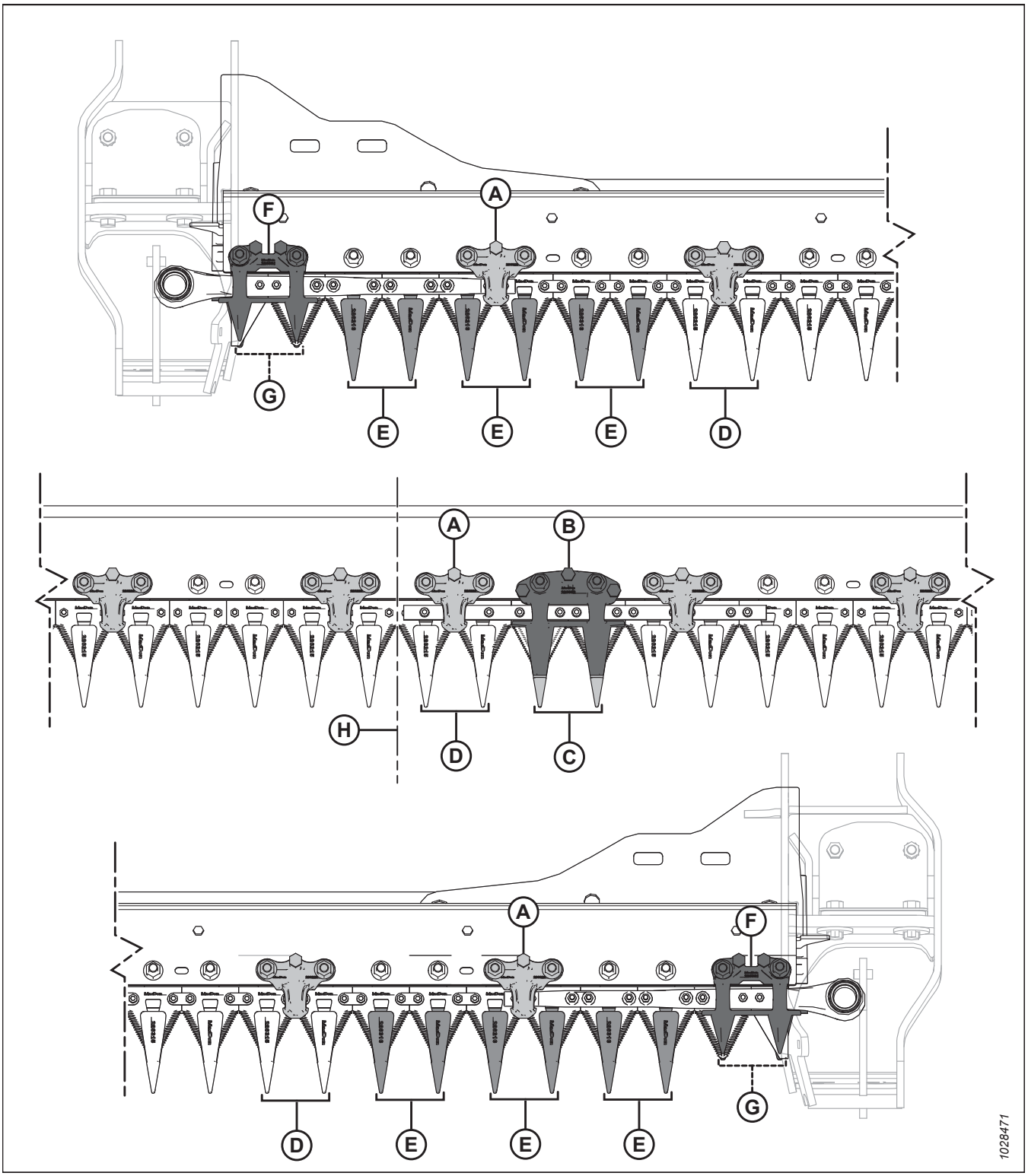


Figure 4.127: Pointed Guard and Hold-Down Locations

A - Pointed Hold-Down (MD #286329)
B - Pointed Center Hold-Down (MD #286332)
C - Pointed Center Knife Guard (MD #286317)
D - Pointed Knife Guard (MD #286315)
E - Pointed End Knife Guard (without Wear Bar) (MD #286316)
F - Short Knife Hold-Down (MD 286331)
G - Short Knife Guard (without Wear Bar) (MD #286319)
H - Center of Header

Pointed Knife Guards on FD250 Double-Knife Header

Knife guards assist with aligning the knife bar. Hold-downs hold the sections on the knife bar down against the knife guards to ensure proper cutting.

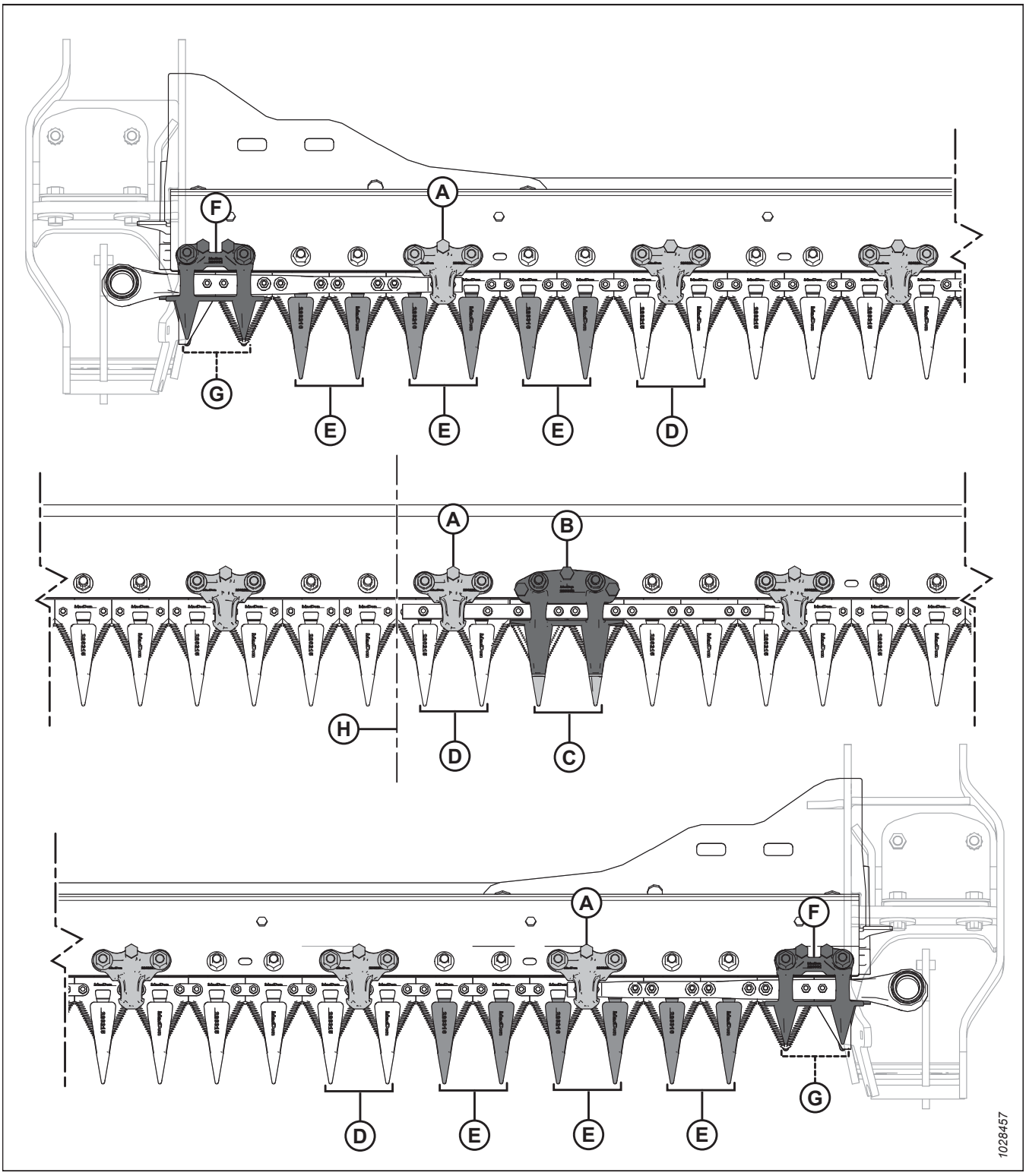


Figure 4.128: Pointed Knife Guard and Hold-Down Locations – FD250 Double-Knife Header

A - Pointed Hold-Down (MD #286329)
B - Pointed Center Hold-Down (MD #286332)
C - Pointed Center Knife Guard (MD #286317)
D - Pointed Knife Guard (MD #286315)
E - Pointed End Guard (without Wear Bar) (MD #286316)
F -Short Knife Hold-Down (MD #286331)
G - Short Knife Guard (without Wear Bar) (MD #286319)
H - Center of Header

Adjusting Knife Guards and Guard Bar

If a knife guard or the guard bar is misaligned due to contact with a rock or similar obstruction, use the guard straightening tool (MD #286705) available from your MacDon Dealer to correct the issue.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. To adjust the guard tips upwards, position tool (A) as shown, and pull up.

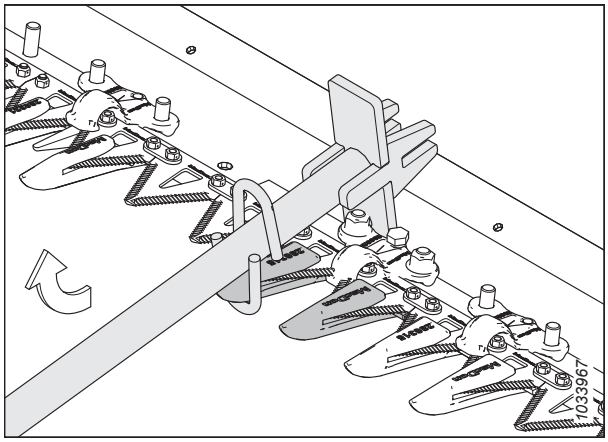


Figure 4.129: Upward Adjustment – Pointed Guard

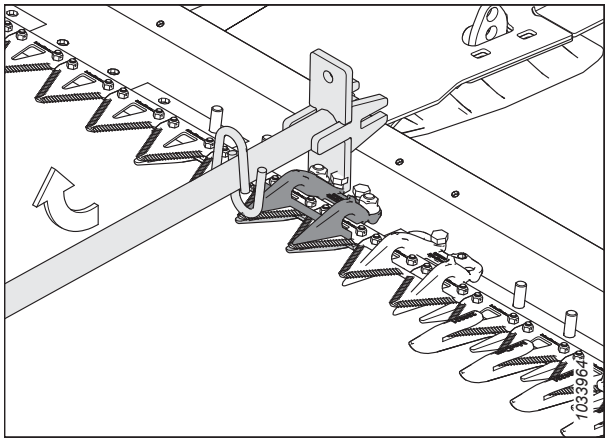


Figure 4.130: Upward Adjustment – Short Knife Guard

5. To adjust the guard tips downwards, position tool (A) as shown, and push down.

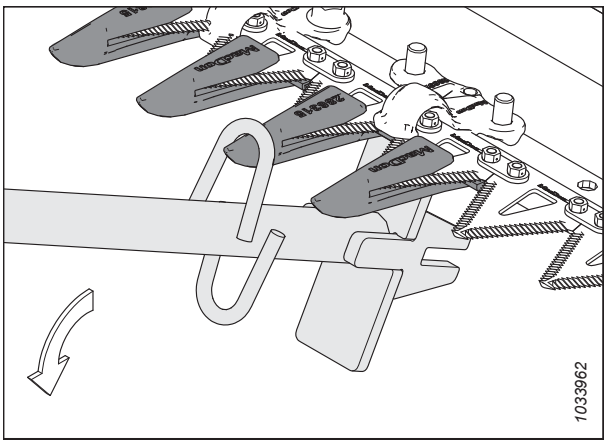


Figure 4.131: Downward Adjustment – Pointed Guard

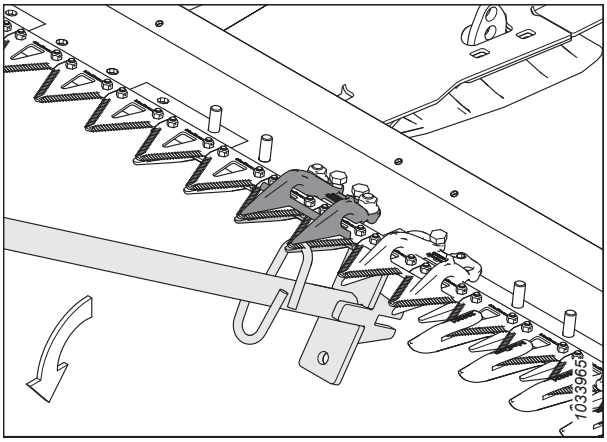


Figure 4.132: Downward Adjustment – Short Knife Guard

6. To adjust the guard bar up or down, position tool (A) as shown, and push on the tool accordingly.

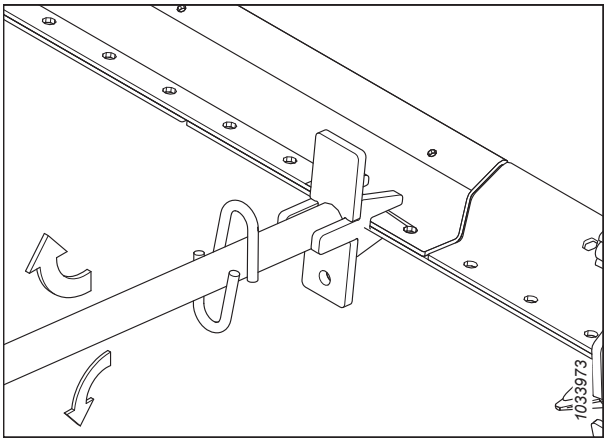


Figure 4.133: Guard Bar Adjustment – No Guards

Replacing Pointed Knife Guards

Guards become dull and need to be replaced. This procedure is for replacing standard guards and the special (drive side) guards closest to the knife drive motor.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

IMPORTANT:

When replacing pointed knife guards, ensure the hold-down sequence is correct for your header type and width. For more information, refer to *4.8.7 Pointed Knife Guards and Hold-Downs, page 542*.

IMPORTANT:

Single- and Double-knife headers: On both ends of the header, position 1 (outboard guard) is a short knife guard. On the drive side(s) of the header, positions 2, 3, and 4 are pointed end knife guards (without wear bar). Starting at position 5, the remaining guards are pointed knife guards. Ensure proper replacement guards are installed at these locations.

IMPORTANT:

Double-knife headers: have a pointed center knife guard installed where the two knives overlap. The pointed center knife guard has a slightly different replacement procedure. For instructions, refer to *Replacing Pointed Center Knife Guard – Double-Knife, page 555*.

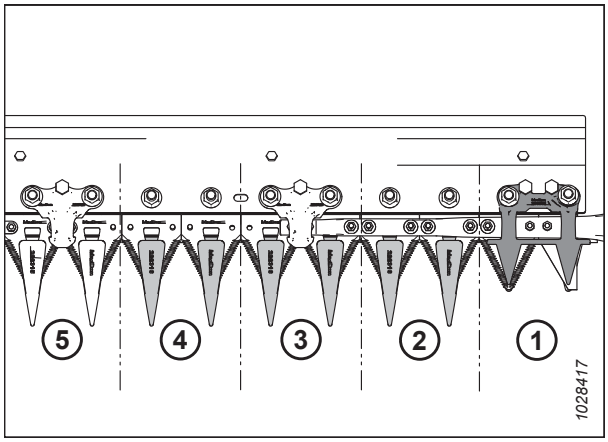


Figure 4.134: Drive Side Pointed Knife Guards

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Stroke the knife manually until the knife sections are spaced midway between the guards.
5. Remove two nuts (B) and bolts attaching pointed knife guard (A) and hold-down (C) (if applicable) to the cutterbar.
6. Remove pointed knife guard (A), hold-down (C), and the plastic wearplate. Discard the pointed knife guard.

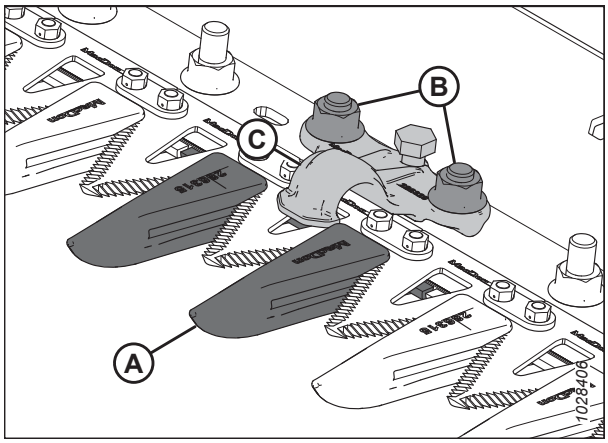


Figure 4.135: Pointed Knife Guards

7. Position plastic wearplate (A) and replacement pointed knife guard (B) under the cutterbar.

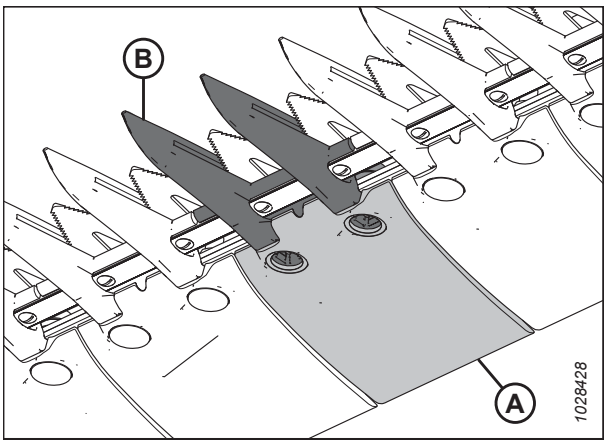


Figure 4.136: Pointed Knife Guard and Wearplate

8. Position hold-down (A) (if applicable), and loosen adjustment bolt (C) so that it is not protruding from the bottom of the hold-down.
9. Secure the pointed knife guard, wearplate, and hold-down (if applicable) with two bolts and nuts (B). Tighten nuts to 85 Nm (63 lbf·ft).
10. If there is a hold-down at this location, proceed with adjustment. Refer to *Adjusting Hold-Down – Pointed Knife Guards, page 554*.

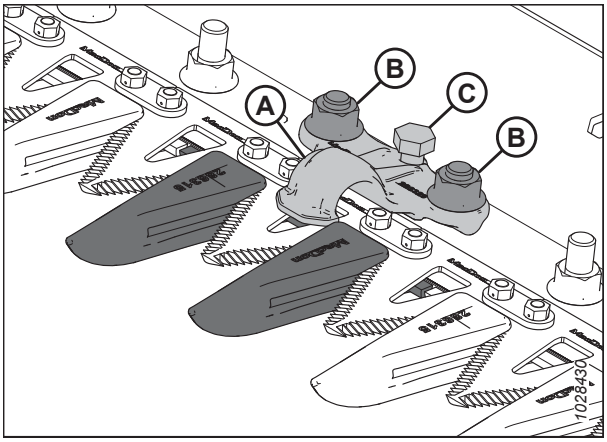


Figure 4.137: Pointed Knife Guards

Checking Hold-Down – Pointed Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

This procedure is for standard hold-downs. To check the center hold-down on double-knife headers, refer to *Checking Center Hold-Down – Pointed Knife Guards, page 557*.

NOTE:

Align guards prior to adjusting the hold-down. For instructions, refer to *Adjusting Knife Guards and Guard Bar, page 550*.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Shut down the engine, and remove the key from the ignition.

2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Manually stroke the knife to position knife section (A) under hold-down (B).
6. Push down on knife section (A) with approximately 44 N (10 lbf) of force, and use a feeler gauge to measure the clearance between hold-down (B) and the knife section. Ensure the clearance is 0.1–0.5 mm (0.004–0.020 in.).
7. If adjustment is required, refer to *Adjusting Hold-Down – Pointed Knife Guards, page 554*.

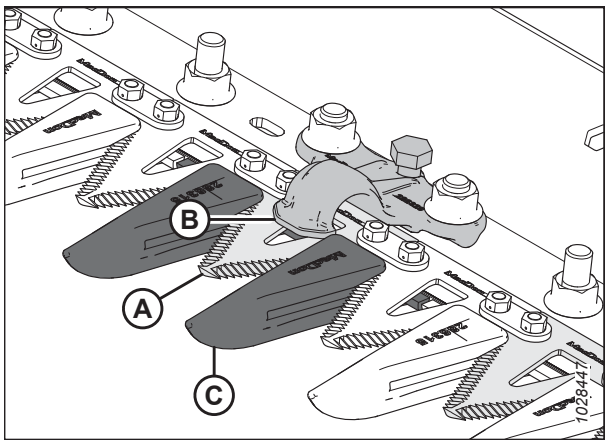


Figure 4.138: Pointed Hold-Down

Adjusting Hold-Down – Pointed Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

This procedure is for standard hold-down. To adjust the center hold-down on double-knife headers, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 558*.

NOTE:

Align guards prior to adjusting the hold-down. For instructions, refer to *Adjusting Knife Guards and Guard Bar, page 550*.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

4. Adjust the hold-down clearance as follows:

   a. To lower the front of hold-down (A) and decrease clearance, turn adjuster bolt (B) clockwise.

   b. To raise the front of hold-down (A) and increase clearance, turn adjuster bolt (B) counterclockwise.

   NOTE:

   For larger adjustments, it may be necessary to loosen nuts (C) before turning adjuster bolt (B). After adjustment, retighten nuts to 85 Nm (63 lbf·ft).

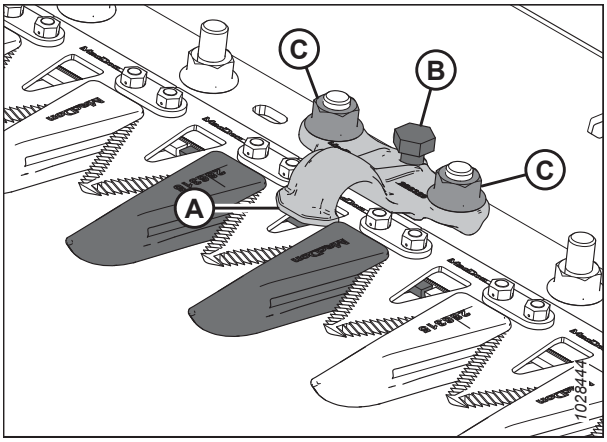


Figure 4.139: Pointed Hold-Down

5. After making the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance. Readjust as necessary.

   IMPORTANT:

   Insufficient hold-down clearance will result in overheating of the knife and guards.

Replacing Pointed Center Knife Guard – Double-Knife

The guard at the center of a double-knife header (where the two knives overlap) requires a slightly different replacement procedure than a pointed knife guard.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Remove two nuts and bolts (C) attaching guard (A) and hold-down (B) to the cutterbar.
5. Remove guard (A), plastic wearplate, and hold-down (B).

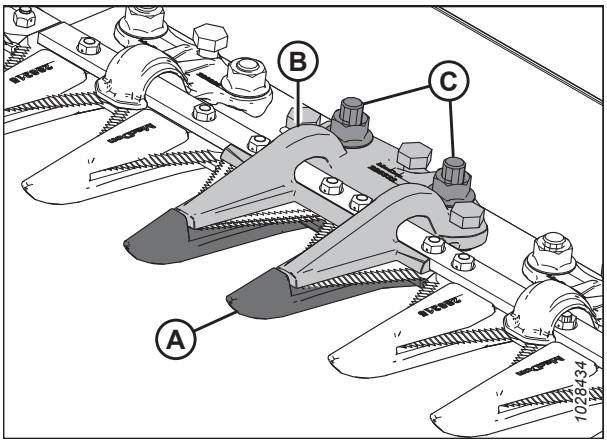


Figure 4.140: Pointed Center Knife Guard

IMPORTANT:

Ensure the replacement guard is the correct guard with offset cutting surfaces (A).

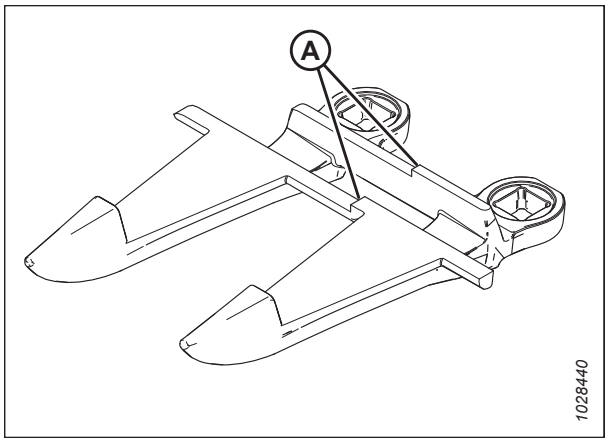


Figure 4.141: Pointed Center Knife Guard

IMPORTANT:

Before installing the new pointed center knife guard, ensure overlap shim (A) is present under the cutterbar, and the thick end of the shim is positioned under the center guard.

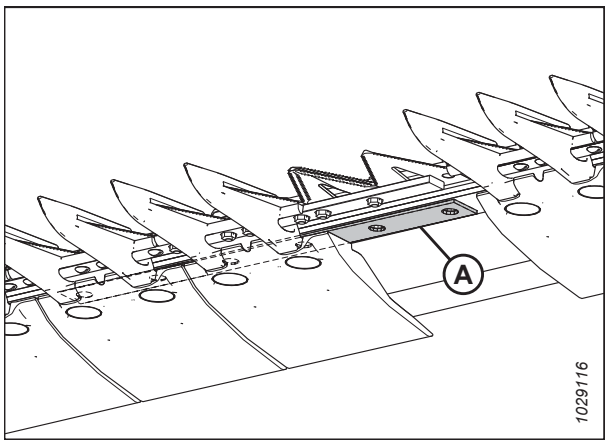


Figure 4.142: Cutterbar

6. Position plastic wearplate (A) and new guard (B) under the cutterbar.

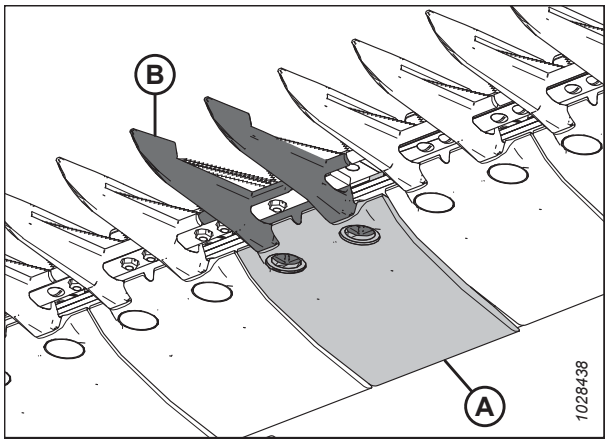


Figure 4.143: Pointed Center Knife Guard and Wearplate

7. Thread three adjustment bolts (A) so they are protruding 4 mm (5/32 in.) from the bottom of pointed center hold-down (B).

8. Position center hold-down (B) onto the cutterbar.

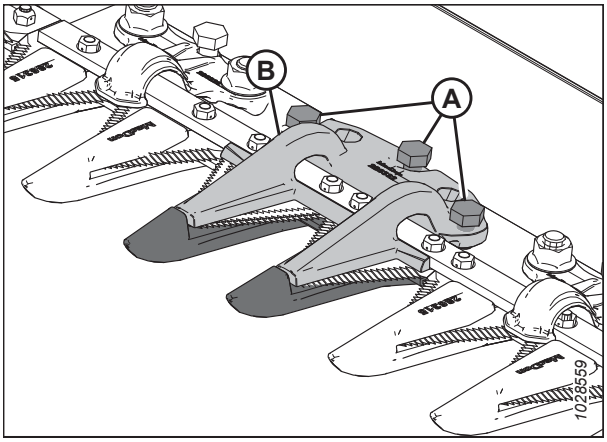


Figure 4.144: Pointed Center Knife Guard

9. Attach pointed center hold-down (A) with two bolts and nuts (B), but do **NOT** tighten at this time.

   IMPORTANT:

   Hold-down (A) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.

10. Adjust the hold-down until the clearance is acceptable.

    - For adjustment instructions, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 558*.
    - For clearance specifications, refer to *Checking Center Hold-Down – Pointed Knife Guards, page 557*.

11. Tighten nuts (B) to 85 Nm (63 lbf·ft).

12. Recheck the clearance.

    - If the clearance is acceptable, the installation of the hold-down is complete.
    - If the clearance is unacceptable, repeat Step *10, page 557* to Step *12, page 557* until the clearance is satisfactory.

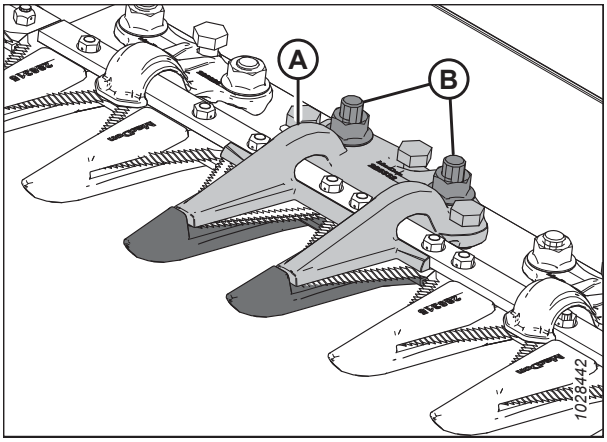


Figure 4.145: Pointed Center Knife Guard

Checking Center Hold-Down – Pointed Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Manually stroke both knives to their inboard end so that the knife sections are under hold-down (A).
5. Push down on the knife section with approximately 44 N (10 lbf) of force, and use a feeler gauge to measure the clearance between hold-down (A) and the knife section. Ensure the clearance is as follows:
   - At tip (B) of hold-down: 0.1–0.5 mm (0.004–0.020 in.)
   - At rear (C) of hold-down: 0.1–1.0 mm (0.004–0.040 in.)
6. If adjustment is required, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 558*.
7. If no adjustment is required, tighten nuts (D) to 85 Nm (63 lbf·ft).
8. Recheck clearance after tightening nuts, and adjust if necessary.

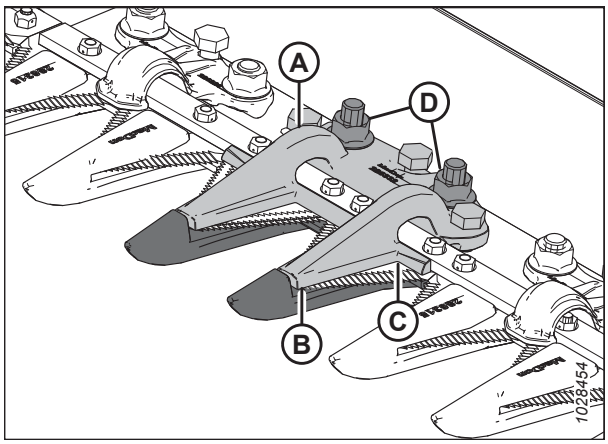


Figure 4.146: Pointed Center Hold-Down

Adjusting Center Hold-Down – Pointed Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

4. To increase the clearance, do the following:
   a. Loosen mounting hardware (B).
   b. Turn adjuster bolts (A).
5. To decrease clearance, turn adjuster bolts (A) clockwise (tighten).
6. To increase clearance, turn adjuster bolts (A) counterclockwise (loosen).
7. To adjust clearance at tip only, adjust using only center (rear) adjustment bolt.
8. Tighten nuts (B) to 85 Nm (63 lbf·ft).
9. Recheck clearances, and make further adjustments if necessary.

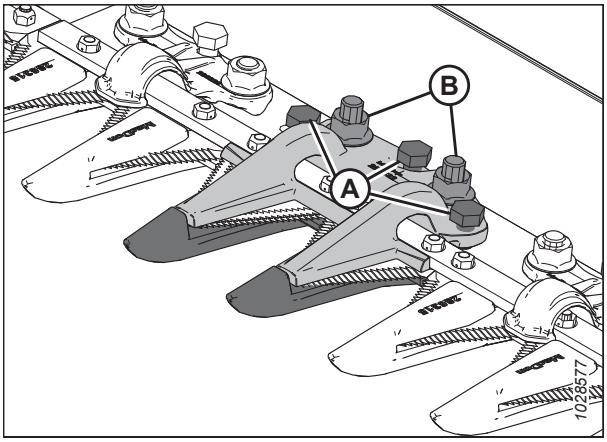


Figure 4.147: Pointed Center Hold-Down

10. After making the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

    IMPORTANT:

    Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

4.8.8 Short Knife Guards and Hold-Downs

Short knife guards are less likely to plug the knife in tough crops such as grasses and canola.

The following knife guards and hold-downs are used in short knife guard configurations:

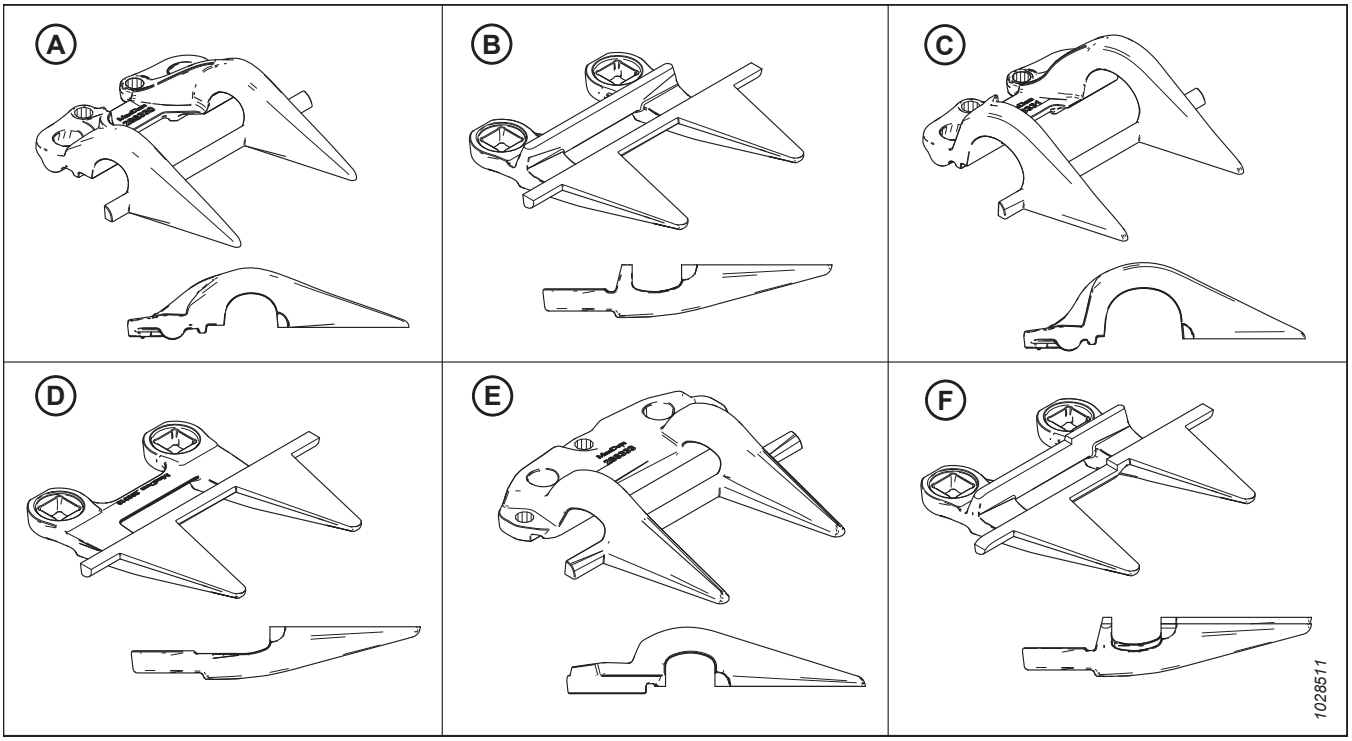


Figure 4.148: Guard and Hold-Down Types used in Short Knife Guard Configurations

A - Short Knife Hold-Down (MD #286330)
B - Short Knife Guard (MD #286318)
C - Short Knife End Hold-Down (MD #286331)[81]
D - Short Knife End Knife Guard (without Wear Bar) (MD #286319)[82]
E - Short Knife Center Hold-Down (MD #286333)[83]
F - Short Knife Center Knife Guard (MD #286320)[83]

Guards are configured differently on different headers. When replacing short knife guards and hold-downs, ensure you use the correct sequence for your header. The following will guide you to the different configurations:

- *Short Knife Guards on Single-Knife Headers, page 561*
- *Short Knife Guards on Double-Knife Headers – All Models Except FD241, page 562*
- *Short Knife Guards on FD241 Double-Knife Header, page 563*

81. Installed in positions 1–3 on drive side(s); installed in position 1 at right end of single-knife headers. Refer to the chapters in the above list for reference.
82. Installed in positions 1–4 on drive side(s). Single-knife headers use standard guard (MD #286318) on the right end. Refer to the chapters in the above list for reference.
83. Double-knife headers only.

Short Knife Guards on Single-Knife Headers

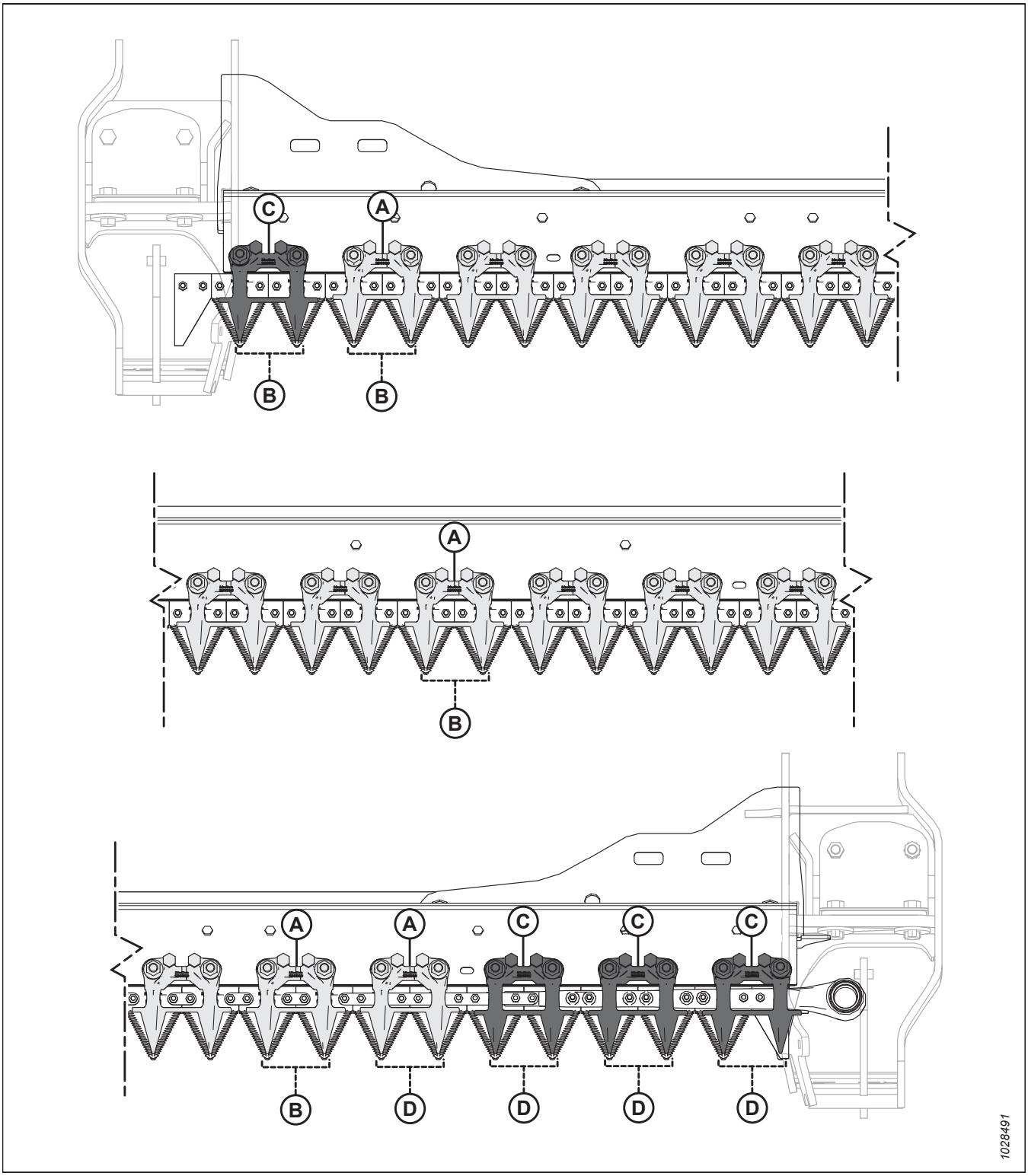


Figure 4.149: Short Knife Guard and Hold-Down Locations – Single-Knife Headers

A - Short Knife Hold-Down (MD #286330)
B - Short Knife Guard (MD #286318)
C - Short Knife End Hold-Down (x4) (MD #286331)
D - Short Knife End Knife Guard (without Wear Bar) (x5) (MD #286319)

Short Knife Guards on Double-Knife Headers – All Models Except FD241

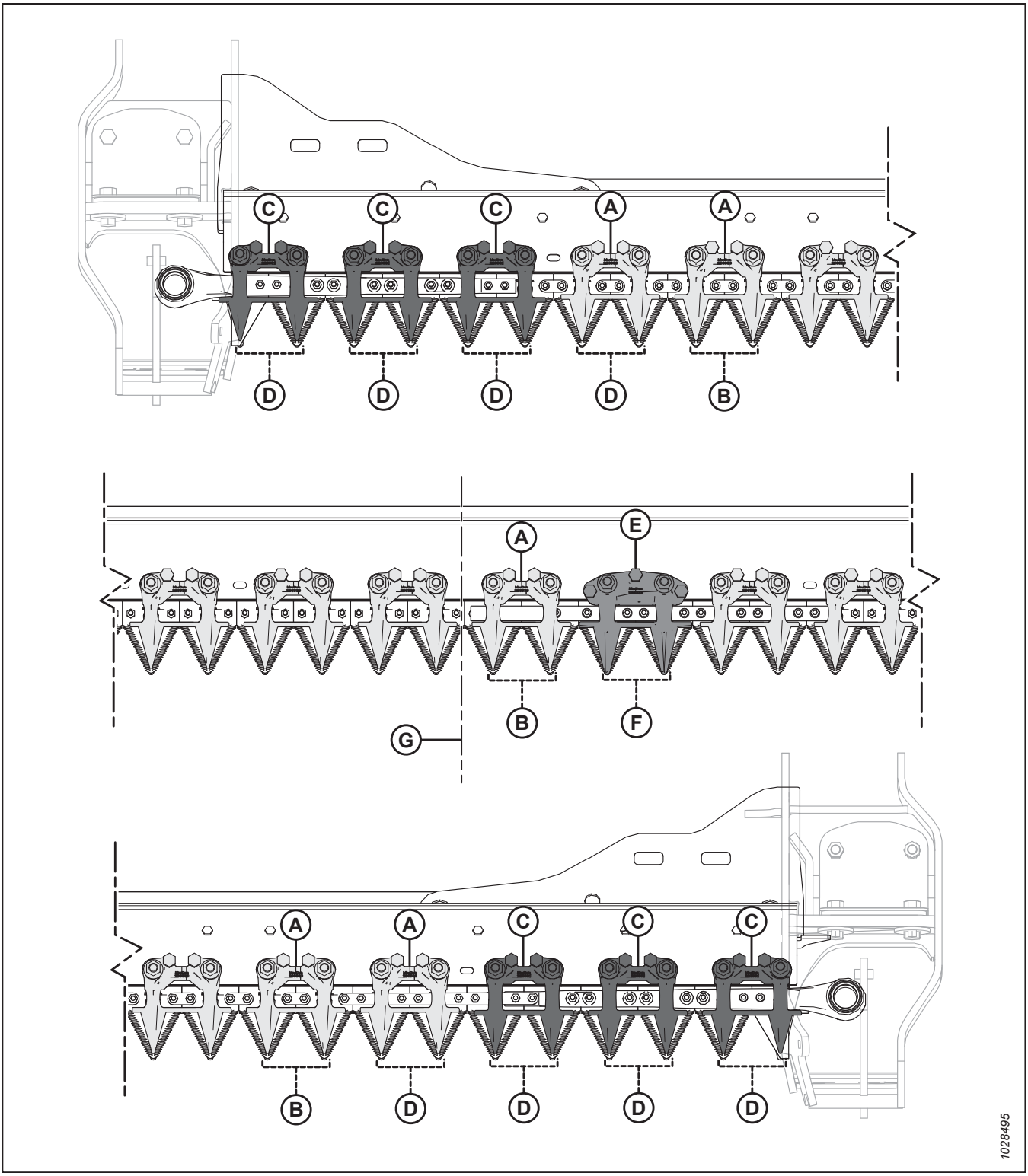


Figure 4.150: Short Knife Guard and Hold-Down Locations – Double-Knife Headers

A - Short Knife Hold-Down (MD #286330)
B - Short Knife Guard (MD #286318)
C - Short Knife End Hold-Down (x6) (MD #286331)
D -Short Knife End Knife Guard (without Wear Bar) (x8) (MD #286319)
E - Short Knife Center Hold-Down (MD #286333)
F - Short Knife Center Knife Guard (MD #286320)
G - Center of Header

Short Knife Guards on FD241 Double-Knife Header

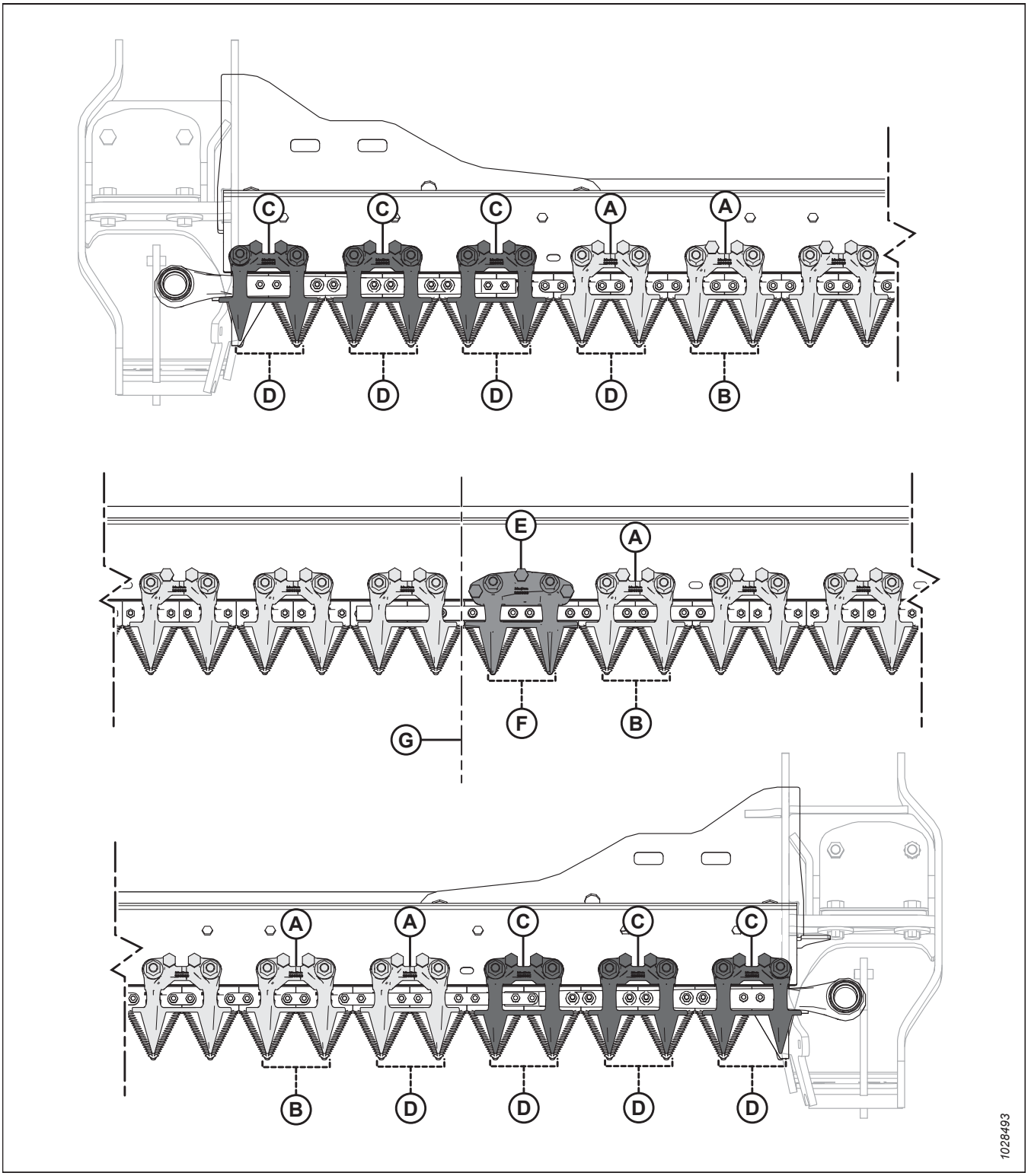


Figure 4.151: Short Knife Guard and Hold-Down Locations – FD241 Double-Knife Header

A - Short Knife Hold-Down (MD #286330)
B - Short Knife Guard (MD #286318)
C - Short Knife End Hold-Down (x6) (MD #286331)
D - Short Knife End Knife Guard (without Wear Bar) (x8) (MD #286319)
E - Short Knife Center Hold-Down (MD #286333)
F - Short Knife Center Knife Guard (MD #286320)
G - Center of Header

Replacing Short Knife Guards or End Knife Guards

Short knife guards or end knife guards are less likely to plug the knife in tough crops such as grasses and canola, and are factory-installed. This procedure is for replacing short knife guards or end knife guards.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

IMPORTANT:

Double-knife headers have an offset center knife guard installed where the two knives overlap. The center knife guard has a slightly different replacement procedure. For instructions, refer to *Replacing Center Knife Guard – Double-Knife, page 567*.

To replace a short knife guard or end knife guard, follow these steps:

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Remove two nuts (A) and bolts attaching short knife guard (B) and hold-down (C) to the cutterbar.
5. Remove short knife guard (B), hold-down (C), and the plastic wearplate.

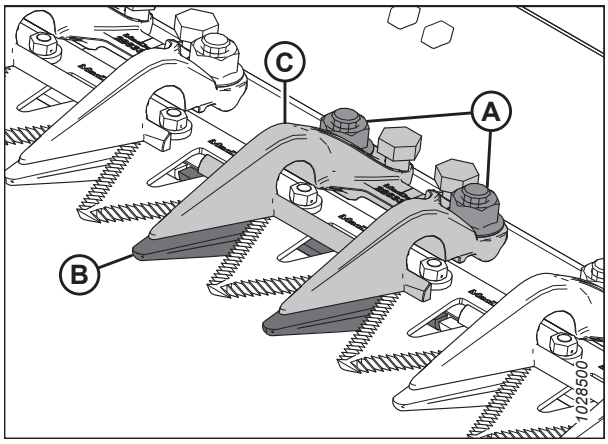


Figure 4.152: Short Knife Guards

IMPORTANT:

The first four knife guards (A) on the drive sides of the header are called end knife guards and do **NOT** have wear bars. Ensure the proper replacement knife guards are installed at these locations.

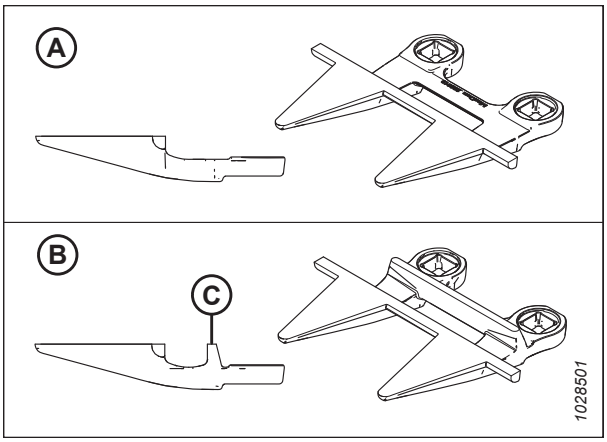


Figure 4.153: End Knife Guard and Short Knife Guards

A - End Knife Guard (MD #286319)
B - Short Knife Guard (with wear bar [C]) (MD #286318)

6. Position plastic wearplate (A) and replacement short knife guard (B) under the cutterbar.

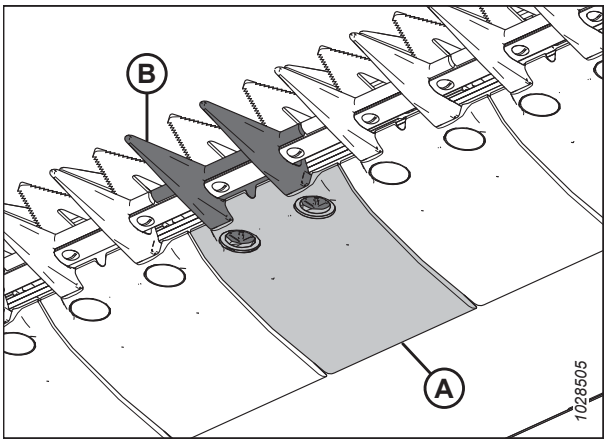


Figure 4.154: Short Knife Guard and Wearplate

7. Position hold-down (A), and loosen two adjustment bolts (B) so that they are not protruding from the bottom of the hold-down.
8. Attach the short knife guard, wearplate, and hold-down with two bolts and nuts (C), but do **NOT** tighten yet.
9. Adjust the hold-down until the clearance is acceptable.
   - For adjustment instructions, refer to *Adjusting Hold-Down – Short Knife Guards, page 566*.
   - For clearance specifications, refer to *Checking Hold-Down – Short Knife Guards, page 566*.
10. Tighten nuts (C) to 85 Nm (63 lbf·ft).

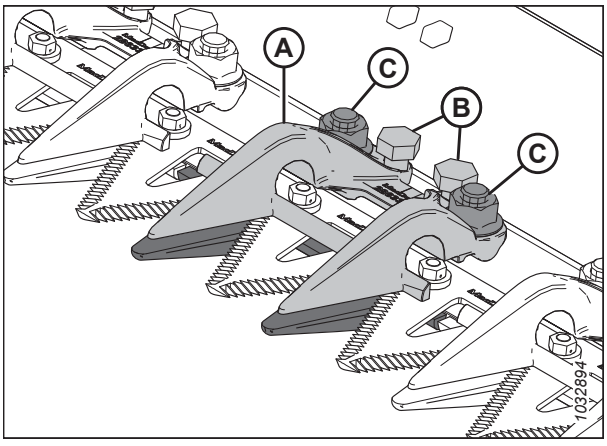


Figure 4.155: Short Knife Guard

11. Recheck the clearance.
    - If the clearance is acceptable, the installation of the hold-down is complete.
    - If the clearance is unacceptable, repeat Step *9, page 565* to Step *11, page 566* until the clearance is satisfactory.

Checking Hold-Down – Short Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

To check the center hold-down on double-knife headers, refer to *Checking Center Hold-Down – Short Knife Guards, page 570*.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Manually stroke the knife to position the section under hold-down (A).
5. Push down on knife section with approximately 44 N (10 lbf) of force, and use a feeler gauge to measure the clearance between the tip of hold-down (B) and the knife section. Ensure the clearance is 0.1–0.5 mm (0.004–0.020 in.).
6. If adjustment is required, refer to *Adjusting Hold-Down – Short Knife Guards, page 566*.

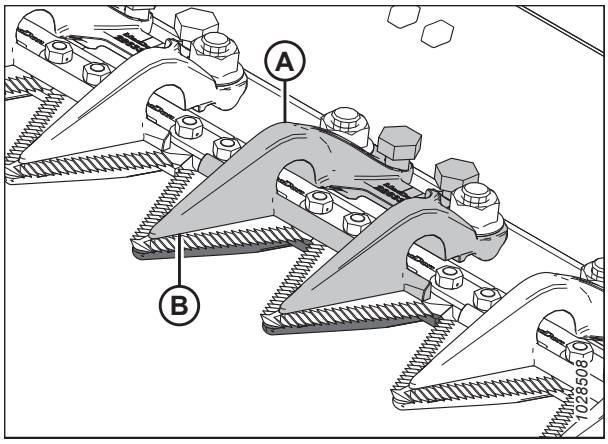


Figure 4.156: Short Knife Guards

Adjusting Hold-Down – Short Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

To adjust the center hold-down on double-knife headers, refer to *Adjusting Center Hold-Down – Short Knife Guards, page 570*.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Adjust the hold-down clearance as follows:
   a. To decrease clearance, turn adjuster bolts (A) clockwise.
   b. To increase clearance, turn adjuster bolts (A) counterclockwise.

      NOTE:

      For larger adjustments, it may be necessary to loosen nuts (B) before turning adjuster bolts (A). After adjustment, retighten nuts to 85 Nm (63 lbf·ft).

   c. Recheck the first point after adjusting the second point, as adjustments to each side can influence the other.
   d. Make further adjustments as necessary.

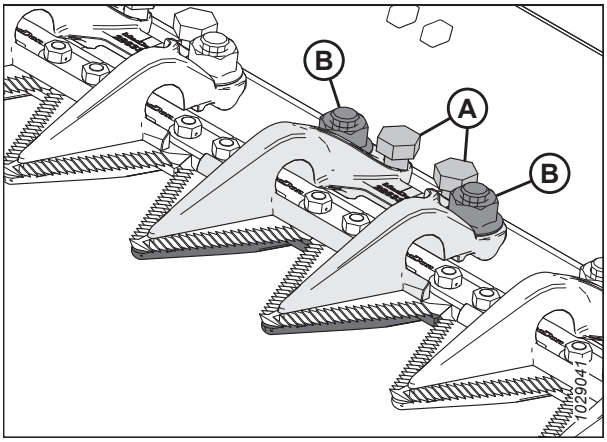


Figure 4.157: Short Knife Guard Hold-Down

5. Recheck clearances, and make further adjustments if necessary.
6. After making the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance. Readjust as necessary.

   IMPORTANT:

   Insufficient hold-down clearance will result in overheating of the knife and guards.

Replacing Center Knife Guard – Double-Knife

The offset guard at the center of a double-knife header (where the two knives overlap) requires a slightly different replacement procedure than a standard guard.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.

3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

4. Remove two nuts and bolts (C) attaching center knife guard (A) and hold-down (B) to the cutterbar.

5. Remove center knife guard (A), plastic wearplate, and hold-down (B).

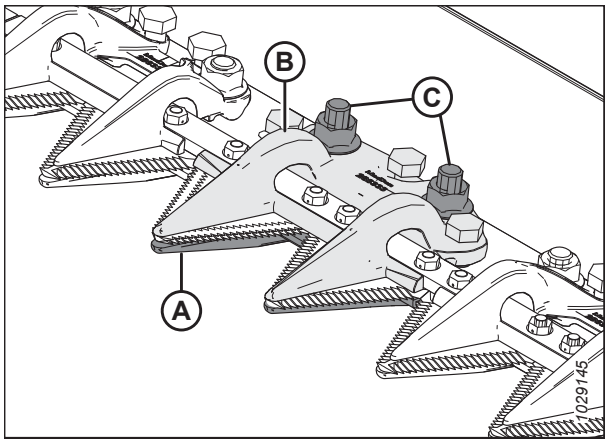


Figure 4.158: Center Knife Guard

IMPORTANT:

Ensure the replacement center knife guard is the correct guard with offset cutting surfaces (A).

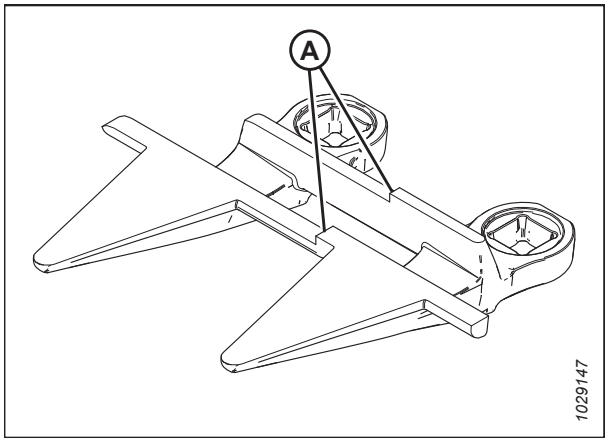


Figure 4.159: Center Knife Guard

IMPORTANT:

Before installing the new center knife guard, ensure overlap shim (A) is present under the cutterbar, and the thick end of the shim is positioned under the center knife guard.

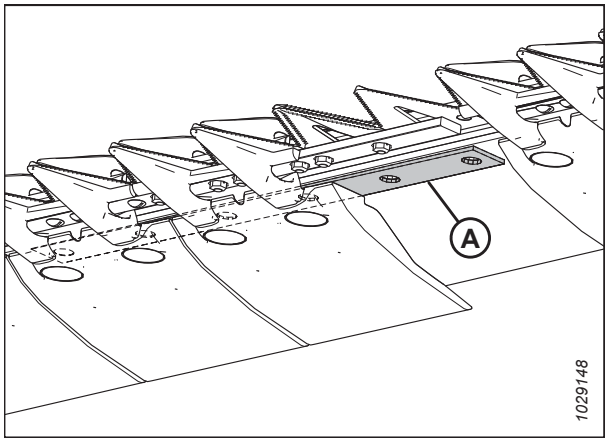


Figure 4.160: Cutterbar

6. Position plastic wearplate (A) and new center knife guard (B) under the cutterbar.

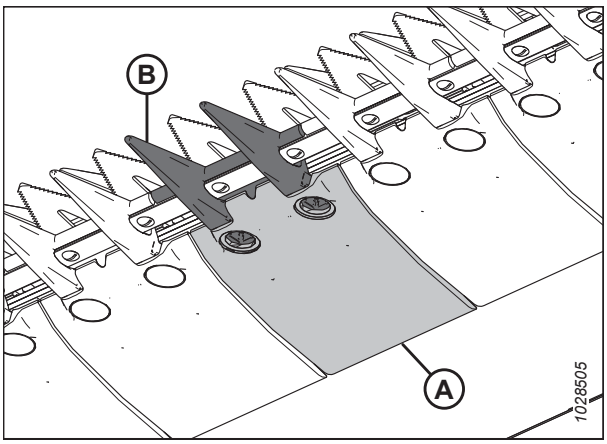


Figure 4.161: Center Knife Guard and Wearplate

7. Thread three adjustment bolts (A) so they are protruding 4 mm (5/32 in.) from the bottom of center hold-down (B).
8. Position center hold-down (B) onto the cutterbar.

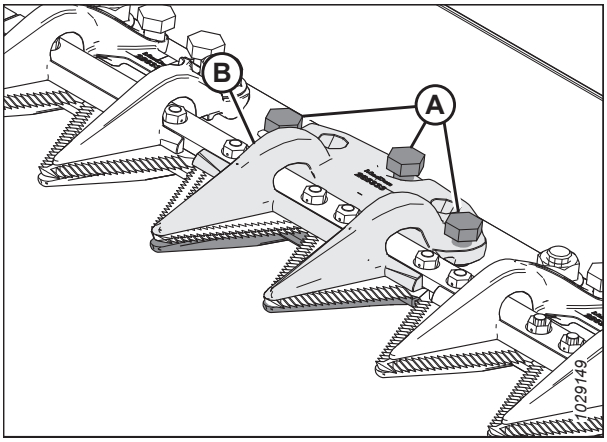


Figure 4.162: Center Knife Guard

9. Attach center hold-down (A) with two bolts and nuts (B), but do **NOT** tighten at this time.

   IMPORTANT:

   Hold-down (A) must accommodate the two overlapping knives at the center knife guard location. Ensure the proper replacement center knife guard is installed at this location.

10. Adjust the hold-down until the clearance is acceptable.
    - For adjustment instructions, refer to *Adjusting Center Hold-Down – Short Knife Guards, page 570*.
    - For clearance specifications, refer to *Checking Center Hold-Down – Short Knife Guards, page 570*.
11. Tighten nuts (B) to 85 Nm (63 lbf·ft).
12. Recheck the clearance.
    - If the clearance is acceptable, the installation of the hold-down is complete.
    - If the clearance is unacceptable, repeat Step *10, page 569* to Step *12, page 569* until the clearance is satisfactory.

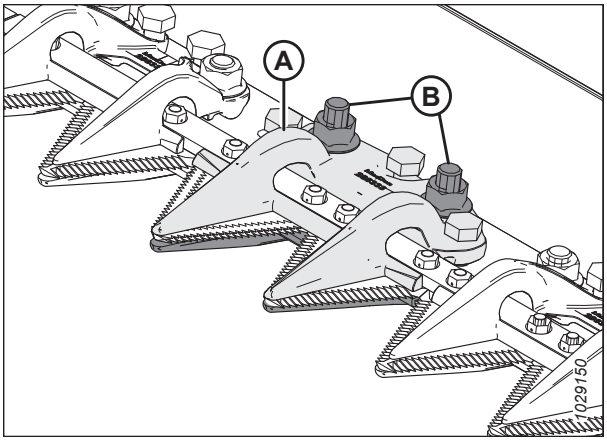


Figure 4.163: Center Knife Guard

Checking Center Hold-Down – Short Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
4. Manually stroke both knives to their inboard end so that knife sections are under hold-down (A).
5. Push down on knife section with approximately 44 N (10 lbf) of force, and use a feeler gauge to measure the clearance between hold-down (A) and the knife section. Ensure the clearance is as follows:
   - At tip (B) of hold-down: 0.1–0.5 mm (0.004–0.020 in.)
   - At rear (C) of hold-down: 0.1–1.0 mm (0.004–0.040 in.)
6. If adjustment is required, refer to *Adjusting Center Hold-Down – Short Knife Guards, page 570*.
7. If no adjustment is required, tighten nuts (D) to 85 Nm (63 lbf·ft).
8. Recheck clearance after tightening nuts.

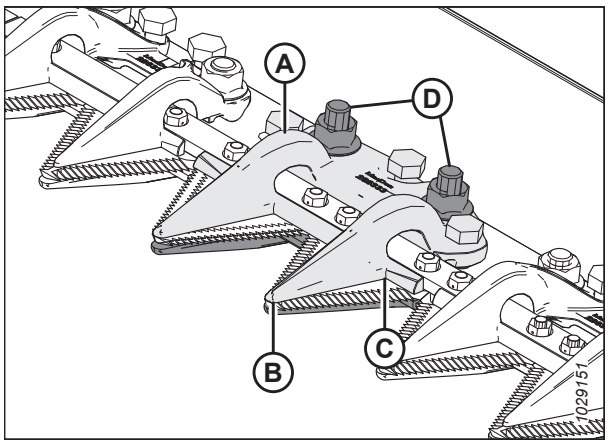


Figure 4.164: Center Knife Guard Hold-Down

Adjusting Center Hold-Down – Short Knife Guards

Perform **DAILY** inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

4. Loosen mounting hardware (B).
5. To decrease clearance, turn adjuster bolts (A) clockwise (tighten).
6. To increase clearance, turn adjuster bolts (A) counterclockwise (loosen).
7. To adjust clearance at tip only, adjust using only center (rear) adjustment bolt.
8. Tighten nuts (B) to 85 Nm (63 lbf·ft).
9. Run the header at low engine speed, and listen for noise caused by insufficient clearance. Readjust as necessary.

   IMPORTANT:

   Insufficient hold-down clearance will result in overheating of the knife and guards.

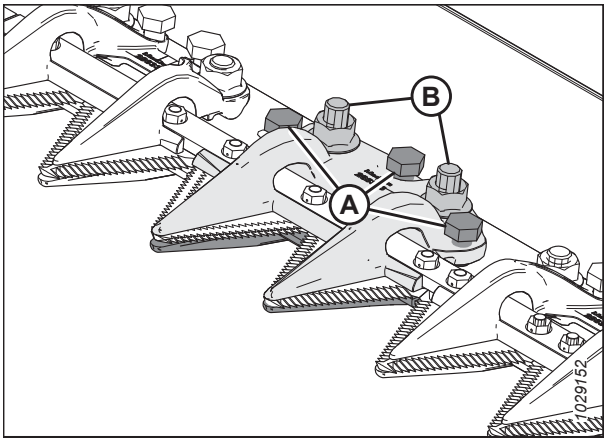


Figure 4.165: Center Hold-Down

4.8.9 Knifehead Shield

The knifehead shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cutout.

Part numbers for knifehead shields / knife opening covers and mounting hardware are listed in the FD2/FM200 Parts Catalog.

IMPORTANT:

Remove the shields when using the cutterbar on the ground in muddy conditions. Mud may pack into the cavity behind the shield which could result in knife drive box failure.

Installing Knifehead Shield

The knifehead shield is primarily used in rice and fine grasses to keep crop from getting caught in the delivery opening. Not recommended in all conditions.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

WARNING

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

5. Retrieve the knifehead shields from the manual storage case.
6. Place knifehead shield (A) against the endsheet as shown. Align the shield so the cutout matches the profile of the knifehead and/or hold-downs.
7. Align the mounting holes and secure with two M10 x 30 hex head bolts, washers (B), and nuts.
8. Tighten bolts (B) just enough to hold knifehead shield (A) in place while allowing it to be adjusted as close to the knifehead as possible.
9. Manually rotate the knife drive box pulley to move the knife and check for areas of contact between the knifehead and knifehead shield (A). Adjust the shield to eliminate interference with the knife if necessary.
10. Tighten bolts (B).

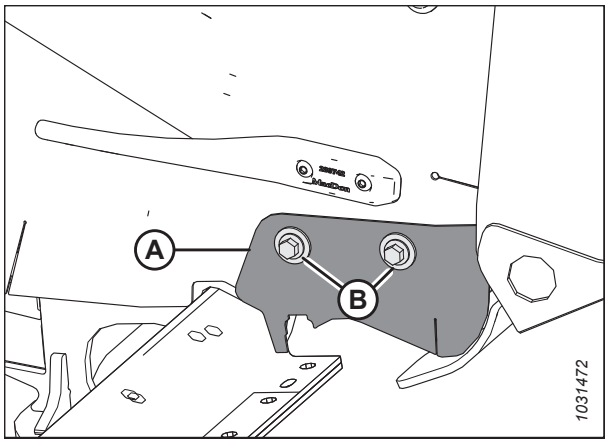


Figure 4.166: Knifehead Shield

4.9 Knife Drive System

The knife drive system transforms pumped hydraulic pressure into a mechanical motion that stokes a series of serrated knife blades at the front of the header back and forth to cut a variety of crops.

4.9.1 Knife Drive Box

Knife drive box (A) is driven by a hydraulic motor (B), and converts rotational motion into the reciprocating motion of the knife. Single-knife headers have a knife drive box and motor on the left side; double-knife headers have a knife drive box and motor at each end.

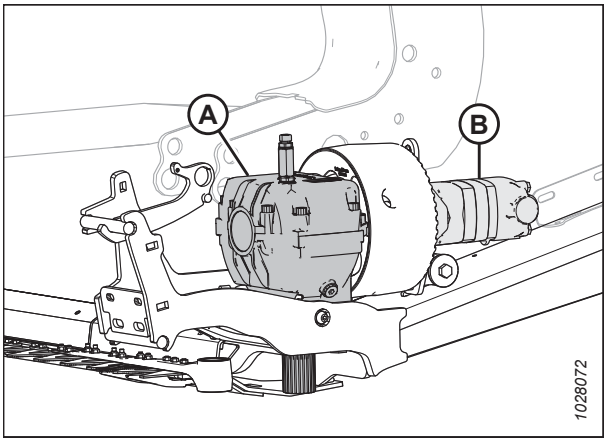


Figure 4.167: Left Side Knife Drive Box Shown – Right Side Similar

Checking Oil Level in Knife Drive Box

Single-knife headers have one knife drive box and double-knife headers have two knife drive boxes. To access the knife drive box(es), the endshield(s) must be fully opened.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
4. Remove oil level dipstick (A) and check the oil level. The oil level must be within range (B).

   NOTE:

   Before checking the oil level, ensure the top of the knife drive box is horizontal and oil level dipstick (A) is screwed in.
5. Reinstall oil level dipstick (A), and tighten to 23 Nm (17 lbf·ft).

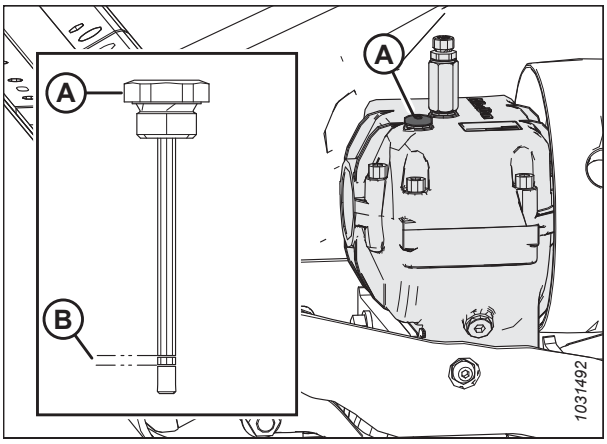


Figure 4.168: Knife Drive Box

Checking Mounting Bolts

Check the torque on the four knife drive box mounting bolts (A) and (B) after the first 10 hours of operation and every 100 hours thereafter.

1. Ensure all bolts are torqued to 343 Nm (253 lbf·ft). Torque side bolts (A) first, then torque bottom bolts (B).

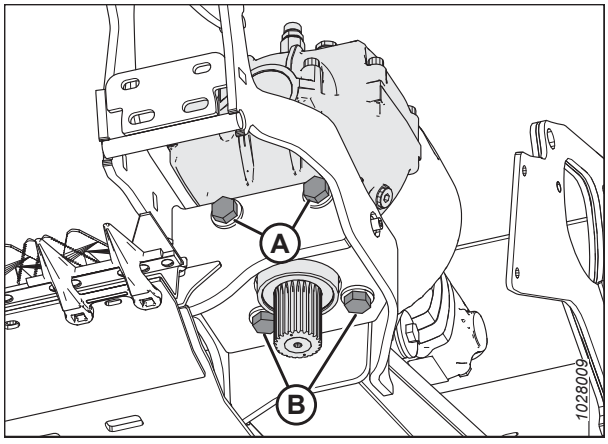


Figure 4.169: Knife Drive Box – View from Below

Changing Oil in Knife Drive Box

Change the knife drive box lubricant after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Raise the header fully.
2. Shut down the combine, and remove the key from the ignition.
3. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
4. Place a container large enough to hold approximately 1.5 L (0.4 US gal) under the knife drive box to collect the oil.
5. Remove dipstick (A) and drain plug (C).
6. Allow the oil to drain from the knife drive box and into the container placed below it.
7. Reinstall drain plug (C).
8. Add 1.5 L (0.4 US gal) of oil to the knife drive box. Refer to the inside back cover for recommended fluids and lubricants.

   NOTE:

   Check the oil level with the top of knife drive box horizontal and with oil level dipstick (A) screwed in.
9. Check that the oil level is within range (B).
10. Close the endshield. For instructions, refer to *Closing Header Endshields, page 48*.

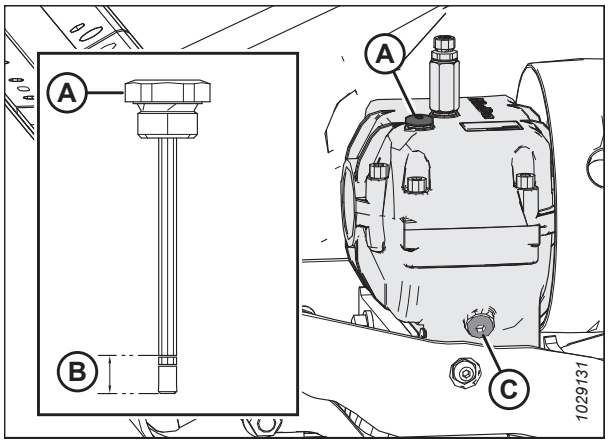


Figure 4.170: Knife Drive Box

4.10 Feed Deck

The feed deck is located on the FM200 Float Module. It consists of a motor and feed draper that conveys cut crop to the feed auger.

4.10.1 Replacing Feed Draper

Replace the feed draper if it is torn, cracked, or missing slats.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header's safety props. For instructions, refer to the combine operator's manual.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
6. To access the draper: Remove five countersunk screws (A) and retainer (B). Remove one button head screw and washer (C). Flip mid-filler (D) over. Repeat this step on the opposite side of the feed deck.

   NOTE:

   If you need to replace mid-fillers (D), obtain service kit MD #347963.

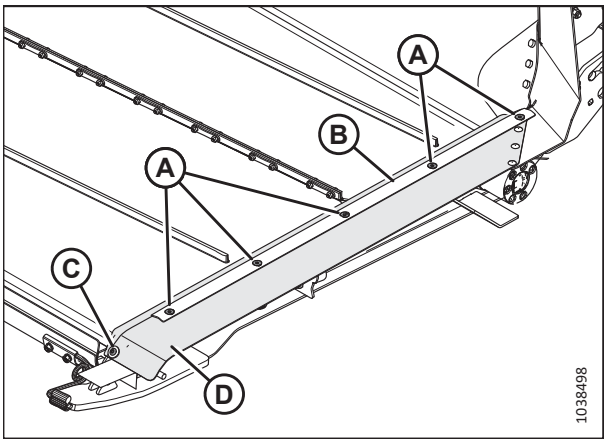


Figure 4.171: Draper Seal

7. To release the draper tension, loosen jam nut (A) and turn bolt (B) counterclockwise. Repeat at the opposite side of the header.

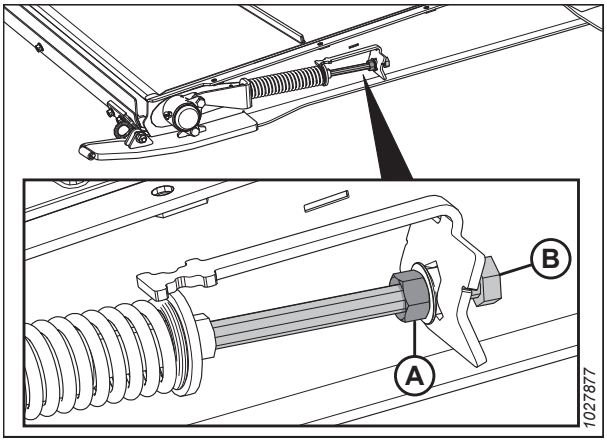


Figure 4.172: Feed Draper Tensioner

8. Remove the following hardware (A) from idler roller casting (B) on both sides of the feed deck:
   - Socket head bolt, washer, and nut.
9. Move the idler roller back within the cutout in the frame to aid in draper replacement.

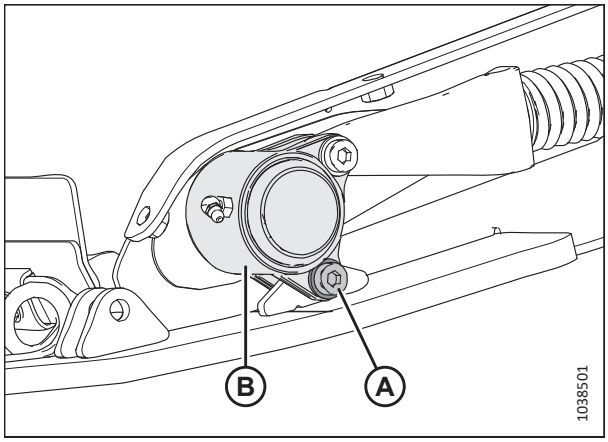


Figure 4.173: Idler Roller Bearing Housing

10. Unlatch feed deck pan handle (A) from handle latch supports (B) on both sides of the feed deck. This will drop the door down and allow access to the feed deck draper and rollers.

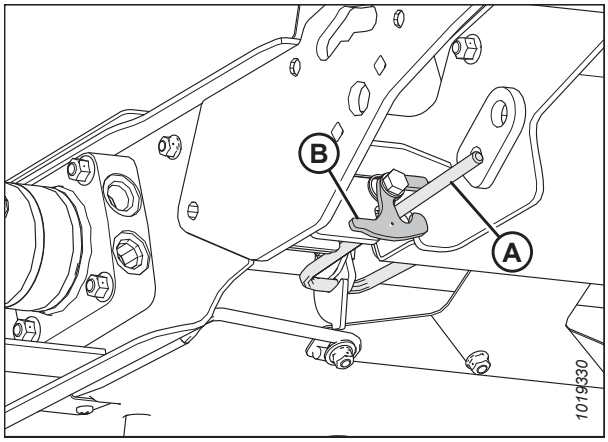


Figure 4.174: Feed Deck Pan Handle and Left Side Pan Handle Latch

11. Remove nuts and screws (A), and remove draper connector straps (B).
12. Pull the draper from the deck.

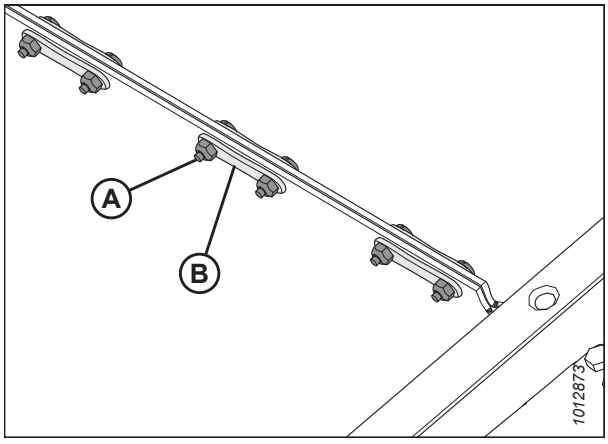


Figure 4.175: Draper Connector

13. Install the new draper over drive roller (A). Make sure the draper guides fit into drive roller grooves (B).
14. Pull draper along bottom of feed deck and over idler roller (C).

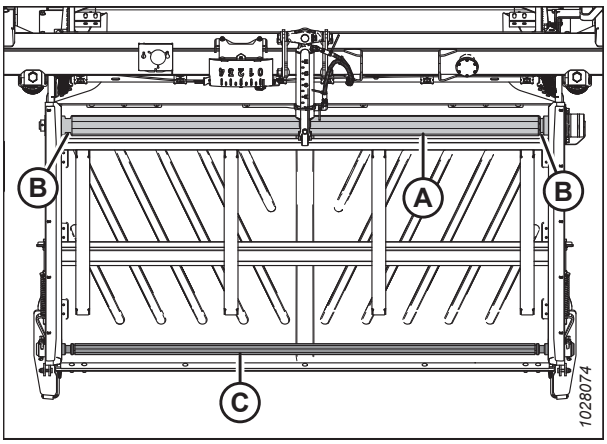


Figure 4.176: Float Module Feed Draper

15. Connect the draper joint with connector straps (B) and secure with nuts and screws (A). Ensure the screw heads face towards the rear of the deck, and tighten only until the end of the screws are flush with the nuts.

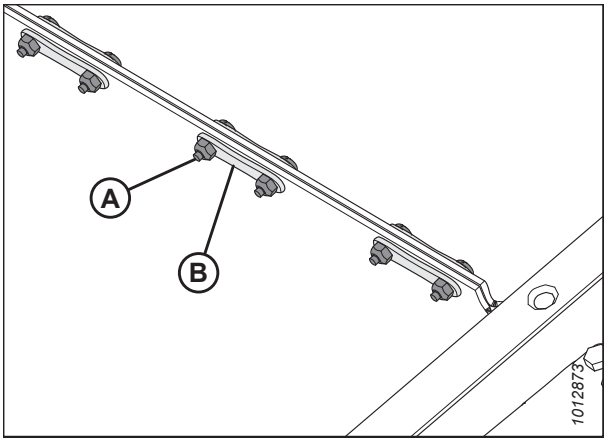


Figure 4.177: Draper Connector Straps

16. Move the idler back to the operating position. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to bolt threads and reinstall the following hardware (A) to secure idler roller casting (B) to the frame. Repeat this step on the opposite side of the feed deck:
    - Socket head bolt, washer, and nut.
17. Tighten bolt (A) to 12 Nm (9 lbf·ft).

    IMPORTANT:

    Do **NOT** fully tighten bolt (A).
18. Adjust the draper tension. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 578*.

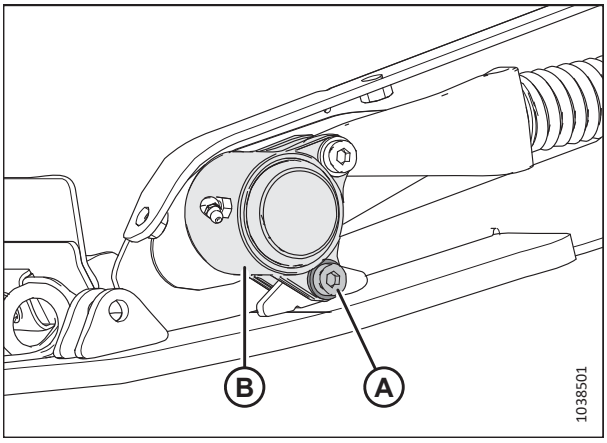


Figure 4.178: Idler Roller Bearing Housing

19. Close the feed deck by latching pan handle latch support (B) to feed deck pan handle (A) at both sides of the feed deck.

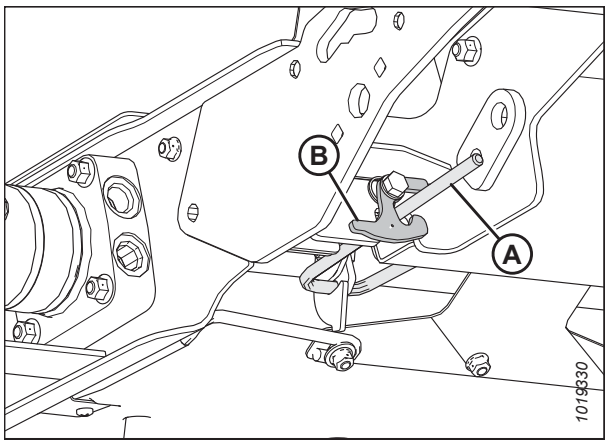


Figure 4.179: Feed Deck Pan Handle and Left Side Pan Handle Latch

20. Reinstall mid-filler (D) with one button head screw and washer (C). Reinstall retainer (B) with five countersunk screws (A). Repeat this step on the opposite side of the feed deck.

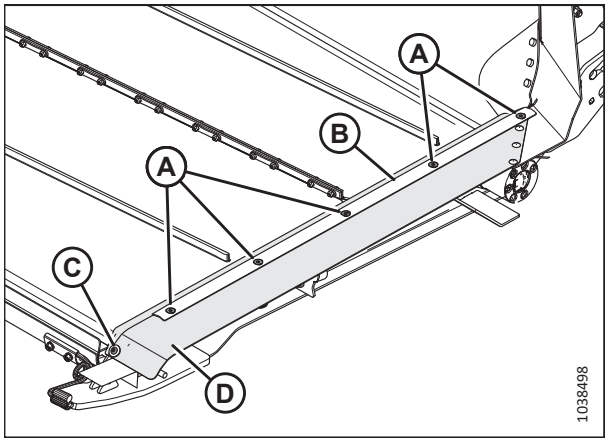


Figure 4.180: Draper Seal

4.10.2 Checking and Adjusting Feed Draper Tension

Proper tension is required for the feed draper not to slip or have tracking issues.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

NOTE:

Illustrations show the left side of the float module. The right side is opposite.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. Refer to the combine Operator's Manual.

Checking feed draper tension:

4. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in the groove on the drive roller and the idler roller is between the guides.

5. Check the position of spring retainer disc (A). If the feed draper tracks properly and the spring retainers on both sides of the draper are correctly positioned, then no adjustment is necessary.

   NOTE:

   The starting position of spring retainer disc (A) is centered within the U shape on indicator (B); however, the position of the disc (A) will vary after draper tracking adjustment.

6. If adjustment is necessary, proceed to Step *7, page 579*.

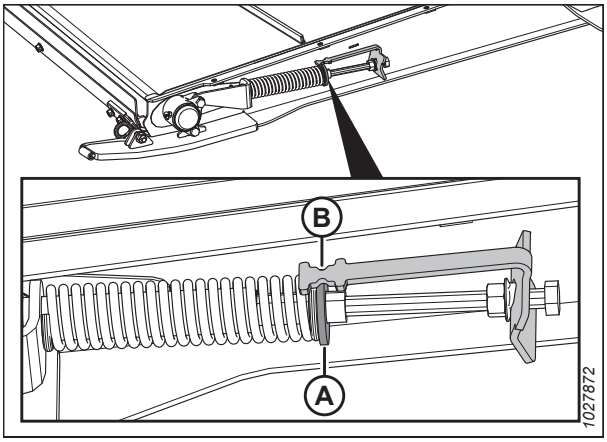


Figure 4.181: Feed Draper Tensioner

Adjusting feed draper tension:

7. Adjust the draper tension by loosening jam nut (A) and turning bolt (B) clockwise to increase draper tension or counterclockwise to decrease draper tension. Retainer disc (C) should be in the middle of indicator (D).

   IMPORTANT:

   For small tension adjustments, you may need to only adjust one side of the draper. For larger tension adjustments and to avoid uneven draper tracking, you may need to adjust both sides of the draper equally.

8. If the draper is not tracking properly, retainer disc (C) can be adjusted so that it is **NOT** in the middle of indicator (D), but within the following range:

   - Loosened to 3 mm (1/8 in.), retainer disc (C) will move towards the front of the deck from center of indicator (D).
   - Tightened to 6 mm (1/4 in.), retainer disc (C) will move towards the back of the deck from the center of indicator (D).

9. Tighten jam nut (A). Ensure flange nut (E) is tight against the indicator bracket.

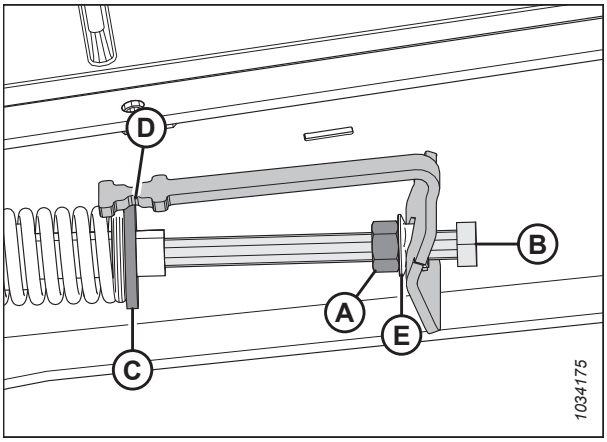


Figure 4.182: Feed Draper Tensioner – Left Side

4.10.3 Feed Draper Drive Roller

The feed draper drive roller is hydraulically driven to rotate the feed draper and convey crop toward the feeder house auger.

Removing Feed Draper Drive Roller

The feed draper drive roller needs to be removed when repairing or replacing it.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
6. Engage the header's safety props. For instructions, refer to the combine operator's manual.
7. To release the draper tension, loosen jam nut (A) and turn bolt (B) counterclockwise. Repeat at the opposite side of the header.

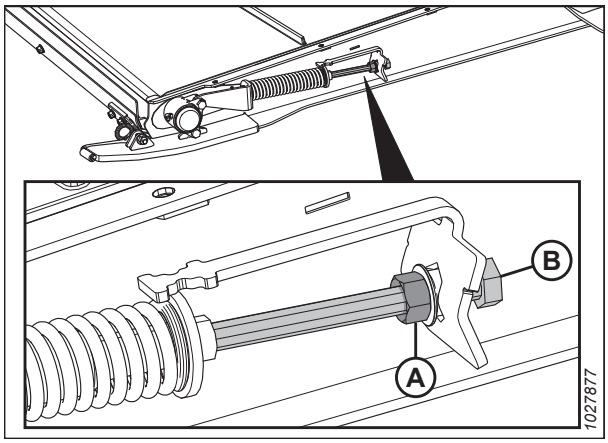


Figure 4.183: Feed Draper Tensioner

8. Remove nuts and screws (A), and remove draper connector straps (B).
9. Lift the sides of the draper to expose the rollers.

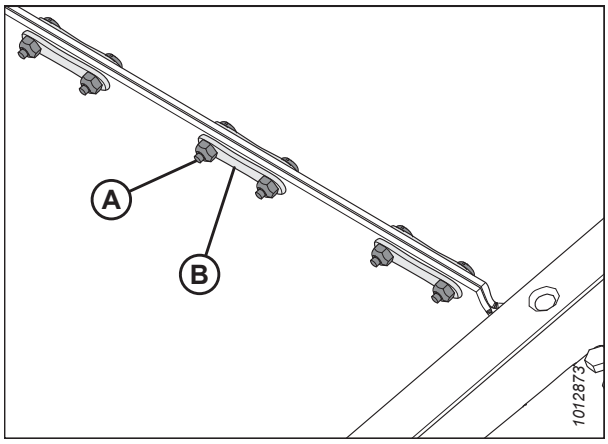


Figure 4.184: Draper Connector

10. On the right side of the deck, remove two nuts (A) and bolts from drive roller bearing housing (B).

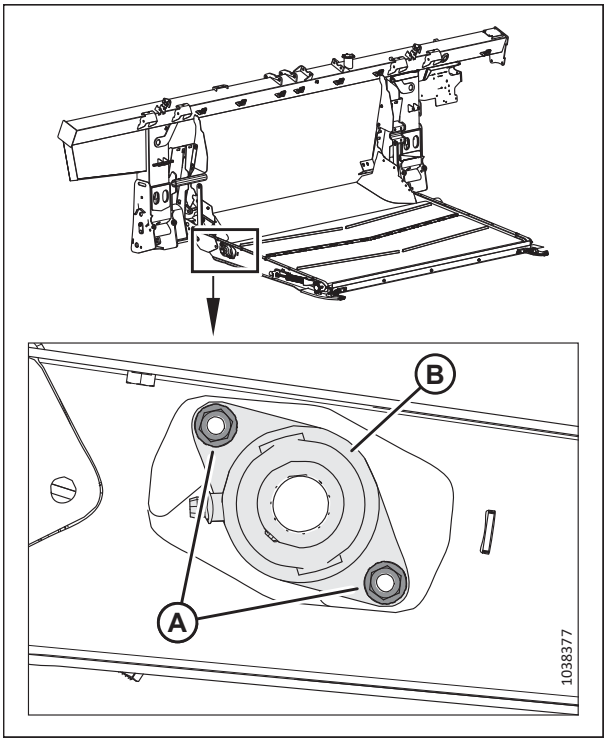


Figure 4.185: Drive Roller Bearing

11. Slide the drive roller with bearing assembly (A) to the right until the left end comes off of the motor spline.

12. Remove both covers (B).

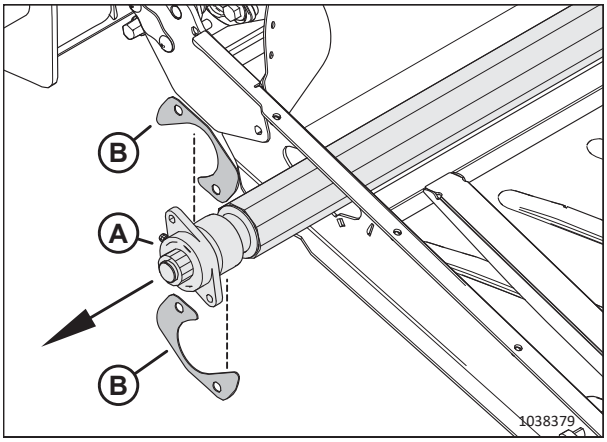


Figure 4.186: Drive Roller

13. Lift the left end out of the frame.
14. Slide assembly (A) to the left, guiding bearing housing (B) through frame opening (C).
15. Remove roller (A).

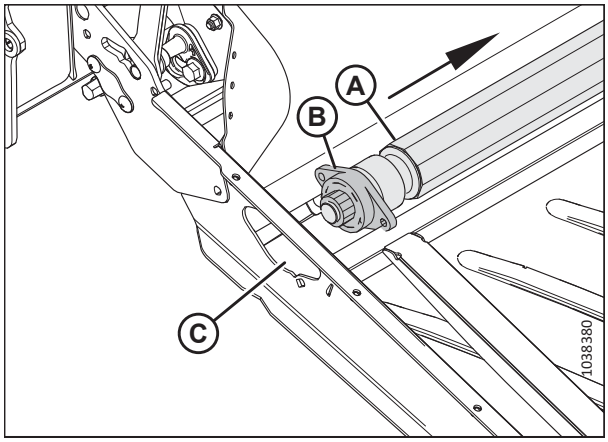


Figure 4.187: Drive Roller

Installing Feed Draper Drive Roller

The feed draper drive roller needs to be installed after it has been repaired or replaced.

1. Apply grease to the motor spline.
2. Guide bearing end (A) of the drive roller through frame opening (B).

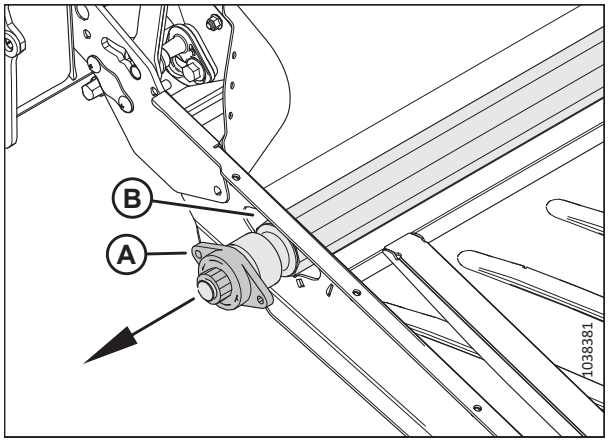


Figure 4.188: Drive Roller – Bearing End

3. Slide the left end of drive roller (A) onto spline of motor (B).

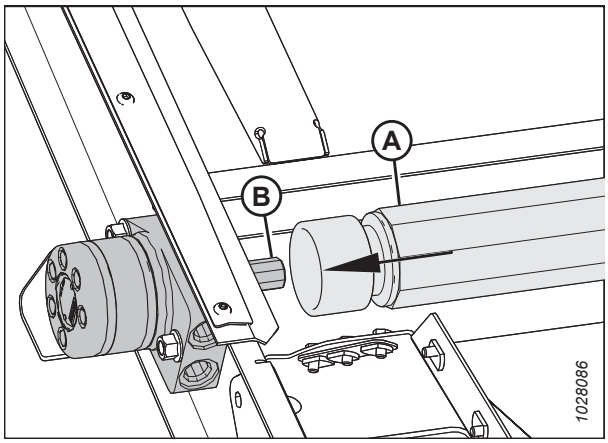


Figure 4.189: Motor

4. Install two bolts (A) into the feed deck.
5. Install both covers (B) onto the two bolts.

   IMPORTANT:

   Position the covers in the order shown.
6. Secure the drive roller bearing housing using two nuts (D).
7. Install the feed deck draper. For instructions, refer to *4.10.1 Replacing Feed Draper, page 575*.
8. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 578*.

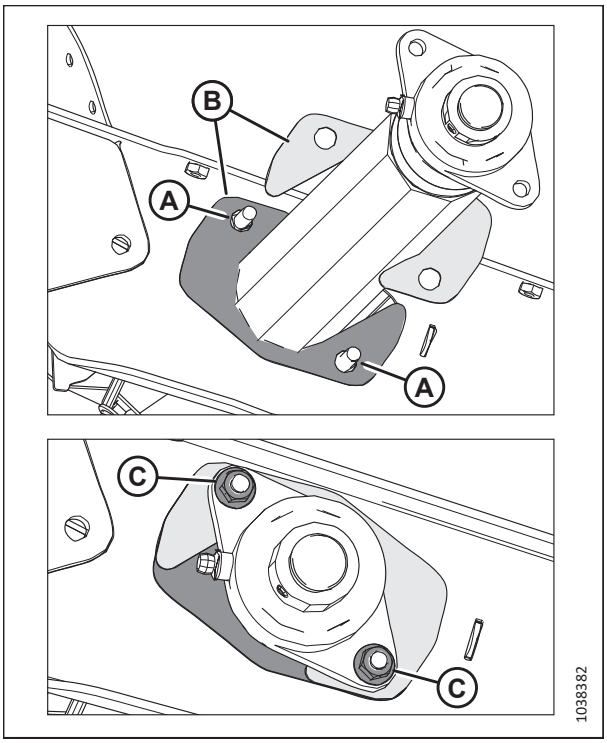


Figure 4.190: Drive Roller – Bearing End

Removing Feed Draper Drive Roller Bearing

The feed draper drive roller bearing helps the roller turn. The bearing needs to be removed when replacing it.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Engage the header's safety props. For instructions, refer to the combine operator's manual.

6. To release the draper tension, loosen jam nut (A) and turn bolt (B) counterclockwise. Repeat at the opposite side of the header.

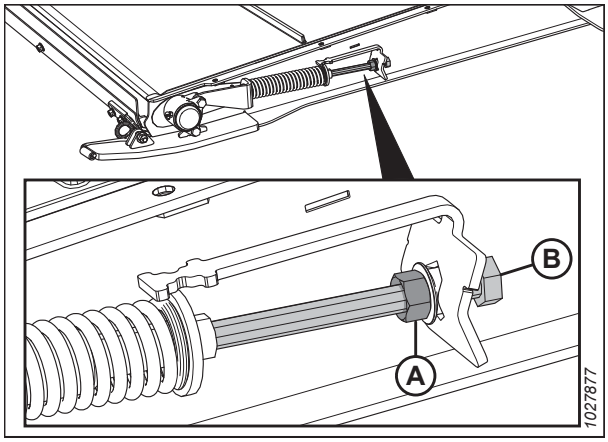


Figure 4.191: Feed Draper Tensioner

7. Loosen set screw (A) on bearing lock (B).
8. Using a hammer and punch, tap bearing lock (B) in the direction opposite to the auger rotation to release the lock.

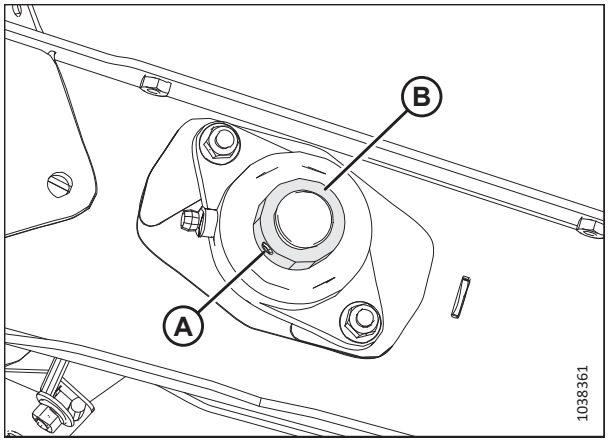


Figure 4.192: Feed Draper Drive Roller Bearing

9. Remove two nuts (A).

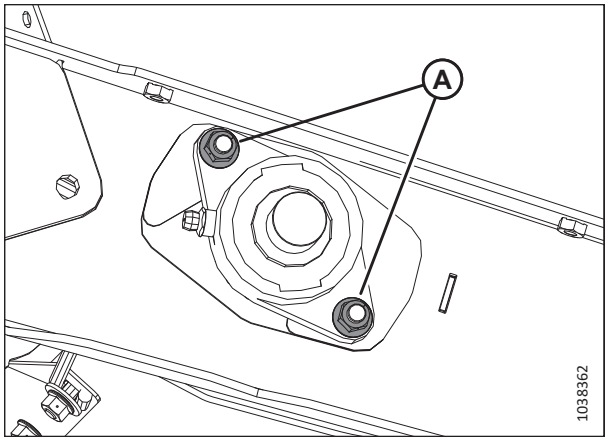


Figure 4.193: Feed Draper Drive Roller Bearing

10. Remove bearing housing (A).

    NOTE:

    If the bearing is seized on the shaft, it may be easier to remove the drive roller assembly. For instructions, refer to *Removing Feed Draper Drive Roller, page 580*.

11. Check both covers (B) for damage. If you need to replacement them, obtain kit MD #347553.

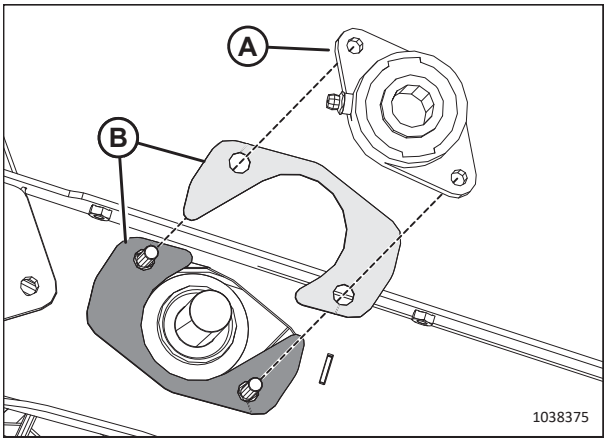


Figure 4.194: Feed Draper Drive Roller Bearing

Installing Feed Draper Drive Roller Bearing

The bearing is held in place with bolts and a lock collar.

1. Install two bolts (A) into the feed deck.
2. Install both covers (B) onto the two bolts.

    IMPORTANT:

    Position the covers in the order shown.

3. Install drive roller bearing housing (C) onto the shaft.
4. Secure the housing using two nuts (D).
5. Install bearing lock collar (E) onto the shaft.
6. Using a hammer and punch, tap the bearing lock in the direction of auger rotation to lock.
7. Tighten bearing lock set screw (F).
8. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 578*.

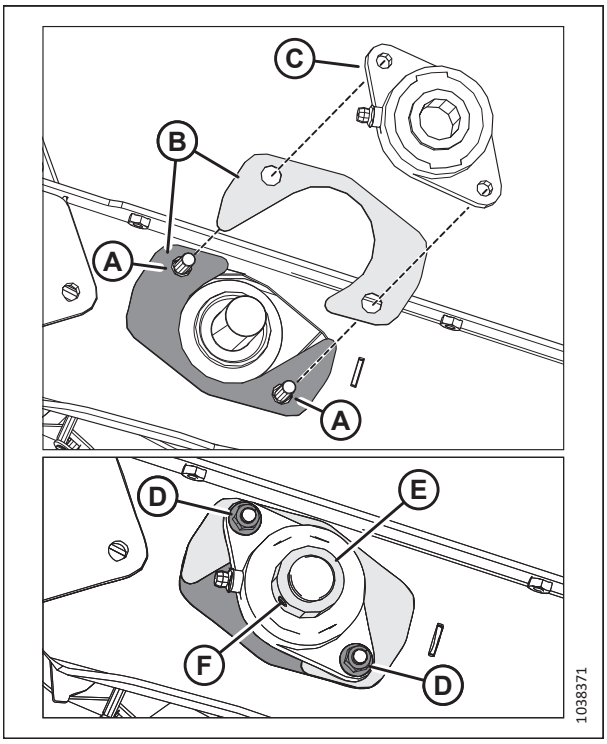


Figure 4.195: Feed Draper Drive Roller Bearing

4.10.4 Feed Draper Idler Roller

The feed draper idler roller is driven by the friction of the feed draper being turned by the drive roller. Like the drive roller, the idler roller helps the feed draper convey crop to the auger.

Removing Feed Draper Idler Roller

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Engage the header's safety props. For instructions, refer to the combine operator's manual.
6. To release the draper tension, loosen jam nut (A) and turn bolt (B) counterclockwise. Repeat at the opposite side of the header.

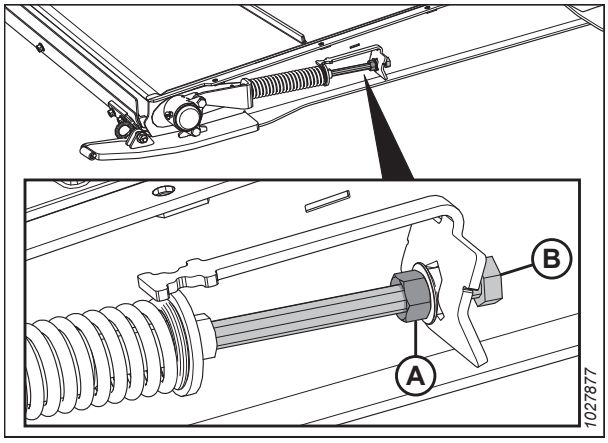


Figure 4.196: Feed Draper Tensioner

7. Remove nuts and screws (A), and remove draper connector straps (B).
8. Separate the draper.
9. Lower the front of the feed deck.

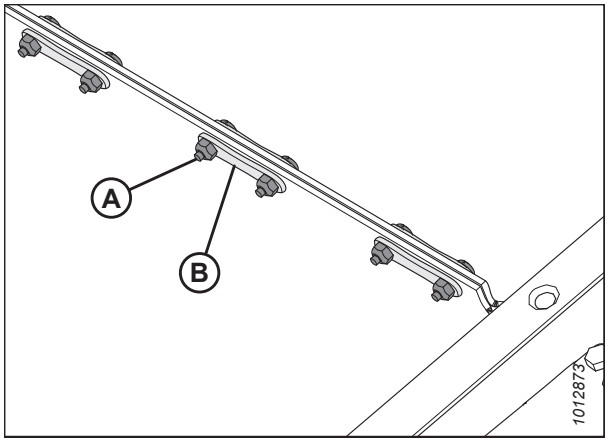


Figure 4.197: Draper Connector

10. Remove dust cap (A) and nut (B) from bearing housing (C).

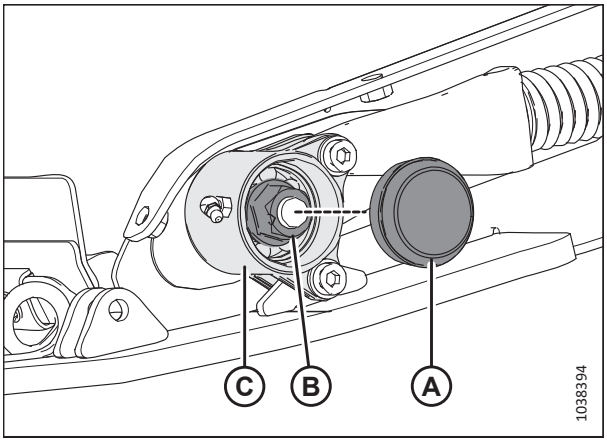


Figure 4.198: Idler Roller Bearing Housing

11. Remove the following hardware from location (A) that secures the bearing housing to the deck skid and tensioner:
    - Socket head bolt, washer, and nut.
12. Remove bearing housing (B) from the idler roller.
13. Repeat Step *10, page 587* to Step *12, page 587* on the opposite side of the feed deck.

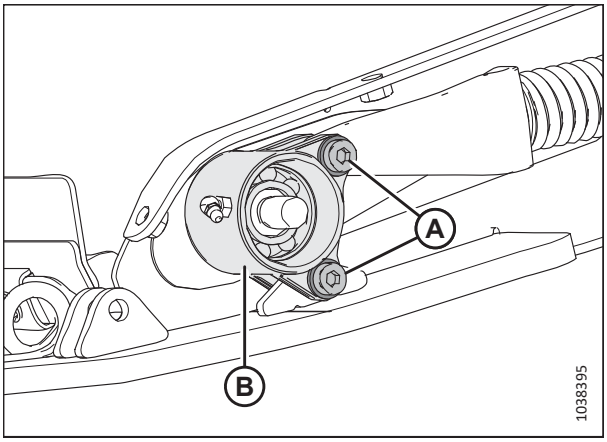


Figure 4.199: Idler Roller Bearing Housing

14. On one side of the deck frame, remove nut (A) and cover (B).

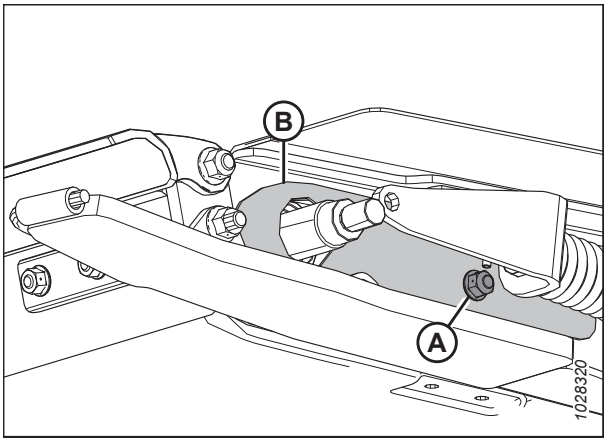


Figure 4.200: Idler Roller Cover

15. Slide idler roller (A) out through the cutout in the deck frame.

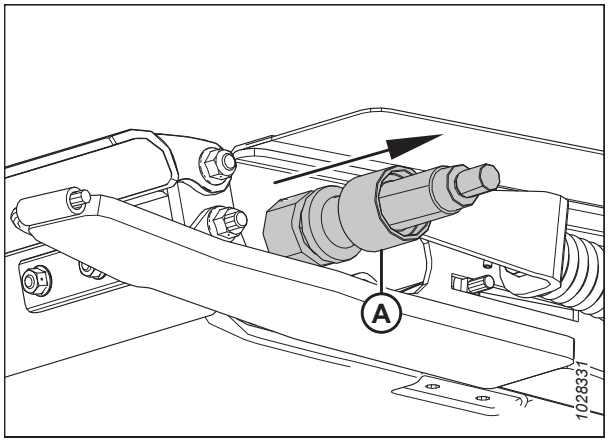


Figure 4.201: Idler Roller

Installing Feed Draper Idler Roller

The feed draper idler roller needs to be installed after it has been repaired or replaced

1. Slide cover (A) over one end of the idler roller.
2. Brush idler roller shaft (B) with oil.
3. Carefully rotate bearing assembly (C) onto the shaft by hand to prevent seal damage.

   IMPORTANT:

   Ensure the bearing assembly is square to the shaft to prevent seal damage during installation.

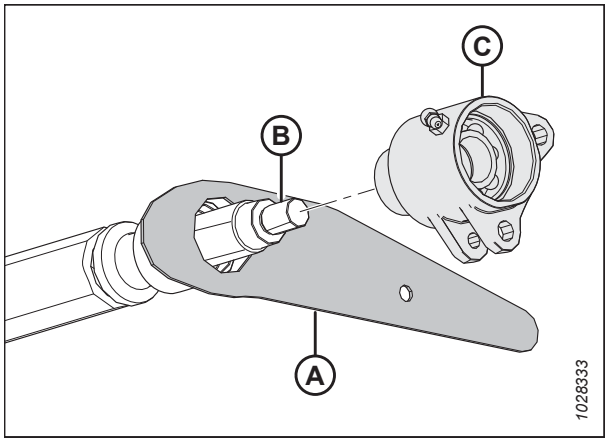


Figure 4.202: Idler Roller

4. After the bearing and both seals are seated around the shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).

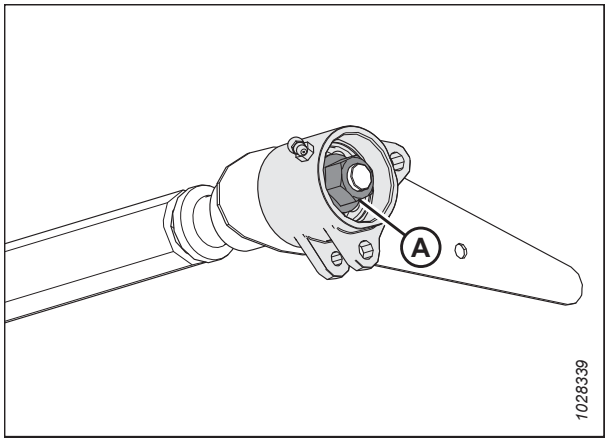


Figure 4.203: Idler Roller

5. Slide idler roller (A) through the cutout in the deck frame.

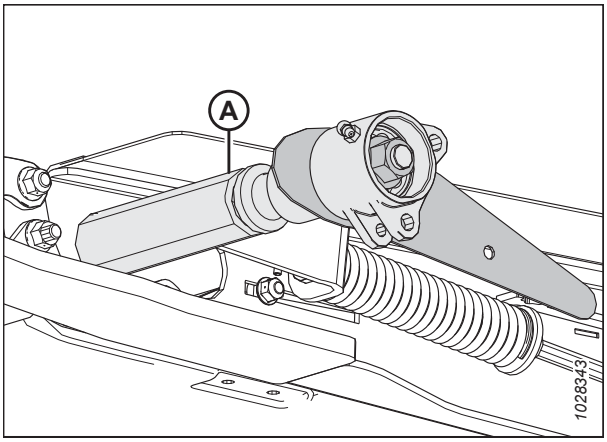


Figure 4.204: Feed Deck – Left Side

6. Install the bolt from inside of the feed deck to secure idler cover (B).
7. Install nut (B). Do **NOT** overtighten the nut. It should be snug, as it holds the idler cover in place and it must move with the idler roller.

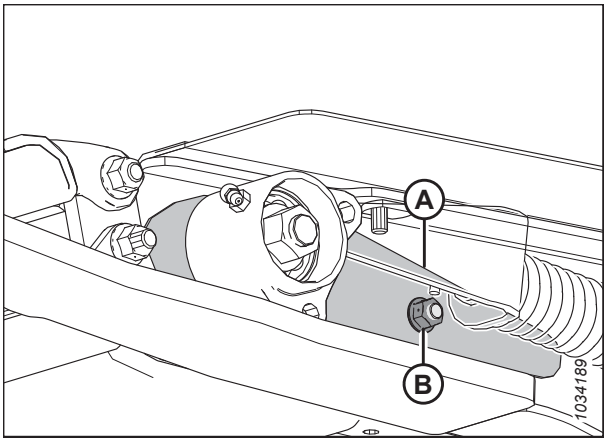


Figure 4.205: Idler Cover – Left Side

8. Slide the idler roller out through the cutout on the opposite side of the deck frame.
9. Brush idler roller shaft (A) with oil.
10. Carefully rotate bearing assembly (B) onto shaft (A) by hand to prevent seal damage.

    IMPORTANT:

    Ensure the bearing assembly is square to the shaft to prevent seal damage during installation.

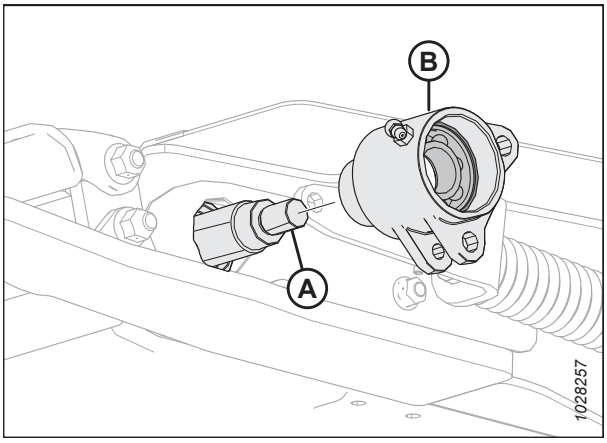


Figure 4.206: Feed Deck – Left Side

11. After the bearing and both seals are seated around the shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).
12. Repeat Step *1, page 588* to Step *11, page 590* on the opposite side.

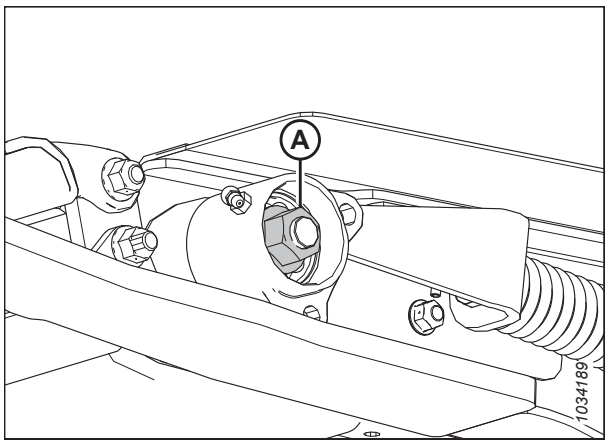


Figure 4.207: Feed Deck – Left Side

13. Rotate idler roller housing (A) until the holes in the lower tabs aligns with the hole in welded tab (B).
14. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert the following hardware at location (C).
    - Socket head bolt, washer, and nut.
15. Align the hole in cast support (D) with the holes in the upper tab on idler roller housing (A).
16. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert the following hardware at location (E).
    - Socket head bolt, washer, and nut.
17. Tighten bolts (C) and (E) to 12 Nm (9 lbf·ft).

    IMPORTANT:

    Do **NOT** fully tighten bolts (C) and (E).
18. Repeat Step *13, page 590* to Step *17, page 590* on the opposite side.

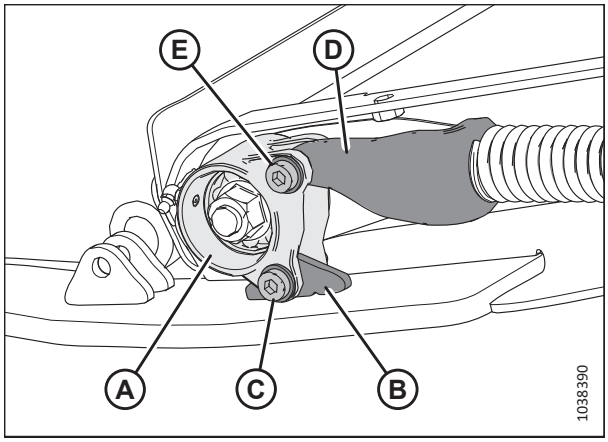


Figure 4.208: Idler Roller Bearing – Left Side

19. Fill the bearing cavity with grease, and install dust cap (A) on both ends of the idler roller. Repeat this step on the opposite side.
20. Check that the grease fittings on both sides are working. Grease the feed draper idler roller bearing until grease comes out of the seal. Wipe any excess grease from area after greasing.

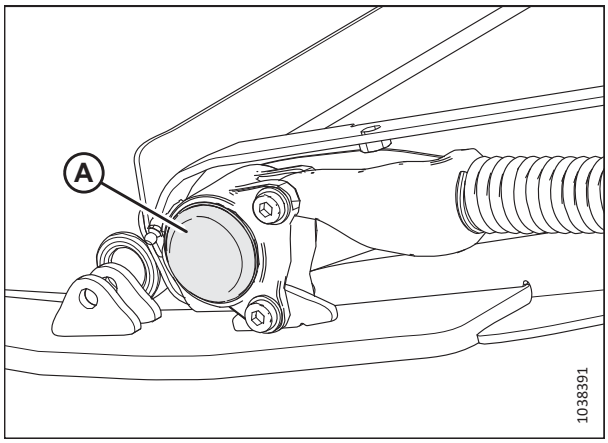


Figure 4.209: Feed Deck – Left Side

21. Close the feed draper and secure it with connector straps (B), screws (A), and nuts.
22. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 578*.

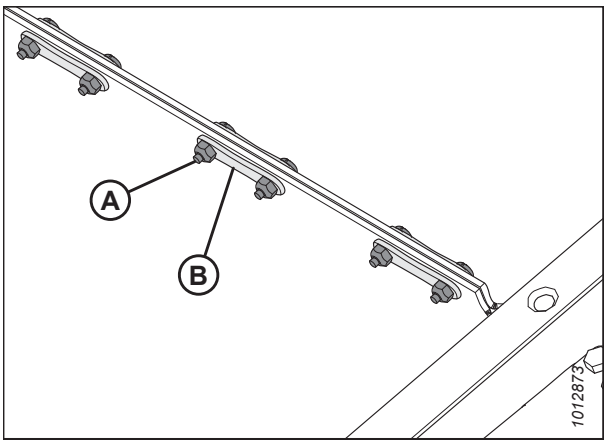


Figure 4.210: Draper Connector

Replacing Feed Draper Idler Roller Bearing

The feed draper idler roller bearing helps the roller turn. The bearing needs to be removed when replacing it.

NOTE:

Procedure is the same for both sides. Left side is shown.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise the reel fully.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Engage the header's safety props. For instructions, refer to the combine operator's manual.
6. To release the draper tension, loosen jam nut (A) and turn bolt (B) counterclockwise. Repeat at the opposite side of the header.

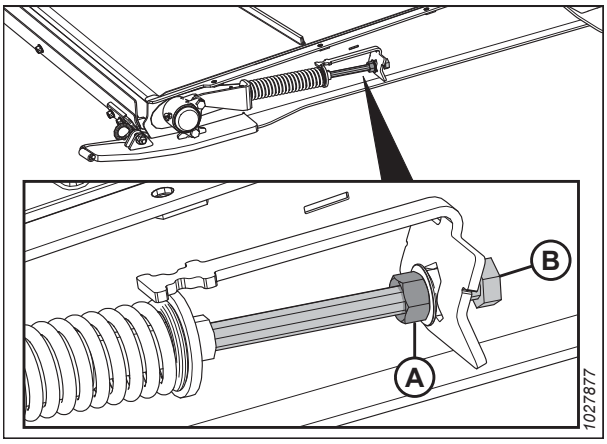


Figure 4.211: Feed Draper Tensioner

7. Unlatch feed deck pan handle (A) from handle latch supports (B) on both sides of the feed deck. This will drop the door down and allow access to the feed deck draper and rollers.

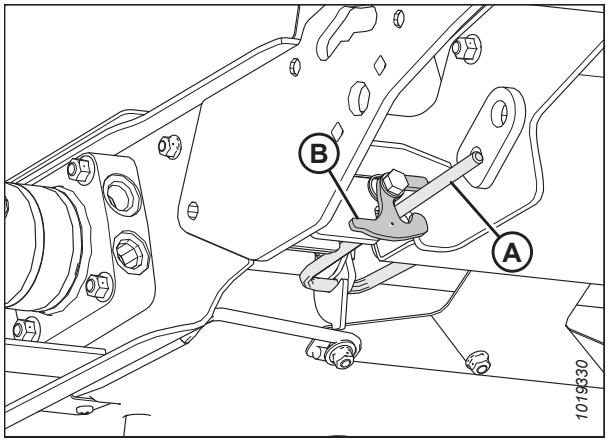


Figure 4.212: Feed Deck Pan Handle and Left Side Pan Handle Latch

8. Remove the following hardware from location (A) that secures the bearing housing to the deck skid and tensioner:
   - Socket head bolt, washer, and nut.
9. Remove dust cap (B).

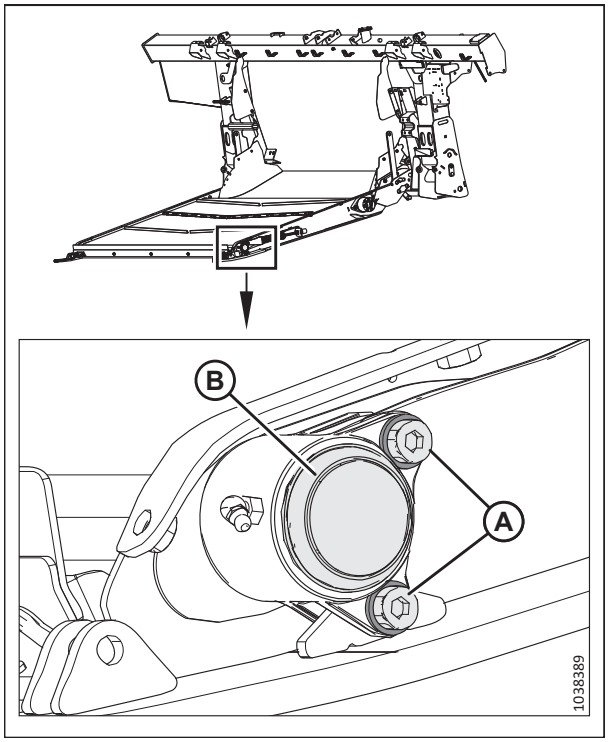


Figure 4.213: Idler Roller Bearing – Left Side

10. Remove nut (A), and remove bearing housing (B) from the deck.

    NOTE:

    If the bearing is seized on the shaft, it may be easier to remove the idler roller assembly. For instructions, refer to *Removing Feed Draper Idler Roller, page 586*.

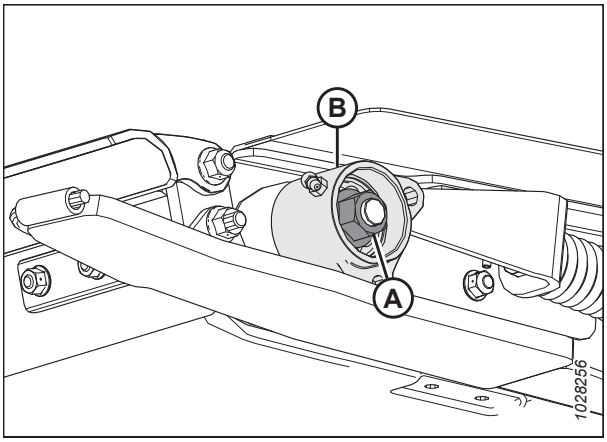


Figure 4.214: Idler Roller Bearing – Left Side

11. Secure housing (D), and remove internal retaining ring (A), bearing (B), and two seals (C).
12. Apply oil to the bore before assembling the parts.
13. Install seals (C) into housing (D).

    NOTE:

    Ensure the flat side of the seal is facing inward.

14. Pack bearing (B) with grease and install as shown.
15. Install retaining ring (A).

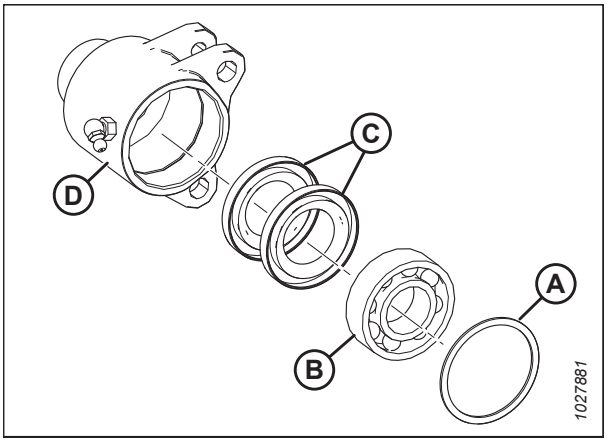


Figure 4.215: Bearing Assembly

16. Brush idler roller shaft (A) with oil.
17. Carefully rotate bearing assembly (B) onto shaft (A) by hand to prevent seal damage.

    IMPORTANT:

    Ensure the bearing assembly is square to the shaft to prevent seal damage during installation.

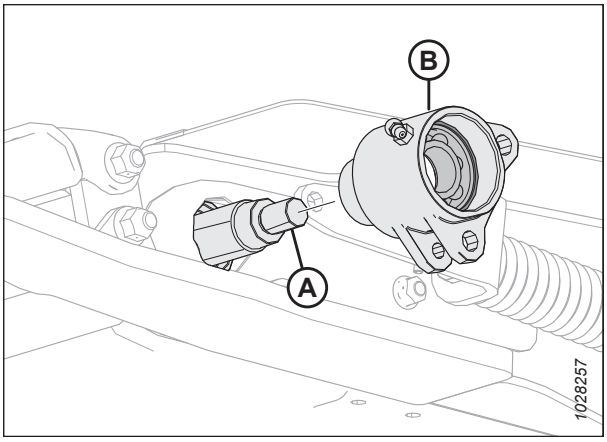


Figure 4.216: Idler Roller Bearing – Left Side

18. After the bearing and both seals are seated around the shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).

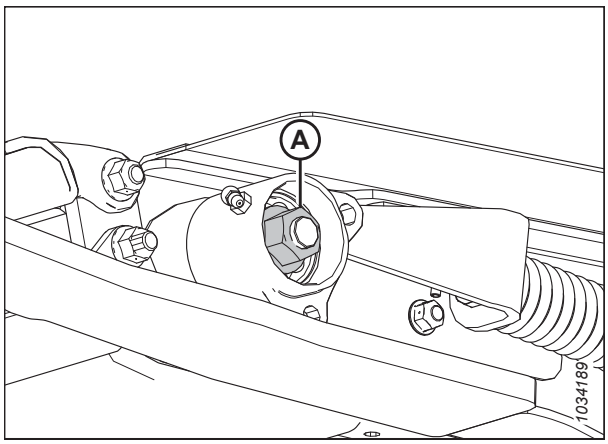


Figure 4.217: Idler Roller Bearing – Left Side

19. Rotate idler roller housing (A) until the holes in the lower tabs aligns with the hole in welded tab (B).
20. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert the following hardware at location (C).
    - Socket head bolt, washer, and nut.
21. Align the hole in cast support (D) with the holes in the upper tab on idler roller housing (A).
22. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert the following hardware at location (E).
    - Socket head bolt, washer, and nut.
23. Tighten bolts (C) and (E) to 12 Nm (9 lbf·ft).

    IMPORTANT:

    Do **NOT** fully tighten bolts (C) and (E).
24. Repeat Step *8, page 592* to Step *23, page 594* on the opposite side.
25. Fill the bearing cavity with grease, and install dust cap (A) on both ends of the idler roller.
26. Check that the grease fitting is working.
27. Repeat Step *25, page 594* to Step *26, page 594* on the opposite side.
28. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 578*.

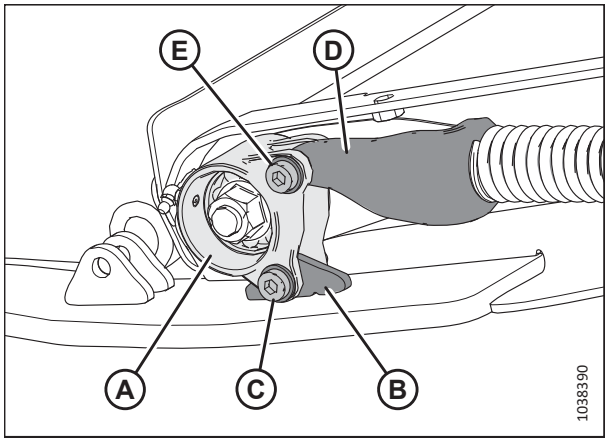


Figure 4.218: Idler Roller Bearing – Left Side

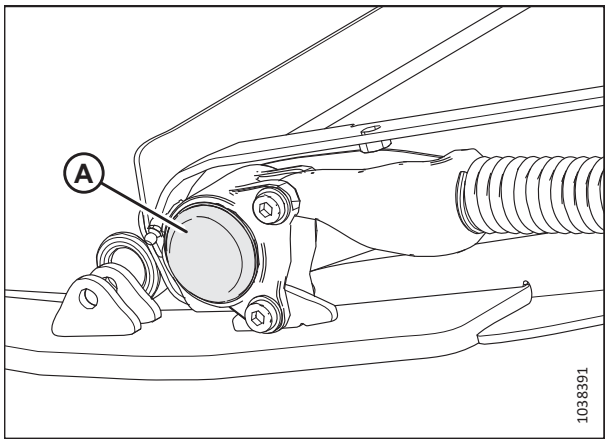


Figure 4.219: Feed Deck – Left Side

4.10.5 Lowering Feed Deck Pan

The feed deck pan protects the feed draper from items on the ground. It can be opened and closed to access the feed draper.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise the header fully.
2. Engage the header safety props. Refer to the combine operator's manual for instructions.
3. Stop the engine, and remove the key from the ignition.
4. On the underside of the feed deck, rotate latch (A) to unlock handle (B). Repeat on the opposite end of the feed deck.

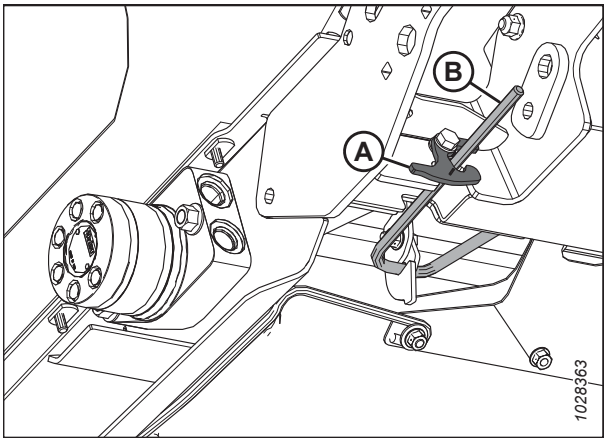


Figure 4.220: Underside of Feed Deck

5. Hold pan (A) and rotate handle (B) downward to release the pan.

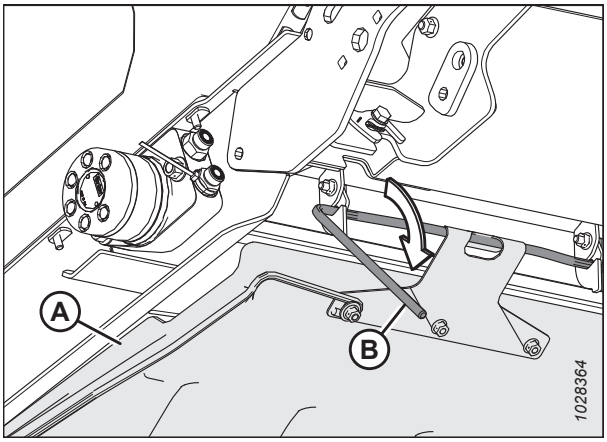


Figure 4.221: Underside of Feed Deck

6. Lower feed deck pan (A).

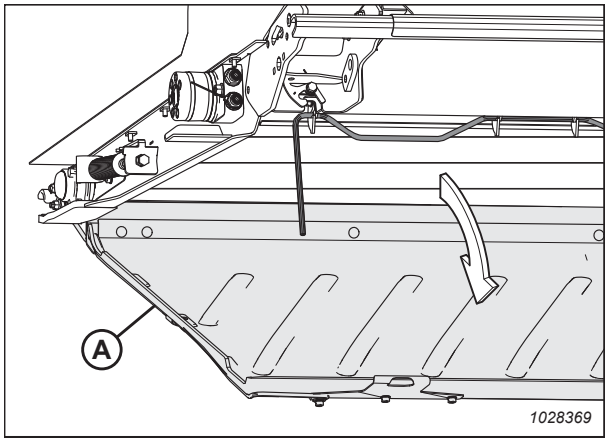


Figure 4.222: Feed Deck Pan

4.10.6 Raising Feed Deck Pan

The feed deck pan protects the feed draper from items on the ground. It can be opened and closed to access the feed draper.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Raise feed deck pan (A).

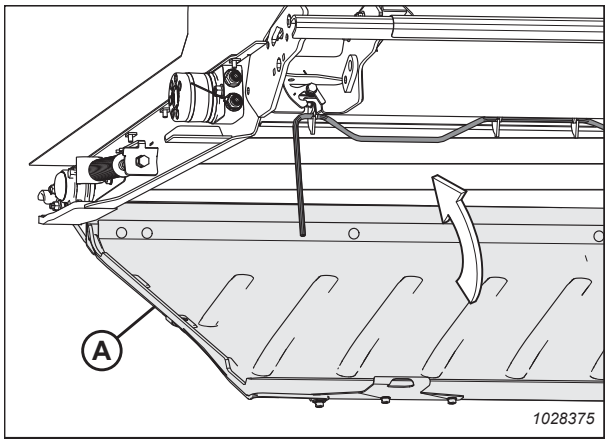


Figure 4.223: Feed Deck Pan

2. Engage lock handle (A) in three feed deck pan hooks (B).

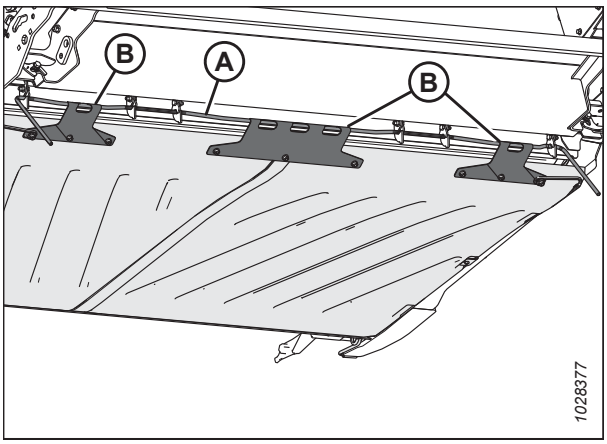


Figure 4.224: Underside of Feed Deck Pan

3. Rotate handles (A) upwards, bringing the feed deck pan into the locked position.

   NOTE:

   Ensure that all three deck pan hooks (B) are secured on the lock handle.

4. Hold the feed deck pan in place, and rotate latch (C) to lock handle (A).

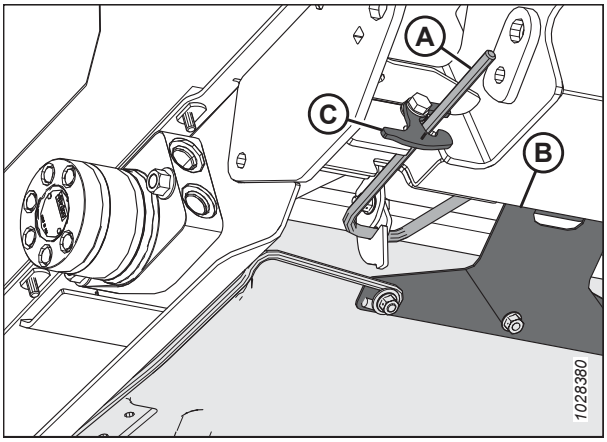


Figure 4.225: Underside of Feed Deck Pan

4.10.7 Checking Link Holder Hooks

Check the left and right link holder hooks **DAILY** to ensure they are not cracked or broken.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. Refer to the combine operator's manual for instructions.

4. Before operation, ensure both link holder hooks (A) are engaged on the float module under the feed deck as shown.

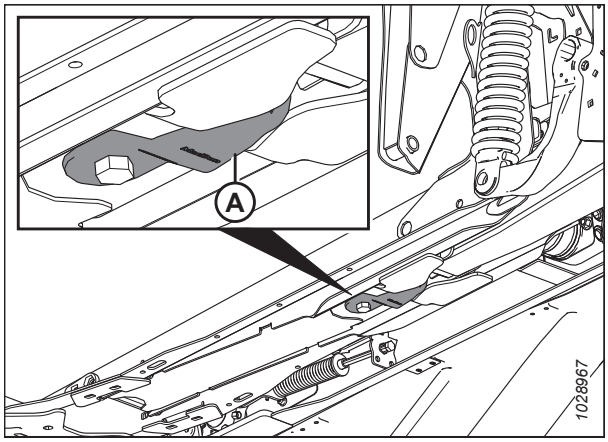


Figure 4.226: Feed Deck – View from Below

- Undamaged link holder hook (A)
- Damaged/broken link holder hook (B)
- Stretched link holder (not shown)

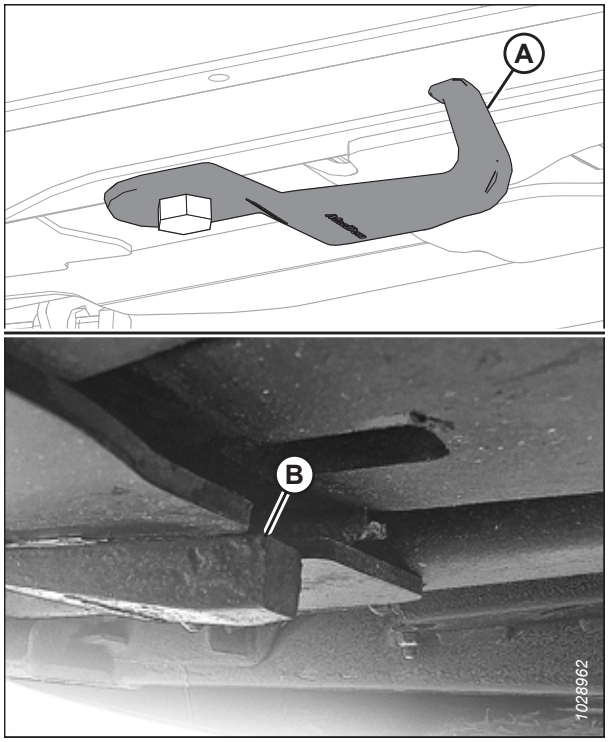


Figure 4.227: Link Holder Hooks

NOTE:

To move hook (A) to the storage position, loosen bolt (B) and rotate the hook 90°.

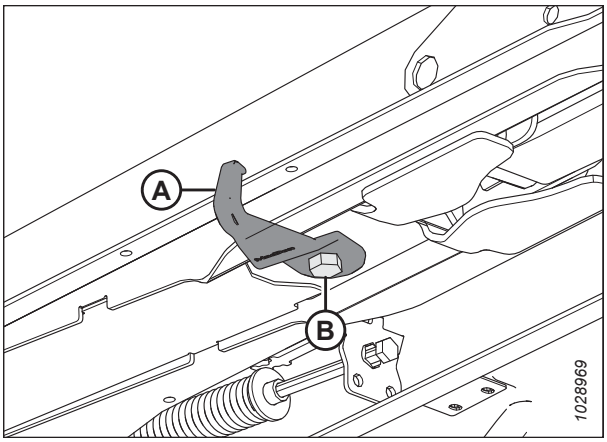


Figure 4.228: Link Holder Hook in Storage Position

4.11 FM200 Stripper Bars

Stripper bars improve feeding in certain crops such as rice.

4.11.1 Removing Stripper Bars

The stripper bars are secured to the float module frame with four bolts and nuts.

1. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.
2. Remove four bolts and nuts (A) securing stripper bar (B) to the float module frame, and remove the stripper bar.

   NOTE:

   There may only be two upper bolts on stripper bar (B).
3. Repeat at the opposite side of the header.

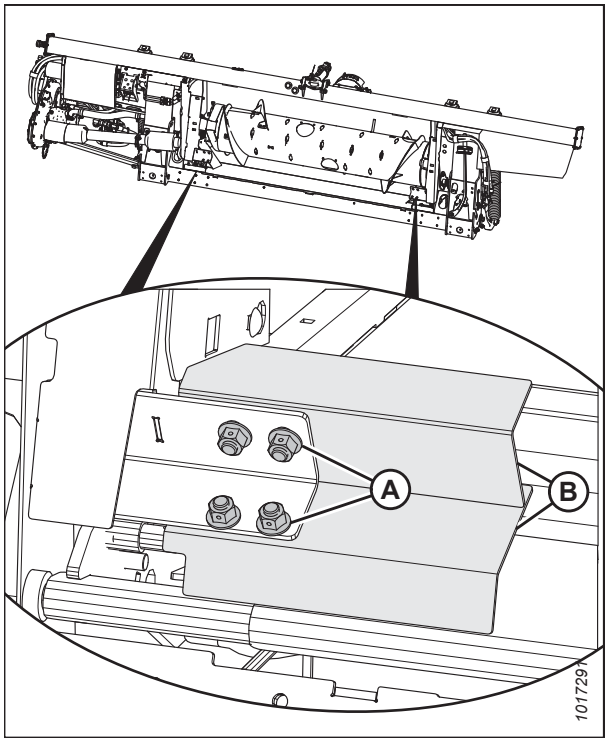


Figure 4.229: Stripper Bar

4.11.2 Installing Stripper Bars

The stripper bars are installed in the lower corners of the float module opening.

1. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.

2. Position stripper bar (B) as shown so the notch is at the corner of the frame.

   NOTE:

   It is ok to only install the upper two bolts on the stripper bars, if the lower two bolts are too difficult to install.

3. Secure stripper bar (B) to the float module with four bolts and nuts (A). Ensure the nuts are facing the combine.

4. Repeat at the opposite side of the header.

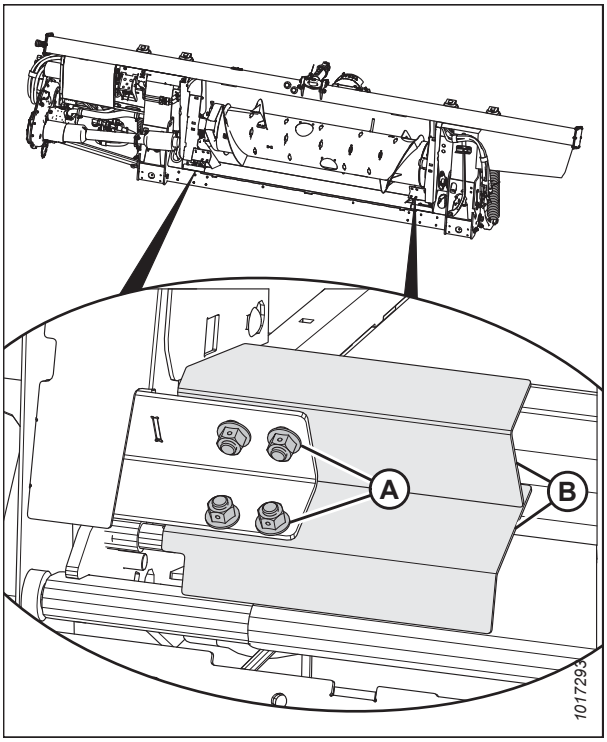


Figure 4.230: Stripper Bar

4.11.3 Replacing Feed Deflectors on New Holland CR Combines

Feed deflectors are used with New Holland CR combines only.

1. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 68*.

2. Remove two bolts and nuts (B) securing feed deflector (A) to the float module frame, and remove the feed deflector.

3. Position replacement feed deflector (A), and secure it with bolts and nuts (B) (ensure the nuts are facing the combine). Do **NOT** tighten the nuts.

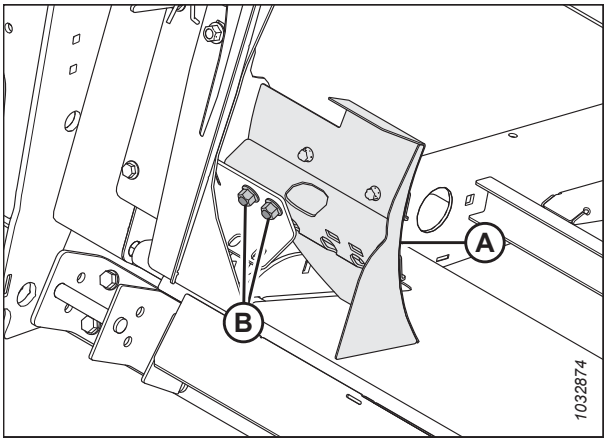


Figure 4.231: Feed Deflector

4. Adjust deflector (A) so that distance (C) between the pan and the deflector is 4–6 mm (5/32–1/4 in.).
5. Tighten nuts (B).
6. Repeat the previous steps for the opposite deflector.
7. Attach the header to the combine. For instructions, refer to Chapter *3.6 Header Attachment/Detachment, page 68*.
8. After attaching the header to the combine, fully extend the center-link and check the gap between the deflector and pan. Maintain the 4–6 mm (5/32–1/4 in.) gap.

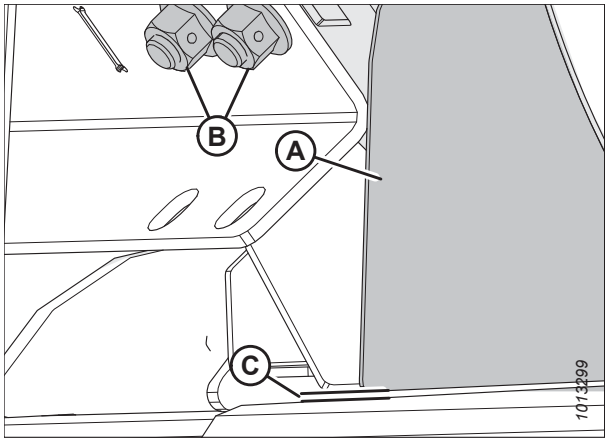


Figure 4.232: Pan and Deflector Distance

4.12 Header Side Drapers

There are two header side drapers. They convey cut crop to the float module feed draper and auger. Replace the drapers if they are torn, cracked, or missing slats.

4.12.1 Removing Side Drapers

Replace the drapers if they are torn, cracked, or missing slats.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. Refer to the combine operator's manual for instructions.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

WARNING

Check to be sure all bystanders have cleared the area.

7. Start the engine.
8. Move the draper until the draper joint is in the work area.
9. Shut down the engine, and remove the key from the ignition.
10. Release the tension on the draper. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 607*.

11. Remove nuts and screws (A), and tube connectors (B) from the draper joint.
12. Remove screws (C), bridge connector (D), and nuts from the front end of the draper joint.
13. Pull the draper from the deck.

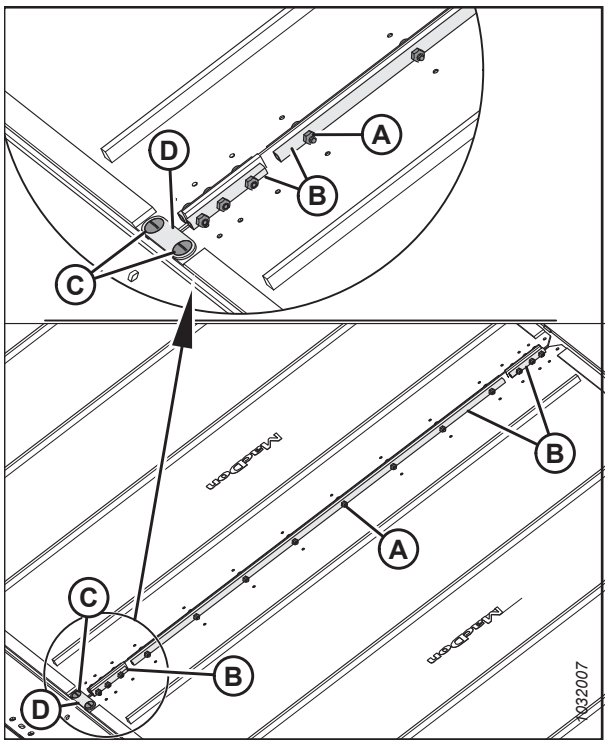


Figure 4.233: Draper Connectors

4.12.2 Installing Side Drapers

Side drapers are used to bring cut crop to the center of the header. To ensure they are installed correctly, follow the recommended installation procedure provided here.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Raise the reel fully.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. Refer to the combine operator's manual for instructions.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
7. Apply talc, baby powder, or talc/graphite lubricant mix to the underside of the draper guides and to the draper surface that forms the seal with the cutterbar.
8. Insert the draper into the deck at the inboard end at the drive roller. Pull the draper into the deck while feeding it at the end.
9. Feed in the draper until it can be wrapped around the drive roller.
10. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.

11. Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.

    NOTE:

    The two short tube connectors are attached at the front and rear of the draper.

12. Install bridge connector (D) using screws (C) and the nuts at the front end of the draper joint.

    NOTE:

    Hold screws (C) at a 90° angle to bridge connector (D) while tightening the nuts. Allowing the screws to rotate while tightening will cause the bridge connector to bow up.

13. Torque the nuts to 9.5 Nm (7 lbf·ft).

14. Adjust the draper tension. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 607*.

15. Operate the drapers with the engine at idle so the talc or talc/graphite lubricant makes contact and adheres to the draper seal surfaces.

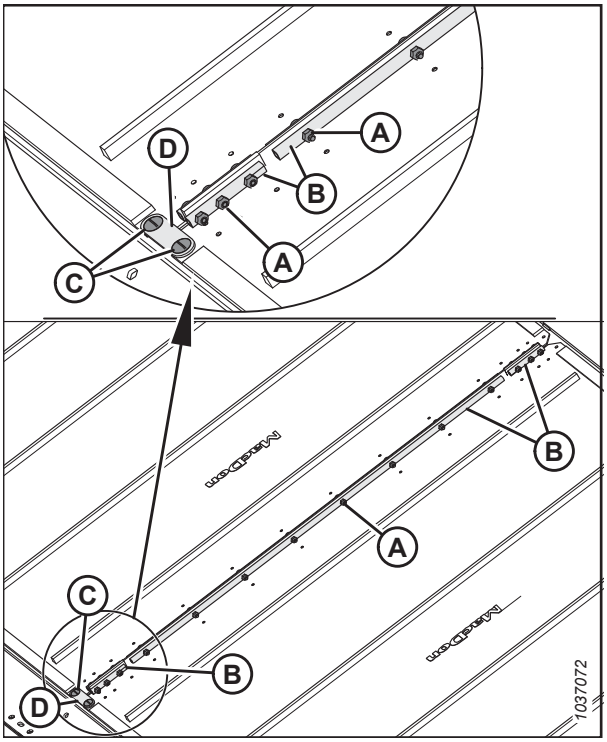


Figure 4.234: Draper Connectors

4.12.3 Adjusting Deck Height

A properly adjusted deck height will prevent material from entering into the side drapers and stalling them.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the safety props before going under the header for any reason.

IMPORTANT:

New factory-installed drapers are pressure and heat checked at the factory. The gap between draper and cutterbar is set to 1–3 mm (0.04–0.12 in.).

1. Lower the header onto four blocks (A) (305–356 mm [12–14 in.]). One block at each end and one block at each hinge point.

2. Shut down the engine, and remove the key from the ignition.

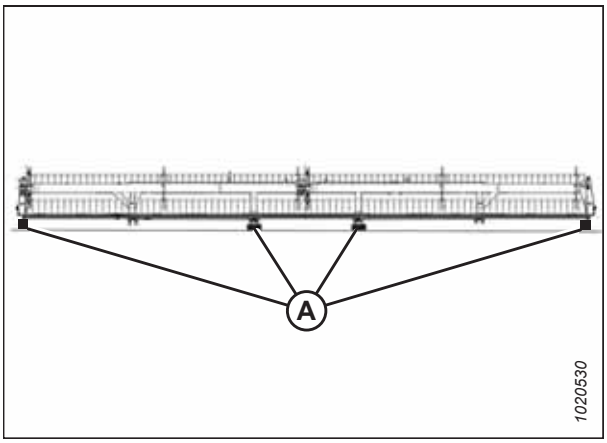


Figure 4.235: Header on Blocks

NOTE:

Take measurements at deck supports (A) with the header in the working position. Depending on the header size, there are between four and seven supports per deck.

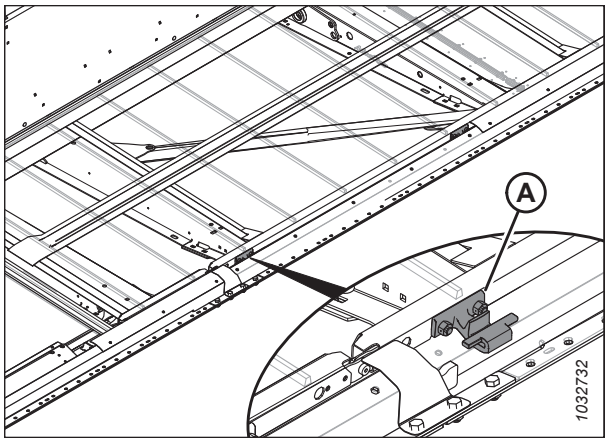


Figure 4.236: Draper Deck Supports

3. Check that clearance (A) between draper (B) and metal seal (C) is 0–2 mm (0.004–0.08 in.).
4. Loosen the draper tension. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 607*.

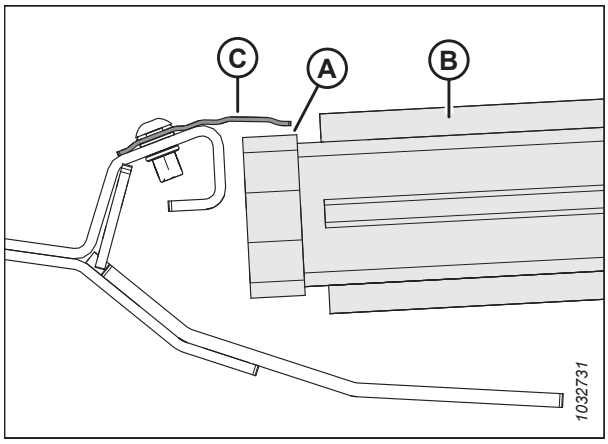


Figure 4.237: Draper Seal

5. Lift front edge of draper (A) past cutterbar (B) to expose the deck support.
6. Measure and note the thickness of the draper belt.

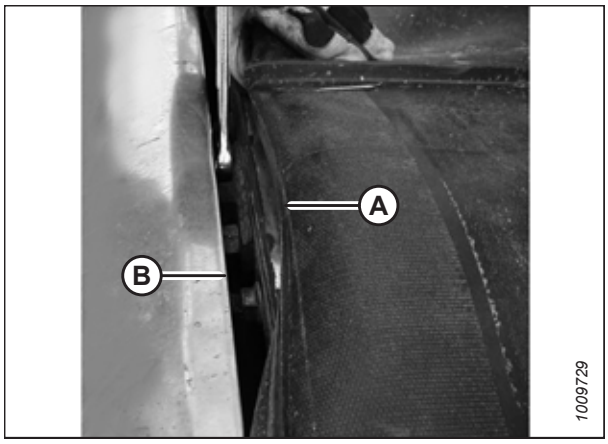


Figure 4.238: Deck Support

NOTE:

The deck is shown with the draper removed.

7. Loosen two lock nuts (A) on deck support (B) one half-turn **ONLY**.
8. Tap deck (C) with a hammer and block of wood to lower the deck relative to the deck supports. Tap deck support (B) using a punch to raise the deck relative to the deck supports.

Table 4.1 Number of Deck Supports (B)

Model	Quantity
FD230	8
FD235, FD240, FD241	10
FD250	14

9. Use a gauge that is the same thickness as the draper belt, plus 1 mm (0.04 in.). Slide the thickness gauge along deck (A) under the metal seal (C) in order to properly set the gap.
10. To create a seal, adjust deck (A) so that clearance (B) between metal seal (C) and deck is the same thickness as the draper belt plus 1 mm (0.04 in.).

    NOTE:

    When checking clearance at either roller, measure from the roller tube, **NOT** the deck.

11. Tighten deck support hardware (D).
12. Recheck gap (B) with thickness gauge. For instructions, refer to Step *9, page 607*.

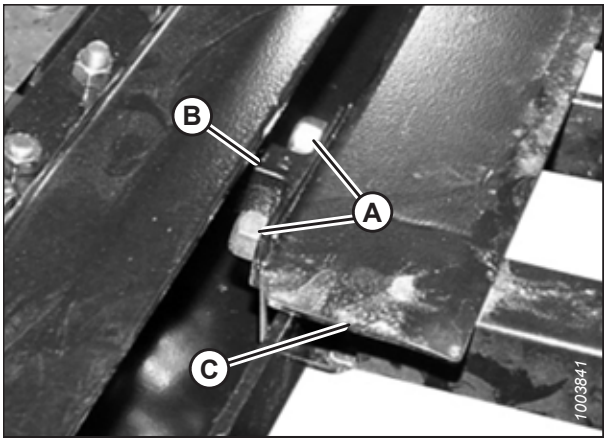


Figure 4.239: Deck Support

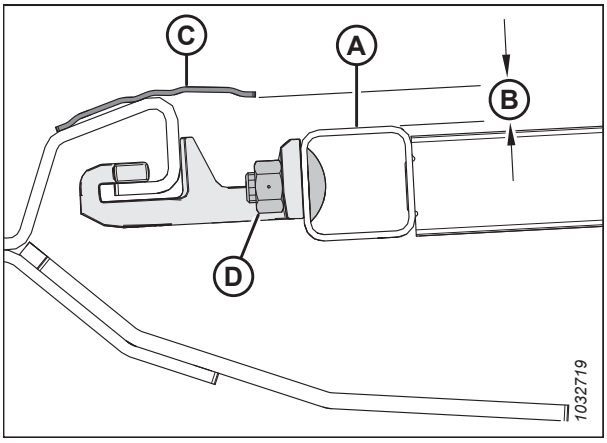


Figure 4.240: Deck Support

4.12.4 Adjusting Side Draper Tension

The drapers are tensioned at the factory and should **NOT** require adjustment. If adjustment is required, draper tension should be just enough to prevent slipping and to keep the draper from sagging below the cutterbar.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine, remove the key, and engage the vehicle's safety props before going under the machine for any reason.

1. Ensure tensioner indicator (A) covers the inboard half of the window.

DANGER

Check to be sure all bystanders have cleared the area.

2. Start the engine. For instructions, refer to the combine operator's manual.
3. Raise the header fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header's safety props. For instructions, refer to the combine operator's manual.

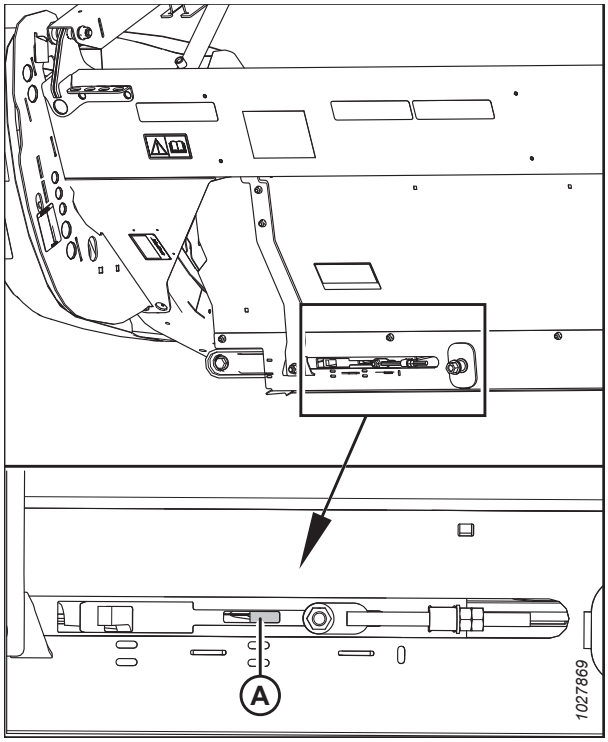


Figure 4.241: Checking Tension Adjuster – Left Side Shown, Right Side Opposite

6. Check that the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) of the drive roller.

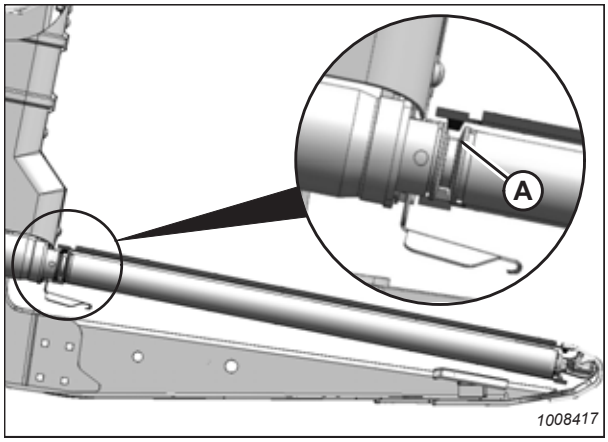


Figure 4.242: Drive Roller

7. Check that idler roller (A) is between guides (B).

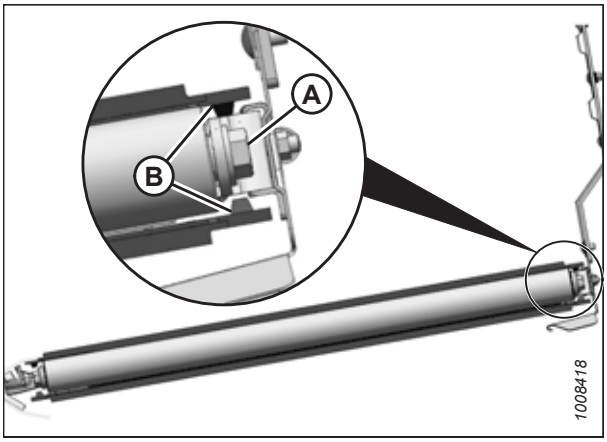


Figure 4.243: Idler Roller

IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

8. Turn adjuster bolt (A) clockwise to tighten, and counterclockwise to loosen. Tensioner indicator (B) will move inboard to show that the draper is tightening. Tighten the adjuster bolt until the tensioner indicator covers the inboard half of the window.

IMPORTANT:

To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate the header with the tensioner indicator not visible.

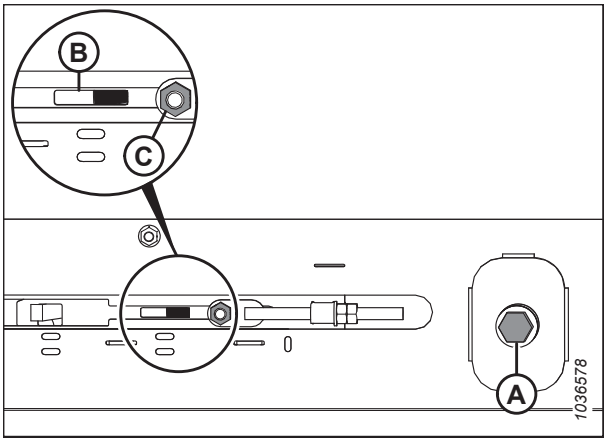


Figure 4.244: Adjusting Tensioner – Left Side Shown, Right Side Opposite

4.12.5 Adjusting Side Draper Tracking

The side draper tracking is adjusted by aligning the drive and idler draper rollers.

Draper tracking is set at the factory and will only need to be adjusted if the draper tracking is incorrect.

NOTE:

The left draper deck is shown in the illustration. The right deck is opposite.

NOTE:

Some parts were removed from the illustration for clarity.

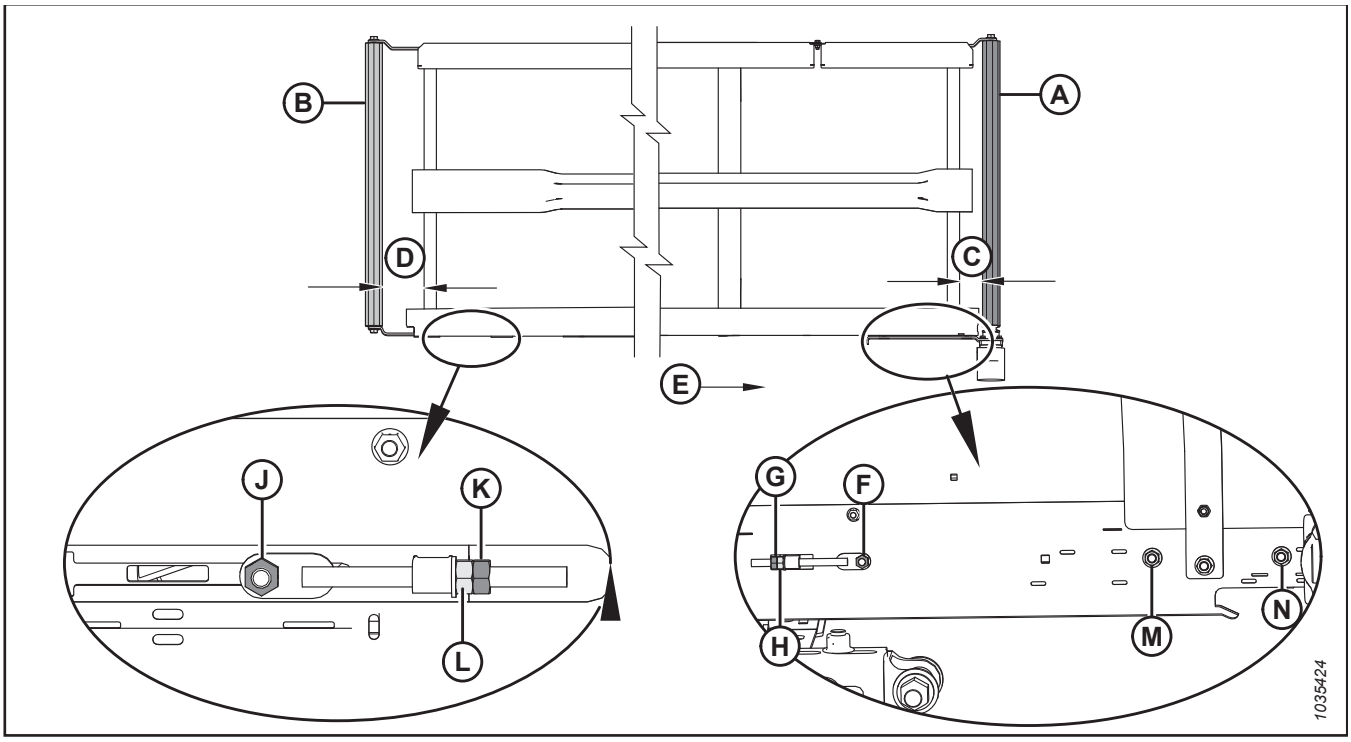


Figure 4.245: Draper Tracking Adjustments

A - Drive Roller
B - Idler Roller
C - Drive Roller Adjust
D - Idler Roller Adjust
E - Draper Direction
F - Nut on Drive Roller Side
G - Jam Nut for Drive Roller
H - Adjuster Nut for Drive Roller
J - Nut on Idler Roller Side
K - Jam Nut for Idler Roller
L - Adjuster Nut for Idler Roller
M - Nut on Drive Roller Side
N - Nut on Drive Roller Side

1. To determine which roller requires adjustment and which adjustments are necessary, refer to the following table:

Table 4.2 Draper Tracking

Tracking	Location	Adjustment	Method
Toward backsheet	Drive roller	Increase **C**	Tighten adjuster nut (H)
Toward Cutterbar	Drive roller	Decrease **C**	Loosen adjuster nut (H)
Toward backsheet	Idler roller	Increase **D**	Tighten adjuster nut (L)
Toward Cutterbar	Idler roller	Decrease **D**	Loosen adjuster nut (L)

2. Adjust drive roller (A) to change **C** (refer to Table *4.2, page 610*) as follows:
   a. Loosen nuts (F), (M), and (N), and jam nut (G).
   b. Turn adjuster nut (H).
   c. Tighten nuts (F), (M), and (N), and jam nut (G).
3. Adjust idler roller (B) to change **D** (refer to Table *4.2, page 610*) as follows:
   a. Loosen nut (J) and jam nut (K).
   b. Turn adjuster nut (L).

   NOTE:

   If the draper does not track at the idler roller end after the idler roller adjustment, the drive roller is likely not square to the deck. Adjust the drive roller, and then readjust the idler roller.

   c. Tighten nut (J) and jam nut (K).

4.12.6 Inspecting Draper Roller Bearing

The draper rollers have non-greaseable bearings; however, the external seal should be checked every 200 hours (more frequently in sandy conditions) to achieve maximum bearing life.

Using an infrared thermometer, check for bad draper roller bearings as follows:

1. Engage the header and run the drapers for approximately 3 minutes.
2. Check the temperature of the draper roller bearings at each of roller arms (A), (B), and (C) on each deck. Ensure the temperature does not exceed 44°C (80°F) above the ambient temperature.

   Replace roller bearings that exceed maximum recommended temperature. For instructions, refer to:

   - *4.12.8 Replacing Side Draper Deck Idler Roller Bearing, page 613*
   - *4.12.11 Replacing Side Draper Drive Roller Bearing, page 618*

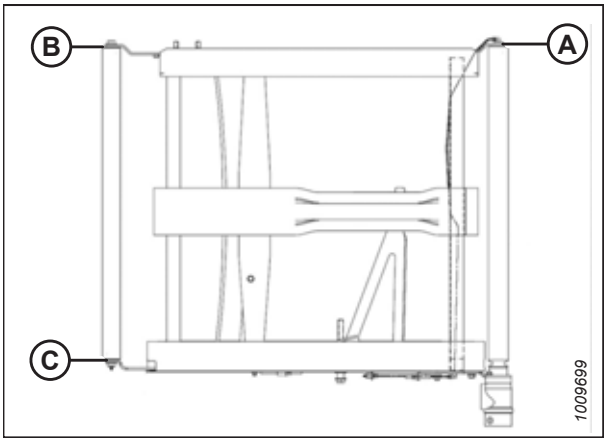


Figure 4.246: Roller Arms

4.12.7 Removing Side Draper Deck Idler Roller

The side draper deck has a roller on either end of the deck. One is the idler roller and one is the drive roller.

DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key before leaving the operator's seat, and always engage the safety props before going under the machine for any reason.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. Start the engine and engage the header until the side draper connector is accessible (preferably close to the outboard end of the deck).

2. Lower the header onto four blocks (A) (305–356 mm [12–14 in.]). One block at each end and one block at each hinge point.

3. Shut down the engine, and remove the key from the ignition.

4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

5. Engage the header's safety props. For instructions, refer to the combine operator's manual.

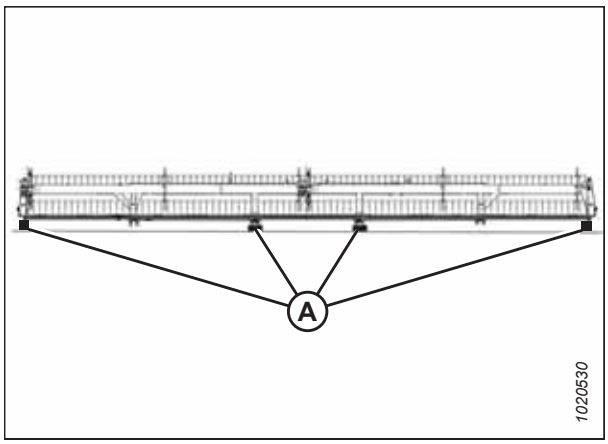


Figure 4.247: Header on Blocks

6. Loosen the draper by turning adjuster bolt (A) counterclockwise until the adjuster bolt runs out of adjustment and hits a hard stop.

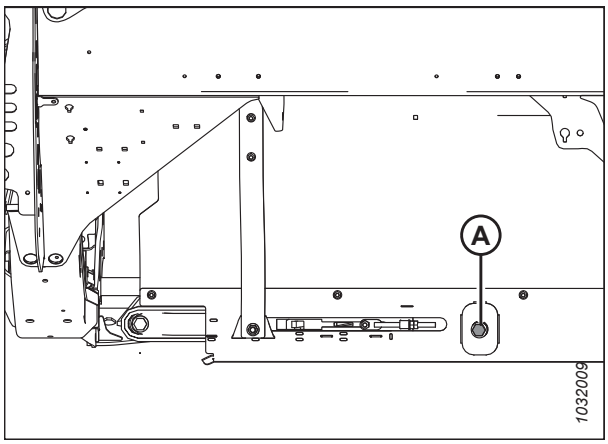


Figure 4.248: Tensioner – Left Side Shown

7. Remove screws (C), bridge connector (D), and nuts from the front end of the draper joint.
8. Remove nuts and screws (A) and tube connectors (B) from the draper joint.
9. Pull the draper off the idler roller.

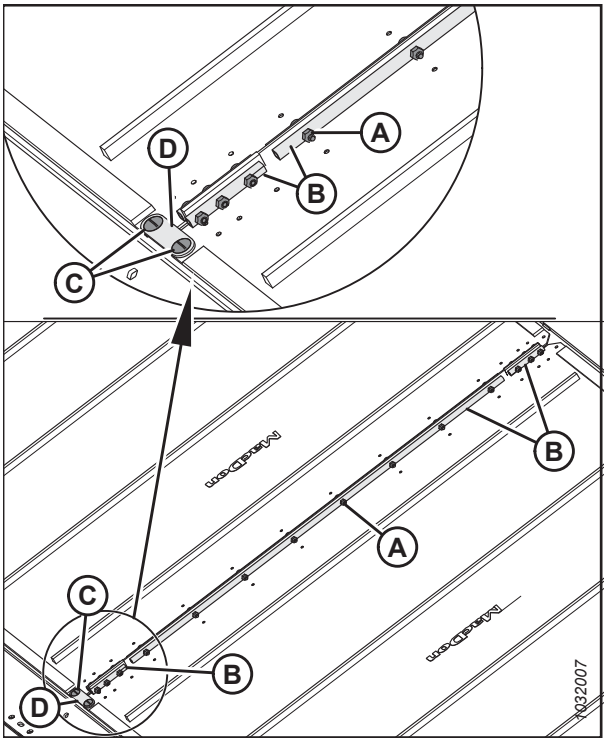


Figure 4.249: Draper Connectors

10. Remove bolt (A) and washer from the idler roller at the back of the header deck.
11. Remove bolt (B) and washer from the idler roller at the front of the header deck.
12. Spread roller arms (C) and (D), and remove the idler roller.

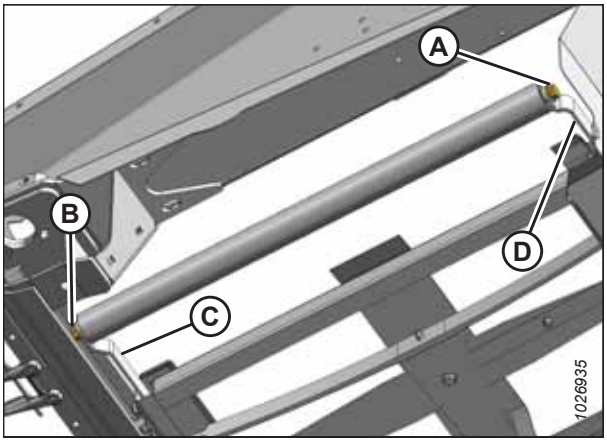


Figure 4.250: Idler Roller

4.12.8 Replacing Side Draper Deck Idler Roller Bearing

The side draper deck idlers rollers have bearings installed to allow the roller to turn.

1. Remove draper deck idler roller. For instructions, refer to *4.12.7 Removing Side Draper Deck Idler Roller, page 611*.

2. Clamp idler roller (A) in a vise with cloth wrapped around the roller to prevent damage to the roller.

3. Use a slide hammer to remove bearing assembly (B) and seal (C) from the roller.

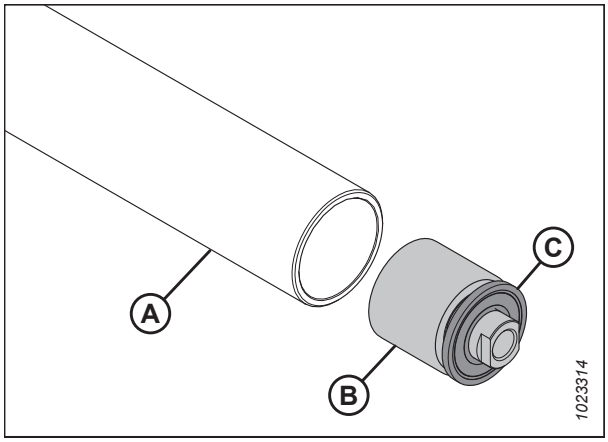


Figure 4.251: Idler Roller Bearing and Seal

IMPORTANT:

When installing the new bearing, do **NOT** place the end of the roller directly onto the ground. Bearing assembly (A) protrudes past roller tube (B), and placing the end on the ground will push the bearing farther into the tube.

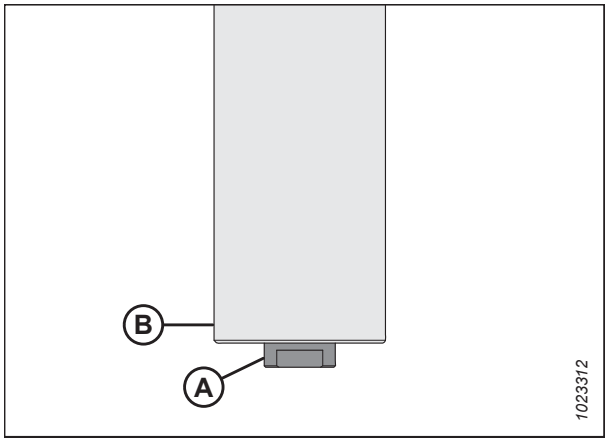


Figure 4.252: Idler Roller

4. Cut a relief (A) into a block of wood.

5. Place the end of idler roller (B) onto the block, with the protruding bearing assembly inside relief (A).

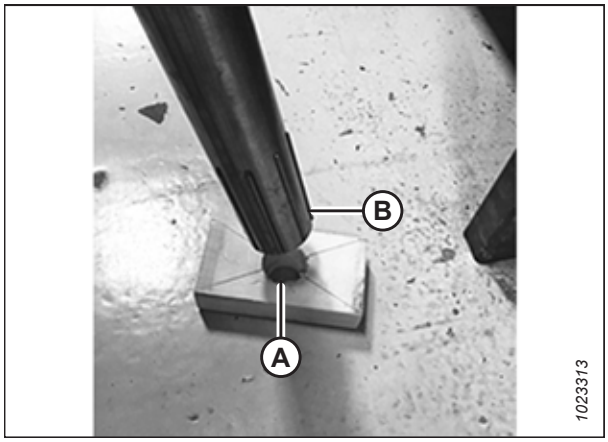


Figure 4.253: Idler Roller

6. Install new bearing assembly (C) by pressing the outer race of the bearing into the tube until it is 14–15 mm (9/16–19/32 in.) (B) from the outside edge of the tube.

   NOTE:

   Before installing new seal, fill area (A) with approximately 8 pumps of grease.

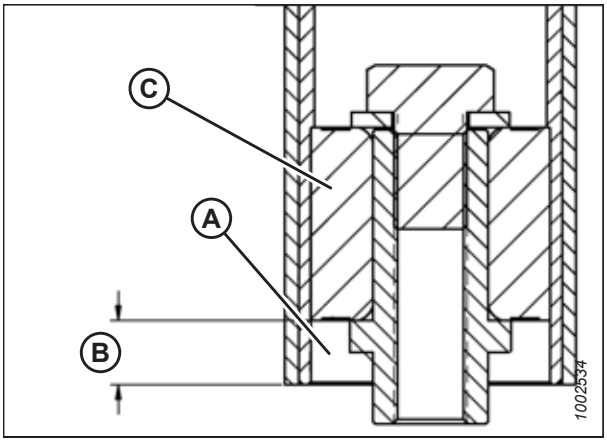


Figure 4.254: Idler Roller Bearing

7. Install new seal (A) by pressing on the inner and outer race of the seal until it is 3–4 mm (1/8–3/16 in.) (B) from the outside edge of the tube.

   NOTE:

   The seal can be oriented in either direction.

8. Reinstall the idler roller. For instructions, refer to *4.12.9 Installing Side Draper Deck Idler Roller, page 615*.

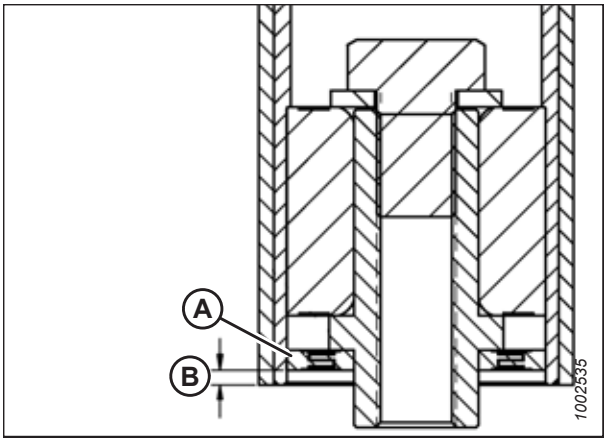


Figure 4.255: Idler Roller Bearing

4.12.9 Installing Side Draper Deck Idler Roller

The side draper deck has a roller on either end of the deck. One is the idler roller and one is the drive roller.

1. Install idler roller (A) between idler arms (B), and secure with two bolts (C) and washers. Tighten the bolts to 95 Nm (70 lbf·ft).

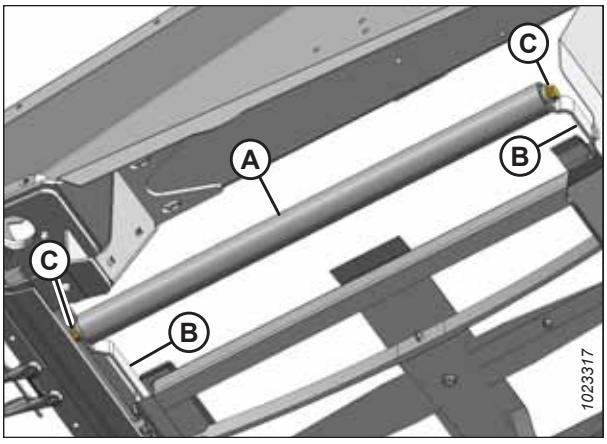


Figure 4.256: Idler Roller

2. Attach the ends of draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.

   NOTE:

   The two short tube connectors are attached at the front and rear of the draper.

3. Install bridge connector (D) using screws (C) and the nuts at the front end of the draper joint.

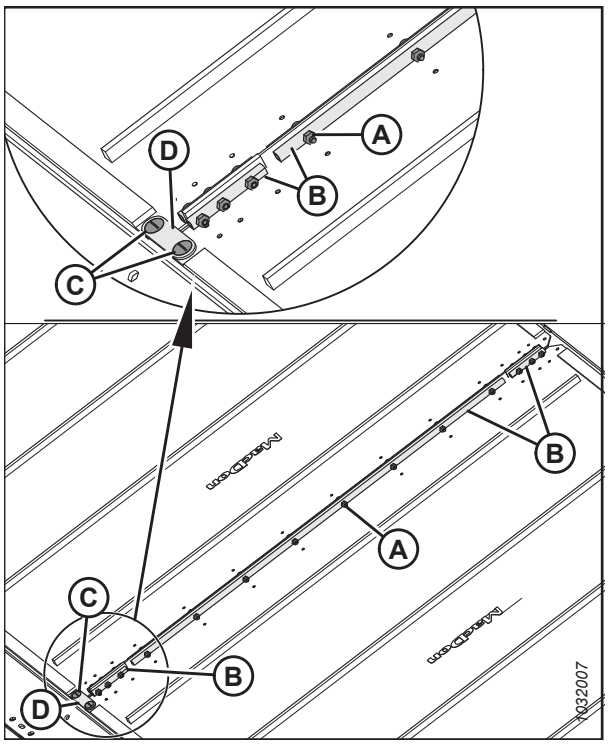


Figure 4.257: Draper Connector

4. Tighten the draper by turning adjuster bolt (A) clockwise. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 607*.

5. Disengage the reel and header safety props.

WARNING

Check to be sure all bystanders have cleared the area.

6. Start the engine and lower the header and the reel.

7. Run machine to verify that draper tracks correctly. Refer to *4.12.4 Adjusting Side Draper Tension, page 607* if additional adjustment is necessary.

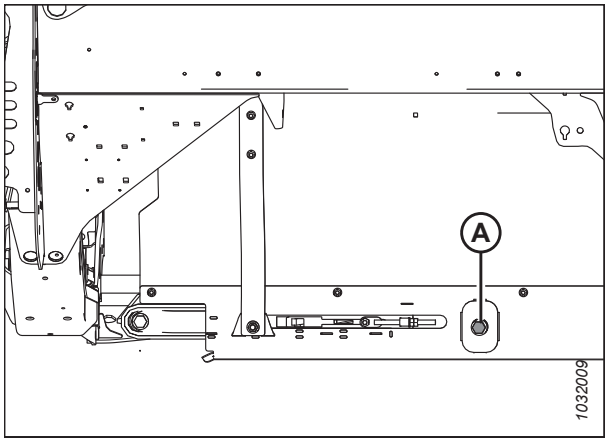


Figure 4.258: Draper Tensioner

4.12.10 Removing Side Draper Drive Roller

The side draper deck has a roller on either end of the deck. One is the idler roller and one is the drive roller.

DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. If the draper connector is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).
2. Start the engine.
3. Raise the header fully.
4. Raise the reel fully.
5. Shut down the engine, and remove the key from the ignition.
6. Engage the reel safety props. For instructions, refer to the header operator's manual.
7. Engage the header safety props. Refer to the combine operator's manual for instructions.
8. Loosen the draper by turning adjuster bolt (A) counterclockwise until the adjuster bolt runs out of adjustment and hits a hard stop.

   IMPORTANT:

   Do **NOT** adjust nut (B). This nut is used for draper alignment only.

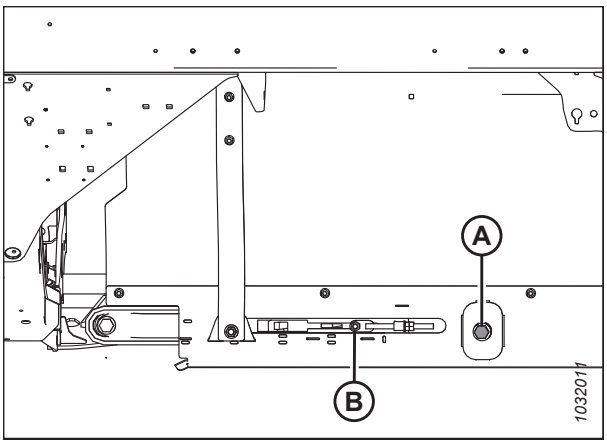


Figure 4.259: Draper Tensioner

9. Remove nuts and screws (A), and tube connectors (B) from the draper joint.
10. Remove screws (C), bridge connector (D), and nuts from the front end of the draper joint.
11. Pull the draper off the drive roller.

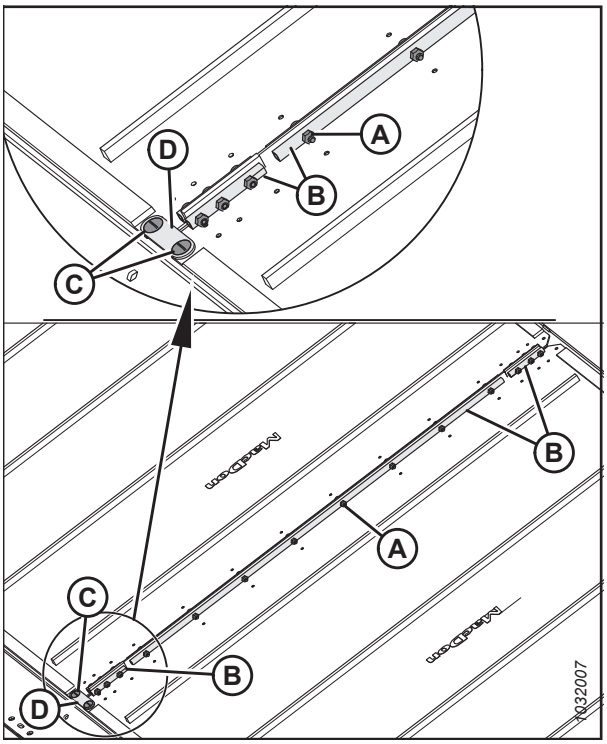


Figure 4.260: Draper Connectors

12. Align the set screws with the hole (A) in the guard. Remove the two set screws holding the motor onto the drive roller.

    NOTE:

    The set screws are 1/4 turn apart.

13. Loosen two bolts (B) securing the motor to the drive roller arm.

    NOTE:

    It may be necessary to remove plastic shield (C) to gain access to the top bolt.

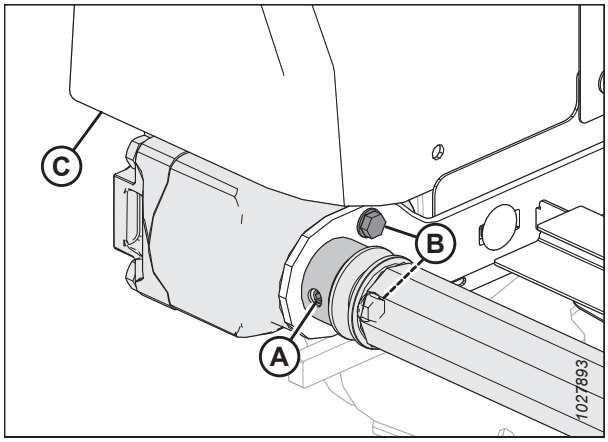


Figure 4.261: Drive Roller

NOTE:

It may be necessary to pry between the roller and bracket (A) to remove the roller from shaft.

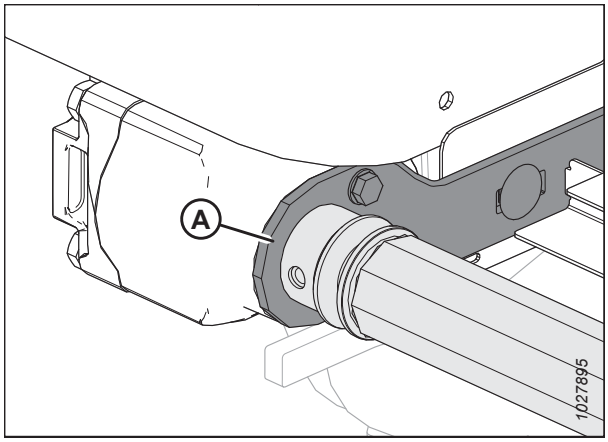


Figure 4.262: Drive Roller

14. Loosen two bolts (A) securing support arm (B).
15. Remove bolt (C) and the washer securing the opposite end of the drive roller to support arm (B).
16. Remove drive roller (D).

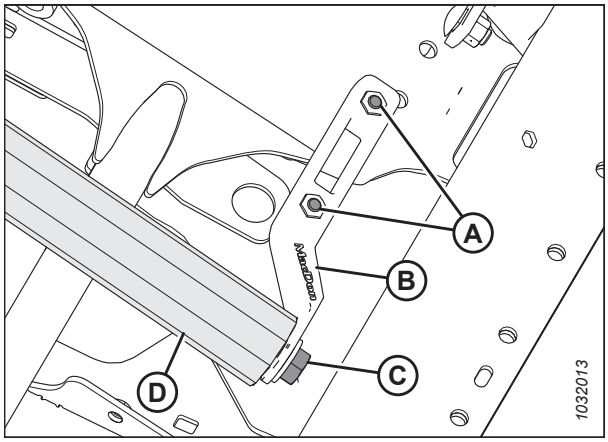


Figure 4.263: Drive Roller

4.12.11 Replacing Side Draper Drive Roller Bearing

You will need a slide hammer to remove and replace the bearing on a drive roller.

1. Remove the draper idler roller assembly. For instructions, refer to *4.12.10 Removing Side Draper Drive Roller, page 616*.

2. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:

   a. Attach slide hammer (D) to threaded shaft (E) in the bearing assembly.

   b. Tap out bearing assembly (A) and seal (B).

3. Clean the inside of roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

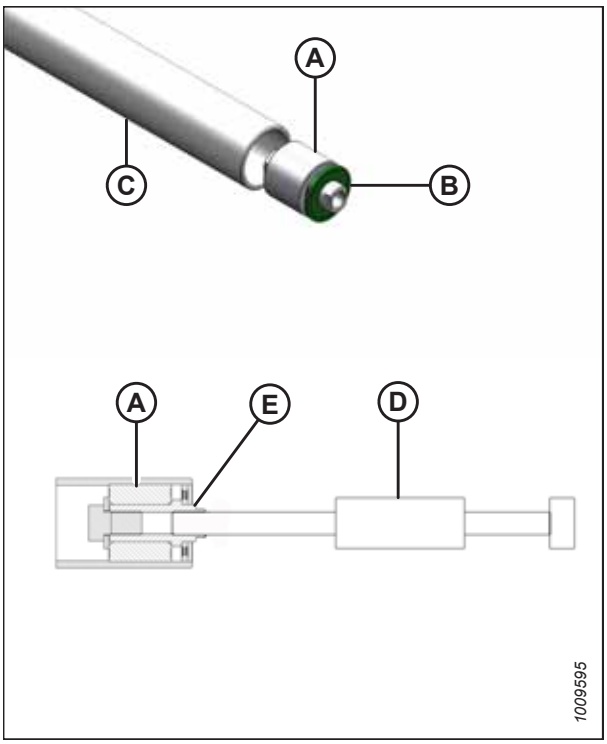


Figure 4.264: Roller Bearing

4. Install new bearing assembly (A) by pressing the outer race of the bearing into the tube until it is 14–15 mm (9/16–19/32 in.) (B) from the outside edge of the tube.

5. Apply grease in front of bearing assembly (A). Refer to the inside back cover of this book for grease specifications.

6. Install new seal (C) at the roller opening, and install a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on the seal.

7. Tap seal (C) into the roller opening with a suitably sized socket. Tap the washer and bearing assembly (A) until the seal is 3–4 mm (1/8–3/16 in.) (D) from the outside edge of the tube.

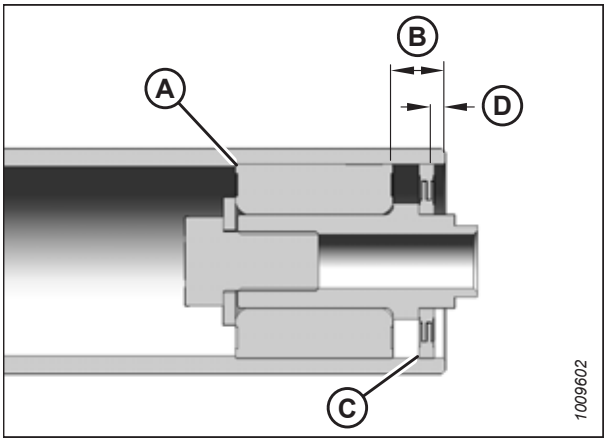


Figure 4.265: Roller Bearing

4.12.12 Installing Side Draper Drive Roller

The side draper deck has a roller on either end of the deck. One is the idler roller and one is the drive roller.

1. Position drive roller (A) between the roller support arms.
2. Secure the drive roller with washer and bolt (B).
3. Tighten bolts (C) on the support arm.
4. Torque bolt (B) to 95 Nm (70 lbf·ft).
5. Grease the motor shaft and insert it into the end of drive roller (A).

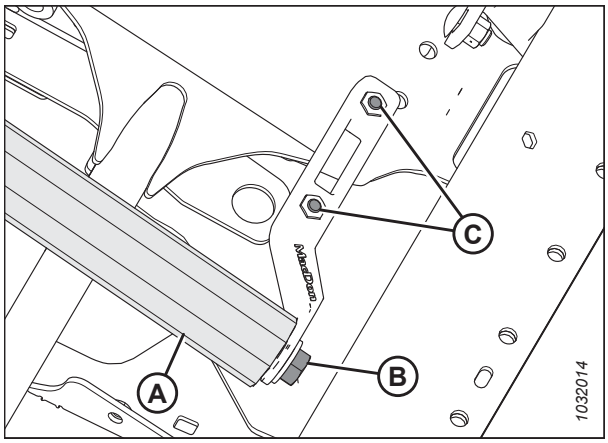


Figure 4.266: Drive Roller

6. Secure the motor to the roller support with two bolts (B). Torque the bolts to 27 Nm (20 lbf·ft).
7. Ensure the motor is all the way into the roller, and straight key is still in place when fully inserted.
8. Tighten the two set screws (not shown) through access hole (A).

   NOTE:

   Tighten any loosened bolts and reinstall plastic shield (C), if previously removed.

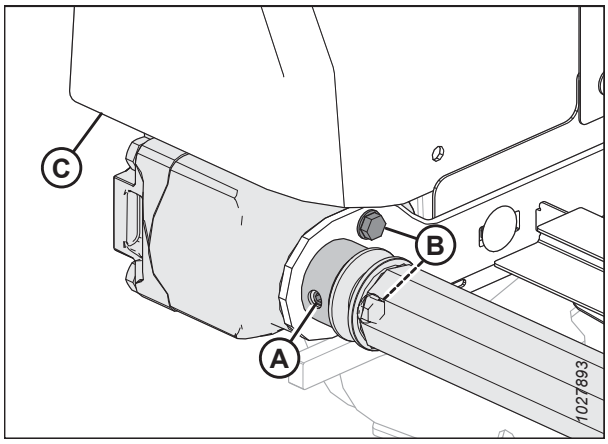


Figure 4.267: Drive Roller

9. Wrap the draper over the drive roller, and attach the ends of draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.

   NOTE:

   The two short tube connectors are attached at the front and rear of the draper.

10. Install bridge connector (D) using screws (C) and nuts at the front end of the draper joint.

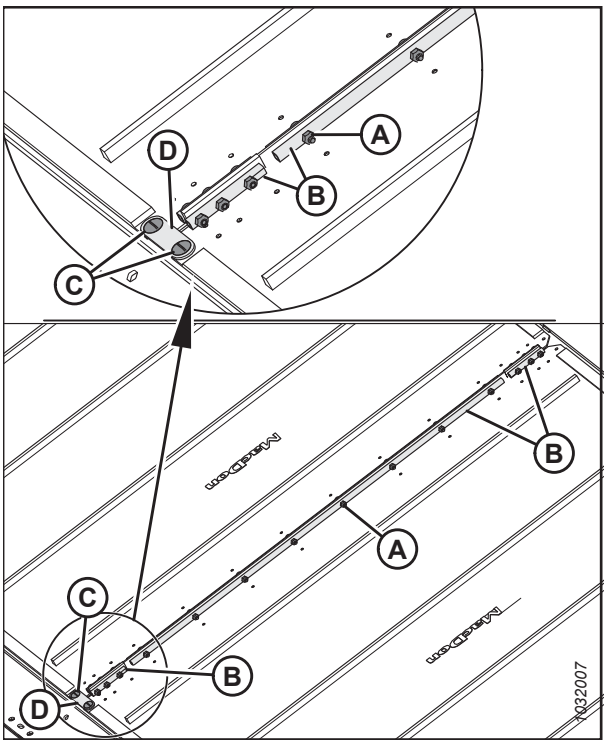


Figure 4.268: Draper Connector

11. Tighten the draper by turning adjuster bolt (A) clockwise. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 607*.

12. Disengage the reel and header safety props. For instructions, refer to *Disengaging Reel Safety Props, page 46*.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

13. Start the engine, and lower the header and reel.

14. Run the machine to verify the draper tracks correctly. If additional adjustment is necessary, refer to *4.12.5 Adjusting Side Draper Tracking, page 609*.

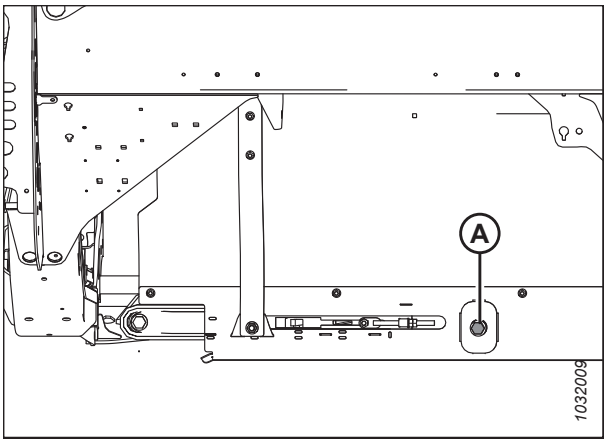


Figure 4.269: Draper Tensioner – Left Side Shown

4.13 Reel

The reel features a uniquely shaped cam, which allows the fingers to get underneath lodged crop and pick it up before it is cut.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *4.1 Preparing Machine for Servicing, page 473*.

4.13.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger tip to pointed guard (B), short guard (C) to cutterbar clearance (A) is shown in the tables below.

Table 4.3 Finger to Guard/Cutterbar Clearance – Double Reel

Header	End Panels	At Hinge Points
FD230	20 mm (0.80 in.)	45 mm (1.77 in.)
FD235 FD240	20 mm (0.80 in.)	20 mm (0.80 in.)

Table 4.4 Finger to Guard/Cutterbar Clearance – Triple Reel

Header	Outer End Panels	Beside Center Arms
FD240 FD241 FD245 FD250	20 mm (0.80 in.)	20 mm (0.80 in.)

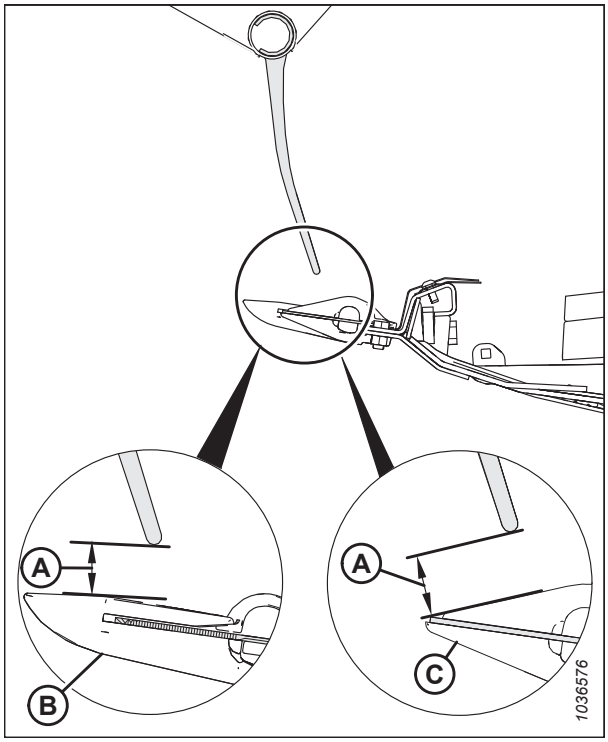


Figure 4.270: Finger Clearance

Measuring Reel Clearance

Make sure there is sufficient clearance between the reel and the cutterbar to prevent the knife from cutting reel finger tips off during operation.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

DANGER

Never start or move the machine until you are sure that all bystanders have cleared the area.

1. Start the engine. For instructions, refer to the combine operator's manual.
2. Park the combine on a level surface.
3. Adjust the reel fore-aft position until the number seven on fore-aft indicator (A) is hidden by sensor support (B).
4. Shut down the engine, and remove the key from the ignition.

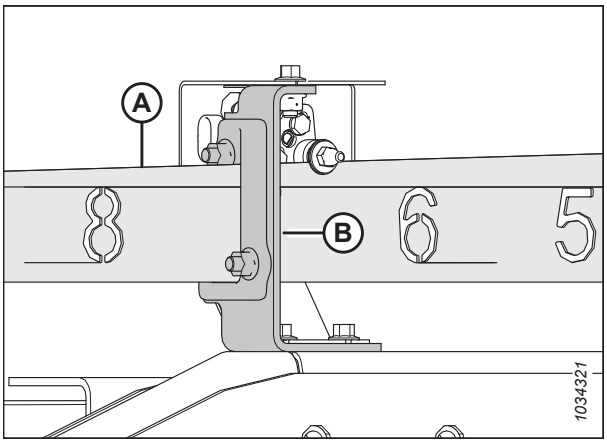


Figure 4.271: Fore-Aft Position

5. Place two 254 mm (10 in.) blocks (A) under the cutterbar, just inboard of the wing flex points.

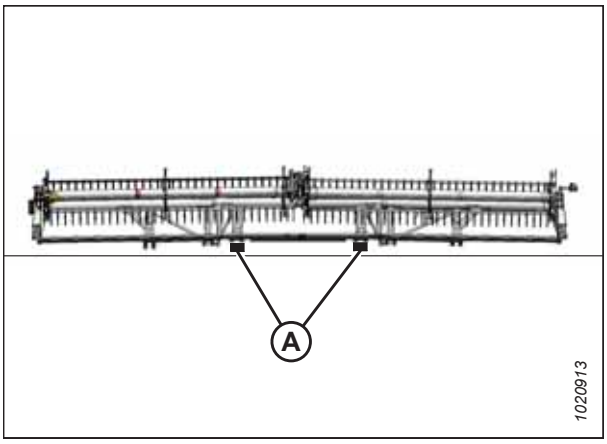


Figure 4.272: FlexDraper® Block Locations – Double Reel

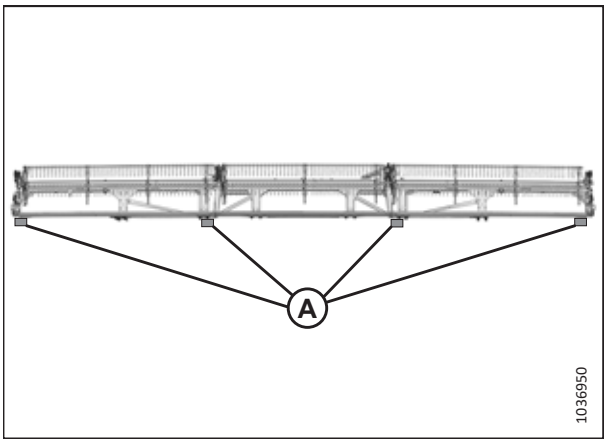


Figure 4.273: FlexDraper® Block Locations – Triple Reel

6. Move wing lock spring handles (A) down to **UNLOCK** position.
7. Ensure all bystanders have cleared the area, and then start the engine.
8. Lower the header fully, allowing it to flex into full frown mode.

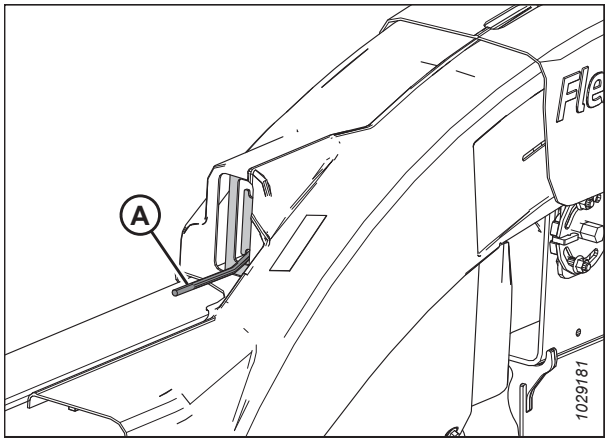


Figure 4.274: Wing Lock in UNLOCK Position

9. Measure clearance (A) between the finger tip and pointed guard (B) or short guard (C) at the ends of the reels. For clearance specifications, refer to *4.13.1 Reel Clearance to Cutterbar, page 622*.

   For measurement locations, refer to:

   - Figure *4.276, page 625* – double reel
   - Figure *4.277, page 625* – triple reel

10. Adjust the reel clearance, if required. For instructions, refer to *Adjusting Clearance between Reel and Cutterbar, page 625*.

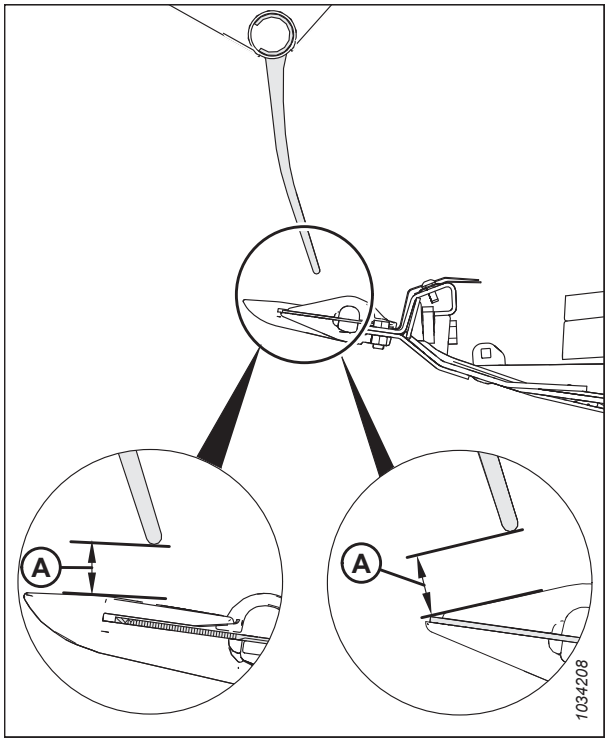


Figure 4.275: Measurement from Finger Tip to Guard

FlexDraper® double-reel measurement location (A): Outer ends of the reels and at both hinge points (four places).

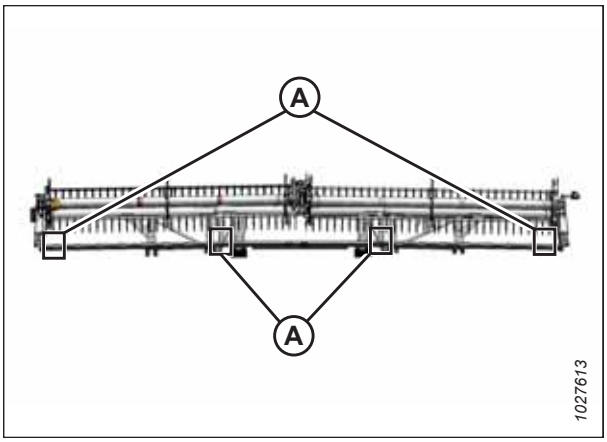


Figure 4.276: FlexDraper® Measurement Locations – Double Reel

FlexDraper® triple-reel measurement location (A): Both ends of three reels (six places).

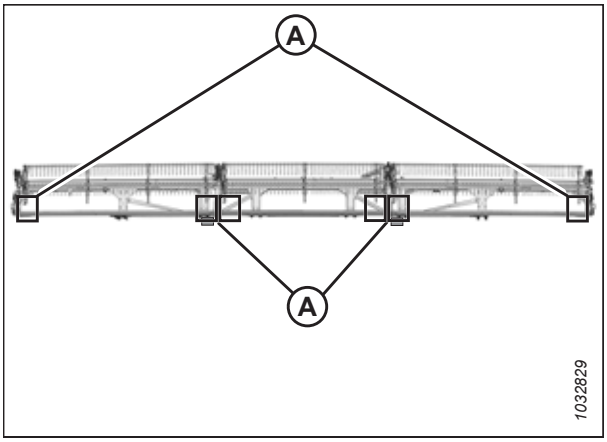


Figure 4.277: FlexDraper® Measurement Locations – Triple Reel

Adjusting Clearance between Reel and Cutterbar

Make sure there is sufficient clearance between the reel and cutterbar to prevent the knife from cutting reel finger tips off during operation.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

To adjust the clearance between the reel and cutterbar, follow these steps:

1. Place two 254 mm (10 in.) blocks (A) under the cutterbar, just inboard of the wing flex points.
2. Shut down the engine, and remove the key from the ignition.

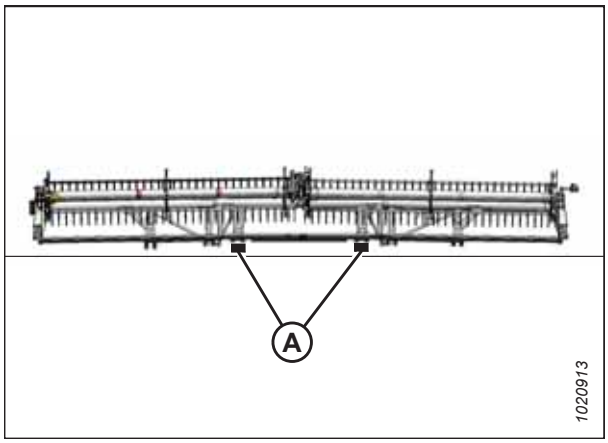


Figure 4.278: FlexDraper® Block Locations

3. Loosen bolts (A) on both center arm cylinders.
4. Ensure distance measurement (B) is equal on both cylinders.

   NOTE:

   Distance measurement (B) is from the center of mounting pins (C) to the tops of the notches in cylinder rods (D).
5. Verify that both mounting pins (C) cannot be rotated by hand. If one of the mounting pins is free to rotate, then adjust cylinder rods (D) as required until both cylinder rods take the load:
   - Turn the cylinder rod out of the clevis to increase the load on the cylinder rod.
   - Turn the cylinder rod into the clevis to decrease the load on the cylinder rod.
6. Tighten bolts (A).
7. **Triple reel:** Repeat Step *3, page 626* to Step *6, page 626* for the other center reel arm.

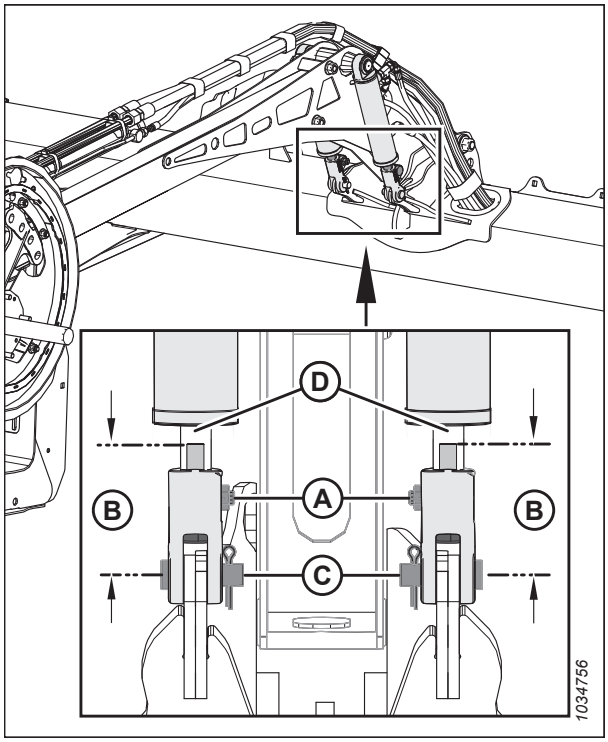


Figure 4.279: Center Arm Cylinders

WARNING

Check to be sure all bystanders have cleared the area.

8. Start the engine. Lower the reel fully, and continue holding the control button down to phase the cylinders.
9. Shut down the engine, and remove the key from the ignition.

10. Adjust the clearance at the outboard ends of the reel as follows:
    a. Loosen bolt (A) on the outer arm cylinder.
    b. Adjust cylinder rod (B) as required:
        - To increase clearance to the cutterbar, turn cylinder rod (B) out of clevis to raise the reel.
        - To decrease clearance to the cutterbar, turn cylinder rod (B) into clevis to lower the reel.
    c. Tighten bolt (A).
11. Repeat Step *10, page 627* at opposite side of the header.

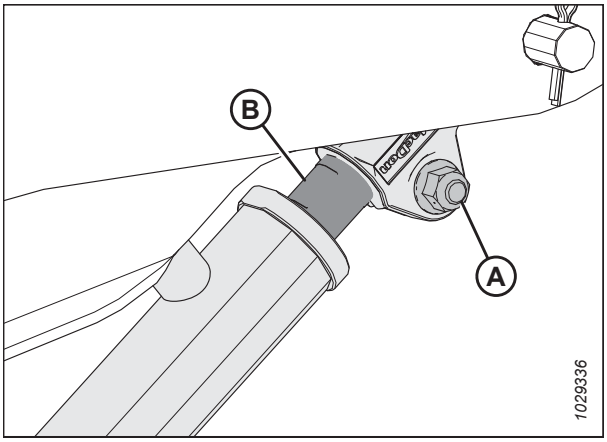


Figure 4.280: Outside Arm Cylinder

12. Loosen bolts (A) on both center arm cylinders.
13. Adjust the clearance as follows:

    IMPORTANT:

    Adjust both cylinder rods equally.

    - To increase clearance to the cutterbar, turn cylinder rods (D) out of clevis to raise the reel.
    - To decrease clearance to the cutterbar, turn cylinder rods (D) into clevis to lower the reel.
14. Ensure distance measurement (B) is equal on both cylinders.

    NOTE:

    Distance measurement (B) is from the center of mounting pins (C) to the tops of the notches in cylinder rods (D).
15. Verify that both mounting pins (C) cannot be rotated by hand. If one of the mounting pins is free to rotate, then adjust cylinder rods (D) as required until both cylinder rods take the load:
    - Turn cylinder rod out of the clevis to increase the load on the cylinder rod.
    - Turn cylinder rod into the clevis to decrease the load on the cylinder rod.

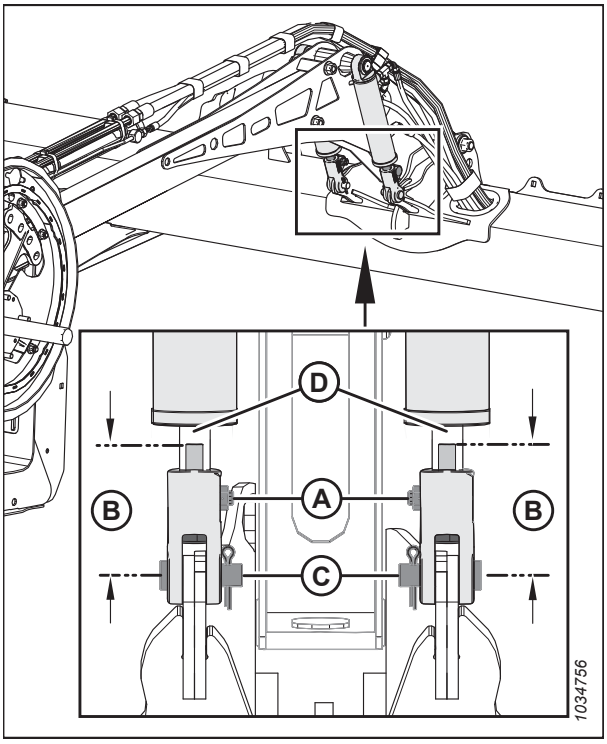


Figure 4.281: Center Arm Cylinders

16. Tighten bolts (A).
17. **Triple reel:** Repeat Step *12, page 627* to Step *16, page 627* for the other center reel arm.

WARNING

Check to be sure all bystanders have cleared the area.

18. Start the engine. Lower the reel fully, and continue holding the control button down to phase the cylinders.
19. Shut down the engine, and remove the key from the ignition.

20. Check measurements and, if necessary, repeat the adjustment procedures.
21. Move the reel back to ensure the steel end fingers do not contact the deflector shields.
22. If contact occurs, adjust the reel upward to maintain the clearance at all reel fore-aft positions. If contact cannot be avoided after adjusting the reel, trim the steel end fingers to obtain proper clearance.
23. Periodically check for evidence of contact during operation, and adjust clearance as required.

4.13.2 Reel Frown

The reel must be set up to frown (providing more clearance at the center of the reel than at the ends) to compensate for reel flexing.

Adjusting Reel Frown

The reel must be set up to frown (provide more clearance at the center of the reel than at the ends) to compensate for reel flexing.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Position the reel over the cutterbar (between **4** and **5** on fore-aft position indicator [A]) to provide adequate clearance at all reel fore-aft positions. Bracket (B) is the position marker.
2. Record the measurement at each reel disc location for each reel tube.

   NOTE:

   Measure the frown profile before disassembling the reel for servicing so the profile can be maintained during reassembly.
3. Shut down the engine, and remove the key from the ignition.

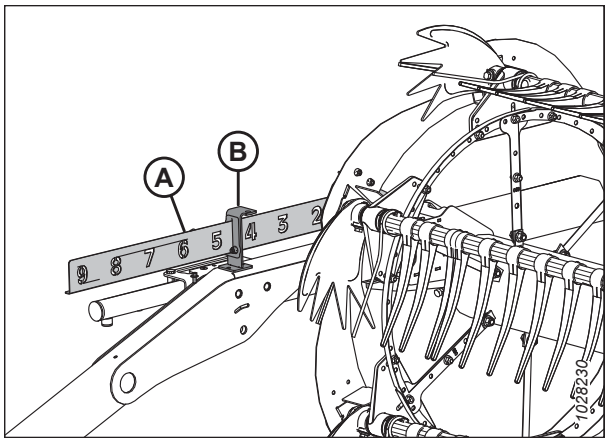


Figure 4.282: Fore-Aft Position Indicator

4. Start with the reel disc closest to the center of the header and proceed outward towards the ends, adjusting the header profile as follows:
   a. Remove bolts (A).
   b. Loosen bolt (B) and adjust arm (C) until the desired measurement is obtained between the reel tube and cutterbar.

      NOTE:

      Allow the reel tubes to curve naturally and position the hardware accordingly.
   c. Reinstall bolts (A) in the aligned holes and tighten them.

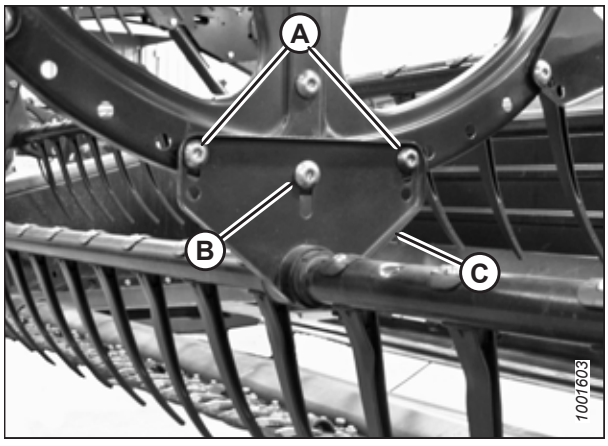


Figure 4.283: Center Reel Disc

4.13.3 Centering Reel

The reel needs to be centered on the header to avoid any contact with the end panels.

DANGER

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key before adjusting the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Measure clearance (A) at locations (B) between the reel tine tube and the endsheet at both ends of the header. The clearances should be the same if the reel is centered.

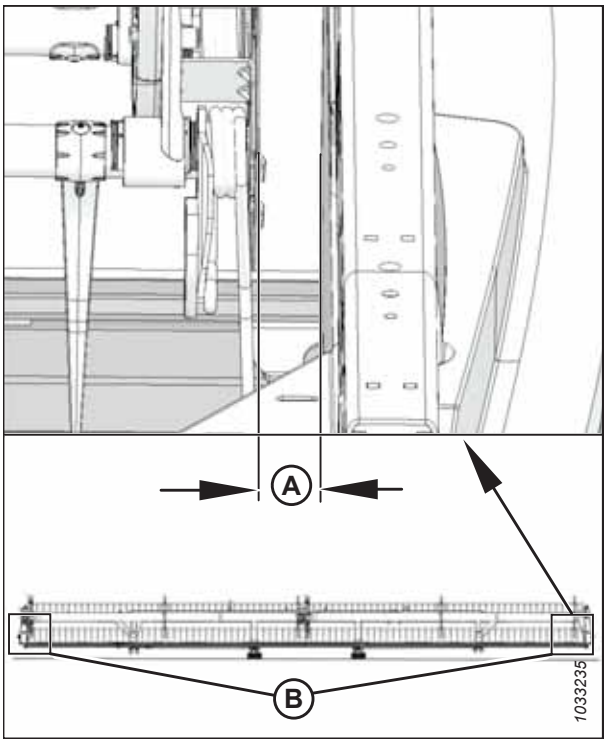


Figure 4.284: Centering Reel

3. Loosen bolt (A) on brace (B) at the center support arm.
4. Move the forward end of reel support arm (C) laterally as required to center the reel.
5. Tighten bolt (A) and torque to 457 Nm (337 lbf·ft).

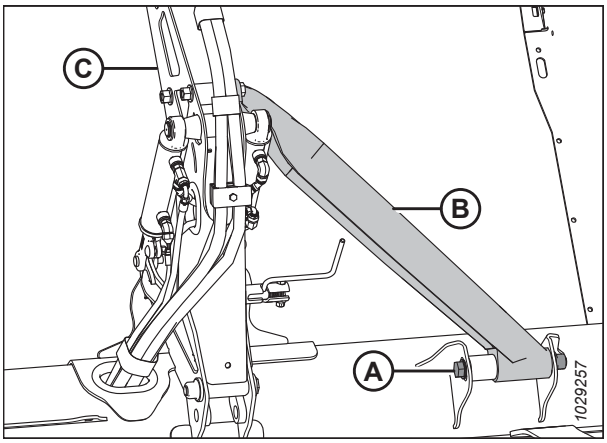


Figure 4.285: Center Support Arm

4.13.4 Reel Fingers

If a reel finger is damaged or worn, it will need to be removed so it can be replaced. Reel fingers are either steel or plastic.

IMPORTANT:

Keep the reel fingers in good condition and straighten or replace them as necessary.

Removing Steel Fingers

Damaged steel fingers will need to be cut off of the reel tine tube.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to avoid damaging it and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.
5. Remove the tine tube bushings from the applicable tine tube at the center and left reel discs. For instructions, refer to *Removing Bushings from Reels, page 633*.
6. Attach tine tube arms (B) to the reel disc at original attachment locations (A).
7. Cut the damaged finger so it can be removed from the tine tube.
8. Remove bolts from the existing fingers and slide the fingers over to replace the finger that was cut off in Step *7, page 630* (remove tine tube arms [B] from the tine tubes as necessary).

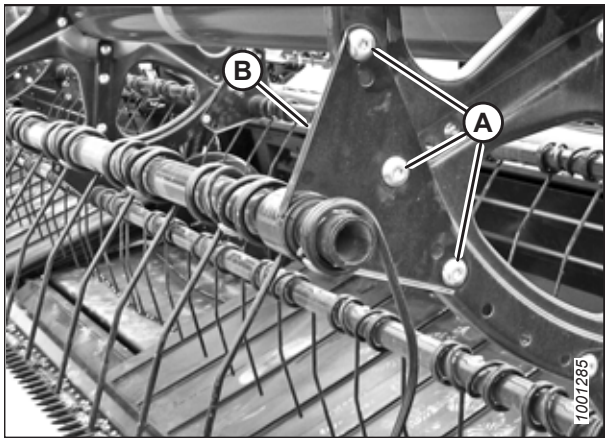


Figure 4.286: Tine Tube Arm

Installing Steel Fingers

Once the old steel finger has been removed, a new finger can be pushed onto the tine tube.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

NOTE:

This procedure assumes a finger has been removed from the machine. For instructions about removing fingers, refer to *Removing Steel Fingers, page 630*.

1. Slide the new finger and tine tube arm (A) onto the end of the tube.
2. Install the tine tube bushings. For instructions, refer to *Installing Bushings onto Reels, page 638*.
3. Attach the fingers to the tine tube with bolts and nuts (B).

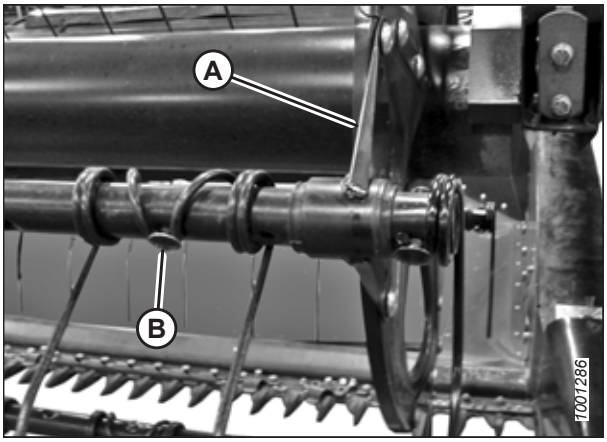


Figure 4.287: Tine Tube

Removing Plastic Fingers

Plastic reel fingers are secured to the tine tube with a single Torx® screw.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

5. Remove screw (A) using a Torx® Plus 27 IP socket wrench.

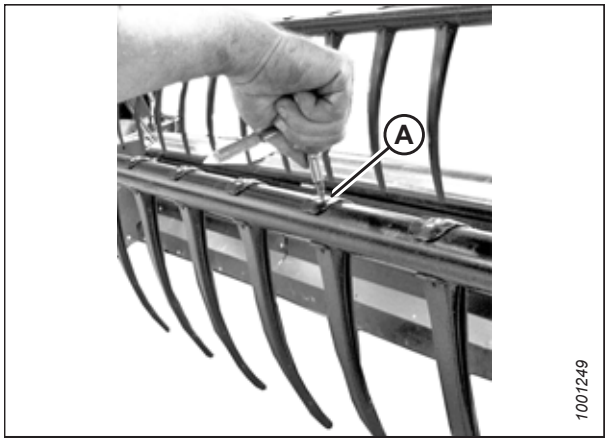


Figure 4.288: Removing Plastic Finger

6. Push the clip at the top of the finger back towards the reel tube as shown and remove the finger from the tube.

Figure 4.289: Removing Plastic Finger

Installing Plastic Fingers

Once the old plastic reel finger has been removed, the new one can be installed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

NOTE:

This procedure assumes a finger has been removed from the machine. For information about removing fingers, refer to *Removing Plastic Fingers, page 631*.

1. Position the new finger on the rear of the tine tube. Engage the lug at the bottom of the finger in the lower hole in the tine tube.
2. Lift the top flange gently and rotate the finger as shown until the lug in the top of the finger engages the upper hole in the tine tube.

Figure 4.290: Installing Plastic Finger

3. Install screw (A) using a Torx® Plus 27 IP socket wrench and torque it to 8.5–9.0 Nm (75–80 lbf·in).

   IMPORTANT:

   Do **NOT** apply force to the finger prior to tightening the mounting screw. Applying force without tightening the mounting screw will break the finger or shear the locating pins.

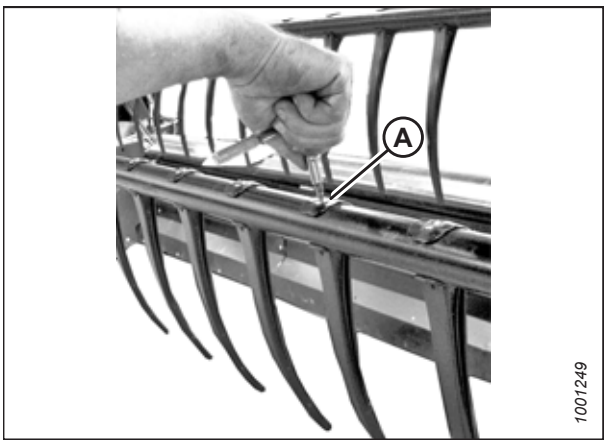


Figure 4.291: Installing Plastic Finger

4.13.5 Tine Tube Bushings

The reel tine tube rests in a tine tube bushing, which is secured to the reel disc. If a tine tube bushing is damaged or worn, it will need to be replaced.

Removing Bushings from Reels

The bushing clamps securing the tine tube to the bushing will need to be released so that the bushing halves can be removed.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube and other components.

1. Lower the header fully.
2. Raise the reel fully.
3. Shut down the engine, and remove the key from the ignition.

4. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 45*.

   NOTE:

   If replacing only the cam end bushing, proceed to Step *10, page 635*.

Center disc and tail end bushings

5. Remove the reel endshields and endshield support (C) from the tail end of the reel at the applicable tine tube location.

   NOTE:

   There are no endshields on the center disc.

6. Remove bolts (A) securing tine tube arm (B) to the disc.

   IMPORTANT:

   Note the hole locations in the arm and disc and ensure bolts (A) are reinstalled at the original locations.

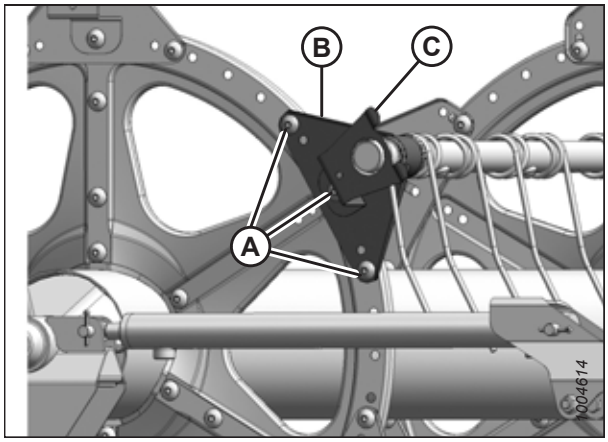


Figure 4.292: Tail End

7. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

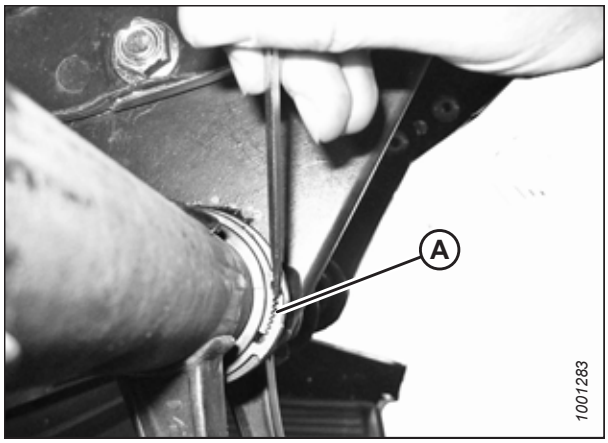


Figure 4.293: Bushing Clamp

8. Rotate tine tube arm (A) until clear of the disc and slide the arm inboard off of bushing (B).

9. Remove bushing halves (B). If required, remove the next steel or plastic finger, so the arm can slide off the bushing. Refer to the following procedures as necessary:

   - *Removing Plastic Fingers, page 631*
   - *Removing Steel Fingers, page 630*

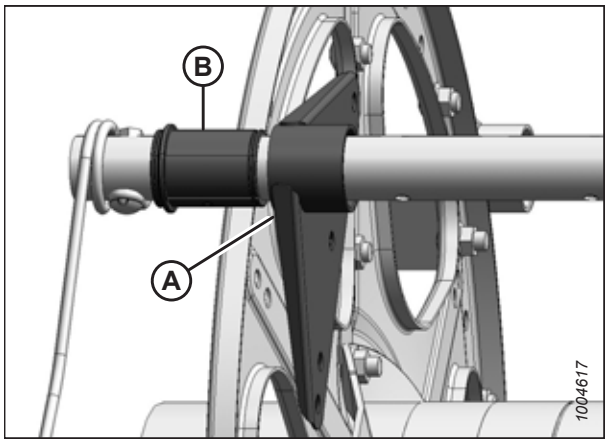


Figure 4.294: Bushing

Cam end bushings

10. Remove the endshields and endshield support (A) from the applicable tine tube location on the cam end.

    NOTE:

    Removing cam end bushings requires the tine tube to be moved through the disc arms to expose the bushing.

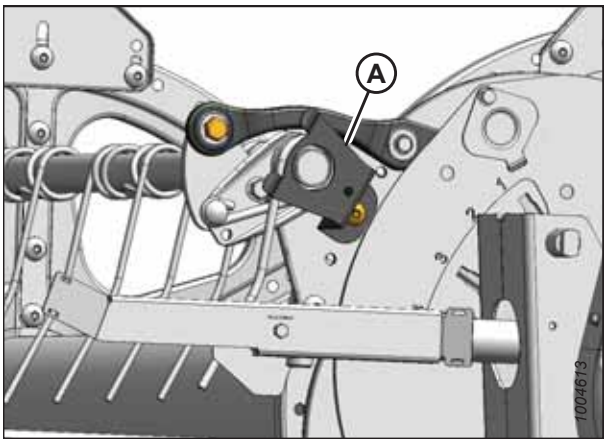


Figure 4.295: Cam End

11. Remove the reel endshields and endshield support (C) from the tail end of the reel at the applicable tine tube location.

    NOTE:

    There are no endshields on the center disc.

12. Remove bolts (A) securing tine tube arms (B) to the tail and center discs.

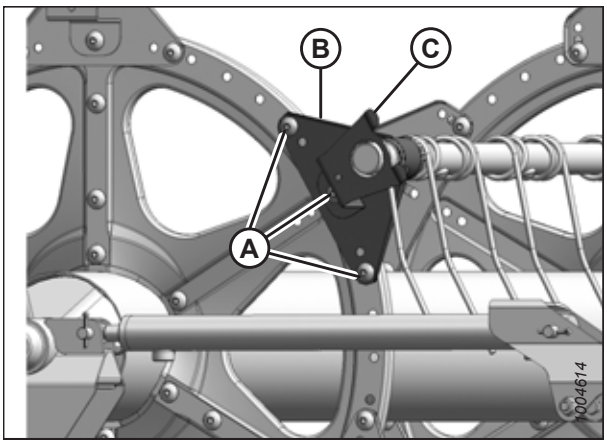


Figure 4.296: Tail End

Tine tube reinforcing kit (option)

13. Release the bushing clamps or disconnect the support channels from the tine tube support (if installed) depending on which tine tube is being moved. Three tine tubes (A) require channel disconnection and two tine tubes (B) require only bushing clamp removal.

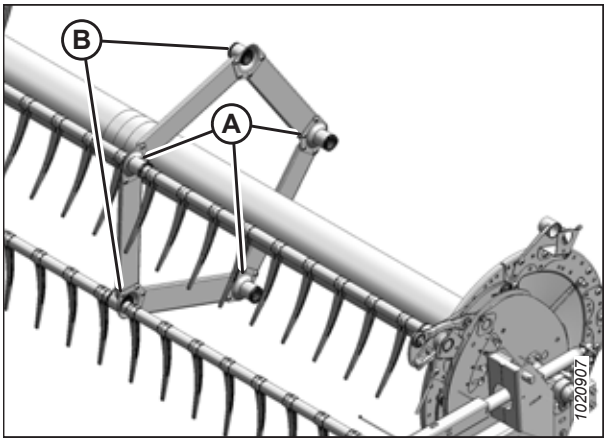


Figure 4.297: Tine Tube Supports

14. Remove bolt (A) from the cam linkage so tine tube (B) is free to rotate.

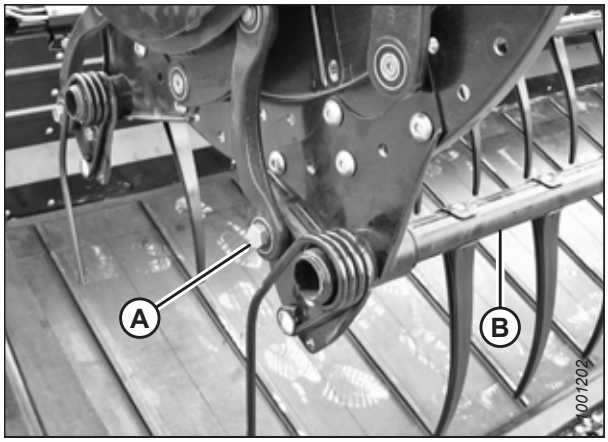


Figure 4.298: Cam End

15. Release bushing clamps (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamps off the bushings.

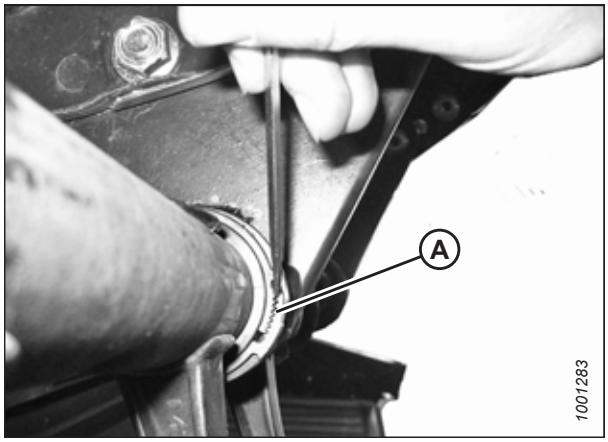


Figure 4.299: Bushing Clamp

16. Slide tine tube (A) outboard to expose bushing (B).

17. Remove bushing halves (B). If required, remove the next steel or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:

    - *Removing Plastic Fingers, page 631*
    - *Removing Steel Fingers, page 630*

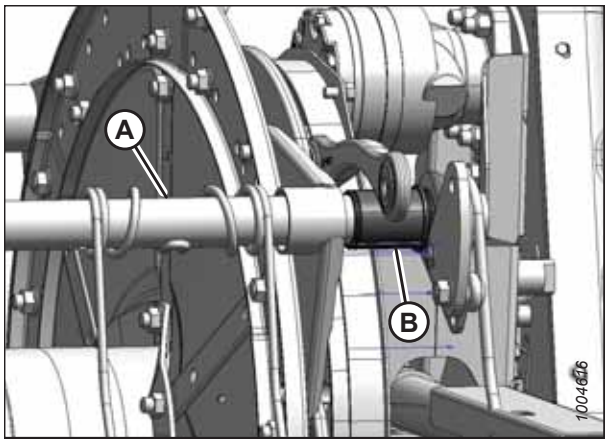


Figure 4.300: Cam End

Tine tube reinforcing kit bushings – option

18. Locate support (A) that requires a new bushing.
19. Remove four bolts (B) securing channel (C) to support (A).
20. Remove screw (E) and remove finger (D) if it is too close to the support to allow access to the bushing. For instructions, refer to *Removing Plastic Fingers, page 631* or *Removing Steel Fingers, page 630*.

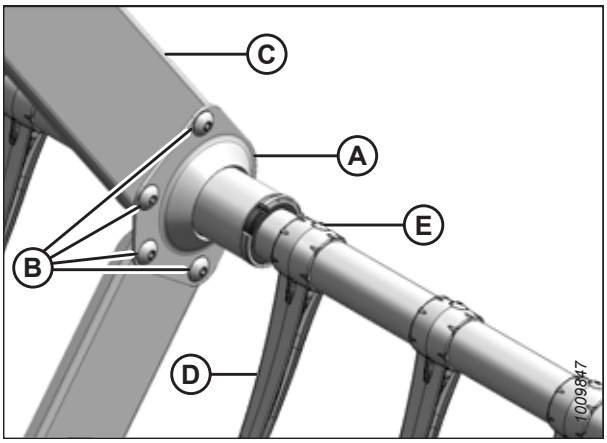


Figure 4.301: Tine Tube Support

21. Release bushing clamps (A) using a small screwdriver to separate the serrations.

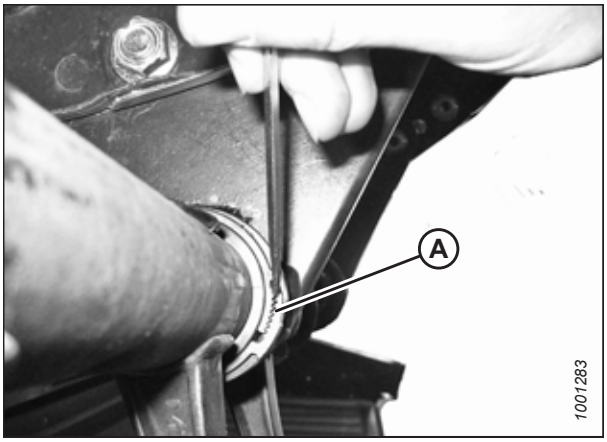


Figure 4.302: Bushing Clamp

22. Move clamps (A) off the bushings.

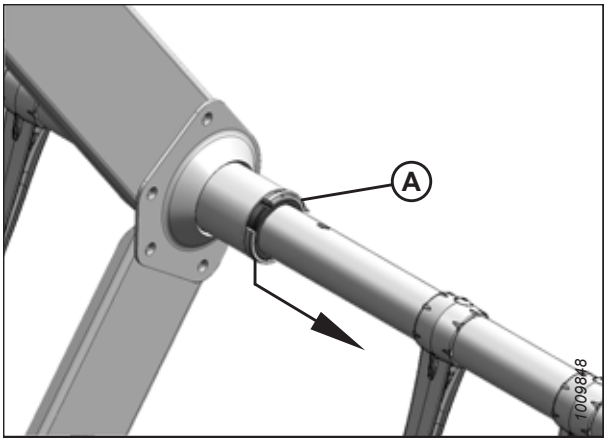


Figure 4.303: Tine Tube Reinforcing Kit Bushing Clamp – Option

23. On each reel, there are three right-facing supports (A). Slide the support off bushing halves (B).

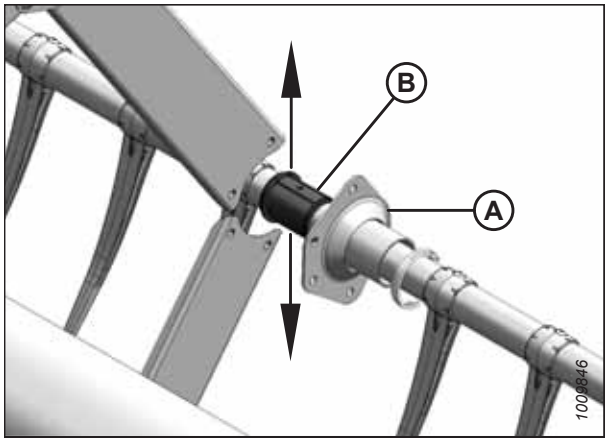


Figure 4.304: Tine Tube Reinforcing Kit Support – Option

24. On each reel, there are two left-facing supports (A). Rotate the supports until the flanges clear the channels before moving them off bushing (B). Move the tube slightly away from the reel if necessary.

25. Remove bushing halves (B) from the tine tubes.

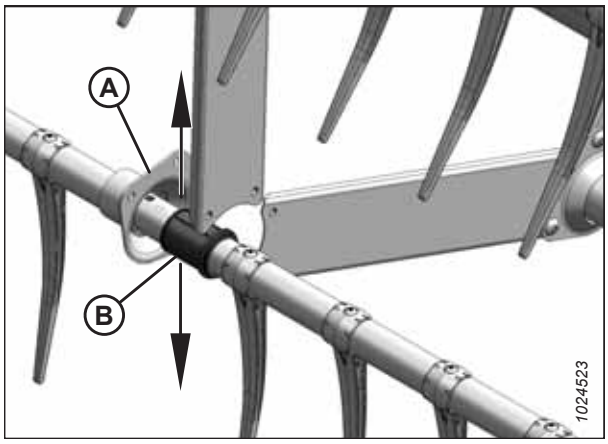


Figure 4.305: Tine Tube Reinforcing Kit Opposite Support – Option

Installing Bushings onto Reels

Once the old tine tube bushing halves have been removed, the new ones can be installed.

NOTE:

This procedure assumes the steps for *Removing Bushings from Reels, page 633* have been completed.

WARNING

To prevent bodily injury from the fall of a raised reel, always engage the reel safety props before going under the raised reel for any reason.

IMPORTANT:

Ensure the tine tube is supported at all times to prevent damage to the tube or other components.

1. Use a pair of modified channel lock pliers (A) to install bushing clamps (C). Secure pliers in a vise and grind a notch (B) into the end of each arm to fit the clamp as shown.

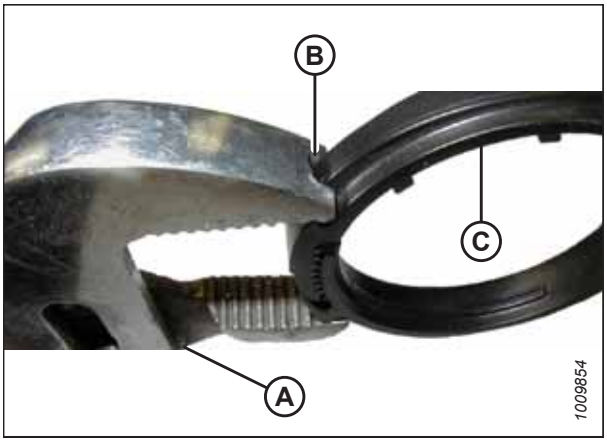


Figure 4.306: Modified Channel Lock Pliers

Cam end bushings

2. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.
3. Slide tine tube (A) towards the tail end of the reel to insert bushing (B) into the tine tube arm. If the tine tube supports are installed, ensure the bushings at those locations slide into the support.
4. Reinstall the previously removed fingers. Refer to the following procedures as necessary:
   - *Removing Plastic Fingers, page 631*
   - *Removing Steel Fingers, page 630*

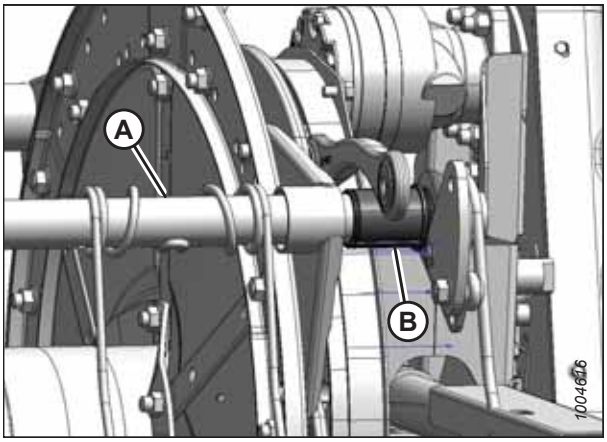


Figure 4.307: Cam End

5. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).
6. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

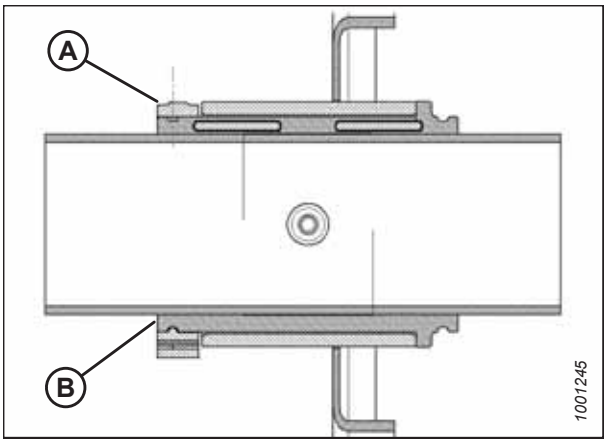


Figure 4.308: Bushing

7. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

   IMPORTANT:

   Overtightening the clamp may result in breakage.

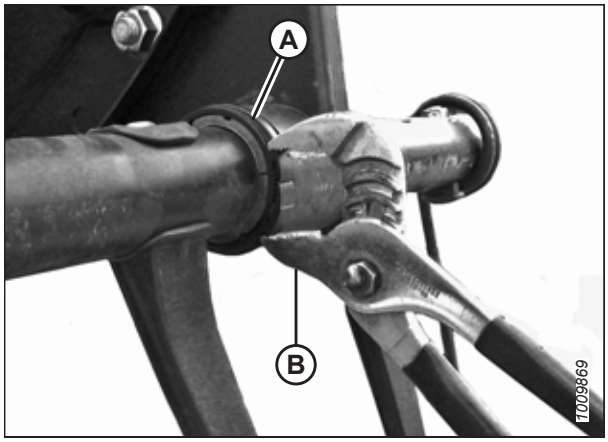


Figure 4.309: Installing Clamp

8. Line up tine tube (B) with the cam arm and install bolt (A). Torque the bolt to 165 Nm (120 lbf·ft).

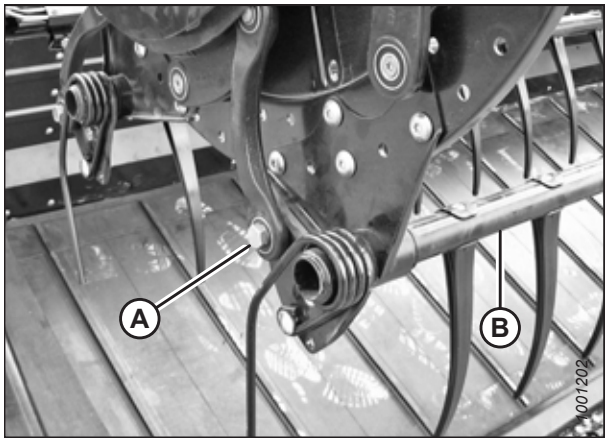


Figure 4.310: Cam End

9. Install bolts (A) securing tine tube arm (B) to the center disc.

10. Install tine tube arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

    NOTE:

    There are no endshields on the center discs.

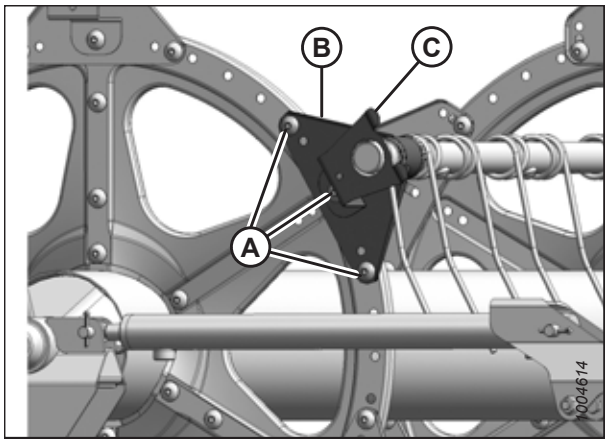


Figure 4.311: Tail End

11. Install endshield support (A) at the applicable tine tube location at the cam end.
12. Reinstall the reel endshields. For instructions, refer to *4.13.6 Reel Endshields, page 644*.

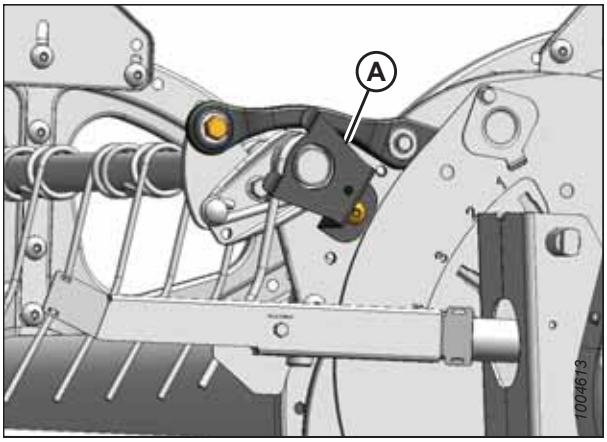


Figure 4.312: Cam End

Center disc and tail end bushings

13. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.
14. Slide tine tube (A) onto bushing (B) and position against the disc at the original location.
15. Reinstall the previously removed fingers. For instructions, refer to:
    - *Removing Plastic Fingers, page 631*
    - *Removing Steel Fingers, page 630*

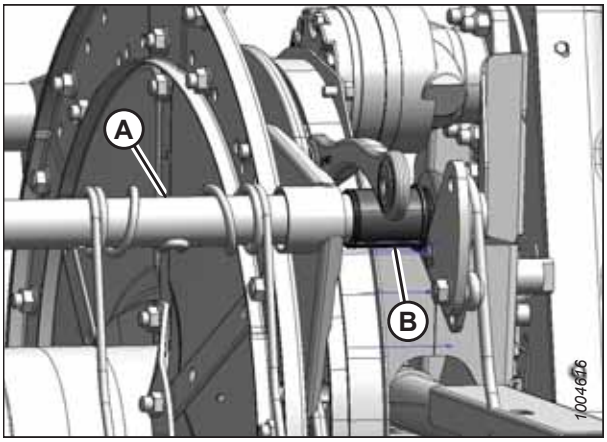


Figure 4.313: Cam End

16. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).
17. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

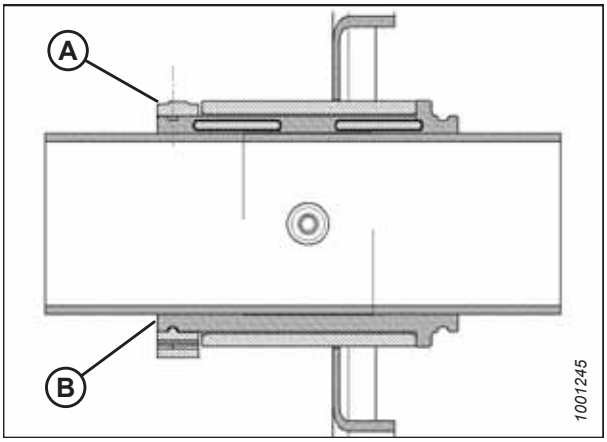


Figure 4.314: Bushing

18. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

    IMPORTANT:

    Overtightening the clamp may result in breakage.

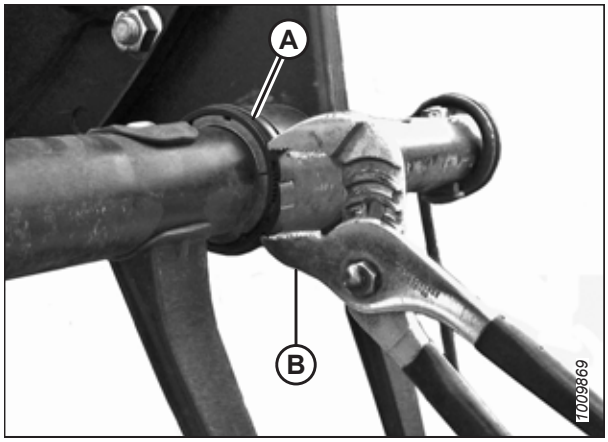


Figure 4.315: Installing Clamp

19. Install bolts (A) securing tine tube arm (B) to the center disc.

20. Install tine tube arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

    NOTE:

    There are no endshields on the center discs.

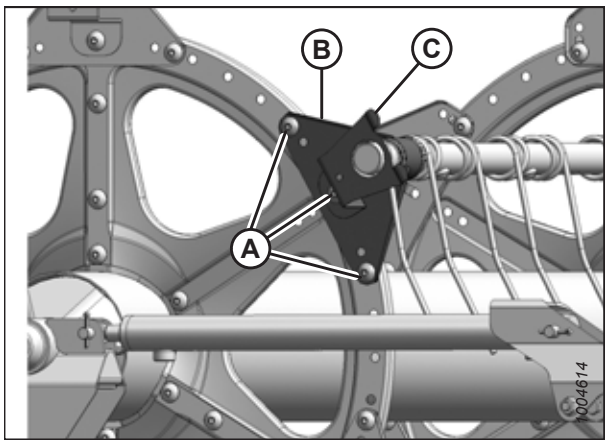


Figure 4.316: Tail End

Tine tube reinforcing kit – option

21. Position bushing halves (B) on tine tube (A) with the flangeless end adjacent to the tine tube arm, and position the lug in each bushing half into the hole in the tine tube.

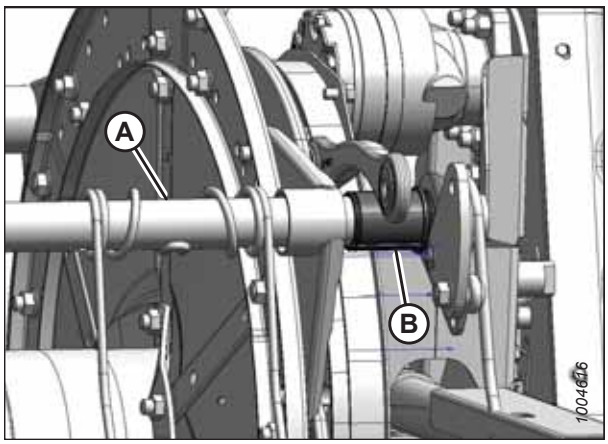


Figure 4.317: Cam End

22. On each reel, there are three right-facing supports (A). Slide the support onto bushing (B).

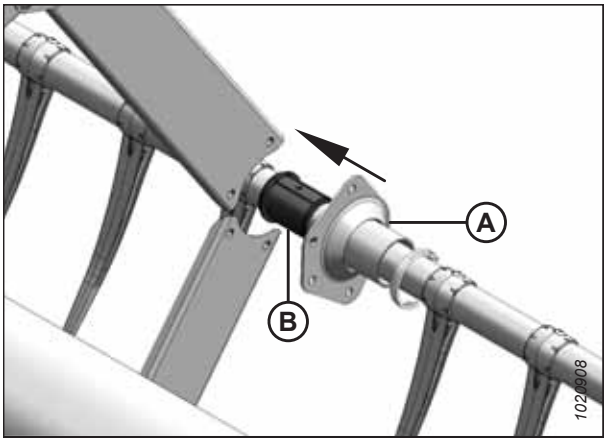


Figure 4.318: Tine Tube Reinforcing Kit Support – Option

23. On each reel, there are two left-facing supports (A). Rotate support (A) until its flanges clear channels (C) before moving the support onto bushing (B).

    NOTE:

    If necessary, move tine tube (D) slightly away from the reel to allow the support flange enough room to clear the channel.

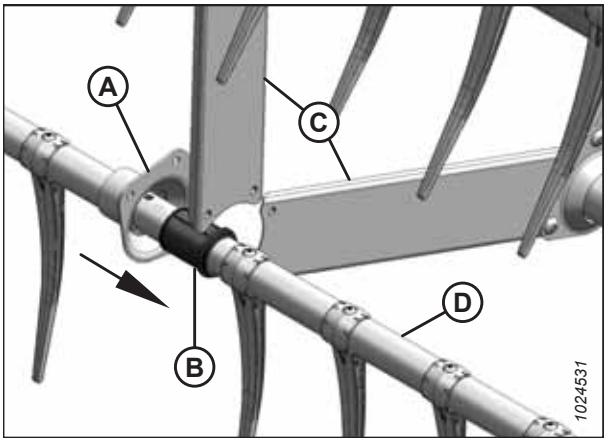


Figure 4.319: Tine Tube Reinforcing Kit Opposite Support – Option

24. Install bushing clamp (A) onto the tine tube adjacent to the flangeless end of bushing (B).

25. Position clamp (A) on bushing (B) so the edges of the clamp and bushing are flush when the clamp is fit into the groove on the bushing and the lock tabs are engaged.

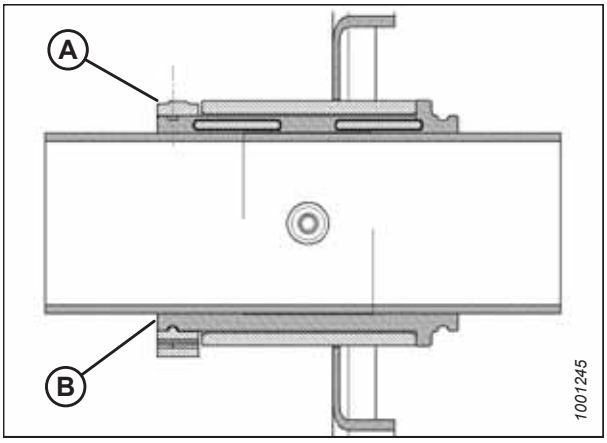


Figure 4.320: Bushing

26. Tighten clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

    IMPORTANT:

    Overtightening the clamp may result in breakage.

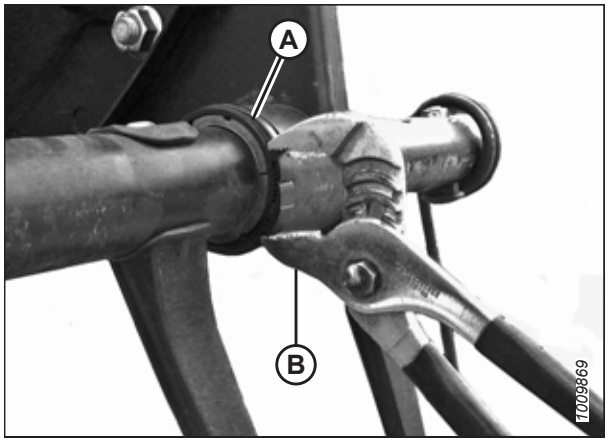


Figure 4.321: Installing Clamp

27. Reattach channels (C) to three right-facing supports (A) on each reel with screws (B) and nuts. Torque the screws to 43 Nm (32 lbf·ft).

28. Using screws (E), reinstall any fingers (D) that were previously removed. For instructions, refer to:

    - *Installing Plastic Fingers, page 632*
    - *Installing Steel Fingers, page 630*

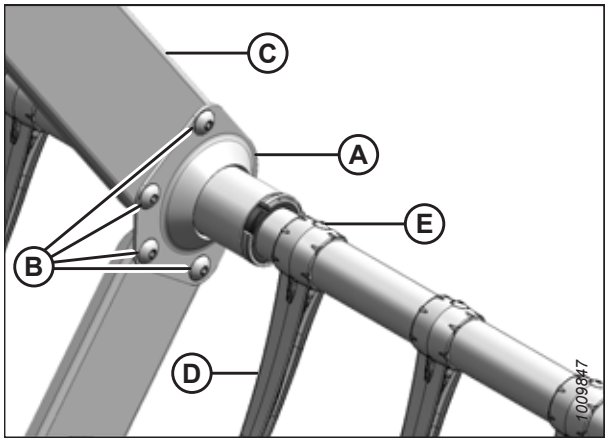


Figure 4.322: Tine Tube Reinforcing Kit Support – Option

29. Reattach channels (C) to two left-facing supports (A) on each reel with screws (B) and nuts. Torque screws to 43 Nm (32 lbf·ft).

30. Using screws (E), reinstall any fingers (D) that were previously removed. For instructions, refer to:

    - *Installing Plastic Fingers, page 632*
    - *Installing Steel Fingers, page 630*

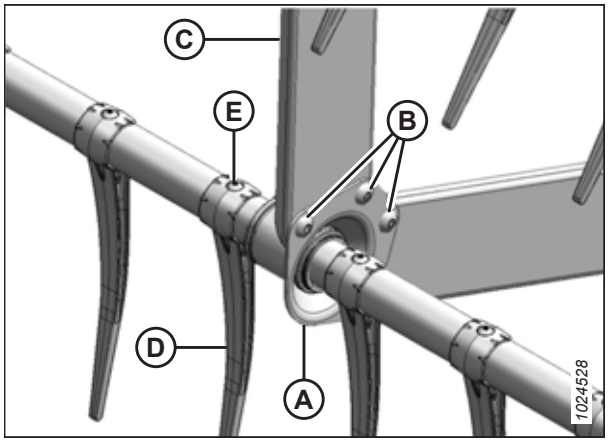


Figure 4.323: Tine Tube Reinforcing Kit Opposite Support – Option

4.13.6 Reel Endshields

Reel endshields and supports do not require regular maintenance, but they should be checked periodically for damage and loose or missing fasteners. Slightly dented or deformed endshields and supports are repairable, but it's necessary to replace severely damaged components.

There are four kinds of endshields. Ensure you are installing the correct endshield to the proper location as shown below.

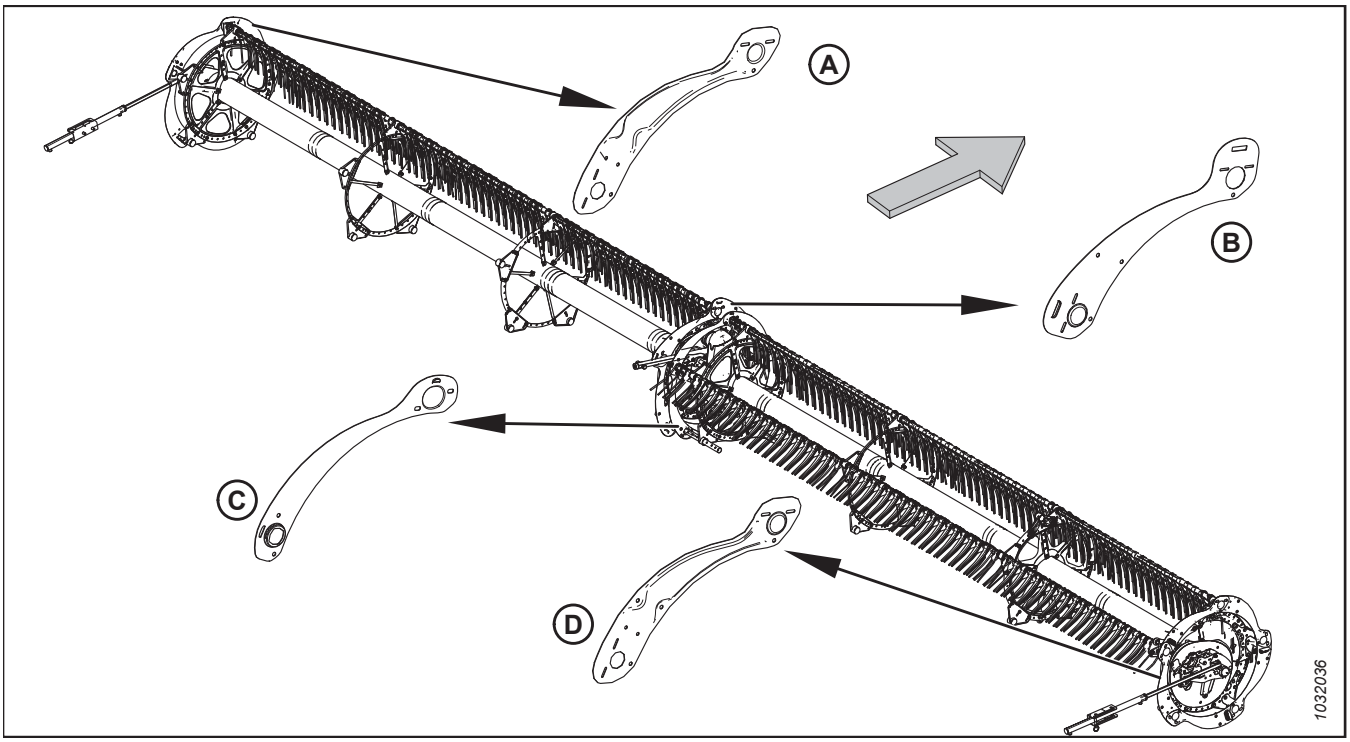


Figure 4.324: Reel Endshields

A - Tail End, Outboard (MD #311695)
B - Cam End, Inboard (MD #273823)
C - Tail End, Inboard (MD #311795)
D - Cam End, Outboard (MD #311694)

NOTE:

Arrow points to the front of machine.

Replacing Reel Endshields at Outboard Cam End

The procedure for replacing reel endshields is applicable to the inboard and outboard cam end. Exceptions are noted where applicable.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Endshields are different for inboard and outboard cam end. Refer to Figure *4.324, page 645*.

NOTE:

Arrows in the following illustrations point to the front of machine.

1. Lower the header and reel.
2. Shut down the engine, and remove the key from the ignition.

3. Rotate the reel manually until reel endshield (A) requiring replacement is accessible.
4. Remove three bolts (B).

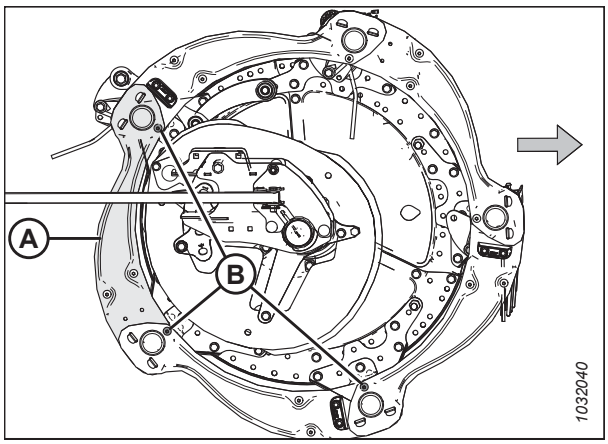


Figure 4.325: Reel Endshields – Outboard Cam End

5. Remove two screws (A), nuts, and outboard cam deflector. Retain for reinstallation.
6. Lift the end of reel endshield (B) off support (C).

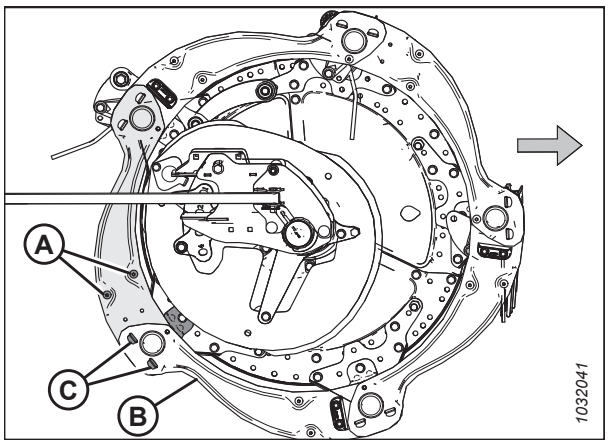


Figure 4.326: Reel Endshields – Outboard Cam End

7. Remove the reel endshield from supports (A).

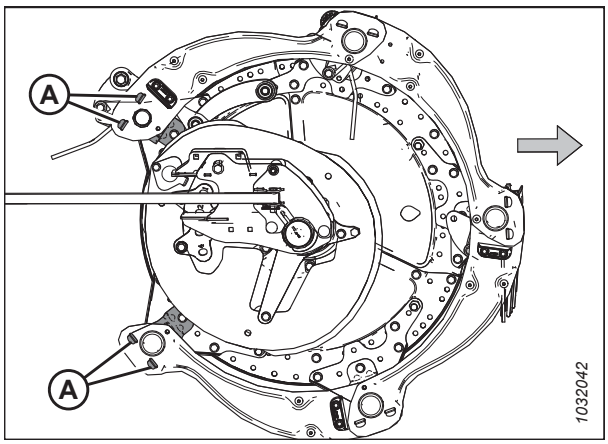


Figure 4.327: Reel Endshield Removed – Outboard Cam End

8. Slightly lift the end of existing reel endshield (A) off of support (B).
9. Position new reel endshield (C) onto support (B) under existing reel endshield (A).
10. Position the other end of new reel endshield (C) onto other support (D) over existing reel endshield (E).
11. Reinstall three bolts (F).
12. Reinstall two screws (G), outboard cam deflector, and nuts (removed in Step *5, page 646*) on the new reel endshield.
13. Tighten all hardware.

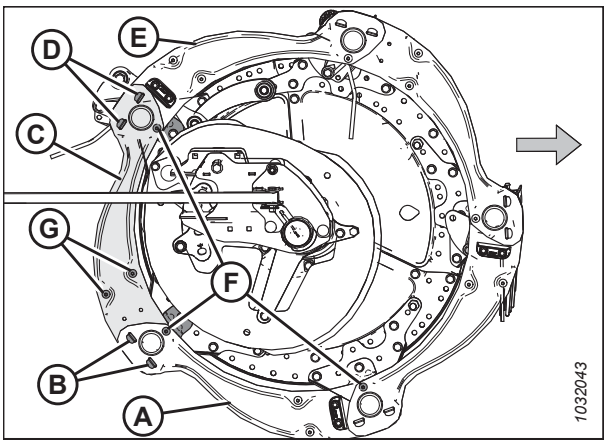


Figure 4.328: Reel Endshields – Outboard Cam End

Replacing Reel Endshields at Inboard Cam End

The procedure for replacing reel endshields is applicable to the inboard and outboard cam end.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

Endshields are different for inboard and outboard cam end. Refer to Figure *4.324, page 645*.

NOTE:

Arrows in the following illustrations point to the front of machine.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Rotate the reel manually until reel endshield (A) requiring replacement is accessible.
5. Remove three bolts (B).

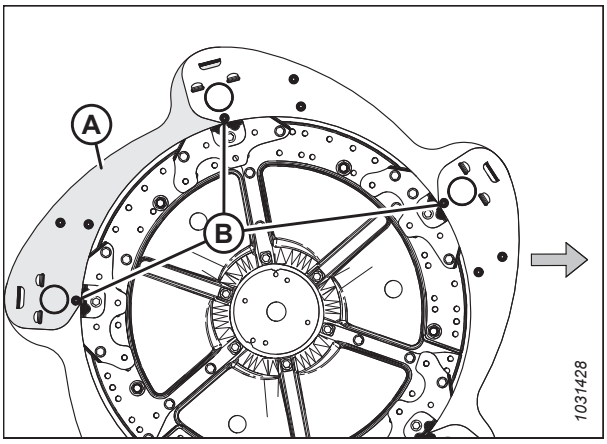


Figure 4.329: Reel Endshields – Inboard Cam End

6. Remove and retain two screws (A), cam deflector, and nuts from the reel endshield.
7. Lift the end of reel endshield (B) off support (C).

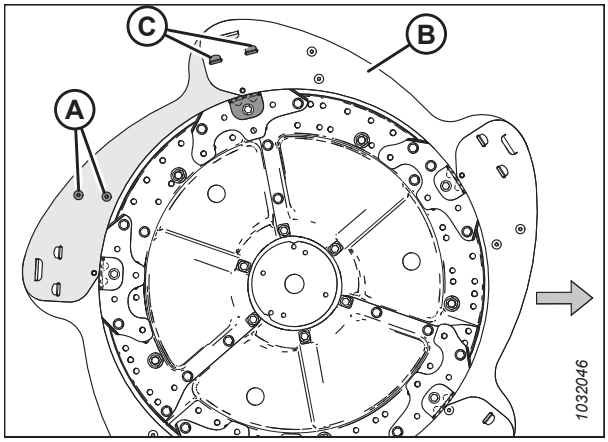


Figure 4.330: Reel Endshields – Inboard Cam End

8. Remove the reel endshield from supports (A).

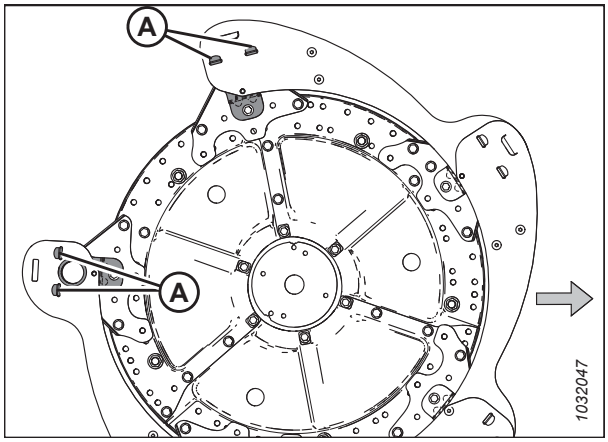


Figure 4.331: Reel Endshield Removed – Inboard Cam End

9. Slightly lift the end of existing reel endshield (A) off of support (B).
10. Position new reel endshield (C) onto support (B) under existing reel endshield (A).
11. Position the other end of new reel endshield (C) onto other support (D) over existing reel endshield (E).
12. Reinstall three bolts (F).
13. Reinstall two screws (G), cam deflector, and nuts (removed in Step *6, page 648*) on the new reel endshield.
14. Tighten all hardware.

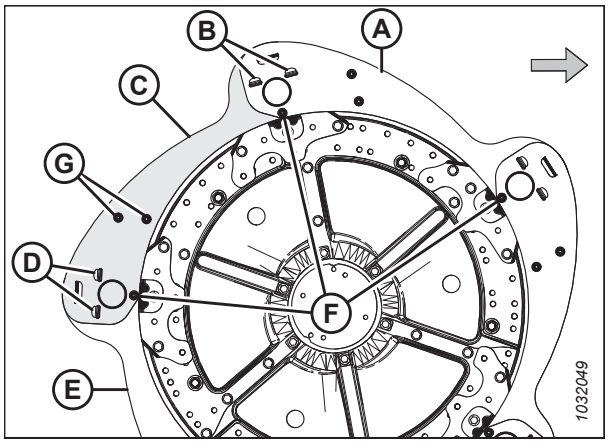


Figure 4.332: Reel Endshields – Inboard Cam End

Replacing Reel Endshields at Outboard Tail End

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Rotate the reel manually until reel endshield requiring replacement (A) is accessible.
5. Remove three bolts (B).

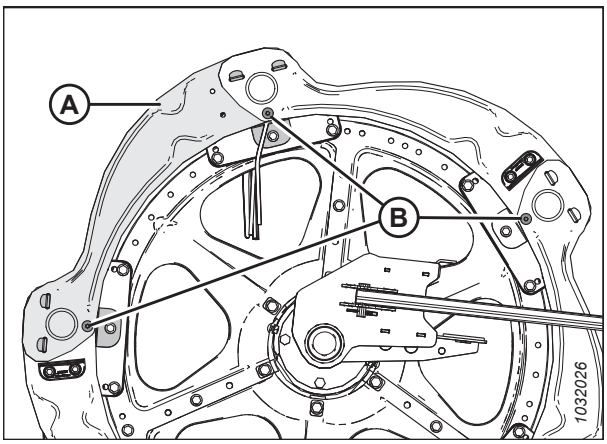


Figure 4.333: Reel Endshields – Outboard Tail End

6. Lift the end of reel endshield (A) off support (B).

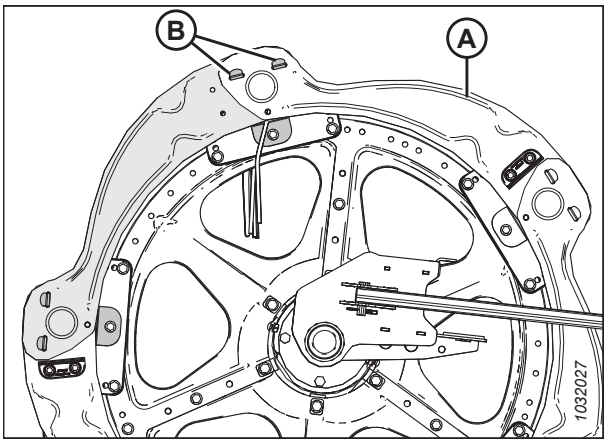


Figure 4.334: Reel Endshields – Outboard Tail End

7. Remove the reel endshield from supports (A).
8. Remove the reel paddle, if installed on the reel endshield.

   NOTE:

   Reel end paddles (B) are installed alternately on the reel endshields.

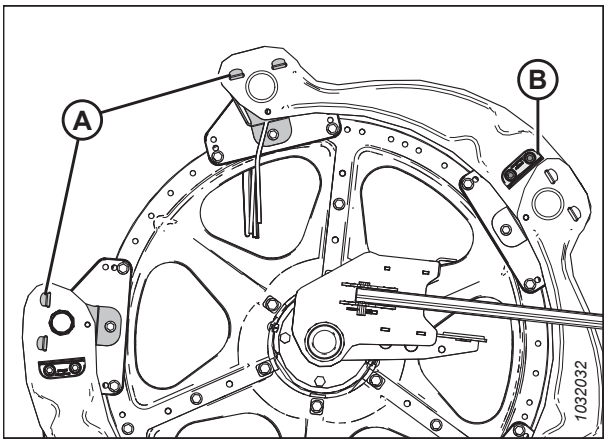


Figure 4.335: Reel Endshield Removed – Outboard Tail End

9. Slightly lift the end of reel endshield (A) off of support (B).
10. Position new reel endshield (C) onto support (B) under existing reel endshield (A).
11. Position the other end of new reel endshield (C) onto other support (E) over the existing reel endshield.
12. Reinstall three bolts (D).
13. Reinstall the paddle (removed in Step *8, page 649*) onto the new reel endshield if previously installed.
14. Tighten all hardware.

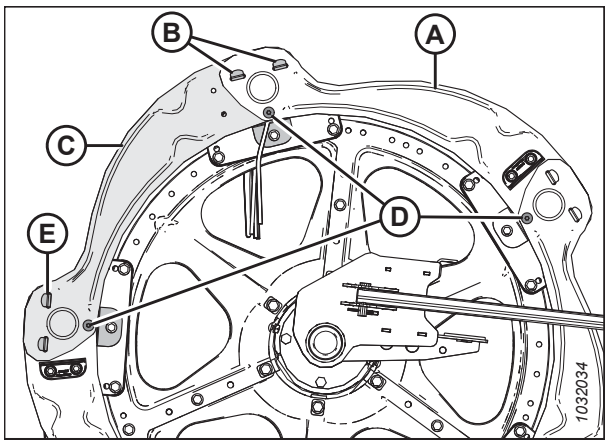


Figure 4.336: Reel Endshields – Outboard Tail End

Replacing Reel Endshields at Inboard Tail End

The reel endshields need to be replaced if they are damaged.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

IMPORTANT:

Reel endshields are different for inboard and outboard tail end of header. For illustration, refer to *4.324, page 645*.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Rotate the reel manually until reel endshield requiring replacement (A) is accessible.
5. Remove six M10 screws (B) and nuts. Retain the hardware for reinstallation.

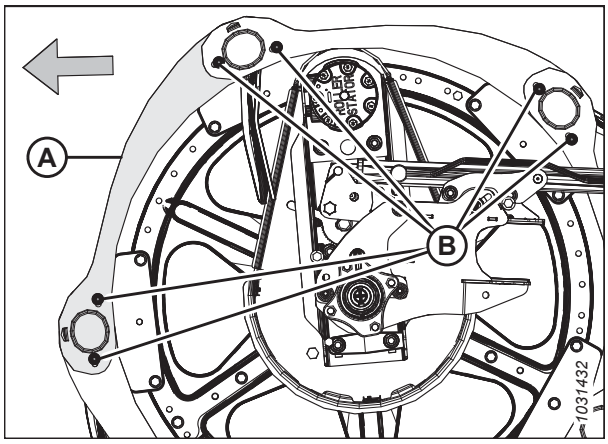


Figure 4.337: Reel Endshields – Inboard Tail End

6. Lift other endshield (A) to disengage the tab from endshield (B).
7. Lift the end of reel endshield (B) off endshield (C), and rotate endshield (B) downward.

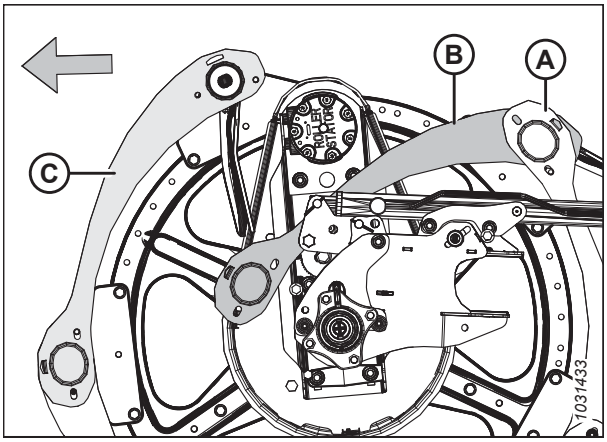


Figure 4.338: Reel Endshields – Inboard Tail End

8. Remove M10 bolt (A), nut (B), and end finger retainer (C) from tine tube that secure the bushing and tail end finger. Retain for reassembly.
9. Slide endshield bushing (D) to remove. Retain the bushing for reassembly.
10. Remove and discard damaged reel endshield (E).

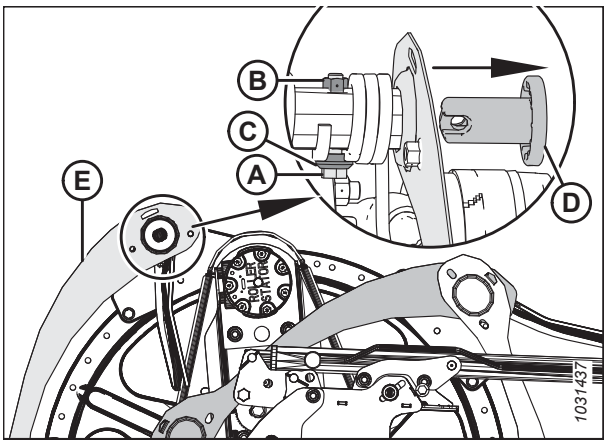


Figure 4.339: Reel Endshields – Inboard Tail End

11. Position new reel endshield (A), and engage tab onto another endshield (B).
12. Position the other end of new endshield (A) on tine tube and secure with bushing (C).

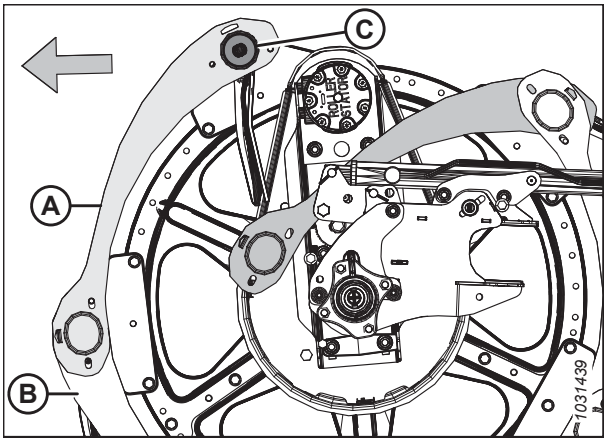


Figure 4.340: Reel Endshields – Inboard Tail End

13. Position tail end finger (A) as shown.
14. Secure tail end finger (A) and bushing (installed in Step *12, page 651*) with M10 bolt (B), end finger retainer (C), and nut (D).

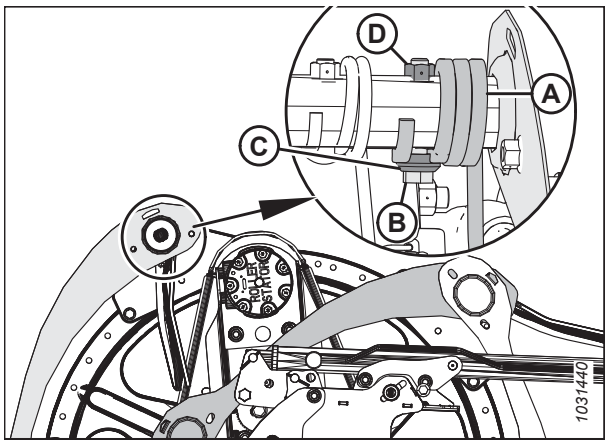


Figure 4.341: Reel Endshields – Inboard Tail End

15. Rotate reel endshield (A) upward and engage tabs (B) on both ends.
16. Secure reel endshields using six M10 screws and nuts (C).
17. Torque nuts (C) to 35 Nm (26 lbf·ft). Do **NOT** overtighten the nuts to prevent flattening of the tube.

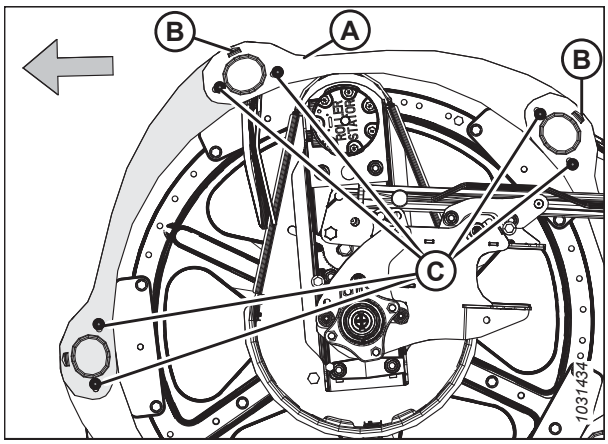


Figure 4.342: Reel Endshields – Inboard Tail End

Replacing Reel Endshield Supports

The reel endshield supports need to be replaced if they are damaged.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

All illustrations shown are from the outboard cam end.

1. Lower the reel fully.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.

4. Rotate the reel manually until the reel endshield support requiring replacement is accessible.
5. Remove bolt (B) securing reel endshields to support (A).
6. Remove bolts (C) from support (A) and two adjacent supports.

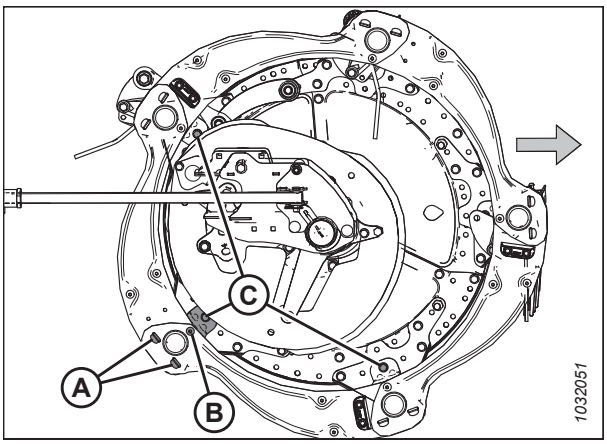


Figure 4.343: Reel Endshield Supports

7. Move reel endshields (A) and support (B) away from the tine tube, then remove the support from the endshields.
8. Insert tabs of new support (B) into the slots in reel endshields (A). Ensure the tabs engage both reel endshields.

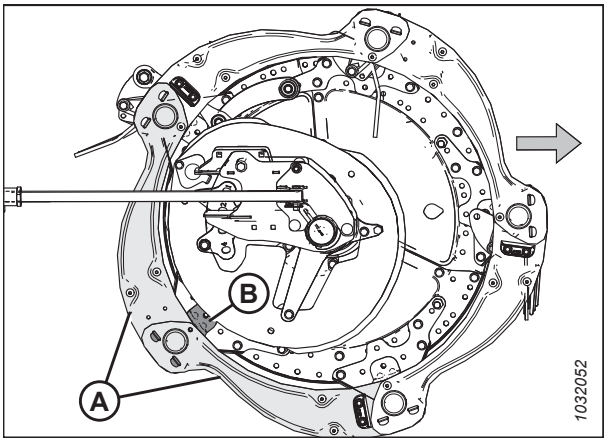


Figure 4.344: Reel Endshield Supports

9. Secure support (A) to the disc sector with bolt (B) and nut. Do **NOT** tighten.
10. Secure reel endshields (C) to support (A) with bolt (D) and nut. Do **NOT** tighten.
11. Reattach the other supports with bolts (E) and nuts.
12. Check the clearance between the tine tube and reel endshield support and adjust if necessary.
13. Torque the nuts to 27 Nm (20 lbf·ft).

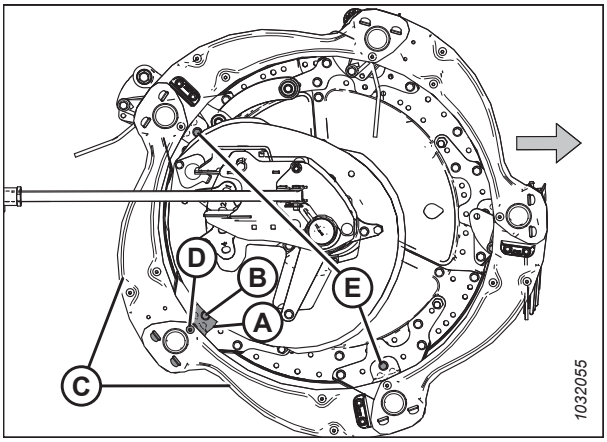


Figure 4.345: Reel Endshield Supports

4.14 Reel Drive

The hydraulically driven reel motor drives a chain that is attached to the center arm between the reels on a double-reel header, and to the left-center arm on a triple-reel header.

4.14.1 Reel Drive Chain

The reel drive chain transfers power from the hydraulically driven reel motor to the sprockets that rotate the reels.

Loosening Reel Drive Chain

The tension on the reel drive chain can be loosened to allow access to drive components.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Start the engine.
2. Lower the header fully.
3. Adjust the reel fully forward.
4. Shut down the engine, and remove the key from the ignition.
5. Remove the reel drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
6. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
7. Remove hairpin (A) securing multi-tool (B) to the bracket on the left endsheet.
8. Remove multi-tool (B), and reinstall the hairpin on the bracket.

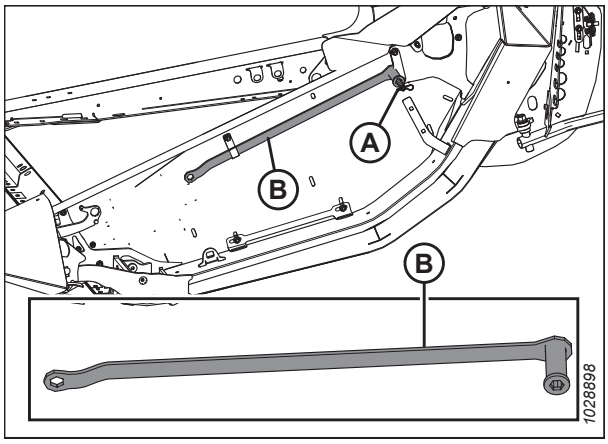


Figure 4.346: Multi-Tool Storage Location

IMPORTANT:

Do **NOT** loosen the motor mount, it is factory-adjusted and secured with Belleville washers. Chain tension is adjusted without loosening the drive mounting bolts.

9. Push tension retainer (A) clockwise with your thumb, and hold it in the unlocked position.
10. Place multi-tool (B) onto chain tensioner (C), and rotate the multi-tool upwards to loosen the chain tension.
11. Return the multi-tool to the storage position.

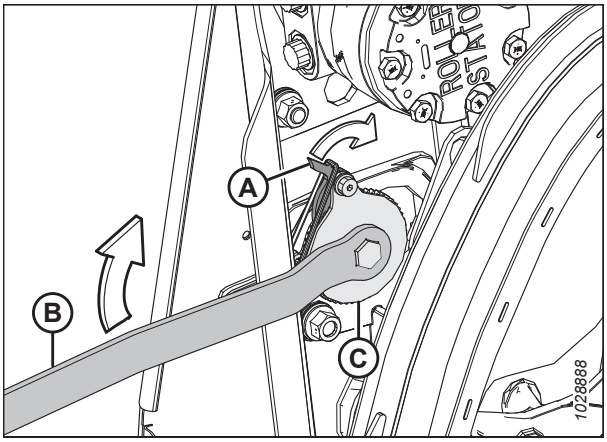


Figure 4.347: Reel Drive

Tightening Reel Drive Chain

A correctly tensioned drive chain ensures optimum power transfer while minimizing component wear.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
3. Remove hairpin (A) securing multi-tool (B) to the bracket on the left endsheet.
4. Remove multi-tool (B), and reinstall the hairpin on the bracket.

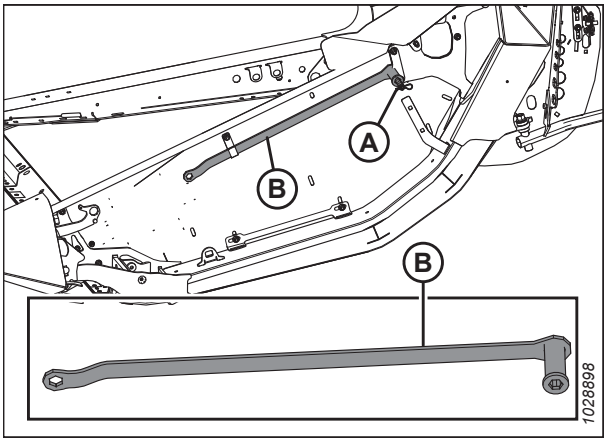


Figure 4.348: Multi-Tool Storage Location – Left Side

IMPORTANT:

Do **NOT** loosen the motor mount, it is factory-adjusted and secured together with Belleville washers. Chain tension is adjusted without loosening the drive mounting bolts.

5. Place multi-tool (A) onto chain tensioner (B).
6. Rotate multi-tool (A) downward until the chain is tight.

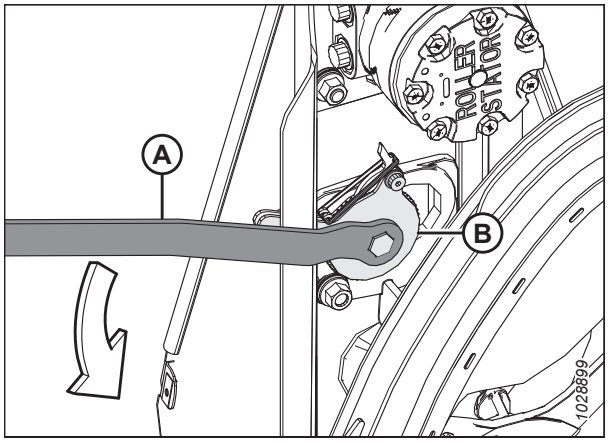


Figure 4.349: Reel Drive

IMPORTANT:

There should be approximately 38 mm (1 1/2 in.) of play on one side (A) of the chain, while it is tight on the other side (B). This level of tension and play in the chain is required to skip one notch on the chain tightener.

7. Once the chain is tight, rotate the multi-tool upward to properly engage the teeth from the lock/latch into the tightener teeth. If the tightener will not skip a tooth before tightening, do **NOT** force the tightener to the next notch.

IMPORTANT:

Do **NOT** overtighten the chain. If overtightened, the chain will put excessive loads on the sprockets, causing the motor bearings and/or other components to fail prematurely.

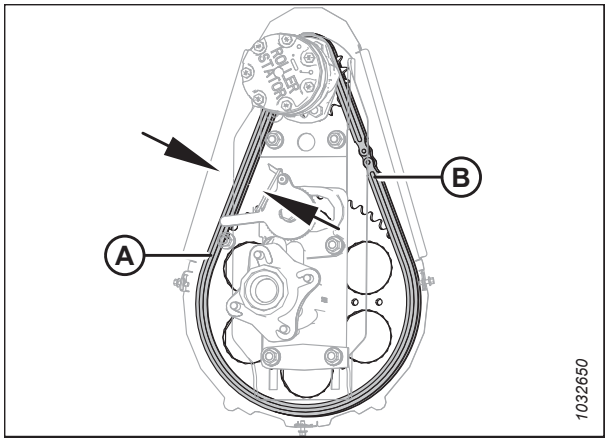


Figure 4.350: Reel Drive

8. Rotate the reel by hand to verify that the chain is still engaged properly on all teeth on lower sprocket (A). To prevent damaging components, ensure the chain does not get too tight as the reel is rotated.
9. Return the multi-tool to the storage position.
10. Close the endshield. For instructions, refer to *Closing Header Endshields, page 48*.

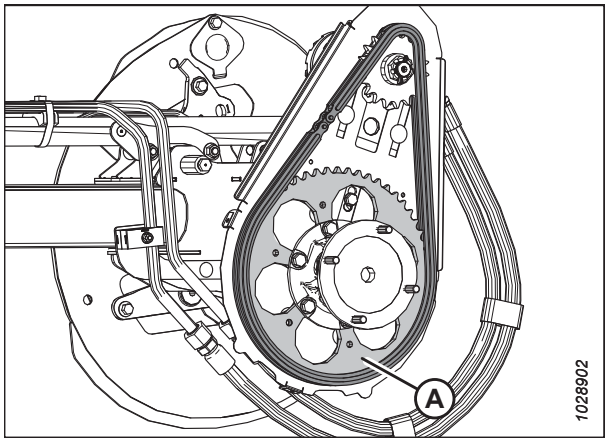


Figure 4.351: Reel Drive

4.14.2 Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

For Case IH and New Holland combine models, configure the combine according to the reel sprocket size in order to optimize the auto reel to ground speed control. Refer to the combine service manual for more information.

NOTE:

There is also a two-speed reel drive option available. Order kit MD #311882.

Removing Reel Drive Single Sprocket

The reel drive sprocket is attached to the reel drive motor. By changing the drive and driven sprockets the speed and torque of the reel can be changed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
3. Loosen reel drive chain (A). For instructions, refer to *Loosening Reel Drive Chain, page 654*.
4. Remove reel drive chain (A) from reel drive sprocket (B).

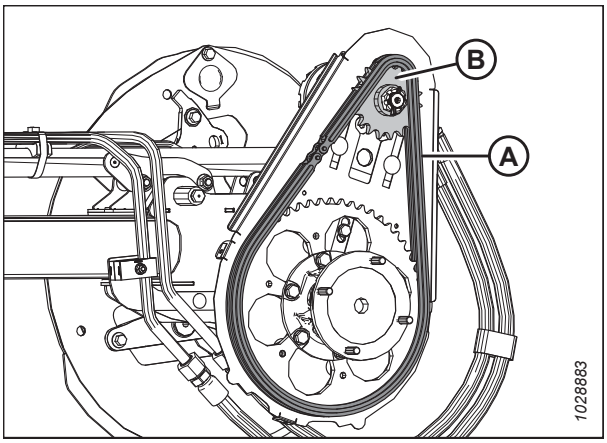


Figure 4.352: Single Sprocket

5. Remove cotter pin and slotted nut (A) from the motor shaft.
6. Remove reel drive sprocket (B). Ensure the key remains in the shaft.

   IMPORTANT:

   To avoid damaging the motor, use a puller if drive sprocket (B) does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove the drive sprocket.

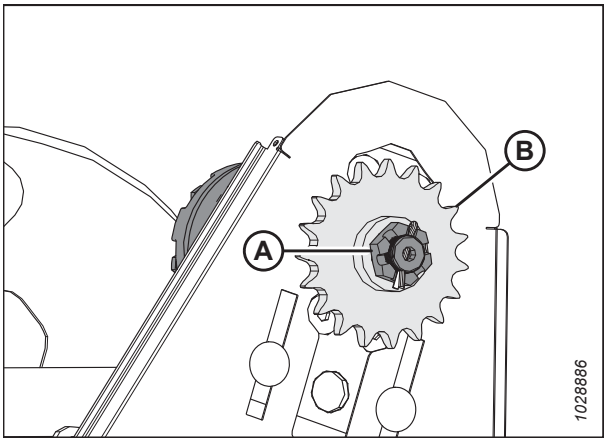


Figure 4.353: Single Sprocket

Installing Reel Drive Single Sprocket

The reel drive sprocket is attached to the reel drive motor. By changing the drive and driven sprockets the speed and torque of the reel can be changed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Align the keyway in sprocket (B) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure it with slotted nut (A).
2. Torque slotted nut (A) to 12 Nm (9 lbf·ft).
3. Install the cotter pin. If necessary, tighten slotted nut (A) to the next slot to install the cotter pin.

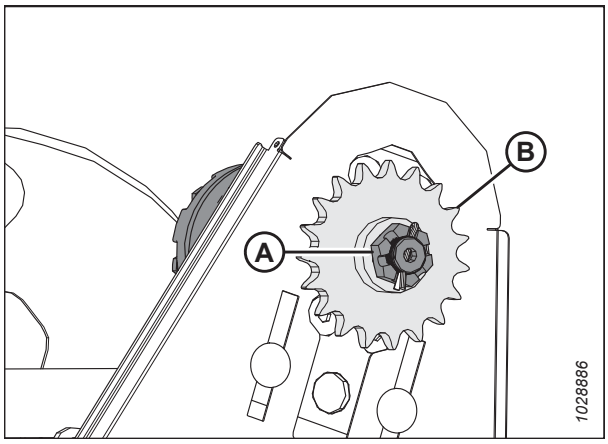


Figure 4.354: Single Sprocket

4. Install drive chain (A) onto drive sprocket (B).
5. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 655*.
6. Reinstall the reel drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

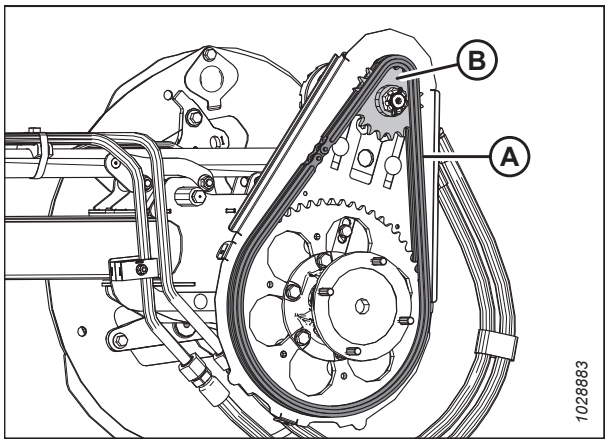


Figure 4.355: Single Sprocket

4.14.3 Changing Reel Speed Chain Position with Two Speed Kit Installed

The reel drive sprocket is attached to the reel drive motor. By changing the drive and driven sprockets the speed and torque of the reel can be changed.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield. For instructions, refer to *Opening Header Endshields, page 47*.
3. Loosen the reel drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 654*.

4. Move chain (A) from the current set of sprockets to other set (B).

   NOTE:

   The inner set of sprockets are for high torque applications, and the outer set of sprockets are for high speed applications.

   NOTE:

   - If converting from the high speed setting to the high torque setting, move the chain on the top driver sprocket first. This will allow for more chain slack to make the change on the bottom driven sprocket
   - If converting from the high torque setting to the high speed setting, move the chain on the bottom driven sprocket first. This will allow for more slack to make the change on the top driver sprocket.

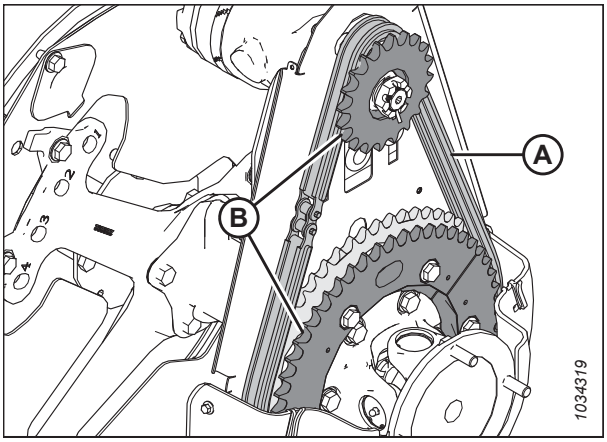


Figure 4.356: Reel Drive Sprocket

5. Tighten the reel drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 655*.

4.14.4 Double-Reel or Triple-Reel Drive U-Joint

On headers equipped with a double-reel, the double-reel drive U-joint allows each reel to move independently.

Lubricate the U-joint according to the specifications. For instructions, refer to *4.3 Lubrication, page 480*.

Replace the U-joint if severely worn or damaged. For instructions, refer to *Removing Double-Reel or Triple Reel Drive U-Joint, page 659*.

Removing Double-Reel or Triple Reel Drive U-Joint

If the double-reel U-joint is worn or damaged, it will need to be replaced.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
3. Support the inboard end of the right reel with a front end loader and nylon slings (A) or equivalent lifting devices.

   IMPORTANT:

   To avoid damaging or denting the center tube, support the reel as close to the end disc as possible.

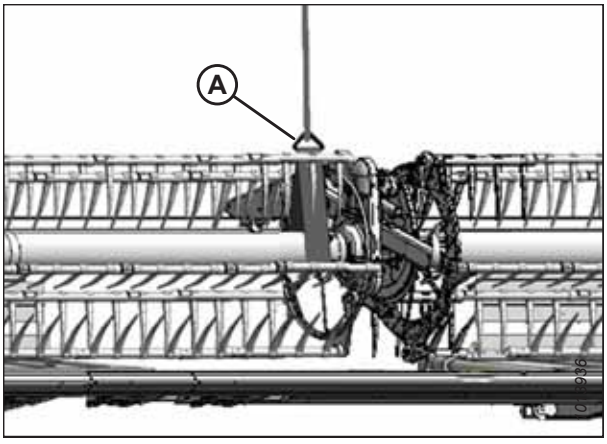


Figure 4.357: Supporting Reel

4. Remove four bolts (A) securing the reel tube to U-joint flange (B), and move the reel sideways.

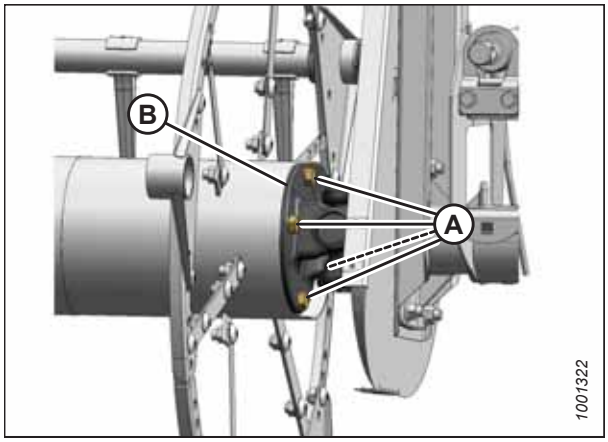


Figure 4.358: U-Joint

5. Remove six bolts (A) attaching U-joint flange (B) to driven sprocket (C).
6. Remove the U-joint.

   NOTE:

   It may be necessary to move the right reel sideways so that the U-joint can clear the tube.

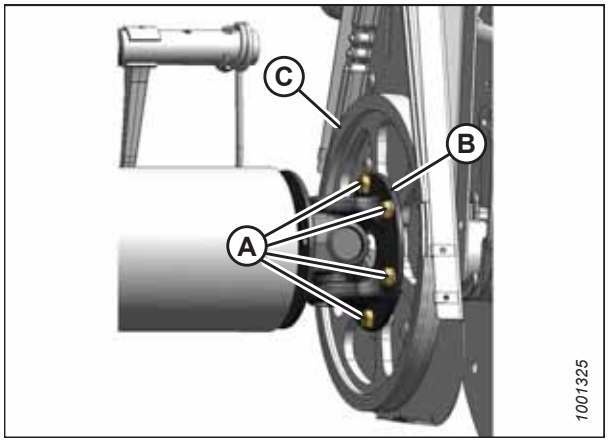


Figure 4.359: U-Joint

7. **Triple reel only:** There is a shim (A) between the reel tube and the U-joint. Make sure to retain this shim for reinstallation.

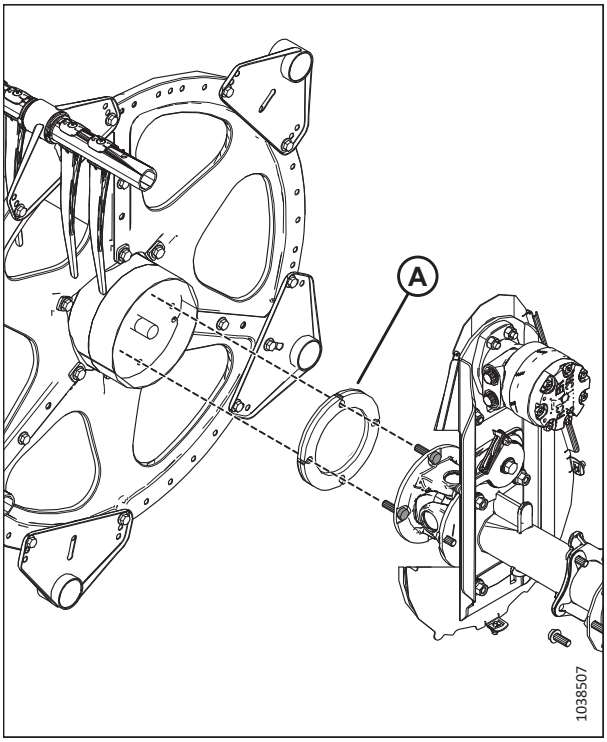


Figure 4.360: Shim – Triple Reel Only

Installing Double-Reel or Triple Reel U-Joint

Once the old U-joint has been removed, the new one can be installed.

1. Position U-joint flange (B) onto driven sprocket (C) as shown.
2. Apply medium-strength threadlocker (Loctite® 243 or equivalent), and install six bolts (A). Hand-tighten the bolts; do **NOT** torque the bolts.

   NOTE:

   Only four bolts (A) are shown in the illustration at right.

   NOTE:

   It may be necessary to move the right reel sideways so that the U-joint can clear the reel tube.

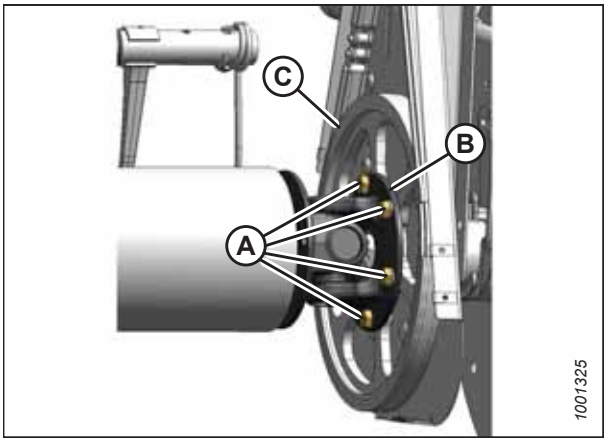


Figure 4.361: U-Joint

3. **Triple reel only:** Make sure shim (A) is placed between the reel tube and the U-joint. Align the holes in the shim with the holes in the reel tube.

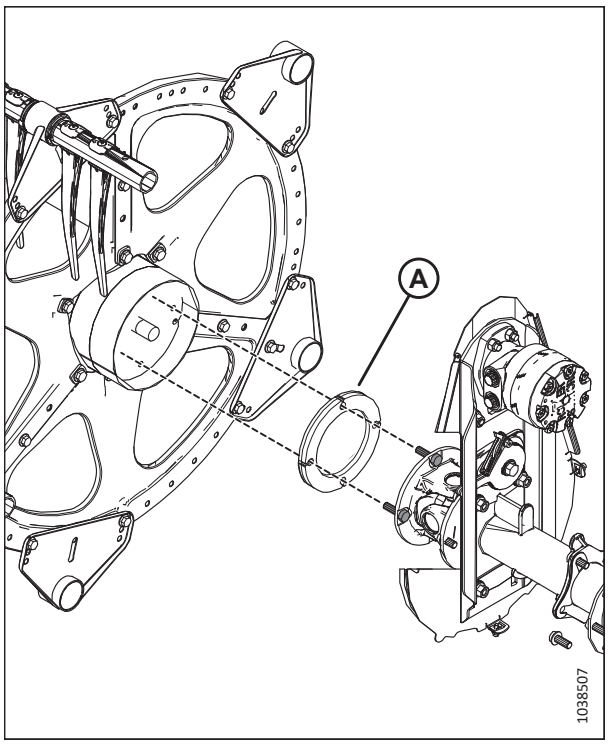


Figure 4.362: Shim – Triple Reel Only

4. Position the reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
5. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
6. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure in the flange.
7. Torque the ten bolts to 110 Nm (81 lbf·ft).

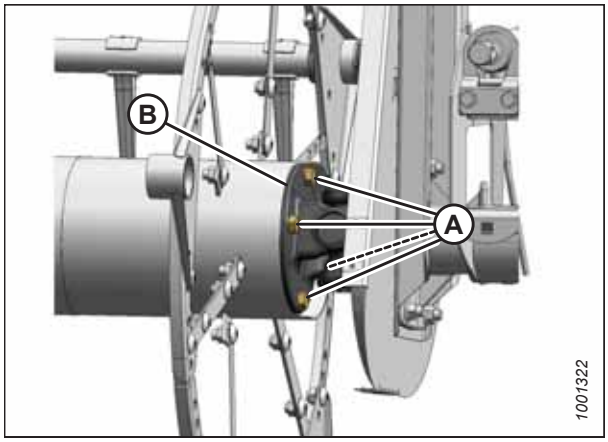


Figure 4.363: U-Joint

8. Remove sling (A) from the reel.
9. Install the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

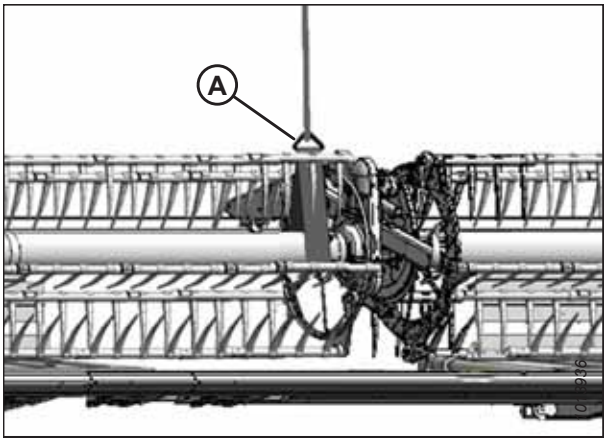


Figure 4.364: Supporting Reel

4.14.5 Reel Drive Motor

The reel drive motor is used on the reel drive system on double-reel, and triple reel draper headers. This motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced by your MacDon Dealer.

Removing Reel Drive Motor

This motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced by your MacDon Dealer.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Loosen the drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 654*.
3. Remove the drive sprocket. For instructions, refer to *Removing Reel Drive Single Sprocket, page 657*.
4. Mark hydraulic lines (A) and their locations in motor (B) to ensure correct reinstallation.

   NOTE:

   Before disconnecting the hydraulic lines, clean the motor's ports and exterior surfaces.
5. Disconnect hydraulic lines (A) at motor (B). Cap or plug open ports and lines.

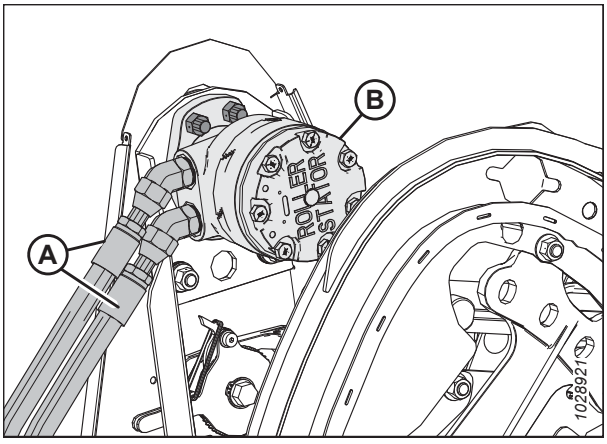


Figure 4.365: Reel Motor and Hoses

6. If countersunk screws (B) are not accessible through the openings in the chain case, loosen the mounting hardware on motor mount (A), and slide the motor mount up or down until the screws are accessible.
7. Remove four countersunk screws (B), and remove motor (C).
8. If the motor is being replaced, remove the hydraulic fittings from the old motor and install them in the new motor using the same orientations.

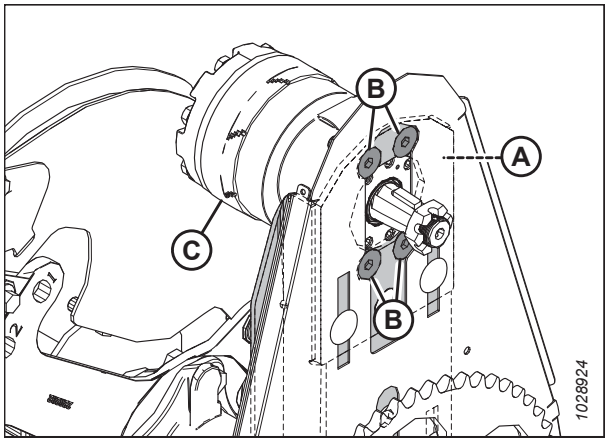


Figure 4.366: Reel Drive Motor Mounting Screws

Installing Reel Drive Motor

This motor does not require regular maintenance or servicing. If problems occoccur with the motor, remove it and have it serviced by your MacDon Dealer.

1. If mounting holes (B) are not accessible through the openings in the chain case, loosen the mounting hardware on motor mount (A), and slide the motor mount up or down as required.

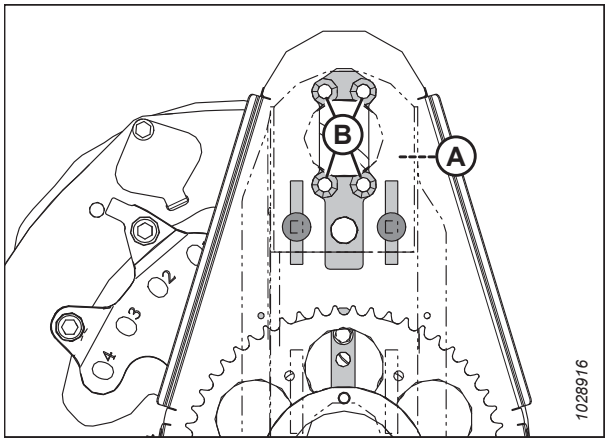


Figure 4.367: Reel Drive Motor Mounting Holes

2. Attach motor (A) to motor mount (B) with four M12 x 40 mm countersunk screws and nuts (C).
3. Torque the hardware to 95 Nm (70 lbf·ft).
4. If installing a new motor, install the hydraulic fittings (not shown) from the original motor.

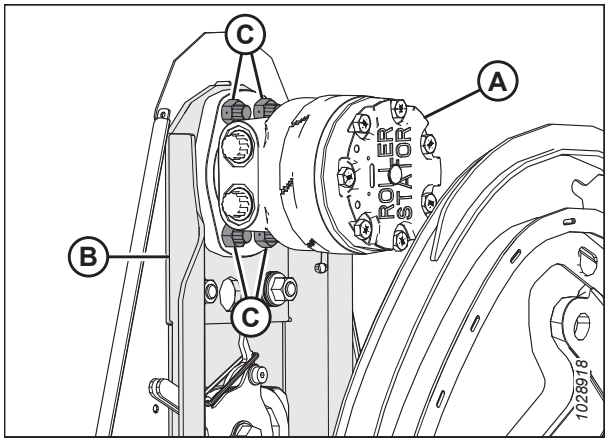


Figure 4.368: Reel Drive Motor

5. Align the keyway in sprocket (B) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure it with slotted nut (A).
6. Torque slotted nut (A) to 12 Nm (9 lbf·ft).
7. Install the cotter pin. If necessary, tighten slotted nut (A) to the next slot to install the cotter pin.

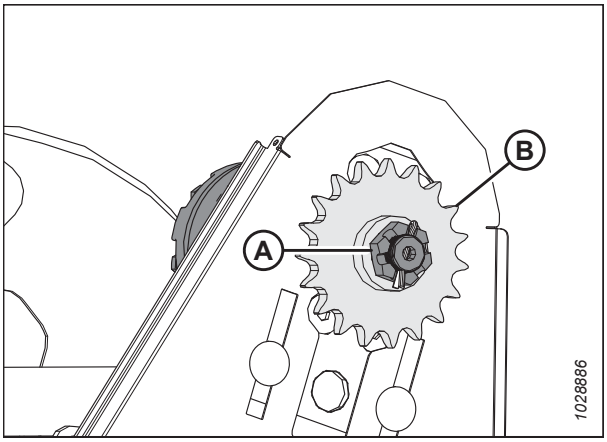


Figure 4.369: Reel Drive

8. Install drive chain (A) onto drive sprocket (B).

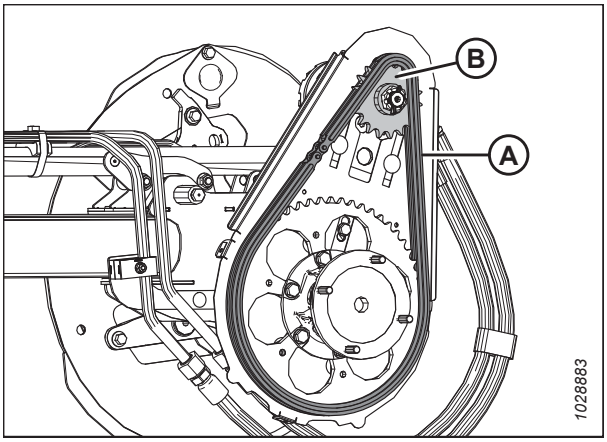


Figure 4.370: Reel Drive

9. If mounting hardware (A) was loosened for this procedure, ensure there are three stacked Belleville washers per bolt (B) before retightening.
10. Orient the Belleville washers so that the outer edge of first washer (C) is against the casting, and the outer edges of the next two washers (D) are facing each other.
11. Tighten nuts (A) until they bottom out (47–54 Nm [35–40 lbf·ft]), then back off a 3/4 turn.
12. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 655*.

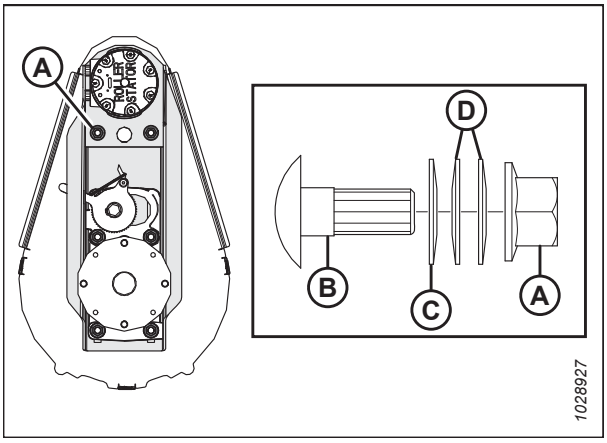


Figure 4.371: Reel Drive Motor Mount

13. Remove the caps or plugs from the ports and lines and connect hydraulic lines (A) to hydraulic fittings (B) on motor (C).

    NOTE:

    Ensure hydraulic lines (A) are installed in their original locations.

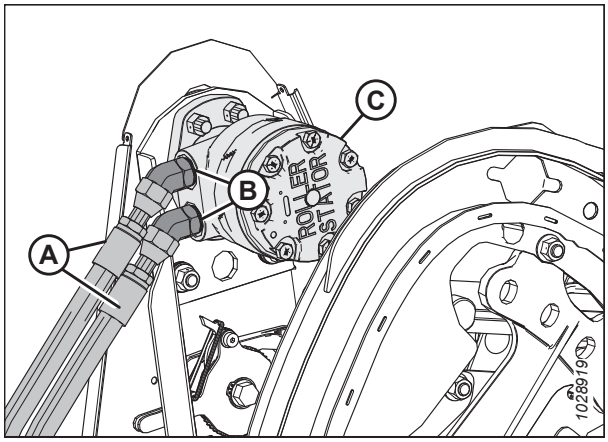


Figure 4.372: Reel Motor and Hoses

4.14.6 Replacing Drive Chain

The drive chain allows the hydraulic reel drive motor to turn the reel. It can be replaced if damaged or worn.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the reel drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
3. Loosen the drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 654*.
4. Support the inboard end of the right reel with a front-end loader and nylon slings (A) or equivalent lifting devices.

    IMPORTANT:

    Avoid damaging or denting the center tube by supporting the reel as close to the end of the reel as possible.

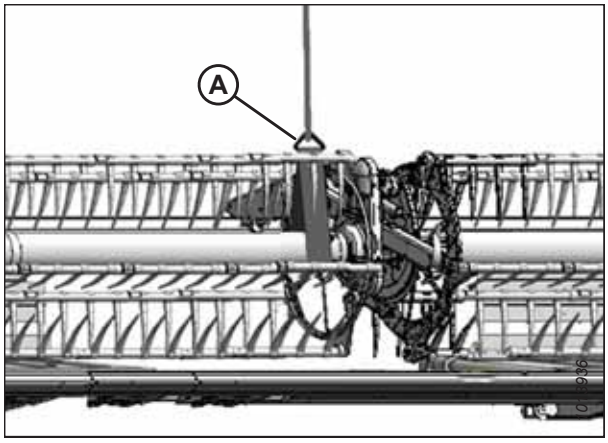


Figure 4.373: Supporting Reel

5. Remove four bolts (A) securing the reel tube to U-joint flange (B).

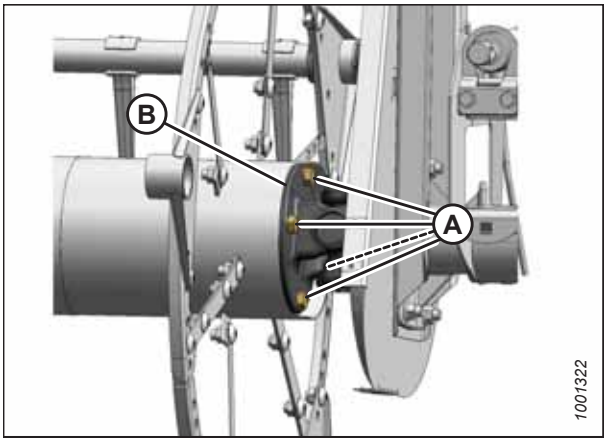


Figure 4.374: U-Joint

6. Move the right reel sideways to separate reel tube (A) from U-joint (B).
7. Remove drive chain (C).
8. Route chain (C) over U-joint (B) and position onto the sprockets.

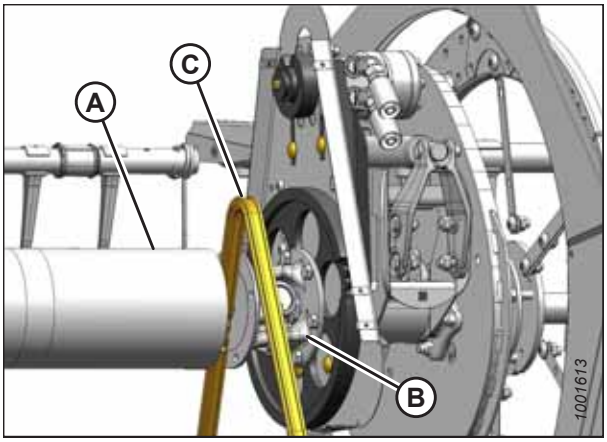


Figure 4.375: Replacing Chain

9. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
10. Rotate the reel until the holes in end of the reel tube and U-joint flange line up.
11. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A) and secure them to the flange with lock washers.
12. Torque bolts (A) to 109 Nm (80 lbf·ft).

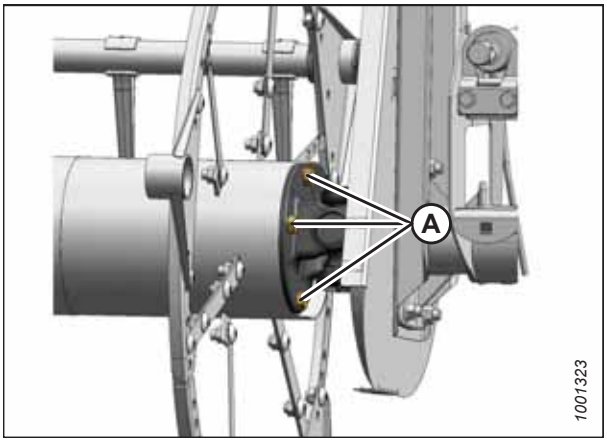


Figure 4.376: U-Joint

13. Remove temporary reel sling (A).
14. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 655*.
15. Reinstall the reel drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

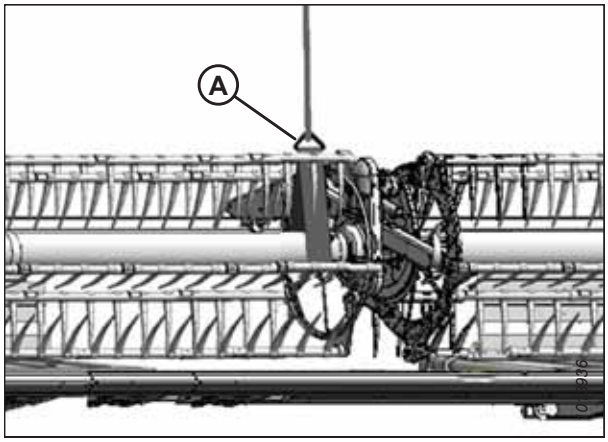


Figure 4.377: Supporting Reel

4.14.7 Reel Speed Sensor

The reel speed sensors (and the procedures for replacing them) vary with the combine model.

Refer to the following topics depending on your combine model:

- *Replacing Challenger®, Gleaner, IDEAL™, or Massey Ferguson™ Reel Speed Sensor, page 668*
- *Replacing John Deere Reel Speed Sensor, page 669*
- *Replacing CLAAS Reel Speed Sensor, page 670*

Replacing Challenger®, Gleaner, IDEAL™, or Massey Ferguson™ Reel Speed Sensor

The reel speed sensor is located on the reel drive and senses how fast the reel drive sprocket is turning. If malfunctioning, it may need adjustment or replacement.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
3. Disconnect electrical connector (A) from the header harness.

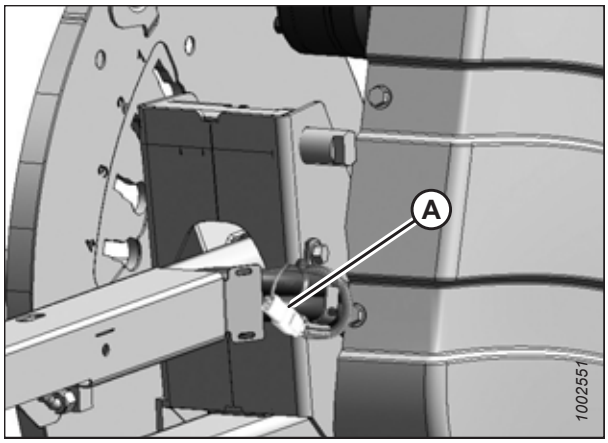


Figure 4.378: Reel Drive Assembly – Electrical Harness

4. Cut cable tie (A) securing the harness to the cover.
5. Remove two screws (B), sensor (C), and the harness. If necessary, bend cover (D) to remove the harness.
6. Feed the wire of the new sensor behind cover (D) and through the chain case.
7. Install the new sensor onto support (E) and attach it with two screws (B).
8. Adjust the gap between sensor disc (F) and sensor (C) to 3.5 mm (0.14 in.).

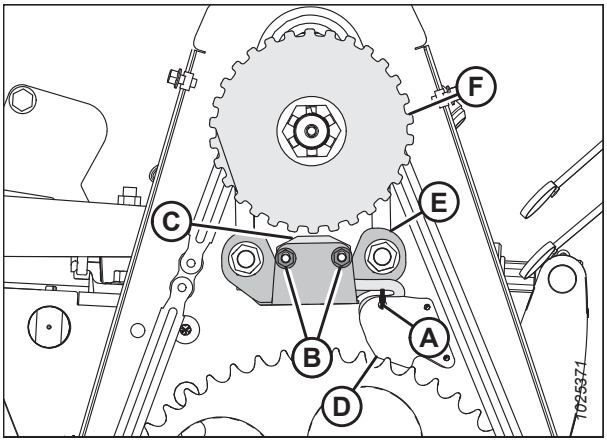


Figure 4.379: Reel Drive Assembly – Speed Sensor

9. Connect the sensor harness to header harness (A).

   IMPORTANT:

   Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

10. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.
11. Verify proper operation of the sensor.

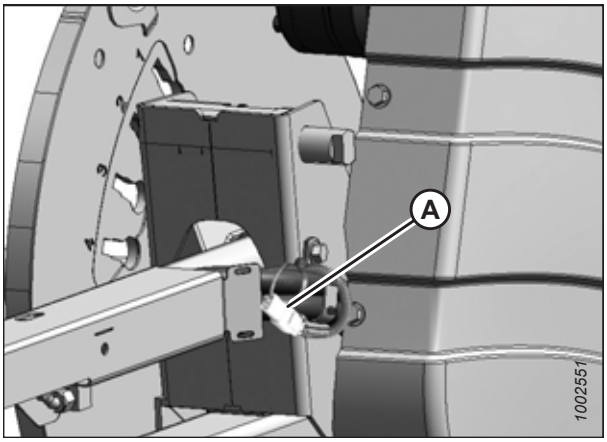


Figure 4.380: Reel Drive Assembly – Electrical Harness

Replacing John Deere Reel Speed Sensor

The reel speed sensor is located on the reel drive and senses how fast the reel drive sprocket is turning. If the sensor is malfunctioning, it may need adjustment or replacement.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.

3. Disconnect electrical connector (D) from the header harness (E).
4. Remove top nut (C) and remove sensor (B).
5. Remove the top nut from the new sensor and position the sensor onto the support. Secure it with top nut (C).
6. Adjust the gap between sensor disc (A) and sensor (B) to 1 mm (0.04 in.) using nut (C).
7. Connect electrical connector (D) to header harness (E).

   IMPORTANT:

   Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

8. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

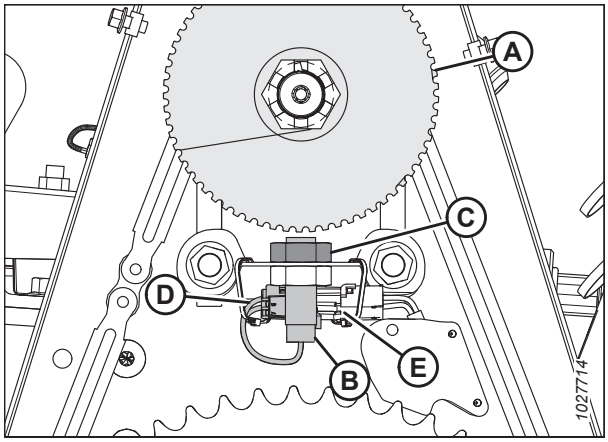


Figure 4.381: Speed Sensor

Replacing CLAAS Reel Speed Sensor

The reel speed sensor is located on the reel drive and senses how fast the reel drive sprocket is turning. If malfunctioning, it may need adjustment or replacement.

DANGER

To prevent injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove the drive cover. For instructions, refer to *Removing Reel Drive Cover, page 53*.
3. Disconnect the header harness connector located behind the chain case from sensor (A).
4. Remove cable ties (B).
5. Remove shield (C) and rivets (D).
6. Remove nut (E) and remove sensor (A).
7. Position new sensor (A) into support (F). Secure with nut (E).
8. Adjust the gap between sensor disc (C) and sensor (B) to 3.5 mm (0.14 in.) using nuts (A) and (D).
9. Route the harness through the knockout hole in the panel and connect it to sensor (A). Secure the harness in place with shield (C) and rivets (D).

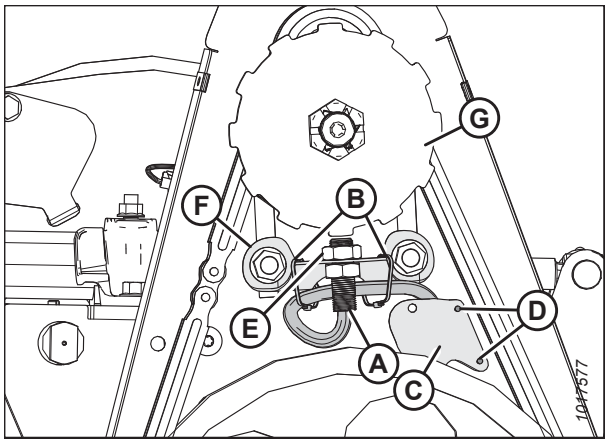


Figure 4.382: Speed Sensor

10. Secure the harness to the sensor support with cable ties (B) as shown.

    IMPORTANT:

    Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

11. Reinstall the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 54*.

4.15 Transport System – Option

The header can be equipped with a set of transport wheels, so that the header can be towed by a combine or tractor.

Refer to *Adjusting EasyMove™ Transport Wheels, page 179* for more information.

4.15.1 Checking Wheel Bolt Torque

The transport wheel bolt torque should be checked after one operating hour following the installation of the wheels, and every 100 operating hours thereafter.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

1. Shut down the engine, and remove the key from the ignition.
2. Follow the bolt tightening sequence shown, and torque the wheel bolts to 115 Nm (85 lbf·ft).

   IMPORTANT:

   Whenever a wheel is removed and reinstalled, check the wheel bolt torque after 1 hour of operation and every 100 hours thereafter.

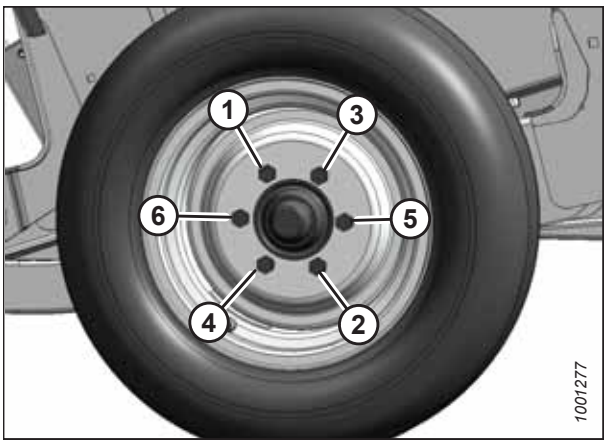


Figure 4.383: Bolt Tightening Sequence

4.15.2 Checking Transport Assembly Bolt Torque

The hardware that secures the optional transport system components to the header must be checked daily to ensure safe operation.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key before making adjustments to the machine.

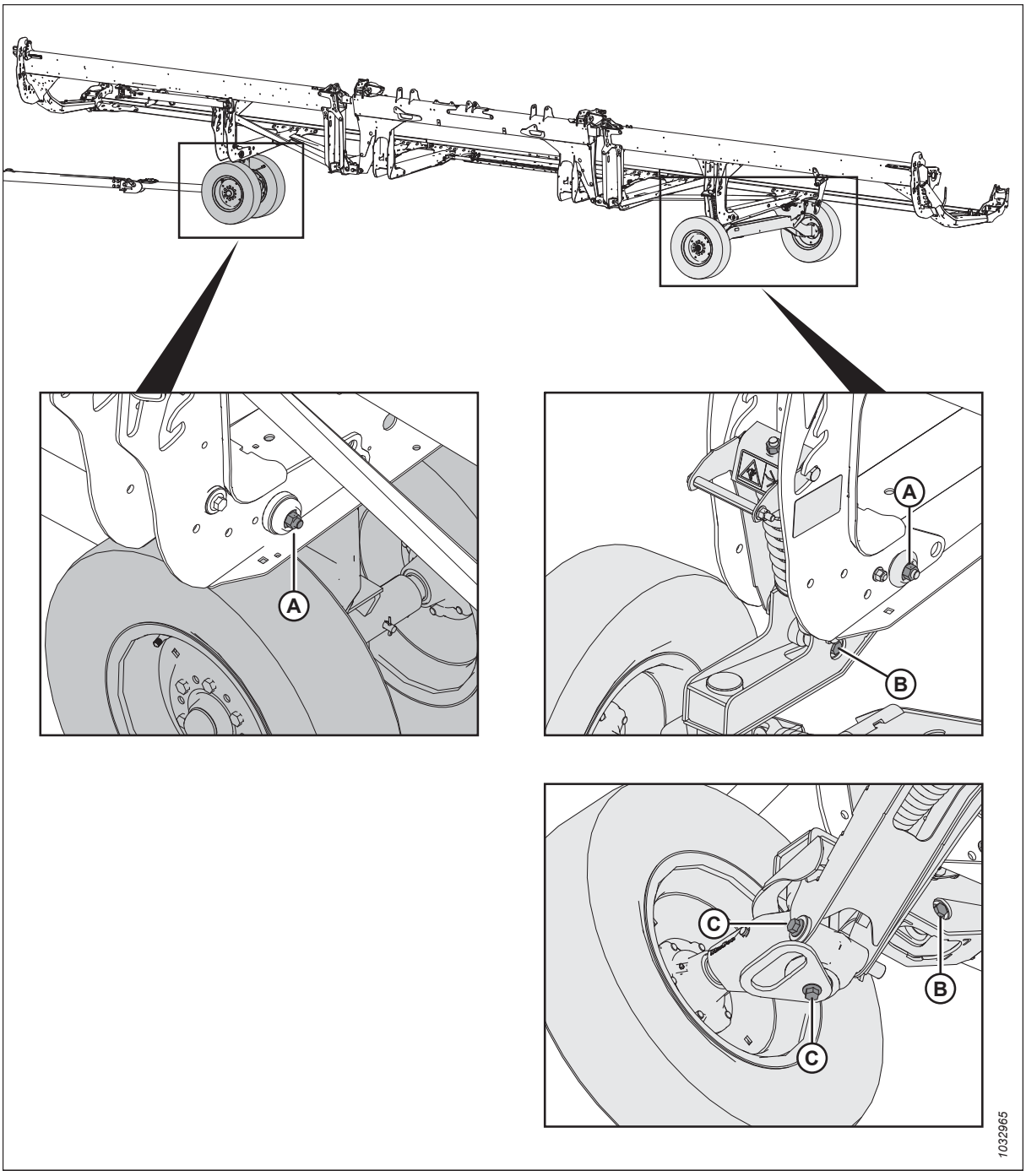


Figure 4.384: Transport Assembly Bolts

1. Check the following bolts **DAILY** to ensure bolts are torqued to specified values:
    - Bolts (A) to 234 Nm (173 lbf·ft)
    - Bolts (B) to 343 Nm (253 lbf·ft)
    - Bolts (C) to 343 Nm (253 lbf·ft)

4.15.3 Checking Tire Pressure

Proper tire pressure ensures tires perform properly and wear evenly.

WARNING

- **A tire can explode during inflation, which could cause serious injury or death.**
- **Do NOT stand over tire. Use a clip-on chuck and extension hose.**
- **Do NOT exceed maximum inflation pressure indicated on tire label or sidewall.**
- **Replace tires that have defects.**
- **Replace wheel rims that are cracked, worn, or severely rusted.**
- **Never weld a wheel rim.**

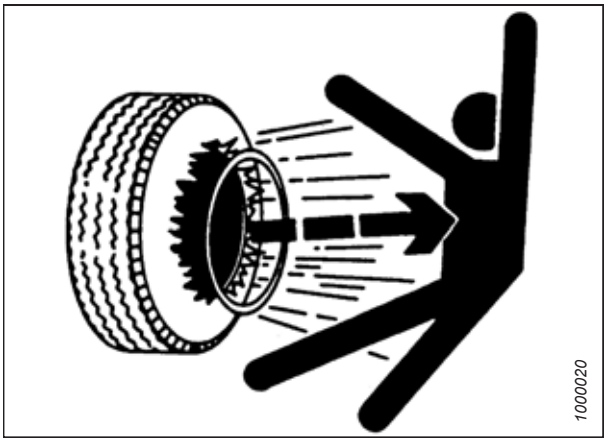


Figure 4.385: Inflation Warning

- **Never use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction endangering anyone in the area.**
- **Make sure all the air is removed from the tire before removing the tire from the rim.**
- **Do NOT remove, install, or repair a tire on a rim unless you have the proper equipment and experience to perform the job.**
- **Take the tire and rim to a qualified tire repair shop.**

1. Check the tire pressure. For pressure specifications, refer to Table *4.5, page 673*.
2. Make sure the tire is correctly seated on the rim before inflating.
   a. If the tire is not correctly positioned on the rim, take the tire to a qualified tire repair shop.
3. If inflation is required, use a clip-on chuck and an extension hose to inflate the tire to the desired pressure.

   IMPORTANT:
   Do **NOT** exceed maximum inflation pressure indicated on tire label or sidewall.

Table 4.5 Tire Inflation Pressure

Size	Load Range	Pressure
225/75 R15	E	552 kPa (80 psi)

4.15.4 Changing Tow-Bar Hitch Connection from Pintle to Clevis

The transport tow-bar includes clevis and pintle ring towing mounts.

1. Remove the hairpin from clevis pin (A) and disconnect chain (B). Store clevis pin (A) with the pintle hitch adapter.
2. Remove four nuts, four bolts, and eight flat washers (C) from the end of the tow-bar. Retain the hardware.

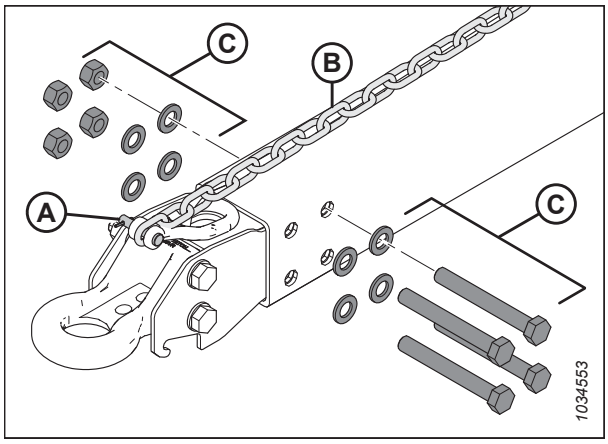


Figure 4.386: Removing Pintle Towing Adapter

3. Tape or tie 6 m (20 ft.) of pull-line to harness transport end (A).
4. Remove bolt (B) securing the harness in the P-clip. Retain the bolt.
5. From hitch end (C), gently pull the harness out through the opening in pintle (D) until you can see the pull-line, then disconnect the pull-line and set the pintle aside. Leave the pull-line inside the tow-bar,

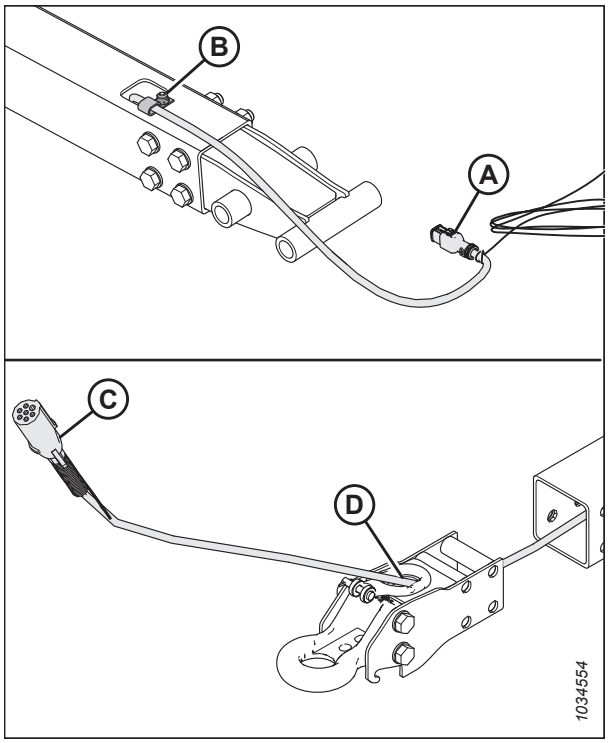


Figure 4.387: Removing Pintle Towing Adapter

6. Retrieve the clevis adapter (MD #327664). Insert transport connector (A) of the electrical harness through opening (B) in the ring on the clevis adapter.
7. Tie or tape pull-line (C) to the harness. Using the pull-line at the transport end, gently pull the harness through the tow-bar.
8. Ensure that transport end (A) of the harness extends 480 mm (18 7/8 in.) past P-clip (D).
9. Secure the harness in the P-clip with the bolt removed in Step *6, page 675*.

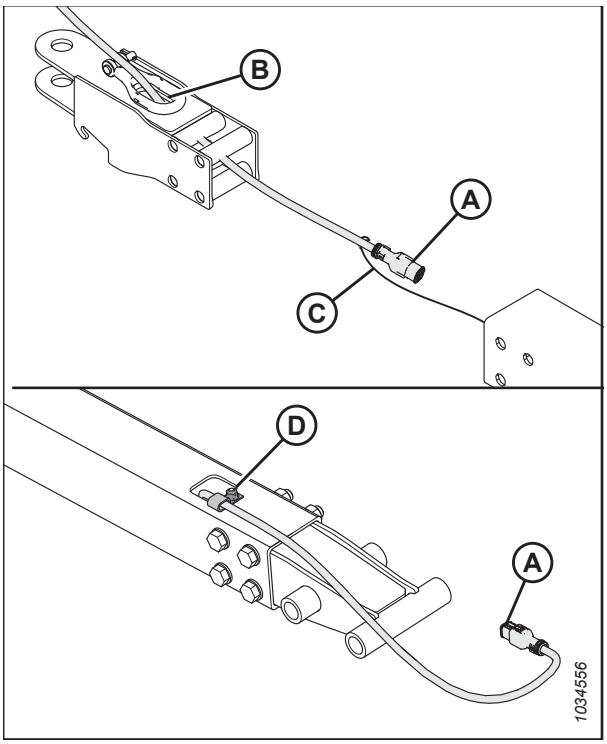


Figure 4.388: Installing Clevis Ring Adapter

10. Install four nuts, four bolts, and eight flat washers (A) to secure the clevis adapter to the tow-bar.

    NOTE:

    Ensure that hardware (A) is reinstalled in the same orientation it was in before it was removed.
11. Reconnect the chain with clevis pin (B) and secure it with the cotter pin.

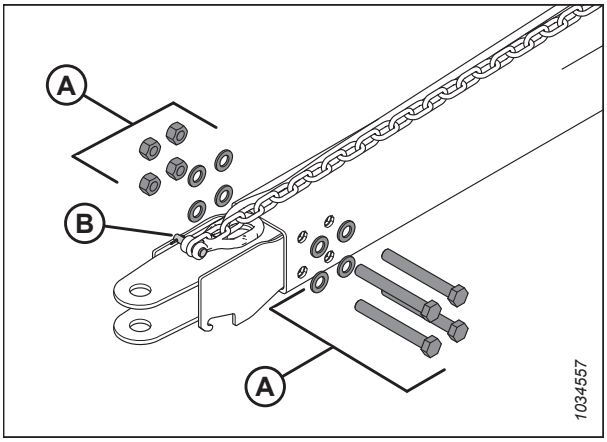


Figure 4.389: Installing Clevis Ring Adapter

12. Tighten nuts (A) in the cross pattern shown. Recheck each nut in sequence until they are torqued to 31 Nm (229 lbf·ft).

13. Insert the hitch pin (MD #118239) into the clevis adapter. Secure the pin with the lynch pin (MD #113561).

    NOTE:

    The pins are not shown in the illustration.

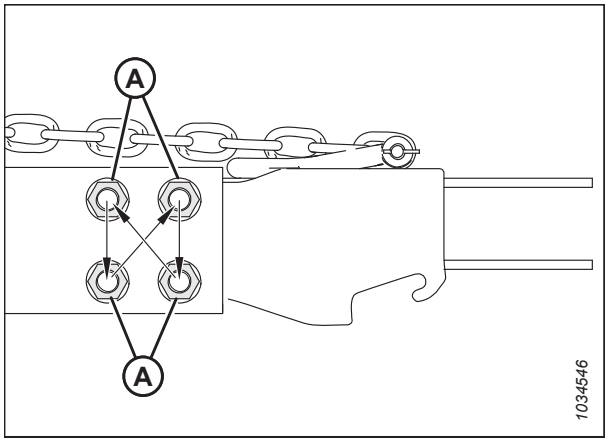


Figure 4.390: Torque Sequence

4.15.5 Changing Tow-Bar Hitch Connection from Clevis to Pintle

The transport tow-bar includes clevis and pintle ring towing mounts.

1. Remove the hairpin from clevis pin (A) and disconnect chain (B). Store clevis pin (A) with the clevis adapter.

2. Remove four nuts, four bolts, and eight flat washers (C) from the end of the tow-bar. Retain the hardware.

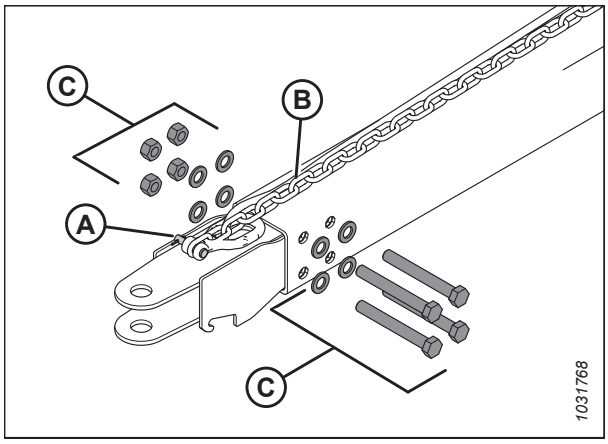


Figure 4.391: Removing Clevis Adapter

3. Tape or tie 6 m (20 ft.) of pull-line to harness transport end (A).
4. Remove bolt (B) securing the harness in the P-clip. Retain the bolt for reinstallation.
5. From hitch end (C), gently pull the harness out through the opening in clevis (D) until you can see the pull-line, then disconnect the pull-line and set the clevis adapter aside. Leave the pull-line inside the tow-bar.

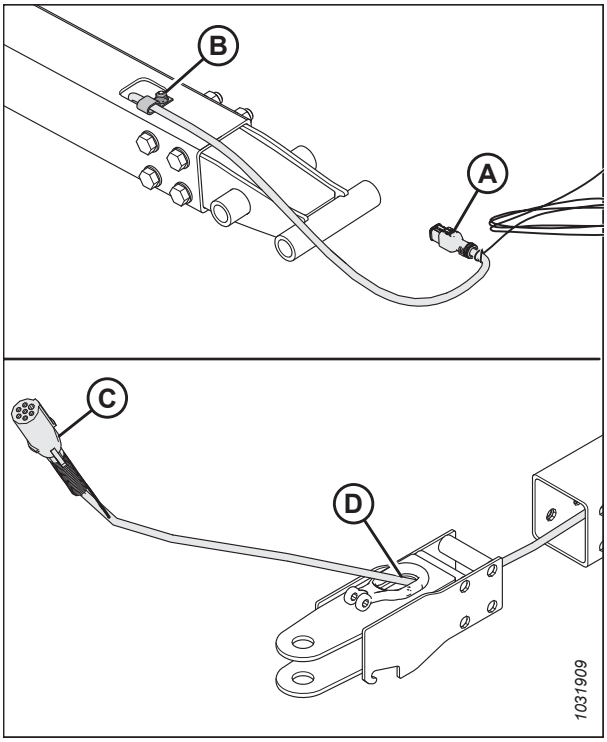


Figure 4.392: Removing Clevis Towing Adapter

6. Insert transport connector (A) of the electrical harness through opening (B) in the pintle ring adapter.
7. Tie or tape pull-line (C) to the harness. Using the pull-line at the transport end, gently pull the harness through the tow-bar.
8. Ensure that transport end (A) of the harness extends 480 mm (18 7/8 in.) past P-clip (D).
9. Secure the harness in the P-clip with the bolt removed in Step *4, page 677*.

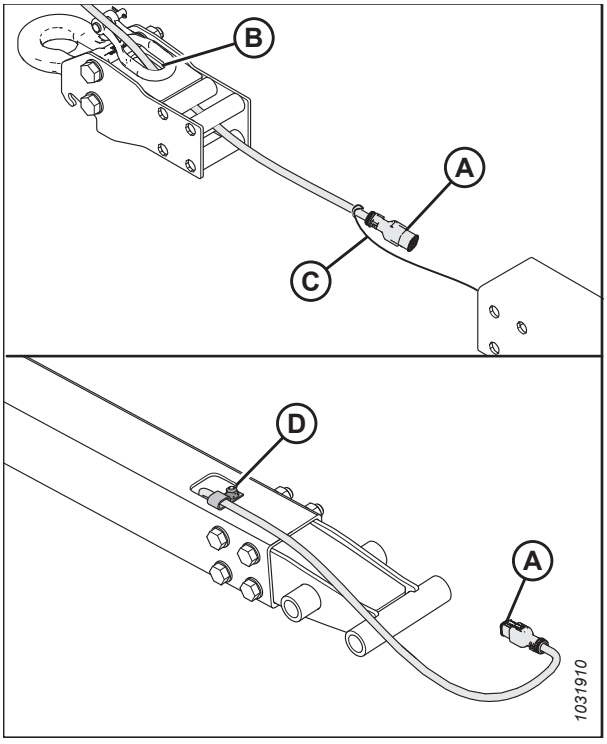


Figure 4.393: Installing Pintle Ring Adapter

10. Install four nuts, four bolts, and eight flat washers (A) to secure the pintle ring adapter to the tow-bar.

    NOTE:

    Ensure that hardware (A) is reinstalled with the four bolt heads on the same side.

11. Reconnect the chain with clevis pin (B) and secure it with the cotter pin.

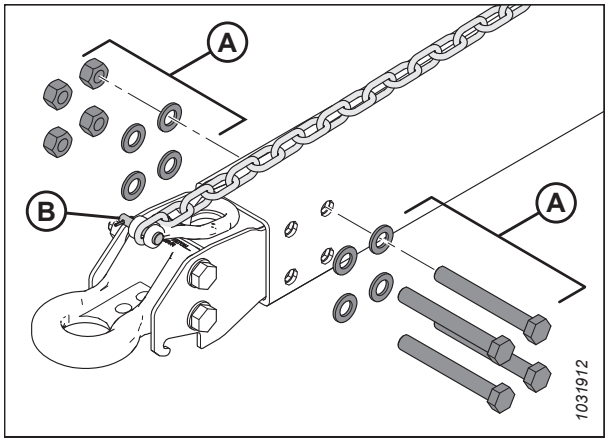


Figure 4.394: Installing Pintle Ring Adapter

12. Tighten nuts (A) in the cross pattern shown. Recheck each nut in sequence until they are torqued to 310 Nm (229 lbf·ft).

13. Insert the hitch pin (MD #118239) into the pintle ring adapter. Secure the pin with the lynch pin (MD #113561).

    NOTE:

    The pins are not shown in the illustration.

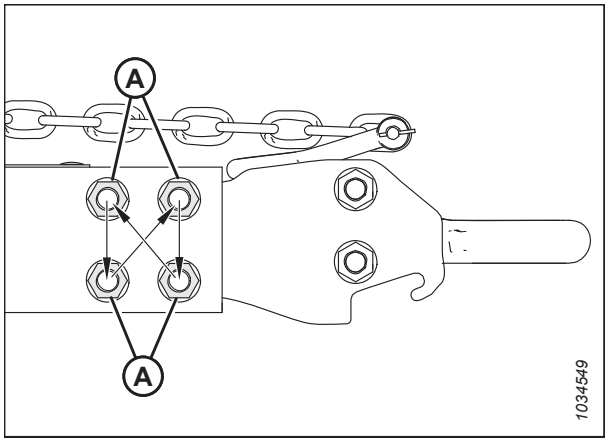


Figure 4.395: Torque Sequence

4.16 Contour Wheels (Option)

The ContourMax™ Contour Wheels option allows the header to flex with the contours of the field leaving a consistent stubble height while cutting up to 46 cm (18 in.) above the ground.

4.16.1 Leveling ContourMax™ Wheel Height

The ContourMax™ wheels allow the header to mirror the contours of the ground, and can be adjusted between 0 mm (0 in.) and 457 mm (18 in.) from the ground surface.

DANGER

To avoid bodily injury or death from the unexpected startup or fall of the raised header, stop the engine, remove the key from the ignition, and engage the safety props before going under the header for any reason. If using a lifting vehicle, be sure the header is secure before proceeding.

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

The header float must be set before leveling the ContourMax™. For instructions refer to *Checking and Adjusting Header Float, page 190*.

NOTE:

The wing balance must be set before leveling the ContourMax™. For instructions refer to *3.9.4 Checking and Adjusting Wing Balance, page 213*.

1. Unlock the header wings. For instructions, refer to *Locking/Unlocking Header Wings, page 205*.
2. Unlock the header float. For instructions refer to *Locking/Unlocking Header Float, page 205*.
3. Start the engine. For instructions, refer to the combine operator's manual.
4. Park the combine on a level surface.
5. Lower the reel fully.
6. Set ContourMax™ wheel height indicator (A) to number 2 (B).

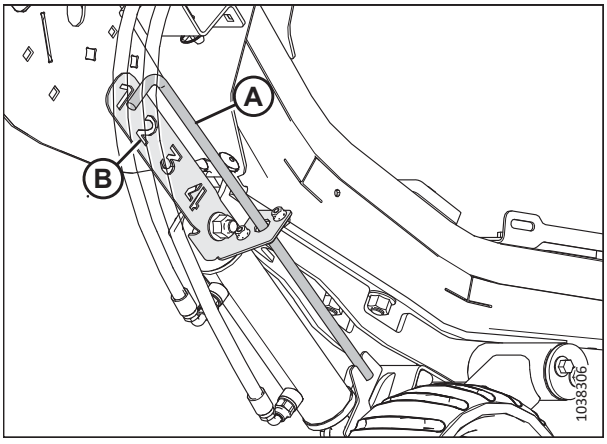


Figure 4.396: Height Indicator

7. Lower the header until the auto header height indicator (A) is at number 2 (B).
8. Shut down the engine, and remove the key from the ignition.

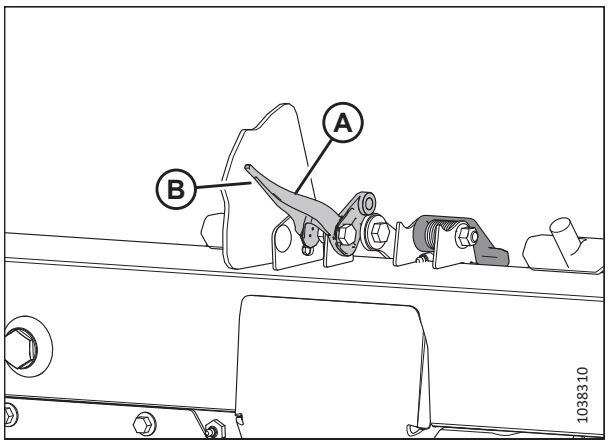


Figure 4.397: Float Setting Indicator

9. At the center of the header, measure distance (A) from the ground to the tip of the center guard and record the measurement.
10. At each end of the header, measure the distance (A) from the ground to the tip of the end guard and record both of the measurements.
    - If the difference between the end measurements and the center measurement is less than 25 mm (1 in.), no adjustment is required.
    - If the difference between the end measurements and the center measurement is greater than 25 mm (1 in.), adjustment is required. Continue to the next step.
11. Start the engine.
12. Raise the header fully.
13. Engage the header's safety props. For instructions, refer to the combine operator's manual.

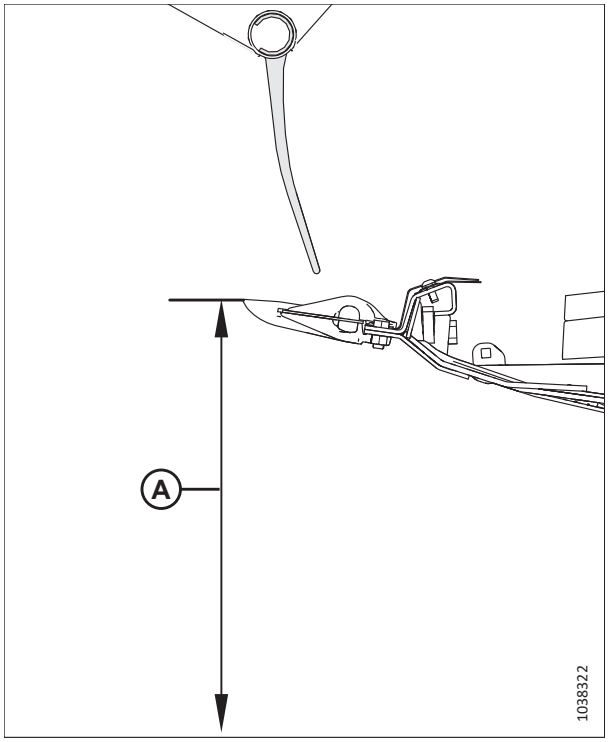


Figure 4.398: Float Setting Indicator

14. Remove pin (A).
15. Reposition adjuster plate (B) in the slot to align with a different hole. There is approximately 24 mm (1/2 in) difference between each of the holes.
    - If the measurement is less than the measurement at the center of the header. The adjuster plate needs to move **TOWARD** the cutterbar.
    - If the measurement is more than the measurement at the center of the header. The adjuster plate needs to move **AWAY** the cutterbar.
16. On the opposite end on the header, repeat Step *14, page 681* and Step *15, page 681*.
17. Disengage the header safety props. Refer to the combine operator's manual for instructions.
18. Lower the header until the auto header height indicator is at number 2.
19. Shut down the engine, and remove the key from the ignition.
20. Measure the guard to ground distance again. Verify that the three measurements are the same. If more adjustment is required. Repeat Step *14, page 681*.

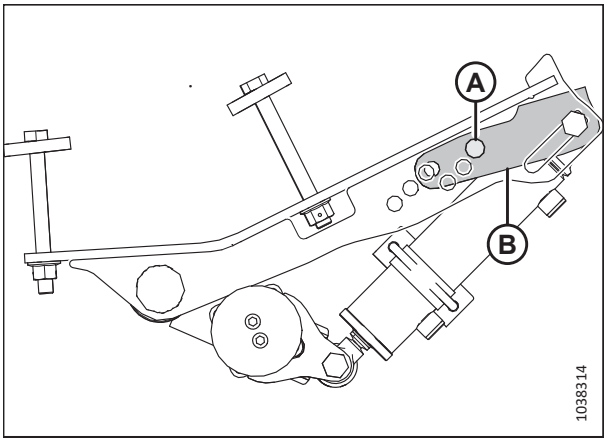


Figure 4.399: Pin Location – Left Outer Wheel

4.16.2 Lubricating Contour Wheel Axles

Contour wheel axles should be lubricated annually.

DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.

5. Remove rubber plug (A) from contour wheel hub. Retain the plug for reinstallation.

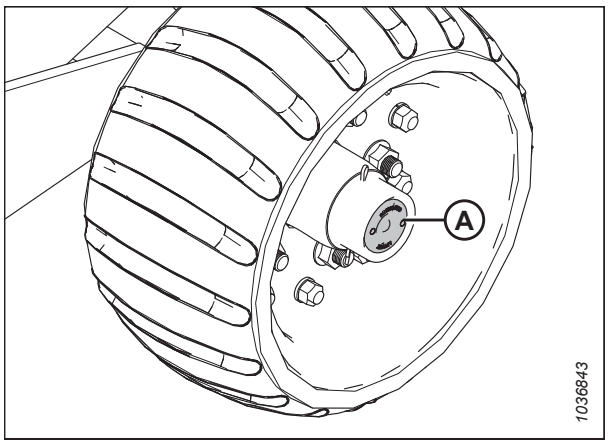


Figure 4.400: Rubber Plug on Contour Wheel Axle

6. Apply grease at lubrication point (A), and allow the excess grease to flow out the front of the axle hub.

   IMPORTANT:

   Grease **SLOWLY**. Rapid greasing may force rear seal to move.

7. Reinstall rubber plug (B).

8. Repeat the procedure for the remaining contour wheels.

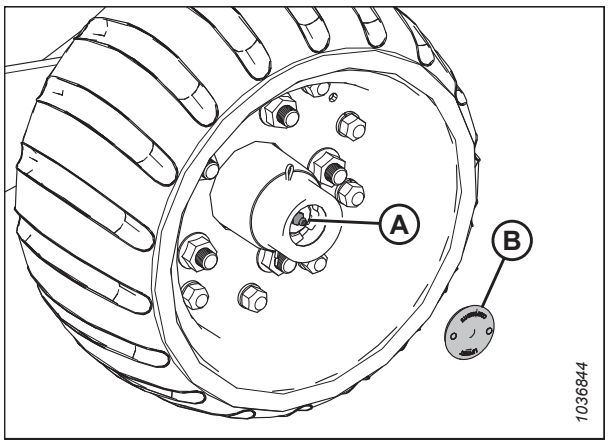


Figure 4.401: Lubrication Point on Contour Wheel Axle

Chapter 5: Options and Attachments

The following options and attachments are available for use with your header. See your MacDon Dealer for availability and ordering information.

5.1 Crop Delivery Kits

Crop delivery is the process of how the crop gets from the cutterbar to the feeder house. Optional crop delivery kits can optimize header performance for specific crops or conditions.

5.1.1 Crop Lifter Kit

Crop lifters are recommended for severely lodged cereal crops where the operator wants maximum possible stubble height.

Installation instructions are included in the kit.

Each kit (MD #B7022) contains 10 lifters. Order the following number of kits depending on header size:

- FD230 – 3 kits
- FD235, FD240, and FD41 – 4 kits
- FD245 and FD250 – 5 kits

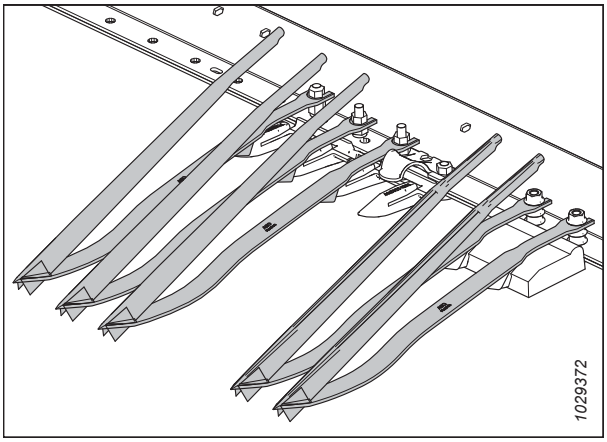


Figure 5.1: Grain Crop Lifter Kit

5.1.2 Crop Lifter Storage Rack Kit

Crop lifter racks are used to store crop lifters at the rear of the header.

Installation instructions are included in the kit.

MD #B7023

NOTE:

This kit is for one side only. Order two kits for both sides of the header.

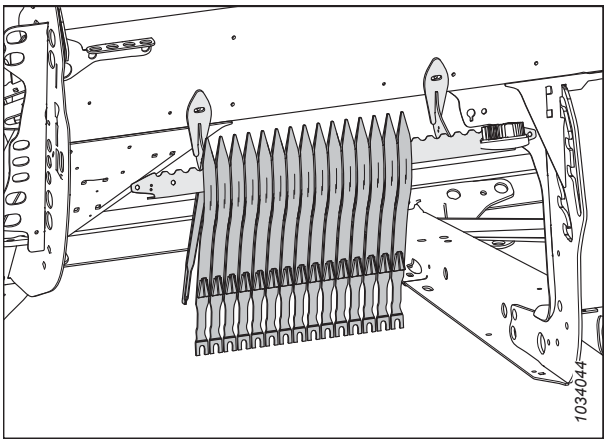


Figure 5.2: Crop Lifter Rack kit – Left Side

5.1.3 Crop Divider Storage Bracket Kit

The divider storage bracket kit is used to store the standard divider cones on the header.

Installation instructions are included in the kit.

MD #B7030

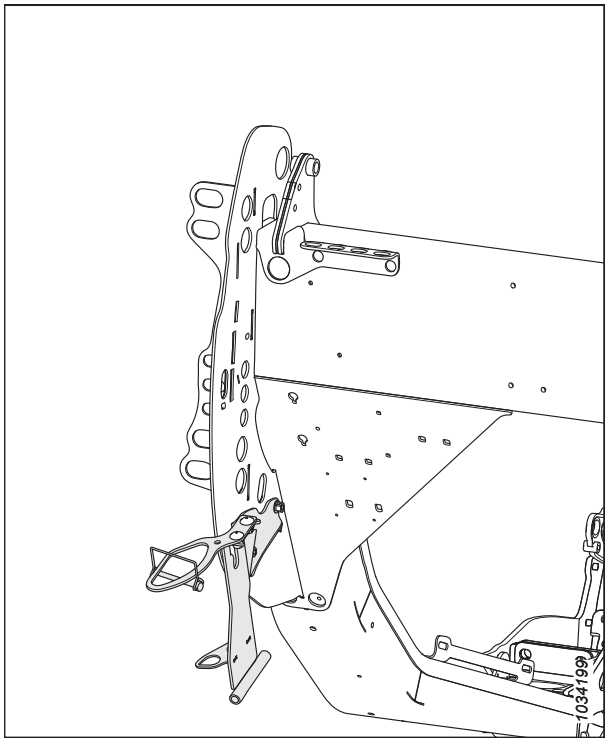


Figure 5.3: Divider Storage Bracket Kit – MD #B7030

5.1.4 Rice Divider Rod Kit

Rice divider rods attach to the left and right crop dividers and divide tall and tangled rice crops in a similar manner to standard crop divider rods performing in standing crops.

The kit includes both left and right rods, and storage brackets.

Installation instructions are included in the kit.

MD #B7238

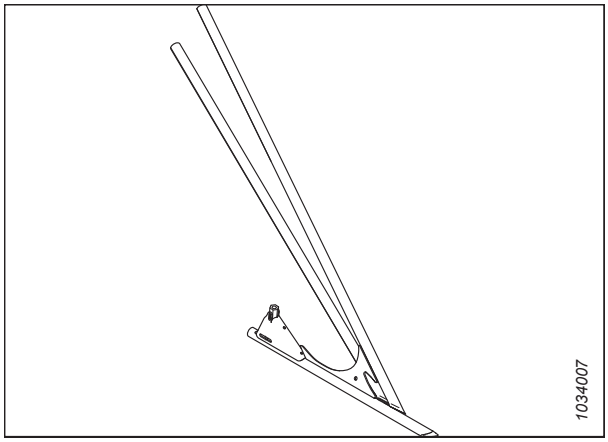


Figure 5.4: Left Rice Divider Rod Kit

5.1.5 Full Length Upper Cross Auger

The upper cross auger attaches to the header in front of the backtube, and improves crop feeding into the center of the header in heavy crop conditions.

The upper cross auger (UCA) (A) is ideal for high-volume harvesting of forages, oats, canola, mustard, and other tall, bushy, hard-to-feed crops. Order the following bundles:

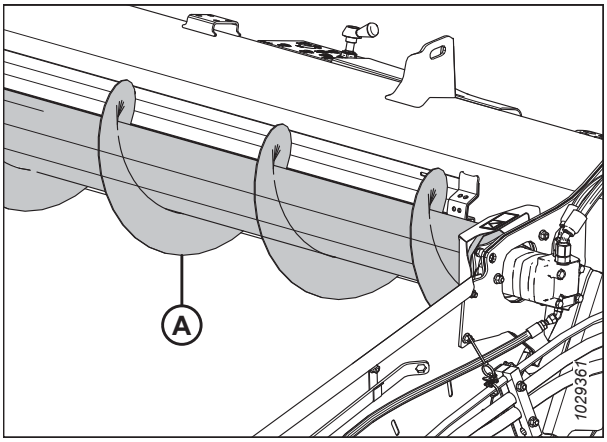


Figure 5.5: Upper Cross Auger

Base auger package

Includes auger, mounts, drive, and hydraulic completion plumbing for headers that are upper cross auger ready.

Order from the following list of kits according to your header model:

- FD230 – MD #B6414 (two piece)
- FD235 – MD #B6415 (two piece)
- FD240 – MD #B6417 (three piece)
- FD241 – MD #B6416 (two piece)
- FD245 – MD #B6418 (three piece)
- FD250 – MDB6419 (three piece)

Hydraulic Plumbing Package

Required only for headers without factory installed UCA hydraulics. Includes hydraulic lines to make header UCA ready, if not factory configured.

Order from the following list of kits according to your header model:

- FD230 – MD #B7117 (two piece)
- FD235 – MD #B7118 (two piece)
- FD240 – MD #B7119 (three piece)
- FD241 – MD #B7120 (two piece)
- FD245 – MD #B7119 (three piece)
- FD250 – MD #B7121 (three piece)

Installation instructions are included with the kits.

5.2 Cutterbar Kits

The cutterbar is located on the front of the header. It supports the knife and guards which is used to cut the crop.

5.2.1 Rock Retarder Kit

A rock retarder extends the height of the cutterbar lip to help prevent rocks rolling onto the draper decks.

Order bundles by header size:

- FD230, FD235, and FD241 – MD #B7122
- FD240, FD245, and FD250 – MD #B7123

NOTE:

Installation instructions are included in the kits.

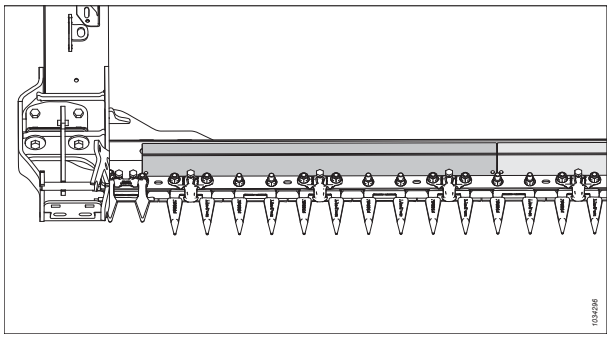


Figure 5.6: Rock Retarder Kit

5.2.2 VertiBlade™ Vertical Knife Kit

The VertiBlade™ is a vertical crop cutter that is mounted to each end of the header. It is used to cut though lodged or tangled crops.

Order the following bundles:

Base VertiBlade™

Includes knives, mounts, drive, and hydraulic completion plumbing to complete installation on power-divider ready header.

MD #B7029

Hydraulic Plumbing Package

The hydraulic plumbing packages are required only for headers without factory-installed power divider hydraulics. The package includes hydraulic lines to make the header power-divider (VertiBlade™) ready.

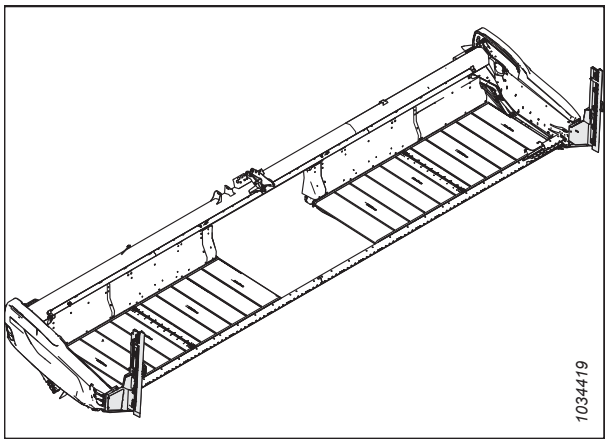


Figure 5.7: VertiBlade™ Vertical Knife Kit

Order one of the following based on your header:

- FD230 – MD #B7127
- FD235 – MD #B7128
- FD240 – MD #B7129
- FD241 – MD #B7130
- FD245 – MD #B7195
- FD250 – MD #B7131

Installation instructions are included in kits.

5.3 FM200 Float Module Kits

The float module is used to attach the header to the combine. It combines the crop flow from both side drapers and also pulls crop into the combine feeder house.

5.3.1 10V Sensor Adapter Kit

This kit is for NH CR/CX Combines that use 10V sensors.

MD #B7241

This kit is for the following NH CR/CX Combines:

- All CX800/CX8000/CX900 combines
- CR9040/CR9060 combines before serial number HAJ111000
- CR9070 combines before serial number Y8G1412000

5.3.2 Crop Deflector Kits

This kit installs different sizes of crop deflectors on the float module depending on feeder house size.

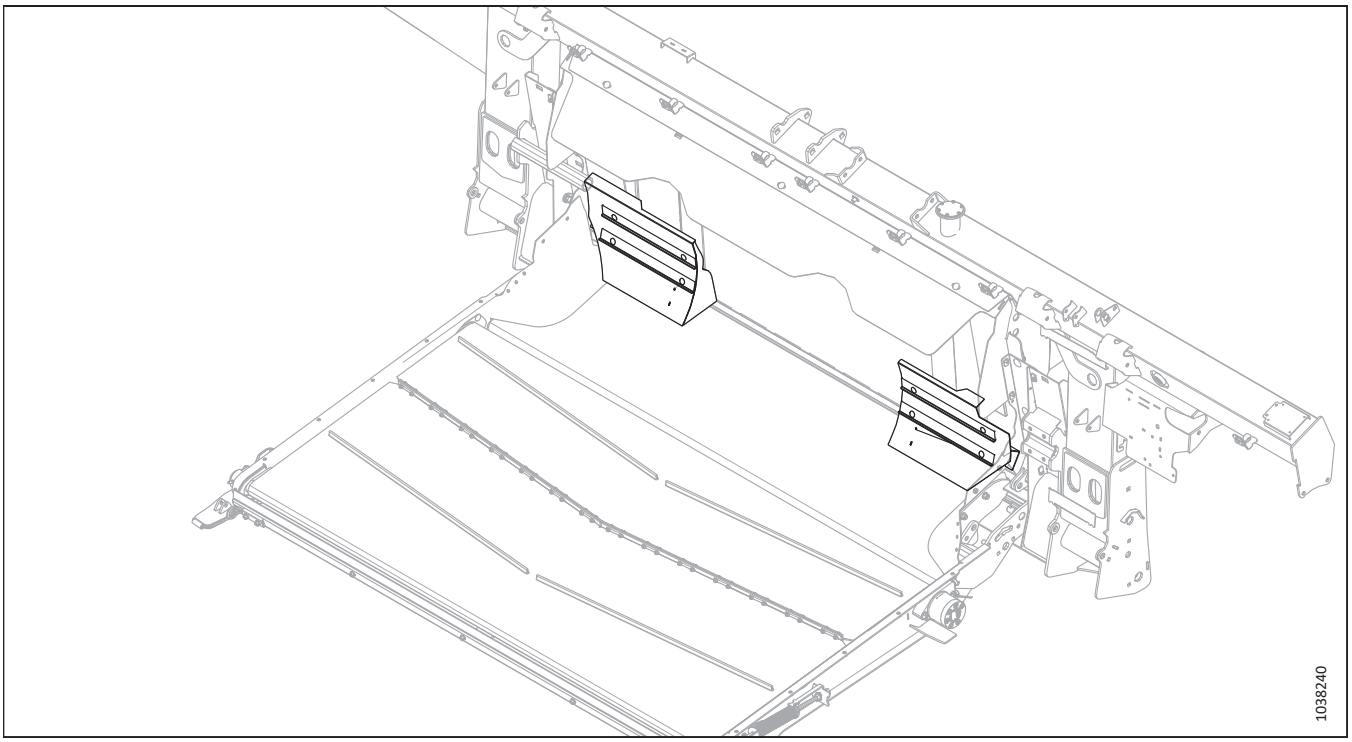


Figure 5.8: Crop Deflectors

Ultra Narrow MD #B7314

Narrow MD #B7347

Medium MD #B7348

5.3.3 Extended Center Filler

This kit is for the float module. It is a longer filler plate to seal the area behind the transition pan.

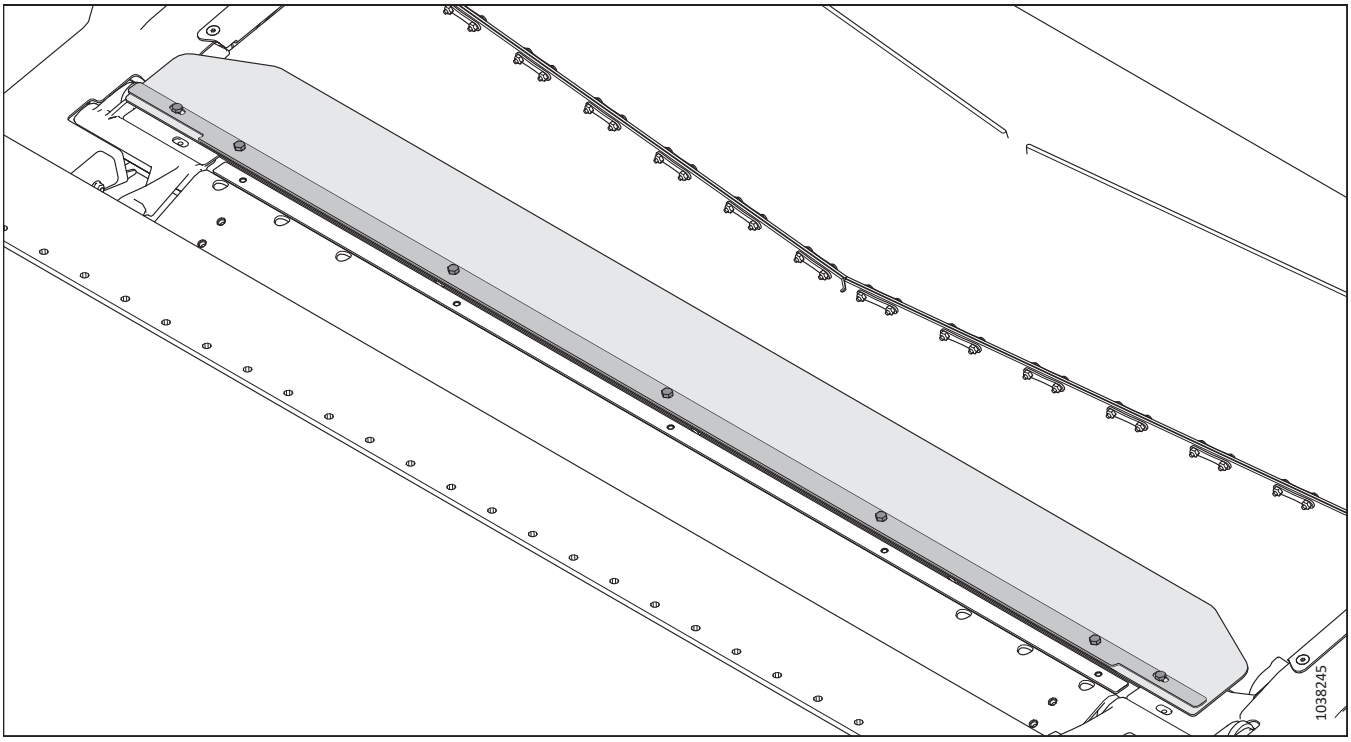


Figure 5.9: Extended Center Filler

MD #6450

NOTE:

Installation instructions are included in the kit.

5.3.4 Feed Auger High-Wear Flighting Extension Kit

The flighting extension kit may allow better feeding of crop in green/wet straw conditions (for example, rice and green cereals).

Refer to *3.8.1 FM200 Feed Auger Configurations, page 147* for a list of flighting combinations.

MD #B6400

NOTE:

Installation instructions are included in the kit.

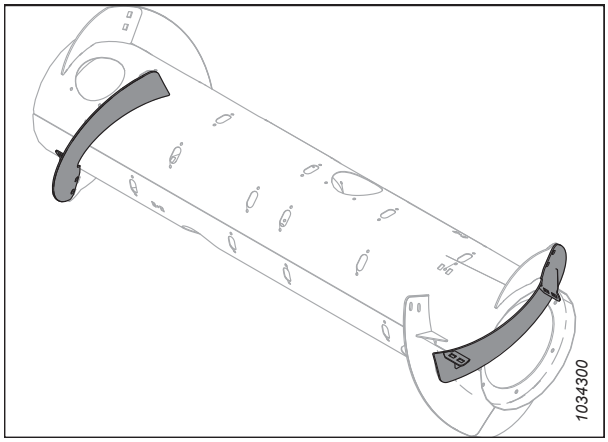


Figure 5.10: Feed Auger High-Wear Flighting Extension Kit

5.3.5 Full Interface Filler Kit

The Full Interface Filler Kit provides additional sealing between float module and header.

NOTE:

This kit is only available for European-configured headers.

Installation instructions are included in the kit.

MD #B7031

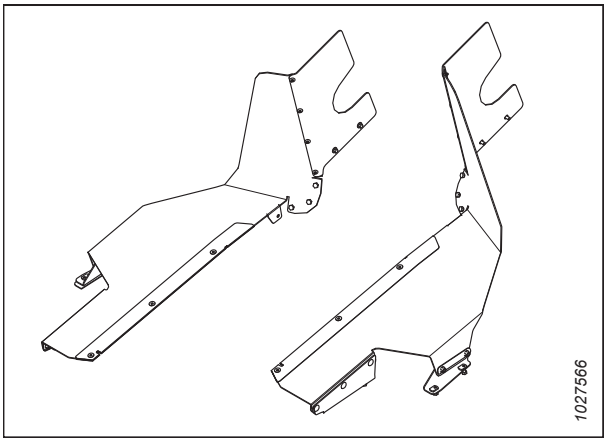


Figure 5.11: Full Interface Filler Kit

5.3.6 Hydraulic Reservoir Extension Kit

The hydraulic reservoir fill extension kit extends the breather cap position. This allows the float module to operate on steep hillsides while maintaining oil supply to the suction side of the pump.

This kit is recommended when operating on hills exceeding 5°.

MD #B6057

NOTE:

Installation instructions are included in the kits.

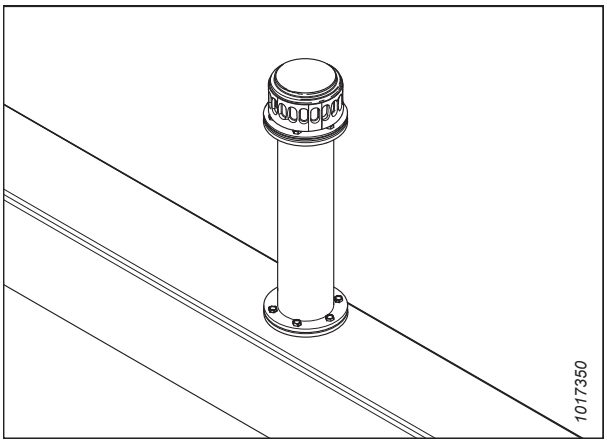


Figure 5.12: Hydraulic Reservoir Extension Kit

5.3.7 Lateral Tilt Plug Kit

This kit allows the combine lateral tilt to work with Auto Header Height Control (AHHC).

MD #B7196

Not recommended for slopes over 10% grade.

NOTE:

Installation instructions are included in the kits.

Figure 5.13: Lateral Tilt Plug

5.3.8 Stripper Bar Kit

Stripper bars improve feeding in certain crops such as rice. They are **NOT** recommended in cereal crops.

Select the stripper bar kit based on combine feeder house width. For information, refer to Table *5.1, page 690*.

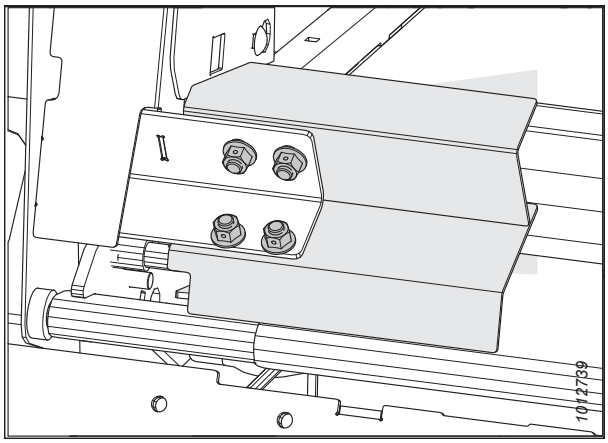


Figure 5.14: Stripper Bar Kit

NOTE:

Installation instructions are included in the kits.

Table 5.1 Stripper Bar Configurations and Recommendations

Bundle (MD #)	Stripper Bar Length	Opening Width Float Module	Recommended Feeder House Width
B6042	265 mm (10 1/2 in.)	1317 mm (52 in.)	1250–1350 mm (49–65 in.)
B6043	265 mm (10 1/2 in.) (with cutout)	1317 mm (52 in.)	For John Deere S Series only
B6044	325 mm (13 in.)	1197 mm (47 in.)	For specialty crops only
B6045	365 mm (14 1/2 in.)	1117 mm (44 in.)	1100 mm (43 1/2 in.) and below
B6046	403 mm (16 in.)	1041 mm (41 in.)	For specialty crops only
B6213	515 mm (20 in.)	817 mm (32 in.)	For specialty crops only

5.4 Header Kits

Header options add features or enhancements to the header frame rather than a specific system or function.

5.4.1 ContourMax™ Contour Wheels Kit

The ContourMax™ provides flex and auto header height control (AHHC) for stubble heights of 0–457 mm (0–18 in.) (standard header provides 0–152 mm [0–6 in.])

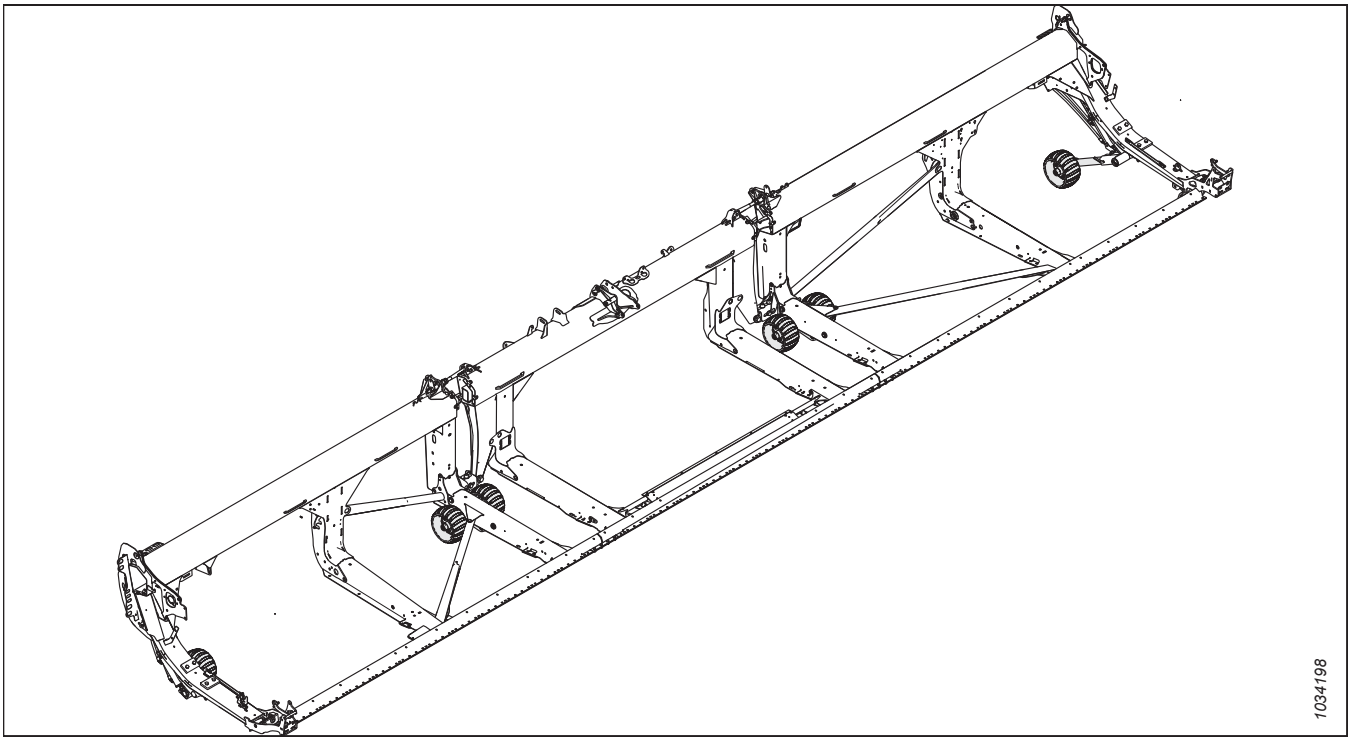


Figure 5.15: ContourMax™ Contour Wheels

The kit consists of four wheel sets and hydraulic height adjustment from inside the combine cab. Installation instructions are included in the kit. Order the following bundles:

Base ContourMax™ Package: Includes wheels, mounts, cylinders, control valve, and hydraulic plumbing to complete installation on ContourMax™ ready header.

MD #B7324

Hydraulic Plumbing Package:Includes hydraulic lines to make the header ContourMax™ ready if it is not factory configured. Order from the following list of ContourMax™ Contour Wheel hydraulic plumbing packages according to your header model:

- FD230 – MD #B7082
- FD235 – MD #B7083
- FD240 – MD #B7113
- FD241 – MD #B7114
- FD245 – MD #B7193
- FD250 – MD #B7116

ContourMax™ Height Sensing[84]: Includes mechanical indicator bundle and sensing bundle.

MD #C2101

5.4.2 ContourMax™ Foot Switch Kit

The ContourMax™ foot switch allows you to change the position of the ContourMax™ without taking your hand off the multifunction handle.

This option is available for John Deere and AGCO (Challenger®, Fendt, Gleaner, and Massey Ferguson®) combines.

MD #B7040

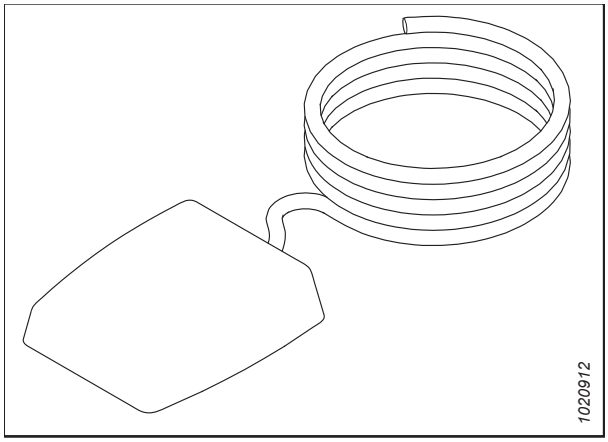


Figure 5.16: ContourMax™ Foot Switch

84. Only compatible with John Deere X9 configured headers.

5.4.3 EasyMove™ Transport System

The EasyMove™ Transport System makes it faster than ever to move your header from field to field. When operating in the field, the wheels can also be used as stabilizer wheels.

Installation instructions are included in the kit.

In order to complete the installation of this kit, order the one of the collector numbers be below:

- MD #C2048 – FD230, FD235
- MD #C2050 – FD240, FD241, FD245, FD250

MD #C2048 consists of

- MD #B6288 – Stabilizer Wheels / Slow Speed Transport Base Kit
- MD #B6275 – Wheels and Tires – White Rims
- FD230 and FD235 – Short Tow Pole (MD #B7391)

MD #C2050 consists of

- MD #B6288 – Stabilizer Wheels / Slow Speed Transport Base Kit
- MD #B6275 – Wheels and Tires – White Rims
- FD240, FD241, and FD250 – Long Tow Pole (MD #B7392)

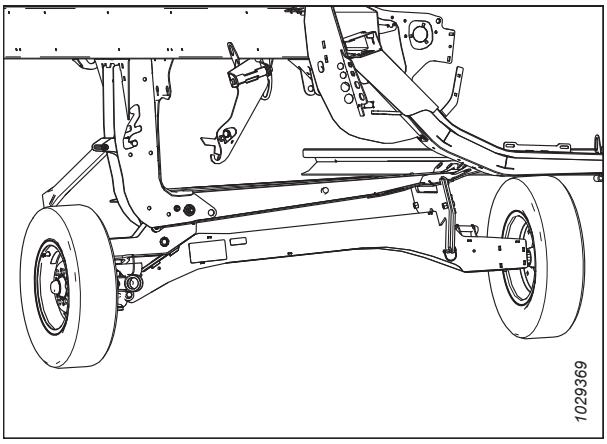


Figure 5.17: EasyMove™ Transport System

5.4.4 Floating Crop Dividers

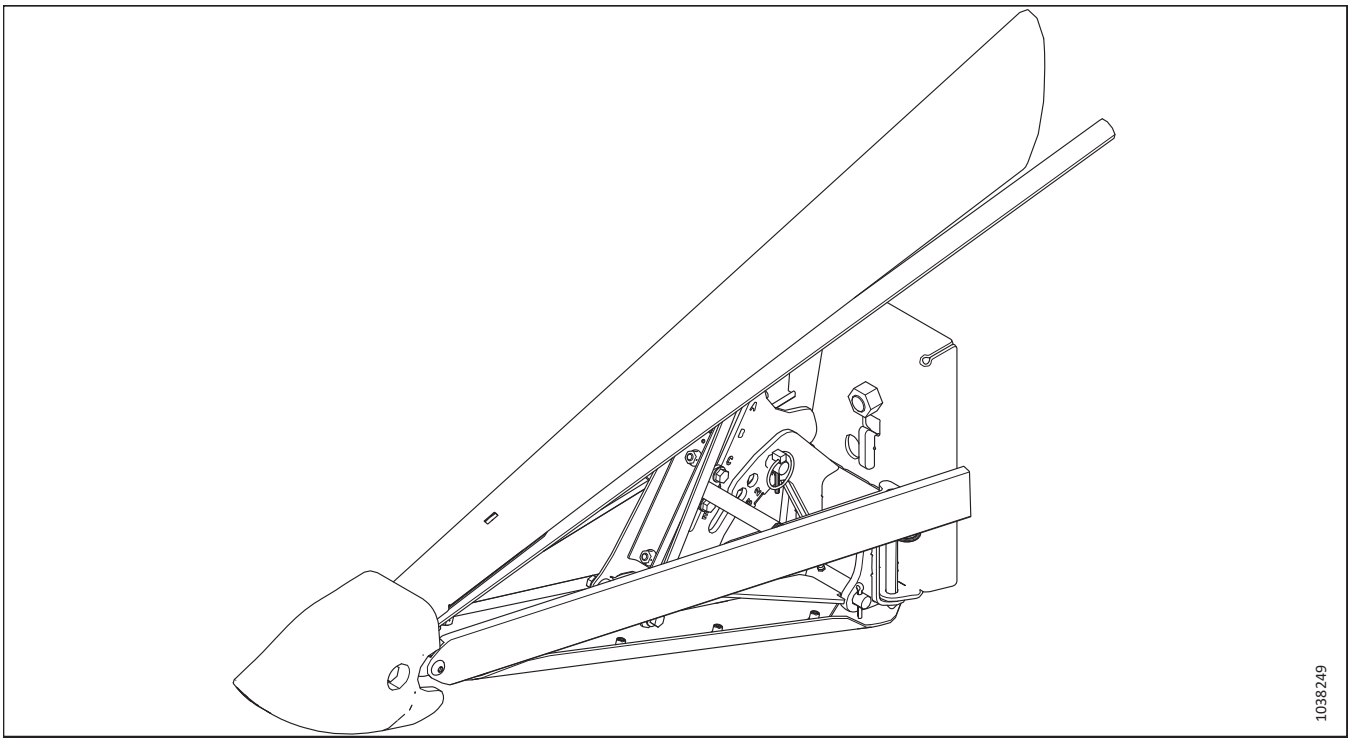


Figure 5.18: Floating Crop Divider

Floating dividers follow the ground contour and allow for improved dividing in both lodged and standing crops and reduce trampling.

Installation instructions are included in the kit.

MD #B7346

5.4.5 Inboard Steel End Finger Kit

Optional fingers to be used in difficult crops, lodged canola, and forage, where the angled plastic finger yields and distorts from heavy crop loads.

Installation instructions are included in the kit.

MD #311972

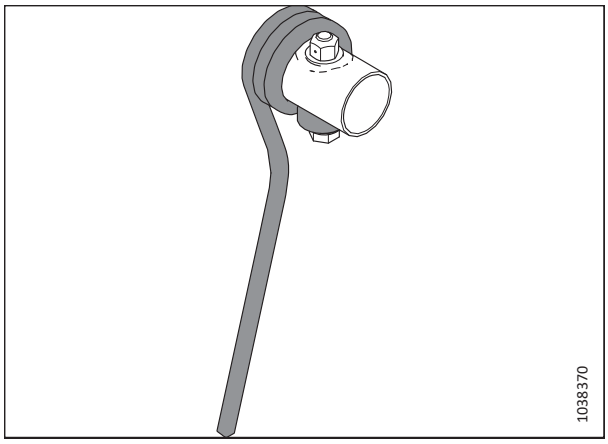


Figure 5.19: Inboard Steel End Finger

5.4.6 Outboard Steel End Finger Kit

Optional fingers to be used in difficult crops such as lodged canola, and forage, where the angled plastic finger yields and distorts from heavy crop loads.

Installation instructions are included in the kit.

MD #311959

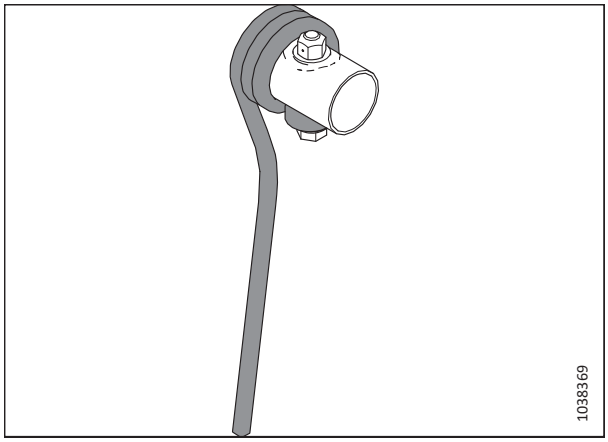


Figure 5.20: Outboard Steel End Finger

5.4.7 Side Hill Stabilizer Kit

The side hill stabilizer kit is recommended for cutting on side hills with a grade steeper than 5°.

Installation instructions are included in the kit.

MD #B7028

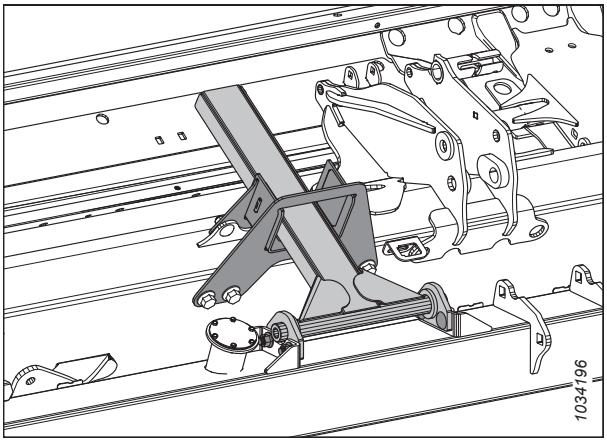


Figure 5.21: Side Hill Stabilizer Kit

5.4.8 Stabilizer Wheel Kit

The stabilizer wheel kit stabilizes the headers lateral movement when cutting at heights higher than possible with the standard skid shoes.

Installation and adjustment instructions are included in the kit.

MD #C2051

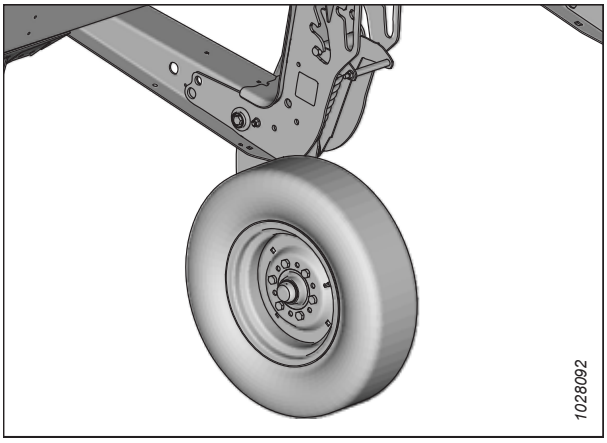


Figure 5.22: Stabilizer Wheel Kit

5.4.9 Steel Skid Shoes Kit

The steel skid shoes kit provides extended wear skid shoes for use in rocky, abrasive conditions.

IMPORTANT:

Not recommended for wet mud or conditions that are prone to sparking.

The kit contains two skid shoes. For full replacement of standard skid shoes, order three bundles (six shoes total).

MD #B6801

NOTE:

Installation instructions are included in the kit.

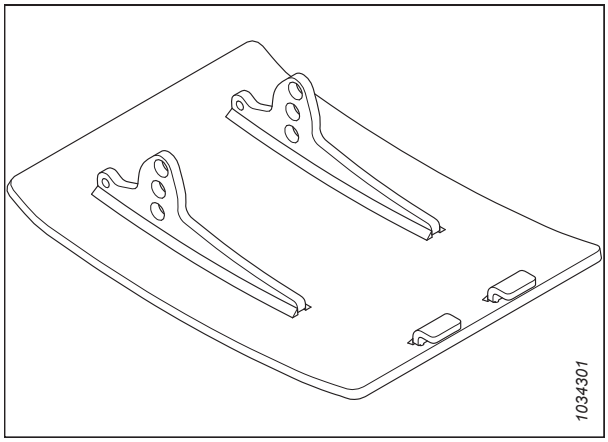


Figure 5.23: Steel Skid Shoes Kit

5.4.10 Stubble Light Kit

Stubble lights are used in low light conditions and allow you to see the stubble cut behind the header. The Stubble Light kit is available for MacDon FD230, FD235, FD240, FD241, and FD245 headers. This kit is currently compatible with John Deere combines only.

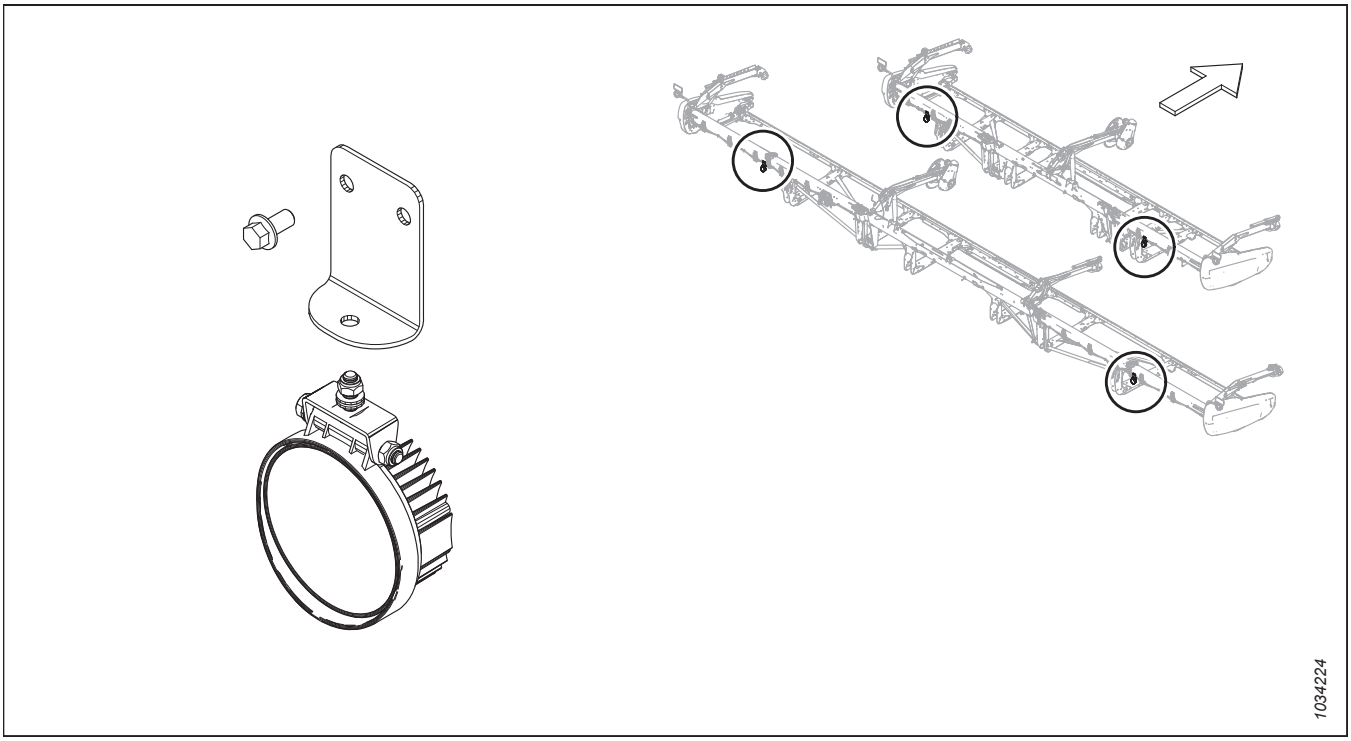


Figure 5.24: Stubble Light Kit

Installation instructions are included with the kit.

MD #B7027

5.4.11 Sunflower Attachment

This kit allows the FD2 Series FlexDraper® (with pointed guards only), to be converted to a sunflower header.

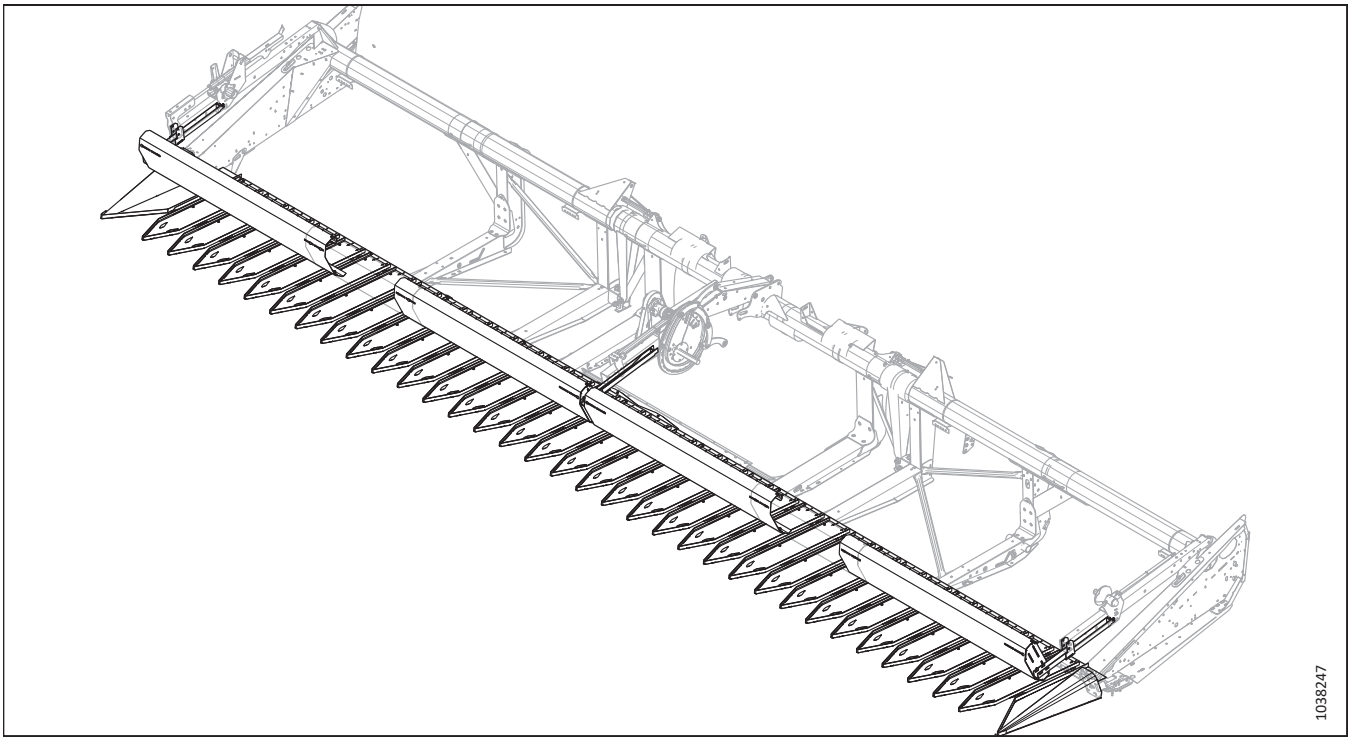


Figure 5.25: Sunflower Attachment

FD230 Sunflower Attachment MD #C2086

FD235 Sunflower Attachment MD #C2087

FD240 Sunflower Attachment MD #C2088

FD245 Sunflower Attachment MD #C2089

The collector contains: Base Kit, Pan, and Deflectors

Base Kit – contains common brackets, end dividers, cutterbar pan supports, lean bar components, and hardware MD #B7302

Pan Kit – contains five pans per kit (two spares). Order the number of kits depending on headers size MD #B7303

- FD230 – The base kit contains enough pans for FD230 headers. No additional pan kits are required.
- FD235 – 1 kit
- FD240 – 2 kits
- FD245 – 3 kits

Deflectors – contains lean bar panels and additional cutterbar pan supports:

- 30 ft – MD #B7304
- 35 ft – MD #B7305
- 40 ft – MD #B7306
- 45 ft – MD #B7307

Chapter 6: Troubleshooting

Troubleshooting tables are provided to help you diagnose and solve any problems you may have with the header.

6.1 Crop Loss at Cutterbar

Use the following tables to determine the cause of crop loss at the cutterbar and the recommended solution.

Table 6.1 Troubleshooting – Crop Loss at Cutterbar

Problem	Solution	Refer to
Symptom: Does not pick up downed crop		
Cutterbar too high	Lower cutterbar	• *3.9.1 Cutting above Ground Level, page 178* • *3.9.2 Cutting on Ground Level, page 188*
Header angle too low	Increase header angle	*3.9.5 Header Angle, page 217*
Reel too high	Lower reel	*3.9.10 Reel Height, page 231*
Reel too far back	Move reel forward	*3.9.11 Reel Fore-Aft Position, page 236*
Ground speed too fast for reel speed	Increase reel speed or reduce ground speed	• *3.9.6 Reel Speed, page 225* • *3.9.7 Ground Speed, page 226*
Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	*3.9.12 Reel Tine Pitch, page 246*
Reel fingers not lifting crop sufficiently	Install crop lifters	MacDon Dealer
Symptom: Heads shattering or breaking off		
Reel speed too fast	Reduce reel speed	*3.9.6 Reel Speed, page 225*
Reel too low	Raise reel	*3.9.10 Reel Height, page 231*
Ground speed too fast	Reduce ground speed	*3.9.7 Ground Speed, page 226*
Crop too ripe	Operate at night when humidity is higher	—
Symptom: Material accumulating in the gap between the cut-out in endsheet and the knifehead		
Crop heads leaning away from knifehead hole in endsheet	Add knifehead shields (except in damp or sticky soils)	*4.8.9 Knifehead Shield, page 571*
Symptom: Strips of uncut material		
Guards plugged with debris	Install short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 559*
Broken knife sections	Replace broken sections	*4.8.1 Replacing Knife Section, page 536*
Symptom: Excessive bouncing at normal field speed		
Float set too light	Adjust header float	*3.9.3 Header Float, page 190*
Symptom: Divider rod running down standing crop		
Divider rods too long	Remove divider rod	*3.9.14 Crop Dividers, page 252*
Symptom: Crop not being cut at ends		

Table 6.1 Troubleshooting – Crop Loss at Cutterbar (continued)

Problem	Solution	Refer to
Reel not frowning or not centered in header	Adjust reel horizontal position or reel frown	• *3.9.11 Reel Fore-Aft Position, page 236* • *4.13.2 Reel Frown, page 628*
Knife hold-down not adjusted properly	Adjust the hold-down so that the knife works freely but still keeps sections from lifting off of the guards	• *Adjusting Hold-Down – Pointed Knife Guards, page 554* or • *Adjusting Hold-Down – Short Knife Guards, page 566*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	*4.8 Knife, page 536*
Header is not level	Level the header	*3.11 Leveling Header, page 446*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position and/or finger pitch	• *3.9.11 Reel Fore-Aft Position, page 236* • *3.9.12 Reel Tine Pitch, page 246*
Divider runs down thick crop at ends preventing proper feeding due to material bridging the guards	Replace 3–4 end guards with short knife guard	• *4.8.8 Short Knife Guards and Hold-Downs, page 559* • MacDon Dealer
Symptom: Bushy or tangled crop flows over the divider rod, and builds up on the endsheets		
Divider rods providing insufficient separation	Install long divider rods	*3.9.14 Crop Dividers, page 252*
Symptom: Cut grain falling ahead of the cutterbar		
Ground speed too slow	Increase ground speed	*3.9.7 Ground Speed, page 226*
Reel speed too slow	Increase reel speed	*3.9.6 Reel Speed, page 225*
Reel too high	Lower reel	*3.9.10 Reel Height, page 231*
Cutterbar too high	Lower cutterbar	• *3.9.1 Cutting above Ground Level, page 178* • *3.9.2 Cutting on Ground Level, page 188*
Reel too far forward	Move reel back on arms	*3.9.11 Reel Fore-Aft Position, page 236*
Cutting at speeds over 10 km/h (6 mph) with 10-tooth reel drive sprocket	Replace with 19-tooth reel drive sprocket	*4.14.2 Reel Drive Sprocket, page 656*
Worn or broken knife components	Replace components	*4.8 Knife, page 536*

6.2 Cutting Action and Knife Components

Use the following tables to determine the cause of the cutting action and knife component problems and the recommended repair procedure.

Table 6.2 Troubleshooting – Cutting Action and Knife Components

Problem	Solution	Refer to
Symptom: Ragged or uneven cutting of crop		
Knife hold-down not adjusted properly	Adjust the hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 554* • *Adjusting Hold-Down – Short Knife Guards, page 566*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	• *Replacing Pointed Center Knife Guard – Double-Knife, page 555* • *Replacing Pointed Knife Guards, page 552* • *Replacing Center Knife Guard – Double-Knife, page 567* • *Replacing Short Knife Guards or End Knife Guards, page 564* • *4.8.1 Replacing Knife Section, page 536*
Knife is not operating at recommended speed	Feeder house speed set too low or knife speed not adjusted to proper range	*Checking Knife Speed, page 230*
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	• *3.9.6 Reel Speed, page 225* • *3.9.7 Ground Speed, page 226*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position/finger pitch	• *3.9.11 Reel Fore-Aft Position, page 236* • *3.9.12 Reel Tine Pitch, page 246*
Cutterbar too high	Lower cutting height	*3.9.1 Cutting above Ground Level, page 178* or *3.9.2 Cutting on Ground Level, page 188*
Header angle too flat	Steepen header angle	*3.9.5 Header Angle, page 217*
Cutting edge of guards not close enough or parallel to knife sections	Align guards	*Adjusting Knife Guards and Guard Bar, page 550*
Tangled/tough-to-cut crop	Install short knife guards	MacDon Dealer • *Adjusting Hold-Down – Pointed Knife Guards, page 554* or *Adjusting Hold-Down – Short Knife Guards, page 566*
Reel too far back	Move the reel forward	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom: Knife plugging		

Table 6.2 Troubleshooting – Cutting Action and Knife Components (continued)

Problem	Solution	Refer to
Reel too high or too far forward	Lower the reel or move reel rearward	• *3.9.10 Reel Height, page 231* • *3.9.11 Reel Fore-Aft Position, page 236*
Ground speed too high	Decrease the ground speed	*3.9.7 Ground Speed, page 226*
Improper knife hold-down adjustment	Adjust the hold-down	*Adjusting Hold-Down – Pointed Knife Guards, page 554* or *Adjusting Hold-Down – Short Knife Guards, page 566*
Dull or broken knife section	Replace knife section	*4.8.1 Replacing Knife Section, page 536*
Bent or broken guards	Align or replace the guards	*Adjusting Knife Guards and Guard Bar, page 550*
Reel fingers not lifting crop properly ahead of knife	Adjust the reel position/finger pitch	• *3.9.11 Reel Fore-Aft Position, page 236* • *3.9.12 Reel Tine Pitch, page 246*
Steel pick-up fingers contacting knife	Increase the reel clearance to cutterbar or adjust “frown”	• *4.13.2 Reel Frown, page 628*
Float too heavy	Adjust the springs for lighter float	*Checking and Adjusting Header Float, page 190*
Mud or dirt build-up on cutterbar	Raise the cutterbar by lowering skid shoes	*3.9.2 Cutting on Ground Level, page 188*
Mud or dirt build-up on cutterbar	Flatten the header angle	*3.9.5 Header Angle, page 217*
Knife is not operating at recommended speed	Check the engine speed of combine or header knife speed	• Combine operator’s manual • *Checking Knife Speed, page 230*
Symptom: Excessive header vibration		
Knife hold-down not adjusted properly	Adjust hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 554* or *Adjusting Hold-Down – Short Knife Guards, page 566*
Excessive knife wear	Replace knife	• *4.8.2 Removing Knife, page 537* • *4.8.5 Installing Knife, page 540*
Knife hold-down not adjusted properly	Adjust hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 554* • *Adjusting Center Hold-Down – Pointed Knife Guards, page 558* • *Adjusting Hold-Down – Short Knife Guards, page 566* • *Adjusting Center Hold-Down – Short Knife Guards, page 570*
Excessive knife wear	Replace knife	• *4.8.2 Removing Knife, page 537* • *4.8.5 Installing Knife, page 540*

Table 6.2 Troubleshooting – Cutting Action and Knife Components (continued)

Problem	Solution	Refer to
Loose or worn knifehead pin or drive arm	Tighten or replace parts	*4.8.1 Replacing Knife Section, page 536*
Symptom: Excessive vibration of float module and header		
Incorrect knife speed	Adjust knife speed	*Checking Knife Speed, page 230*
Bent cutterbar	Straighten the cutterbar	MacDon Dealer
Symptom: Excessive breakage of knife sections or guards		
Knife hold-down not adjusted properly	Adjust the hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 554* or • *Adjusting Hold-Down – Short Knife Guards, page 566*
Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	*3.9.2 Cutting on Ground Level, page 188*
Float is set too heavy	Adjust float springs for lighter float	*Checking and Adjusting Header Float, page 190*
Bent or broken guard	Straighten or replace the guard	• *4.8.7 Pointed Knife Guards and Hold-Downs, page 542* or • *4.8.8 Short Knife Guards and Hold-Downs, page 559*
Header angle too steep	Flatten the header angle	*3.9.5 Header Angle, page 217*
Symptom: Knife back breakage		
Bent or broken guard	Straighten or replace the guard	• *4.8.7 Pointed Knife Guards and Hold-Downs, page 542* or • *4.8.8 Short Knife Guards and Hold-Downs, page 559*
Worn knifehead pin	Replace the knifehead pin	• *4.8.3 Removing Knifehead Bearing, page 539* and • *4.8.4 Installing Knifehead Bearing, page 540*
Dull knife	Replace the knife	• *4.8.2 Removing Knife, page 537* and • *4.8.5 Installing Knife, page 540*
Knife speed too fast	Lower the knife speed	Consult your MacDon Dealer
Loose knife section hardware	Check/tighten all of the knife hardware	—

6.3 Reel Delivery

Use the following tables to determine the cause of reel delivery problems and the recommended repair procedure.

Table 6.3 Troubleshooting – Reel Delivery

Problem	Solution	Refer to
Symptom – Reel not releasing material in normal standing crop		
Reel speed too fast	Reduce the reel speed	*3.9.6 Reel Speed, page 225*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 231*
Reel tines too aggressive	Reduce the cam setting	*3.9.12 Reel Tine Pitch, page 246*
Reel too far back	Move the reel forward	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom – Reel not releasing material in lodged and standing crop (reel fully lowered)		
Reel tines too aggressive for standing crop	Reduce the cam setting (one or two) or move reel forward	*3.9.12 Reel Tine Pitch, page 246*
Symptom – Wrapping on reel end		
Reel tines too aggressive	Reduce the cam setting	*3.9.12 Reel Tine Pitch, page 246*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 231*
Reel speed too fast	Reduce the reel speed	*3.9.6 Reel Speed, page 225*
Reel not centered in header	Center the reel in the header	*4.13.3 Centering Reel, page 629*
Symptom – Reel releases crop too quickly		
Reel tines not aggressive enough	Increase the cam setting to match reel delivery to the reel fore-aft position	*3.9.12 Reel Tine Pitch, page 246*
Reel too far forward	Move the reel back to match the reel cam setting	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom – Reel will not lift		
Reel lift couplers are incompatible or defective	Change the quick coupler	MacDon dealer
Symptom – Reel will not turn		
Quick couplers not properly connected	Connect the couplers	*3.6 Header Attachment/Detachment, page 68*
Reel drive chain disconnected or broken	Connect/replace the chain	*4.14.6 Replacing Drive Chain, page 666*
Symptom – Reel motion uneven under no load		
Excessive slack in reel drive chain	Tighten the chain	*Tightening Reel Drive Chain, page 655*
Symptom – Reel motion is uneven or stalls in heavy crops		
Reel speed too fast	Reduce the reel speed	*3.9.6 Reel Speed, page 225*
Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	*3.9.12 Reel Tine Pitch, page 246*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 231*
Relief valve on combine (not on combine float module) has low relief pressure setting	Increase the relief pressure to the manufacturer's recommendations	Combine operator's manual
Low oil reservoir level on combine **NOTE:** Sometimes there is more than one reservoir	Fill to the proper level	Combine operator's manual

Table 6.3 Troubleshooting – Reel Delivery (continued)

Problem	Solution	Refer to
Relief valve malfunction	Replace the relief valve	Combine operator's manual
Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace the sprocket with an appropriate high torque sprocket to match the combine reel circuit pressure	• *4.14.2 Reel Drive Sprocket, page 656* • Install Two Speed Kit (MD #311882)
Symptom – Plastic fingers cut at tip		
Insufficient reel to cutterbar clearance	Increase the clearance	*4.13.1 Reel Clearance to Cutterbar, page 622*
Symptom – Plastic fingers bent rearward at tip		
Reel digging into ground with reel speed slower than ground speed	Raise the header	• *3.9.2 Cutting on Ground Level, page 188*
Reel digging into ground with reel speed slower than ground speed	Decrease the header tilt	*3.9.5 Header Angle, page 217*
Reel digging into ground with reel speed slower than ground speed	Move the reel aft	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom – Plastic fingers bent forward at tip		
Reel digging into ground with reel speed faster than ground speed	Raise the header	• *3.9.2 Cutting on Ground Level, page 188*
Reel digging into ground with reel speed faster than ground speed	Decrease the header tilt	*3.9.5 Header Angle, page 217*
Reel digging into ground with reel speed faster than ground speed	Move the reel aft	*3.9.11 Reel Fore-Aft Position, page 236*

Table 6.3 Troubleshooting – Reel Delivery (continued)

Problem	Solution	Refer to
Symptom – Plastic fingers bent close to tine tube		
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Correct the plugging/cutting issues	*3.12 Unplugging Cutterbar, page 449*
Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Stop the reel before plugging becomes excessive	*3.12 Unplugging Cutterbar, page 449*

6.4 Troubleshooting Header and Drapers

Use the following tables to determine the header and draper problems and the recommended repair procedure.

Table 6.4 Troubleshooting – Header and Drapers

Problem	Solution	Refer to
Symptom: Insufficient header lift		
Low relief pressure	Increase the relief pressure	Combine Dealer
Symptom: Insufficient side draper speed		
Speed control set too low	Increase the speed control setting	*3.9.8 Side Draper Speed, page 227*
Combine header drive too slow	Adjust to the correct speed for the combine model	Combine operator's manual
Symptom: Insufficient feed draper speed		
Relief pressure too low	Test the feed draper hydraulic system	See your MacDon Dealer
Combine header drive too slow	Adjust to the correct speed for the combine model	Combine operator's manual
Symptom: Feed draper will not move		
Drapers are loose	Tighten the drapers	*4.10.2 Checking and Adjusting Feed Draper Tension, page 578*
Drive or idler roller wrapped with material	Loosen the draper and clean the rollers	*4.10.2 Checking and Adjusting Feed Draper Tension, page 578*
Slat or connector bar jammed by frame or material	Loosen the draper and clear the obstruction	*4.10.2 Checking and Adjusting Feed Draper Tension, page 578*
Roller bearing seized	Replace the roller bearing	*Replacing Feed Draper Idler Roller Bearing, page 591*
Low hydraulic oil	Fill the combine hydraulic oil reservoir to the full level	Combine operator's manual
Material not feeding evenly off knife	Lower the reel	*3.9.10 Reel Height, page 231*
Material not feeding evenly off knife	Install short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 559*
Symptom: Hesitation in the flow of bulky crop		
Header angle too low	Increase the header angle	*3.9.5 Header Angle, page 217*
Material overload on drapers	Increase the side draper speed	*3.9.8 Side Draper Speed, page 227*
Material overload on drapers	Install an upper cross auger	*5.1.5 Full Length Upper Cross Auger, page 685*
Material overload on drapers	Add flighting extensions	MacDon Dealer
Symptom: Drapers back-feed		
Drapers running too slow in heavy crop	Increase the draper speed	*3.9.8 Side Draper Speed, page 227*
Symptom: Crop is thrown across the opening and under opposite side draper		
Drapers running too fast in light crop	Reduce the draper speed	*3.9.8 Side Draper Speed, page 227*
Symptom: Material accumulating on the end deflectors and releasing in bunches		
End deflectors too wide	For headers with manual deck shift only, trim the deflector or replace with a narrow deflector (MD #172381)	*3.12 Unplugging Cutterbar, page 449*

6.5 Cutting Edible Beans

Use the following tables to determine the cause of any cutting edible bean problems and the recommended solutions.

Table 6.5 Troubleshooting – Cutting Edible Beans

Problem	Solution	Refer to
Symptom: Plants being stripped and complete or partial plants left behind		
Header off ground	Lower the header to ground and run it on the skid shoes and/or the cutterbar	*3.9.2 Cutting on Ground Level, page 188*
Float set too light—rides on high spots and does not lower soon enough	Set the float to 335–338 N (75–85 lbf). Increase or decrease as necessary to prevent the header from bouncing excessively or plowing into soft ground	*3.9.3 Header Float, page 190*
Reel too high with cylinders fully retracted	Adjust the reel height	*3.9.10 Reel Height, page 231*
Finger pitch not aggressive enough	Adjust the finger pitch	*3.9.12 Reel Tine Pitch, page 246*
Reel too far aft	Move the reel forward until the fingertips skim the soil surface with the header on the ground and the header angle properly adjusted	*3.9.11 Reel Fore-Aft Position, page 236*
Header angle too shallow	Adjust the header angle	*Adjusting Header Angle from Combine, page 219*
Header angle too shallow	Increase the header angle by fully retracting lift cylinders (if cutting on ground)	*Adjusting Header Angle from Combine, page 219*
Reel too slow	Adjust the reel speed to be marginally faster than ground speed	*3.9.6 Reel Speed, page 225*
Ground speed too fast	Lower the ground speed	*3.9.7 Ground Speed, page 226*
Skid shoes too low	Raise the skid shoes to the highest setting	*3.9.2 Cutting on Ground Level, page 188*
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar; raises the cutterbar off the ground	Ground too wet – allow soil to dry	—
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar; raises the cutterbar off the ground	Float too heavy	*Checking and Adjusting Header Float, page 190*
Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar; raises the cutterbar off the ground	Manually clean the bottom of the cutterbar when excessive accumulation occurs	—
Header not level	Level the header	*3.11 Leveling Header, page 446*
Worn or damaged knife sections	Replace the sections or replace the knife	*4.8 Knife, page 536*
Parts of vines get caught in pointed guard tip. (Occurs more in row-cropped beans that are hilled from cultivating.)	Install the short knife guard conversion kit	*4.8.8 Short Knife Guards and Hold-Downs, page 559*
Pushing of crop debris on the ground	Install the short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 559*

Table 6.5 Troubleshooting – Cutting Edible Beans (continued)

Problem	Solution	Refer to
Knife speed too low	Increase the feeder house speed or check that the knife speed is set within the recommended range	*3.9.9 Knife Speed Information, page 229* or *Checking Knife Speed, page 230*
Symptom: Excessive losses at dividers		
Divider rod running down crop and shattering the pods	Remove the divider rod	*3.9.14 Crop Dividers, page 252*
Vines and plants build up on the endsheet	Install the divider rod	*3.9.14 Crop Dividers, page 252*
Symptom: Plant vines pinched between top of draper and cutterbar		
Cutterbar fills with debris when draper to cutterbar gap is properly adjusted	Raise the header fully at each end of the field (or as required) and shift decks back and forth to help clean out the cutterbar	—
Shifting the decks with the header raised does not clean out the cutterbar debris.	Manually remove the debris from the cutterbar cavity to prevent damaging the drapers	—
Symptom: Crop accumulating at guards and not moving rearward onto the drapers		
Reel finger pitch not aggressive enough	Increase the finger aggressiveness (cam position)	*3.9.12 Reel Tine Pitch, page 246*
Reel too high	Lower the reel	*3.9.10 Reel Height, page 231*
Minimum reel clearance to cutterbar setting too high	Adjust the minimum reel height with cylinders fully retracted	*4.13.1 Reel Clearance to Cutterbar, page 622*
Reel too far forward	Reposition the reel	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom: Crop wrapping around reel		
Reel too low	Raise the reel	*3.9.10 Reel Height, page 231*
Symptom: Reel shattering pods		
Reel too far forward	Reposition the reel	*3.9.11 Reel Fore-Aft Position, page 236*
Reel speed too high	Reduce the reel speed	*3.9.6 Reel Speed, page 225*
Bean pods too dry	Cut at night when heavy dew is present and pods have softened	—
Reel finger pitch not aggressive enough	Increase the finger aggressiveness (cam position)	*3.9.12 Reel Tine Pitch, page 246*
Symptom: Cutterbar guards breaking		
Float insufficient (float setting too heavy)	Increase the float (adjust to lighter float setting)	*3.9.3 Header Float, page 190*
Excessive number of rocks in field	Consider installing optional short knife guards **Note:** With the installation of short knife guards, you are trading guard damage for section damage (although changing sections with short knife guards is easier)	MacDon Dealer
Symptom: Cutterbar pushing too much debris and dirt		

Table 6.5 Troubleshooting – Cutting Edible Beans (continued)

Problem	Solution	Refer to
Header too heavy	Readjust the float to make the header lighter	*3.9.3 Header Float, page 190*
Header angle too steep	Decrease the header angle	*3.9.5 Header Angle, page 217*
Guards plug with debris or and soil	Install the short knife guard	*4.8.8 Short Knife Guards and Hold-Downs, page 559*
Insufficient support for the header	Install the center skid shoes	*3.9.2 Cutting on Ground Level, page 188*
Symptom: Crop wrapping around reel ends		
Uncut crop interfering on reel ends	Add reel endshields	Header parts catalog
Symptom: Cutterbar fills up with dirt		
Excessive gap between the draper and the cutterbar	Raise the header fully at each end of field (or as required) and shift the decks back and forth to help clean out the cutterbar	—
Symptom: Reel occasionally carries over plants in the same location		
Steel fingers bent and hooking plants from drapers	Straighten the fingers (steel)	—
Dirt accumulation on end of fingers preventing plants from falling off fingers onto drapers	Raise the reel	*3.9.10 Reel Height, page 231*
Dirt accumulation on end of fingers preventing plants from falling off fingers onto drapers	Adjust the reel fore-aft position to move the fingers out of the ground	*3.9.11 Reel Fore-Aft Position, page 236*
Symptom: Cutterbar pushing soil		
Tire tracks or row crop ridges	Cut at an angle to crop rows or ridges	—
Rolling terrain along length of field	Cut at 90° to the rolling terrain (provided knife floats across without digging in)	—
Symptom: Reel carries over an excessive amount of plants or wads		
Excessive accumulation of crop on drapers (up to reel center tube)	Increase the draper speed	*3.9.8 Side Draper Speed, page 227*
Finger pitch too slow	Increase the finger pitch	*3.9.12 Reel Tine Pitch, page 246*

Chapter 7: Reference

The reference section provides additional, support information on topics such as torque specifications, the requirements for lifting equipment, unit measurement conversions, and terminology definitions. Refer to this section as needed.

7.1 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Use these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Use the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Use the standard torque values when installing self-tapping screws. Do **NOT** install self-tapping screws on structural or otherwise critical joints.

7.1.1 Metric Bolt Specifications

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 7.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

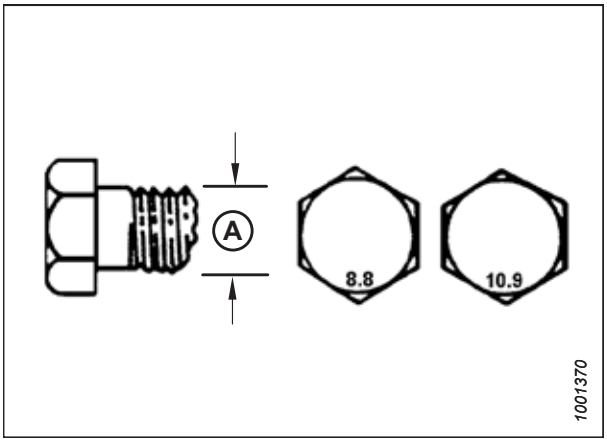


Figure 7.1: Bolt Grades

Table 7.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

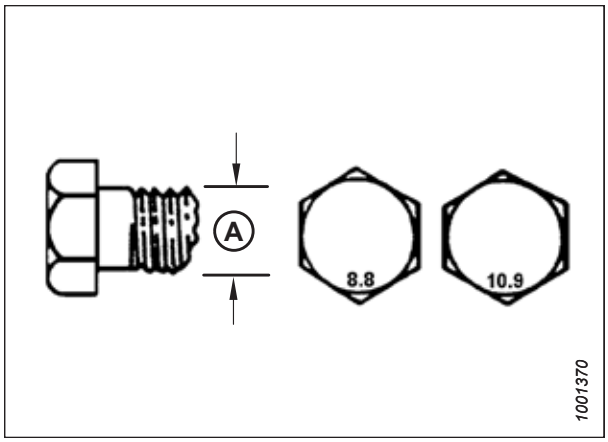


Figure 7.2: Bolt Grades

Table 7.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

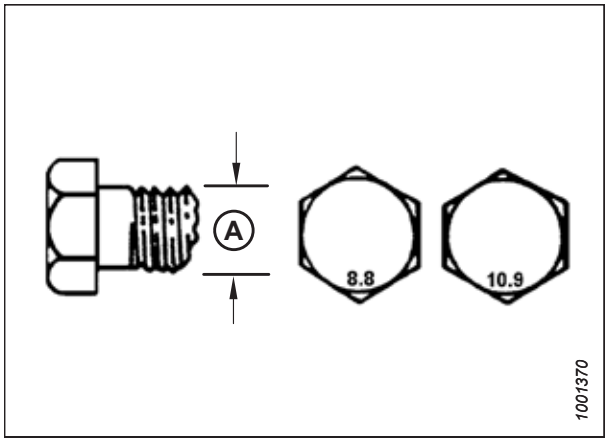


Figure 7.3: Bolt Grades

Table 7.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

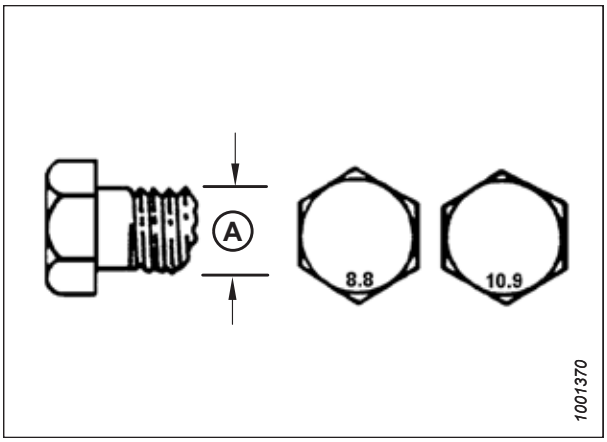


Figure 7.4: Bolt Grades

7.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 7.5 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf·ft	Nm	lbf·ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

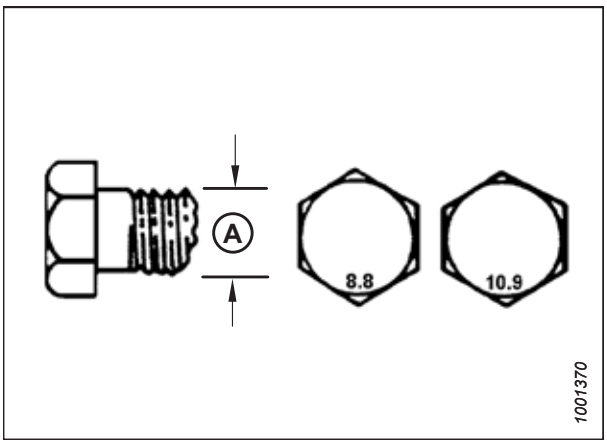


Figure 7.5: Bolt Grades

7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

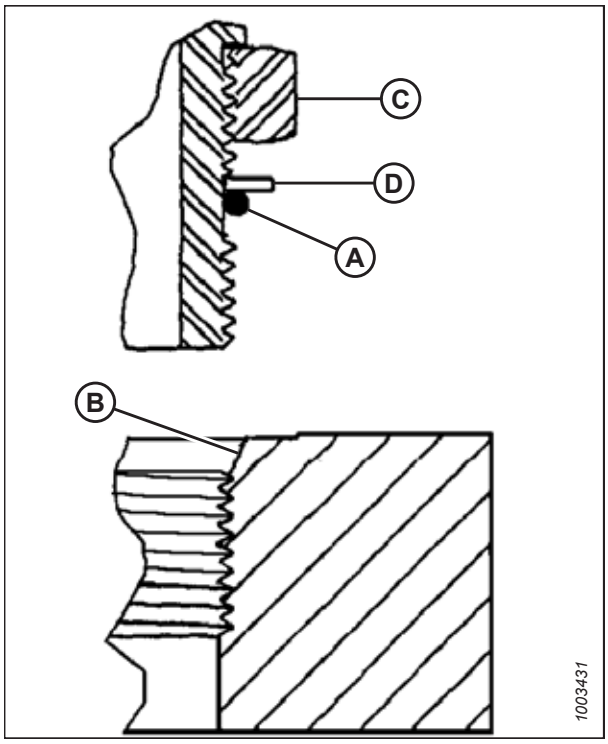


Figure 7.6: Hydraulic Fitting

5. Install fitting (B) into the port until backup washer (D) and O-ring (A) contact part face (E).
6. Position the angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten it to the torque value indicated in the table. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Check the final condition of the fitting.

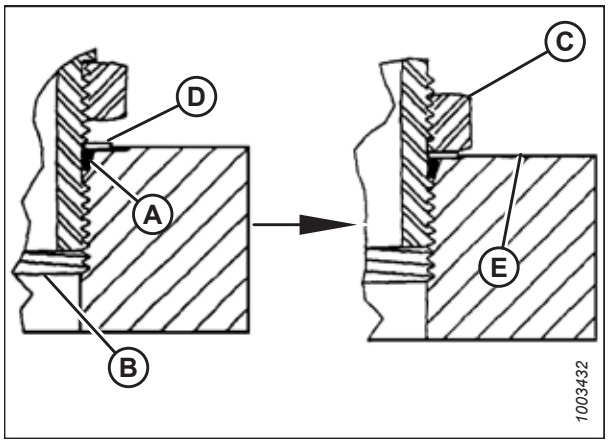


Figure 7.7: Hydraulic Fitting

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[85]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115

85. Torque values shown are based on lubricated connections as in reassembly.

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[86]	
		Nm	lbf·ft (*lbf·in)
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1 1/16–12	120–132	88–97
-14	1 3/8–12	153–168	113–124
-16	1 5/16–12	176–193	130–142
-20	1 5/8–12	221–243	163–179
-24	1 7/8–12	270–298	199–220
-32	2 1/2–12	332–365	245–269

7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values are provided for non-adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

Torque values are shown in the table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *7.7, page 716*.
6. Check the final condition of the fitting.

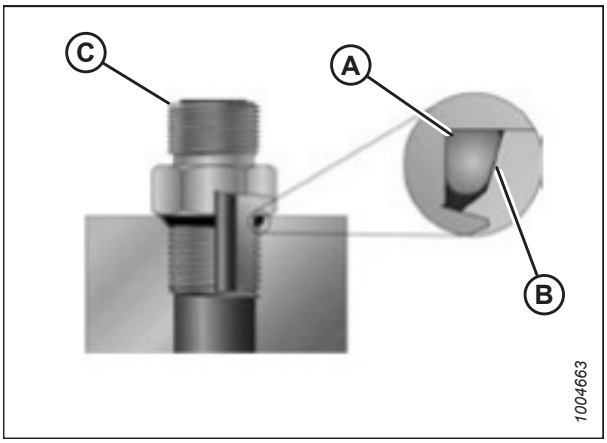


Figure 7.8: Hydraulic Fitting

86. Torque values shown are based on lubricated connections as in reassembly.

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[87]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1 1/16–12	120–132	88–97
-14	1 3/8–12	153–168	113–124
-16	1 5/16–12	176–193	130–142
-20	1 5/8–12	221–243	163–179
-24	1 7/8–12	270–298	199–220
-32	2 1/2–12	332–365	245–269

7.1.5 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

Torque values are shown in the table below.

1. Check the components to ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

Figure 7.9: Hydraulic Fitting

87. Torque values shown are based on lubricated connections as in reassembly.

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table *7.8, page 717*.

   NOTE:

   If applicable, hold the hex flange on fitting body (E) to prevent the rotation of the fitting body and the hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Check the final condition of the fitting.

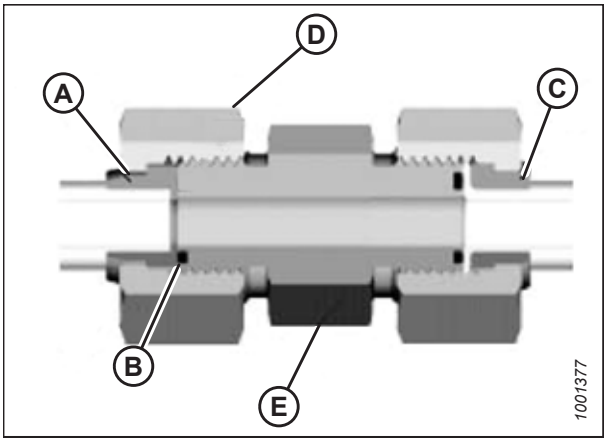


Figure 7.10: Hydraulic Fitting

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[88]	
			Nm	lbf·ft
-3	Note[89]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[89]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[89]	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

7.1.6 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Check the components to ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.

88. Torque values and angles shown are based on lubricated connection as in reassembly.
89. O-ring face seal type end not defined for this tube size.

4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table *7.9, page 718*. Make sure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never back off (i.e., loosen) the threaded connectors to achieve alignment.

5. Clean all residue and any excess thread conditioner with an appropriate cleaner.

6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.

7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

   The failure of fittings due to overtorquing may not be evident until the fittings are disassembled and inspected.

Table 7.9 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

7.2 Conversion Chart

Both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement are used in this manual. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 7.10 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	x 2.4710 =	acre	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newton	N	x 0.2248 =	pound force	lbf
Length	millimeter	mm	x 0.0394 =	inch	in.
Length	meter	m	x 3.2808 =	foot	ft.
Power	kilowatt	kW	x 1.341 =	horsepower	hp
Pressure	kilopascal	kPa	x 0.145 =	pounds per square inch	psi
Pressure	megapascal	MPa	x 145.038 =	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	x 14.5038 =	pounds per square inch	psi
Torque	Newton meter	Nm	x 0.7376 =	pound feet or foot pounds	lbf·ft
Torque	Newton meter	Nm	x 8.8507 =	pound inches or inch pounds	lbf·in
Temperature	degrees Celsius	°C	(°C x 1.8) + 32 =	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
Velocity	meters per second	m/s	x 3.2808 =	feet per second	ft/s
Velocity	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liter	L	x 0.2642 =	US gallon	US gal
Volume	milliliter	mL	x 0.0338 =	ounce	oz.
Volume	cubic centimeter	cm^3 or cc	x 0.061 =	cubic inch	$in.^3$
Weight	kilogram	kg	x 2.2046 =	pound	lb.

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Recommended Fluids and Lubricants

Ensure your machine operates at top efficiency by using clean fluids and lubricants only.

- Use clean containers to handle all fluids and lubricants.
- Store fluids and lubricants in an area protected from dust, moisture, and other contaminants.

Table: Recommended Fluids and Lubricants

Lubricant	Specification	Description	Use	Capacities
Grease	SAE multi-purpose	High temperature extreme pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
		High temperature extreme pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
Gear Lubricant	SAE 85W-140	API service class GL-5	Knife drive box	1.5 liters (1.3 quarts)
			Main gearbox	2.75 liters (2.9 quarts)
			Completion gearbox	2.25 liters (2.4 quarts)
Hydraulic Oil	Single grade trans-hydraulic oil. Viscosity at 60.1 cSt @ 40° C (104° F)Viscosity at 9.5 cSt @ 100° C (212° F) Recommended brands: • Petro-Canada Duratran • John Deere Hy-Gard J20C • Case Hy-Tran Ultraction • AGCO Power Fluid 821 XL	Lubricant trans / hydraulic oil	Header drive systems reservoir	95 liters (25.1 US gallons)

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