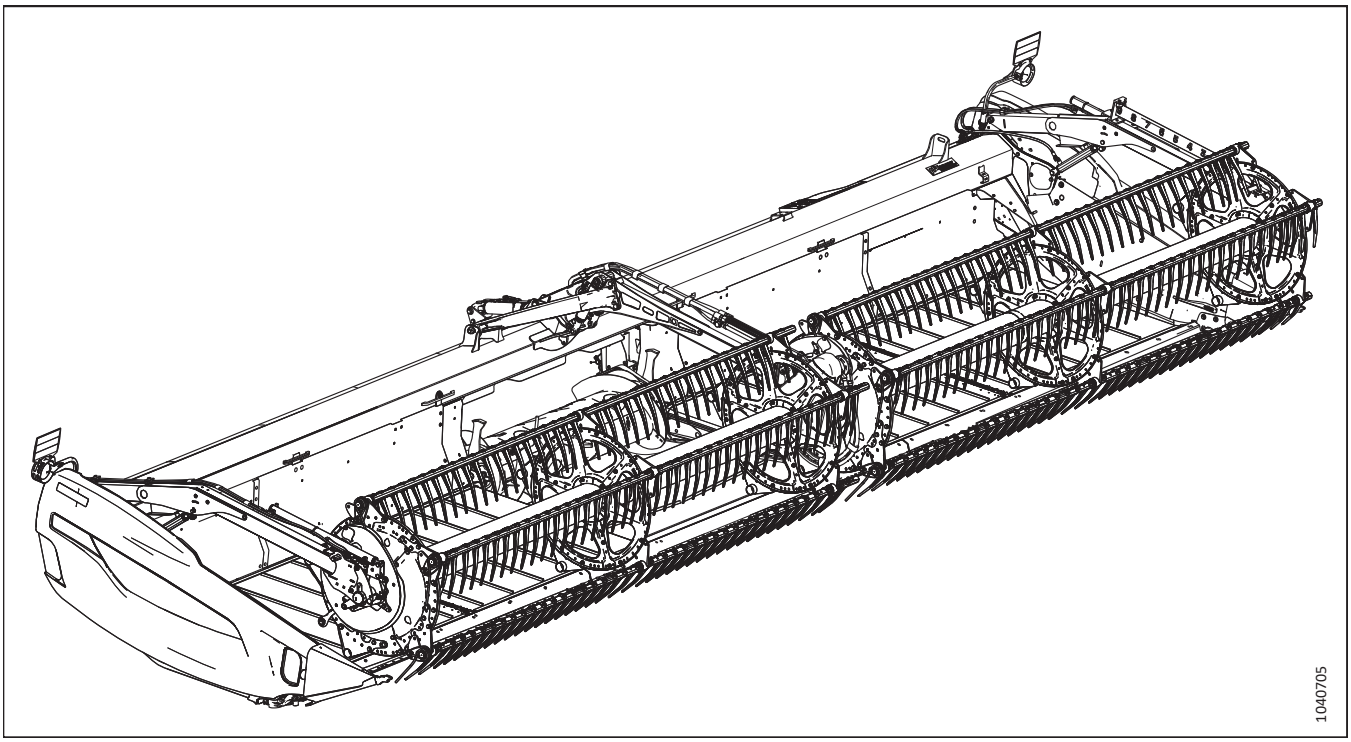
D2 Series
Draper Header with FM200 Float Module

Operator's Manual

MAC215990 Revision A

Original Instruction

D2 Series Draper Header



Published: February 2023

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 D2 Series

[4] As per Shipping Document

[5] February 10, 2023

[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] June 29, 2022

[6] _____
Christoph Martens
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

UK Declaration of Conformity

[1] MacDon

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

[2] Combine Header

[3] MacDon D2 Series

[4] As per Shipping Document

[5] February 10, 2023

[6] _____
Adrienne Tankeu
Product Integrity

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfills all relevant provisions of the Supply of Machinery (Safety) Regulations 2008

Designated standards used are :

EN ISO 4254-1:2015
EN ISO 4254-7:2017

Place and date of declaration: [5]

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

UK 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] June 29, 2022

[6] _____
Christoph Martens
Product Integrity

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

fulfills all relevant provisions of the Supply of Machinery (Safety) Regulations 2008

Designated standards used are :

EN ISO 4254-1:2015
EN ISO 4254-7:2017

Place and date of declaration: [5]

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

Introduction

This instructional manual contains information on the D2 Series Draper Header and the FM200 Float Module. It must be used in conjunction with your combine operator's manual.

Your machine

The D2 Series Draper Header is specially designed as a straight cut header and is equipped to work well in all straight cut conditions—whether cutting on or above the ground.

The FM200 Float Module is used to attach a D2 Series Draper Header to a combine.

Your warranty

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

Your manual

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.

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 479*.

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.

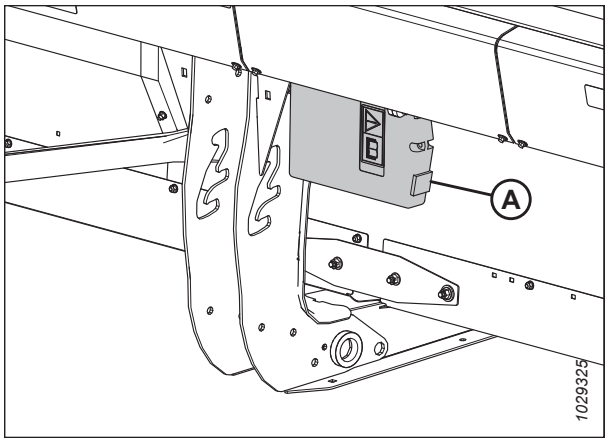


Figure 1: Manual Storage Location

Recording 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.

D2 Series Draper 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.

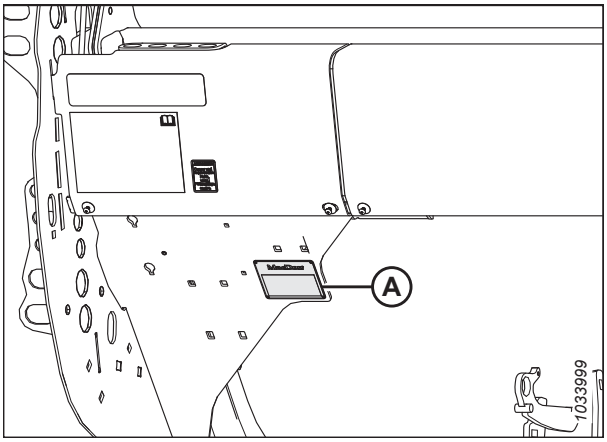


Figure 2: Header Serial Number Plate Location

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.

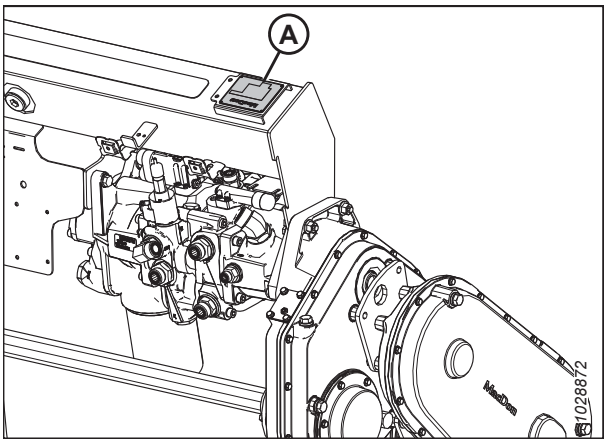


Figure 3: Float Module Serial Number Plate Location

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.

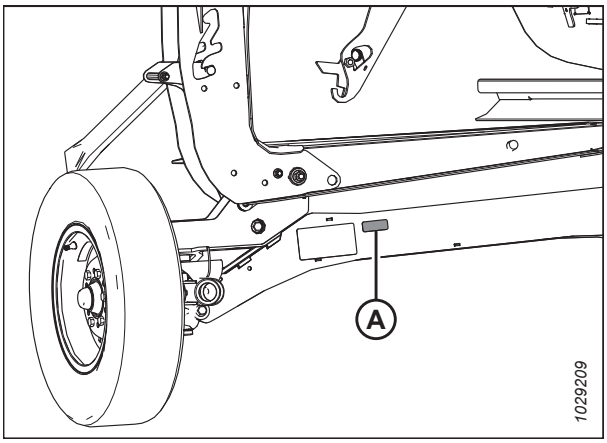


Figure 4: EasyMove™ Transport Option

Chapter 1: Safety

Understanding and 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 it is not prevented, will result in death or serious injury.

WARNING

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

CAUTION

Indicates a potentially hazardous situation that, if it is not prevented, may result in minor or moderate injury. It may also be used to alert you to unsafe practices.

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Operating, servicing, and assembling machinery presents several safety risks. These risks can be reduced or eliminated by following the relevant safety procedures and wearing the appropriate personal protective equipment.

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

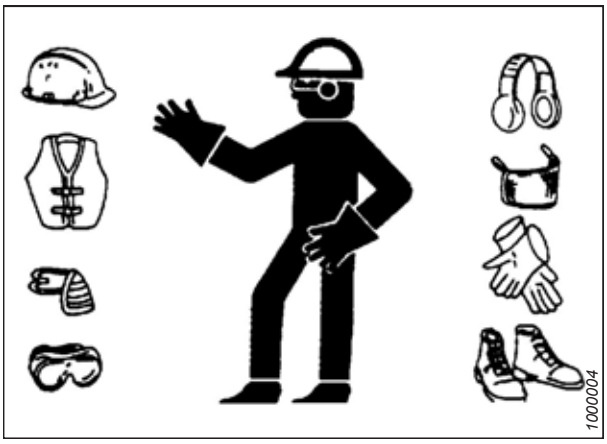


Figure 1.2: Safety Equipment

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.

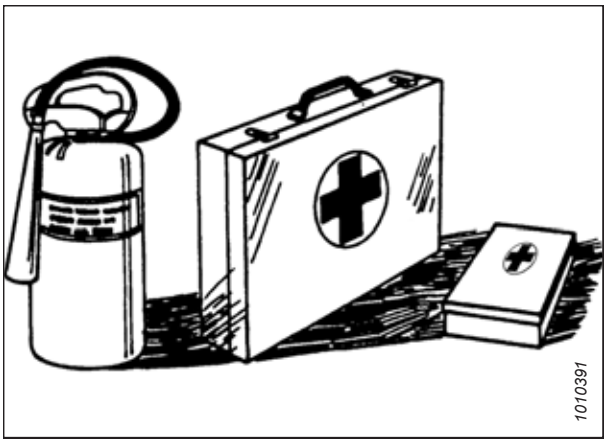


Figure 1.4: Safety Equipment

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as hoodies, 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.

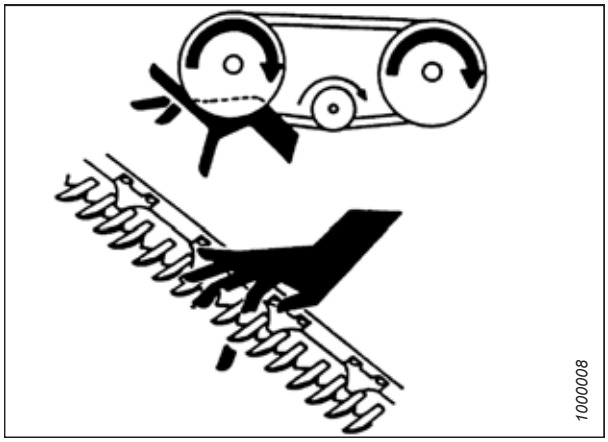


Figure 1.6: Safety around Equipment

- 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

Maintaining your equipment safely requires that you follow the relevant safety procedures and wear the appropriate personal protective equipment for the task.

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: Wet Floors Present Safety Risks

- 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.

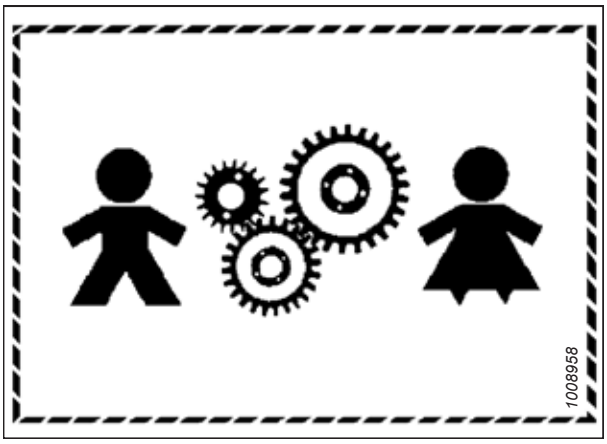


Figure 1.9: Equipment is NOT Safe for Children

- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

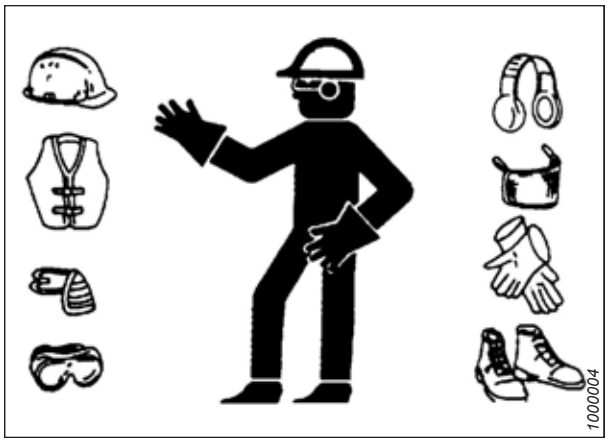


Figure 1.10: Personal Protective Equipment

1.5 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. The proper safety procedures must be followed when inspecting for hydraulic fluid leaks and servicing hydraulic equipment.

- Always place all hydraulic controls in Neutral before leaving the operator's seat.
- Ensure that all the 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.

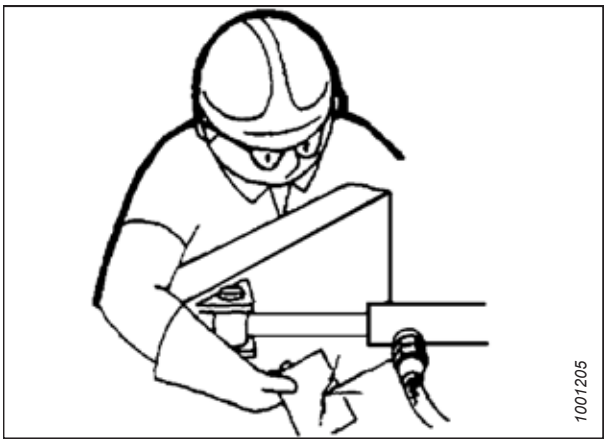


Figure 1.11: Testing for Hydraulic Leaks

- 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.

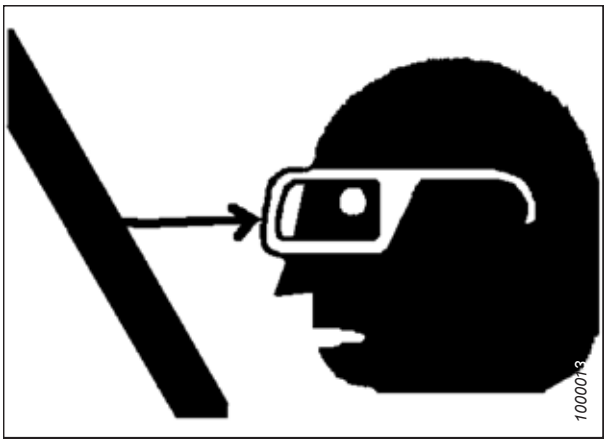


Figure 1.13: Safety around Equipment

1.6 Tire Safety

Inflating, installing, removing, and handling tires presents several safety risks that must be taken into account.

WARNING

- **A tire can explode during inflation, causing serious injury or death.**
- **Follow the proper procedures when mounting a tire. Failure to do so can produce an explosion, causing serious injury or death.**

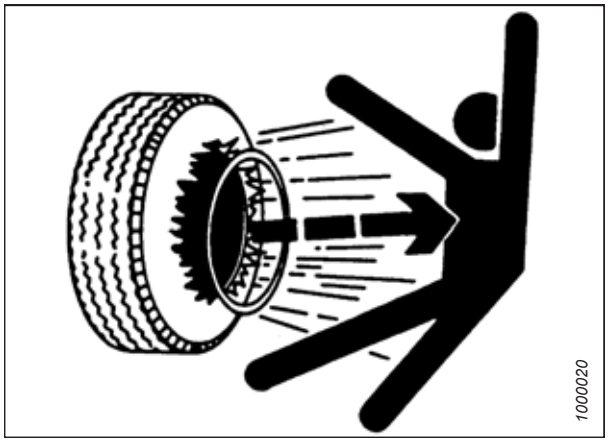


Figure 1.14: Overinflated Tire

WARNING

- **Do NOT remove, install, or repair a tire on a rim unless you have the proper equipment and experience to perform the task. Take the tire and rim to a qualified tire repair shop if necessary.**
- **Ensure that the tire is correctly seated on the rim before inflating it. 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.**
- **Do NOT stand over the tire when inflating it. Use a clip-on chuck and extension hose when inflating a tire.**
- **Do NOT exceed the maximum inflation pressure indicated on the tire label.**

Figure 1.15: Safely Inflating Tire

- **Never use force on an inflated or partially-inflated tire.**
- **Ensure that all air is removed from the tire before removing the tire from the rim.**
- **Never weld a wheel rim.**
- **Replace tires that have defects. Replace wheel rims that are cracked, worn, or severely rusted.**

1.7 Decommissioning and Disposing of Agricultural Equipment

When agricultural equipment is no longer serviceable and needs to be decommissioned and disposed of, recyclable materials including ferrous and non-ferrous metals, rubber, and plastics; fluids such as lubricants, refrigerants, and fuels; and hazardous materials found in batteries, some light bulbs, and electronic equipment must be handled safely and not introduced into the environment.

Comply with local regulations and authorities.

Products with symbol (A) should **NOT** be disposed of with domestic waste.

Figure 1.16: Symbol for Do NOT Dispose with Domestic Waste

Materials with symbol (B) should be recycled as labelled.

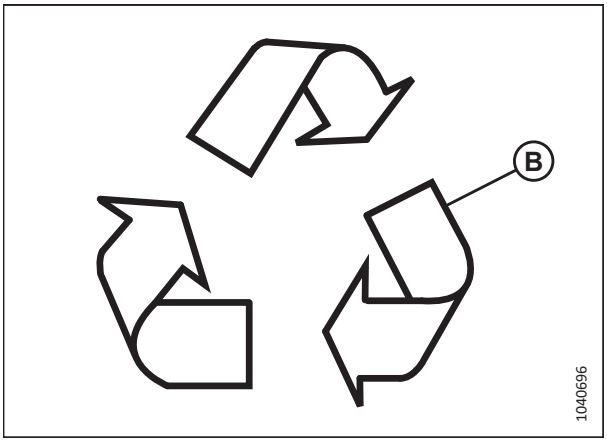


Figure 1.17: Symbol for Recycle as Labelled

- Use appropriate personal protective equipment when removing and handling objects and materials.
- Use appropriate personal protective equipment when handling objects with residue from pesticides, fertilizers, or other agricultural chemicals. Follow local regulations when handling and disposing of these objects.
- Safely release stored energy from suspension components, springs, hydraulic, and electrical systems.
- Recycle or reuse packaging material.
- Recycle or reuse plastics that are labelled with specifications for a material such as PP TV 20. Do **NOT** dispose of them with domestic waste.
- Return batteries to the vendor or take them to a collection point. Batteries contain hazardous substances. Do **NOT** dispose of batteries with domestic waste.
- Follow local regulations to correctly dispose of hazardous materials such as oils, hydraulic fluids, brake fluids, and fuels.
- Take refrigerants to qualified people at specialized facilities for disposal. Refrigerants must **NEVER** be released into the atmosphere.

1.8 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 Dealer.

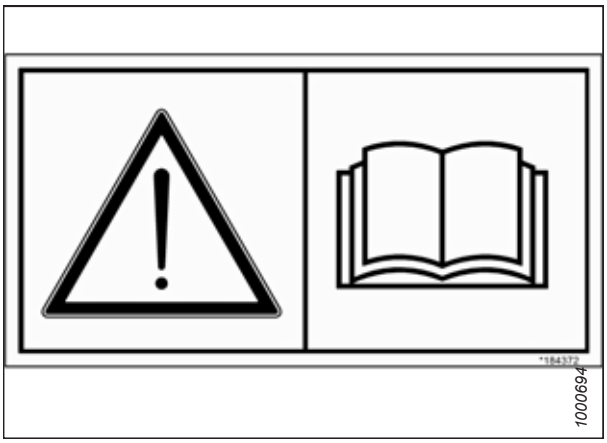


Figure 1.18: Operator's Manual Decal

1.8.1 Installing Safety Decals

Worn or damaged safety decals will need to be removed and replaced.

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.

1.9 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.

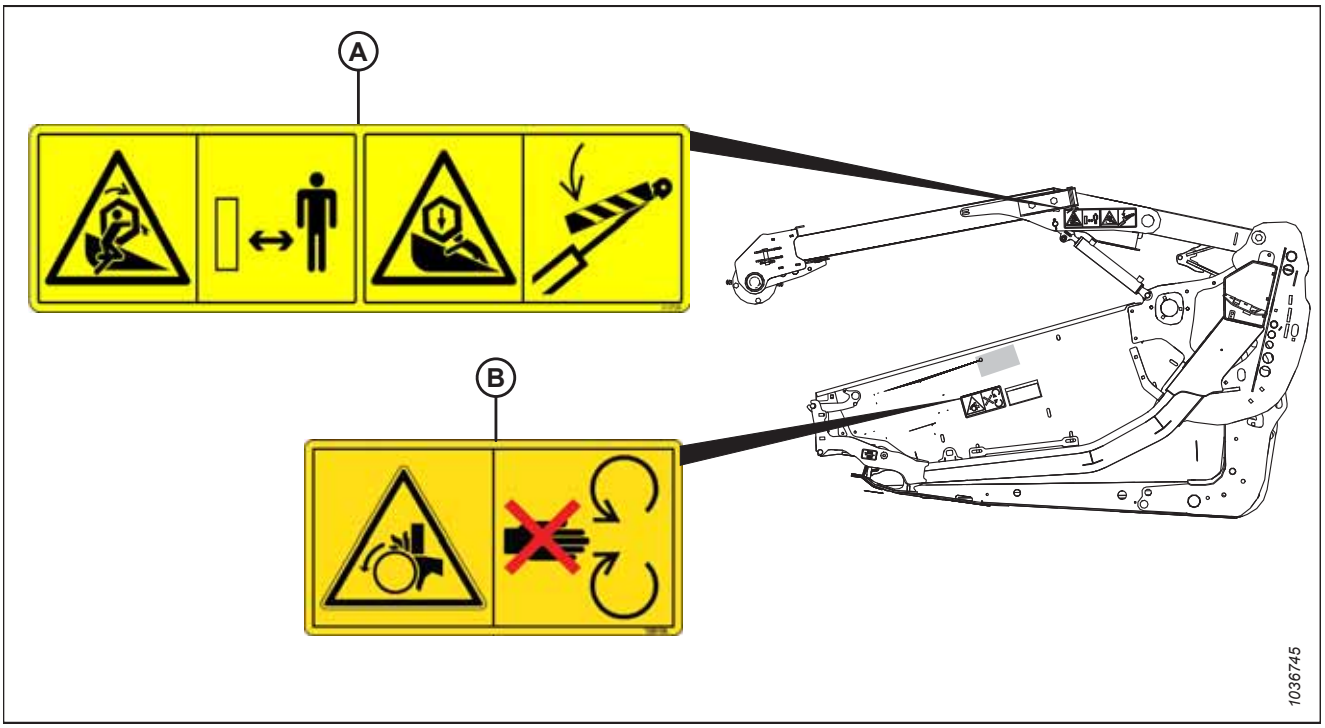


Figure 1.19: Reel Arms and Endsheets

A -MAC360541 – Reel Entanglement/ Hazard (Two Locations)

B - MAC288195 – Danger, Rotating Part (Two Locations)

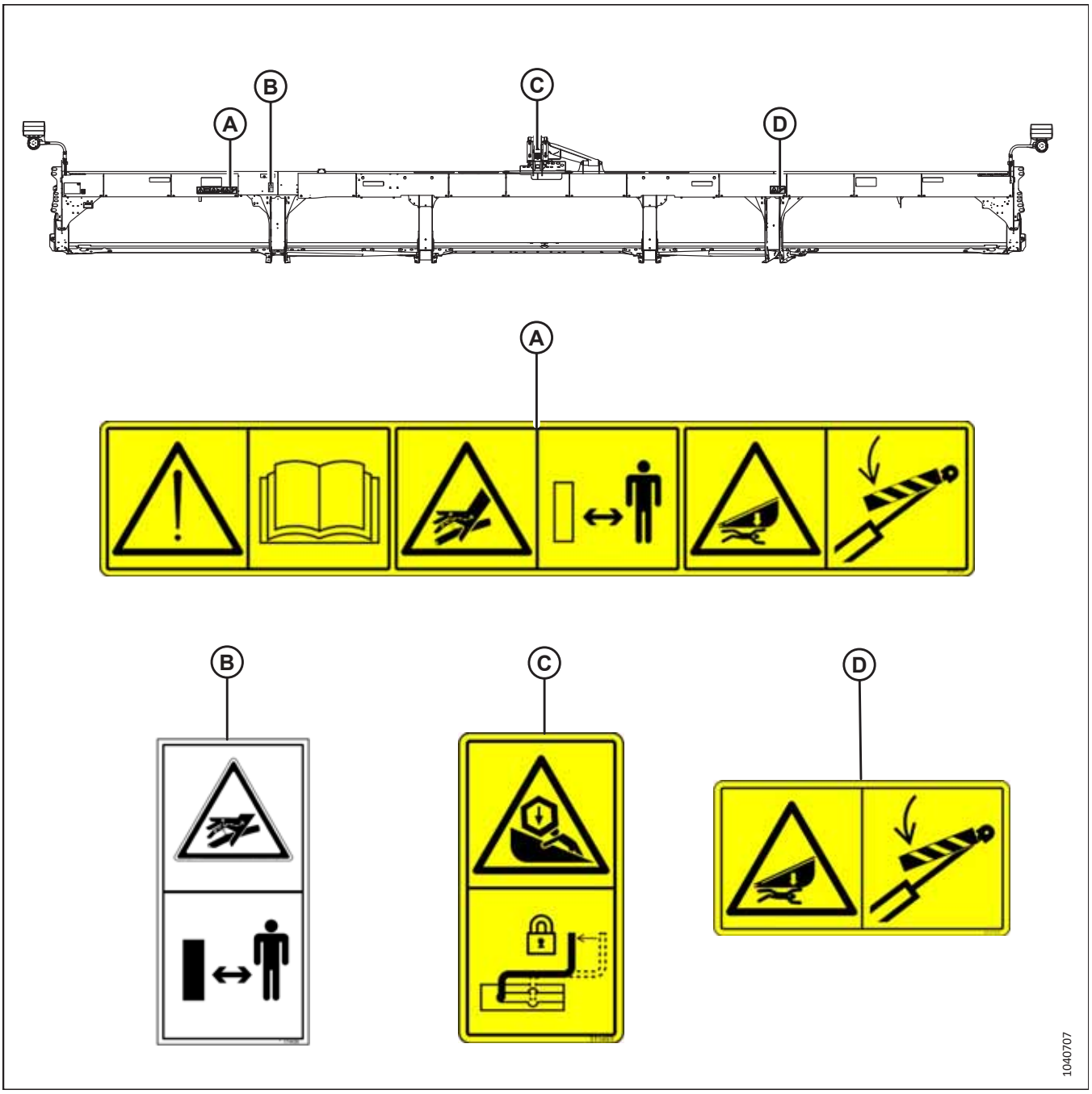


Figure 1.20: Backtube

A - MAC313725 – Read Manual / High Pressure Fluid / Header Hazard
B - MAC174436 – High Pressure Fluid Hazard
C - MAC311493 – Center Prop Lock
D - MAC313733 – Header Crushing Hazard

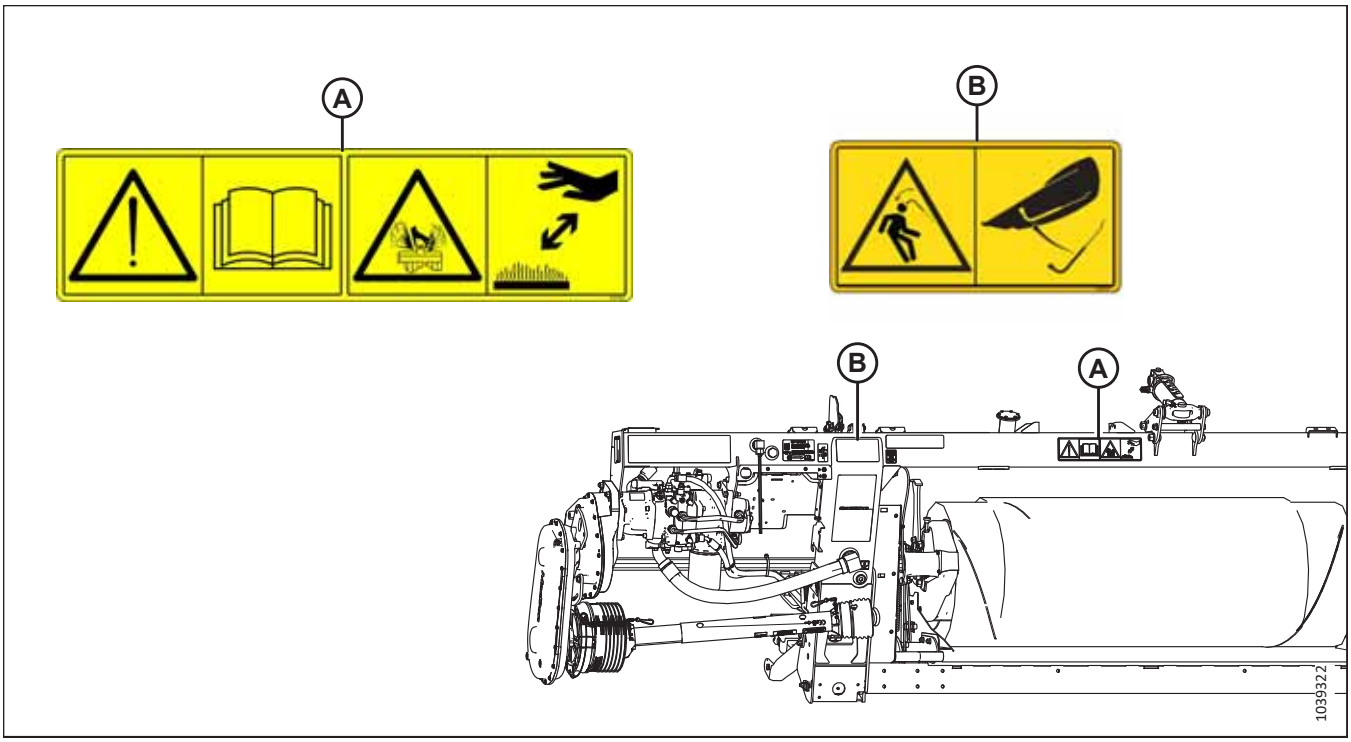


Figure 1.21: FM200 Float Module

A - MAC313728 – Read Manual / Fluid Spray Hazard

B - MAC360655 – Released Spring Energy Hazard

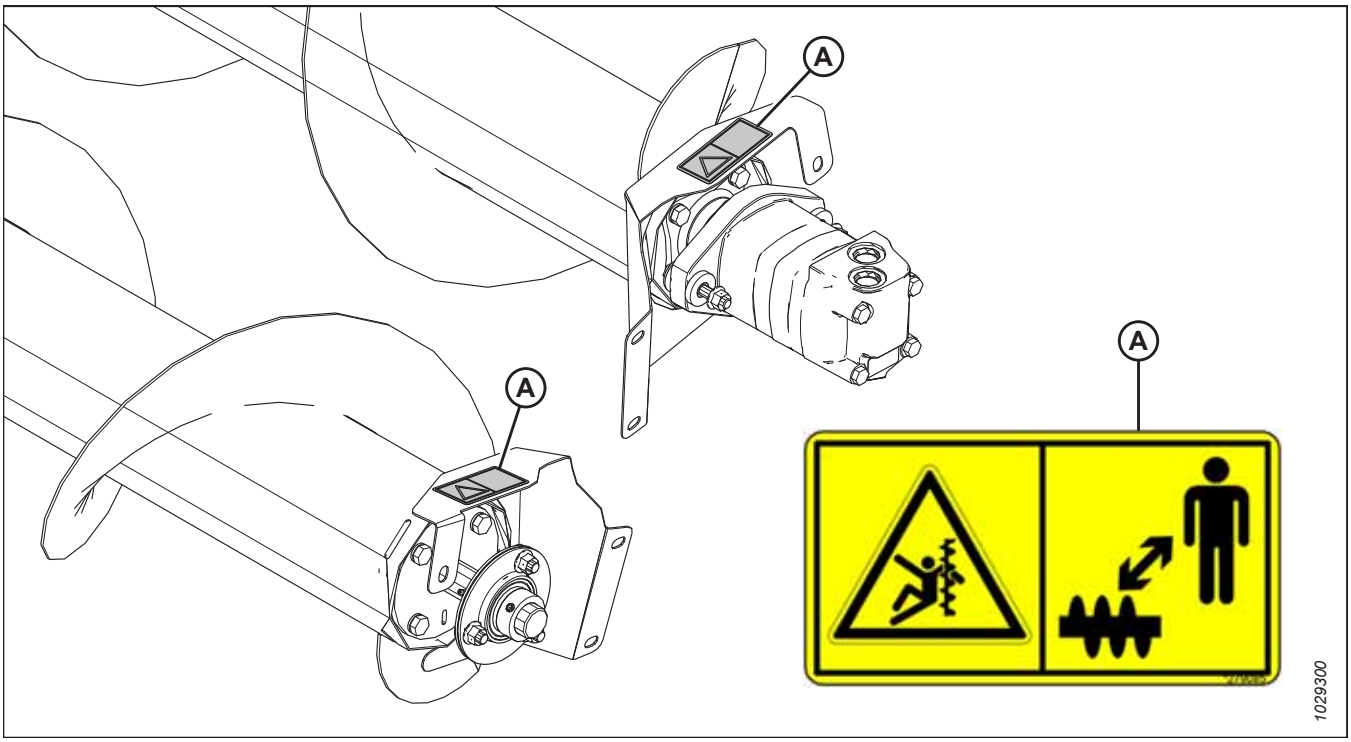


Figure 1.22: Upper Cross Auger

A - MAC279085 – Auger Warning

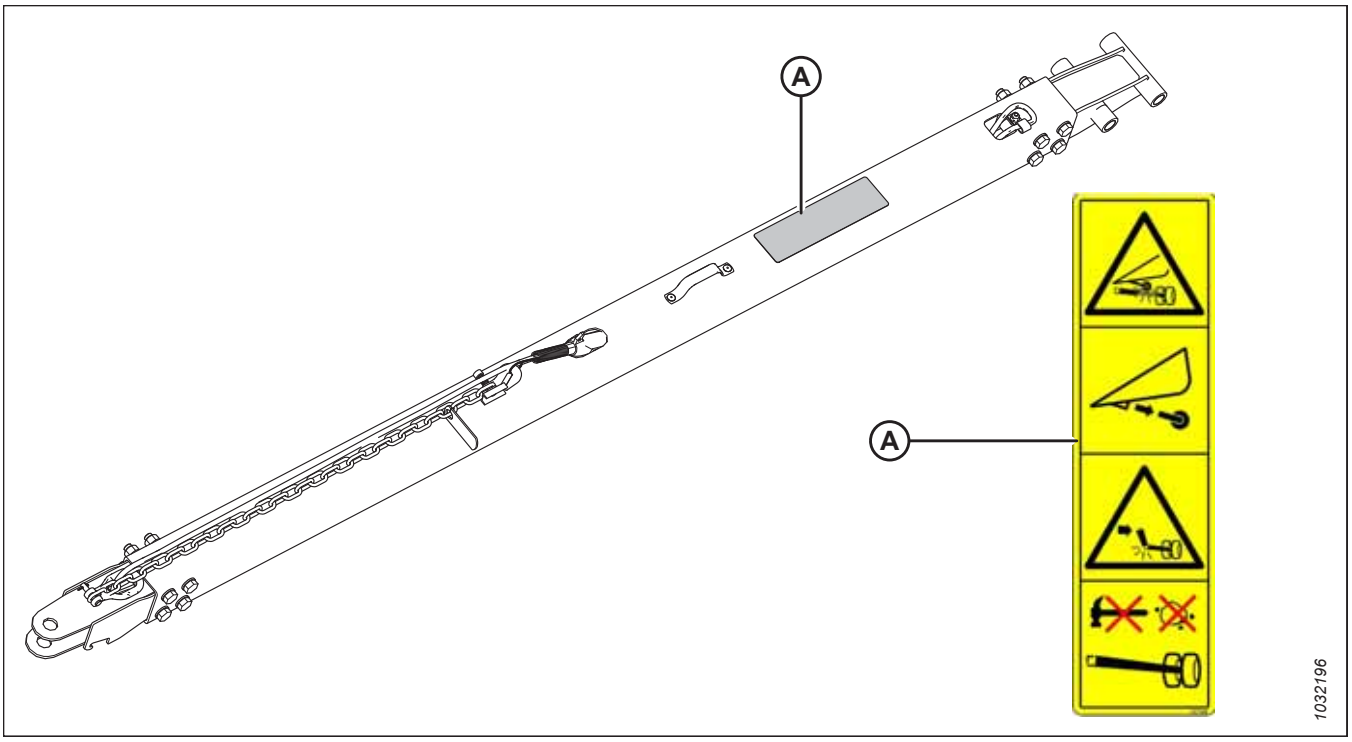


Figure 1.23: EasyMove™ Transport System – Tow-Bar (Short Bar Shown; Long Bar Similar)

A - MAC327588 – Hitch Damage Hazard

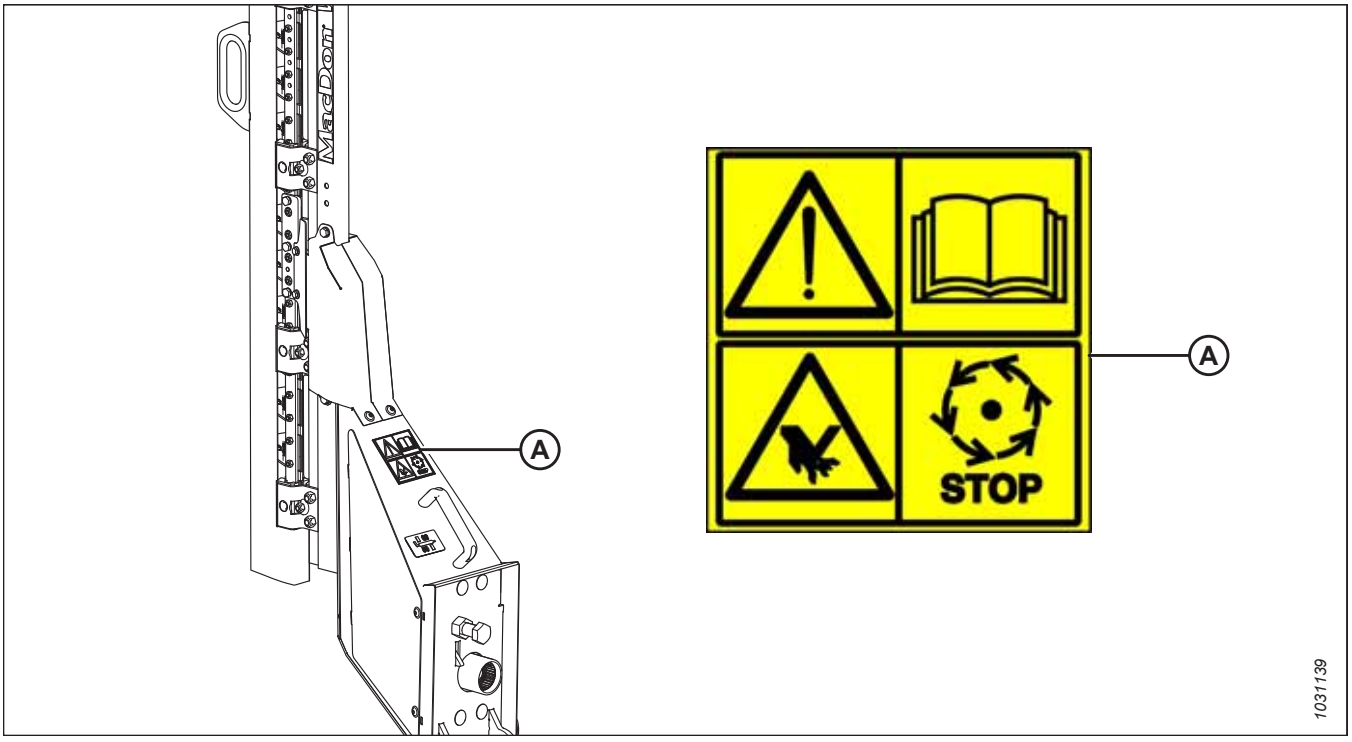


Figure 1.24: Vertical Knife

A - MAC313881 – Knife Hazard

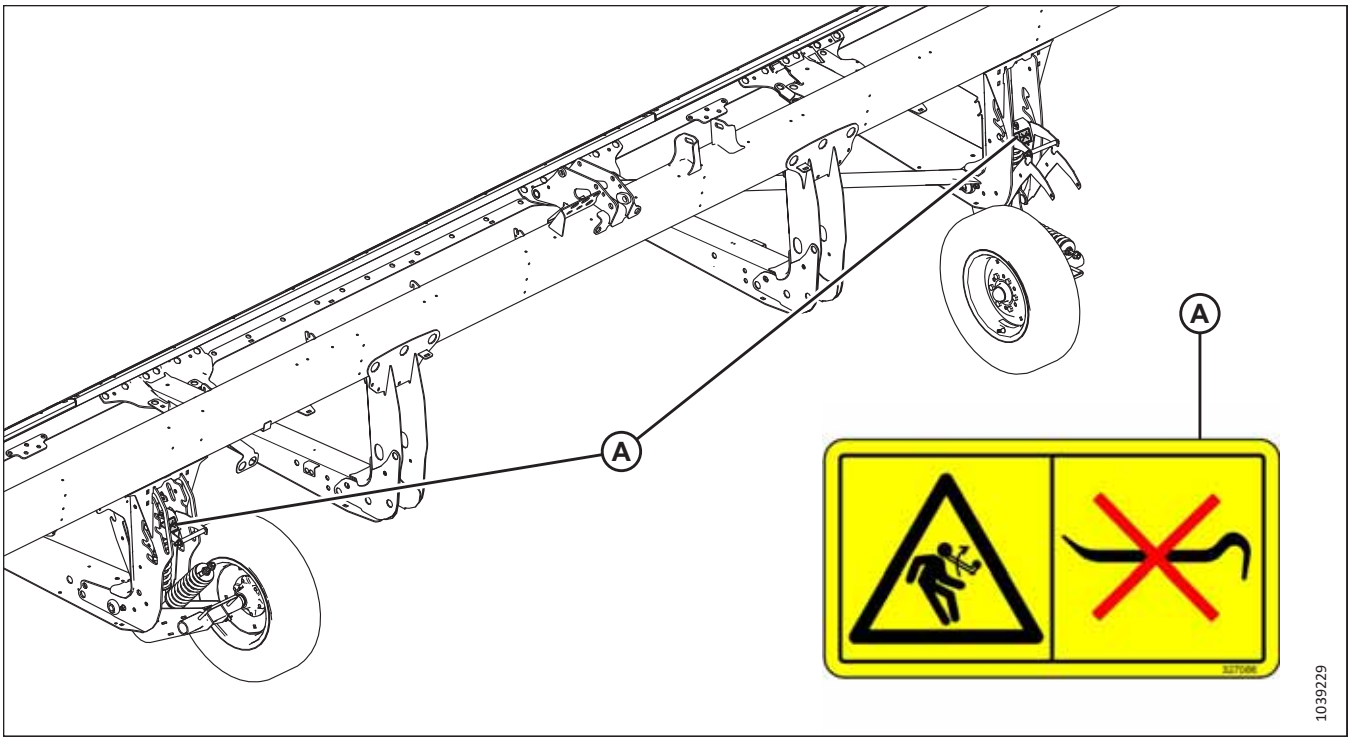


Figure 1.25: Stabilizer Wheels

A - MAC327086 – Released Spring Energy Hazard

1.10 Understanding Safety Signs

Safety sign decals use illustrations to convey important safety or equipment maintenance information.

MAC174436

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 1.26: MAC174436

MAC279085

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 1.27: MAC279085

MAC288195

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.

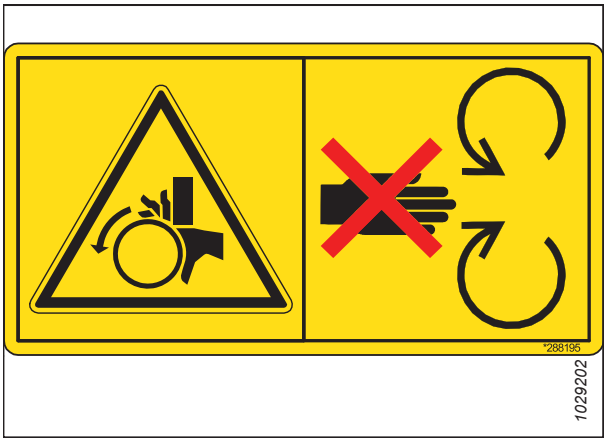


Figure 1.28: MAC288195

MAC311493

Reel crushing hazard

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 1.29: MAC311493

MAC313725

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.

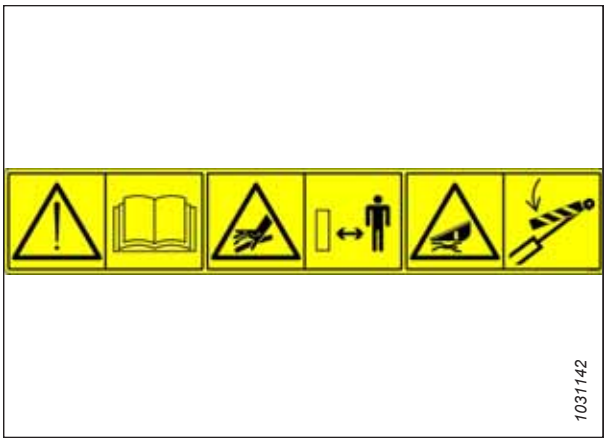


Figure 1.30: MAC313725

MAC313728

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 1.31: MAC313728

MAC313733

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 1.32: MAC313733

MAC313881

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 1.33: MAC313881

MAC327086

Released spring energy hazard

WARNING

To prevent injury:

- When servicing or replacing wheel axle components, the lift-assist spring no longer has counterweight and becomes energized.
- Do **NOT** attempt to pry adjustment handle out of a position slot before releasing tension from the assist springs.

Figure 1.34: MAC327086

MAC327588

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.

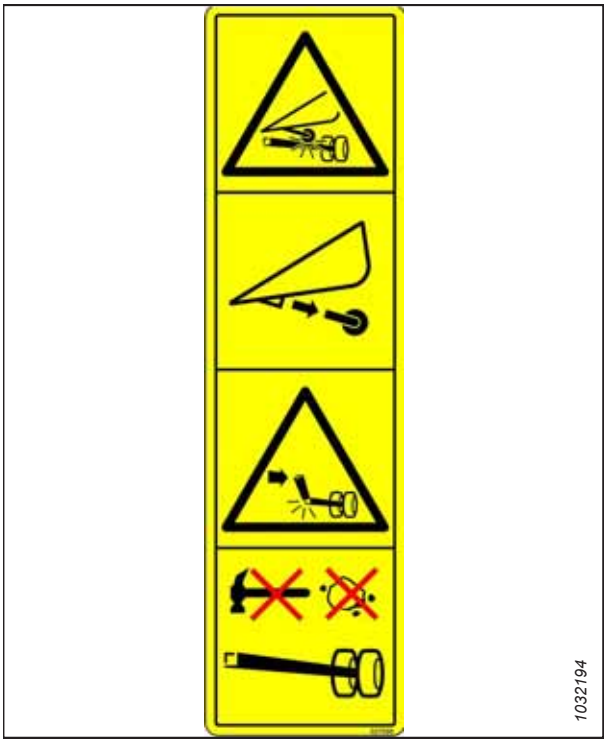


Figure 1.35: MAC327588

MAC360541

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 1.36: MAC360541

MAC360655

Released spring energy hazard

DANGER

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

- After pulling the float setting lever over center, remove the multi-tool and return it to its storage location.
- Do **NOT** use the multi-tool to push the float setting lever over. Return the multi-tool to its storage location.
- Failure to return the multi-tool to its storage location can result in the multi-tool swinging upward and releasing the stored spring energy, which can result in injury.

Figure 1.37: MAC360655

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.

Definitions

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 or manually adjustable turnbuckle type 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
D2 Series Header	MacDon D225, D230, D235, D241, and D245 rigid draper headers for combines
Export header	The header configuration typical outside North America
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 a D2 or FD2 Series 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
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

Definitions (continued)

Term	Definition
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
PTO	Power take-off
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
spm	Strokes per minute
SR	Single reel
SST	Slow speed transport
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
TFFT	Turns from finger tight
Timed knife drive	Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor
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
Untimed knife drive	Unsynchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor or from two hydraulic motors
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 D2 Series Draper Header Specifications

The following symbols and letters are used in specification tables.

D2 | FM200 | Attachments

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

Header Specifications

Cutterbar			
Effective cutting width (distance between crop divider points)			
7.6 m (25 ft.) header		7,658 mm (301.5 in.)	S
9.1 m (30 ft.) header		9,182 mm (361.5 in.)	S
10.7 m (35 ft.) header		10,706 mm (421.5 in.)	S
12.5 m (41 ft.) header		12,535 mm (493.5 in.)	S
13.7 m (45 ft.) header		13,754 mm (541.5 in.)	S
Cutterbar lift range		Varies with combine model	—
Frame and Structure			
Feature	**Reference**	**Dimension**	
Header width (field position)	For the effective cutting width, see the Cutterbar section.	Effective cut width plus 500 mm (19.5 in.)	
Cutterbar width	For the effective cutting width, see the Cutterbar section.	Effective cut width minus 76 mm (3 in.)	
Knife			
Single-knife drive 7.6–10.7 m (25–35 ft.): One hydraulic motor mounted to an enclosed heavy duty knife drive box on the left side of the header.			O_F
Double-knife timed drive 12.5–13.7 m (41 and 45 ft.): Each end of the header has one hydraulic motor mounted to an enclosed heavy duty knife drive box. Each knife is timed electronically using hydraulic valves and position/speed sensors.			O_F
Knife stroke		76 mm (3 in.)	S
Single-knife speed	7.6 m (25 ft.) header	1200–1400 (strokes/min.)	S
Single-knife speed	9.1 m (30 ft.) header	1200–1500 (strokes/min.)	S
Single-knife speed	10.7 m (35 ft.) header	1100–1400 (strokes/min.)	S
Double-knife speed	12.5 m and 13.7 m (41 ft. and 45 ft.) headers	1200–1500 (strokes/min.)	S
Knife Sections			
Over-serrated, ultra coarse, ClearCut™, quick change, 4 serrations per inch			O_F
Over-serrated, coarse, ClearCut™, quick change, bolted, 9 serrations per inch			O_F

Header Specifications (continued)

Over-serrated, fine, ClearCut™, quick change, bolted, 14 serrations per inch			O_F
Knife overlap at center (double-knife headers)		3 mm (1/8 in.)	S
Knife Guards	**Hold-Downs**		
ClearCut™ pointed - forged and double heat treated (DHT)	Forged with single adjustment bolt		
ClearCut™ four point - forged and double heat treated (DHT)	Forged with single adjustment bolt		
ClearCut™ PlugFree™ - forged and double heat treated (DHT)	Forged with dual adjustment bolt		
Guard Angle - Cutterbar on Ground (nominal)			
Center-link retracted	D2 (FM200)	1.7 degrees	S
Center-link extended	D2 (FM200)	8.9 degrees	S
Cutterbar Wearplates and Skid Shoes			
All header sizes	Plastic wear plates across the full width of cutterbar		S
7.6 m (25 ft.) headers	4 plastic skid shoes with steel support structure		S
9.1–13.7 m (30–45 ft.) headers	6 skid shoes with steel support structure		S
Draper (Conveyor) and Decks			
Draper width		1,270 mm (50 in.)	S
Draper drive		Hydraulic	S
Draper speed (FM200 Float Module controlled)		0–209 m/min. (0–687 ft/min.)	S
PR15 Pick-Up Reel			S
Quantity of tine tubes		5, 6, or 9	—
Center tube diameter		203 mm (8 in.)	—
Finger tip radius	Factory assembled	800 mm (31.5 in.)	—
Finger tip radius	Adjustment range	766–800 mm (30.2–31.5 in.)	—
Effective reel diameter (via cam profile)		1650 mm (65 in.)	—
Finger length		290 mm (11 in.)	—
Plastic finger spacing (nominal - staggered on alternate bats)		100 mm (4 in.)	—
Reel drive		Hydraulic	—
Reel speed (adjustable from cab, varies with combine model)		0–13 km/h (0–8 mph) (0–67 rpm)	—

Header Attachments

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	1630 mm (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		75 liters (19.8 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	—

Header Weight

Estimated weight range for base header and shipping stands without float module or performance options. (variances are due to different package configurations)		
7.6 m (25 ft.) header		2120–2163 kg (4672–4768 lb.)
9.1 m (30 ft.) header		2476–2622 kg (5457–5779 lb.)
10.7 m (35 ft.) header		2706–2843 kg (5963–6266 lb.)
12.5 m (41 ft.) header	North America frame	2946 kg (6493 lb.)
12.5 m (41 ft.) header	Export frame	3000–3006 kg (6611–6626 lb.)
13.7 m (45 ft.) header	Export frame	3121–3127 kg (6878–6893 lb.)

2.3 D2 Series Draper Header Dimensions

Know the dimensions of your machinery before operating, transporting, or shipping.

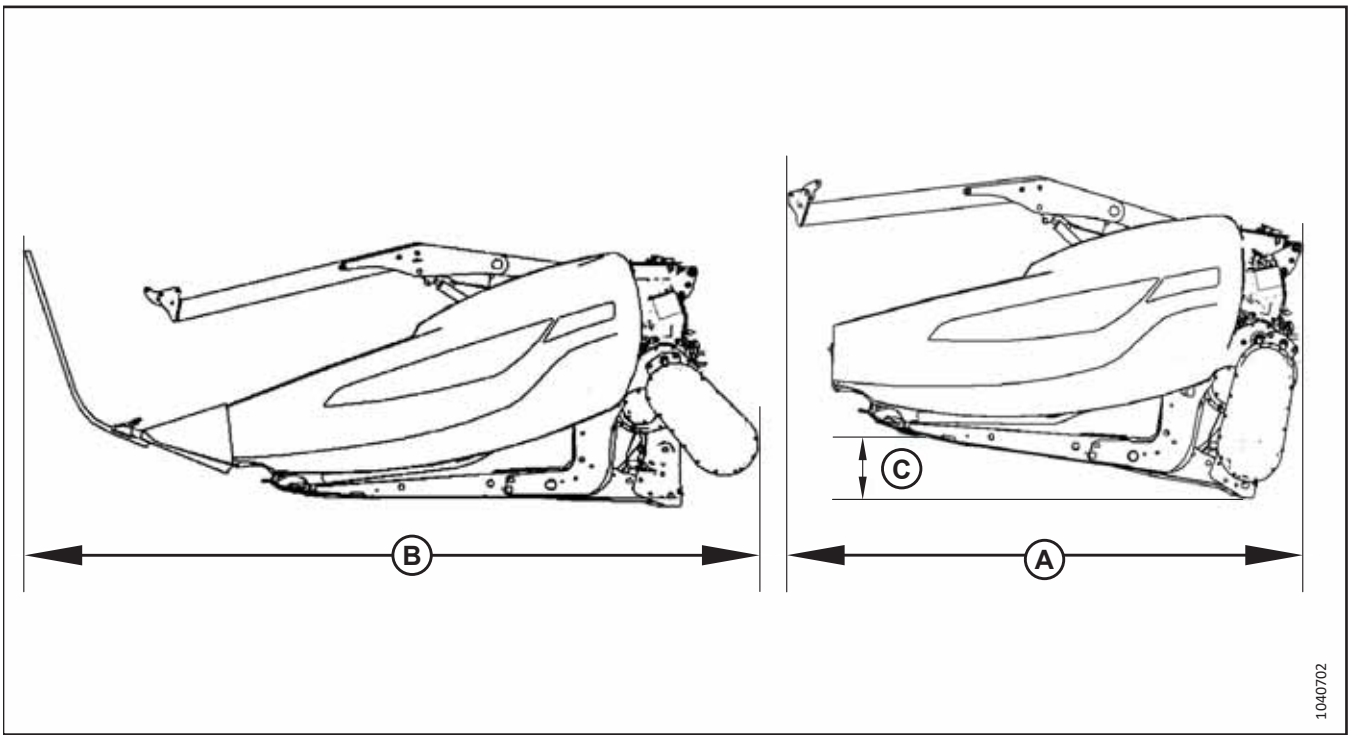


Figure 2.1: Header Dimensions

Header Dimension

Frame and Structure		
Feature	**Reference**	**Dimension**
Header width in transport position with FM200 installed (shortest center-link)	Dimension (A) shows the gearbox rotated (storage) with the crop dividers removed Refer to Figure *2.1, page 30*	2591 mm (102 in.)
Header width in transport position with FM200 installed (shortest center-link)	Dimension (B) shows the gearbox in operating position with standard crop dividers installed Refer to Figure *2.1, page 30*	3505 mm (138 in.)
Header width in transport position with reel fully retracted and FM200 installed (shortest center-link)	Dimension (C) indicates the minimum dimension required to achieve transport width (A) with the gearbox rotated (storage) and the crop dividers removed. Refer to Figure *2.1, page 30* **NOTE:** Dimension (A) can be decreased by using a trailer with a greater (C) dimension	533 mm (21 in.)

2.4 D2 Series Draper Header

Familiarize yourself with the main components of the header to make it easier to follow the operation and maintenance instructions provided.

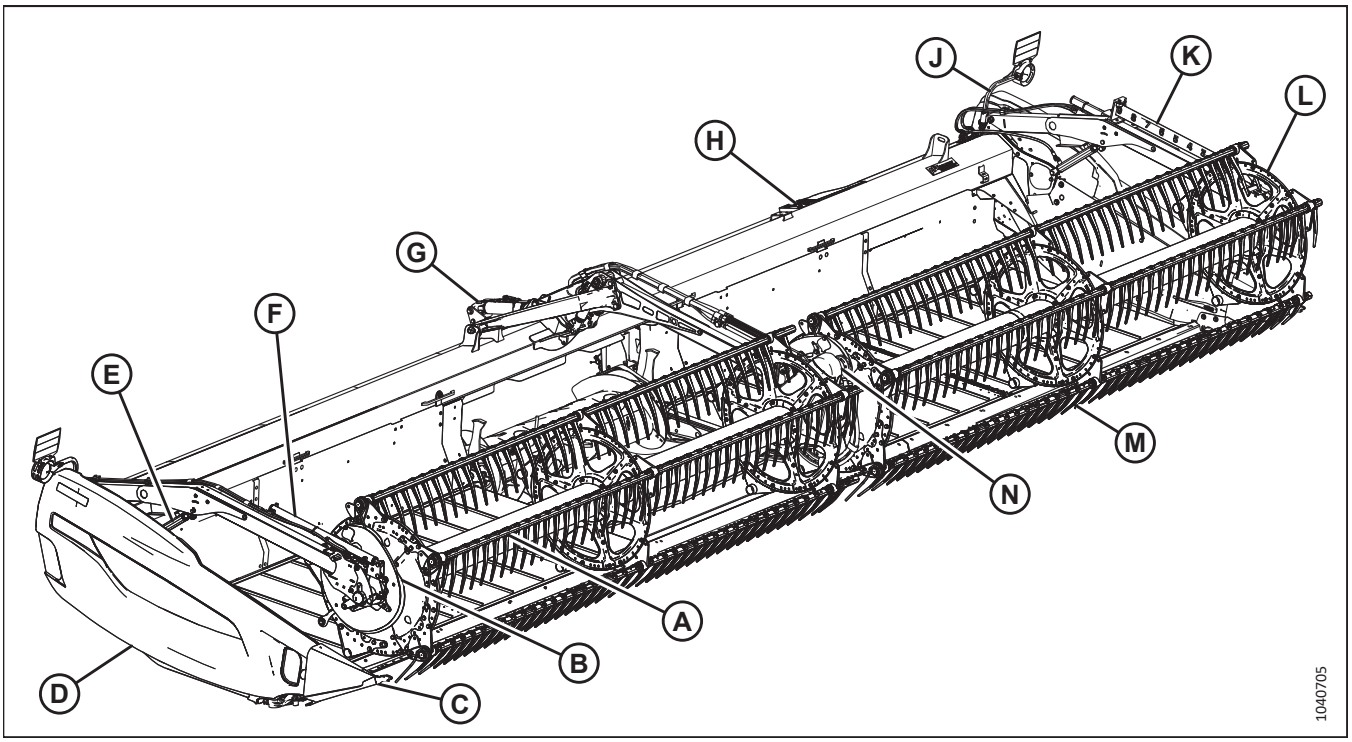


Figure 2.2: D2 Series Draper Header – Double Reel Shown

A - Pick-Up Reel
B - Reel Cam
C - Divider Cone (Divider Rod Not Shown)
D - Endshield
E - Reel Lift Cylinder
F - Reel Fore-Aft Cylinder
G - Center-Link
H - Reel Hydraulics Manifold
J - Transport Light
K - Reel Fore/Aft Position Indicator
L - Reel Endshields
M - Reel Fingers
N - Reel Drive

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.

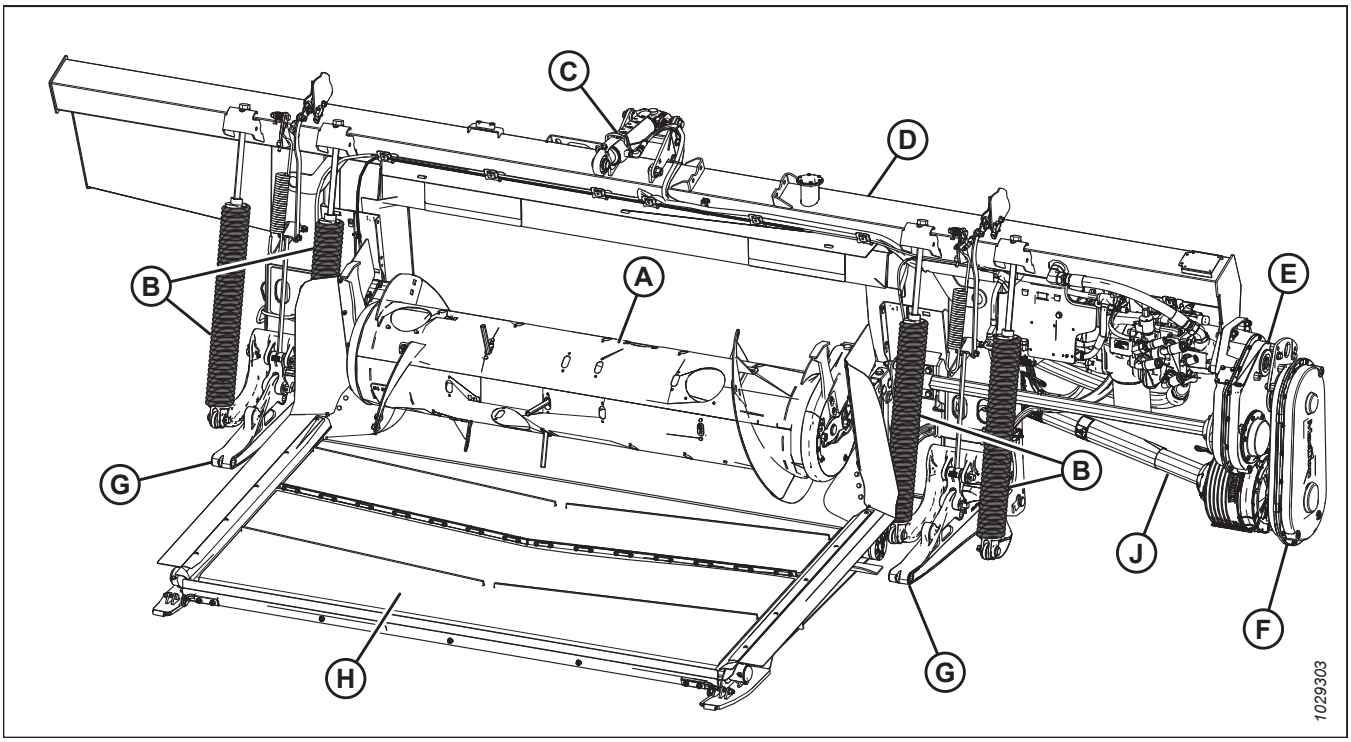


Figure 2.3: Header Side of FM200 Float Module

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

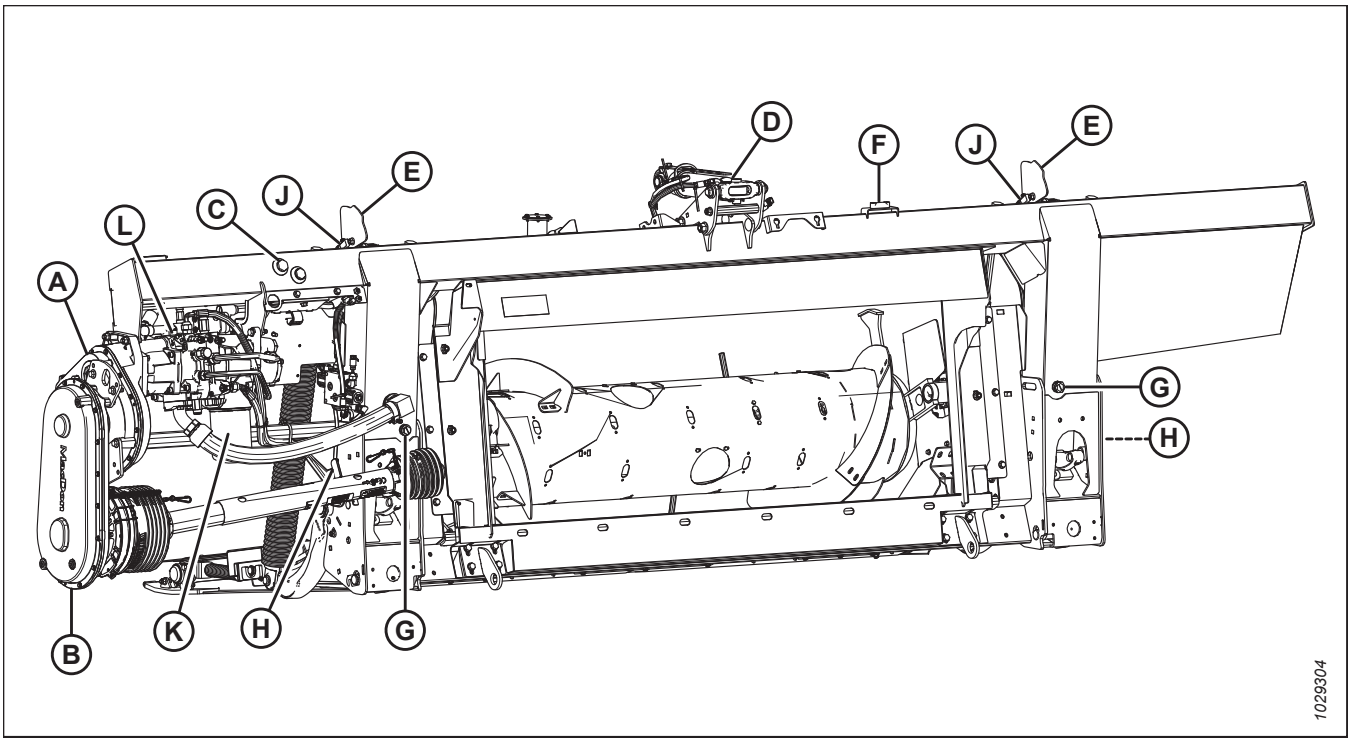


Figure 2.4: Combine Side of FM200 Float Module

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 people 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.**

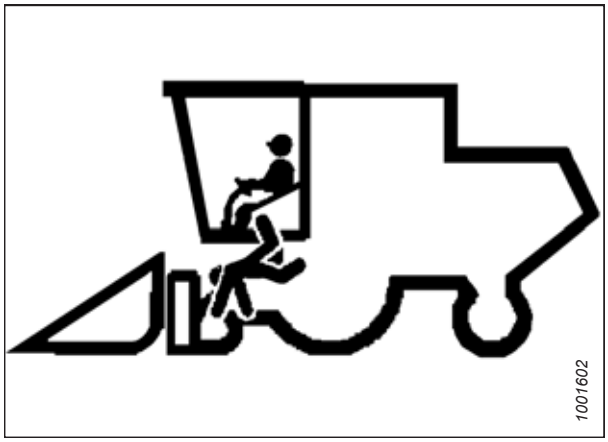


Figure 3.1: No Riders

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 the 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.**

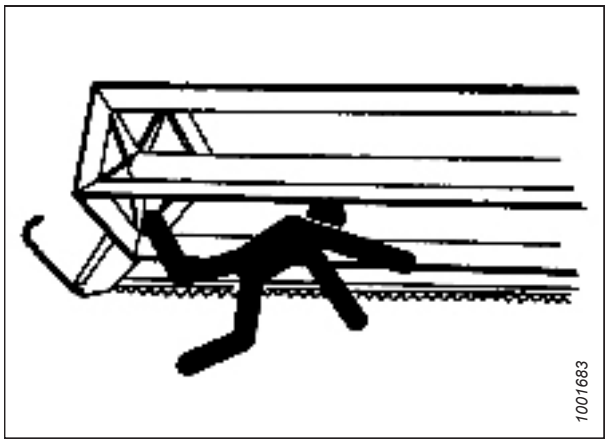


Figure 3.2: Bystander Safety

- **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.**
- **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 53*.**
- **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 arms. When engaged, the reel safety props prevent the reel from falling unexpectedly.

IMPORTANT:

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

Engaging Reel Safety Props

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

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.

Outer reel arms

2. Raise the reel to its maximum height.
3. Lift up on safety prop (A) and push it forward to remove the prop from hook (B).

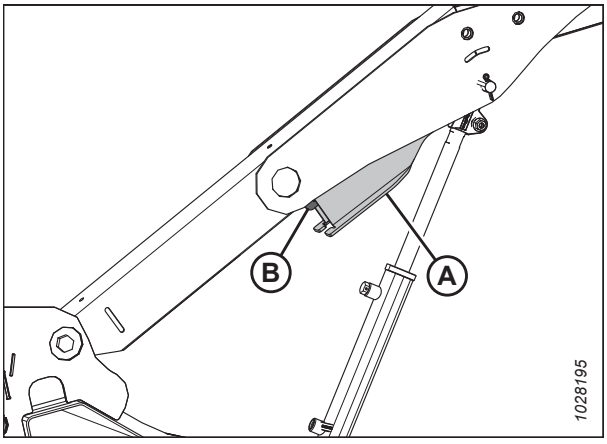


Figure 3.3: Outer Right Arm

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

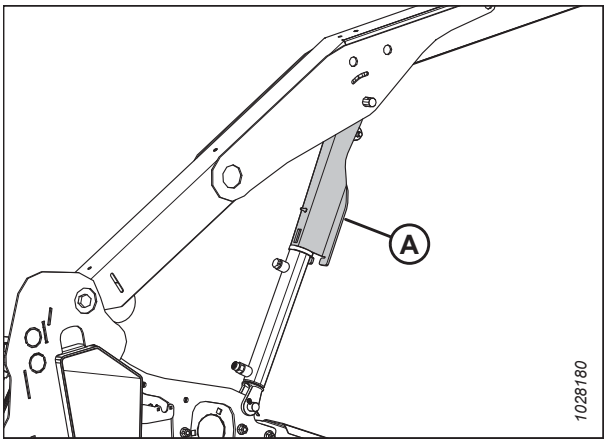


Figure 3.4: Engaged Reel Safety Prop – Outer Right Arm

Center reel arm – double-reel headers

5. Rotate handle (A) to release the spring tension and allow the spring to guide the pin into the locked position.
6. Lower the reel until the safety props contact the outer arm cylinder mounts and the center arm pins.

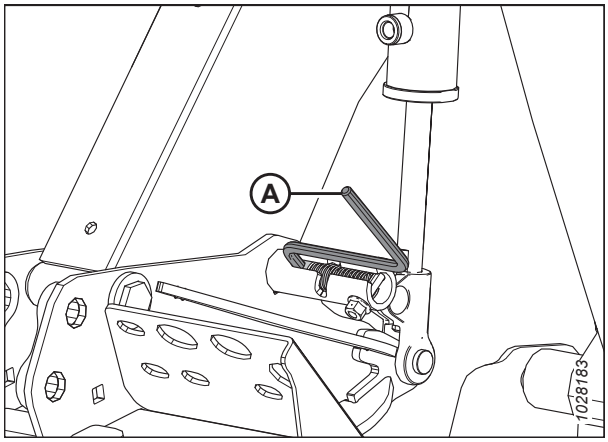


Figure 3.5: Engaged Reel Safety Prop – Center Arm

Disengaging Reel Safety Props

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

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.

Outer reel arms

2. Raise the reel to its maximum height.
3. Move reel safety prop (A) up onto hook (B) under the reel arm. Repeat this step on the opposite reel arm.

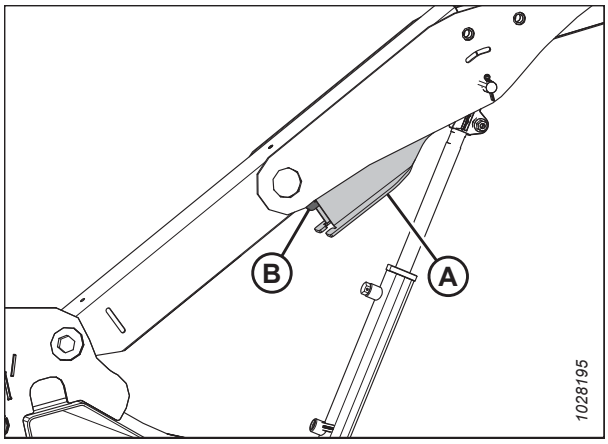


Figure 3.6: Reel Safety Prop – Right Outer Arm

Center reel arm – double-reel headers

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

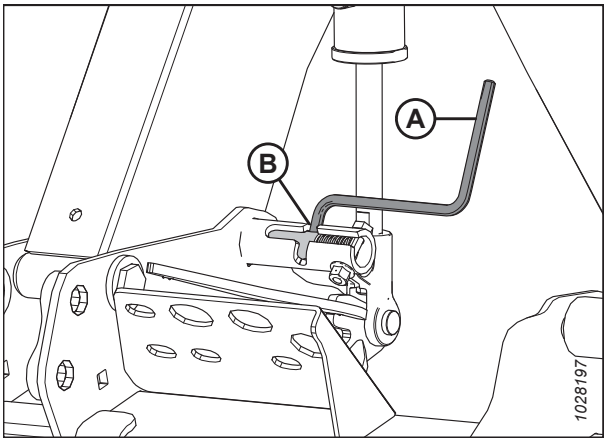


Figure 3.7: Reel Safety Prop – Center Arm

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 covers knife drive components, hydraulic hoses, electrical connections, the header wrench, the spare knife, and the optional transport hitch. 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.

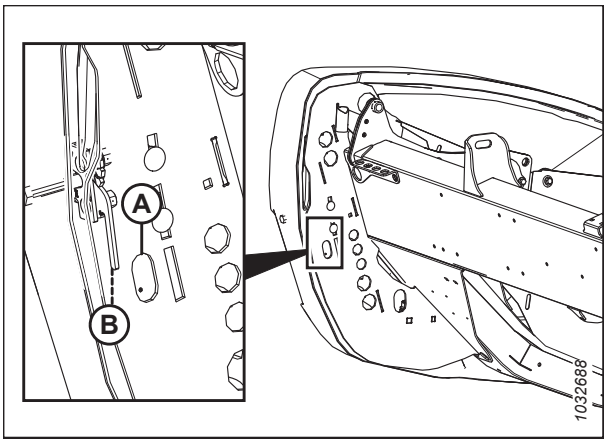


Figure 3.8: Left Header Endshield

2. Pull header endshield (A) open.

   NOTE:

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

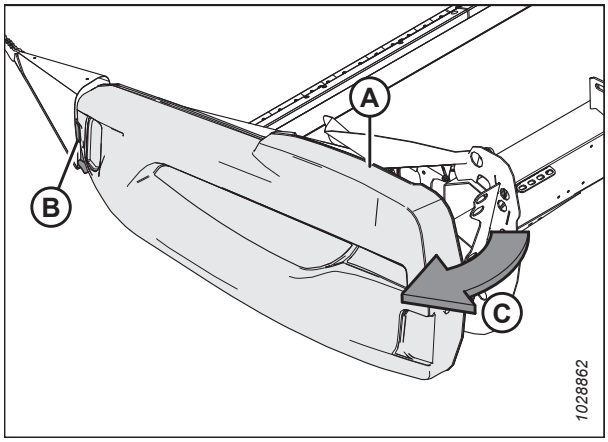


Figure 3.9: Left Header Endshield

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.

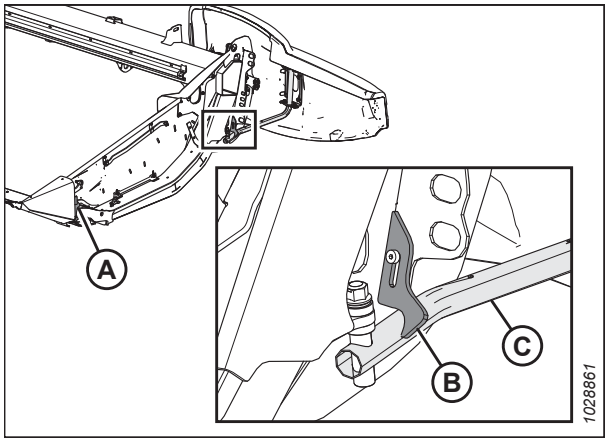


Figure 3.10: Left Header Endshield

Closing Header Endshields

The header endshields covers knife drive components, hydraulic hoses, electrical connections, the header wrench, the spare knife, and the optional transport hitch. 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.

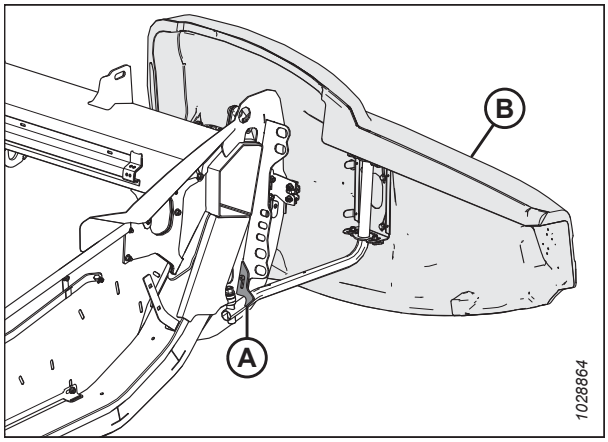


Figure 3.11: Left Header Endshield

3. While closing the endshield, ensure header endshield (A) does not contact the top of endsheet (B). If adjustment is required, refer to *Checking and Adjusting Header Endshields, page 41*.

   IMPORTANT:

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

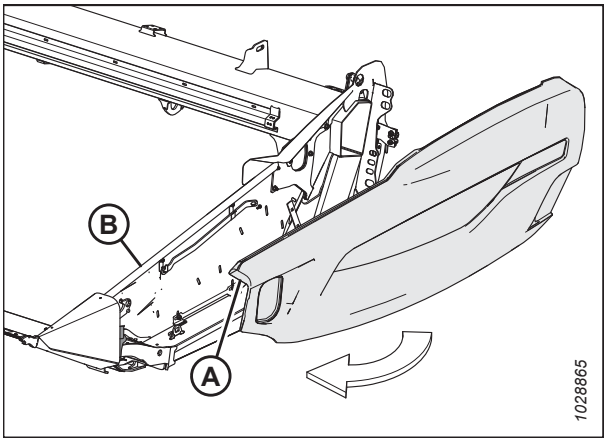


Figure 3.12: Left Header Endshield

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.

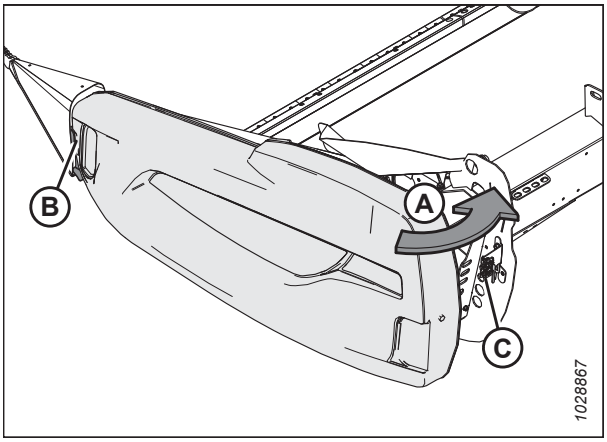


Figure 3.13: Left Header Endshield

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. If adjustment is required, refer to *Checking and Adjusting Header Endshields, page 41*.

NOTE:

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

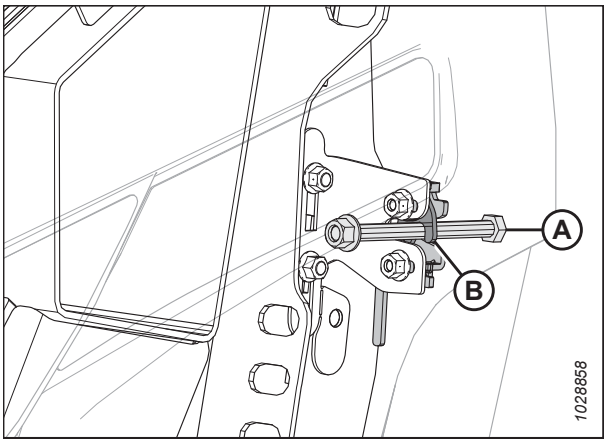


Figure 3.14: Two-Stage Latch

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:

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

1. Measure clearance (A) between header endshield (B) and endsheet (C). The clearance should be 1–3 mm (0.04–0.12 in.).

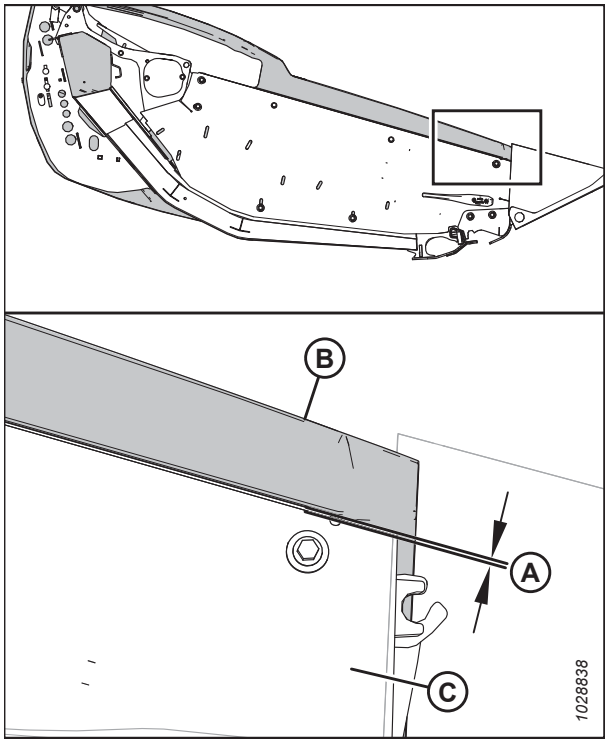


Figure 3.15: Clearance between Header Endshield and Endsheet

2. If the clearance between the header endshield and the endshield is insufficient, adjust support bracket (A) as follows:
   a. Loosen bolts (B).
   b. Move support bracket (A) up or down as needed.
   c. Retighten the hardware.

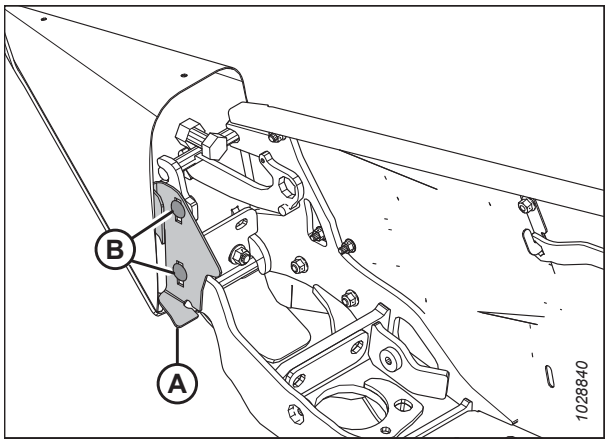


Figure 3.16: Header Endshield Support Bracket

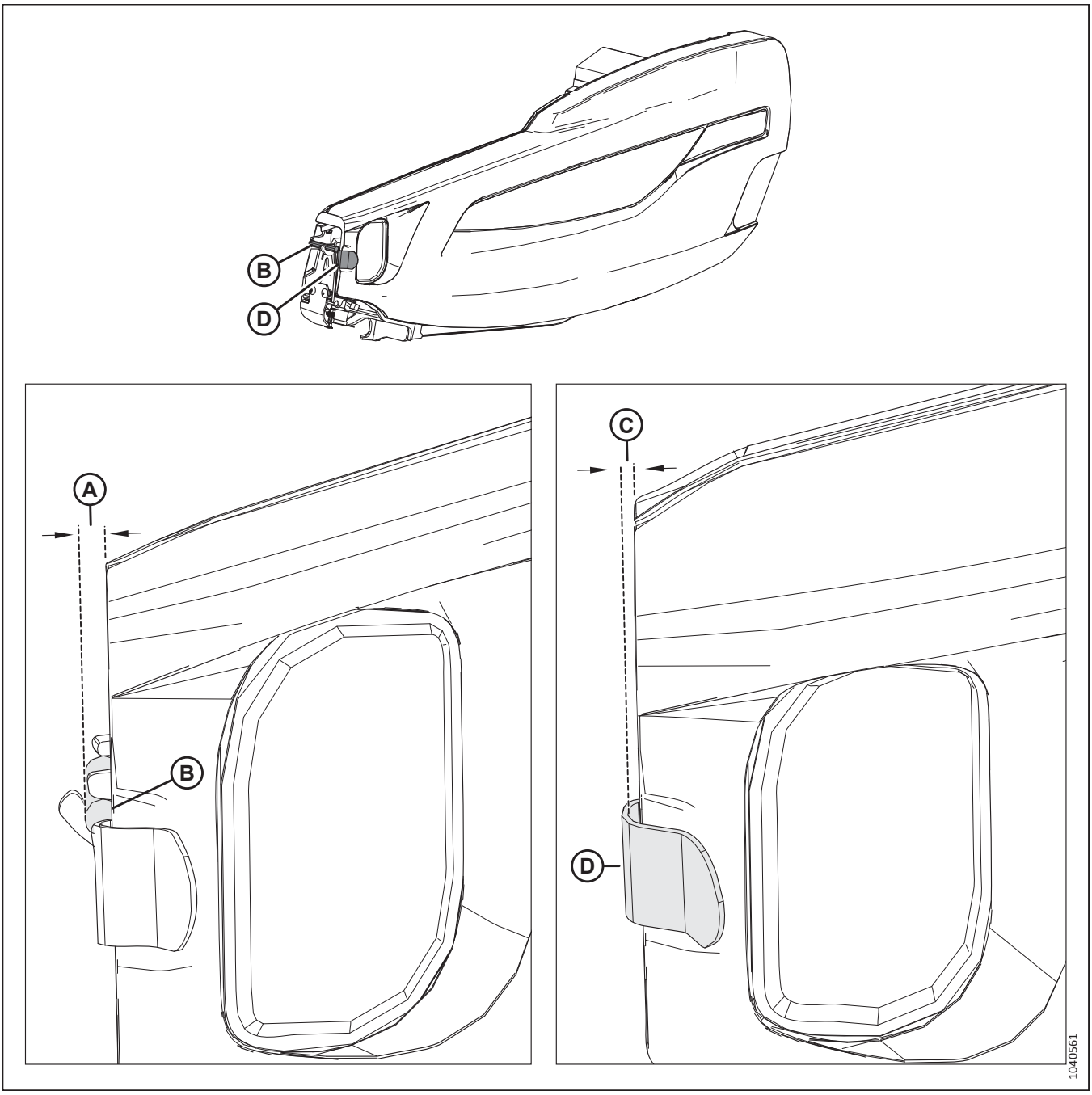


Figure 3.17: Clearance Specifications at the Front of the Endshield

3. Measure clearance (A) between the front of the header endshield and cylindrical weldment (B). The clearance should be 8–18 mm (0.3–0.7 in).

4. Measure clearance (C) between the front of the header endshield and support bracket (D). The clearance should be 6–10 mm (0.24–0.39 in).

5. If the clearances at the front of the endshield are insufficient, 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.

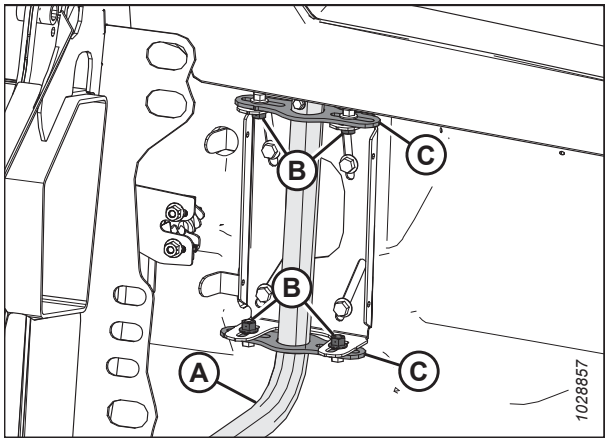


Figure 3.18: Left Header Endshield

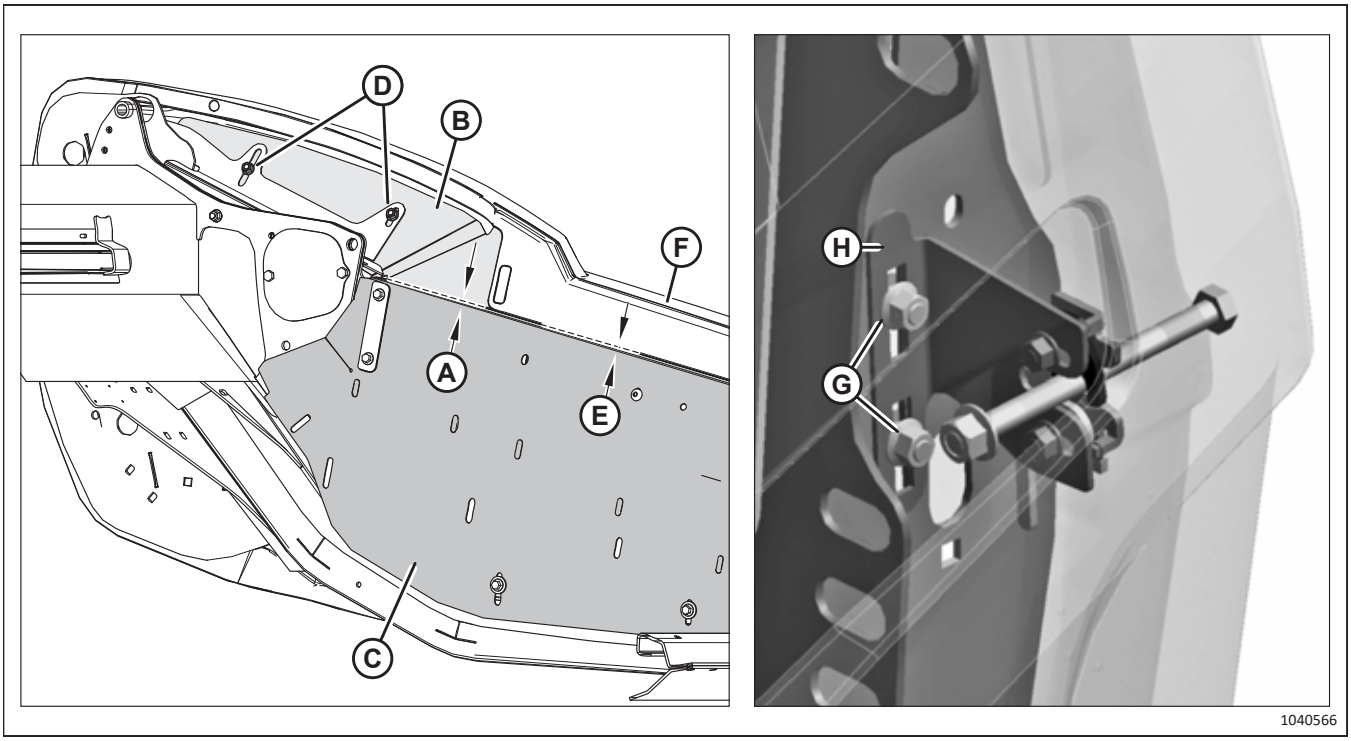


Figure 3.19: Clearance Specification between Neck Shield and Panel

6. Measure clearance (A) between neck shield (B) and panel (C). The clearance must be at least 3 mm (0.12 in.). To adjust the clearance, loosen two nuts (D), move neck panel (B), and tighten nuts (D).

7. Measure clearance (E) between panel (C) and endshield (F). The clearance must be 1–3 mm (0.04–0.12 in.). To adjust the clearance, loosen two nuts (G), slide bracket (H) up or down, and re-tighten the nuts. Make sure the endshield does **NOT** rest on neck panel (B).

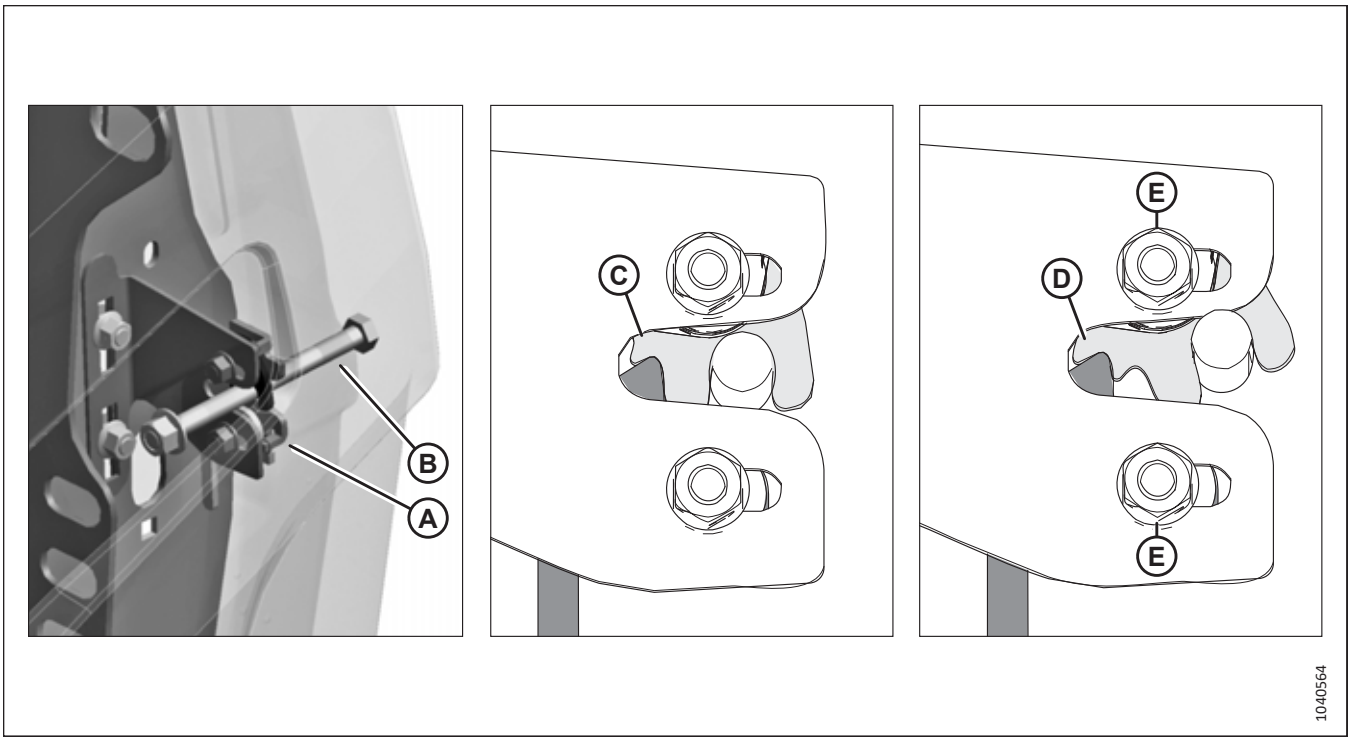


Figure 3.20: Two-Stage Latch

8. When the endshield is closed, two-stage latch (A) must engage first catch (C). This will allow second catch (D) to prevent the endshield from opening completely in case the endshield unlatches by accident. Confirm the endshield latches properly by following Step *9, page 45* to Step *11, page 45*.

9. Close the endshield. Confirm bolt (B) engages latch (A).

10. Release the latch.

11. Try to open the endshield.

    - If you can open the endshield partially, but **NOT** completely, then the latch is positioned properly. No further adjustment is necessary.

    - If you can open the endshield completely, then loosen two nuts (E), move the latch along the slotted holes, and then re-tighten the nuts. Repeat Step *9, page 45* to Step *11, page 45*.

Removing Header Endshields

Remove the endshields when servicing the end shields.

1. Fully open the header endshield. For instructions, refer to *Opening Header Endshields, page 39*.
2. Engage latch (A) to prevent any endshield movement.
3. Remove self-tapping screw (B).
4. Slide the header endshield upwards and remove it from hinge arm (C).
5. Place the header endshield away from the work area.

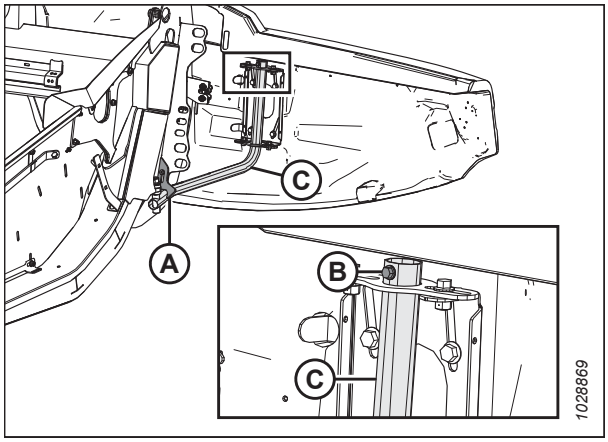


Figure 3.21: Left Header Endshield

Installing Header Endshields

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

IMPORTANT:

Be careful not to rest the endshield on the aluminum endsheet while installing.

1. Guide the header endshield onto hinge arm (C) and slowly slide it downwards.
2. Install self-tapping screw (B).
3. Disengage latch (A) to allow the header endshield movement.
4. Close the header endshield. For instructions, refer to *Closing Header Endshields, page 40*.

   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 41*.

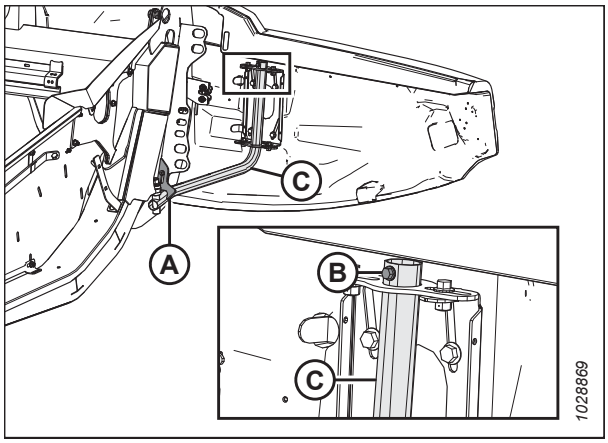


Figure 3.22: Left Header Endshield

3.2.4 Reel Drive Cover

The reel drive cover protects the reel drive components from dirt and debris. Different covers are used on single- and double-reel headers.

Removing Reel Drive Cover

The reel drive cover can be removed to access the reel drive 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.

Single-reel drive:

5. Support reel drive cover (A), and rotate spring latch (B) up and over the back plate.
6. Slide the reel drive cover down to unlatch it from two tabs (C). Remove reel drive cover.

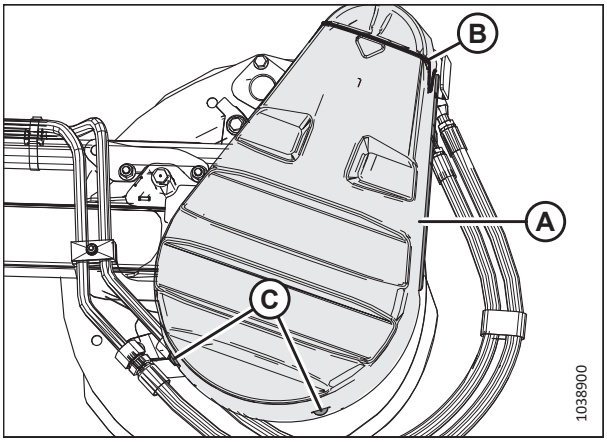


Figure 3.23: Drive Cover

Double-reel drive:

7. Rotate spring latch (A) up and over the back plate.

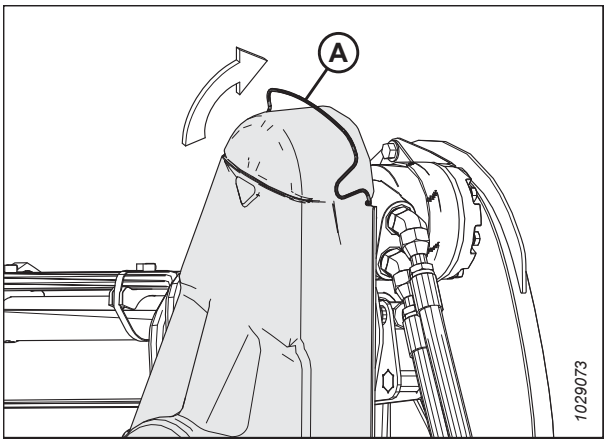


Figure 3.24: Upper Drive Cover

8. 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.

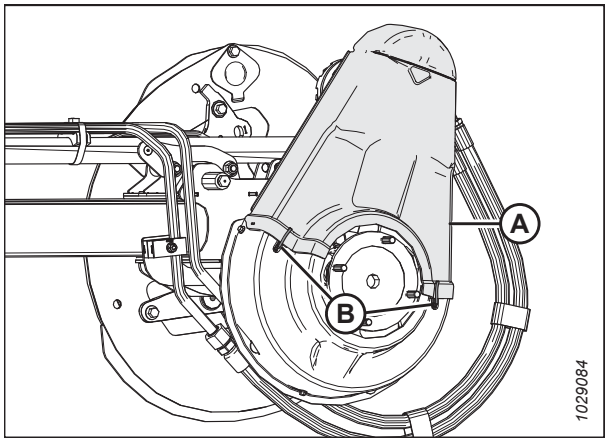


Figure 3.25: Upper Drive Cover

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

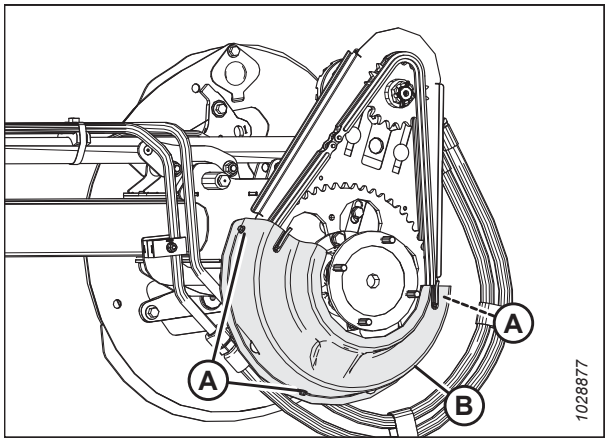


Figure 3.26: Lower Drive Cover

Installing Reel Drive Cover

The reel drive cover protects the drive components from weather and debris. The header should not be operated without the cover.

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.

Single-reel drive:

2. Align the slot in the bottom of reel drive cover (A) to tabs (C) on the reel drive back plate support, and slide the reel drive up.

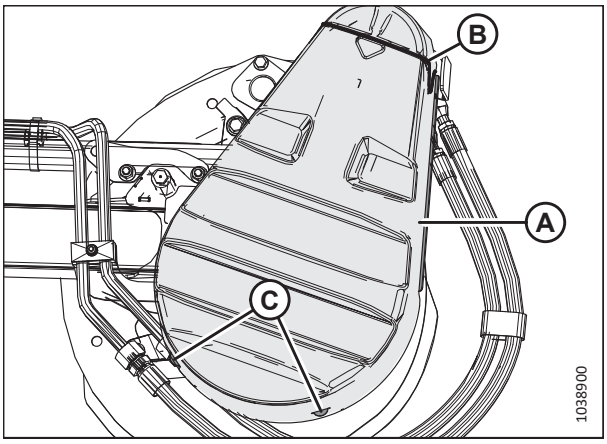


Figure 3.27: Drive Cover

3. 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.

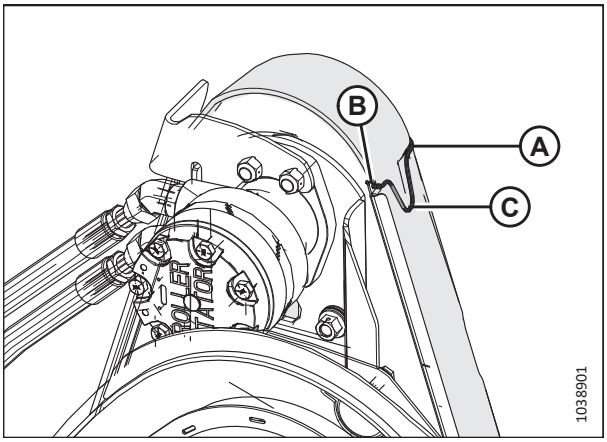


Figure 3.28: Reel Drive

Double-reel drive:

4. Position lower drive cover (B) (if previously removed) onto the reel drive. Secure the cover with three bolts (A).

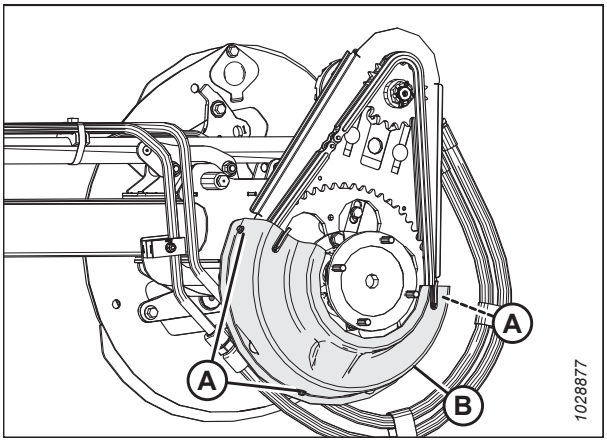


Figure 3.29: Lower Drive Cover

5. Position upper cover (A) on the reel drive. Secure the cover with two clips (B) on the lower cover.

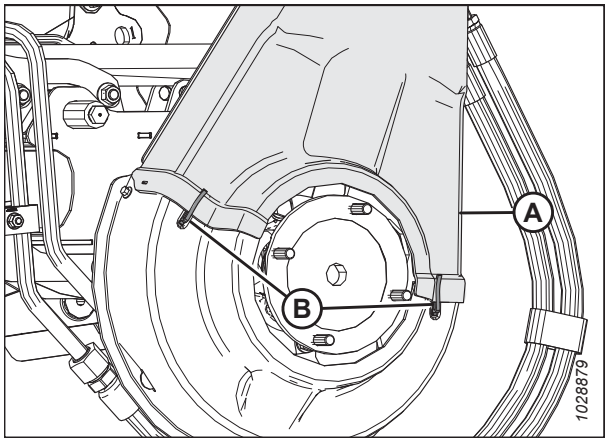


Figure 3.30: Upper Drive Cover

6. 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.

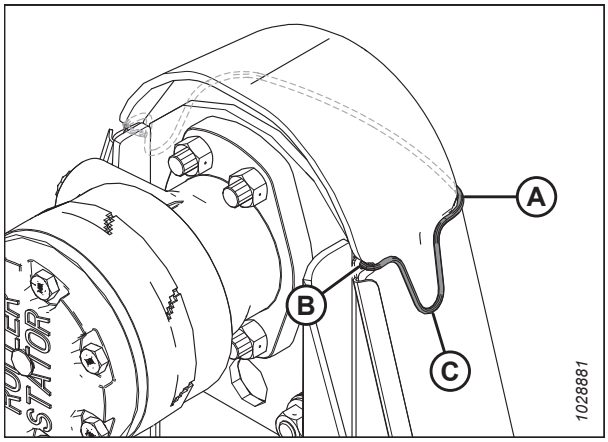


Figure 3.31: Reel Drive

3.2.5 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.**

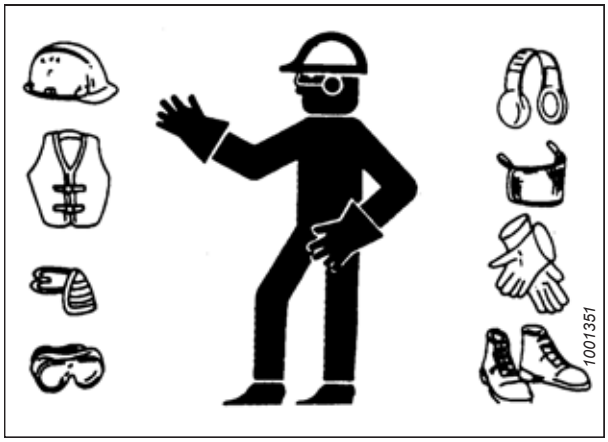


Figure 3.32: Safety Devices

- **Protect against noise. Wear a suitable hearing protection device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.**

Perform the following checks before starting the machine:

1. Inspect 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 247*.

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 242*.

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 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 the hydraulic oil fills the lines.

2. Refer to *4.2.2 Break-in Inspection, page 245* and perform all the 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 the combine on level ground.
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
New Holland CR and CX Series	*3.6.1 New Holland Combines, page 55*

NOTE:

Ensure the applicable functions (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 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.

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 or CX Combine

The header will need to be physically connected to the combine's feeder house, and the electrical and hydraulic connections completed.

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:

If the combine is **NOT** equipped with a rock trap, feeder house faceplate (A) **MUST** be in mid-position (B). For instructions on adjusting the faceplate, refer to the combine operator's manual.

NOTE:

A rock trap prevents rocks or debris from entering the combine, and is located on the front of the combine and behind the feeder house.

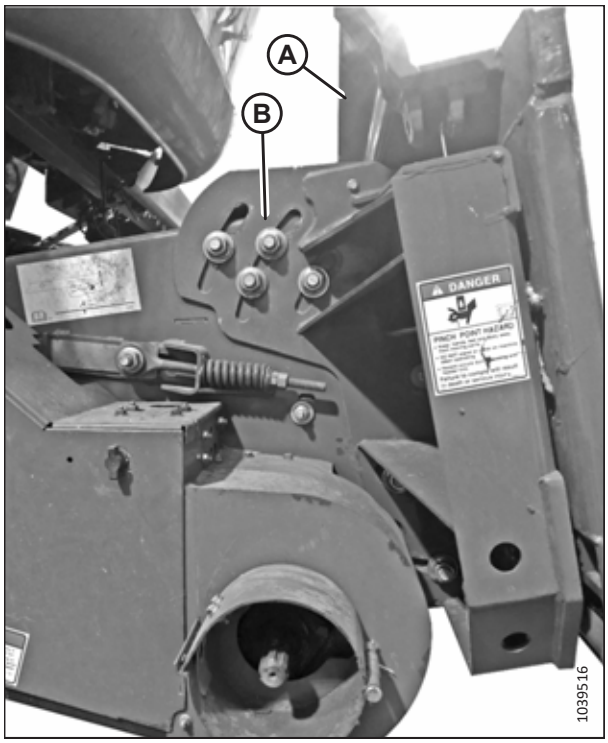


Figure 3.33: Faceplate Tilted to Mid-Position on Unspecified Combine

1. Shut down the engine, and remove the key from the ignition.
2. Ensure that handle (A) is positioned so that locks (B) can engage the float module.

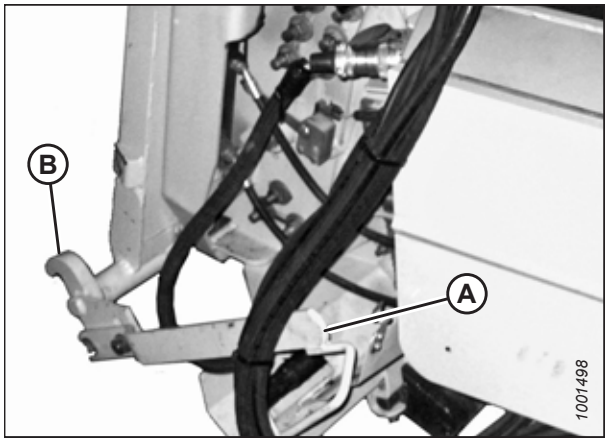


Figure 3.34: Feeder House Locks

DANGER

Ensure that all bystanders have cleared the area.

3. Start the engine.
4. Slowly drive the combine up to the float module until feeder house saddle (A) is directly under float module top cross member (B).
5. Raise the feeder house slightly to lift the header. Ensure that the feeder saddle is fully engaged in the float module frame.
6. Shut down the engine, and remove the key from the ignition.
7. 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.
8. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.
9. 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.

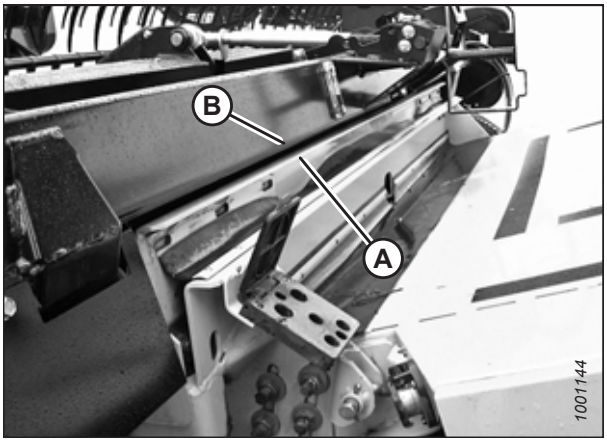


Figure 3.35: Header on Combine

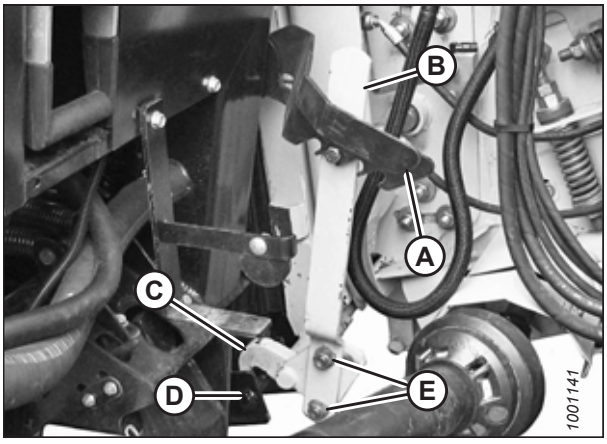


Figure 3.36: Feeder House Locks

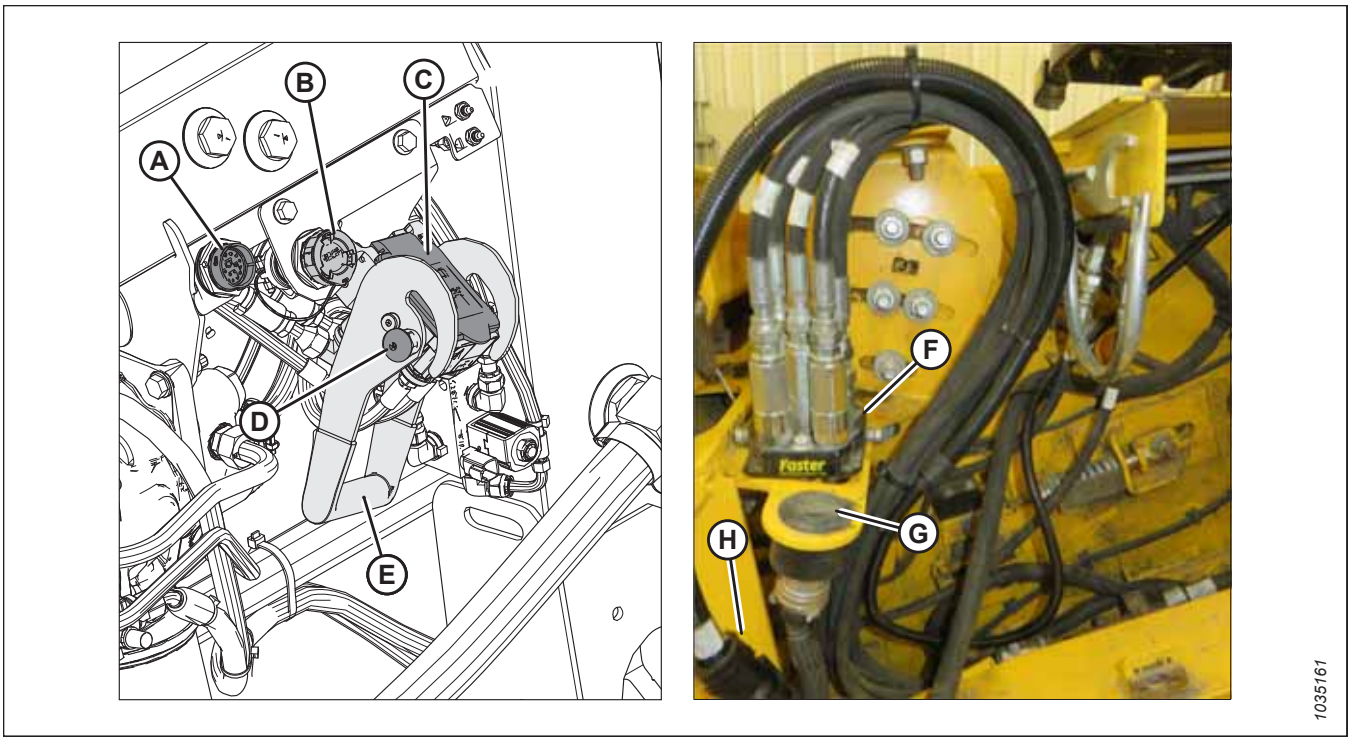


Figure 3.37: Multicoupler and Electrical Connections

10. Remove the caps from connectors C81B (A) and (B).
11. Remove the cover from hydraulic receptacle (C). Clean the receptacle mating surfaces.
12. Push in lock button (D) and pull handle (E) to the fully open position.
13. Remove hydraulic quick coupler (F) from the storage plate on the combine. Clean the mating surface of the coupler.
14. Position coupler (F) onto float module receptacle (C). Push handle (E) to insert the pins into the receptacle.
15. Push handle (E) to the closed position until lock button (D) snaps out.
16. 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.
17. 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.

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

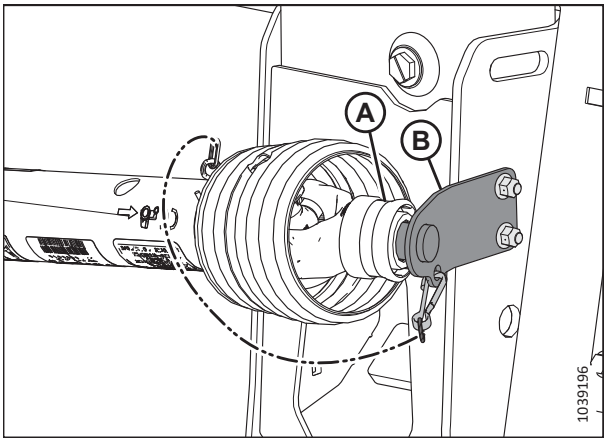


Figure 3.38: Driveline in Storage Position – Driveline B7038 or B7039

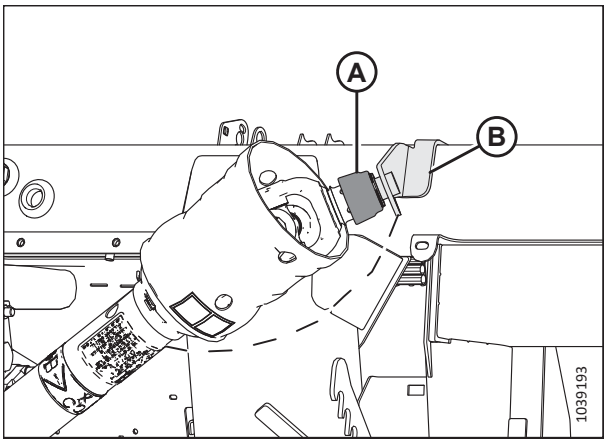


Figure 3.39: Driveline in Storage Position – Sidehill/ Hillside Driveline B7180, B7181, or B7326

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

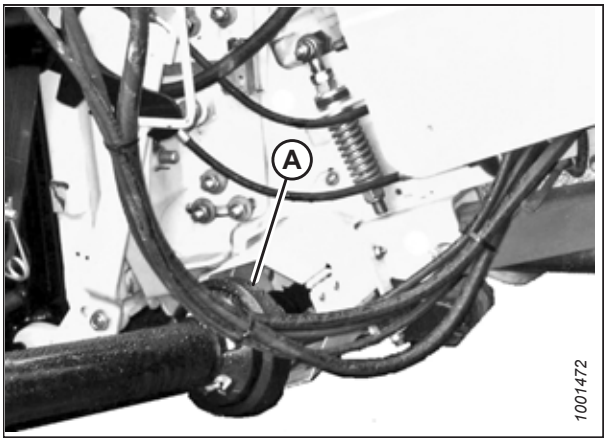


Figure 3.40: Driveline and Output Shaft

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 shows the right float lock; the left float lock is similar.

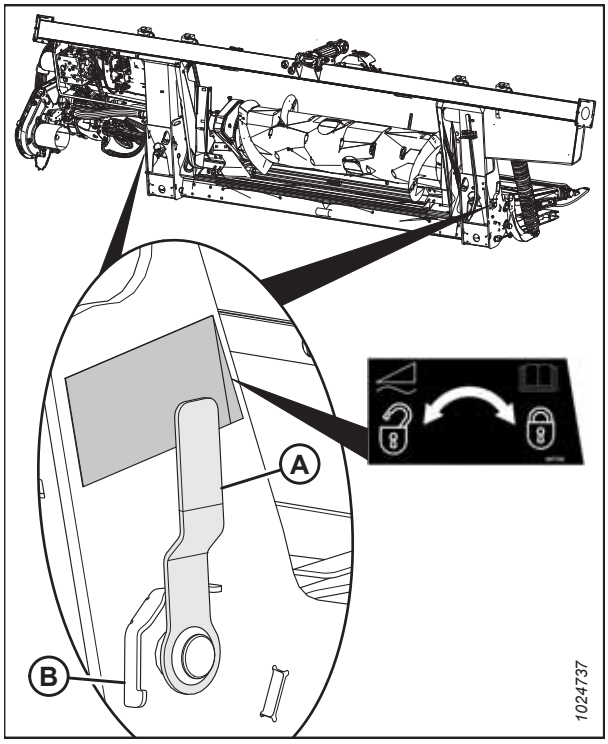


Figure 3.41: Float Lock Handle

Detaching Header from New Holland CR or 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 117*.

    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 116*.

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.

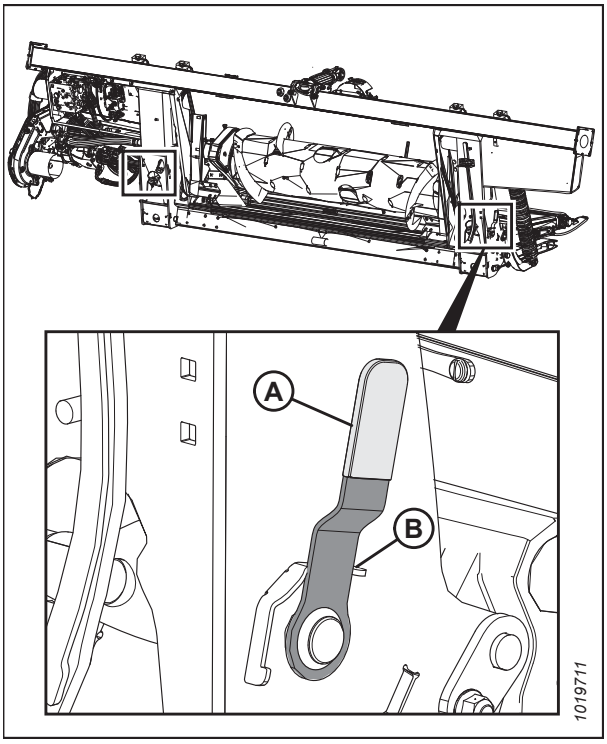


Figure 3.42: Float Lock Handle

4. Disconnect driveline from the combine. Push back collar on the end of the driveline and pull the driveline out of combine output shaft (A) until the collar disengages.

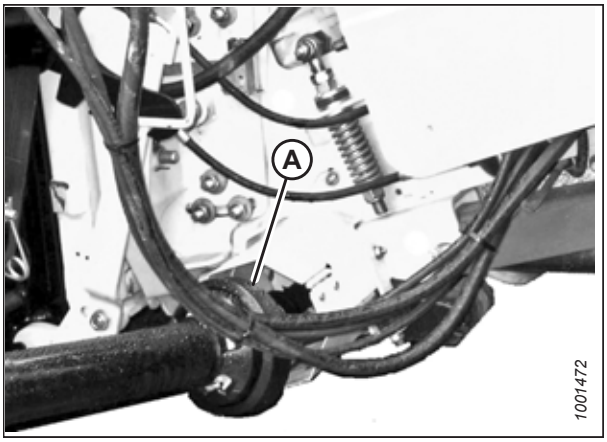


Figure 3.43: Driveline

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.

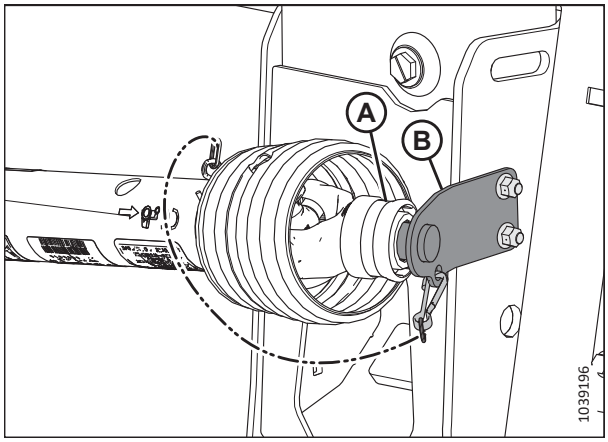


Figure 3.44: Driveline in Storage Position – Driveline B7038 or B7039

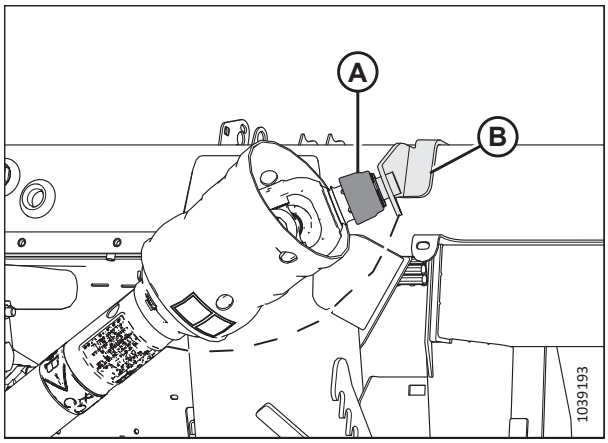


Figure 3.45: Driveline in Storage Position – Sidehill/ Hillside Driveline B7180, B7181, or B7326

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

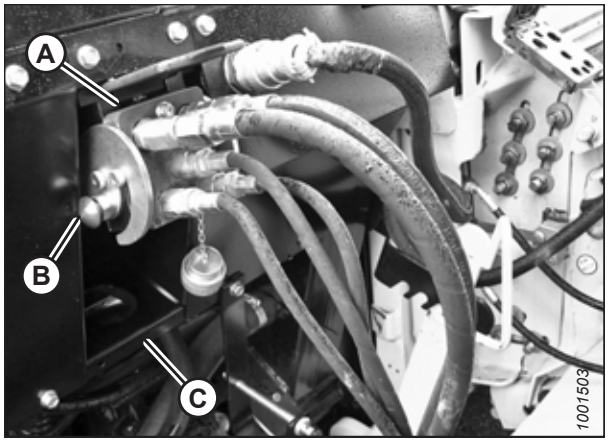


Figure 3.46: Float Module Connections

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

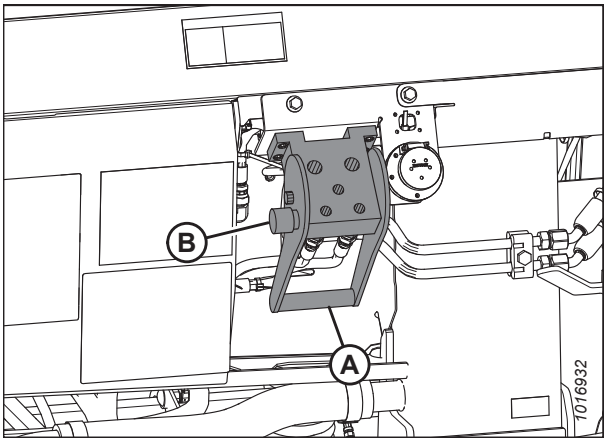


Figure 3.47: Float Module Receptacles

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

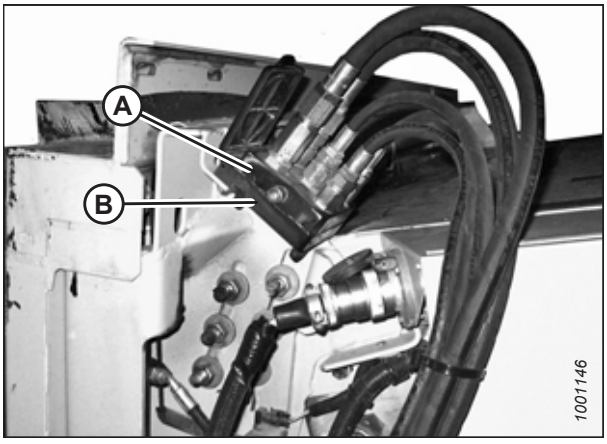


Figure 3.48: Combine Coupler

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

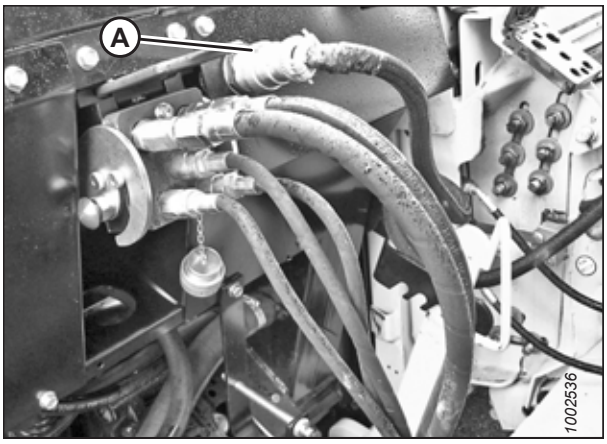


Figure 3.49: Float Module Connections

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

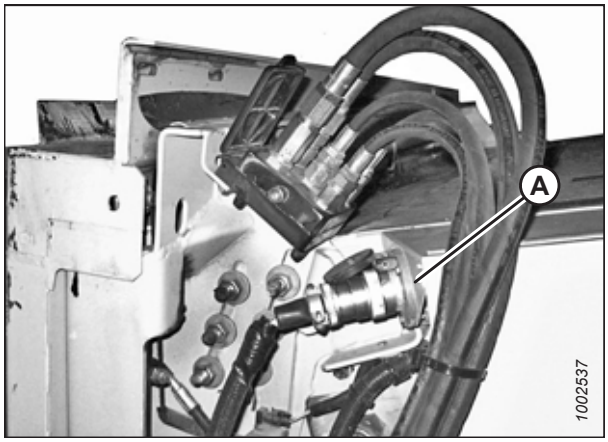


Figure 3.50: Combine Couplers

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

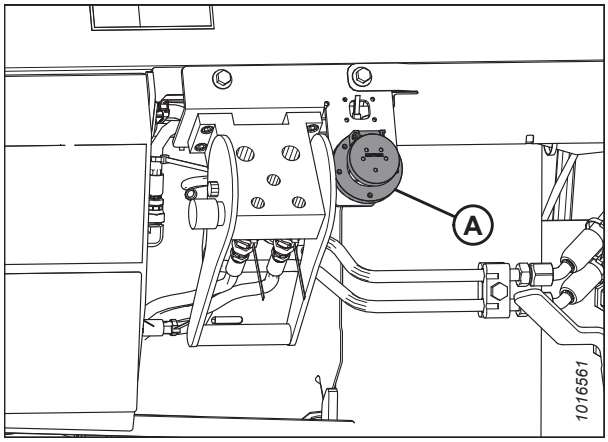


Figure 3.51: Float Module Receptacles

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

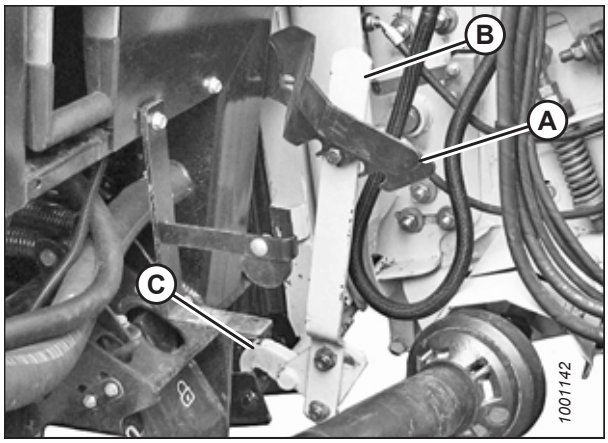


Figure 3.52: Feeder House Locks

13. Lower feeder house (A) until the feeder house disengages float module support (B).

14. Back the combine slowly away from the header.

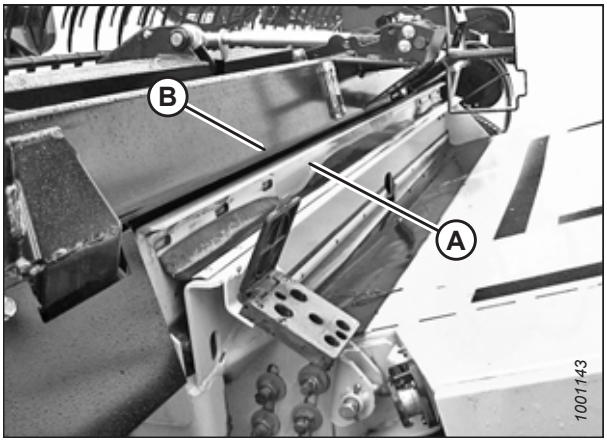


Figure 3.53: Header on Combine

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 Feeder Deflectors on New Holland CR Combines, page 369*.

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

Feeder Kits for New Holland CR Model Combines

Feeder House Size	Feeder Kit Size	Part Number
1250–1350 mm (49–65 in.)	Narrow: 200 mm (7 7/8 in.)	MAC328082, 328083
1100 mm (43 1/2 in.) and below	Wide: 325 mm (12 13/16 in.)	MAC314690, 314691

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 447* for descriptions of available items.

3.7.2 Header Settings

The following tables provide guidelines 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 79*

For information on configuring the FM200 auger, refer to *3.8.1 FM200 Feed Auger Configurations, page 84*.

NOTE:

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

Recommended 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 needed						
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 and vertical movement of the header when cutting off of the ground.
2. Setting on FM200 draper control.
3. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
4. The header's cutting height is determined by the skid shoe settings and the header angle.
5. Percentage above ground speed.

Recommended Settings for Cereals (continued)

Stubble Height	203 mm + (8 in. +)						
Stabilizer Wheels	As needed						
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

Recommended 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 and vertical movement of the header when cutting off of the ground.
7. Setting on FM200 draper control.
8. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
9. The header's cutting height is determined by the skid shoe settings and the header angle.
10. Percentage above ground speed.

Recommended 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 and vertical movement of the header when cutting off of the ground.
12. Setting on FM200 draper control.
13. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
14. The header's cutting height is determined by the skid shoe settings and the header angle.
15. Percentage above ground speed.

Recommended Settings for Canola

Stubble Height	102–203 mm (4–8 in.)						
Stabilizer Wheels[16]	As needed						
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 needed						
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 and vertical movement of the header when cutting off of the ground.
17. Setting on FM200 draper control.
18. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
19. The header's cutting height is determined by the skid shoe settings and the header angle.
20. Percentage above ground speed.

Recommended 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 needed						
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 and vertical movement of the header when cutting off of the ground.
22. The rice divider rod is available. The rice divider rod is not required on both ends of header.
23. Setting on FM200 draper control.
24. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
25. The header's cutting height is determined by the skid shoe settings and the header angle.
26. Percentage above ground speed.

Recommended Settings for California Rice (continued)

Recommended 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

Recommended Settings for Delta Rice

Stubble Height	51–152 mm (2–6 in.)						
Stabilizer Wheels[27]	As needed						
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 needed						
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 and vertical movement of the header when cutting off of the ground.
28. Setting on FM200 draper control.
29. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
30. The header's cutting height is determined by the skid shoe settings and the header angle.
31. Percentage above ground speed.

Recommended 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 and vertical movement of the header when cutting off of the ground.
33. Setting on FM200 draper control.
34. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
35. The header's cutting height is determined by the skid shoe settings and the header angle.
36. Percentage above ground speed.

Recommended Settings for Flax

Stubble Height	51–153 mm (2–6 in.)						
Stabilizer Wheels[37]	As needed						
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 and vertical movement of the header when cutting off of the ground.
38. Setting on FM200 draper control.
39. Set the header angle as shallow as possible (setting A) using the center-link and skid shoes while maintaining the cutting height.
40. The header's cutting height is determined by the skid shoe settings and the 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 information on the recommended attachments, settings, and adjustments to optimize 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 447*.

Recommended settings

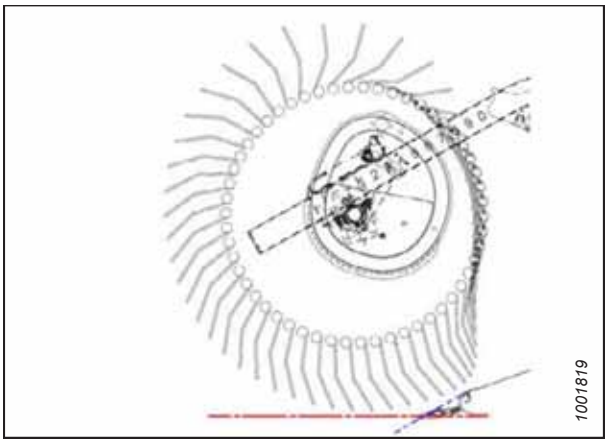
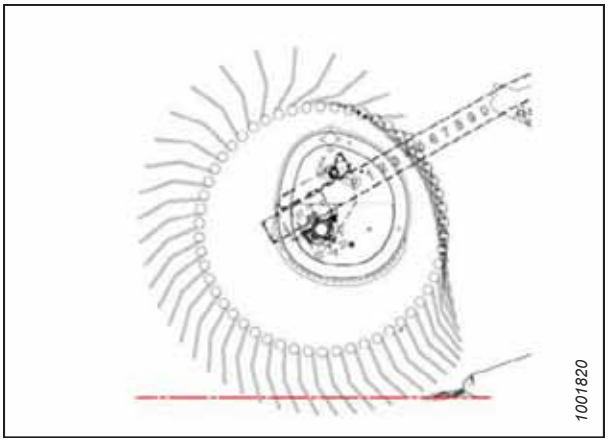
To optimize the header for straight-combining canola, make the following adjustments:

- Relieve the tension on the auger spring. For instructions, refer to *3.8.5 Checking and Adjusting Feed Auger Springs, page 113*.
- Set the reel speed so that it is equal to the combine's ground speed. Increase the speed as needed For instructions, refer to *3.9.5 Reel Speed, page 133*.
- Set the side draper speed to position six on in-cab side draper speed control. For instructions, refer to *3.9.7 Side Draper Speed, page 135*.
- Adjust the reel height so that fingers just engage the crop. For instructions, refer to *3.9.10 Reel Height, page 139*.
- Adjust the reel fore-aft position. For instructions, refer to *Adjusting Reel Fore-Aft Position, page 145*.
- Move the reel fore-aft cylinders to the alternative aft location. For instructions, refer to *Repositioning Fore-Aft Cylinders, page 145*.
- Set the reel cam to position 1. For instructions, refer to *Adjusting Reel Cam, page 154*.
- Set auger to floating position. For instructions, refer to *3.8.4 Setting Auger Position, page 111*.

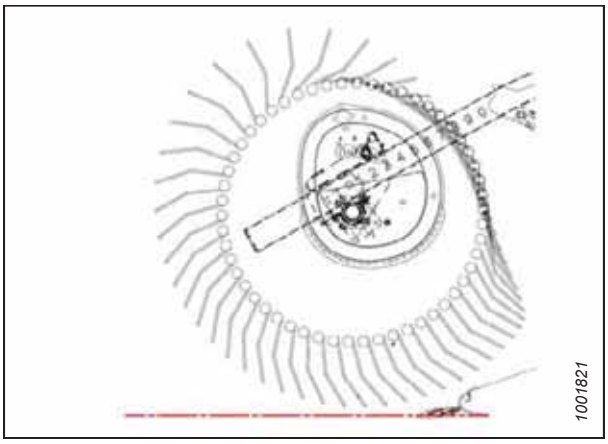
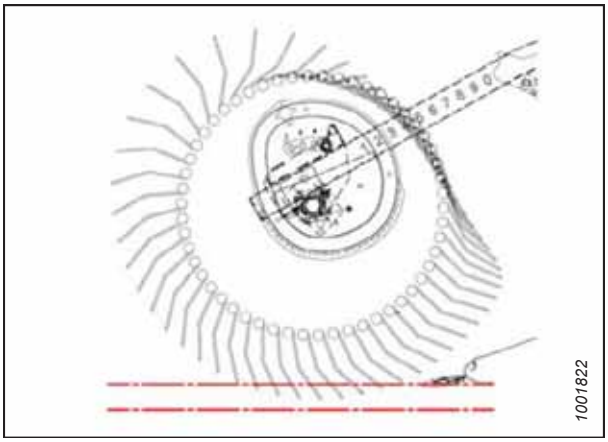
3.7.4 Reel Settings

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

Effect on Reel Finger Pattern of Cam Setting and Reel Position Number

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
1 (0%)	6 or 7	 1001819
2 (20%)	3 or 4	 1001820

Effect on Reel Finger Pattern of Cam Setting and Reel Position Number (continued)

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
3 (30%)	6 or 7	
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 , *page 79*.

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.

For instructions on how to make adjustments to the floating crop divider, refer to *Adjusting Floating Crop Dividers, page 167*. For settings, refer to the applicable stubble height table below.

Stubble Height 50 mm to 125 mm (2 in. to 5 in.)

	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

42. A (min) – E (max)

Stubble Height 20 mm to 100 mm (3/4 in. to 4 in.)

	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
	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

Stubble Height 16 mm to 50 mm (5/8 in. to 2 in.) 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
	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 463*.

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 Configuration: 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 86*.

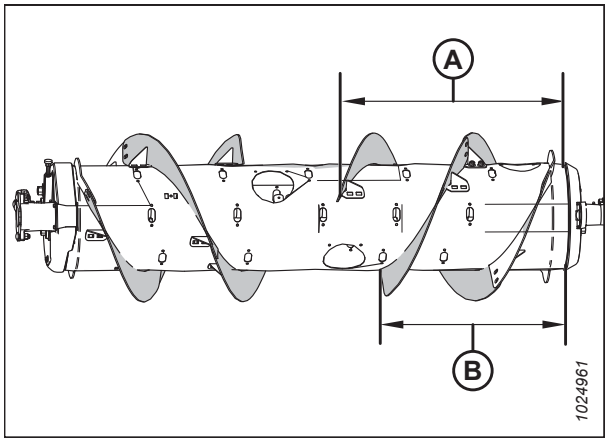


Figure 3.54: Ultra Narrow Configuration – Rear View

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:

- New Holland CR 920/940/960, 9020/40/60/65, 6090/7090, 8060/8070/8080

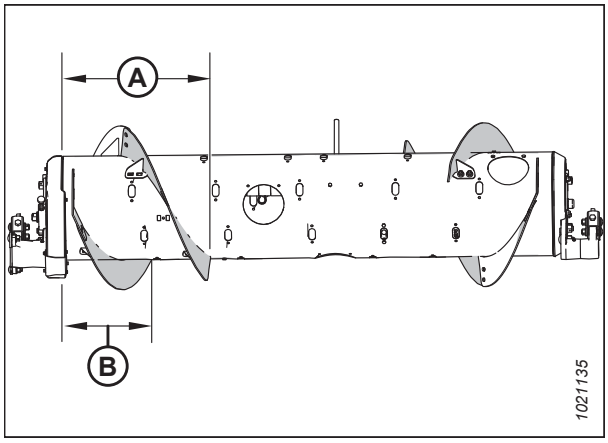


Figure 3.55: Narrow Configuration – Rear View

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:

- New Holland CR 970/980, 9070/9080, 8090/9090, X.90, X.80
- New Holland CX 8X0, 80X0, 8.X0

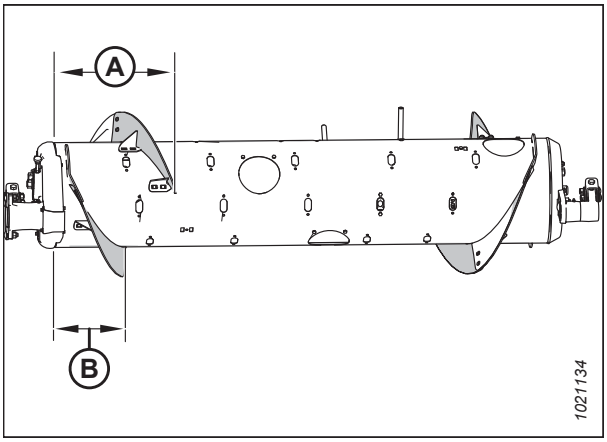


Figure 3.56: Medium Configuration – Rear View

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 93*.

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 an optional configuration for the following combines:

- New Holland CX 8X0, 80X0, 8.X0

NOTE:

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

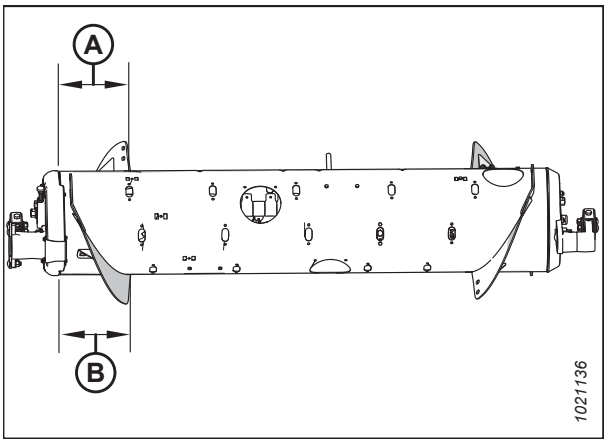


Figure 3.57: Wide Configuration – Rear View

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

For more information on converting to Wide configuration, refer to *Wide Configuration – Auger Flighting, page 95*.

Ultra Wide Configuration: 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 98*.

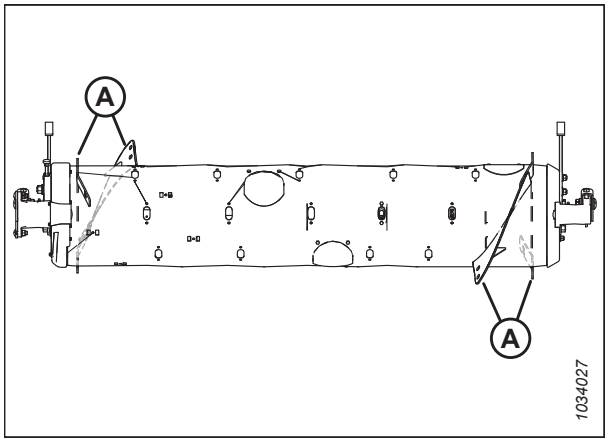


Figure 3.58: Ultra Wide Configuration – Rear View

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.

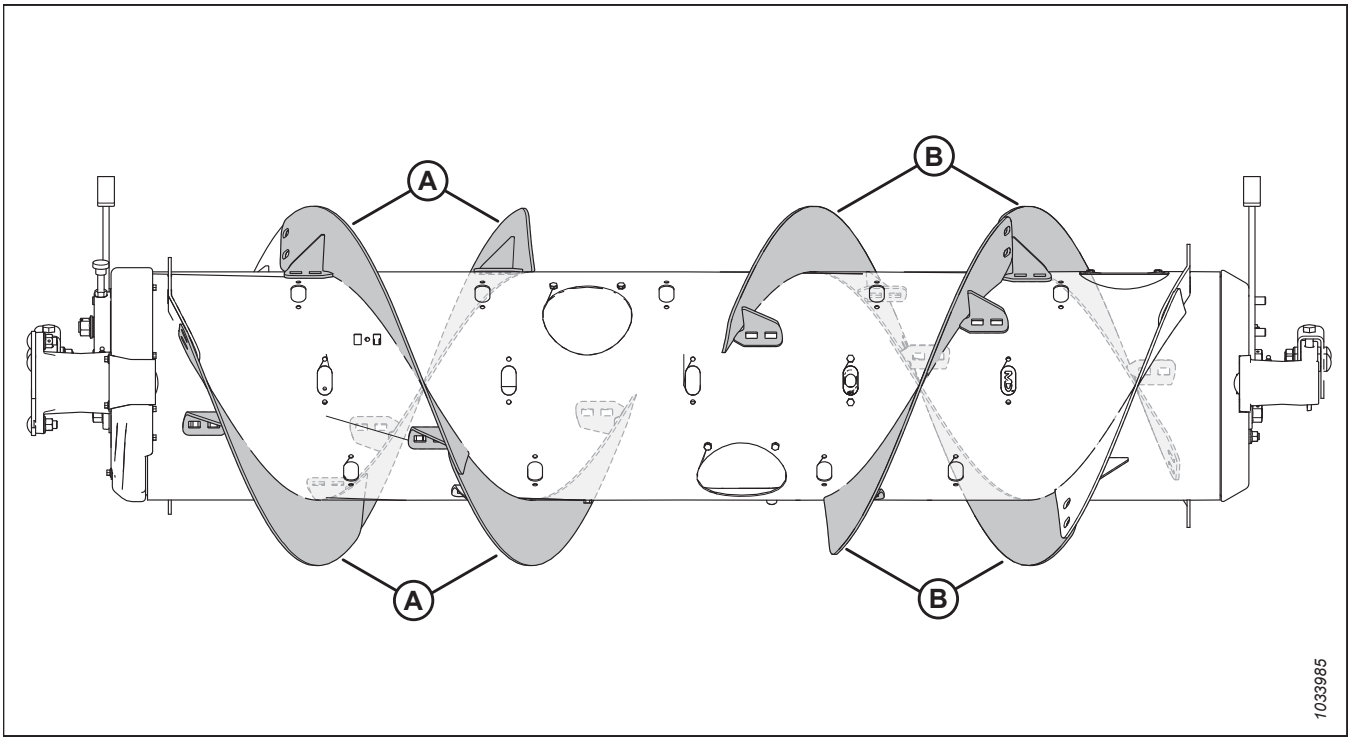


Figure 3.59: Ultra Narrow Configuration

A - Left Long Flighting (MAC287889)

B - Right Long Flighting (MAC287890)

To convert to Ultra Narrow Configuration from Narrow Configuration:

One flighting kit (MAC357234 or 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 102*.
- To install the additional flightings that require hole drilling, refer to *Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 105*.
- For finger installation/removal instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109* and *3.8.2 Removing Feed Auger Fingers, page 107*.

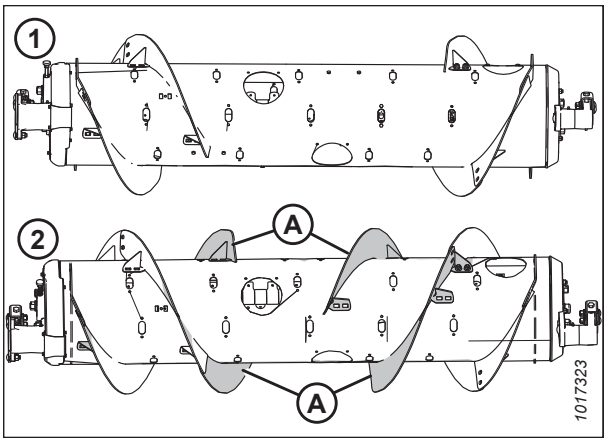


Figure 3.60: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**

To convert to Ultra Narrow Configuration from Medium, Wide, or Ultra Wide Configuration:

Two flighting kits (MAC357234 or 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 100* and *Installing Bolt-On Flighting, page 102*.
- To install the additional flightings that require hole drilling, refer to *Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only, page 105*.
- For finger installation/removal instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109* and *3.8.2 Removing Feed Auger Fingers, page 107*.

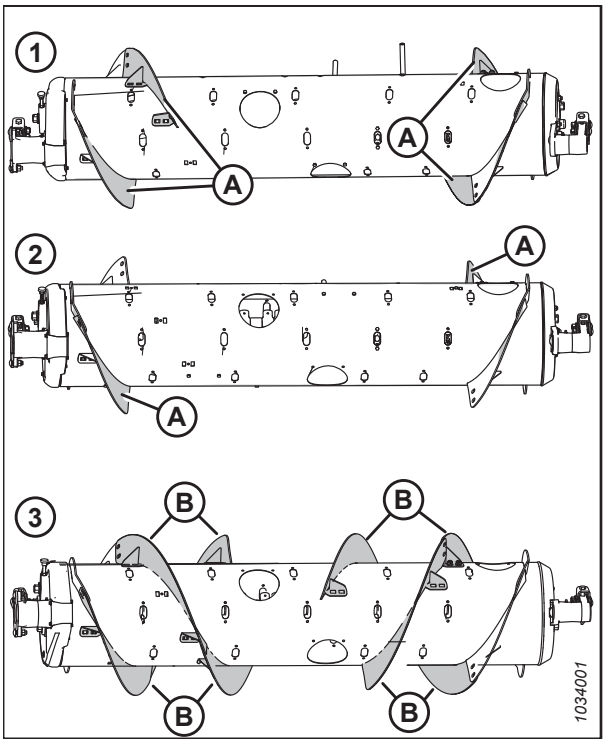


Figure 3.61: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**
3 - Ultra Narrow Configuration

43. MAC357234 is available only through MacDon Parts. B7345 is available only through MacDon 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).

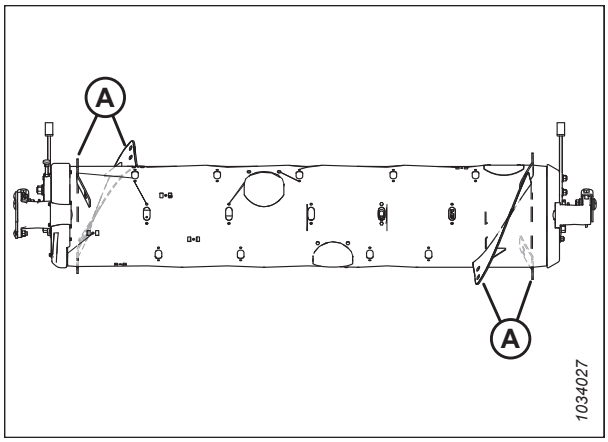


Figure 3.62: Ultra Wide Configuration

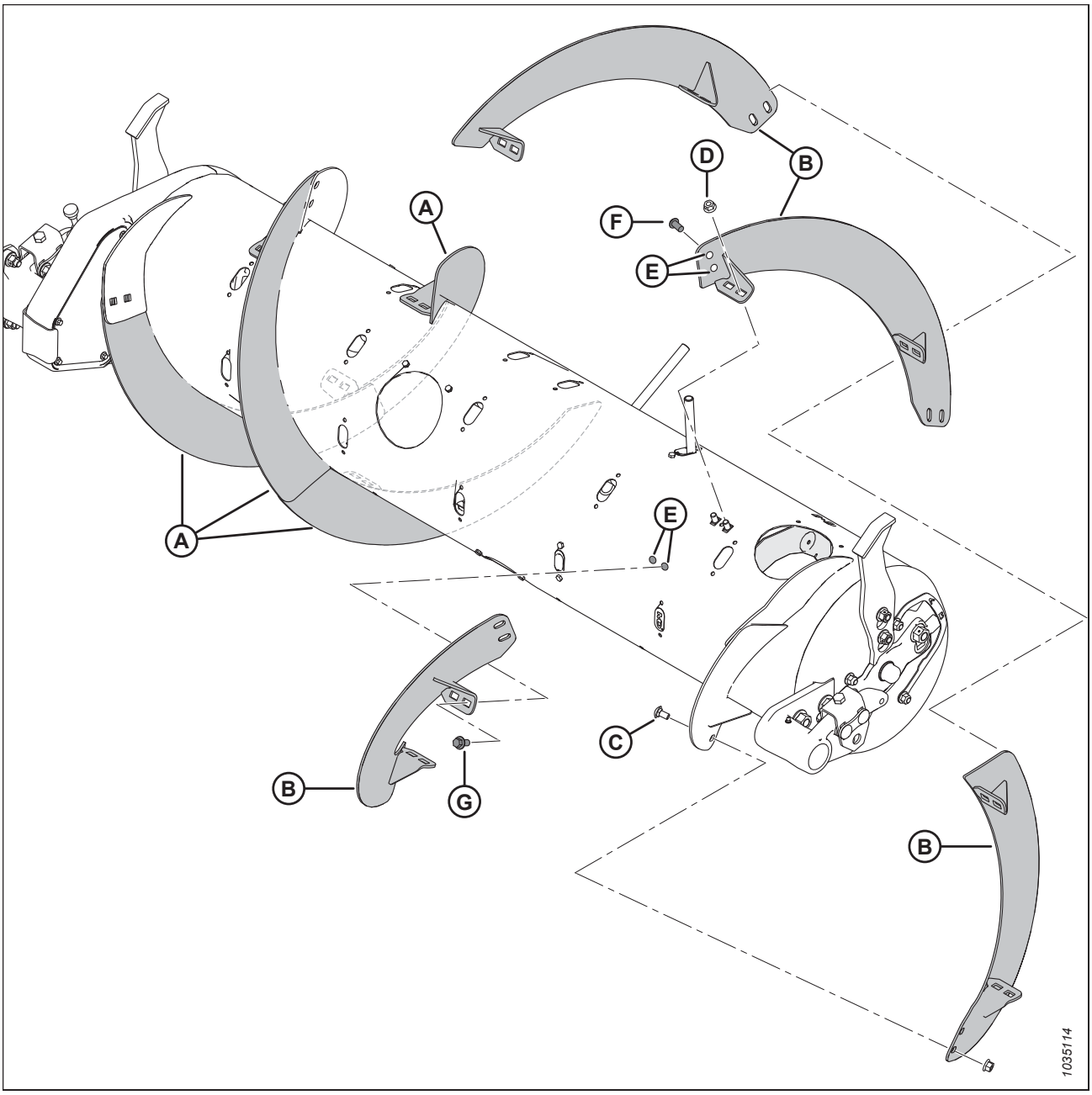


Figure 3.63: Ultra Narrow Configuration

A - Left Long Flighting (MAC287889)

B - Right Long Flighting (MAC287890)

C - M10 x 20 mm Carriage Bolt (MAC136178)

D - M10 Center Lock Flange Nut (MAC135799)

E - Drilled Holes – 11 mm (7/16 in.) [45]

F - M10 x 20 mm Button Head Bolt (MAC135723)[46]

G - M10 x 20 mm Flange Head Bolt (MAC152655)[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.

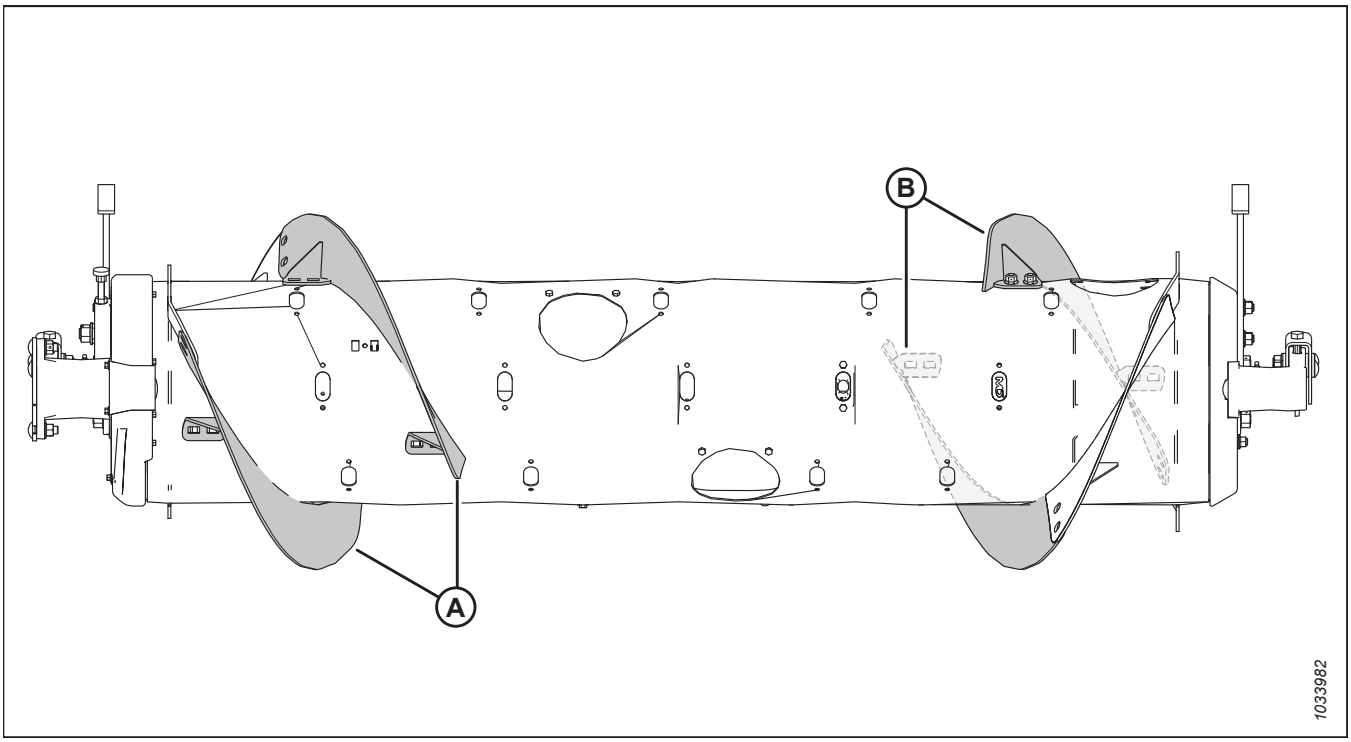


Figure 3.64: Narrow Configuration

A - Left Long Flighting (MAC287889) **B - Right Long Flighting (MAC287890)**

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 100*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109*.

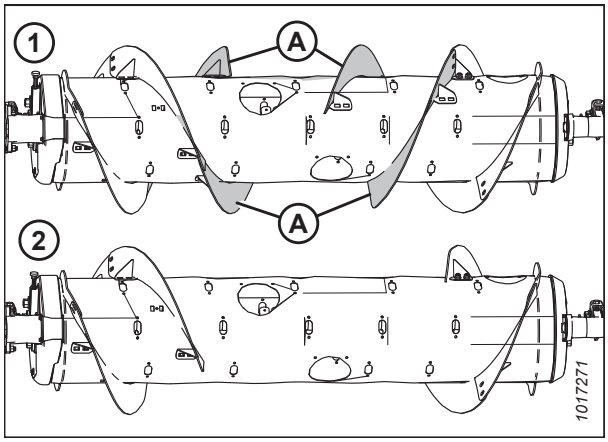


Figure 3.65: Auger Configurations – Rear View

1 - Ultra Narrow Configuration **2 - Narrow Configuration**

To convert to Narrow Configuration from Medium, Wide, or Ultra Wide Configuration:

One flighting kit (MAC357234 or 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 100* and *Installing Bolt-On Flighting, page 102*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 107*.

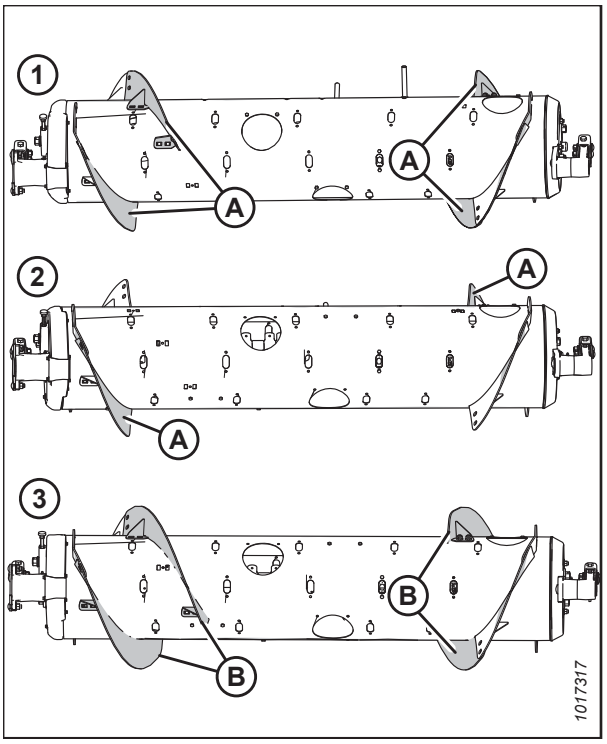


Figure 3.66: Auger Configurations – Rear View

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).

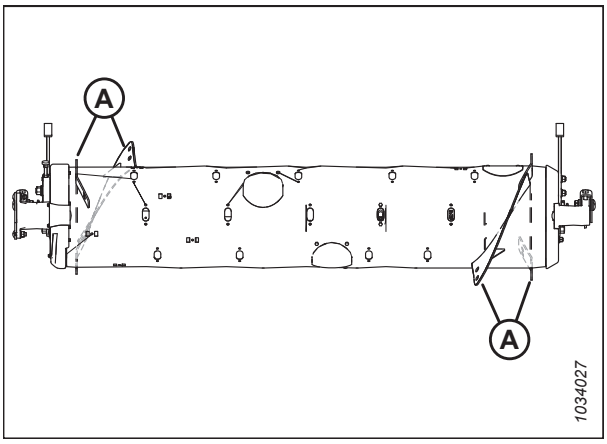


Figure 3.67: Ultra Wide Configuration

48. MAC357234 is available only through MacDon Parts. B7345 is available only through MacDon 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.

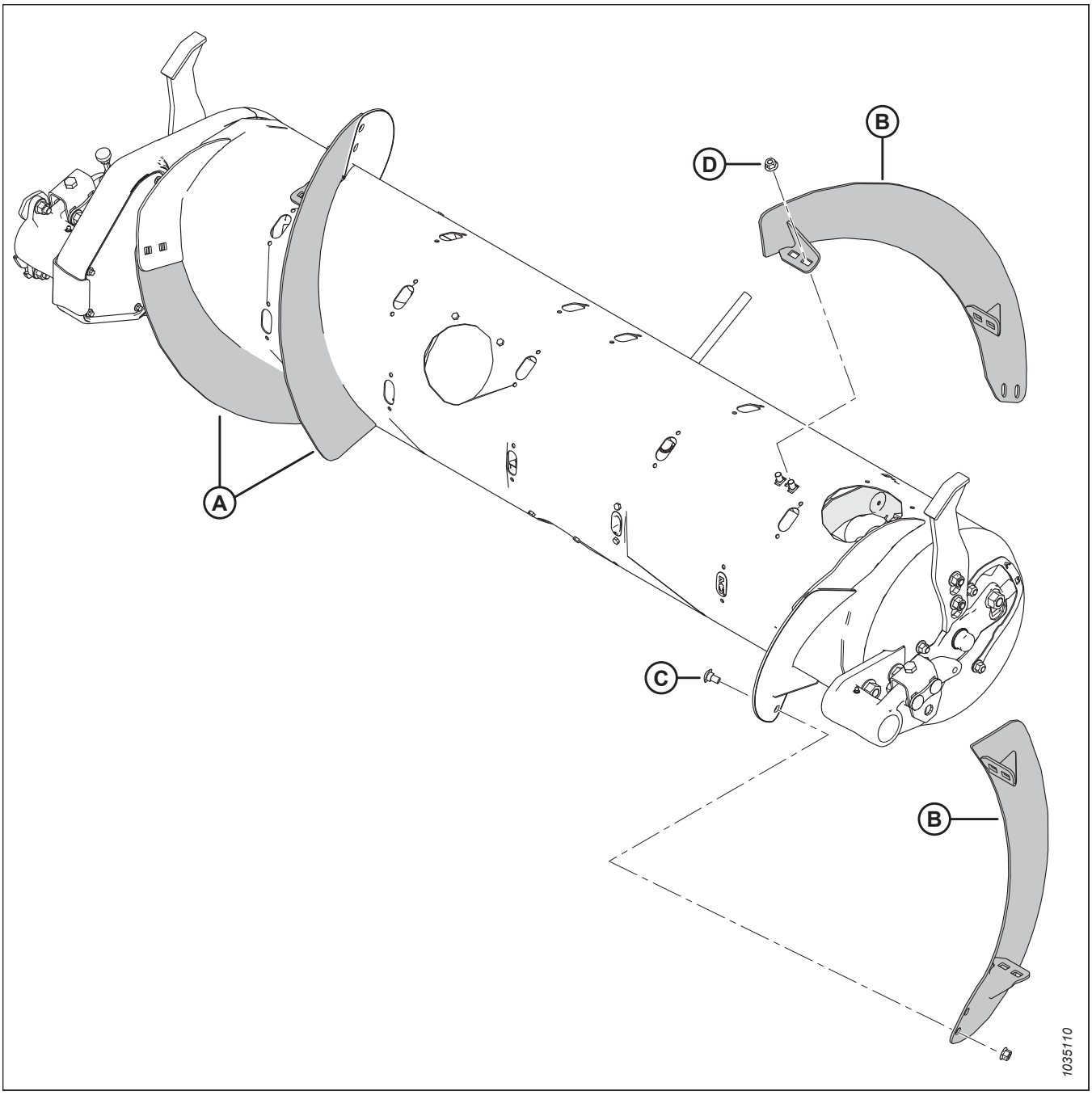


Figure 3.68: Narrow Configuration

A - Left Long Flighting (MAC287889)

B - Right Long Flighting (MAC287890)

C - M10 x 20 mm Carriage Bolt (MAC136178)

D - M10 Center Lock Flange Nut (MAC135799)

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.

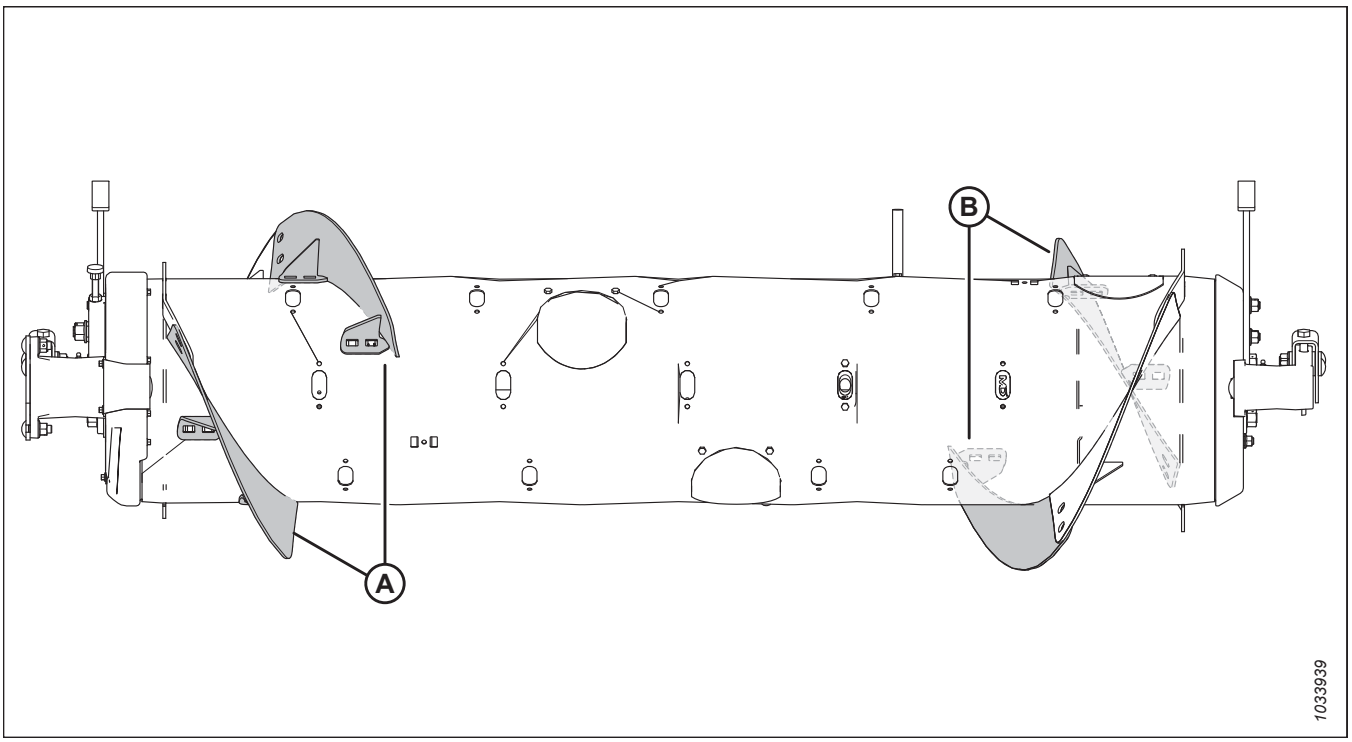


Figure 3.69: Medium Configuration

A - Left Short Flighting (MAC287888) **B - Right Short Flighting (MAC287887)**

To convert to Medium Configuration from Wide Configuration:

One flighting kit (MAC357233 or 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 102*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 107*.

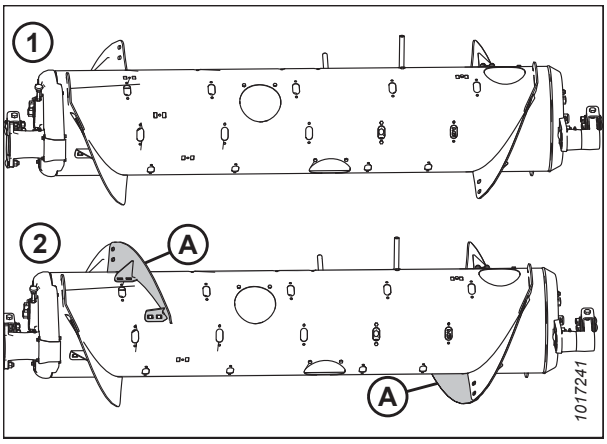


Figure 3.70: Auger Configurations – Rear View

1 - Wide Configuration **2 - Medium Configuration**

50. MAC357233 is available only through MacDon Parts. B7344 is available only through MacDon Whole Goods. Both kits contain wear-resistant flightings.

To convert to Medium Configuration from Narrow or Ultra Narrow Configuration:

Two flighting kits (MAC357233 or 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 100* and *Installing Bolt-On Flighting, page 102*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109*.

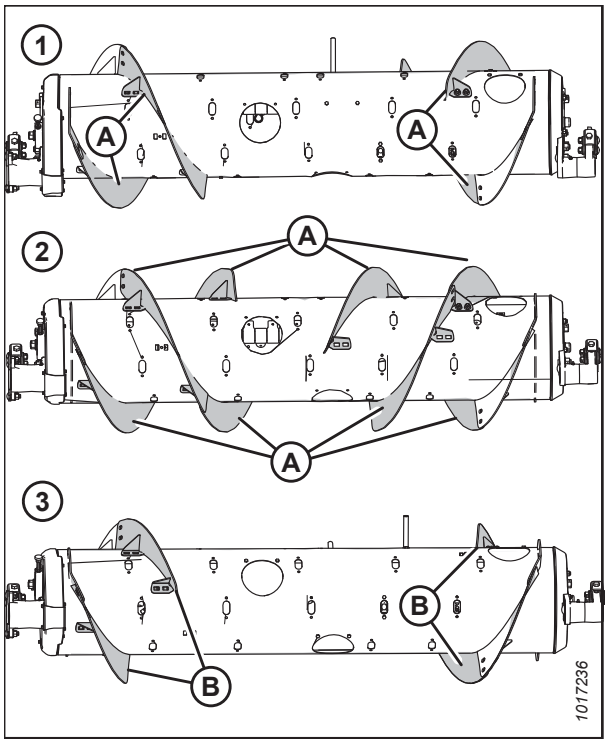


Figure 3.71: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**
3 - Medium Configuration

To convert to Medium Configuration from Ultra Wide Configuration:

Two flighting kits (MAC357233 or 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 102*.
- For finger removal instructions, refer to *3.8.2 Removing Feed Auger Fingers, page 107*.

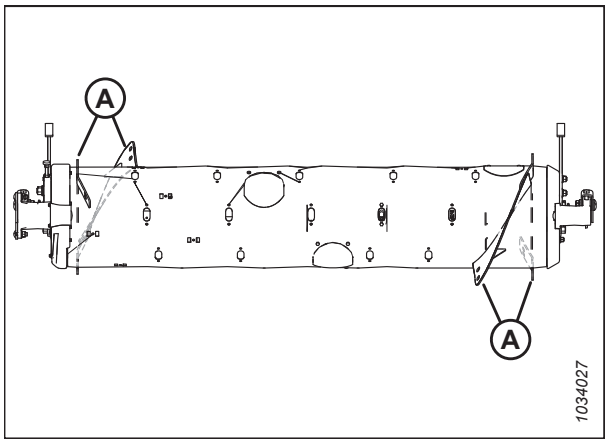


Figure 3.72: Ultra Wide Configuration

51. The quantity of existing long flightings is either 4 or 8, depending on the current configuration.

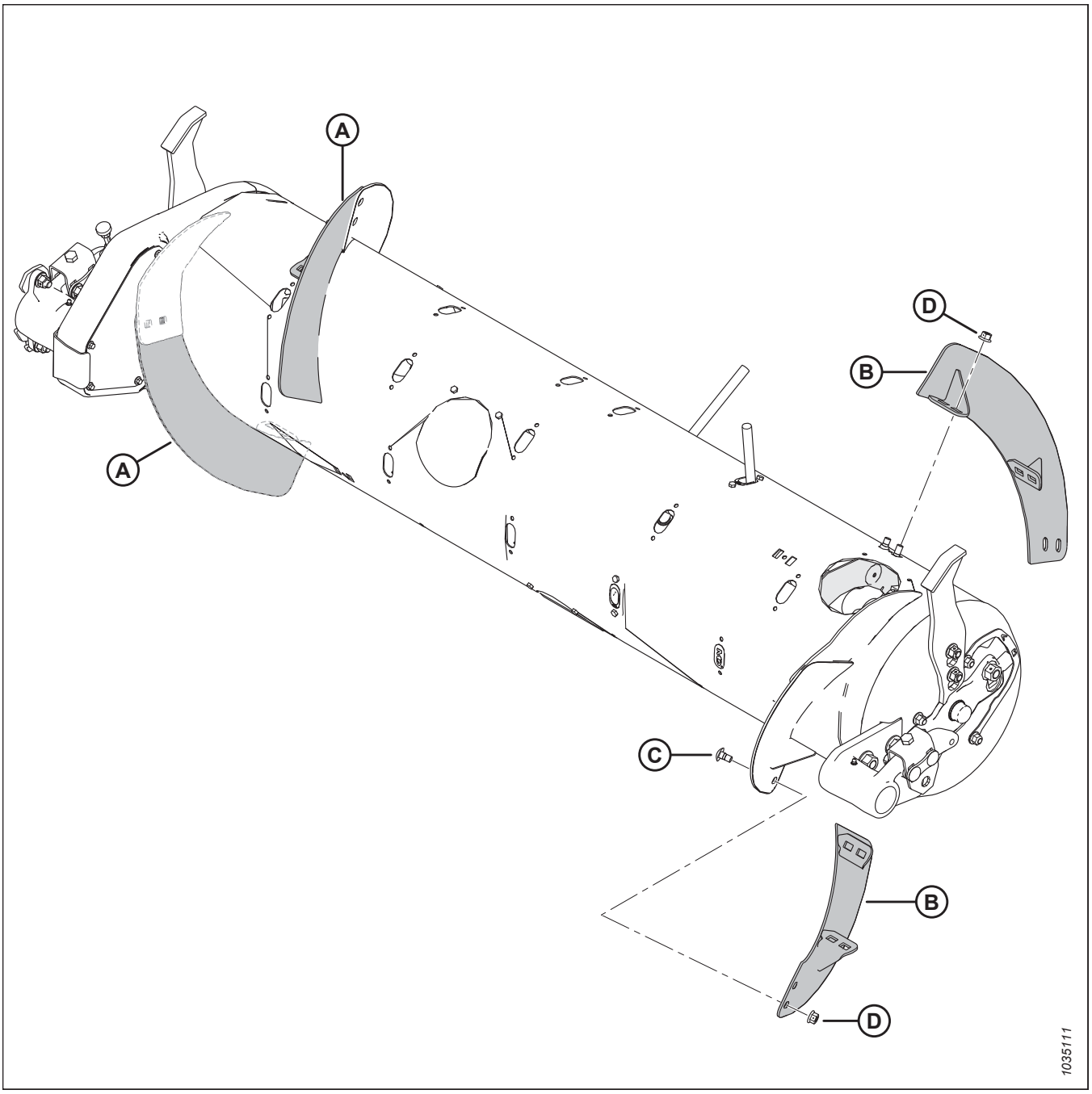


Figure 3.73: Medium Configuration

A - Left Short Flighting (MAC287888)

B - Right Short Flighting (MAC287887)

C - M10 x 20 mm Carriage Bolt (MAC136178)

D - M10 Center Lock Flange Nut (MAC135799)

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.

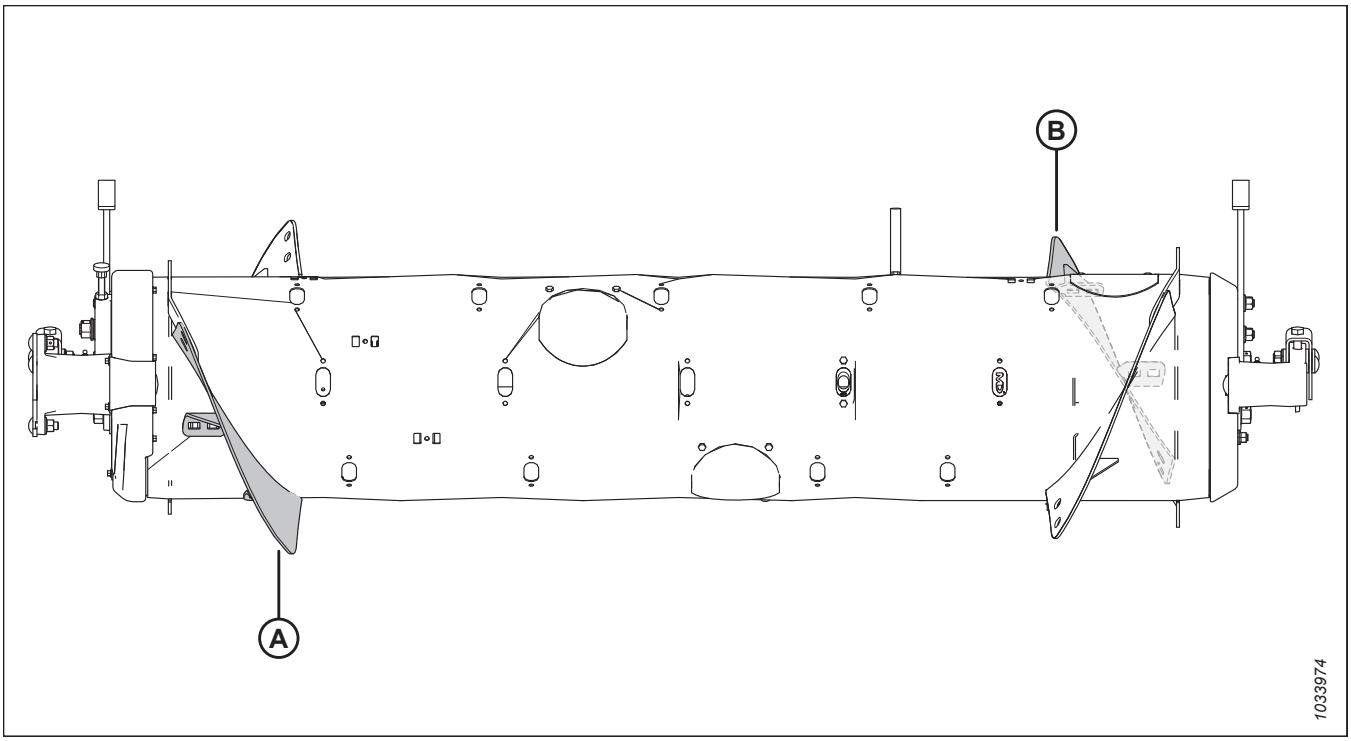


Figure 3.74: Wide Configuration

A - Left Short Flighting (MAC287888) **B - Right Short Flighting (MAC287887)**

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 100*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109*.

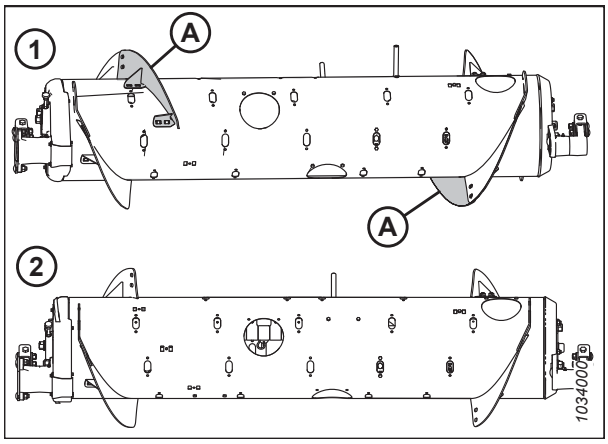


Figure 3.75: Auger Configurations – Rear View

1 - Medium Configuration **2 - Wide Configuration**

To convert to Wide Configuration from Ultra Wide Configuration:

One flighting kits (MAC357233 or 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 102*.
- If required to remove auger fingers, refer to *3.8.2 Removing Feed Auger Fingers, page 107*.

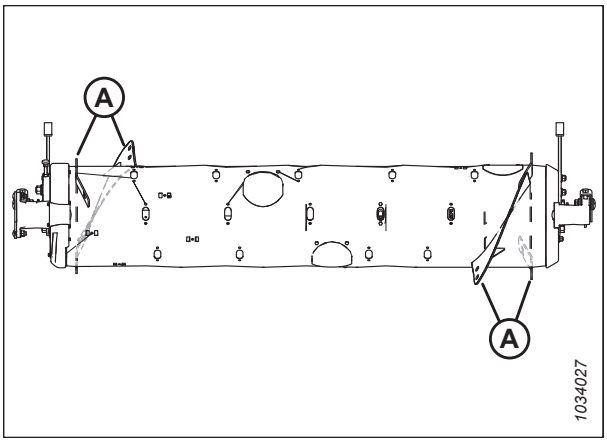


Figure 3.76: Ultra Wide Configuration

To convert to Wide Configuration from Narrow or Ultra Narrow Configuration:

One flighting kit (MAC357233 or 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 100* and *Installing Bolt-On Flighting, page 102*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109*.

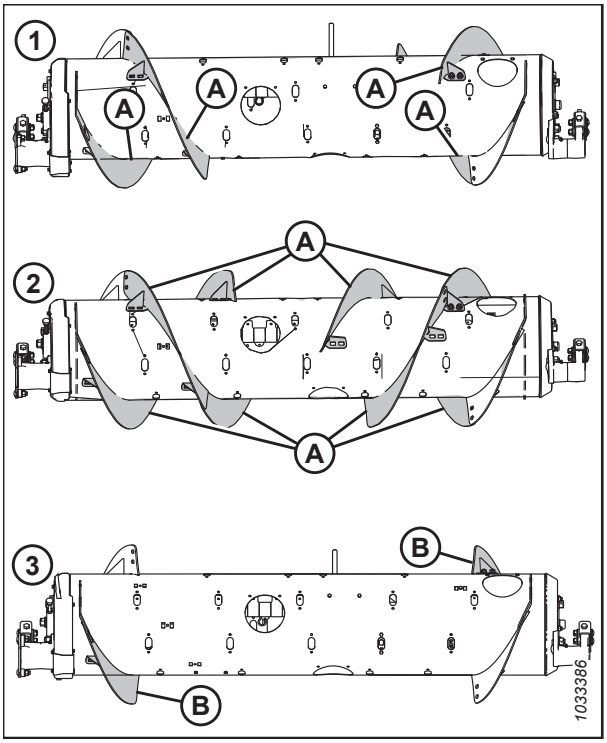


Figure 3.77: Auger Configurations – Rear View

1 - Narrow Configuration **2 - Ultra Narrow Configuration**
3 - Wide Configuration

52. MAC357233 is available only through MacDon Parts. 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.

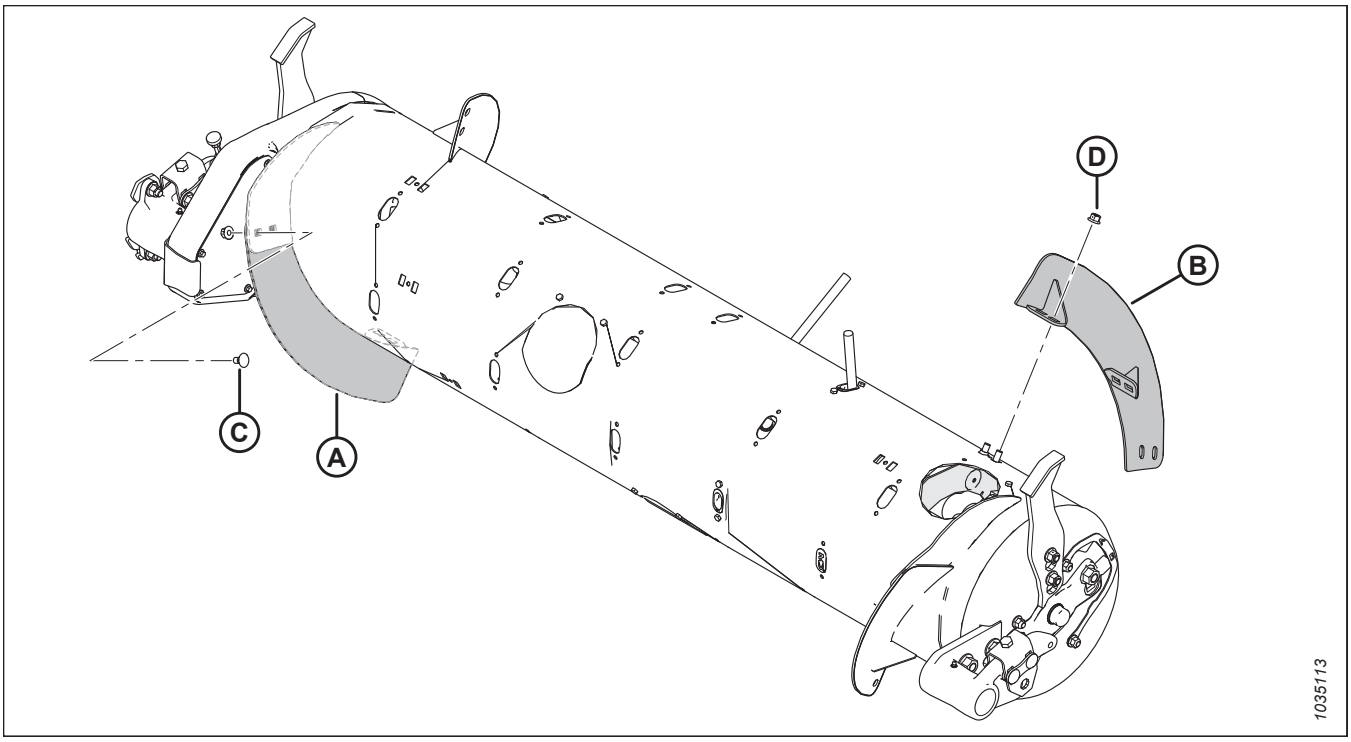


Figure 3.78: Wide Configuration

A - Left Short Flighting (MAC287888)

B - Right Short Flighting (MAC287887)

C - M10 x 20 mm Carriage Bolt (MAC136178)

D - M10 Center Lock Flange Nut (MAC135799)

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.

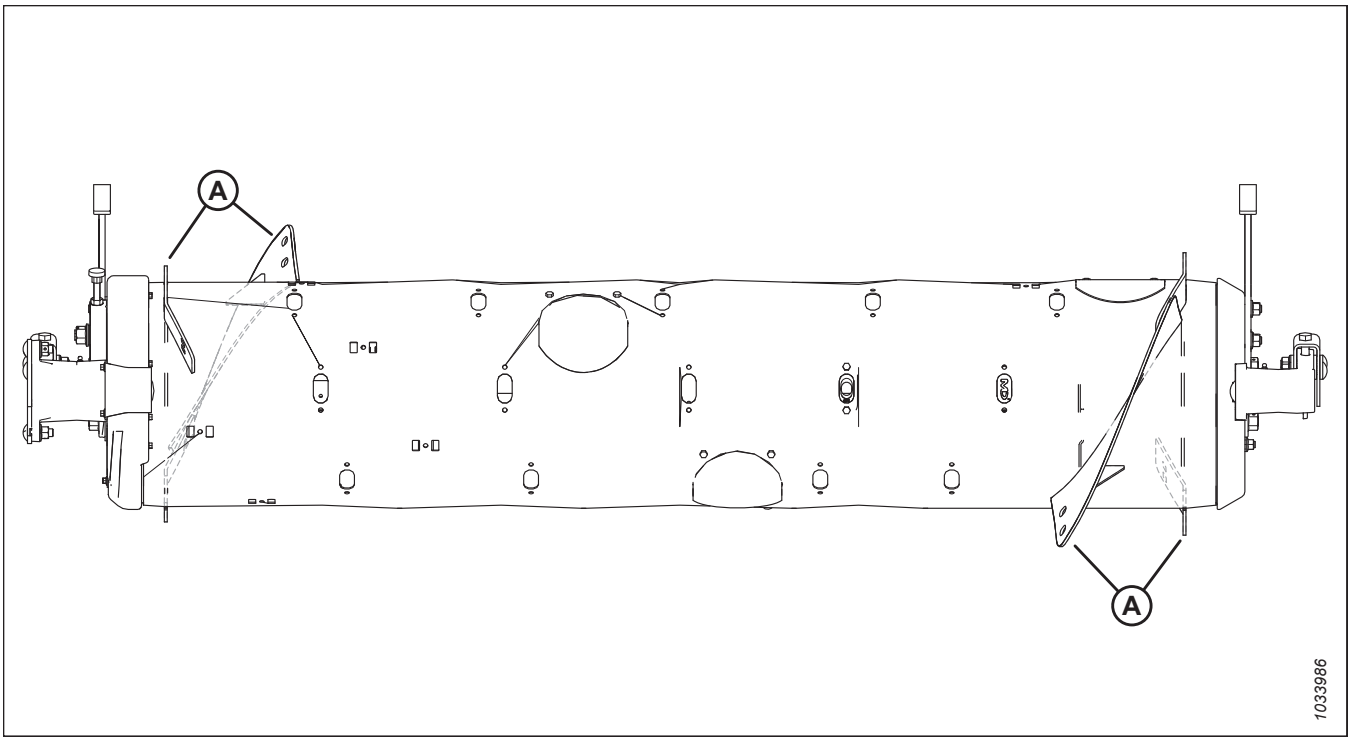


Figure 3.79: Ultra Wide Configuration

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 100*.
- For finger installation instructions, refer to *3.8.3 Installing Feed Auger Fingers, page 109*.

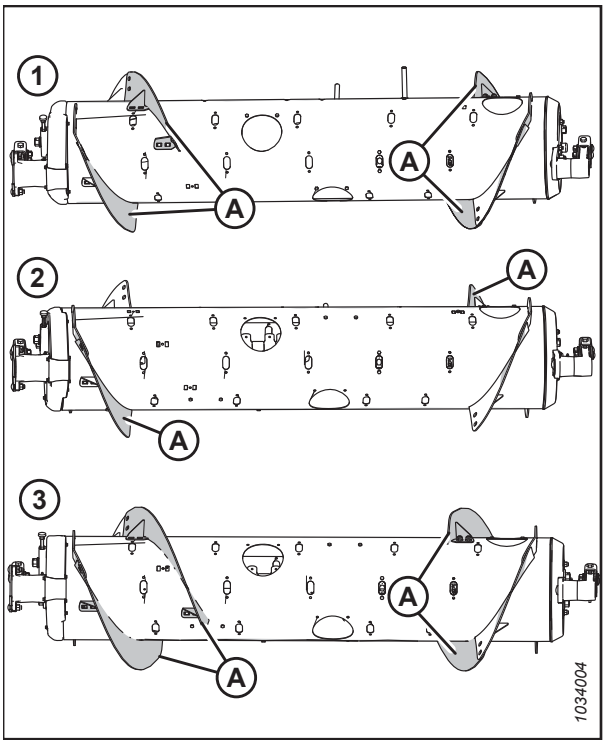


Figure 3.80: Auger Configurations – Rear View

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 84* 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 84*.

To remove bolt-on flighting, follow these steps:

1. To improve access to the feed auger, remove the float module from the combine.
2. Shut down the engine, and remove the key from the ignition.
3. Rotate the auger as needed.

   NOTE:

   The illustrations in this procedure 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.
4. Remove bolts (A) and access cover (B). Retain these parts for reassembly. If necessary, remove multiple access covers.

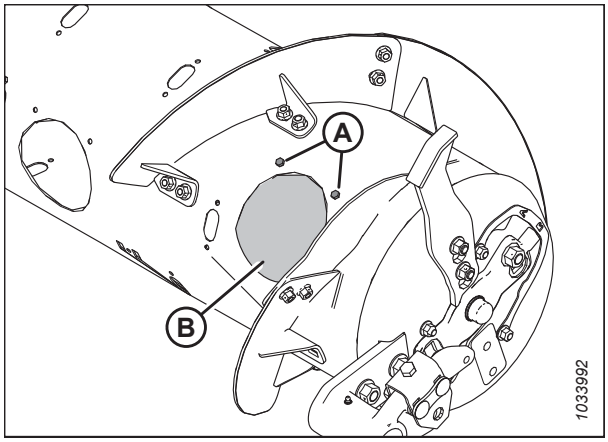


Figure 3.81: Auger Access Cover – Right Side

5. Remove bolts and nuts (B) and remove flighting (A).

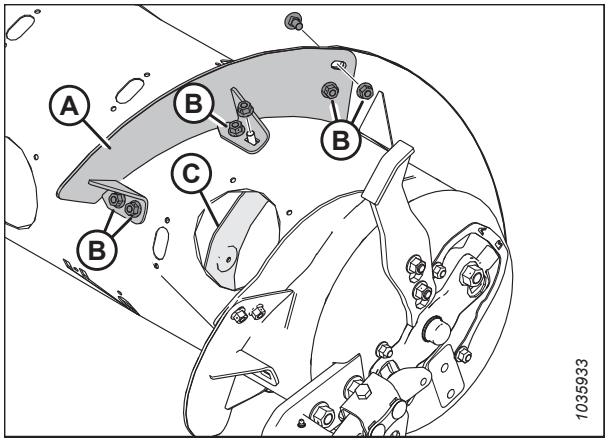


Figure 3.82: Short Flighting – Right Side

NOTE:

The illustration shows new long flighting (A) installed.

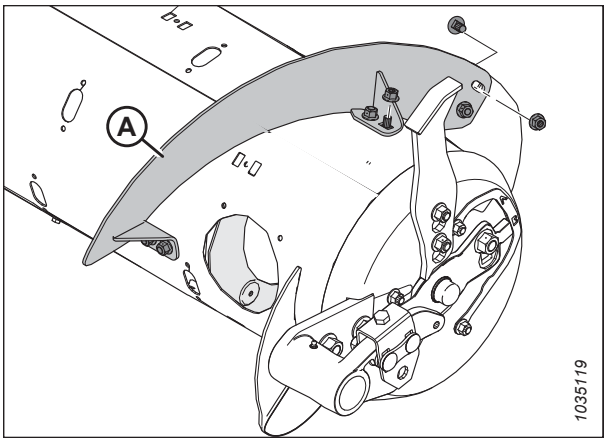


Figure 3.83: Long Flighting – Right Side

6. Install slot plug (A) with M6 bolt (B) and tee nut (C) at each location from which the flighting was removed. Torque to 9 Nm (80 lbf·in).

   NOTE:

   If the plug bolts are **NOT** new, coat them with medium-strength threadlocker (Loctite® 243 or equivalent) prior to installation.

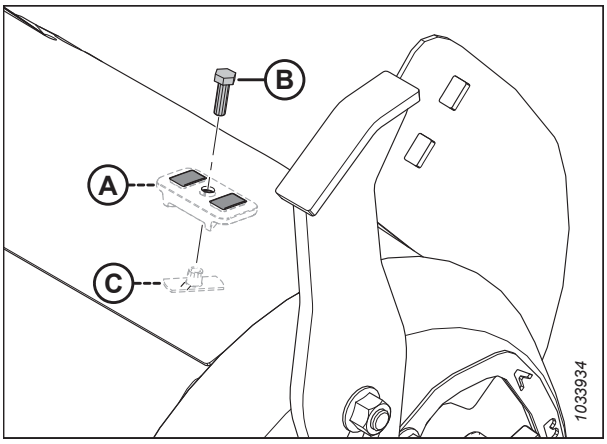


Figure 3.84: Installing Slot Plugs

7. Repeat this procedure to remove flighting (A) from the left side of the auger.

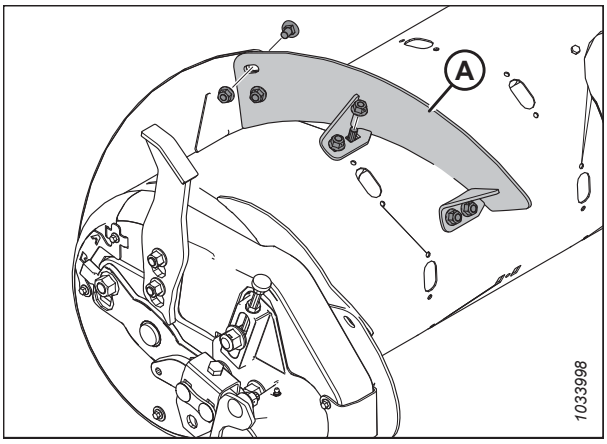


Figure 3.85: Short Flighting – Left Side

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).

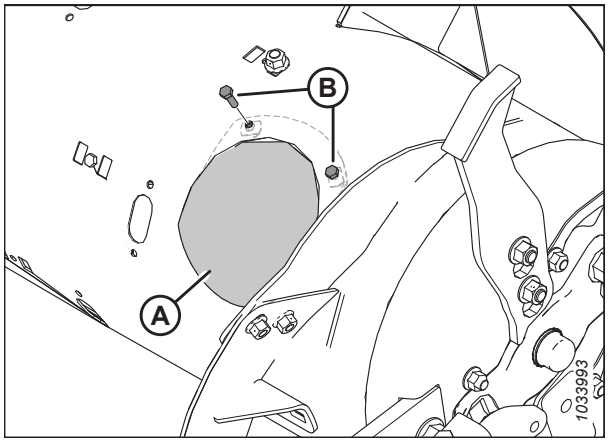


Figure 3.86: Access Cover – Right Side

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 84*.

To install bolt-on flighting, follow these steps:

1. To improve access to the feed auger and ease installation, remove the float module from the combine.
2. Shut down the engine, and remove the key from the ignition.
3. Rotate the auger as needed.

   NOTE:

   The illustrations in this procedure show the feed auger separated from the float module for clarity. This procedure can be performed with the feed auger installed in the float module.
4. Remove bolts (A) and access cover (B). Retain for reassembly. If necessary, remove multiple access covers.

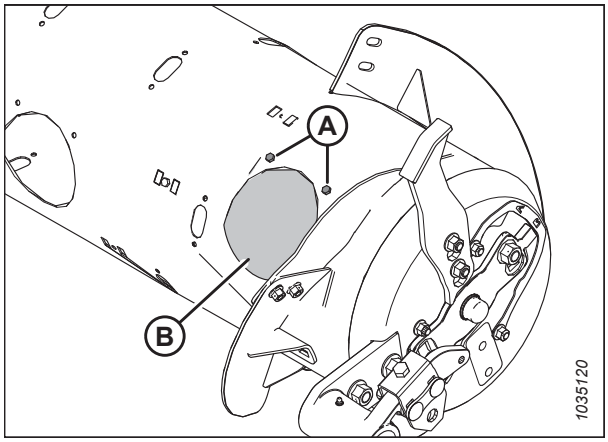


Figure 3.87: Auger Access Cover – Right Side

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.

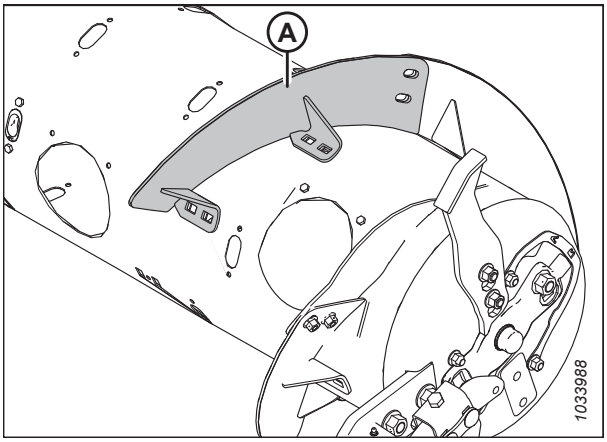


Figure 3.88: Right Side of Auger

6. Remove applicable slot plugs(s) (A).

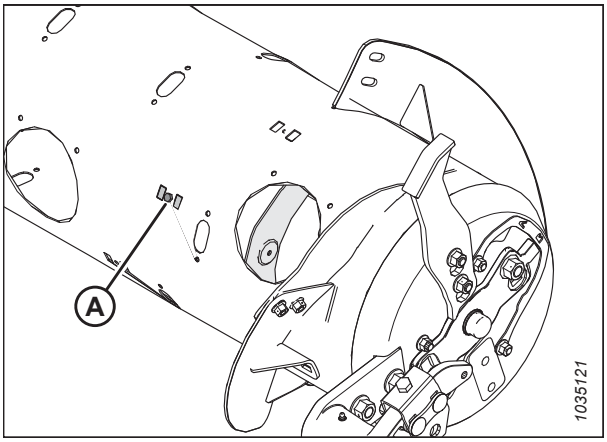


Figure 3.89: Right Side of Auger

7. Install flighting (A) using M10 x 20 mm square neck carriage bolts and center lock nuts at locations (B).

   IMPORTANT:

   The bolt heads must be installed on the inside of the auger to prevent damage to the auger's 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 torque them to 61 Nm (45 lbf·ft).

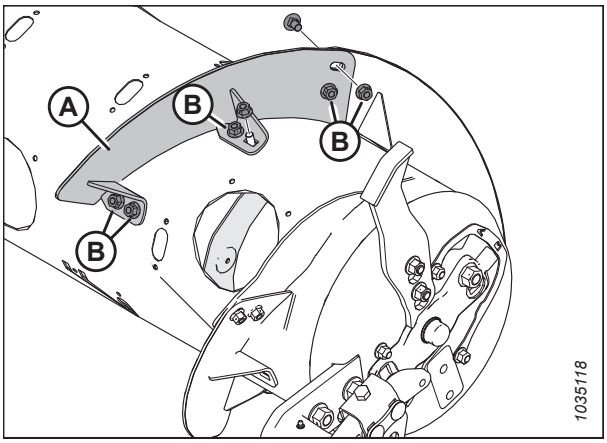


Figure 3.90: Short Flighting – Right Side

NOTE:

The illustration shows long flighting (A) installed.

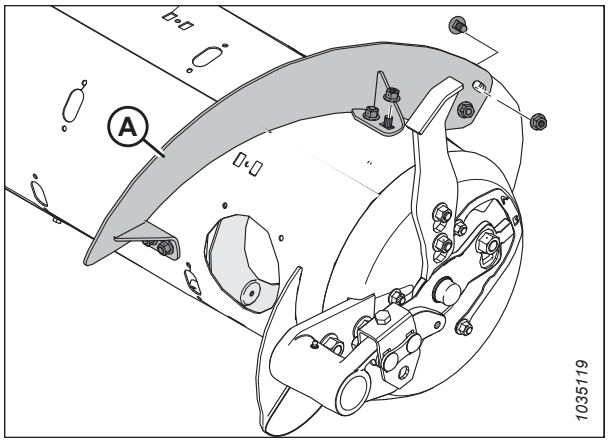


Figure 3.91: Long Flighting – Right Side

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.

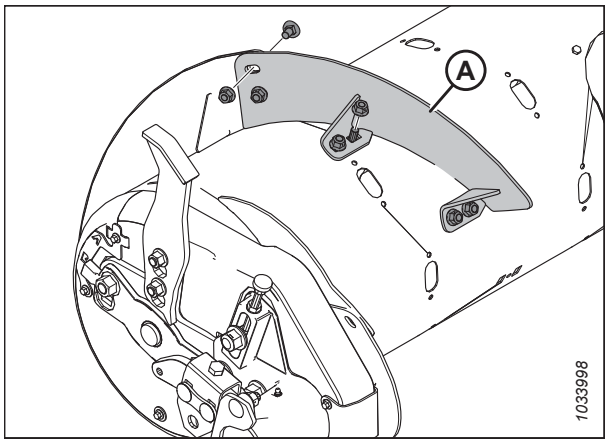


Figure 3.92: Short Flighting – Left Side

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).

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 105*.

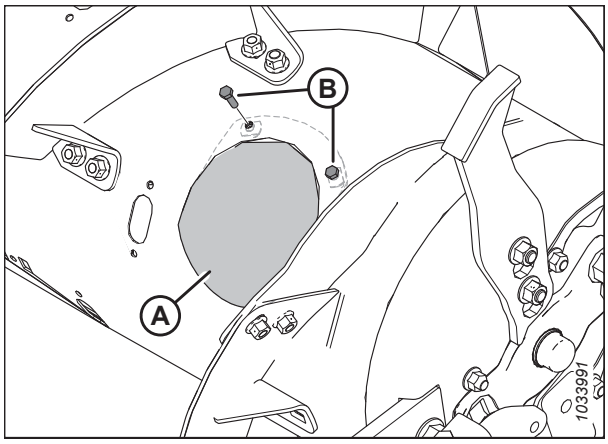


Figure 3.93: Access Cover – Right Side

Installing Additional Bolt-On Flighting – Ultra Narrow Configuration Only

When converting the feed auger to Ultra Narrow configuration, some hole drilling is required to install additional flighting.

NOTE:

This procedure assumes the feed auger is currently in Narrow configuration (4 long flightings [A] installed).

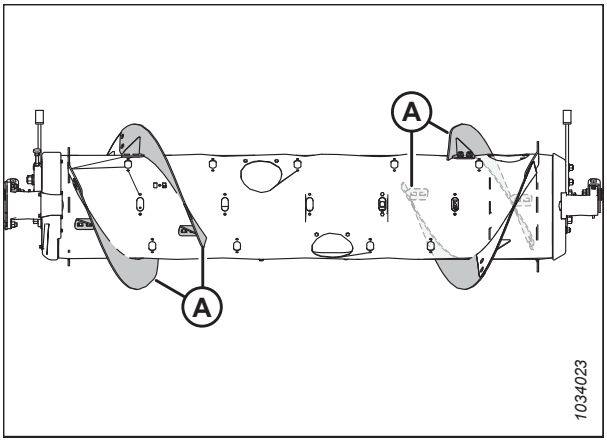


Figure 3.94: Narrow Configuration

To install the four additional long flightings for Ultra Narrow configuration, follow these steps:

1. To improve access to the feed auger and ease installation, remove the float module from the combine.
2. Shut down the engine, and remove the key from the ignition.
3. Rotate the auger as needed.

   NOTE:

   The illustrations in this procedure show the feed auger separated from the float module for clarity. This procedure can be performed with the feed auger installed in the float module.
4. Place new flighting (A) outboard of existing flighting (B) on the left side of the auger, as shown.
5. Mark hole locations (C) onto existing flighting (B).
6. Remove nearest access cover to existing flighting (B). Retain the hardware for reassembly.
7. Remove existing bolt-on flighting (B) from the auger. Retain the hardware for reassembly.

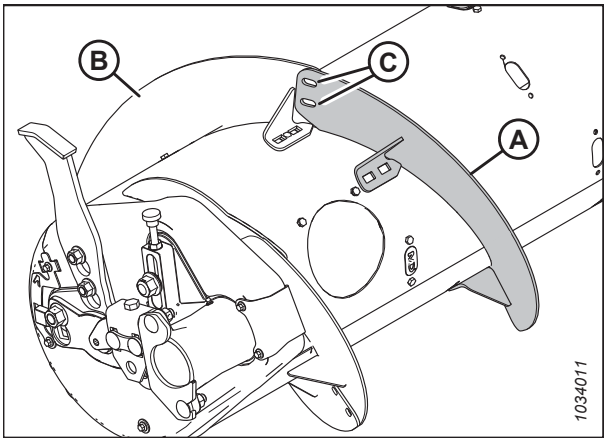


Figure 3.95: Left Side of Auger

8. Drill two 11 mm (7/16 in.) holes at the marked locations (A) on the existing flighting.

9. Reinstall the existing bolt-on flighting.

   IMPORTANT:

   Ensure the carriage bolt heads are on the inside of the auger to prevent damage to the internal components.

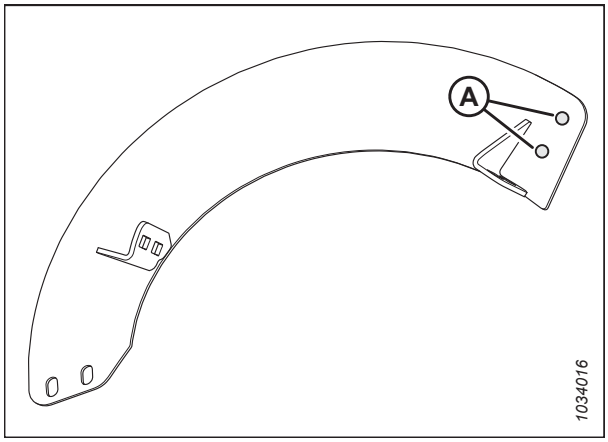


Figure 3.96: Drilling Locations

10. Place new flighting (A) into position on the auger, outboard of existing flighting (B).

11. Secure with two M10 x 20 mm button head bolts and center lock nuts (C).

    IMPORTANT:

    Ensure the bolt heads are on the inboard side (crop side) and the nuts are on the outboard side of the flighting.

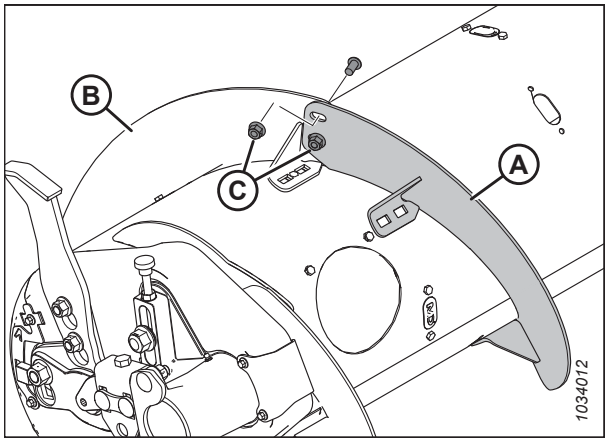


Figure 3.97: Left Side of Auger

12. Stretch flighting (A) to fit the auger tube as shown. Use the slotted holes on the flighting to get the best fit around the auger tube.

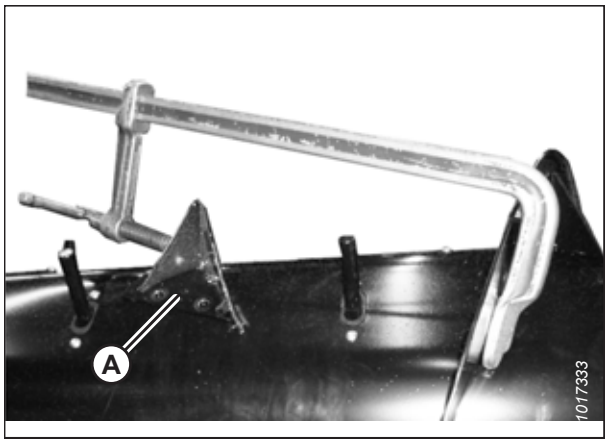


Figure 3.98: Flighting Stretched Axially

13. With the flighting in the desired position, mark four hole locations (A) and drill 11 mm (7/16 in.) holes in the auger tube.

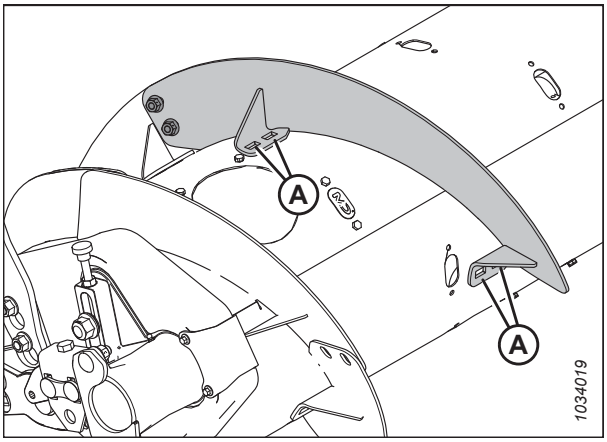


Figure 3.99: Flighting on Left Side of Auger

14. Remove nearest access cover(s) (B). Retain the cover for reinstallation.
15. Secure the flighting to the auger at drilled holes (A) using four M10 x 20 mm flange head bolts and center lock nuts.
16. Repeat Step *3, page 105* to Step *15, page 107* for the other flighting on the left side of the auger.
17. Repeat Step *3, page 105* to Step *15, page 107* for both flightings on the right side of the auger.
18. Torque all flighting nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on the flighting, then torque the nuts and bolts to 61 Nm (45 lbf·ft).

    NOTE:

    Flighting performs best when there are no gaps between the flighting and the auger drum. If desired, use silicone sealant to fill any gaps.

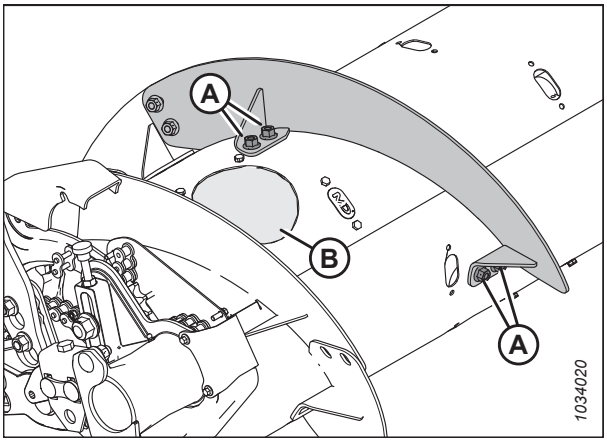


Figure 3.100: Left Side of Auger

19. 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 107* or *3.8.3 Installing Feed Auger Fingers, page 109*.
20. If you are not adding or removing auger fingers, reinstall all access covers. Coat the retained bolts with medium-strength threadlocker (Loctite® 243 or equivalent), then use them to secure the auger covers. 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.

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:

When removing auger fingers from the feed auger, work from outside inward. Make sure there is an equal number of fingers on each side of the auger.

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 37*.
5. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain parts for reinstallation.

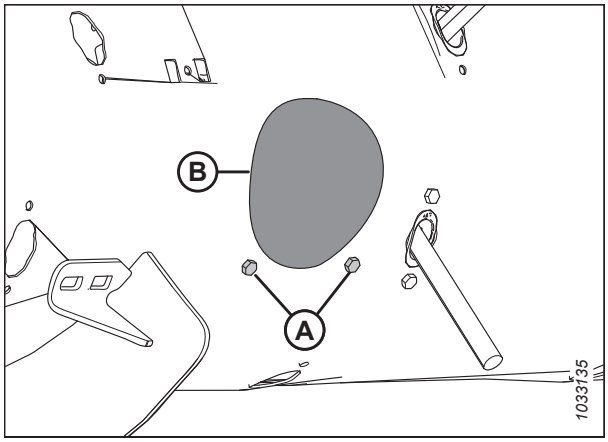


Figure 3.101: Auger Access Hole Cover

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.

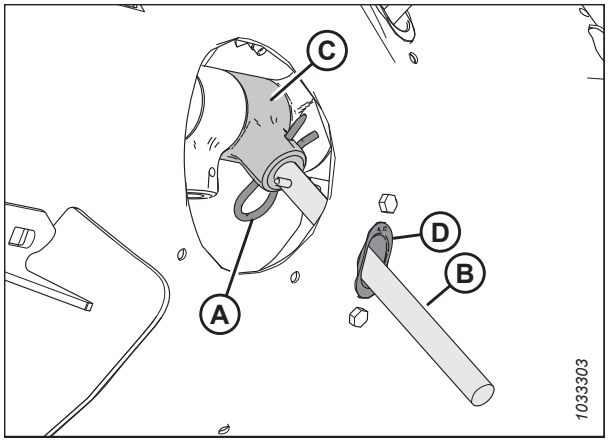


Figure 3.102: Auger Finger

7. Remove and retain two bolts (A) and tee nuts (not shown) securing finger guide (B) to the auger. Remove guide (B).

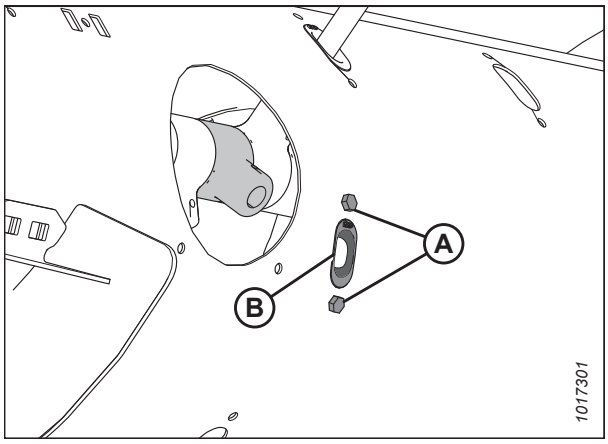


Figure 3.103: Auger Finger Hole

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.

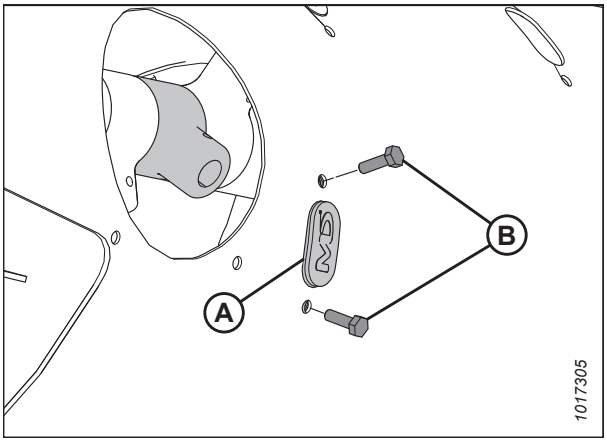


Figure 3.104: Plug

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.

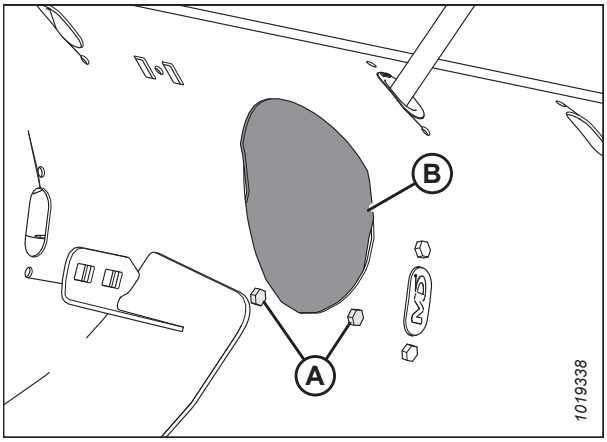


Figure 3.105: Auger Access Hole Cover

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.

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:

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 37*.

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).

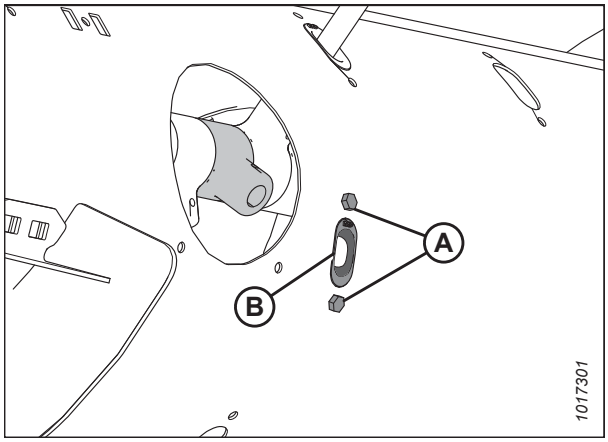


Figure 3.106: Auger Finger Hole

6. Place auger finger (A) inside the drum. Insert one end of auger finger (A) up through the bottom of guide (B) and insert the other end into holder (C).

7. Secure the finger by inserting hairpin (D) into the holder. Make sure the round end (the 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 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 the auger's internal components.

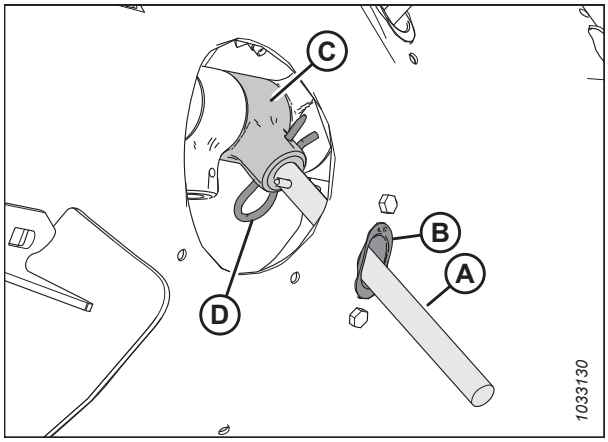


Figure 3.107: Auger Finger

8. 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.

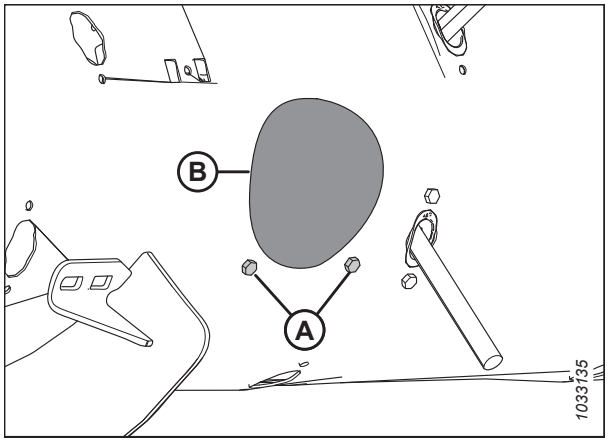


Figure 3.108: Auger Access Hole Cover

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.

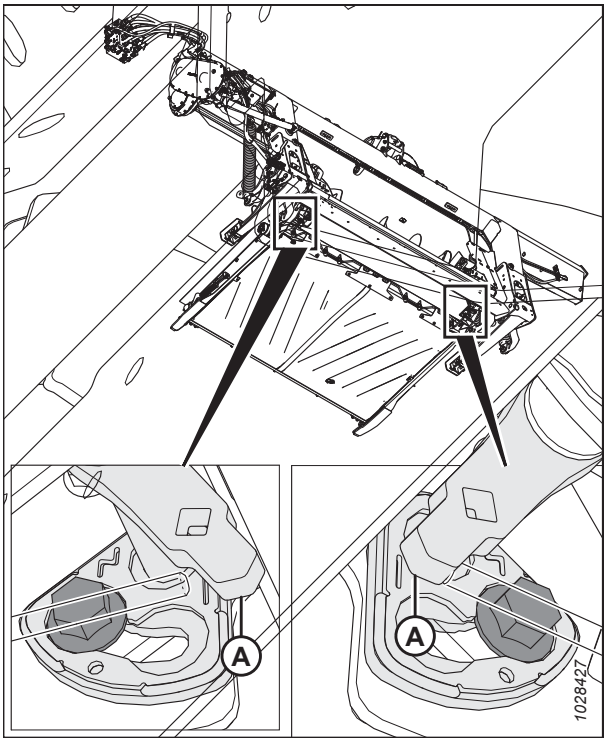


Figure 3.109: Auger Float Adjustment Arms

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.

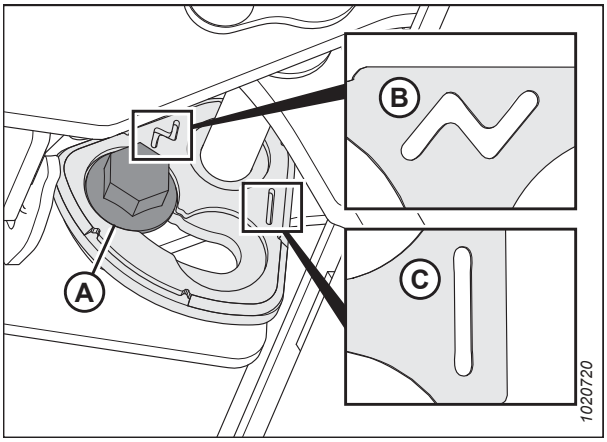


Figure 3.110: Auger Float Positions

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 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).

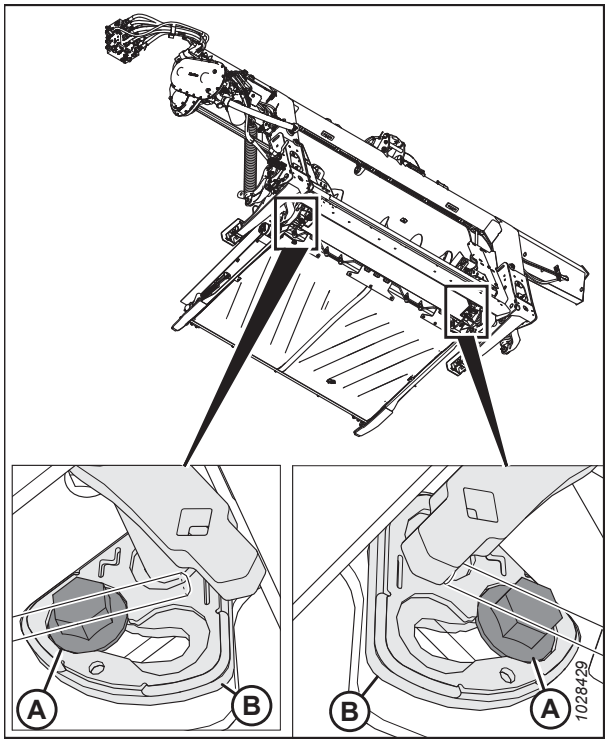


Figure 3.111: Feed Auger Float Adjustment

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 the recess on the bracket before tightening the bolt. If arm (B) can be moved after tightening the 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.

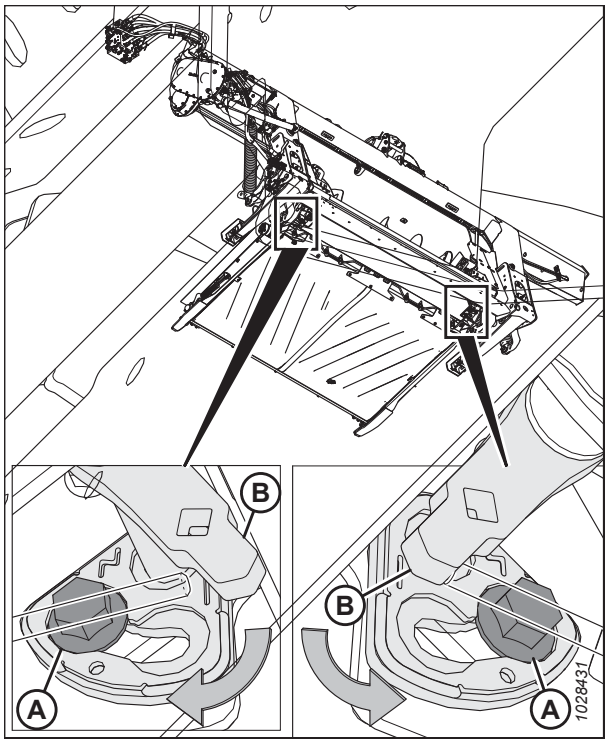


Figure 3.112: Feed Auger Float Adjustment

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. For instructions, refer to the combine operator's manual.
5. Check the thread length protruding past nut (A). The length should be 22–26 mm (7/8–1 in.).

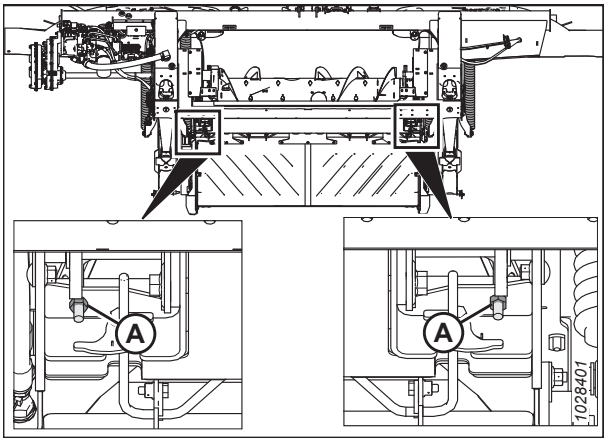


Figure 3.113: Spring Tensioner

If adjustment is required, follow these steps:

6. Loosen upper jam nut (A) on the spring tensioner.

   NOTE:

   The 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 113* to *8, page 113* on the opposite side.

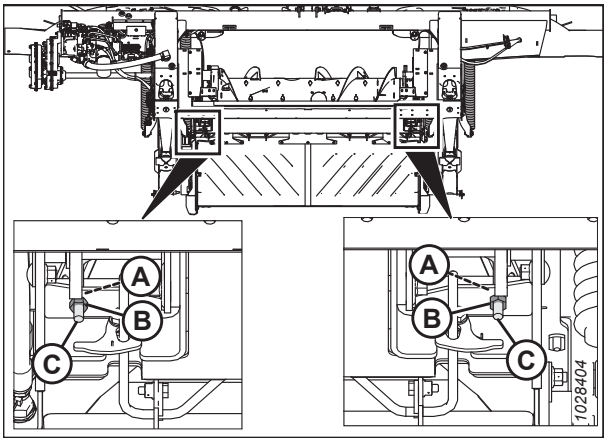


Figure 3.114: Spring Tensioner

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 Stripper Bars, page 368*.

3.9 Header Operating Variables

The header will perform better if you adjust it to suit your specific 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 *, page 115* 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.

Operating Variables

Variable	Refer to
Cutting height	*3.9.1 Cutting off Ground, page 115* *3.9.2 Cutting on Ground, page 118*
Header float	*3.9.3 Header Float, page 120*
Header angle	*3.9.4 Header Angle, page 131*
Reel speed	*3.9.5 Reel Speed, page 133*
Ground speed	*3.9.6 Ground Speed, page 135*
Draper speed	*3.9.7 Side Draper Speed, page 135*
Knife speed	*3.9.9 Knife Speed Information, page 138*
Reel height	*3.9.10 Reel Height, page 139*
Reel fore-aft position	*3.9.11 Reel Fore-Aft Position, page 144*
Reel tine pitch	*3.9.12 Reel Tine Pitch, page 152*
Crop divider rods	*3.9.14 Crop Dividers, page 159*
Feed auger configurations	*3.8.1 FM200 Feed Auger Configurations, page 84*

3.9.1 Cutting off Ground

The header's design allows you to cut crop above the ground, which results in stubble being cut to a uniform height.

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.

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 116* to change the wheel position.

If the EasyMove™ Transport option is installed, refer to *Adjusting EasyMove™ Transport Wheels, page 117* 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 66* for recommended use in specific crops and crop conditions.

NOTE:

When cutting off the ground using stabilizer wheels: If stubble is uneven when cutting off the ground on stabilizer wheels, and other common header leveling problems have been eliminated (refer to *3.11 Leveling Header, page 217*), then adjust float until the stubble height is even:

- Loosen the float springs (make the header heavier) on the side of the header where the stubble is high.
- Tighten the float springs (make the header lighter) on the side of the header where the stubble is low.

IMPORTANT:

Set the float using the standard float adjustment procedure (*Checking and Adjusting Header Float, page 121*) when cutting on the ground. Poor performance and potential wear will occur if using the stabilizer wheels float settings while cutting on the ground.

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.
2. Shut down the engine, and remove the key from the ignition.
3. Hold axle pivot handle (B); do **NOT** lift the handle.

   NOTE:

   Lifting the handle will make the system harder to take out of slot (C).
4. Pull suspension handle (A) rearward to remove the pin from slot (C).
5. Lift the wheel to the desired height position using support (B), and engage the support channel into center slot (C) in the upper support.
6. Suspension handle (A) should snap into the slot. If not, push in (for middle and lower position) or pull in (for top position) the suspension handle to ensure it is seated in the slot.
7. Use the combine's auto header height control (AHHC) to automatically maintain cutting height. For instructions, refer to *3.10 Auto Header Height Control System, page 180* 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.

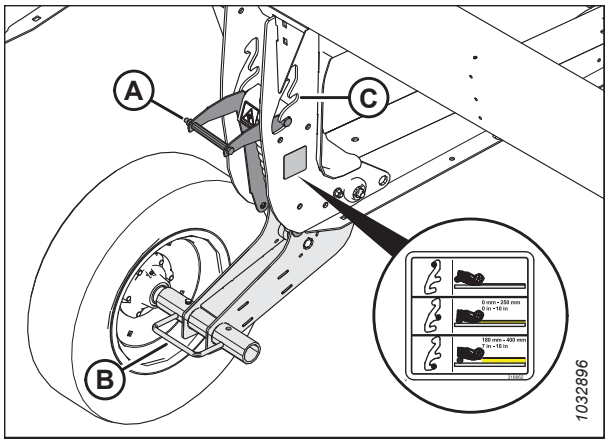


Figure 3.115: Stabilizer Wheel

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 121*.
4. Hold axle pivot handle (C); do **NOT** lift the handle.

   NOTE:

   Lifting the handle will make the system harder to take out of slot (B).
5. Pull suspension handle (A) rearward to remove the pin from slot (B).
6. Adjust the wheel to the desired slot position.
7. Suspension handle (A) should snap into the slot. If not, push in (for middle position) or pull in (for top position) the suspension handle to ensure it is seated in the slot.

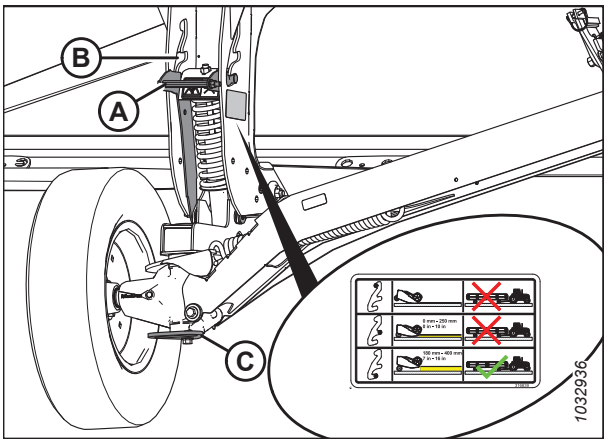


Figure 3.116: Right Wheel

8. Hold axle pivot handle (A); do **NOT** lift the handle.

   NOTE:

   Lifting the handle will make the system harder to take out of the slot.
9. Pull suspension handle (B) rearward to remove the pin from the slot.
10. Adjust the wheel to the desired slot position.

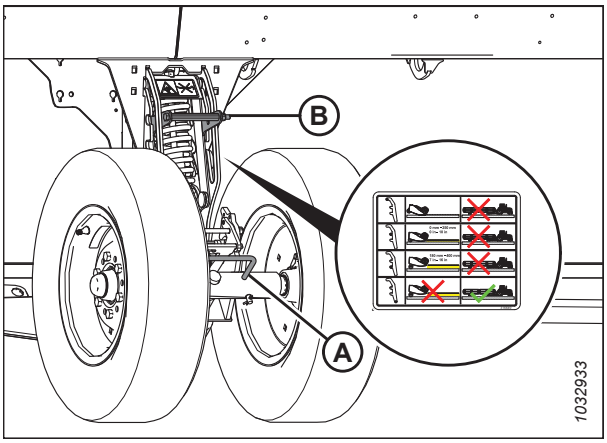


Figure 3.117: Left Wheel

11. Suspension handle (B) should snap into the slot. If not, pull out the suspension handle to ensure it is seated in 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 System, page 180* and your combine operator's manual.

    NOTE:

    The height sensor on the FM200 Float Module must be connected to the combine header control module in the cab.

3.9.2 Cutting on Ground

Cutting height will vary depending on crop type, crop conditions, cutting conditions, etc.

Cutting on the ground is performed with the 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 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.

The header float system compensates for 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 118*
- *Adjusting Outer Skid Shoes, page 119*
- *3.9.3 Header Float, page 120*
- *3.9.4 Header Angle, page 131*

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.

IMPORTANT:

Running skid shoes in the down position can result in accelerated wear of the skid shoe wear plates.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the combine operator's manual.
4. Raise the stabilizer wheels or transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting Stabilizer Wheels, page 116*
   - *Adjusting EasyMove™ Transport Wheels, page 117*

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.
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 120*.

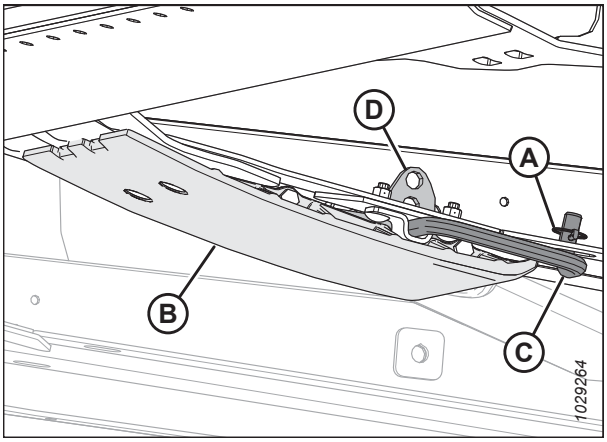


Figure 3.118: Inner Skid Shoe

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.

IMPORTANT:

Running skid shoes in the down position can result in accelerated wear of the skid shoe wear plates.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the combine operator's manual.
4. Raise the stabilizer wheels or transport wheels fully (if installed). For instructions, refer to the following:
   - *Adjusting Stabilizer Wheels, page 116*
   - *Adjusting EasyMove™ Transport Wheels, page 117*

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 120*.

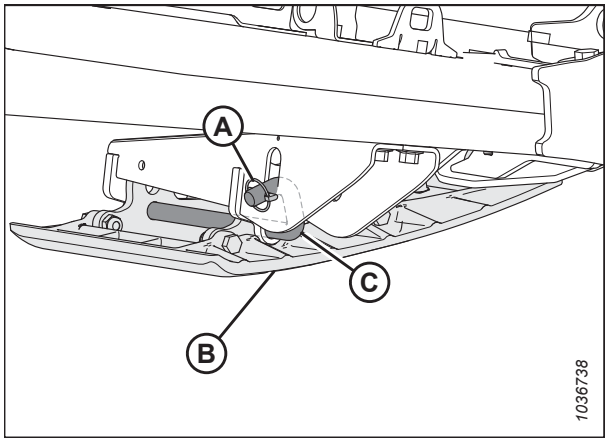


Figure 3.119: Outer Skid Shoe

3.9.3 Header Float

The header float system supports the majority of the header weight to reduce 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.

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.

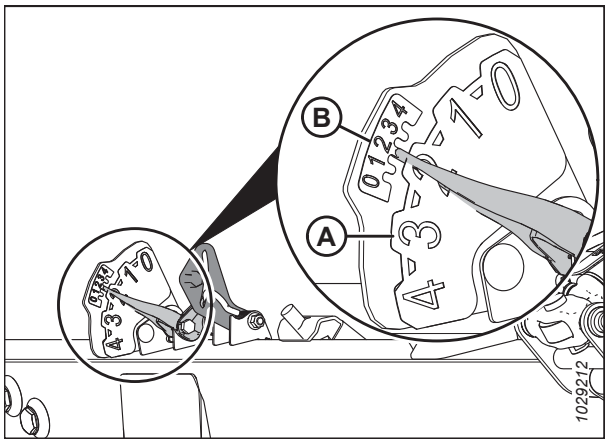


Figure 3.120: Float Indicator – Left Side

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 121*.

The D2 Series draper header for combines 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 131*.
   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 off Ground, page 115*.
   b. Note the float value on the float indicator and maintain this value during operation (disregard minor fluctuations on the indicator).

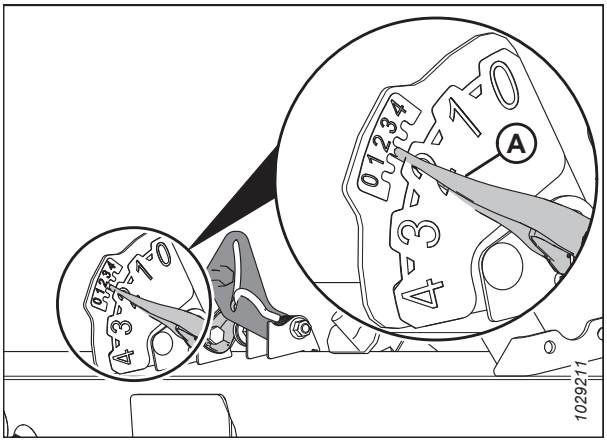


Figure 3.121: Cutting on the Ground

Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for changes in ground elevation. If the header float is not set properly, the cutterbar may scoop soil or leave crop uncut. If the float setting is not satisfactory, it will need to be inspected and adjusted.

IMPORTANT:

Do **NOT** use the float module springs to level the header.

Use the following guidelines when adjusting the float:

- Set the header float as light as possible, but not so light that the header bounces when the combine is moving. This will help prevent knife breakage, soil pushing, soil build-up at the cutterbar in wet conditions, and excessive wear to the skid plates.
- To prevent the header from bouncing excessively and cutting unevenly when the float is light, operate the combine at a lower ground speed.
- To cut crop while the header is above ground level, use the stabilizer wheels in conjunction with the header float. This will minimize bouncing at the header ends and will help regulate the cut height. For instructions, refer to *Adjusting Stabilizer Wheels, page 116*.

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:

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, page 126*.

To check and adjust the float settings, do the following:

Preliminary steps

1. Park the combine on a level surface.
2. Locate spirit level (A) on top of the float module frame. Ensure that the bubble is in the center. If adjustment is required, refer to *3.11 Leveling Header, page 217*.
3. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.

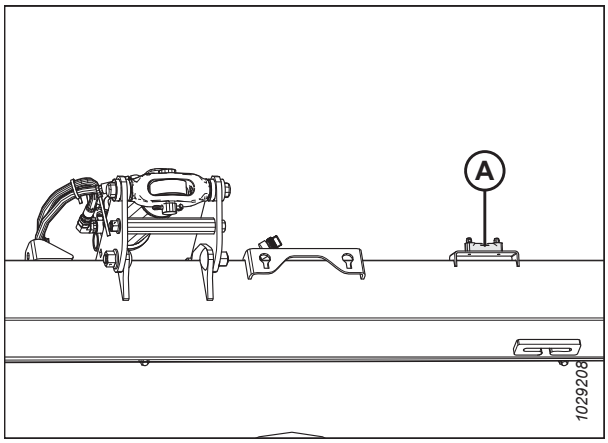


Figure 3.122: Spirit Level

4. Adjust the reel fore-aft position so that the indicator on left indicator bracket (A) is at position 6.

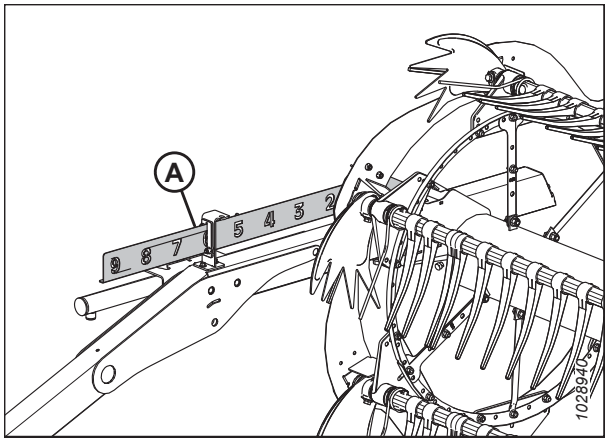


Figure 3.123: Fore-Aft Position

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. If transport wheels are installed on the header, move the transport wheels to the uppermost position.

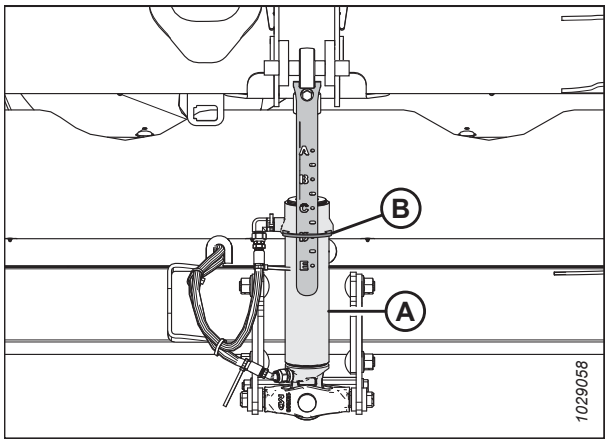


Figure 3.124: Center-Link

9. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D). Tighten the nut on bolt (A).

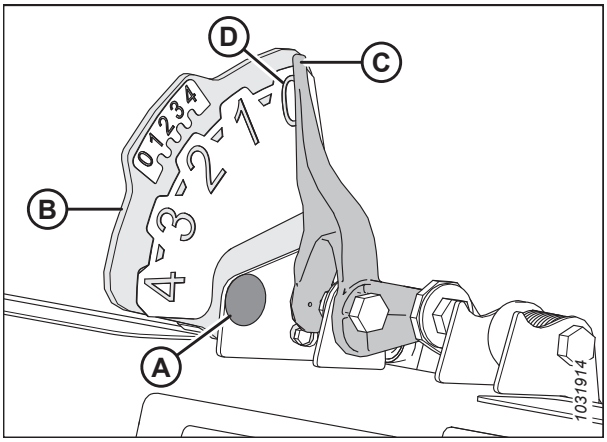


Figure 3.125: Float Indicator

10. On the left side of the float module, pull float lock handle (A) away from the float module, and pull the float lock handle down and into position (B) (UNLOCK).

11. Repeat the previous step on the right side of the float module.

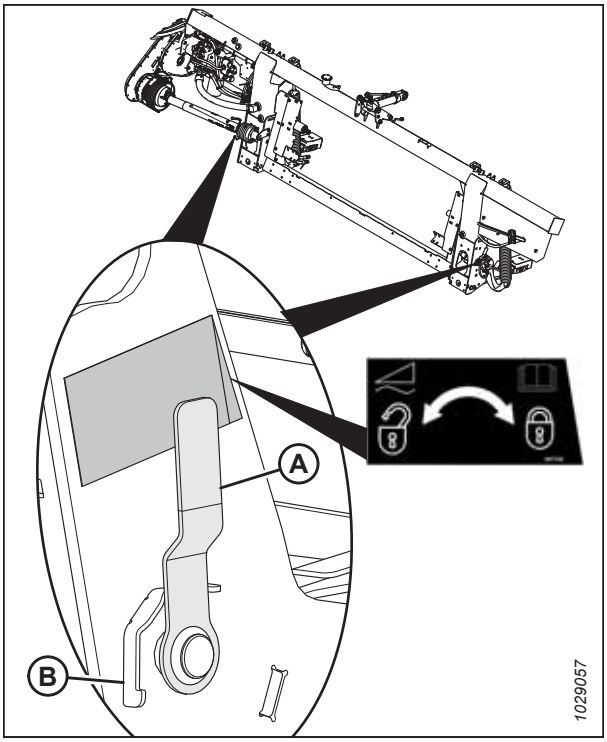


Figure 3.126: Header Float Lock in Locked Position

12. Open the left endshield. For instructions, refer to *Opening Header Endshields, page 39*.

13. Remove hairpin (A) securing multi-tool (B) to the bracket on the left endsheet.

14. Remove multi-tool (B). Replace the hairpin.

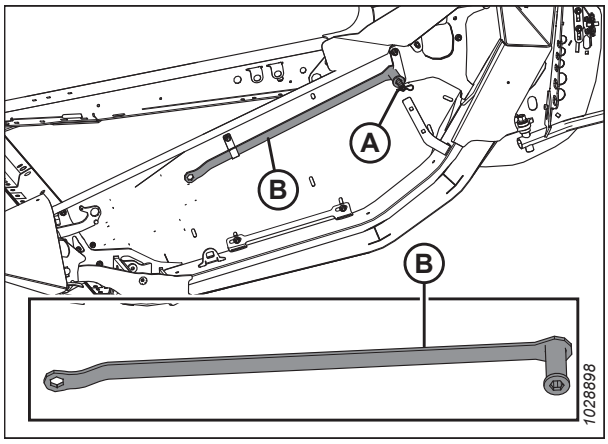


Figure 3.127: Multi-Tool Location

Setting float setting levers

15. On the left side of the float module, lift float setting lever (A) by hand so that the lever is free of slack.

16. Place the flat end of multi-tool (B) on the float setting lever as shown. The multi-tool should be angled slightly toward the front of the float module.

    IMPORTANT:

    To prevent damage to the float setting lever, ensure that multi-tool (B) is fully engaged with the lever.

WARNING

Once the float setting lever has been set, remove the multi-tool from the lever IMMEDIATELY. If the lever falls to its starting position while the multi-tool is engaged with it, injury can occur.

17. Pull multi-tool (B) toward the back of the float module until float setting lever (A) is locked into place and will not return to its original position. Remove the multi-tool.

18. Repeat Steps *15, page 124* to *17, page 124* to set the right float setting lever.

    IMPORTANT:

    Both the left and the right float setting levers must be set before the float on either side of the header can be adjusted.

19. Place the multi-tool back in its storage location. Secure the multi-tool with the hairpin.

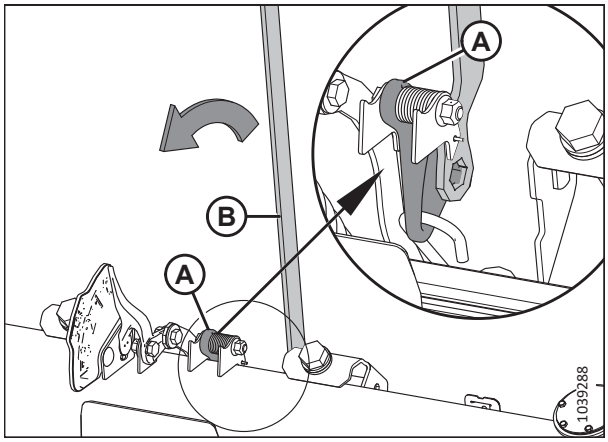


Figure 3.128: Multi-Tool Engaged with Left Float Setting Assembly

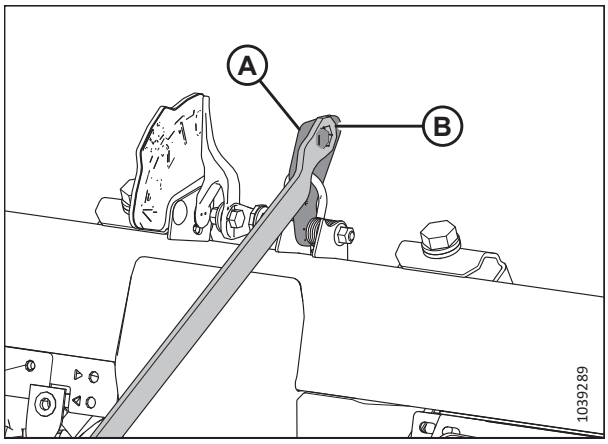


Figure 3.129: Left Float Setting Lever in Set Position

Checking float

20. Set the left float by pushing the left end of the header down by approximately 76 mm (3 in.). Allow the header to rise. Repeat this step at least three times.

    NOTE:

    Moving the left side of the header up and down ensures that the reading on the left float setting indicator (FSI) will be accurate.

21. On the left side of the float module, inspect smaller float setting indicator (FSI) (B). Arm (A) on the FSI should point to the number 2.

    - If arm (A) on FSI (B) points to a value higher than 2, the float is too heavy.
    - If arm (A) on FSI (B) points to a value lower than 2, the float is too light.

    NOTE:

    The larger set of numbers is used to determine the float height setting. They are used when the header is being operated in the field.

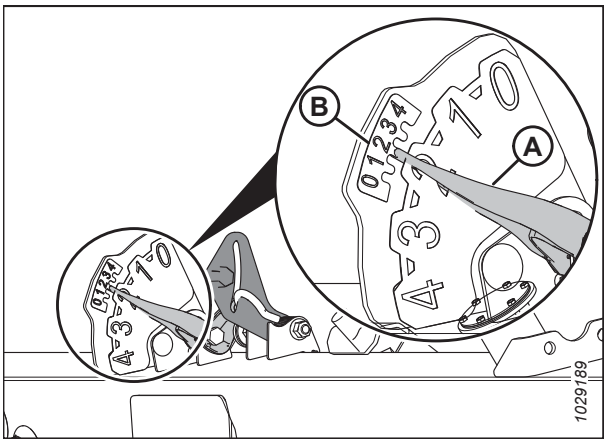


Figure 3.130: Left Float Setting Indicator

Adjusting float

22. On the left side of the float module, loosen bolts (C). Move spring locks (B) so that bolt heads (A) are accessible.

23. Increase or decrease the float on the left side of the float module as needed:

    - To increase the float, turn both left adjustment bolts (A) clockwise.
    - To decrease the float, turn both left adjustment bolts (A) counterclockwise.

    NOTE:

    Each pair of bolts (A) must be adjusted by the same amount.

24. Set the left float again. Refer to Step *20, page 125* for instructions.

25. Check the left FSI indicator again. Refer to Step *21, page 125* for instructions.

26. If the left float setting is not satisfactory, repeat Step *23, page 125* to Step *25, page 125* until the left float setting is satisfactory.

27. Check and adjust the right float. For instructions, refer to Step *20, page 125* to Step *26, page 125*.

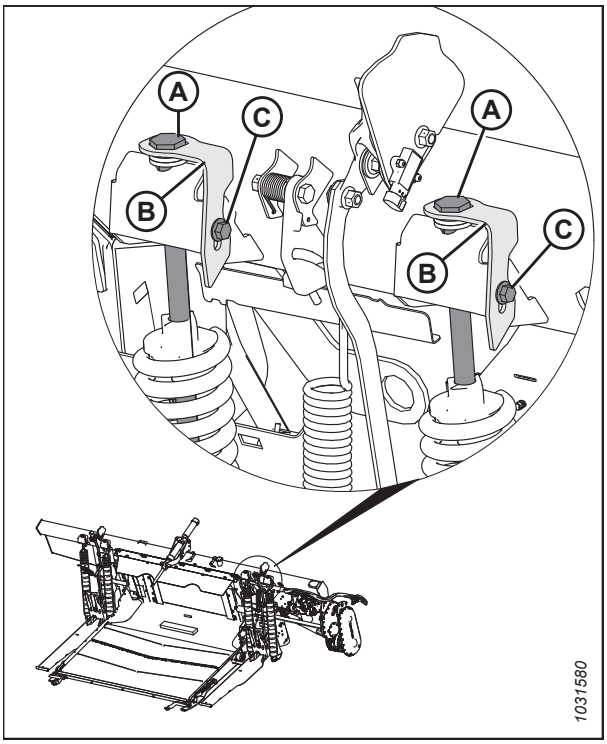


Figure 3.131: Left Float Adjustment

28. On both sides of the float module, lock adjustment bolts (A) with spring locks (B). Ensure that bolt heads (A) are engaged in the spring lock cutouts. Tighten bolts (C) to secure the spring locks.

Releasing float setting levers

29. Start the engine.

WARNING

Do NOT use the multi-tool to release the float setting lever. Using the multi-tool to release the float setting lever can result in injury.

30. Use the combine to fully lower the header.

NOTE:

This will cause the left and right float setting levers to return to their original positions.

Changing Float Spring Configuration

The header's float spring configuration is determined by the weight of the header. If the weight of the header has changed (for example, due to the addition of optional equipment), the float spring configuration may need to be changed. To determine the appropriate float spring configuration, the weight of the header and optional equipment must be calculated.

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.

Determining header weight and spring configuration

1. Refer to Table , *page 126* to determine the total header weight according to the following formula:

(A) Base Header Weight (no options)	+	**(B)** Dividers Weight (if installed)	+	**(C)** and **(D)** Option Weight (sum of all options)	=	**Total Header Weight**

Header Component Weights

Category	Header Model	Knife Configuration	Reel Configuration	Weight
(A) Base header weight – select one	D225	Single	Single	1,850 kg (4,079 lb.)
	D230	Single	Double	2,300 kg (5,070 lb.)
	D235	Single	Double	2,500 kg (5,512 lb.)
	D241	Double	Double	2,800 kg (6,173 lb.)
	D245	Double	Double	2,950 kg (6,504 lb.)

Header Component Weights (continued)

(B) Dividers – select up to one option	**Divider Option Installed**	20 kg (44 lb.)
	Rice divider rods	
	Vertical knives	185 kg (408 lb.)[54]
(C) Upper cross auger (UCA) – select one size option[55]	**UCA Option Installed**	142 kg (312 lb.)
	9.1 m (30 ft.) two-piece auger	
	10.7 m (35 ft.) two-piece	156 kg (343 lb.)
	12.5 m (41 ft.) two-piece	163 kg (360 lb.)
	13.7 m (45 ft.) three-piece	191 kg (420 lb.)
(D) Other options – add any installed options	**Option Installed**	379 kg (835 lb.)
	Transport wheels	
	Stabilizer wheels	160 kg (353 lb.)

2. Using the total header weight determined in the previous step, refer to *, page 127* to determine which weight range the header is in, and therefore what float spring configuration is most appropriate for the header.

   NOTE:

   Generally, heavier headers will need the float springs placed in the front float lever hole; lighter headers will use the back hole. Some headers have only one possible float spring configuration.

Float Spring Installation Location in Float Lever

Header Model	Knife Configuration	Reel Configuration	Lighter Weight Range	Float Lever Hole	Heavier Weight Range	Float Lever Hole
D225	Single	Single	Use the back hole on the float lever for all configurations			
D230	Single	Double	Use the back hole on the float lever for all configurations			
D235	Single	Double	Use the back hole on the float lever for all configurations			
D241	Double	Double	2,800–3100 kg (6173–6834 lb.)	Back	3101–3490 kg (6837–7694 lb.)	Front
D245	Double	Double	2,950–3,200 kg (6504–7055 lb.)	Back	3,201–3,710 kg (7057–8179 lb.)	Front

3. If the float spring configuration needs to be changed, proceed to the next step.

Changing float spring configuration

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

54. Weight includes B7029 and B7410 (hydraulic package for D245).
55. Add 24.5 kg (54 lb.) for hydraulic plumbing, if this was installed separately.

5. Lock the header float by pulling the float lock handle into position (A) on the left side of the float module.

   NOTE:

   The float is unlocked when the handle is in position (B).

6. Repeat the previous step to set the float lock handle on the other side of the float module.

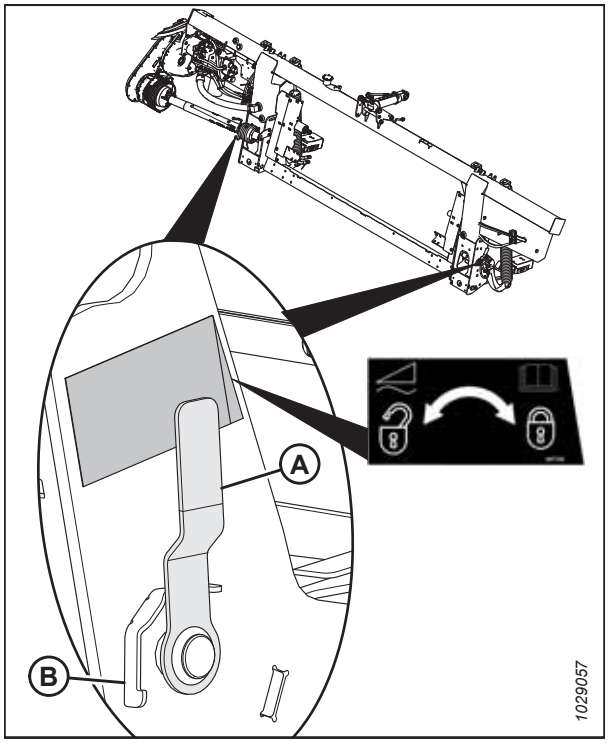


Figure 3.132: Header Float Lock in Locked Position

7. Access float spring adjustment bolts (A) by loosening bolts (C) and rotating spring locks (B) forward.

8. Loosen adjustment bolts (A) by making small adjustments to each bolt, one after the other, in identical increments, until the springs are loose.

   NOTE:

   The adjustment bolts will rise slightly above the washers when the springs are loose.

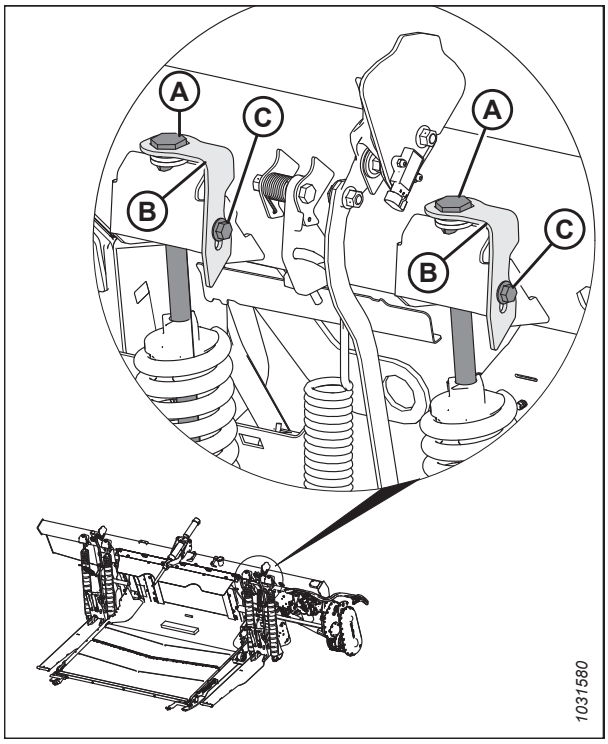


Figure 3.133: Left Float Adjustment

9. Remove cotter pin (C) from pin (A).
10. Remove pin (A) and washers (B).

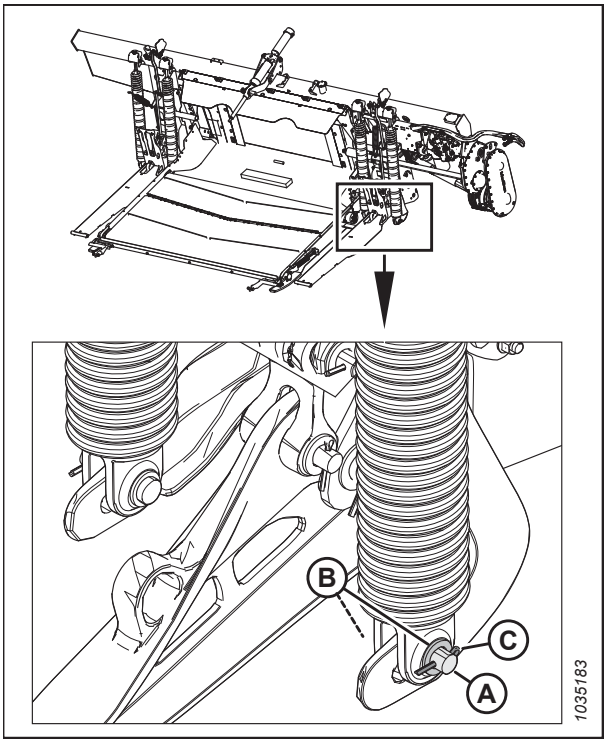


Figure 3.134: Left Float Spring Installed in Rear Float Lever Hole

11. Align the spring with front float lever hole (A) or back float lever hole (B) according to the specifications in Table *, page 127*.

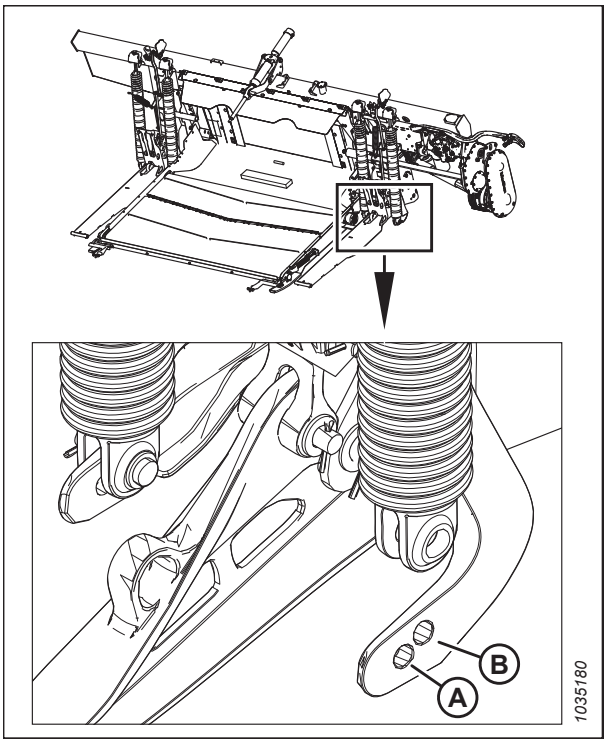


Figure 3.135: Left Float Spring Installed in Rear Float Lever Hole

12. Install pin (A) and two washers (B) into the new hole.
13. Secure the pin with cotter pin (C).
14. Repeat Step *9, page 129* to Step *13, page 130* to configure other spring (D).

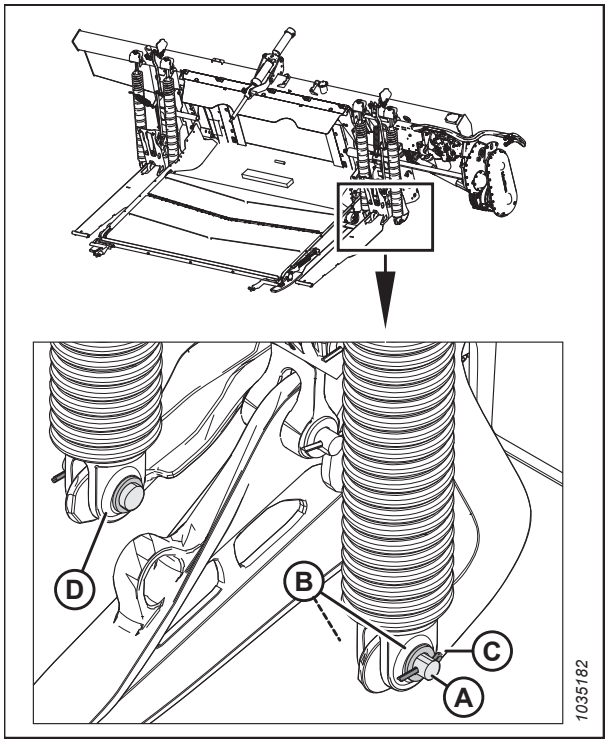


Figure 3.136: Left Float Spring – Installed in Rear Float Lever Hole

15. Retighten adjustment bolts (A) by making small adjustments to each bolt, one after the other, in identical increments, until the float springs are the same length.
16. Repeat Step *7, page 128* to Step *15, page 130* on the pair of float springs (B) on the opposite side of the float module.
17. Check and adjust the float. For instructions, refer to *Checking and Adjusting Header Float, page 121*.

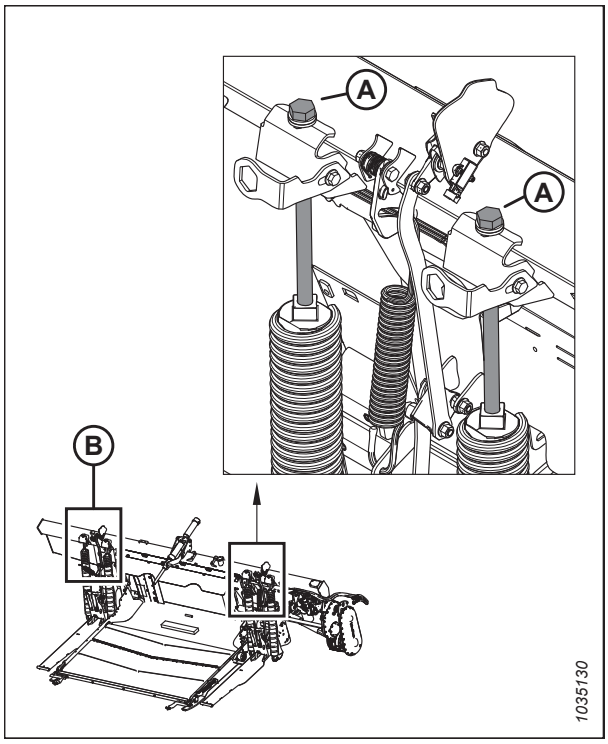


Figure 3.137: Float Adjustment – Left

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 the float module from the combine to enable the feeder house to release the float module.

To disengage (unlock) the 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) the float locks, push float lock handle (A) into position (C). In this position, the header cannot move with respect to the float module.

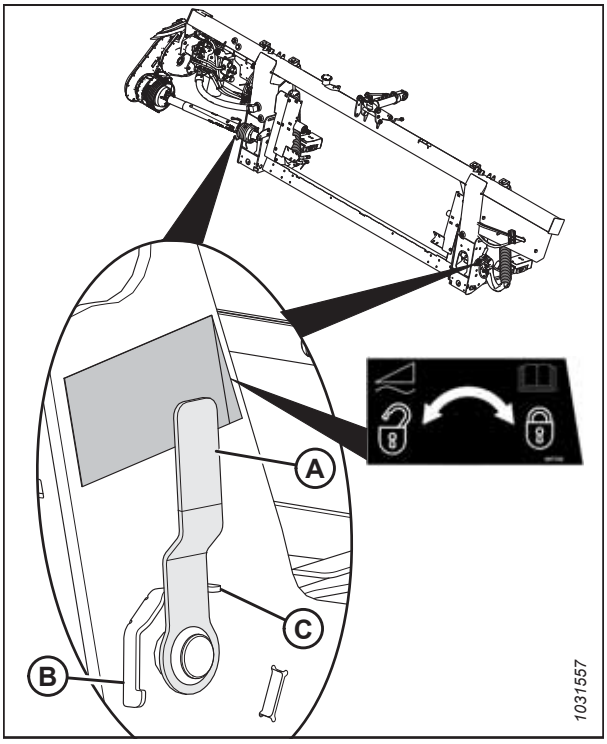


Figure 3.138: Float Lock – in Locked Position

3.9.4 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 133* 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.

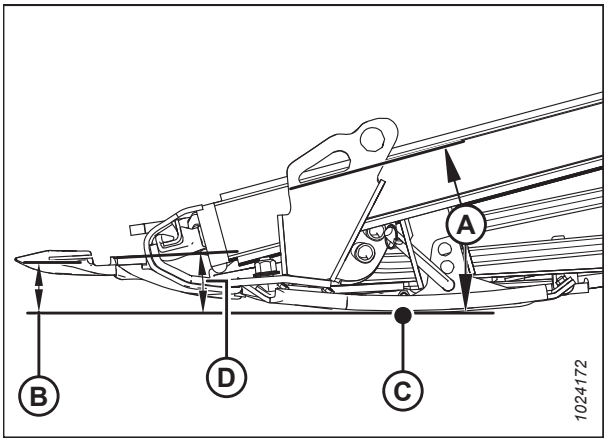


Figure 3.139: Header Angle

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.

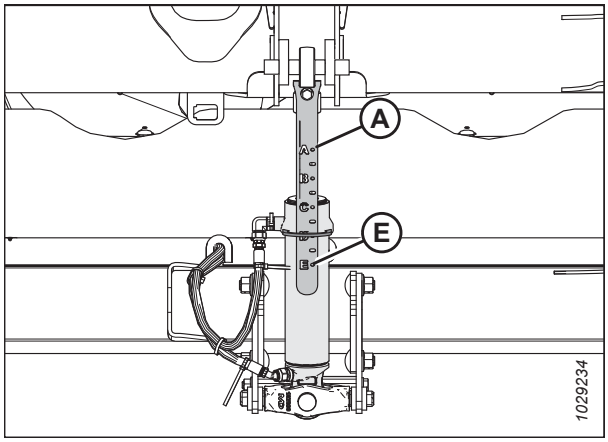


Figure 3.140: Center-Link

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.

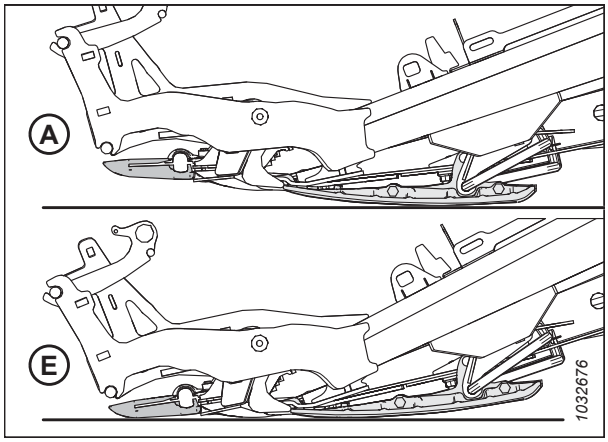


Figure 3.141: Guard Angles

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.

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).

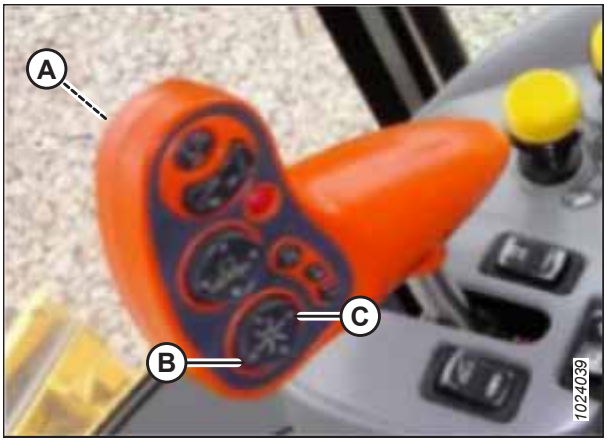


Figure 3.142: New Holland CR/CX Controls

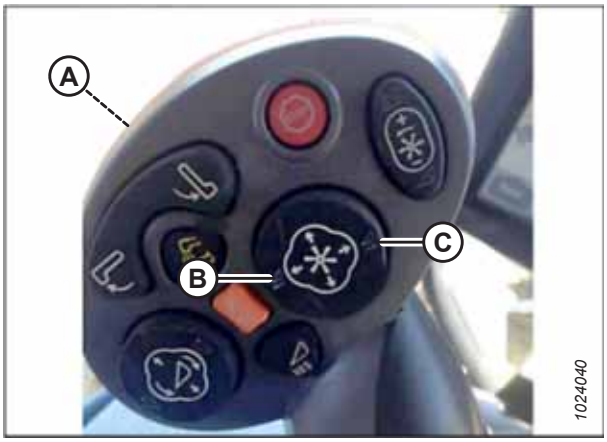


Figure 3.143: New Holland CR/CX Controls

3.9.5 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 66*.

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 specific 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 , and *, page 135*. Contact your MacDon Dealer for ordering information.

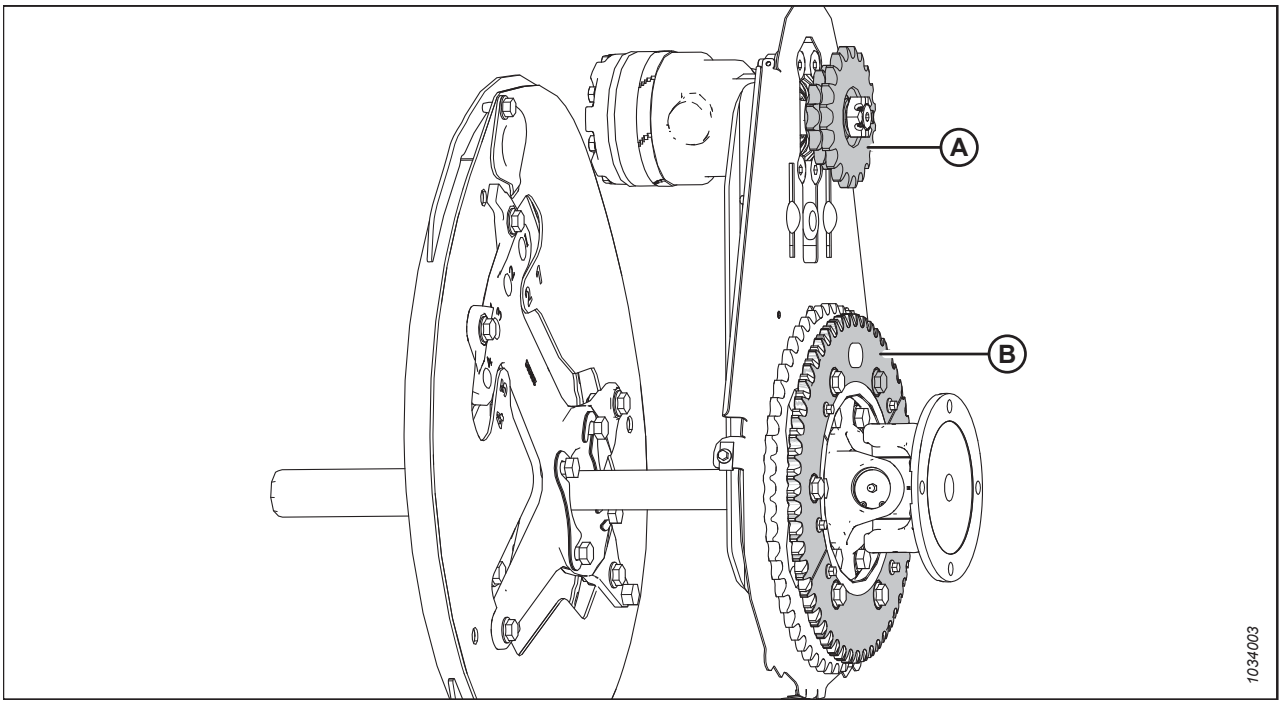


Figure 3.144: Reel Drive with Optional Sprockets

A - Dual Reel Drive Sprocket (MAC273451, MAC273452, or MAC273453)[56]

B - 52-Tooth Sprocket (MAC273689)[57]

56. These sprockets are sold separately (individual parts).
57. This sprocket is included in kit MAC311882.

Optional Sprockets

Sprocket	Machine Hydraulics	Combine	Application	Optional Drive Sprocket
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

3.9.6 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 the ground speed is increased, the draper and reel speeds should generally be increased to handle the extra material.

Figure illustrates the relationship between the ground speed and the area cut for the various sized headers.

3.9.7 Side Draper Speed

Operating with the correct draper speed is an important factor for achieving the desired flow of cut crop away from the cutterbar.

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 135*.

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.

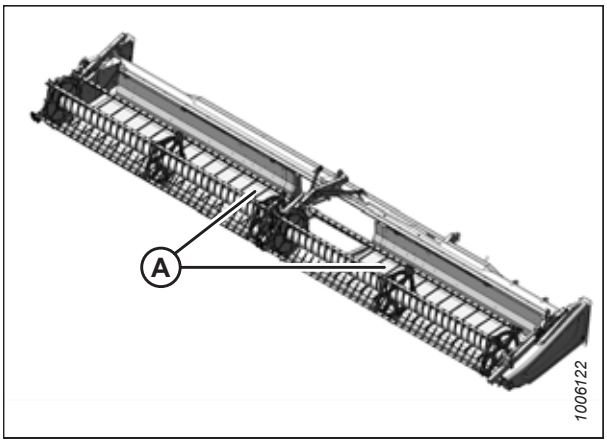


Figure 3.145: Side Drapers

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 133*.

   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 66*
   - *3.7.3 Optimizing Header for Straight-Combining Canola, page 78*

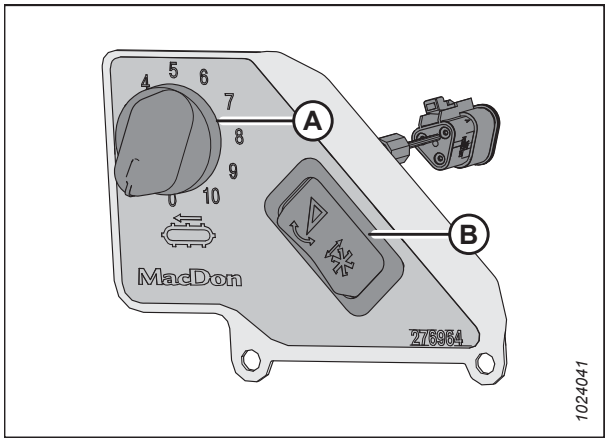


Figure 3.146: In-Cab Side Draper Speed Control

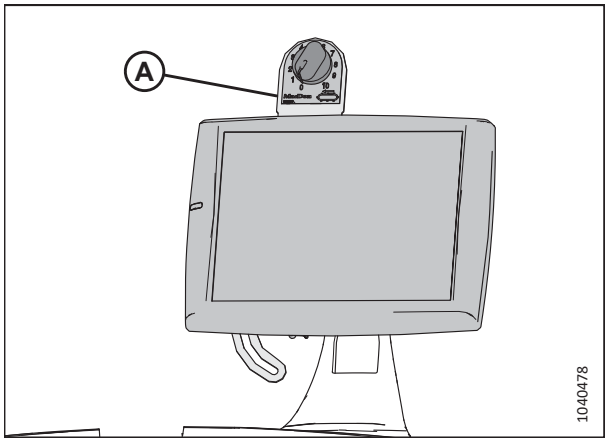


Figure 3.147: CNH In-Cab Side Draper Speed Control

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.

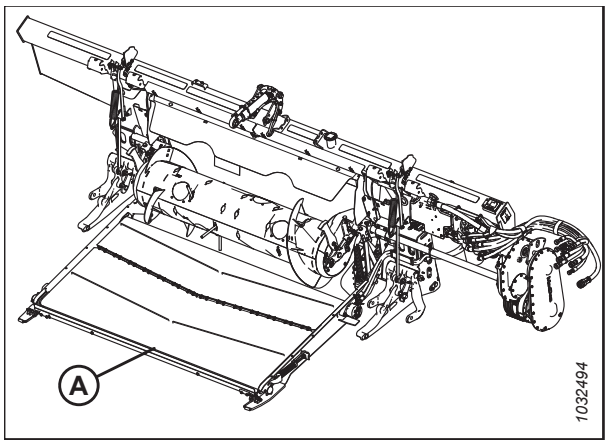


Figure 3.148: FM200 Float Module

3.9.8 Knifehead Shield

The knifehead shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cutout.

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 37*.
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. Torque bolts (B) to 11 Nm (97 lbf·in).

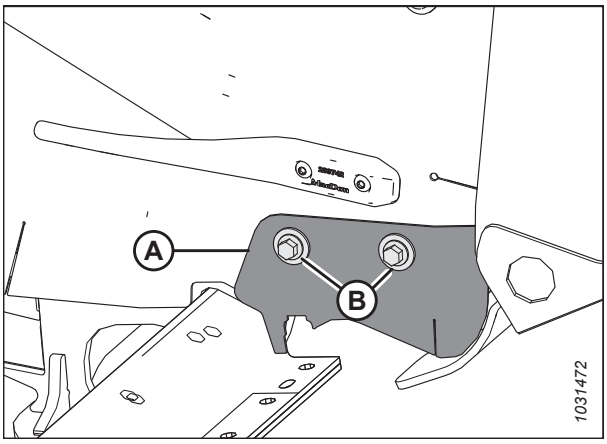


Figure 3.149: Knifehead Shield

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.

Feeder House Speed

Combine Make	Feeder House Speed (rpm)
New Holland	580

D2 Series Header Knife Speed

Header	Recommended Knife Drive Speed Range (rpm)	
	Single-Knife Drive	Double-Knife Drive
D225	600–700	—
D230	600–750	—
D235	600–700	600–750
D241	—	600–750
D245	—	600–750

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 , *page 138*. For instructions, refer to *Checking Knife Speed, page 138*.

IMPORTANT:

To avoid causing the knife to overspeed, set the knife speed while the feeder house speed is to set maximum speed.

Checking Knife Speed

For best performance, the header's knife drive must run within the specified rpm range. The knife speed can be checked at the flywheel of the knife drive motor using a photo tachometer.

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 39*.

DANGER

Ensure that 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. For maximum speed information, refer to Table , *page 139*.

   IMPORTANT:

   Before checking the 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 the header until the oil temperature is 38°C to 52°C (100°F to 125°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. Contact your MacDon Dealer if the pulley rpm measurement exceeds the specified rpm range for your header. For more information refer to *3.9.9 Knife Speed Information, page 138*.

Feeder House Speed

Combine Make	Feeder House Speed (rpm)
New Holland	580

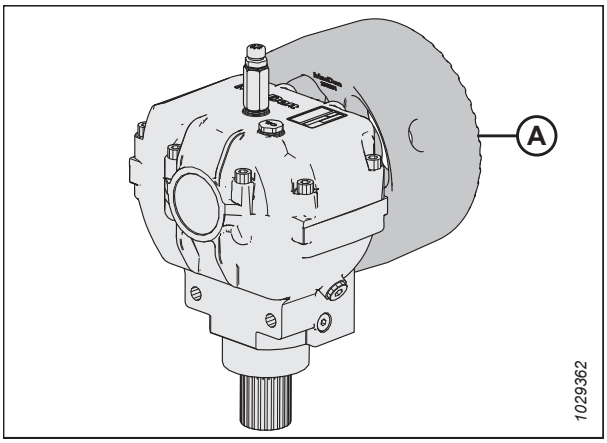


Figure 3.150: Flywheel

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.

NOTE:

One touch return presets for reel height and reel fore/aft are only available for XL headers. For more information on checking and adjusting reel height sensors refer to *Checking and Adjusting Reel Height Sensor, page 140*.

Where applicable, this manual contains instructions for presetting reel height on selected combines. Refer to *3.10 Auto Header Height Control System, page 180* for more information.

For more information on fore-aft positioning, refer to *3.9.11 Reel Fore-Aft Position, page 144*.

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 66*.

IMPORTANT:

Maintain adequate clearance to prevent fingers contacting the knife or the ground. For instructions, refer to *4.13.1 Reel-to-Cutterbar Clearance, page 389*.

Checking and Adjusting Reel Height Sensor

The orientation of the reel height sensor arm must be checked manually at the sensor. The output voltage range of the sensor can be checked either manually at the sensor or from the cab.

IMPORTANT:

Ensure that the minimum reel height is set before adjusting the reel height sensor. For instructions, refer to *4.13.1 Reel-to-Cutterbar Clearance, page 389*.

NOTE:

For in-cab instructions, refer to the combine operator's manual.

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

Ensure that all bystanders have cleared the area.

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.

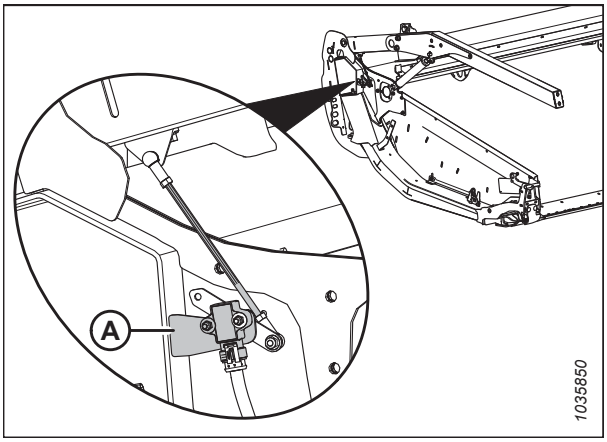


Figure 3.151: Reel Height Sensor Location

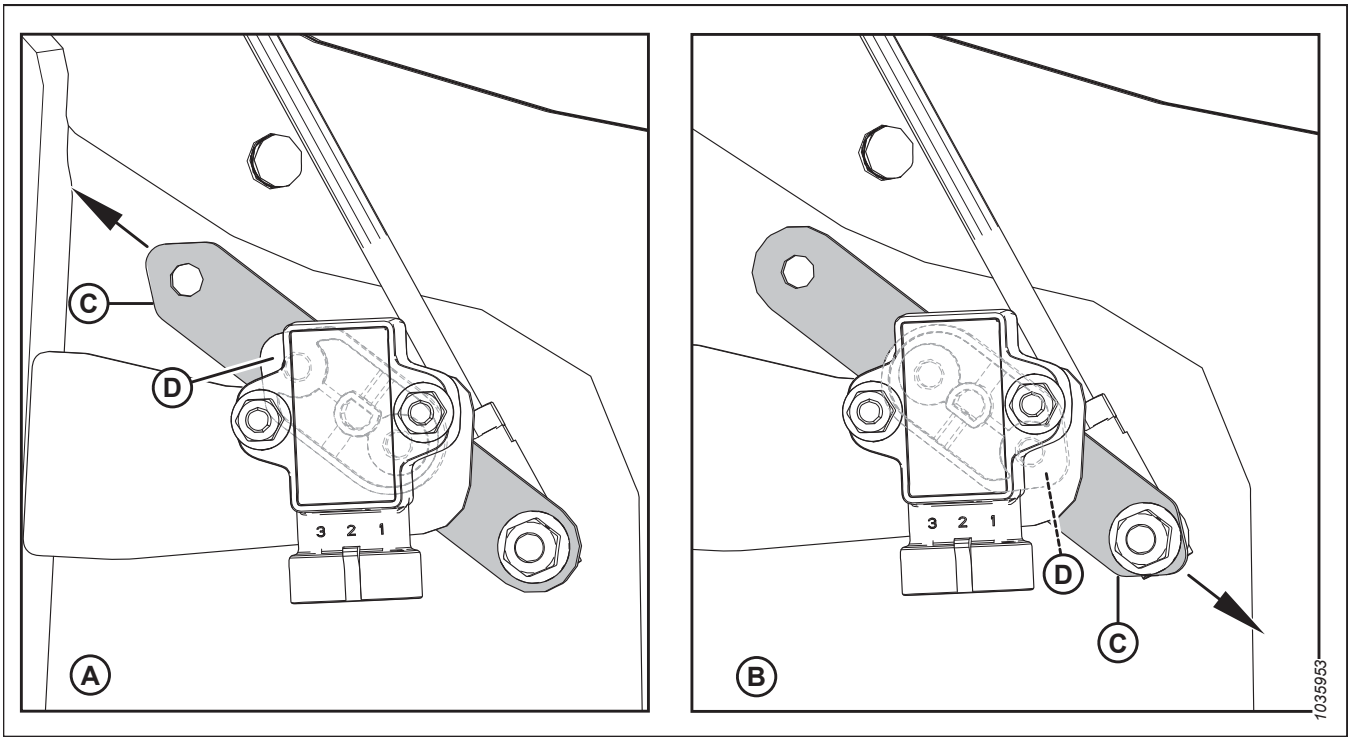


Figure 3.152: Sensor Arm/Pointer Configurations

A - Incorrect Configuration

B - Case/New Holland Configuration

C - Sensor Arm

D - Sensor Pointer (Located Between Sensor and Sensor Arm)

4. Ensure that sensor arm (C) and pointer (D) are configured properly for the header. For instructions, refer to Figure *3.152, page 141*.

   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.

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 (72.5 lbf·in).

Checking and adjusting sensor output voltage when reel is lowered

6. Engage the parking brake.
7. Start the engine. For instructions, refer to the combine operator's manual.
8. Lower the reel fully.
9. Use the combine display or a voltmeter to measure the voltage range when the reel is lowered. Refer to Table , *page 142* for the recommended voltage ranges.

Reel Height Sensor Voltage Limits

Combine Type	Recommended Voltage Range	
	Voltage with Reel Raised	Voltage with Reel Lowered
Case/New Holland	0.7–1.1 V	3.9–4.3 V

10. Shut down the engine, and remove the key from the ignition.
11. Using a voltmeter, measure the voltage between the ground (pin 2 wire) and the signal (pin 3 wire) at reel height sensor (B).
12. Ensure that the voltage is within the recommended voltage range. If the voltage is not within the range, loosen jam nuts (D) and (E), and adjust the rod length. Hand-tighten the jam nuts. Tighten the jam nuts by another quarter-turn.

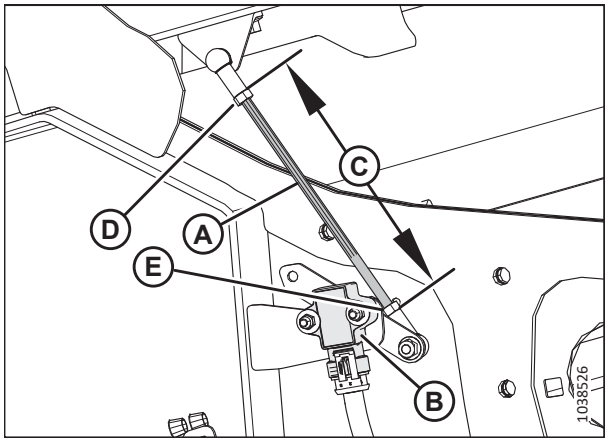


Figure 3.153: Reel Height Sensor – Right Reel Arm with Reel Down

Checking and adjusting sensor output voltage when reel is raised

13. Start the engine.
14. Fully raise the reel.
15. Use the combine display or a voltmeter to measure the voltage range when the reel is raised. Refer to Table , *page 142* for the recommended voltage ranges.
16. Shut down the engine, and remove the key from the ignition.

17. Using a voltmeter, measure the voltage between the ground (pin 2 wire) and the signal (pin 3 wire) at reel height sensor (A).
18. 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. Tighten nuts (B) to 2.5 Nm (22 lbf·in).
19. Repeat this procedure until the voltage range is within the range specified.
20. Start the engine.
21. Lower the reel fully.
22. Recheck the voltage range. Ensure that the voltage range is still within the specified values. Repeat this procedure as needed.

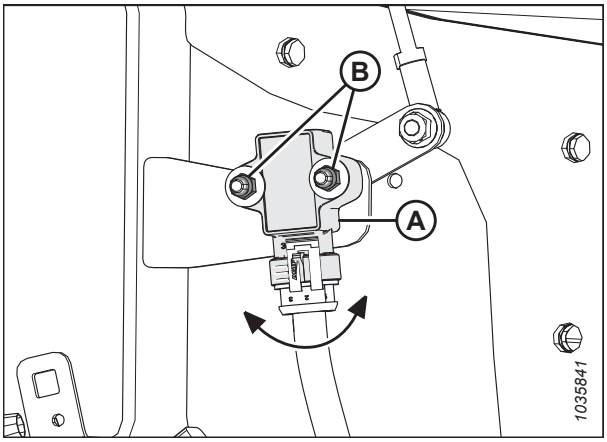


Figure 3.154: Reel Height Sensor – Right Reel Arm with Reel Up

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 from the ignition 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.

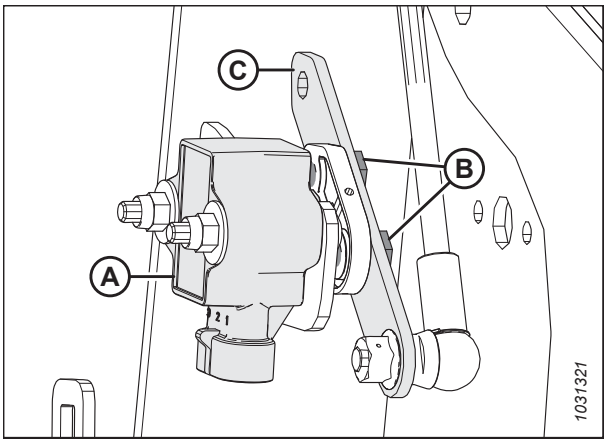


Figure 3.155: Reel Height Sensor – Right Reel Arm

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).

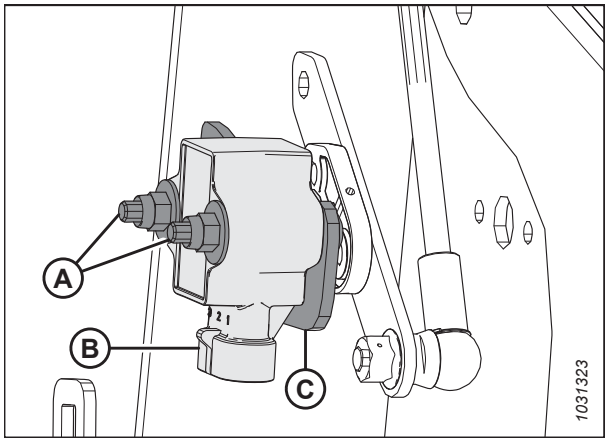


Figure 3.156: Reel Height Sensor – Right Reel Arm

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 140*.

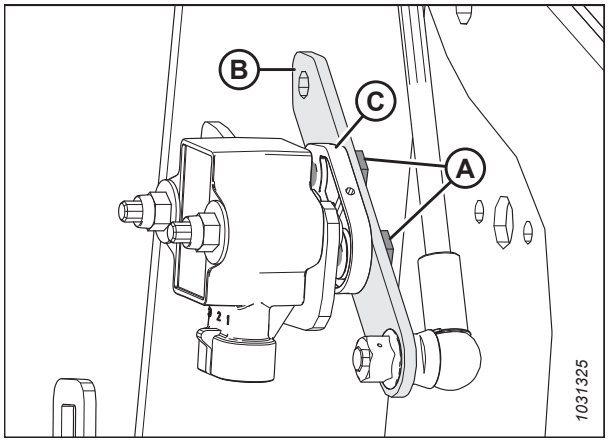


Figure 3.157: Reel Height Sensor – Right Reel Arm

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 improve the reel's performance in certain crop conditions. For instructions on repositioning the reel fore-aft cylinders, refer to *Repositioning Fore-Aft Cylinders, page 145*.

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 *3.9.4 Header Angle, page 131* for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

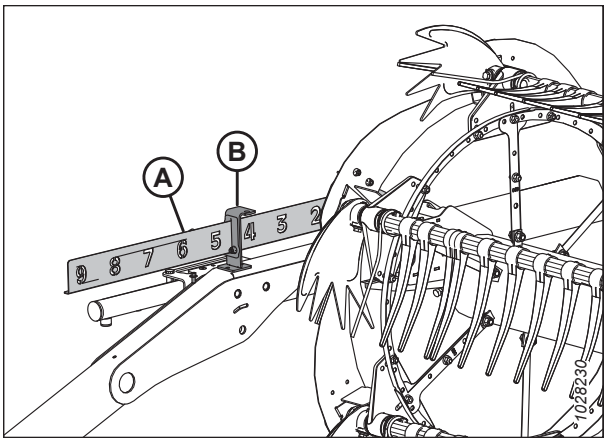


Figure 3.158: Fore-Aft Indicator

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 152* 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-to-Cutterbar Clearance, page 389*
   - *4.13.2 Reel Frown, page 394*

   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.

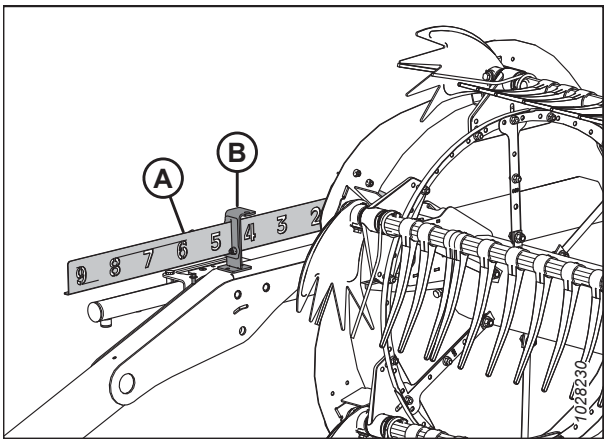


Figure 3.159: Fore-Aft Indicator

Repositioning Fore-Aft Cylinders

To accommodate certain crop conditions, the reel can be moved approximately 155 mm (6 in.) farther aft by repositioning the fore-aft cylinders on the reel arms.

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 that all fore-aft cylinders are set to the same position.

1. Adjust the reel height so that the reel arms are parallel with the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Remove hairpin (A) securing the multi-tool to the holder bracket on the left endsheet.
4. Remove multi-tool (B). Install the hairpin in the holder.

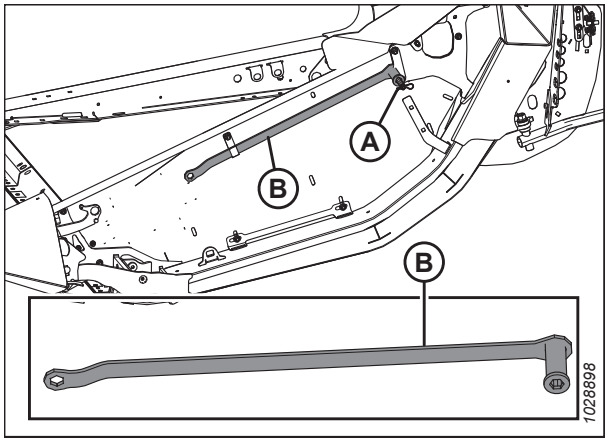


Figure 3.160: Left Endsheet

5. Refer to Figure *3.161, page 147* to determine the fore-aft cylinder adjustment procedures for your header type. The number on the illustration refers to one of the following procedures:

   - For reel arms with fore-aft cylinder adjustment [**1**] at the front, refer to Step *1, page 148*
   - For reel arms with fore-aft cylinder adjustment [**2**] at the rear, refer to Step *1, page 149*

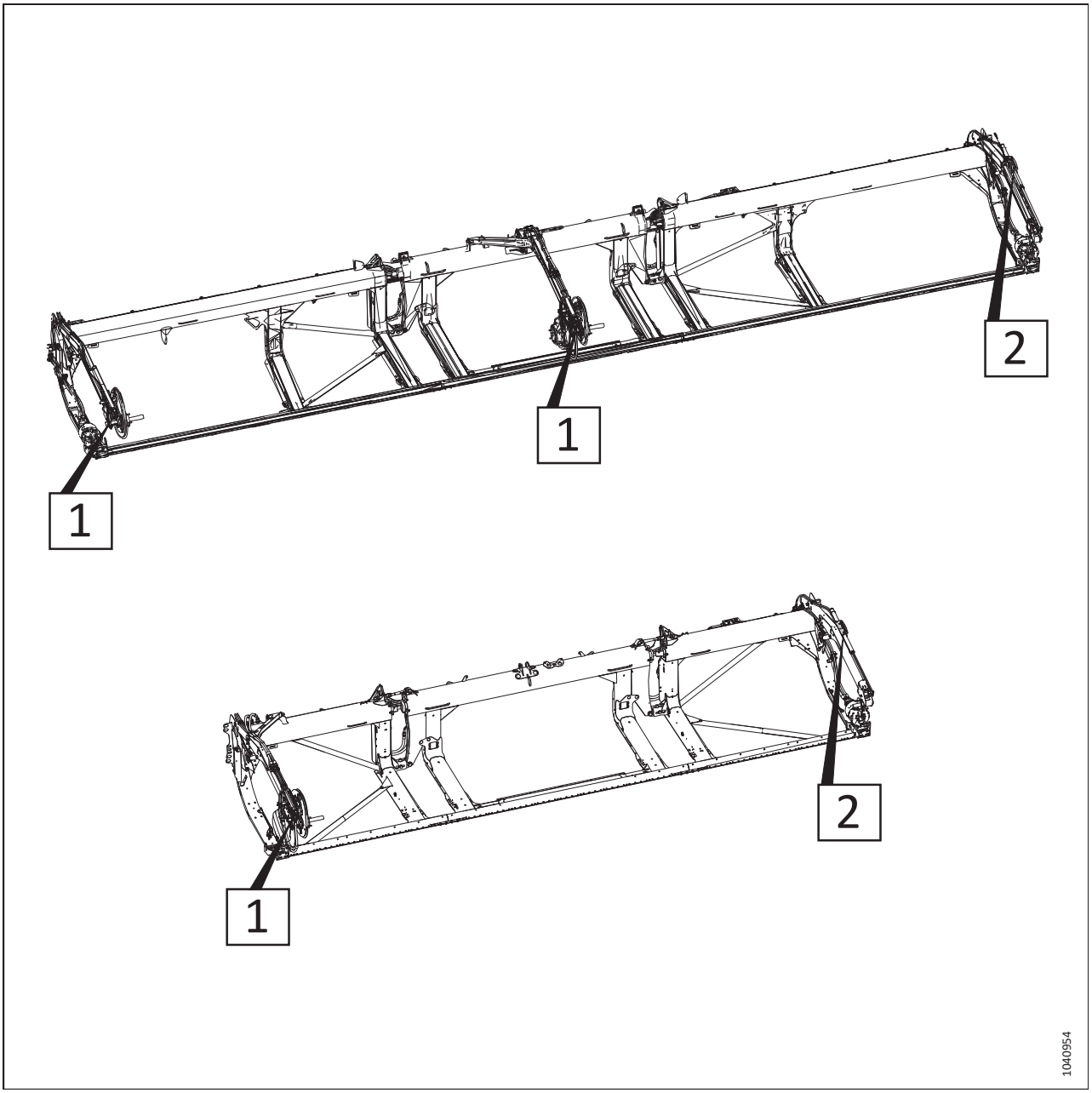


Figure 3.161: Adjustable Fore-Aft Cylinders – Procedure Reference Numbers

To change the reel position on fore-aft cylinders that adjust at the front of the reel arm, follow these steps:

1. Remove split ring (A), clevis pin (B), and flat washer (not shown) securing the adjustable fore-aft cylinder in the forward position.

   NOTE:

   The reel drive components are not shown in the illustration.

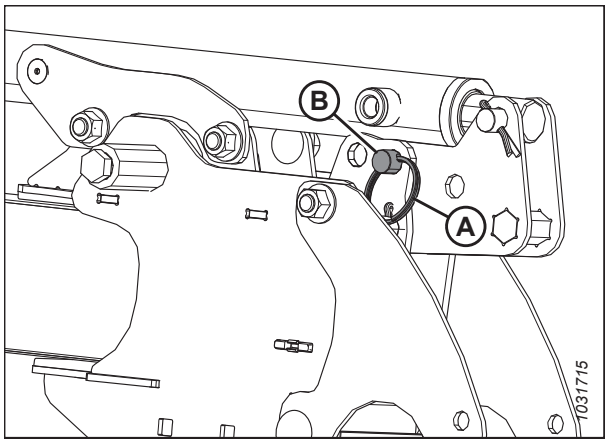


Figure 3.162: Fore-Aft Cylinder Adjustment Type 1 – Forward Position

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).

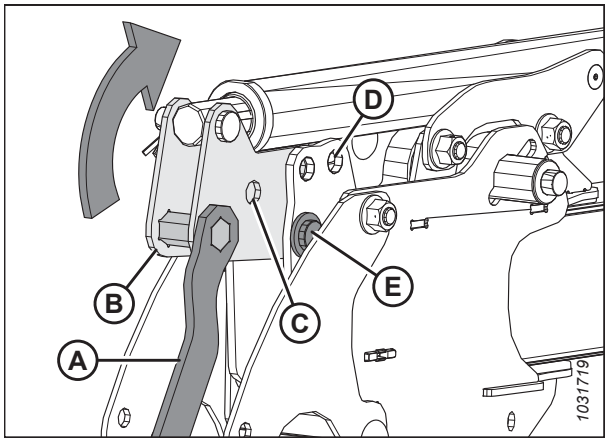


Figure 3.163: Fore-Aft Cylinder Adjustment Type 1 – Forward Position

3. Secure the cylinder in the aft position with clevis pin (A), flat washer, and split ring (B).

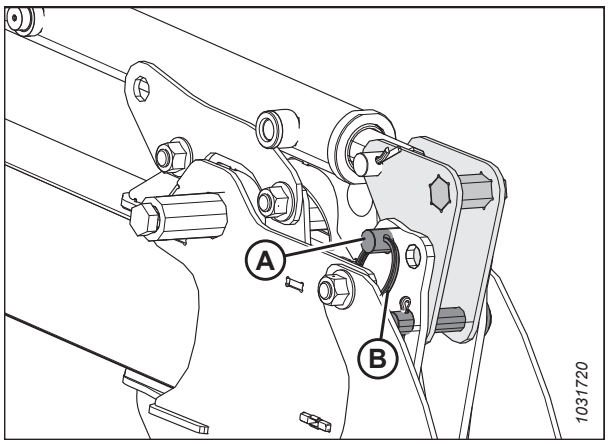


Figure 3.164: Fore-Aft Cylinder Adjustment Type 1 – Aft Position

To change the reel position on fore-aft cylinders that adjust at the back of the reel arm, follow these steps:

1. Remove split ring (A) and clevis pin (B) securing the left cylinder in the forward position on cylinder bracket (C).

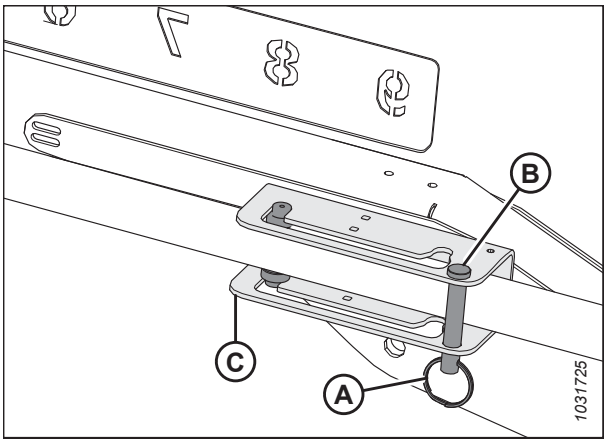


Figure 3.165: Fore-Aft Cylinder Adjustment Type 2 – Forward Position

2. Slide cylinder guides (A) along the bracket slot and into aft position (B).

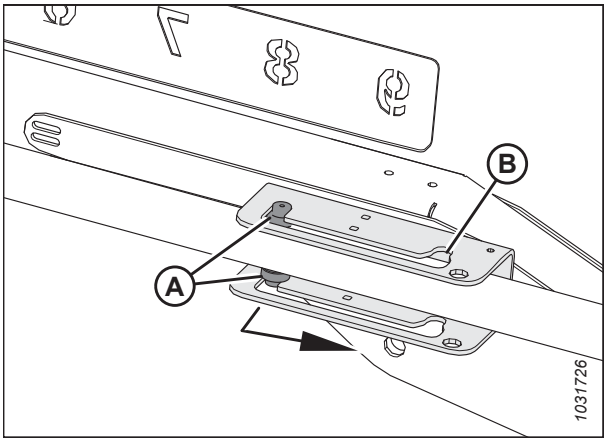


Figure 3.166: Fore-Aft Cylinder Adjustment Type 2 – Forward Position

3. Reinstall clevis pin (A) and split ring (B) to secure the cylinder in aft position (C) on the bracket.

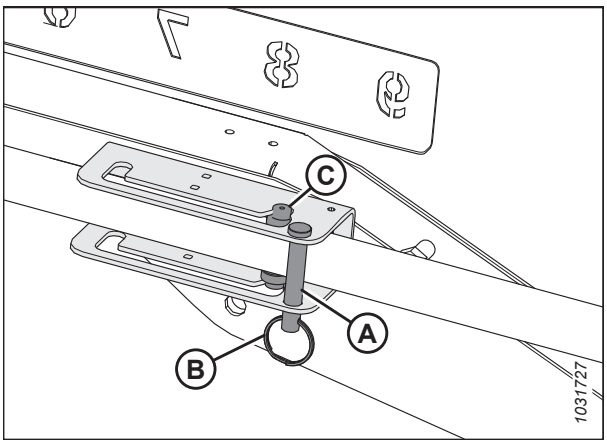


Figure 3.167: Fore-Aft Cylinder Adjustment Type 2 – Aft Position

4. Ensure that there is still adequate clearance between the reel and the following parts of the header:
   - Backsheet
   - Reel braces
   - Upper cross auger (if this is installed on the header)
5. If necessary, adjust the reel tine pitch. For instructions, refer to *3.9.12 ., page 152*.

Checking and Adjusting Fore-Aft Position Sensor

The fore-aft position sensor indicates the position of the reel in the fore-aft plane. The sensor arm's orientation and the sensor's output voltage range must be calibrated.

Checking and adjusting sensor arm orientation

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.

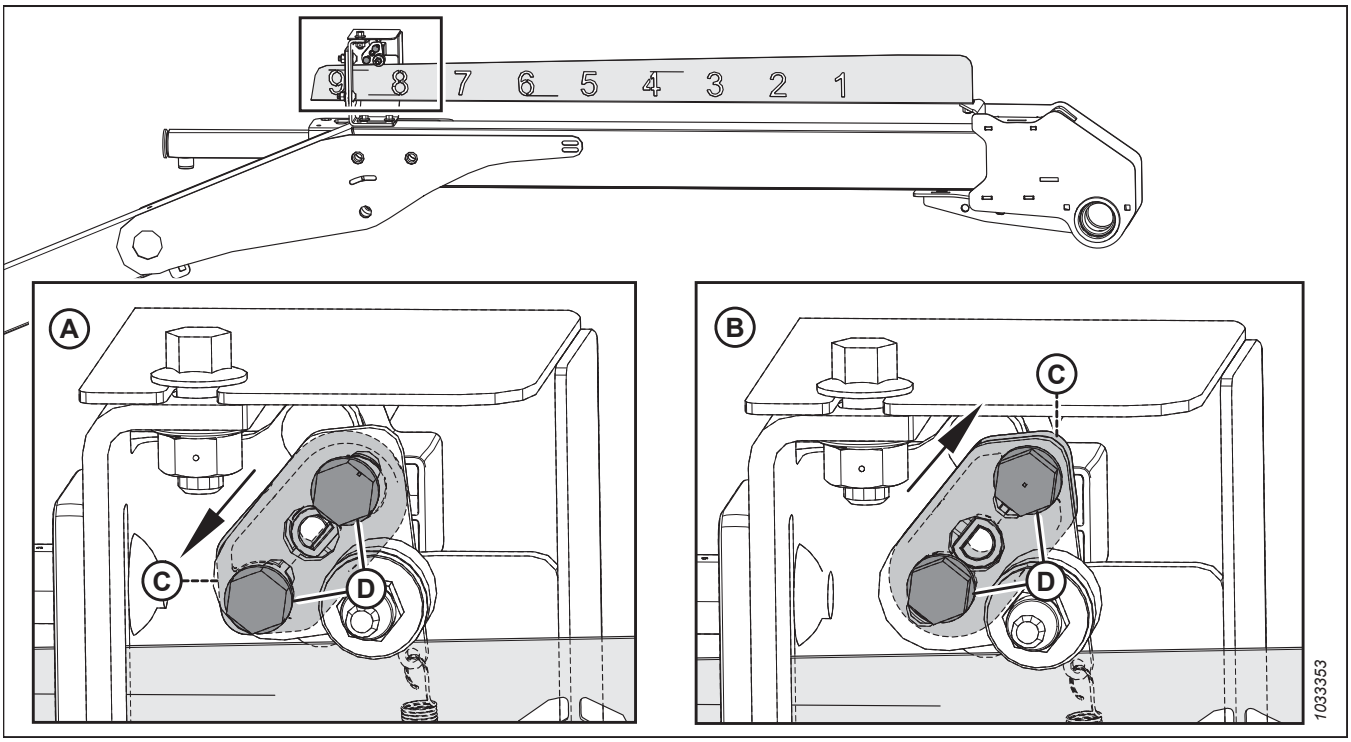


Figure 3.168: Sensor Arm Configurations

A - Incorrect Configuration

B - Case/New Holland Configuration

C - Sensor Arm

D - Mounting Hardware

3. Check the orientation of sensor arm (C) and hardware (D). If sensor arm (C) is not oriented correctly, remove it and reinstall it in the correct orientation.

Checking and adjusting sensor output voltage

DANGER

Ensure that all bystanders have cleared the area.

4. 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.

5. Start the engine.

6. Adjust the reel to the fully forward position. Ensure that dimension (B) (from the sensor bracket to the end of the indicator) is 62–72 mm (2.4–2.8 in.).

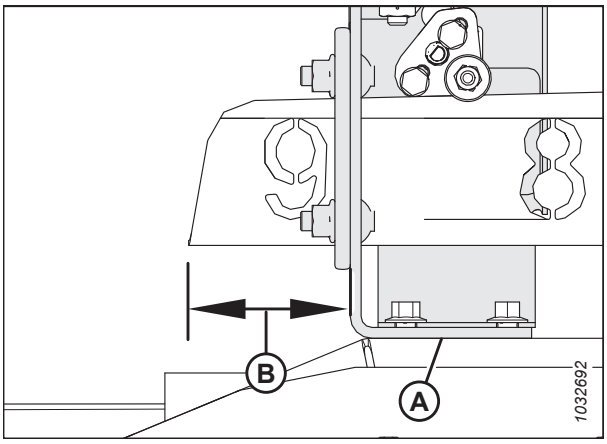


Figure 3.169: Fore-Aft Bracket

7. Use the combine display or a voltmeter (if measuring the sensor manually) to measure the voltage range. If using a voltmeter, check sensor voltage (A) between pin 2 (ground) and pin 3 (signal).

   - For Case and New Holland combines, the voltage range should be 0.7–1.1 V

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

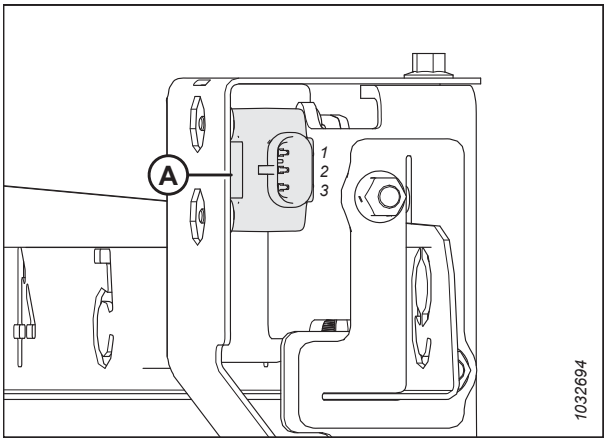


Figure 3.170: Fore-Aft Sensor

9. If adjustment is required, loosen hardware (A) and rotate sensor (B) until the voltage is in the correct range.

10. Once sensor adjustment is complete, torque the hardware to 2.1 Nm (22 lbf·in).

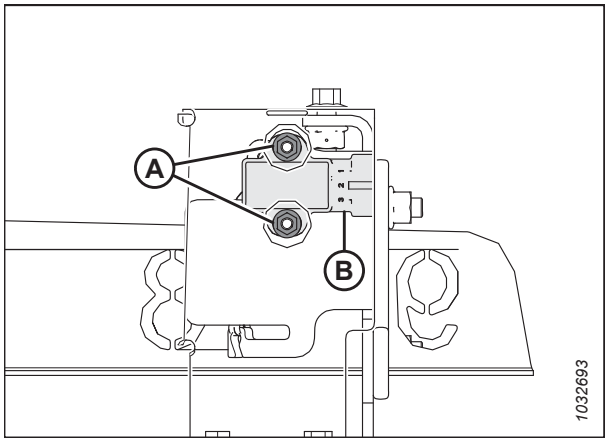


Figure 3.171: Fore-Aft Sensor

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 can be changed by changing the reel fore-aft position and the reel cam setting. You 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 66*.

Reel Cam Settings

Changing the cam position allows you 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 154*.

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 the ground while the reel is far forward. Therefore, set the initial reel speed so that it close to the ground speed.

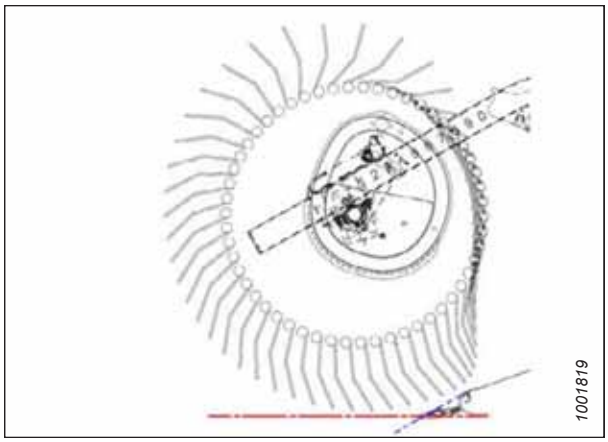


Figure 3.172: Finger Profile – Position 1

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.

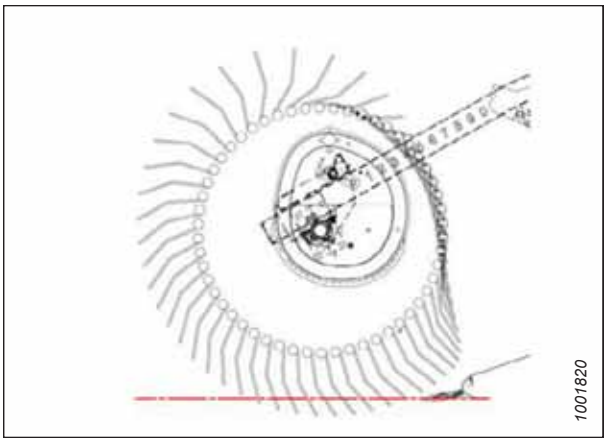


Figure 3.173: Finger Profile – Position 2

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.

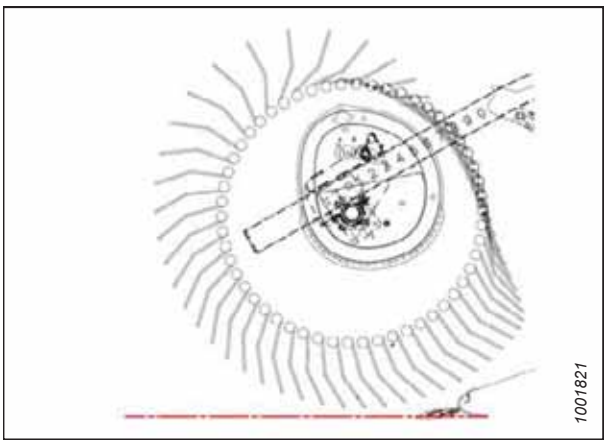


Figure 3.174: Finger Profile – Position 3

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.

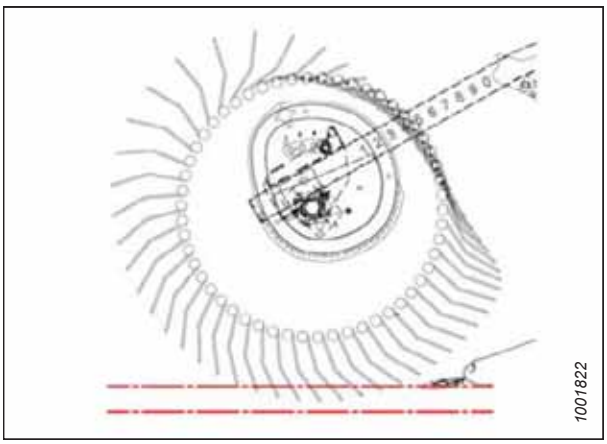


Figure 3.175: Finger Profile – Position 4

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 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.

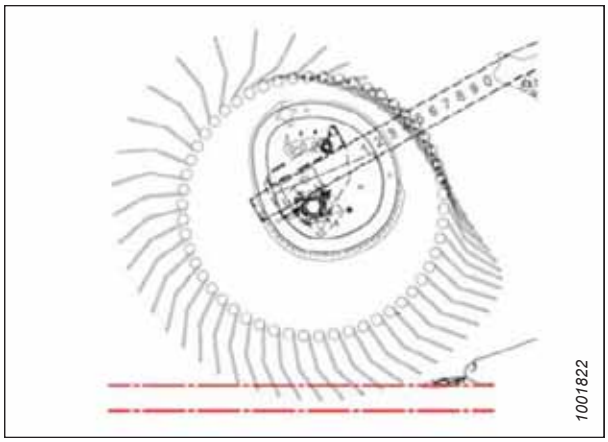


Figure 3.176: Finger Profile – Position 4

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.

IMPORTANT:

Always check the reel-to-cutterbar clearance after adjusting the reel tine pitch and reel fore-aft positions. For information, refer to *4.13.1 Reel-to-Cutterbar Clearance, page 389*.

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:

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.

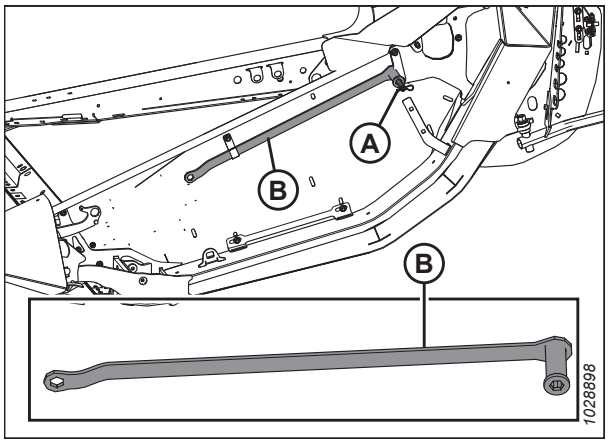


Figure 3.177: Left Endsheet

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.

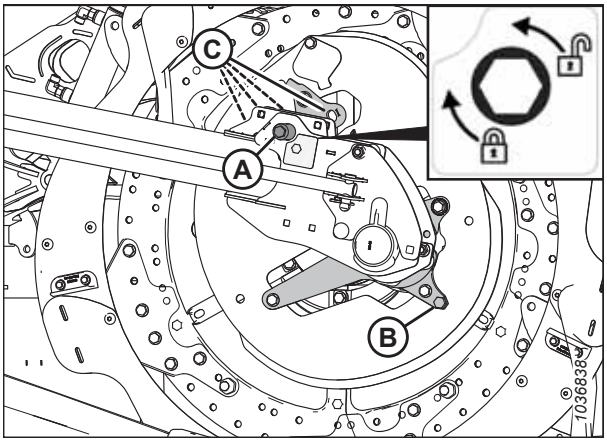


Figure 3.178: Cam Disc Positions

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 shutoff valve (A) turns off the UCA when it is not needed.

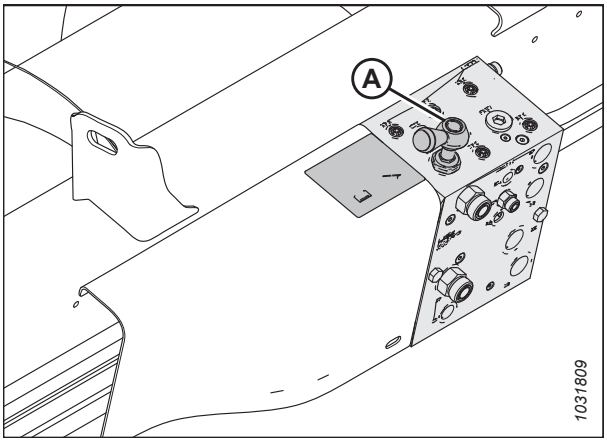


Figure 3.179: Shutoff Valve

Adjusting Upper Cross Auger Position

The upper cross auger (UCA) has an adjustable mount that allows the auger position to be adjusted for different harvesting conditions. Headers with three-piece augers have two adjustable mounts: one on each end of the center auger.

NOTE:

For information on the positions of the primary and secondary front bolts, refer to Figure *3.182, page 156*.

The mount(s) are initially installed in the rear-most position, so that front bolt (A) is in the primary position. This is the recommended configuration for most conditions.

When front bolt (A) is in the primary position, the auger and the reel are safe to operate in any position. The position of the auger can be adjusted (to a limited extent) by changing the position of the mount with respect to rear bolt (B).

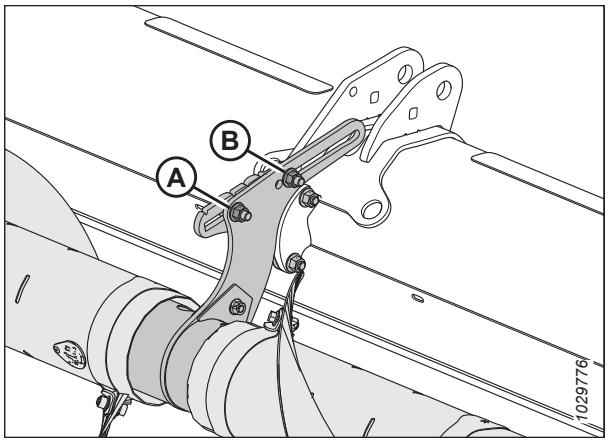


Figure 3.180: Initial Position of Adjustable Mounts – Two-Piece Auger

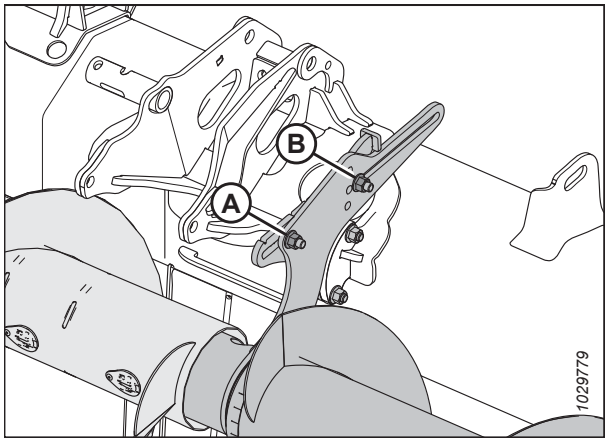


Figure 3.181: Initial Position of Adjustable Mounts – Three-Piece Auger

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 if you wish to raise or lower the auger. When the front bolt is in one of these positions, the fore-aft adjustment is limited, which prevents the UCA from interfering with the feed auger and the 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 UCA. When the reel is moved fully back (for example, when harvesting canola), the UCA must also be moved fully back in order to allow for sufficient clearance between the reel fingers and the auger.

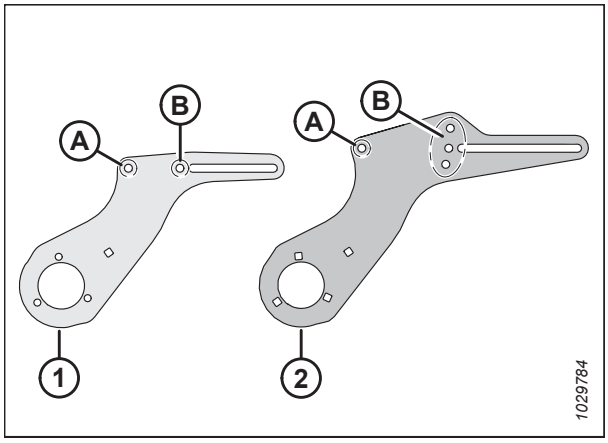


Figure 3.182: Adjustable Mount Details

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 forward to

- Help convey light crops, especially on side hills
- Improve the feeding of light crops
- Reduce the reel carry over or the crop flow disruption caused by the reel

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 around the auger

To adjust the auger position, do the following:

1. Locate the adjustable mount.

   NOTE:

   On two-piece augers, the adjustable mount protrudes from the center support assembly. On three-piece augers, the adjustable mount protrudes from the ends of the center auger.

   NOTE:

   The illustration 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 *3.182, page 156* for more information.

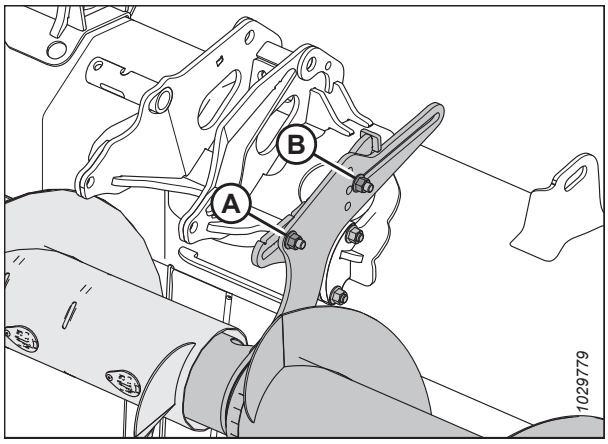


Figure 3.183: Initial Position of Adjustable Mounts – Three-Piece Auger

2. If desired, relocate front bolt and nut (A). The front bolt and nut have two possible locations on two-piece augers: the primary location and the secondary location. On three-piece augers, there are four possible locations: one primary location and three secondary locations.
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).
6. If a three-piece UCA is installed, repeat this procedure on the second adjustable mount.

   IMPORTANT:

   On headers with three-piece augers, ensure that both mounts are in the same position.

7. Check for interference between the reel fingers and the UCA. Check for interference between the cam arms and the UCA along the entire hydraulic fore-aft range of the reel. For instructions, refer to *Checking Upper Cross Auger for Interference, page 158*.

Checking Upper Cross Auger for Interference

If the upper cross auger (UCA) is out of adjustment, it can contact the reel or the header frame. The clearance between the UCA and certain header components will need to be inspected.

WARNING

Ensure that 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:

   If the reel cam adjustment is changed, this procedure will need to be performed again.

DANGER

To prevent injury or death from the unexpected startup of the machine, stop the engine and remove the key from the ignition before you make adjustments to the machine.

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

4. Manually rotate UCA (A). Ensure that the clearance between the UCA and the header components is at least 10 mm (13/32 in.) at the following locations:
   - Reel cam arms (B)
   - Reel fingers (C)
   - Reel cylinder supports (D)
   - Split frame joint (E)

5. If the clearance between the UCA and the header components requires adjustment, proceed to *Adjusting Upper Cross Auger Position, page 155*.

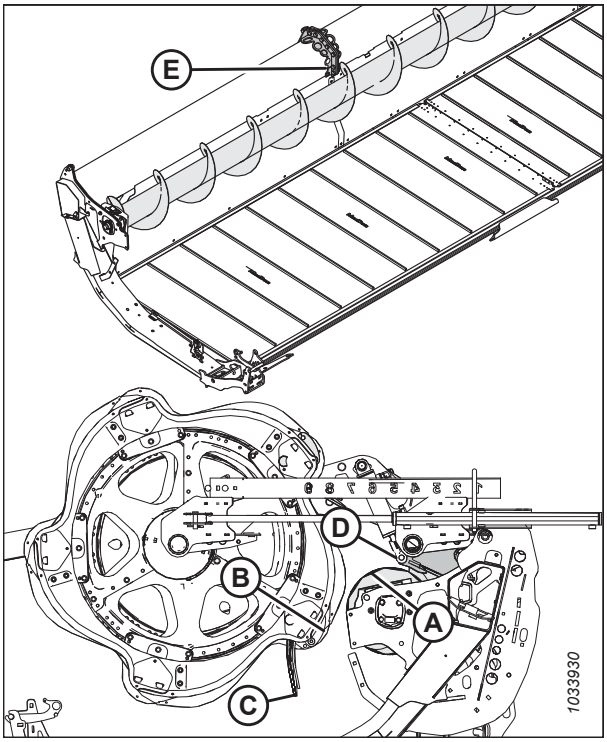


Figure 3.184: UCA Clearance Check Locations

3.9.14 Crop Dividers

Crop dividers are used to separate the crop when harvesting. They are removable to allow the installation of vertical knives or the sunflower attachment, and to decrease transport width.

Standard crop dividers are provided with all headers. Optional floating crop dividers may also be purchased. Refer to *5.1.4 Floating Crop Dividers, page 448*.

Removing Crop Dividers

Crop dividers can be removed to allow installation of other options 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 the reel and raise the header. For instructions, refer to your combine operator's manual for instructions.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the safety props. For instructions, refer to your combine operator's manual for instructions.
4. Open the endshields. For instructions, refer to *Opening Header Endshields, page 39*.

5. Remove lynch pin (A).
6. Hold onto crop divider (E).
7. Rotate hex shaft (B) on divider latch (C) forward to disengage it from bolt (D).

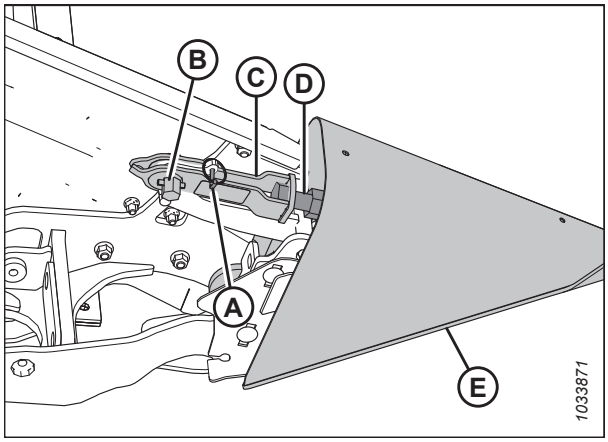


Figure 3.185: Crop Divider with Latch

8. Lower crop divider (A), and remove it from the endsheet.
9. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

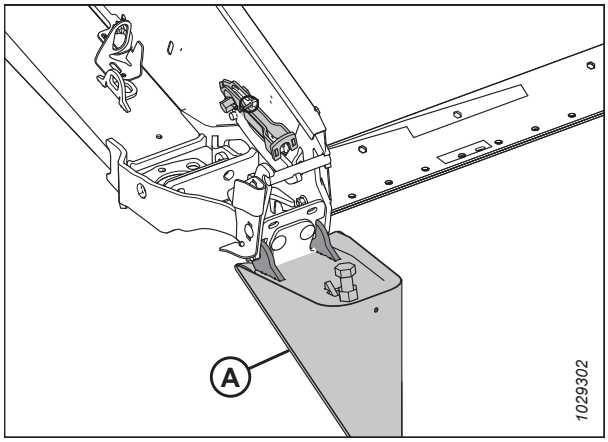


Figure 3.186: Crop Divider with Latch

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.

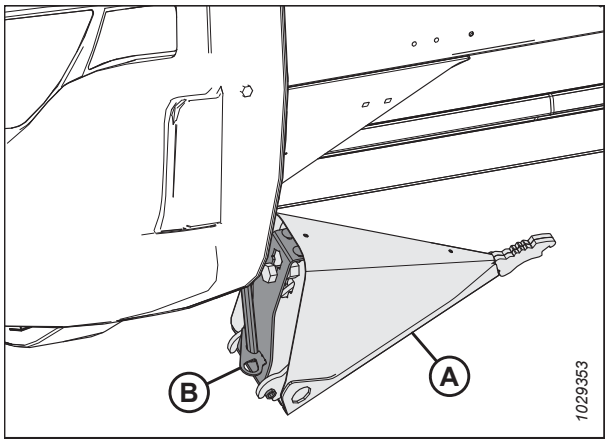


Figure 3.187: Optional Crop Divider Storage

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. For instructions, refer to the combine operator's manual.
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 39*.

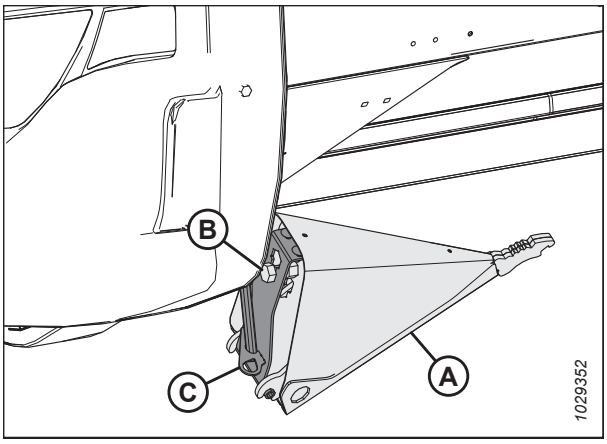


Figure 3.188: Optional Crop Divider

9. Insert crop divider lugs (A) into holes in the endsheet as shown.
10. Remove lynch pin (B) from latch (C).

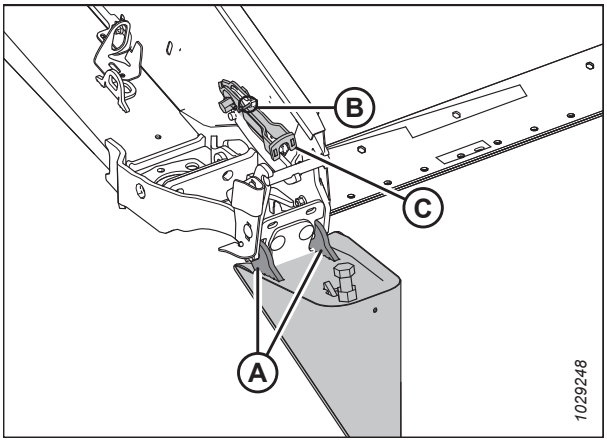


Figure 3.189: Crop Divider with Latch

11. Lift the forward end of latch (A) and crop divider (B).

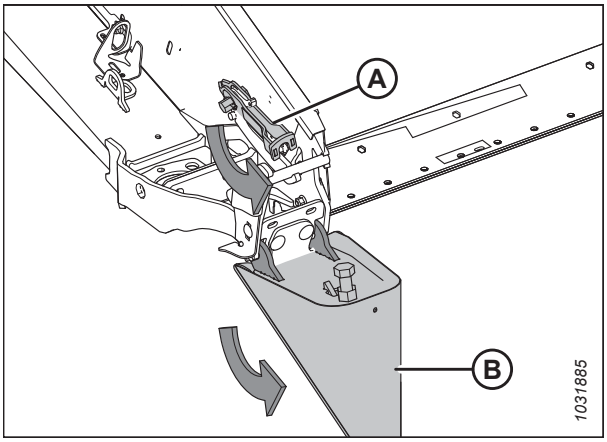


Figure 3.190: Crop Divider with Latch

12. Engage latch (A) onto crop divider bolt (B).
13. Rotate hex shaft (D) on latch (A) counter-clockwise to engage lock.

    NOTE:

    Hex shaft (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 40*.

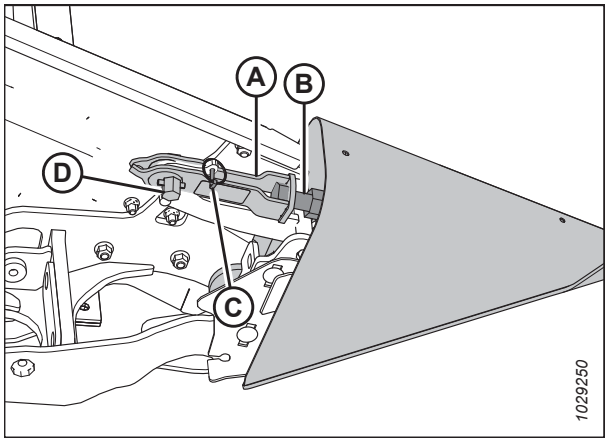


Figure 3.191: Crop Divider with Latch

Removing Floating Crop Dividers

Floating crop dividers can be removed to allow installation of other attachments or the standard crop dividers.

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 from the ignition before making adjustments to the machine. 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).

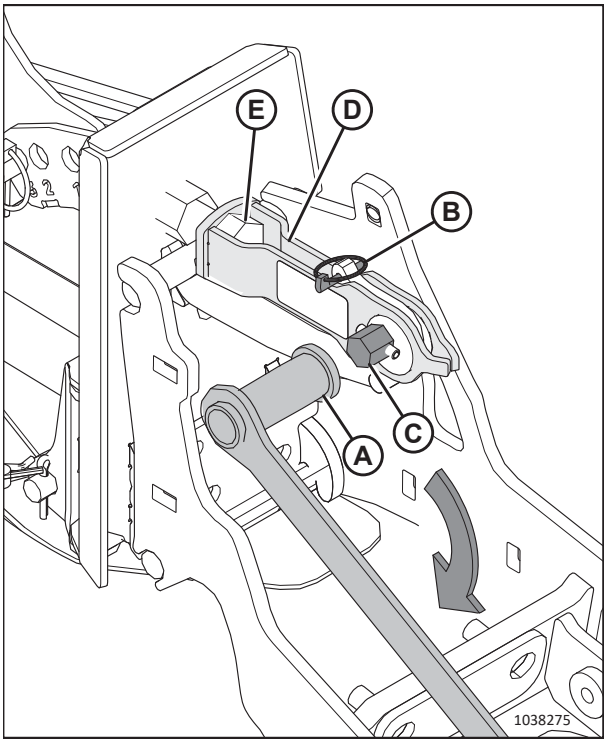


Figure 3.192: Floating Crop Divider Installed

11. Tilt the floating crop divider forward and pull it out of the header.
12. Reinstall lynch pin (A).
13. Close the endshield.
14. Repeat Step *5, page 162* to Step *13, page 163* at the opposite end of the header to remove the opposite floating crop divider.

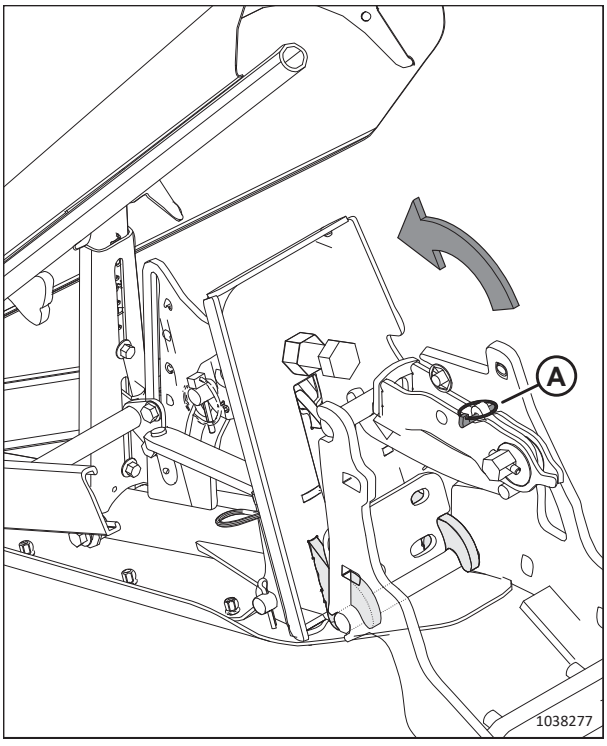


Figure 3.193: Latch Released

Installing Floating Crop Dividers

Follow these instructions to properly install the floating crop dividers onto the header.

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 from the ignition before making adjustments to the machine. 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 endshields.
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.

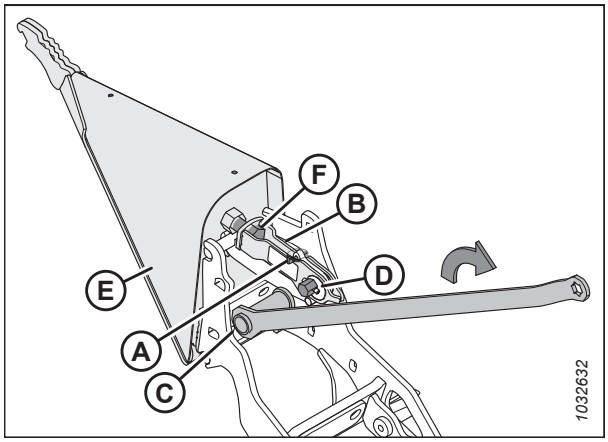


Figure 3.194: Crop Divider Installed

9. Insert crop divider lugs (A) into the slots in the header frame.

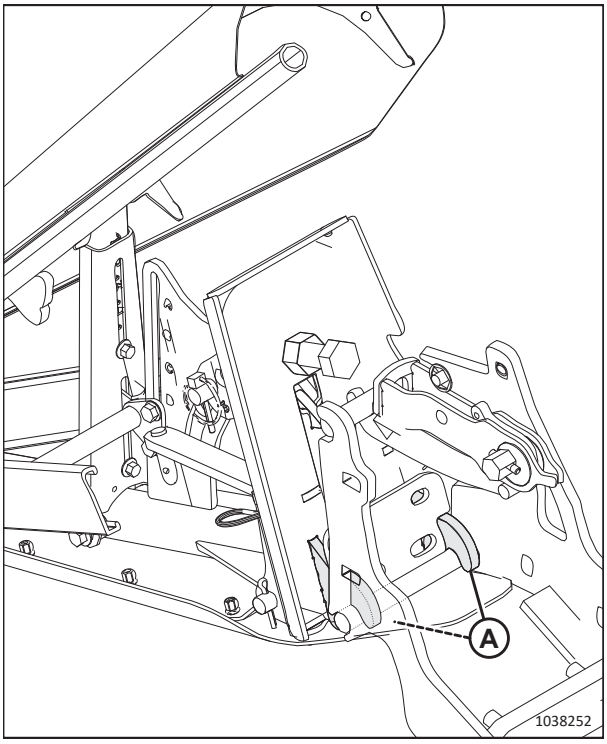


Figure 3.195: Crop Divider Installation

10. Lift the forward end of quick latch (A), and rotate crop divider (B) up into position.

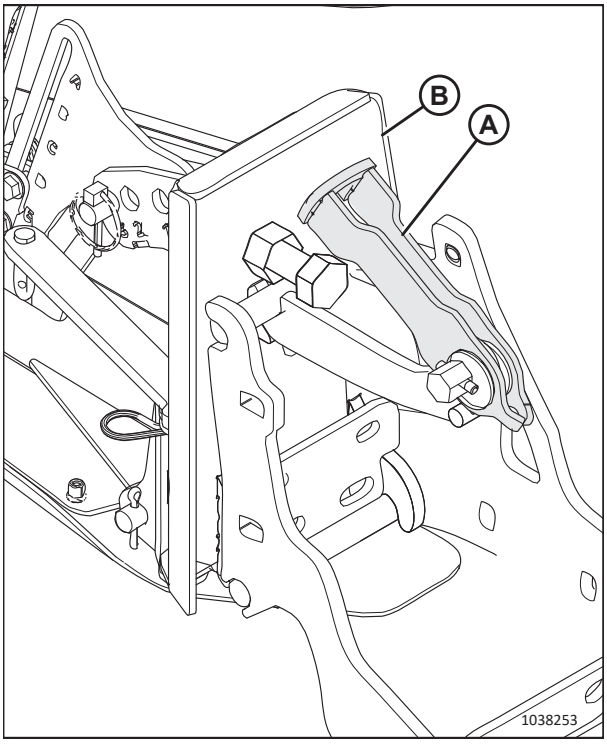


Figure 3.196: Quick Latch

11. Engage quick latch (A) onto the bolt.
12. Make sure the latch closes tightly and crop divider stop (B) contacts header stop (C).

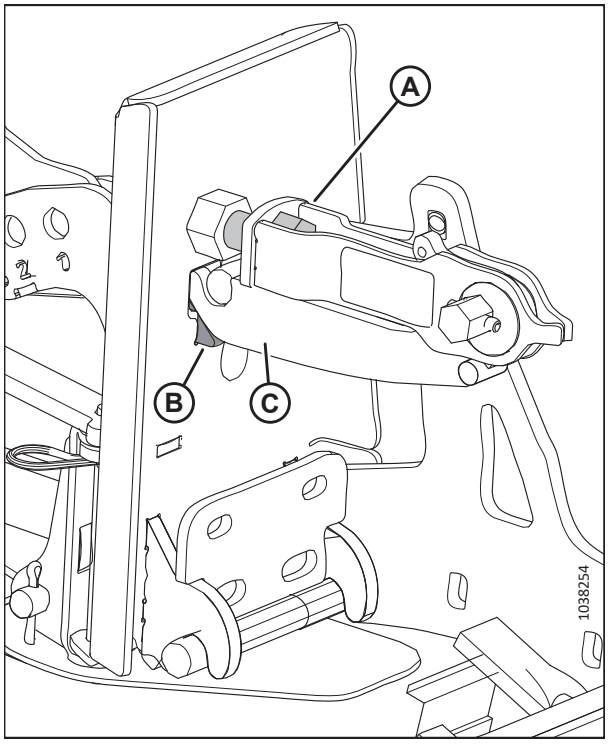


Figure 3.197: Crop Divider Latched to Header

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 164* to Step *16, page 166* at the opposite end of the header to install the opposite crop divider.

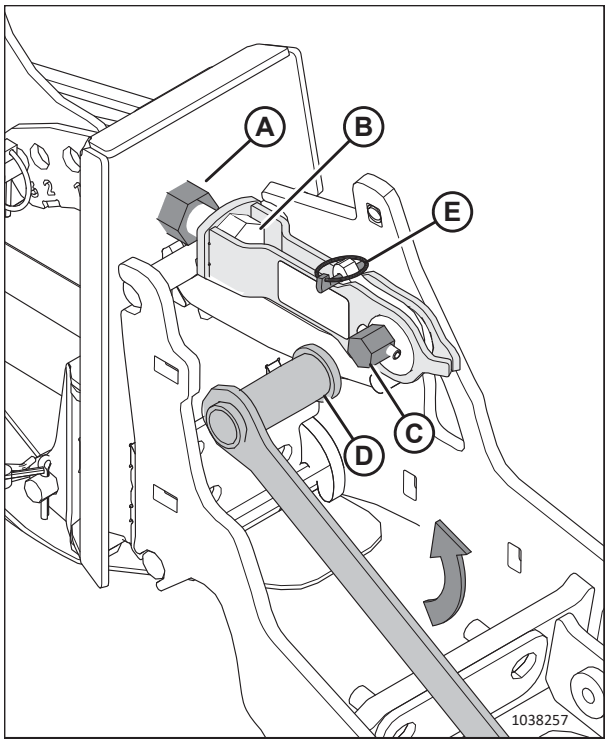


Figure 3.198: Latch Adjustment

18. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.
19. Check the float. For instructions, refer to *Checking and Adjusting Header Float, page 121*.

Adjusting Floating Crop Dividers

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 and remove the key from the ignition before making adjustments to the machine. 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:
   - Field with a stubble height of 50–125 mm (2–5 in.), double-reel headers: refer to Step *6, page 168*.
   - Field with a stubble height of 20–100 mm (3/4–4 in.), double-reel headers: refer to Step *7, page 169*.
   - Cutterbar on the ground, field with a stubble height of 16–50 mm (5/8–2 in.), double-reel headers: refer to Step *8, page 170*.
   - Field with a stubble height of 50–125 mm (2–5 in.), single-reel headers: refer to Step *9, page 171*.
   - Field with a stubble height of 20–100 mm (3/4–4 in.), single-reel headers: refer to Step *10, page 172*.
   - Cutterbar on the ground, field with a stubble height of 16–50 mm (5/8–2 in.), single-reel headers: refer to Step *11, page 173*.

Floating Crop Divider Settings – Double-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 *12, page 174* to Step *18, page 176*.

	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.)

Floating Crop Divider Settings – Double-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 *12, page 174* to Step *18, page 176*.

	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.)

Floating Crop Divider Settings – Double-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 *12, page 174* to Step *18, page 176*.

	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.)

Floating Crop Divider Settings – Single-Reel Header, Field with a Stubble Height of 50–125 mm (2–5 in.)

9. 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 *12, page 174* to Step *18, page 176*.

	Stubble Height	Header Angle[64]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing or Lodged Crop	125 mm (5 in.)	A	Down	2	4	1	A–E	In or Out
	50 mm (2 in.)	E	Down	1	5	2.5	A–E	In or Out
Severely Lodged[65]	125 mm (5 in.)	A	Down	2	4	1	A–E	In or Out
	50 mm (2 in.)	E	Down	1	5	2.5	A–E	In or Out

64. A (min) – E (max)
65. Crop canopy lower than 150 mm (6 in.)

Floating Crop Divider Settings – Single-Reel Header, Field with a Stubble Height of 20–100 mm (3/4–4 in.)

10. 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 *12, page 174* to Step *18, page 176*.

	Stubble Height	Header Angle[66]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing or Lodged Crop	100 mm (4 in.)	A	Middle	2	5	1	A–E	In or Out
	20 mm (3/4 in.)	E	Middle	1	5	2.5	A–E	In or Out
Severely Lodged[67]	100 mm (4 in.)	A	Middle	2	4	1	A–E	In or Out
	20 mm (3/4 in.)	E	Middle	1	5	2.5	A–E	In or Out

66. A (min) – E (max)
67. Crop canopy lower than 150 mm (6 in.)

Floating Crop Divider Settings – Single-Reel Header, Cutterbar on the Ground, Field with a Stubble Height of 16–50 mm (5/8–2 in.)

11. 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 *12, page 174* to Step *18, page 176*.

	Stubble Height	Header Angle[68]	Header Skid Shoes	Down Stop	Nose Cone Fore-Aft Position	Top Deflector Height	Side Deflector Height	Top Deflector Side Rod
Standing or Lodged Crop	50 mm (2 in.)	A	Up	2	4	1	A–E	In or Out
	16 mm (5/8 in.)	E	Up	1	5	2.5	A–E	In or Out
Severely Lodged[69]	50 mm (2 in.)	A	Up	2	4	1	A–E	In or Out
	16 mm (5/8 in.)	E	Up	1	5	2.5	A–E	In or Out

68. A (min) – E (max)
69. Crop canopy lower than 150 mm (6 in.)

12. **Down stop:** Remove lynch pin (A) from the clevis pin, and remove the clevis pin.

13. Tilt the divider and install the clevis pin into a numbered hole “1” to “3”. Secure the clevis pin with the lynch pin.

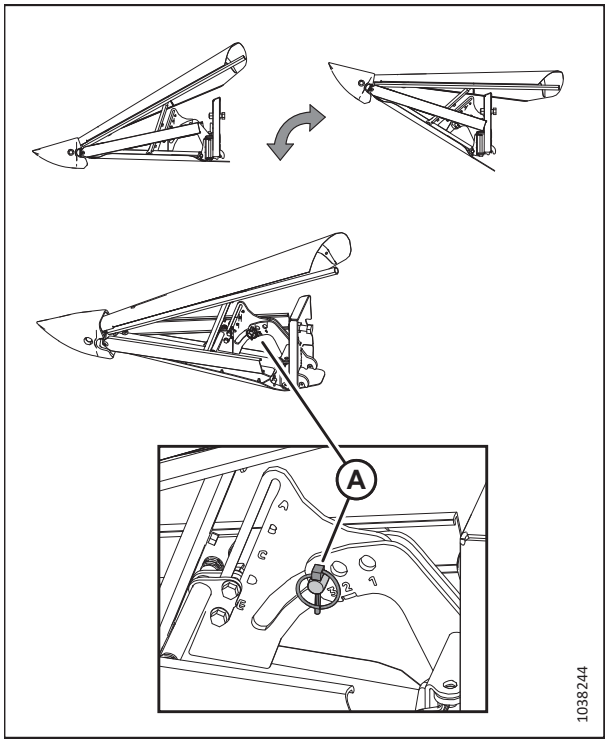


Figure 3.199: Down Stop Adjustment

14. **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”.

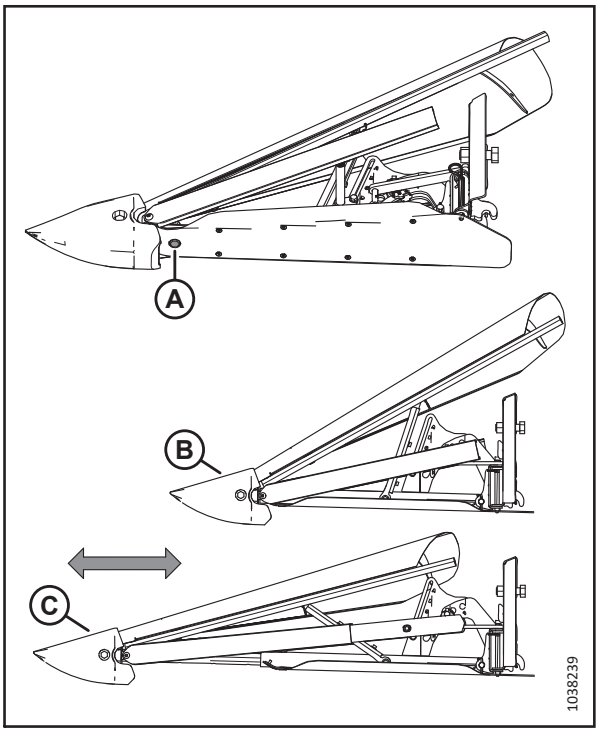


Figure 3.200: Nose Cone Fore-aft Adjustment

15. **Top deflector height:** Loosen the 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.

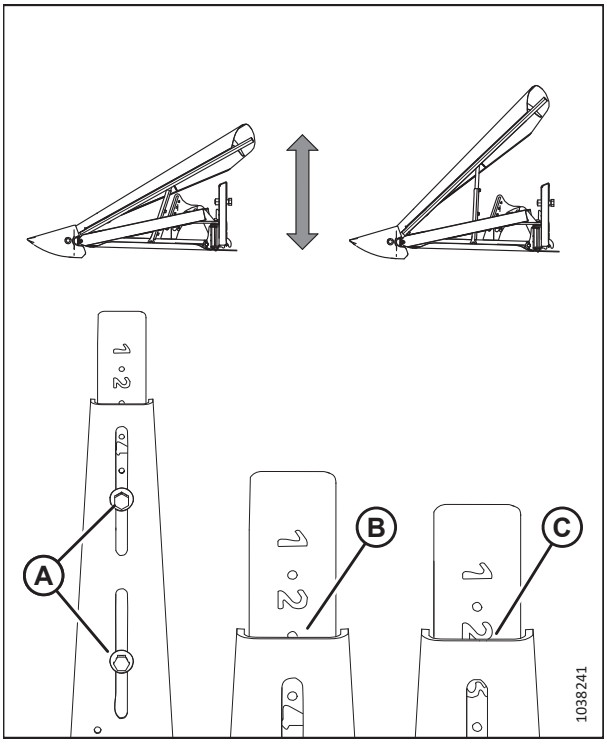


Figure 3.201: Top Deflector Height Adjustment

16. **Side deflector height:** Loose the nuts on bolts (A), slide deflectors until notch (B) is at the desired setting “A” to “E”, and tighten nuts.

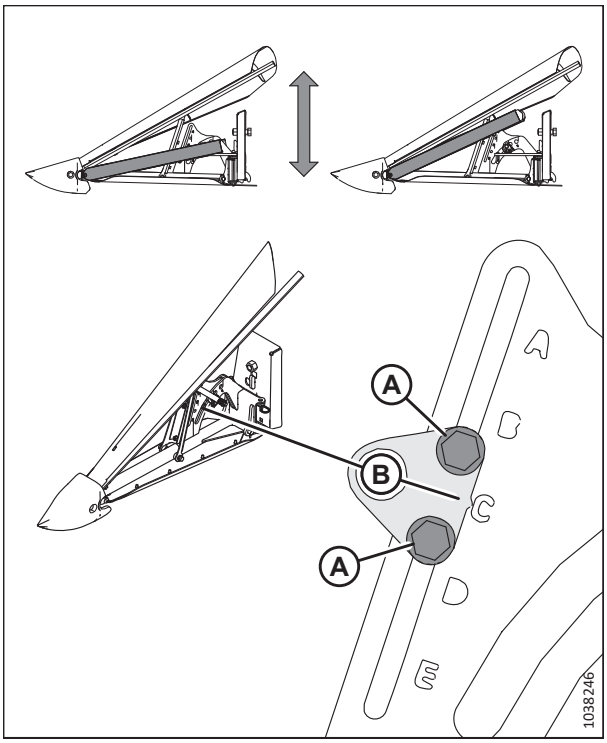


Figure 3.202: Side Deflector Height Adjustment

17. **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).

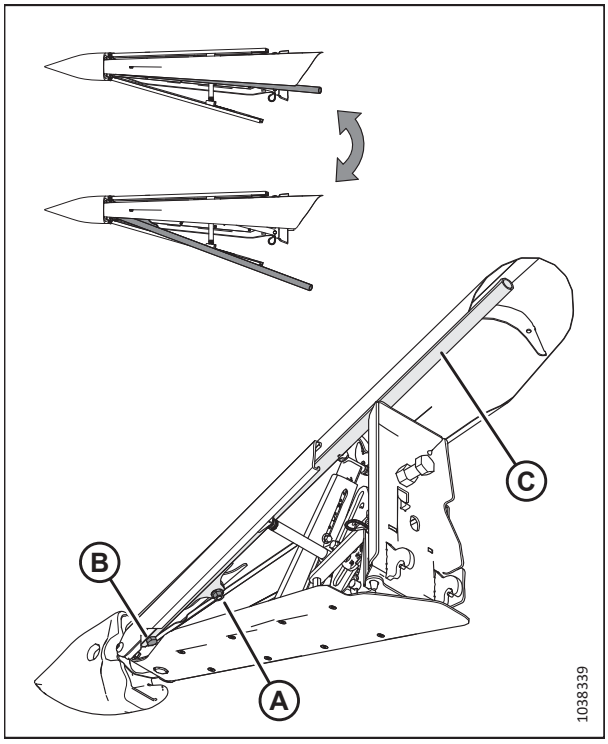


Figure 3.203: Top Deflector Side Rod Adjustment

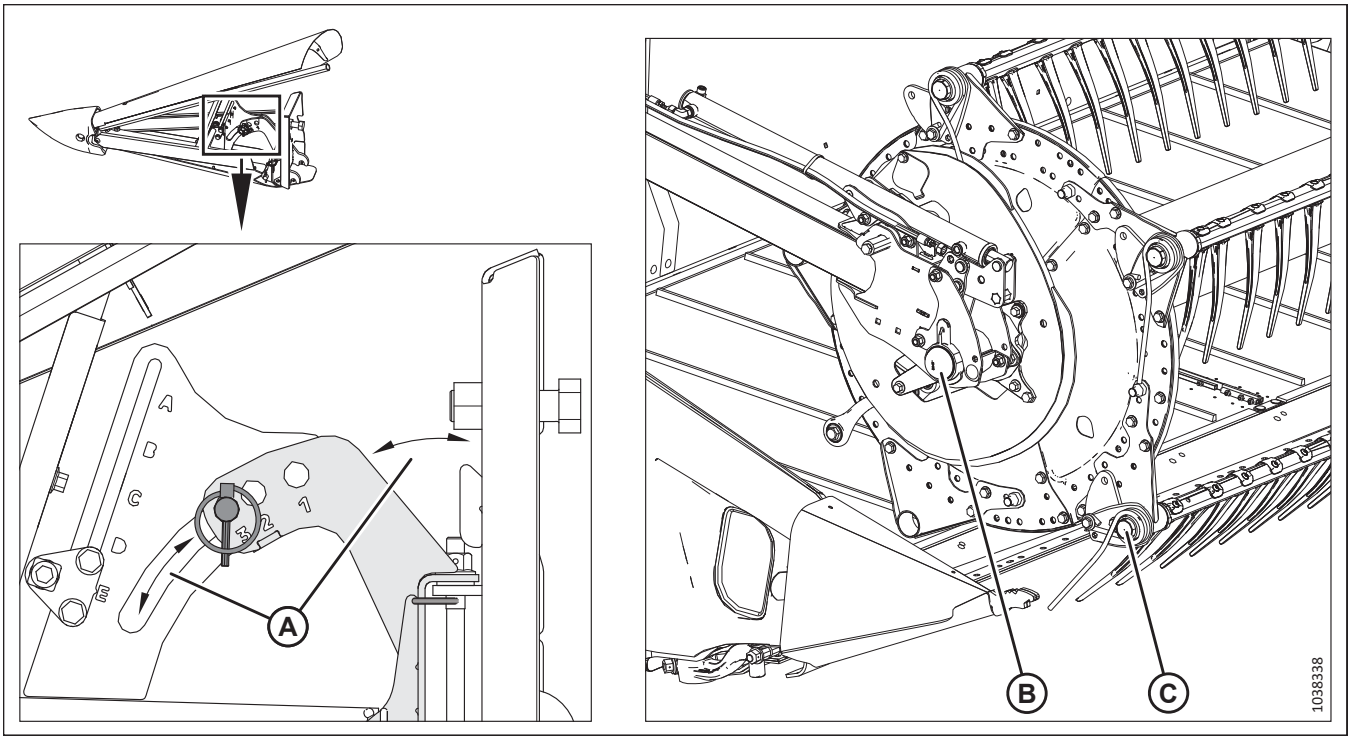


Figure 3.204: Floating Crop Divider Range of Motion

18. **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).

IMPORTANT:

When checking for interference between the floating crop dividers and a **single reel**, also make sure that the floating crop dividers do **NOT** contact the reel drive.

3.9.15 Crop Divider Rods

Removable crop divider rods are provided with the header and to be used in conjunction with crop dividers to help separate crop when harvesting. The rods are most useful when crop is bushy or down. In standing crops, using only crop dividers is recommended.

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

Crop divider rods can be removed from the ends of the crop dividers and stored on the header.

1. Loosen bolt (B) and remove crop divider rod (A) from both sides of the header.

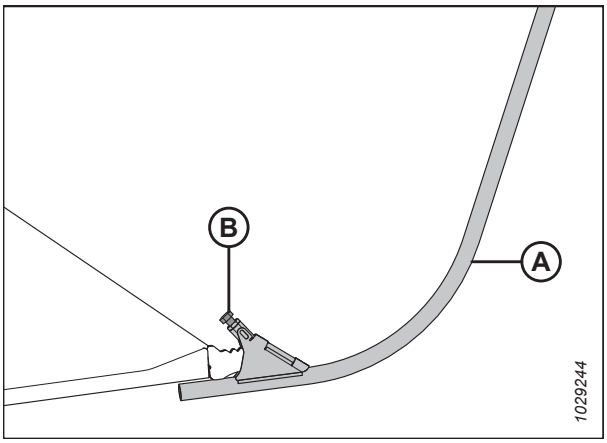


Figure 3.205: Crop Divider Rod

2. Store both crop divider rods (B) on the right endsheet, and secure with lynch pin (A).

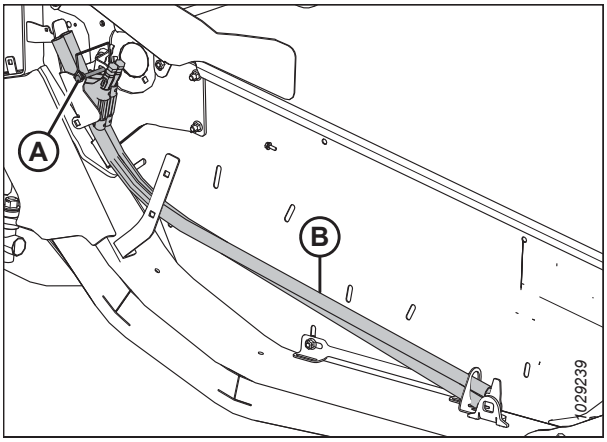


Figure 3.206: Right Endsheet

Installing Crop Divider Rods

The crop divider rods can be installed on the ends of the crop dividers to help separate bushy crop.

1. Open the right endshield. For instructions, refer to *Opening Header Endshields, page 39*.
2. Undo lynch pin (A) securing divider rods (B) to the header endsheet. Remove the divider rods from their storage location.
3. Reinstall lynch pin (A).

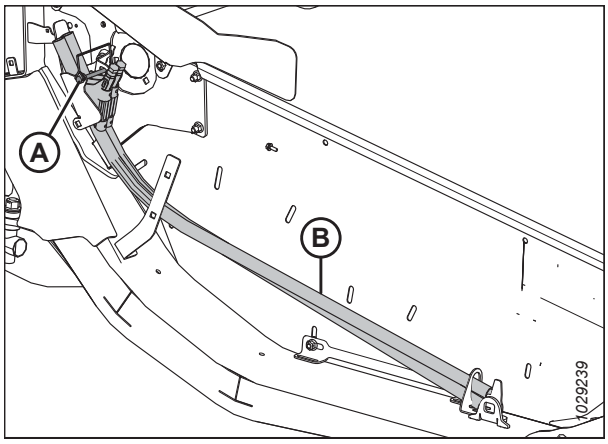


Figure 3.207: Divider Rods in Storage Location at Right Header Endsheet

4. Position crop divider rod (A) on the tip of the crop divider as shown. Tighten bolt (B).
5. Repeat this procedure to install the crop divider rod on the the opposite end of the header.
6. Close the right endshield. For instructions, refer to *Closing Header Endshields, page 40*.

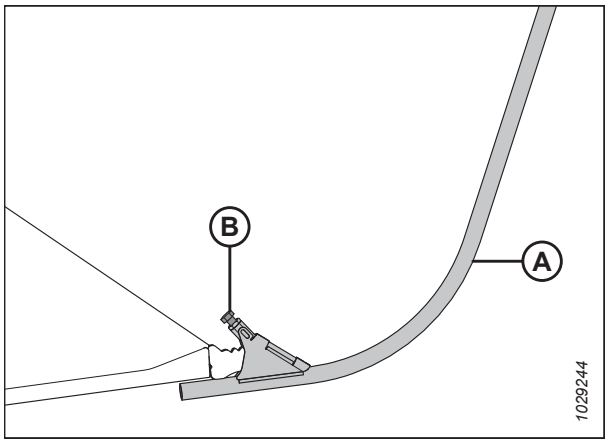


Figure 3.208: Divider Rod on Crop Divider

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.

Rice divider rods provide improved performance in tall and tangled rice crops. For more bundle information, refer to *5.1.7 Rice Divider Rod Kit, page 450*.

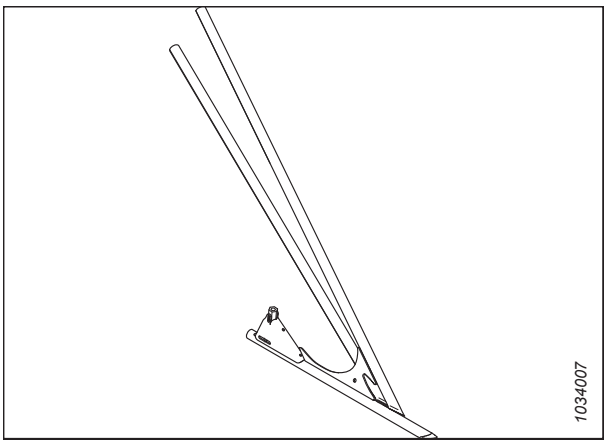


Figure 3.209: Optional Divider Rod for Rice

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.

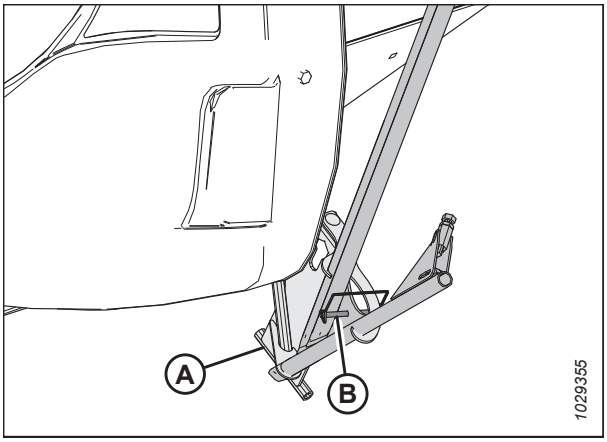


Figure 3.210: Rice Divider Rod Storage

3.10 Auto Header Height Control System

MacDon's auto header height control (AHHC) system works in conjunction with the AHHC option available on certain combine models.

Two Hall effect sensors (A) are installed on the float setting indicators on the float module. These sensors send signals to the combine, which allow the combine to maintain the header at a consistent cutting height and the optimum float setting as the header follows the contours of the ground.

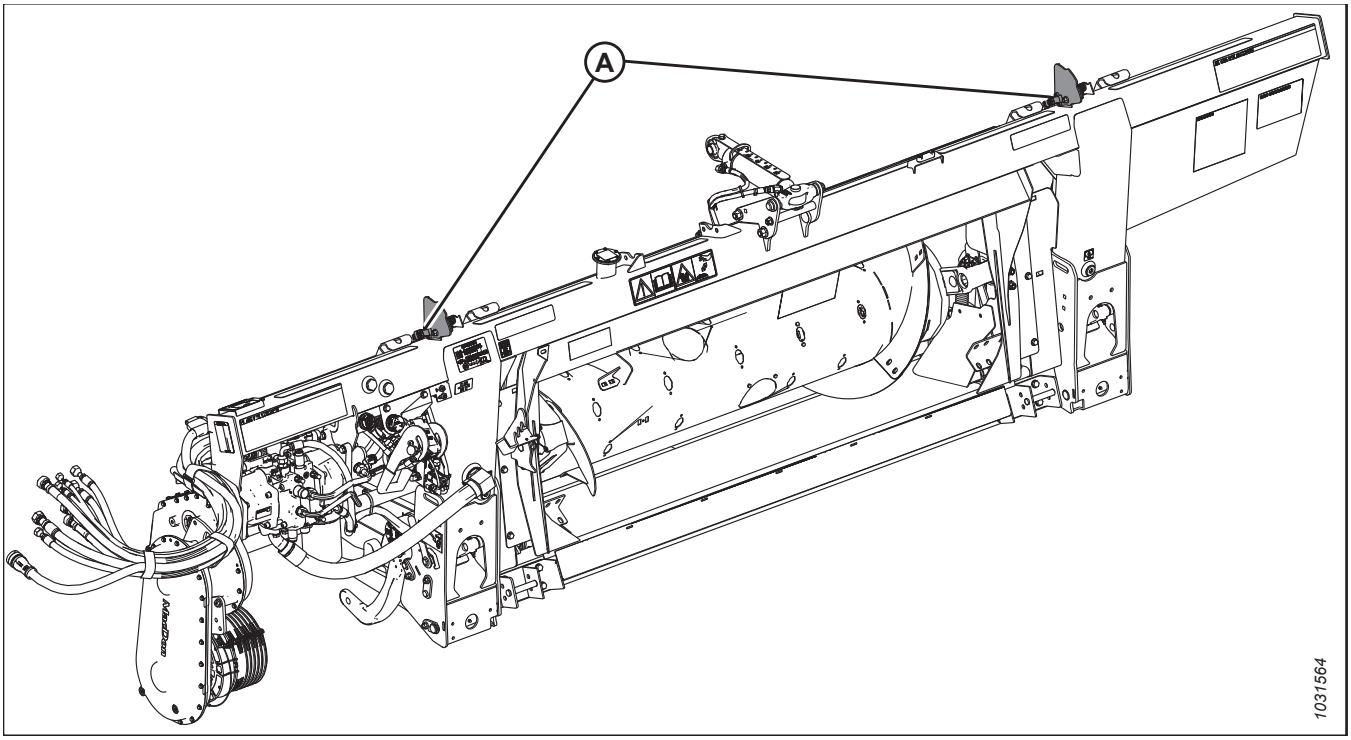


Figure 3.211: FM200 Float Module

The following tasks will need to be completed before the AHHC system can be used:

1. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the instructions for your combine).
2. Calibrate the sensors used by the AHHC system so that the combine can correctly interpret data from the Hall effect sensors on the float module. For more information, refer to the combine operator's manual.

To configure the AHHC system for a particular combine model, refer to the relevant procedure:

- *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*
- *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*

3.10.1 Auto Header Height Control Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system communicate data about the header's height to the combine's computer.

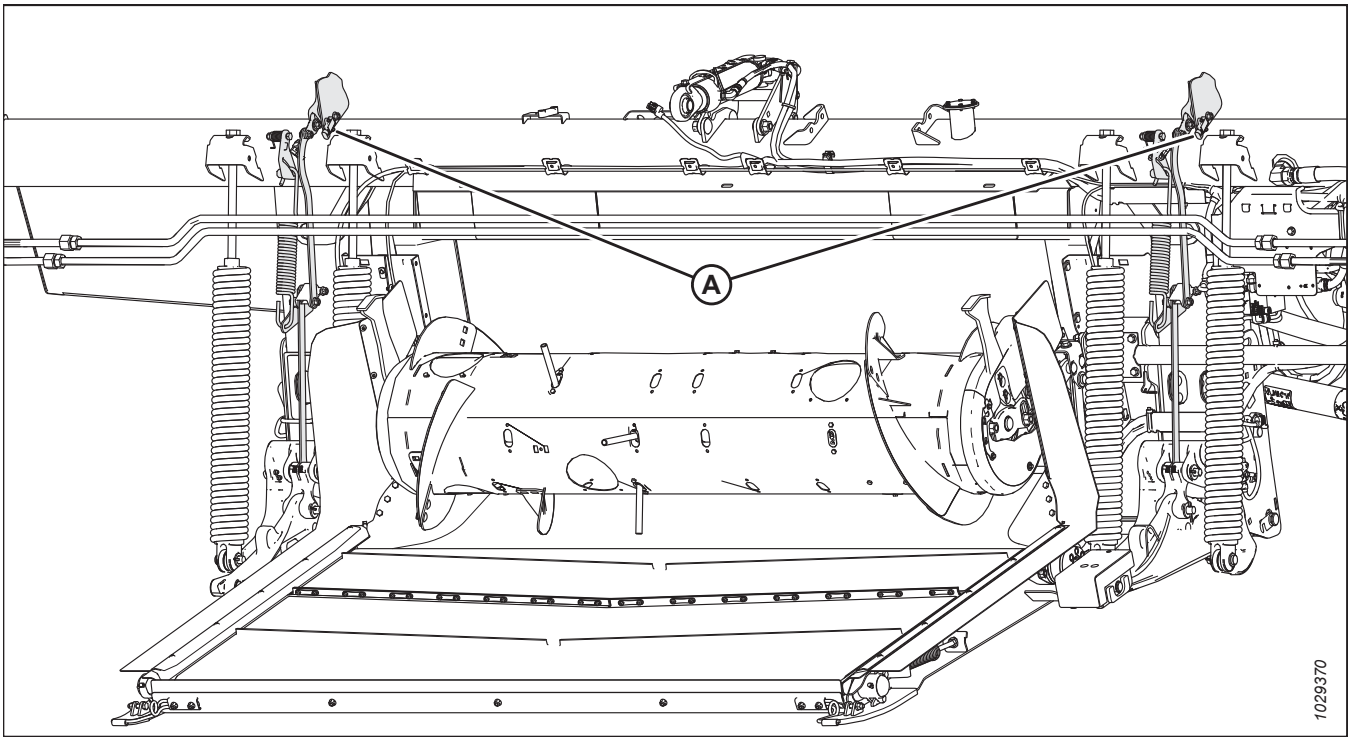


Figure 3.212: Height Control Sensor Locations on Float Module

Auto header height control sensor overview

Two Hall effect sensors are installed on float indicator needles (A). As the header rises and falls, the sensors communicate the header's height to the combine's computer. The combine's computer will, in response, raise or lower the feeder house so that the header can maintain a consistent cutting height.

The normal operating signal voltages for the sensors fall between 0.7 VDC and 4.3 VDC. An increase in sensor voltage correlates to an increase in header height, while a decrease in sensor voltage correlates to a decrease in header height. Any sensor error results in a 0 V signal, which indicates either a faulty sensor or insufficient voltage supply.

Auto header height control sensor voltage ranges

The voltage reported by the sensors occurs in a range of at least 2.5 V (Range [A]) and at most 4.0 V (Range [C]). The ideal voltage range for the sensors is 0.7–4.3 V (Range C), a total range of 3.6 V. If the voltage is too close to low end (D) of the voltage range, calibrating the AHHC system will be difficult. A properly set sensor will have sufficient clearance on both ends of the voltage range.

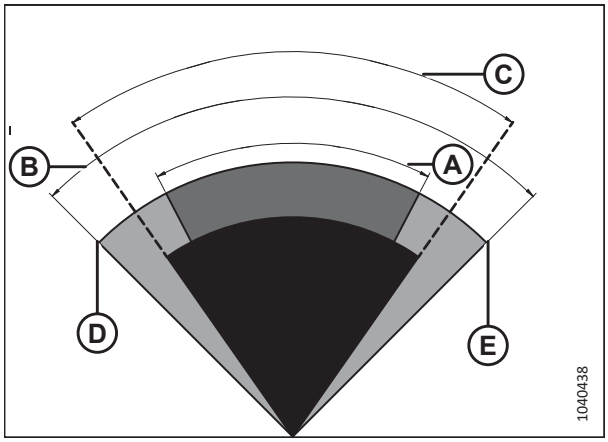


Figure 3.213: Optimal Sensor Voltage Range

A - Minimum Voltage Range – 2.5 V
B - Maximum Voltage Range – 4.0 V
C - Ideal Voltage Range – 3.3 V, between 0.7 and 4.3 V
D Minimum Voltage – 0.5 V
E Maximum Voltage – 4.5 V

A sensor that is configured so that the voltage range (for example, voltage range [C]) is too close to the sensor's low voltage limit (D) or high voltage limit (E) will have difficulty staying within the sensor's operating range of ideal operating range (A) of 0.7-4.3 V. If the sensor reports values that are above maximum voltage (E) or minimum voltage (D), the AHHC system will stop functioning correctly.

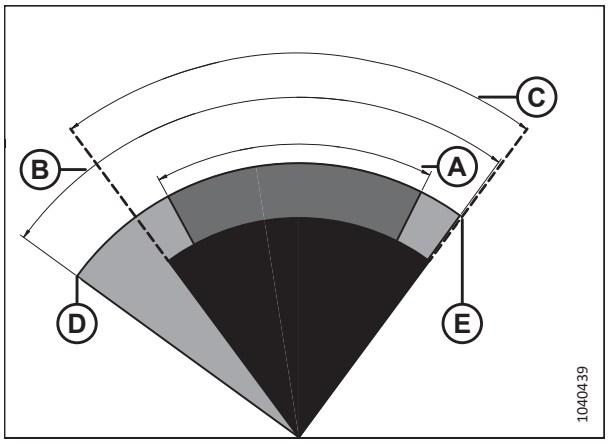


Figure 3.214: Sensor Range Set too Close to Voltage Limit

A - Minimum Voltage Range – 2.5 V
B - Maximum Voltage Range – 4.0 V
C - Configured Voltage Range
D Minimum Voltage – 0.5 V
E Maximum Voltage – 4.5 V

A sensor configured to have a voltage range that is less than 2.5 V (for example, range [C]) will have difficulty staying within the ideal range of 3.6 V. The combine will seek to keep the sensor within the narrow set range, resulting in the combine continually “hunting” for the appropriate header height.

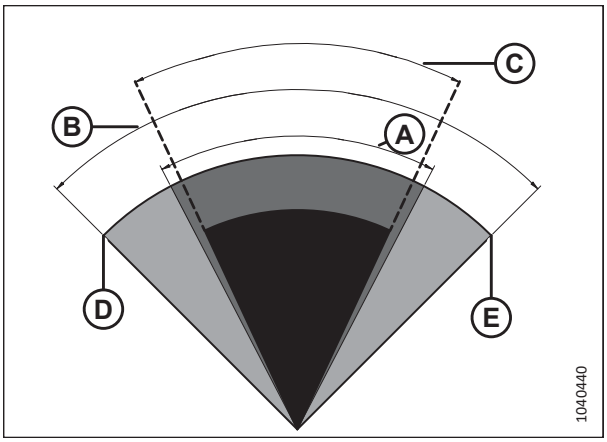


Figure 3.215: Sensor Range too Narrow

A - Minimum Voltage Range – 2.5 V **B - Maximum Voltage Range – 4.0 V**

C - Configured Voltage Range **D Minimum Voltage – 0.5 V**

E Maximum Voltage – 4.5 V

3.10.2 Recommended Sensor Output Voltages for Combines

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. The recommended lower and upper voltage values for best AHHC operation are provided.

Combine Voltage Limits

Combine	Lower Voltage Limit (V)	Upper Voltage Limit (V)	Minimum Range (V)
New Holland CR/CX - 5 V system	0.7	4.3	2.5
New Holland CR/CX - 10 V system	2.8	7.2	4.1–4.4

3.10.3 Manually Checking Voltage Limits

For the auto header height (AHHC) system to function correctly, the voltages reported to the combine by the header height sensors must occur within the specified range.

NOTE:

On some combine models, the voltage can be seen in the combine cab.

NOTE:

If the standard plug is installed in connector P600, the plug sends the average of both sensors to the combine. If the optional lateral tilt plug is installed in connector P600, the plug sends separate voltage signals from both sensors to 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. 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 upper voltage limit

4. Extend the guard angle until header angle indicator (A) is at E.

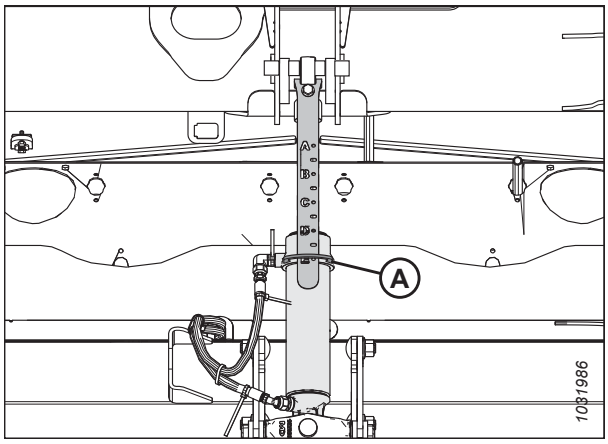


Figure 3.216: Center-Link

5. 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 217* for instructions.

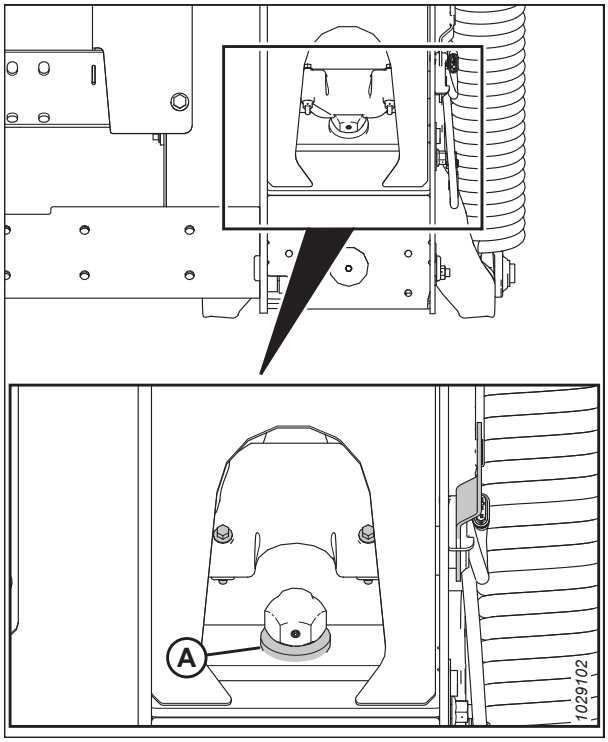


Figure 3.217: Down Stop Washer

6. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D). Tighten the nut on bolt (A).
7. Shut down the engine, and remove the key from the ignition.

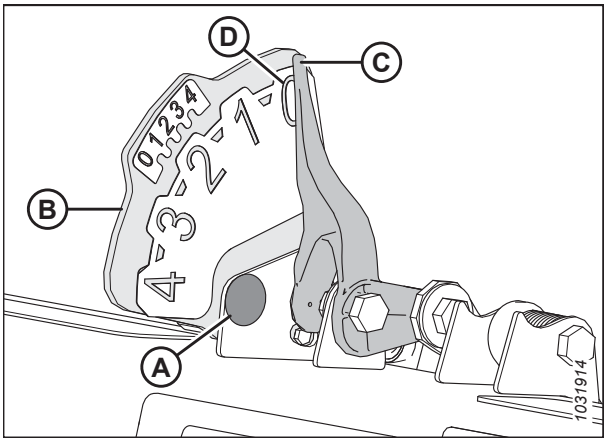


Figure 3.218: Float Indicator

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 connector 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, compare the voltage reported by the left sensor (pins 1 and 8) and the right sensor (pins 3 and 8) to the upper range specified in *3.10.2 Recommended Sensor Output Voltages for Combines, page 183*.
    - Pin 1 - FM3326A – left sensor signal
    - Pin 3 - FM3328A – right sensor signal
    - Pin 8 - FM2515E – ground

    NOTE:

    With the float lock linkage on the down stops, the upper voltage reading must be the same on both (left and right) sensors.

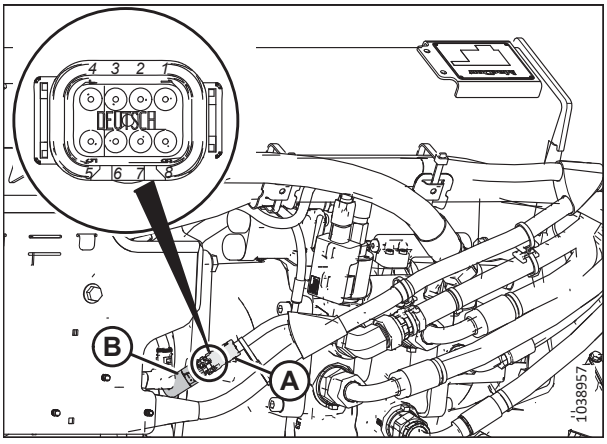


Figure 3.219: Connector P600 – View from Rear

13. If you need to adjust the voltage, then loosen both nuts (A), reposition sensor (B) in the indicator plate, and then tighten nuts (C) to 3 Nm (22 lbf·in.). While tightening the nuts, make sure that sensor (D) does **NOT** move in the indicator plate.

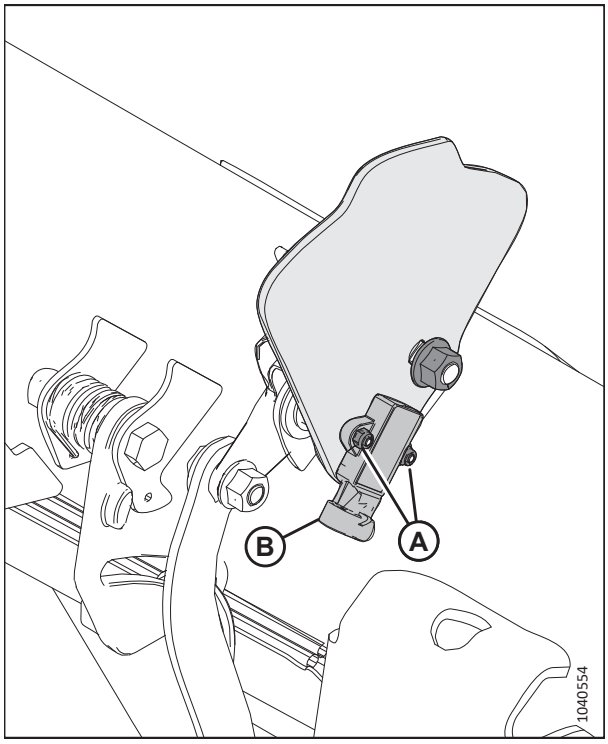


Figure 3.220: Left Float Indicator Plate

Checking sensor lower voltage limit

14. Extend the guard angle until header angle indicator (A) is at E.

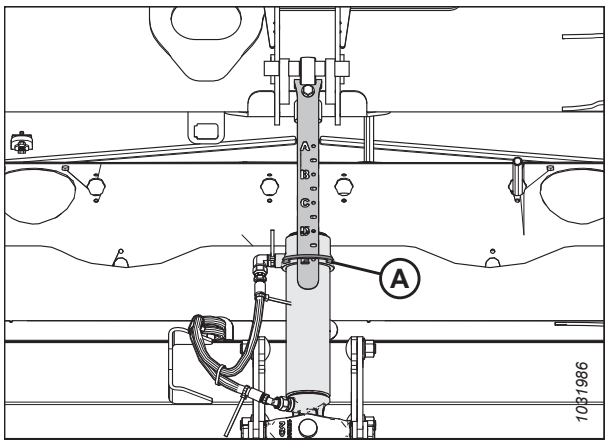


Figure 3.221: Center-Link

15. Fully lower header the to the ground. Float indicator pointer (A) should be at 4 (B).
16. Turn the key to the run position.
17. On connector P600, compare the voltage reported by the left sensor (pins 1 and 8) and the right sensor (pins 3 and 8) to the lower voltage specified in *3.10.2 Recommended Sensor Output Voltages for Combines, page 183*.
    - Pin 1 - FM3326A – left sensor signal
    - Pin 3 - FM3328A – right sensor signal
    - Pin 8 - FM2515E – ground
18. If you need to adjust the voltage, refer to Step *13, page 186* for instructions.

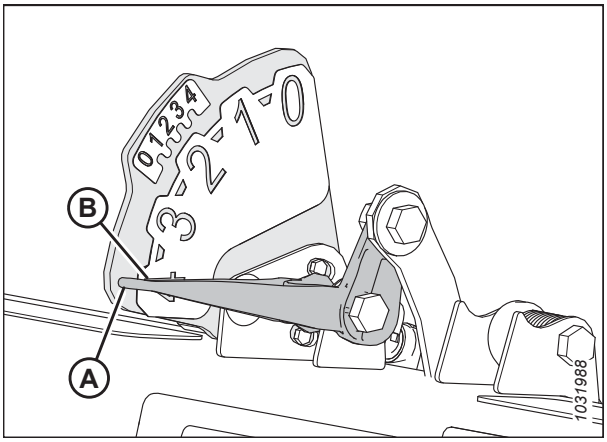


Figure 3.222: Left Float Indicator – View from Rear

3.10.4 Replacing Float Height Sensor

If a float height sensor is not reporting the correct voltage to the combine, it will need to be replaced. This procedure applies to both the left and right float height sensors.

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. 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 the float height indicator sensor on the right side of the float module will be replaced, disconnect plug P539 also.
6. Remove bolt (A).
7. Remove indicator plate (B); the sensor should be attached to the plate.

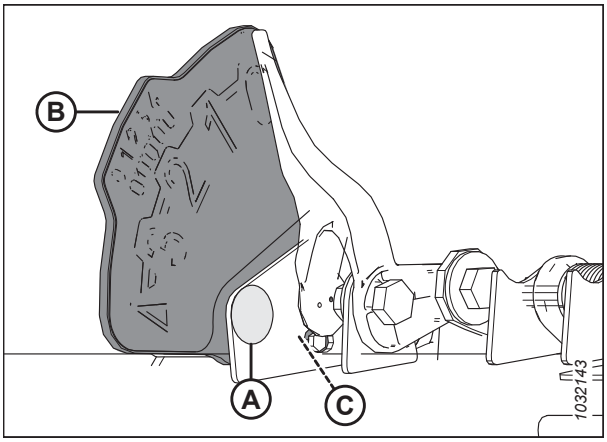


Figure 3.223: Float Setting Indicator – Left

8. Remove two bolts and nuts (A).
9. Remove and discard old sensor (B).
10. Install new sensor (B) so that the plug faces down.
11. Install two bolts and nuts (A) so that the bolt heads are on the same side as the decal.

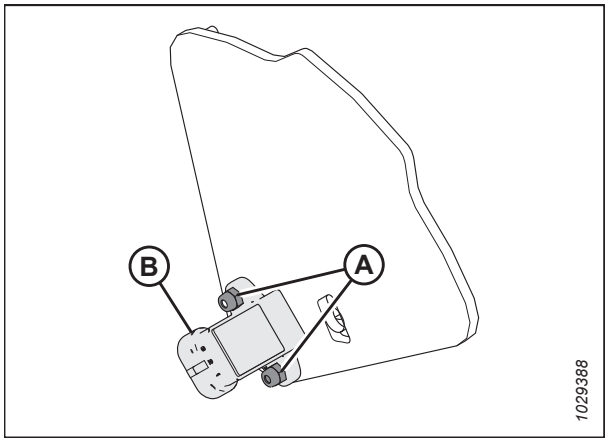


Figure 3.224: Float Height Sensor

12. Install indicator plate (B); the sensor should be attached to the plate.
13. Install bolt (A).
14. Connect harness plug (C).
15. Check the voltage range using the combine's instrumentation. If the combine does not have instruments for checking the voltage, it will need to be checked manually. For instructions, refer to *3.10.3 Manually Checking Voltage Limits, page 183*.

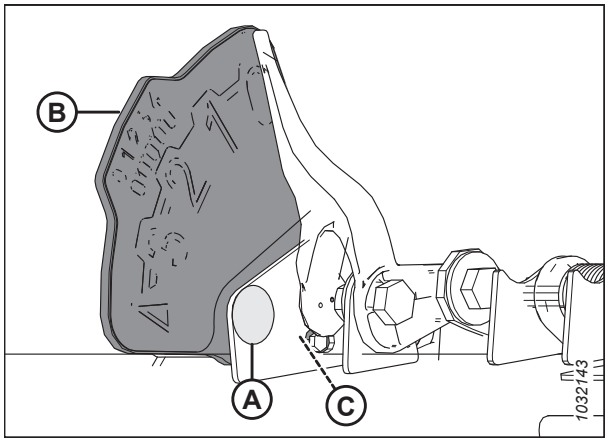


Figure 3.225: Float Setting Indicator – Left

3.10.5 10 Volt Adapter – New Holland Combines Only

New Holland combines equipped with a 10 V system require a 10 V adapter in order for the auto header height control (AHHC) system to be calibrated.

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's position.

For instructions on checking the sensor voltages, refer to *Checking Voltage Range from Combine Cab – New Holland CR and CX Series, page 189* or *3.10.3 Manually Checking Voltage Limits, page 183*.

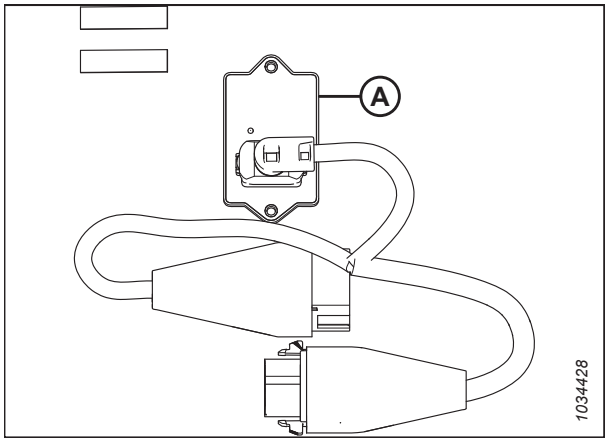


Figure 3.226: 10 V Adapter (B7241)

3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier

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-model year 2015 New Holland CR/CX models.

Checking Voltage Range from Combine Cab – New Holland CR and 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

DANGER

Ensure that 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 217* for instructions.

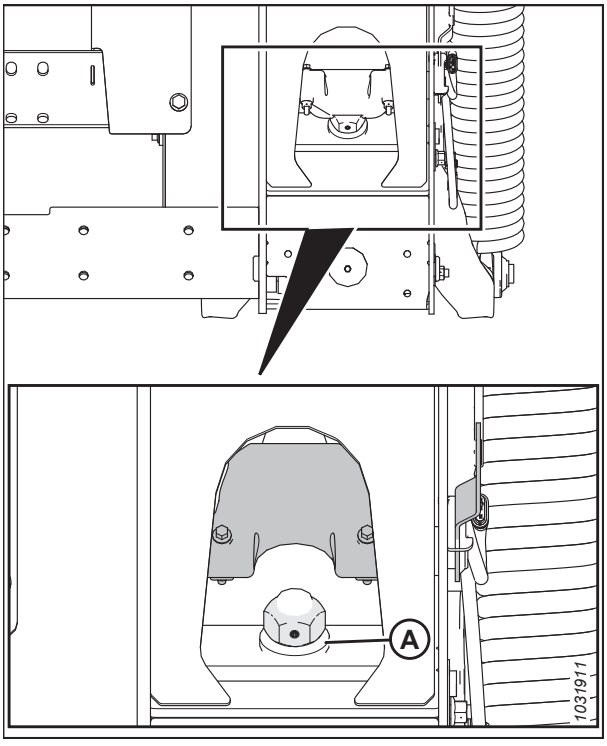


Figure 3.227: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D). Tighten the nut on bolt (A).

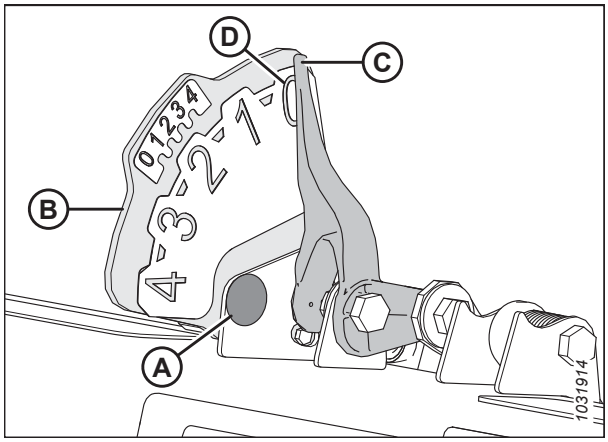


Figure 3.228: Float Indicator

5. Ensure the header float is unlocked.
6. Select DIAGNOSTICS (A) on the main page. The DIAGNOSTICS page appears.
7. Select SETTINGS. The SETTINGS page appears.

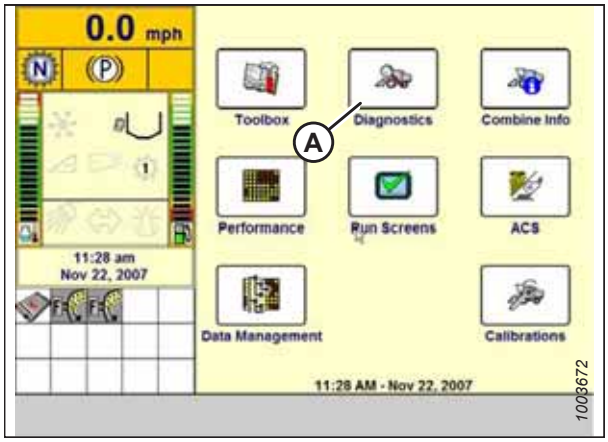


Figure 3.229: New Holland Combine Display

8. Select GROUP drop-down menu (A). The GROUP dialog box appears.

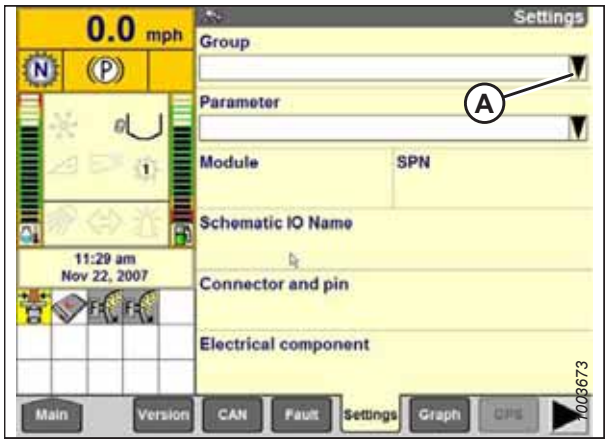


Figure 3.230: New Holland Combine Display

9. Select HEADER HEIGHT/TILT (A). The PARAMETER page appears.

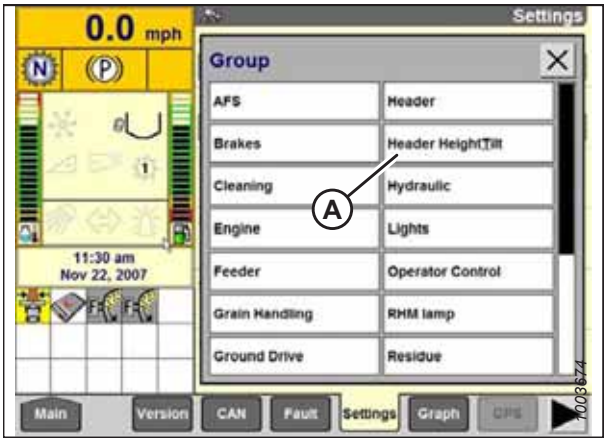


Figure 3.231: New Holland Combine Display

10. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The voltage reading appears at the top of the page.
11. Raise and lower the header to see the full range of voltage readings.
12. Compare the voltage readings on the display to voltage ranges specified in *3.10.2 Recommended Sensor Output Voltages for Combines, page 183*.

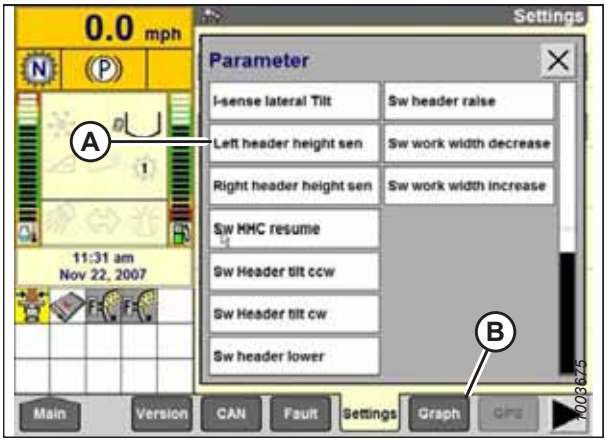


Figure 3.232: New Holland Combine Display

Header Settings Quick Reference – New Holland CR Series

Use the information in the following table to quickly reference the recommended settings for a header paired with a New Holland CR Series combine.

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.

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

Header Settings – New Holland CR Series (continued)

Setup Parameter	Suggested Setting
HHC tilt sensitivity	Set for best performance
Reel height sensor	Yes

Setting up Auto Header Height Control – New Holland CR and 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

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.

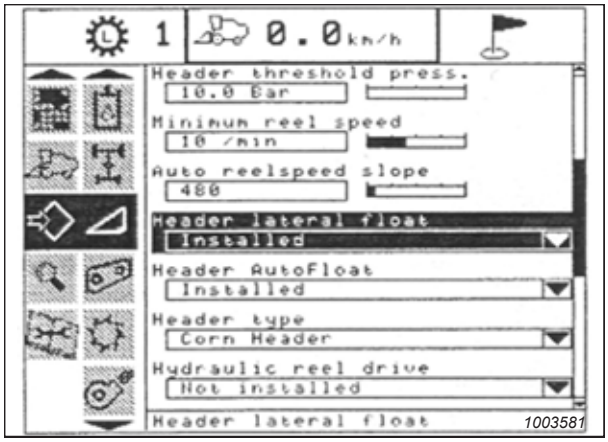


Figure 3.233: New Holland Combine Display

3. Select HEADER AUTOFLOAT, and press ENTER.
4. Use the up and down navigation keys to move between options, and select INSTALLED.

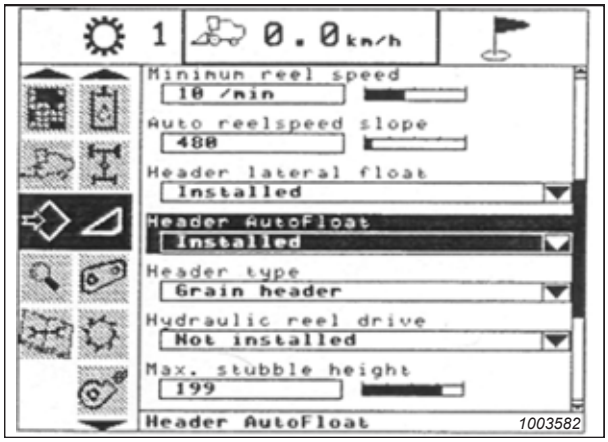


Figure 3.234: New Holland Combine Display

Calibrating Auto Header Height Control – New Holland CR and 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

Ensure that 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

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 *3.9.4 Header Angle, page 131*.

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.

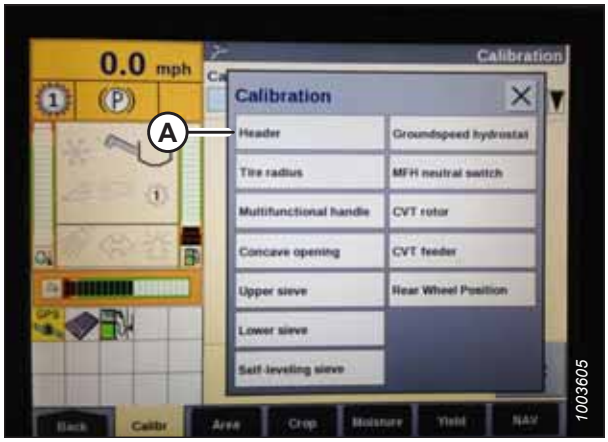


Figure 3.235: New Holland Combine Display

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.

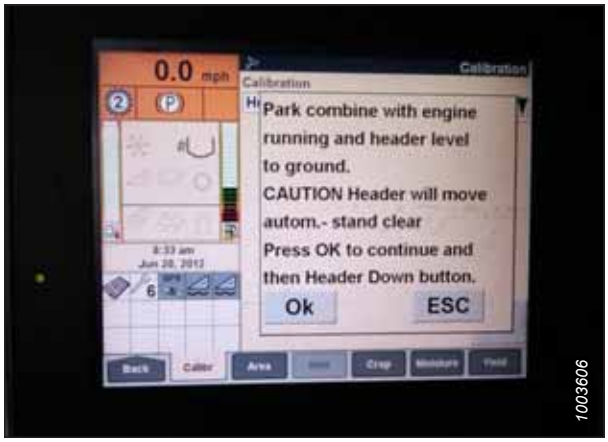


Figure 3.236: New Holland Combine Display

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 and CX Series, page 194*.

Calibrating Maximum Stubble Height – New Holland CR and CX Series

This procedure details how to set the height at which the harvest area counter will start and stop counting harvested 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.

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

Ensure that 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.

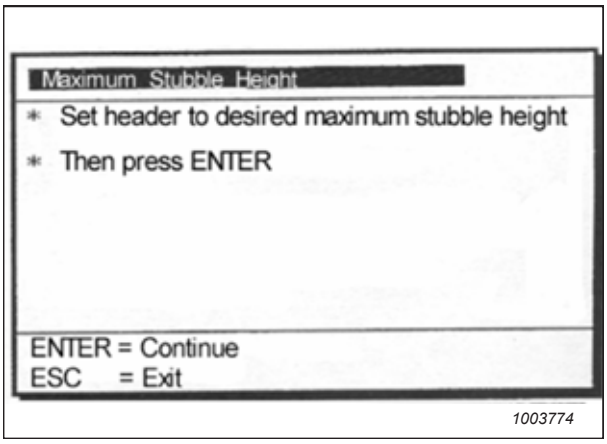


Figure 3.237: New Holland Calibration Dialog Box

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.

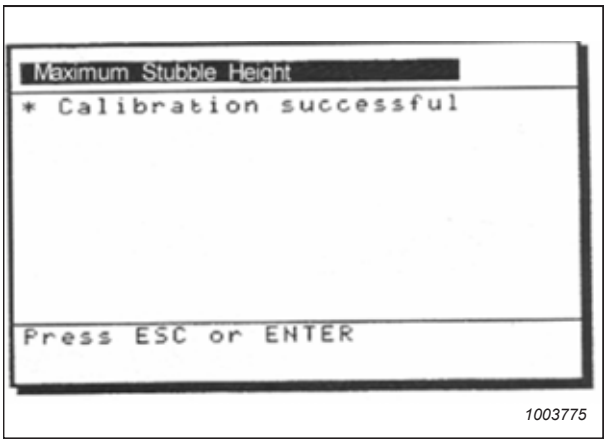


Figure 3.238: New Holland Calibration Dialog Box

Adjusting Header Raise Rate – New Holland CR and 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

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.

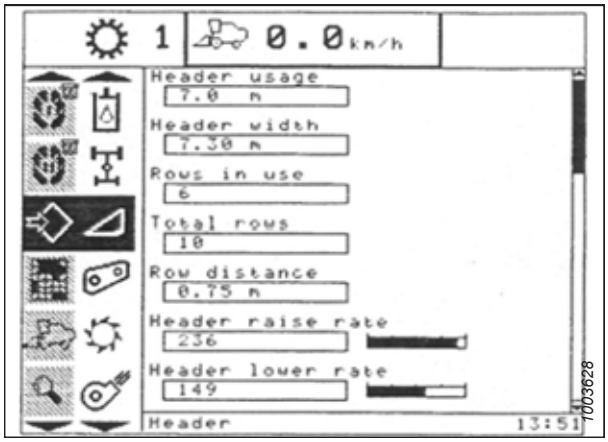


Figure 3.239: New Holland Combine Display

Setting Header Lower Rate – New Holland CR and 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

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.

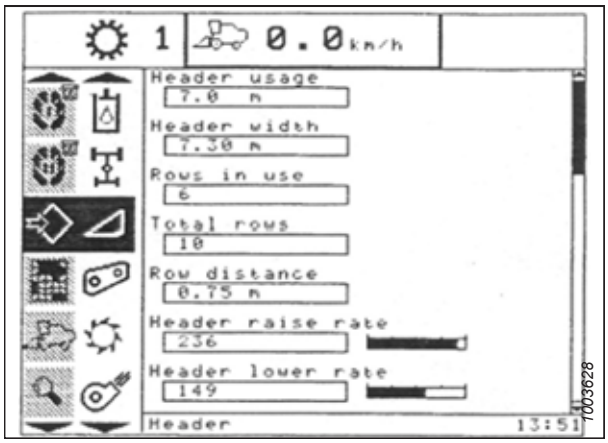


Figure 3.240: New Holland Combine Display

Setting Auto Header Height Control Sensitivity – New Holland CR and 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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

DANGER

Ensure that 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 3.241: New Holland Combine Display

Setting Preset Cutting Height – New Holland CR and CX Series

The reel and cut height setting can be stored in the combine's computer as presets. These settings can be set and selected using the combine's control console.

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 *3.10.7 New Holland Combines – CR Series, 2015 and Later, page 198*.

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.

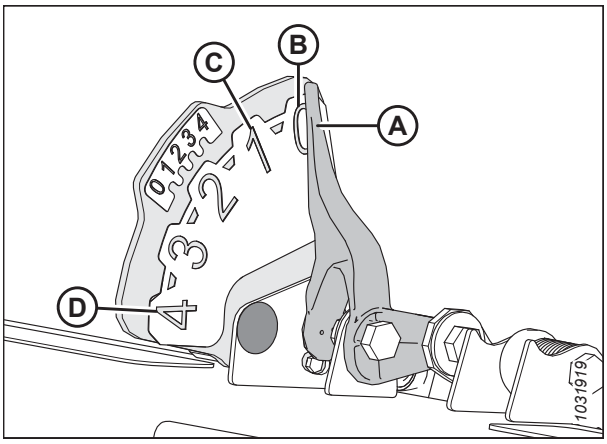


Figure 3.242: Float Indicator

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 the REEL HEIGHT momentary switch.
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.
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.

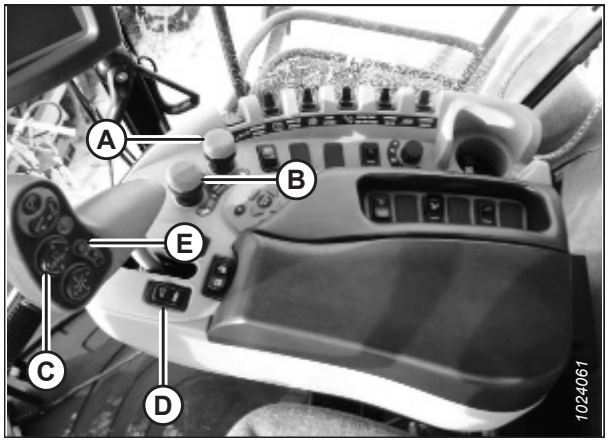


Figure 3.243: New Holland Combine Controls

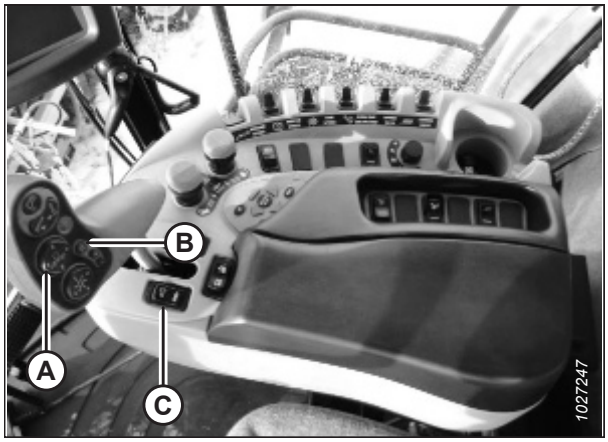


Figure 3.244: New Holland Combine Controls

3.10.7 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).

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 *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*.

DANGER

Ensure that 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 217* for instructions.

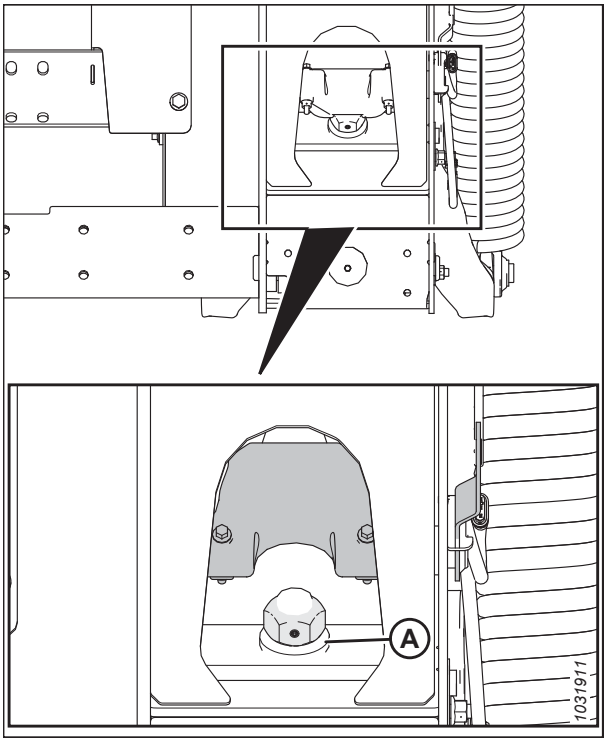


Figure 3.245: Float Lock

4. If the pointer is not on zero, loosen bolt (A) and slide float indicator plate (B) until pointer (C) is on **0** (D). Tighten the nut on bolt (A).
5. Ensure the header float is unlocked.

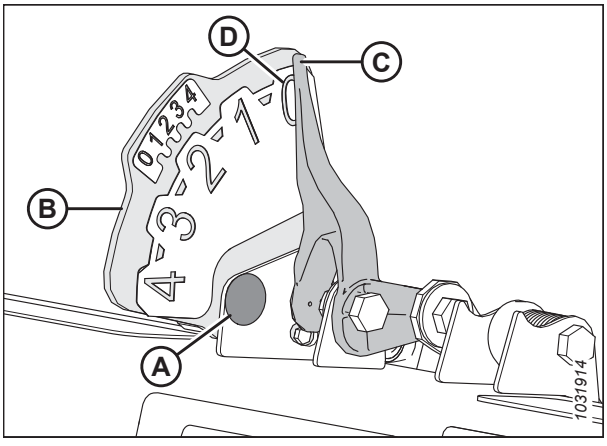


Figure 3.246: Float Indicator

6. Select DIAGNOSTICS (A) on the main page. The DIAGNOSTICS page appears.

Figure 3.247: New Holland Combine Display

7. Select SETTINGS (A). The SETTINGS page appears.

Figure 3.248: New Holland Combine Display

8. Select HEADER HEIGHT/TILT (A) from the GROUP drop-down menu.
9. Select HEADER HEIGHT SENS. L (B) from the PARAMETER drop-down menu.

Figure 3.249: New Holland Combine Display

10. Select GRAPH (A). The exact voltage (B) is displayed at the top of the page.
11. Raise and lower the header to see the full range of voltage readings.

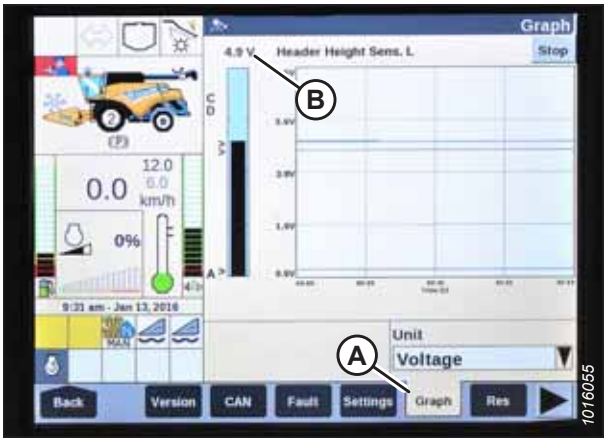


Figure 3.250: New Holland Combine Display

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.

To ensure the 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 the 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 *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*.

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.

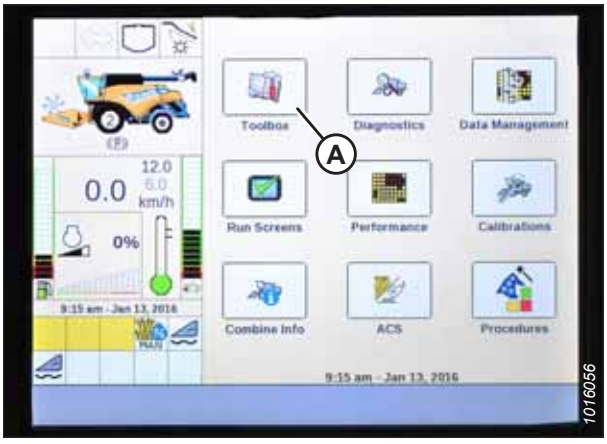


Figure 3.251: New Holland Combine Display

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 3.252: 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 3.253: New Holland Combine Display

8. Select HEADER SUB TYPE drop-down arrow, and set HEADER SUB TYPE to 80/90 (A).

Figure 3.254: New Holland Combine Display

9. Select HEAD 2 (A). The HEADER SETUP 2 page displays.

Figure 3.255: New Holland Combine Display

10. Select the AUTOFLOAT drop-down menu and set AUTOFLOAT to INSTALLED (A).
11. 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.

12. Set the values for MANUAL HHC RAISE RATE (C) and MANUAL HHC LOWER RATE (D) for best performance according to ground conditions.

Figure 3.256: New Holland Combine Display

13. Set the values for HHC HEIGHT SENSITIVITY (A) and HHC TILT SENSITIVITY (B) for best performance according to ground conditions.

Figure 3.257: New Holland Combine Display

14. From REEL HEIGHT SENSOR menu (A), select YES.

Figure 3.258: New Holland Combine Display

Setting up Reel Speed – New Holland CR Series

The reel diameter and reel displacement settings will need to be entered into the combine's computer before the reel can be operated.

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. Ensure that the combine display software is updated to the relevant version specified below or better:
   - Combines from model years 2015–2018: UCM v38.10.0.0
   - Combines from model year 2019 or newer: 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 3.259: 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 3.260: 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 specific combination of drive and driven sprocket sizes detailed in the following table.

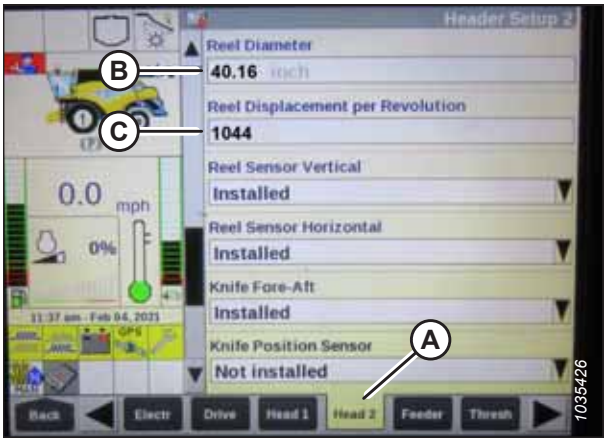


Figure 3.261: New Holland Combine Display

Reel Displacement per Revolution Chart

Drive Sprocket Size (Number of Teeth)	Driven Sprocket Size (Number of Teeth)	Reel Displacement Per Revolution
19 (standard)	56	769
14 (high torque / low speed)[70]	56	1044
20 (low torque / high speed)[71]	52	679

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

Ensure that all bystanders have cleared the area.

70. Two speed kit with chain on inner sprockets.
71. Two speed kit with chain on outer sprockets.

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 *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*.

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 *3.9.4 Header Angle, page 131*.

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 3.262: New Holland Combine Display

2. Select CALIBRATION drop-down menu (A).

Figure 3.263: New Holland Combine Display

3. Select HEADER (A) from the list of calibration options.

Figure 3.264: 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 3.265: 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 3.266: New Holland Combine Display

Calibrating Reel Height Sensor and Reel Fore-Aft Sensor – New Holland CR Series

The reel height sensor and reel fore-aft sensor will need to be calibrated before the auto header height control (AHHC) system can be used. Calibrating the reel position calibrates the reel height sensor and the reel fore-aft sensor.

DANGER

Ensure that 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 appears.

Figure 3.267: New Holland Combine Display

3. Select CALIBRATION drop-down menu (A).

Figure 3.268: New Holland Combine Display

4. Select REEL POSITION (A) from the list of calibration options.

Figure 3.269: New Holland Combine Display

5. CAUTION statement (A) will appear. Press ENTER.

Figure 3.270: 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.

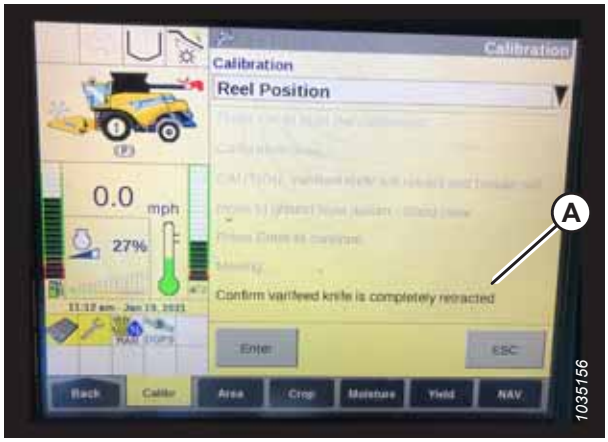


Figure 3.271: New Holland Combine Display

7. Follow 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.

Figure 3.272: 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 3.273: 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.

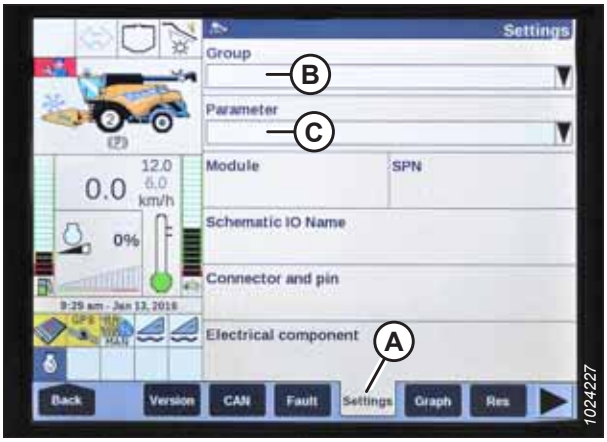


Figure 3.274: New Holland Combine Display

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.

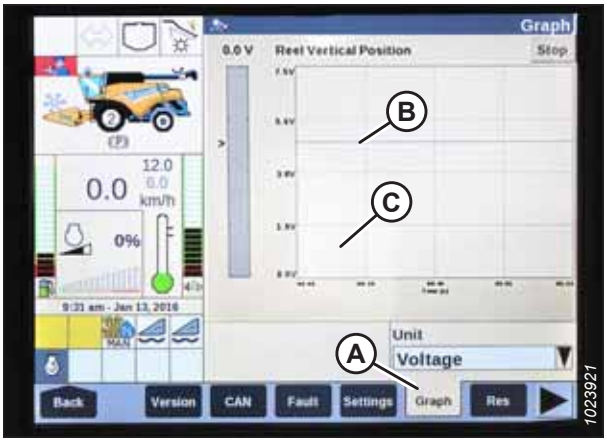


Figure 3.275: New Holland Combine Display

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:

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 *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*.

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.

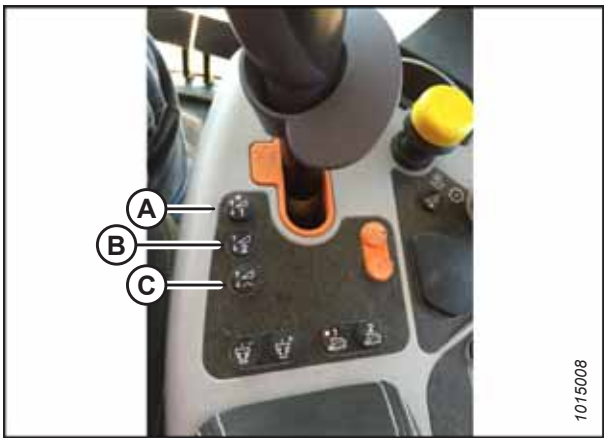


Figure 3.276: New Holland Combine Controls

DANGER

Ensure that 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 3.277: 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 212* to Step *6, page 212*, using preset button 2.

Figure 3.278: New Holland Combine Multifunction Handle

8. Lower the header to the ground.
9. Select RUN SCREENS (A) on the main page.

Figure 3.279: 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 3.280: New Holland Combine Display

Setting Maximum Work Height – New Holland CR Series

The maximum work height can be set 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:

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 *3.10.6 New Holland CR and CX Series Combines – 2014 and Earlier, page 189*.

1. Select TOOLBOX (A) on the main page. The TOOLBOX page appears.

Figure 3.281: New Holland Combine Display

2. Select FEEDER (A). The FEEDER SETUP page appears.
3. Select MAXIMUM WORK HEIGHT field (B).

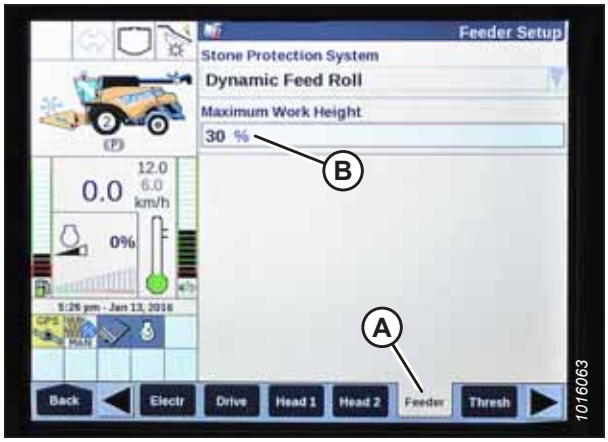


Figure 3.282: New Holland Combine Display

4. Set MAXIMUM WORK HEIGHT to the desired value.
5. Press SET and then press ENTER.

Figure 3.283: 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. Shut down the engine.
2. Turn the key to the run position.
3. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

Figure 3.284: New Holland Combine Controls

4. On the HEAD 1 page, change the CUTTING TYPE from FLEX to PLATFORM as shown at location (A).

Figure 3.285: New Holland Combine Display

5. On the HEAD 2 page, change HEADER SUB TYPE from DEFAULT to 80/90 as shown at location (A).

Figure 3.286: 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.

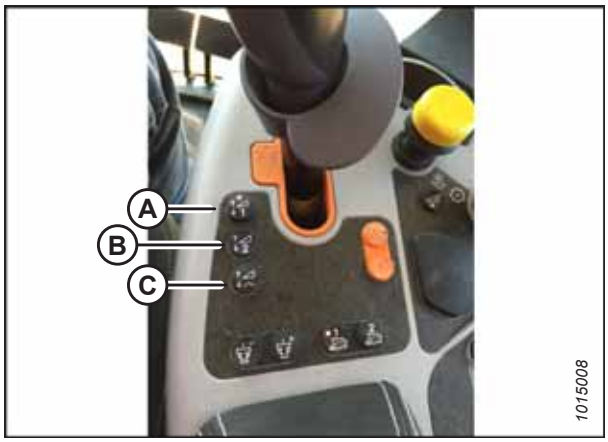


Figure 3.287: New Holland Combine Controls

3.11 Leveling Header

The float module is set at the factory to provide the proper level for the header and should not normally require adjustment. However, if adjustment is required, a procedure for doing so is provided.

Normally, the header level does not need to be adjusted. Before attempting to level the header, perform the following checks:

- Ensure that the combine's tires are inflated to the correct pressure.
- Ensure that the combine's feeder house is level. For instructions, refer to the combine operator's manual.
- Ensure that the top of the float module is level and is parallel with the combine's feeder house by checking the spirit level on the float module.

IMPORTANT:

The float springs are **NOT** used to level the header.

If the header still is not level, perform the following 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.

1. Park the combine on a level surface.
2. Inspect the header to determine which side is too high, and which side is too low.
3. Shut down the engine, and remove the key from the ignition.
4. Check, and if necessary adjust the float. For instructions, refer to *Checking and Adjusting Header Float, page 121*.
5. 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**).

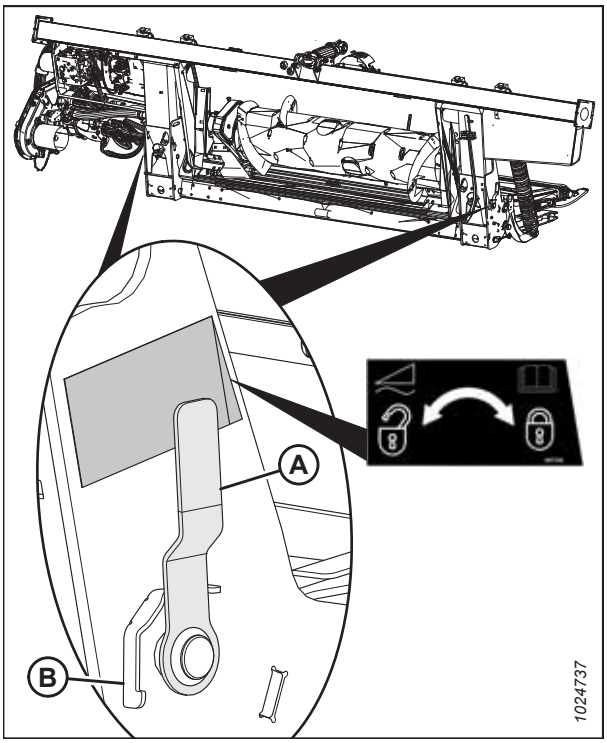


Figure 3.288: Header Float Lock in Locked Position

6. On the high side of the header, make **one** small (1/4–1/2 turn) **counterclockwise** adjustment to nut (A). Do **NOT** make any further adjustments to the float lock nut on this side of the header yet.

   IMPORTANT:

   Adjustment of more than two turns in either direction may adversely affect the header float.

   NOTE:

   Turning the float lock nut clockwise raises that side of the header; turning it counterclockwise lowers that side of the header.

   NOTE:

   Set screw (B) does not require loosening for adjustments of up to one-half turn of nut (A).

7. Make the same adjustment to the float lock nut on the low side of the header in the **counterclockwise** direction. For example, if an adjustment of 1/4 turn counterclockwise was made on the high side of the header, make an adjustment of 1/4 turn clockwise on the low side of the header.

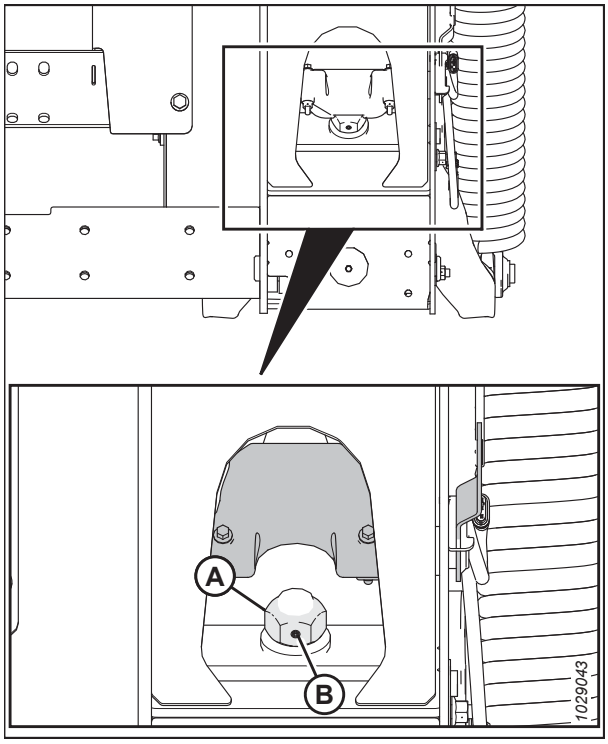


Figure 3.289: Float Lock – Right

8. Reset float indicator needle (A) to zero. To do so, loosen the nut securing bolt (B) and center the indicator needle on zero as shown. Ensure that the tip of the needle lines up with the white dot on the back plate.

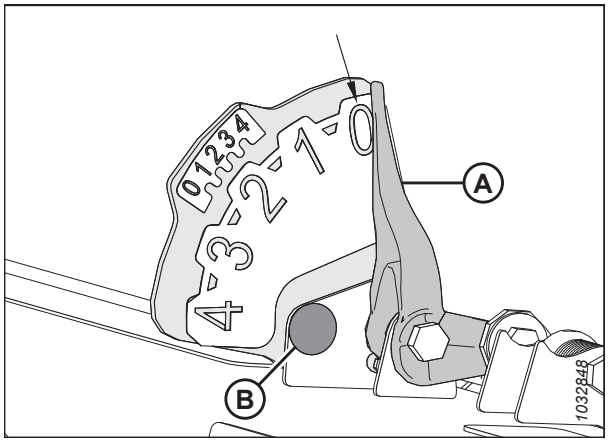


Figure 3.290: Left Float Indicator

9. Ensure that there is a minimum clearance of 2–3 mm (1/8 in.) (A) between the frame and the back of the bell crank lever.

10. Check the float after leveling header. For instructions, refer to *Checking and Adjusting Header Float, page 121*

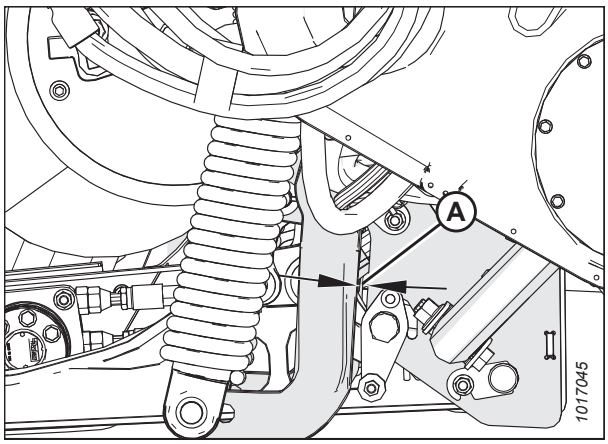


Figure 3.291: Bell Crank

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.

1. Reverse the combine feeder house. If the cutterbar is still plugged, proceed to the next steps.
2. Stop the forward movement of the machine, and disengage the header drives.
3. Raise the header to prevent it from filling with dirt, and engage the header drive clutch.
4. If the plug does **NOT** clear, disengage the header drive clutch, and raise the header fully.
5. Shut down the engine, and remove the key from the ignition.
6. Engage the header safety props. For instructions, refer to the combine operator's manual.
7. Clean the cutterbar.

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 221*
- *3.14.2 Towing, page 221*

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:

- **The weight of the towing vehicle must exceed the 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 the 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.**
- **Ensure that all pins are properly secured in the transport position at wheel supports, cutterbar support, and hitch.**
- **Check tire condition and pressure prior to transporting.**
- **Connect the hitch to the towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.**
- **Attach the hitch safety chain to the towing vehicle. Adjust the safety chain length to provide only enough slack to permit turning.**
- **Connect the header seven-pole plug wiring harness to the mating receptacle on towing vehicle. (The seven-pole receptacle is available from your MacDon Dealer parts department.)**
- **Ensure that 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.

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 3.292: 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 224*. If removing a tow-bar without an extension, proceed to Step *16, page 225*.

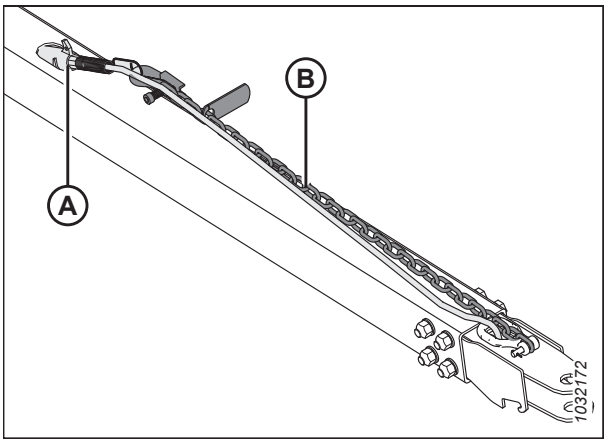


Figure 3.293: Tow-Bar Assembly

Removing tow-bar installed with an extension:

4. Disconnect tow-bar harness (A) from extension harness (B).
5. Remove lynch pin (C) from latch.

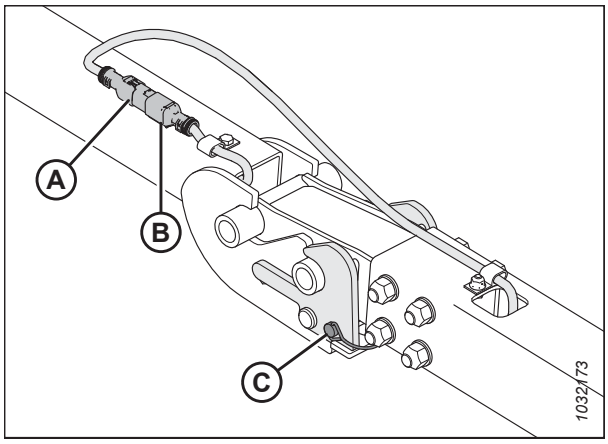


Figure 3.294: Tow-Bar / Extension Harness

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).

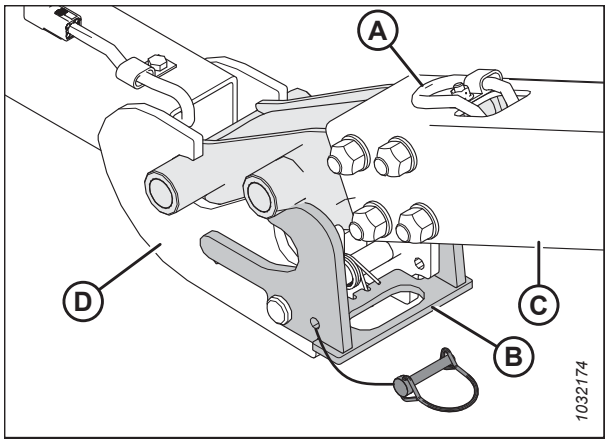


Figure 3.295: Tow-Bar / Extension Joint

9. Unplug tow-bar extension electrical harness (A) from left transport pivot harness (B).

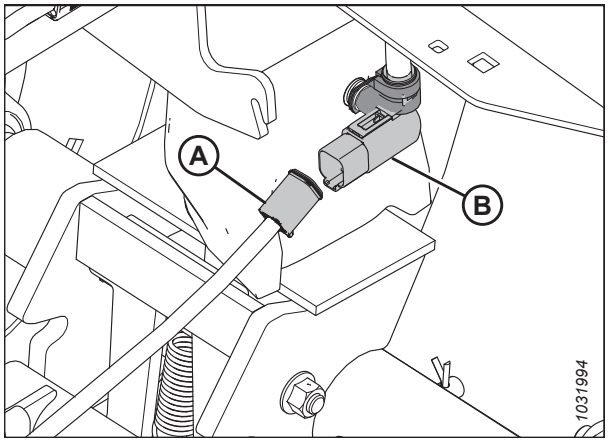


Figure 3.296: Tow-Bar Electrical Connection

10. Remove lynch pin (A) from transport pivot (B).
11. Push back on latch (C) to free extension (D).

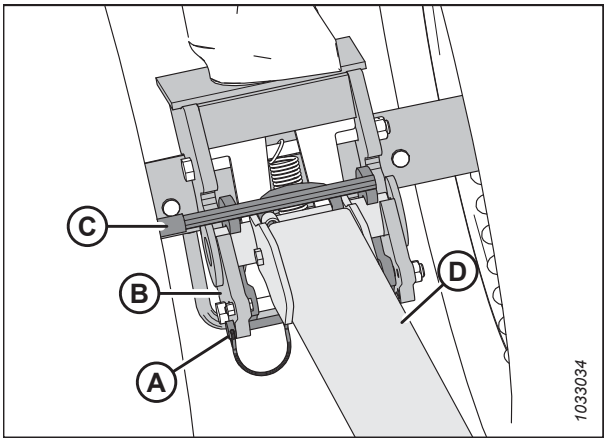


Figure 3.297: Tow-Bar Extension and Transport Pivot

12. Lift extension (A) and pull away from transport pivot (B).
13. Secure extension harness (C) inside the tow-bar extension tube (A).
14. Reinstall lynch pin in left transport pivot for safe keeping.
15. For tow-bar storage, refer to *Storing Tow-Bar, page 226*.

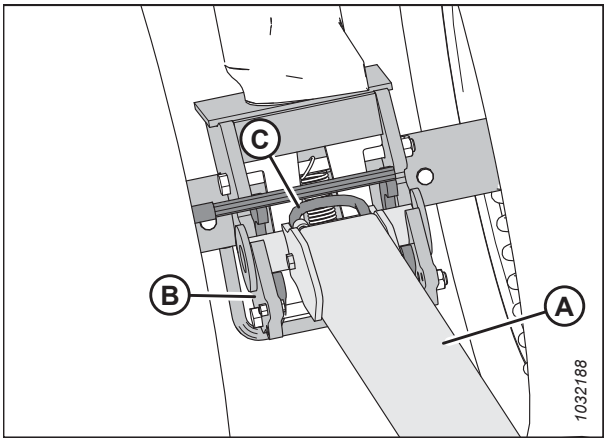


Figure 3.298: Latch Disengaged from Extension

Removing tow-bar installed without an extension:

16. Unplug tow-bar extension electrical harness (A) from left transport pivot harness (B).

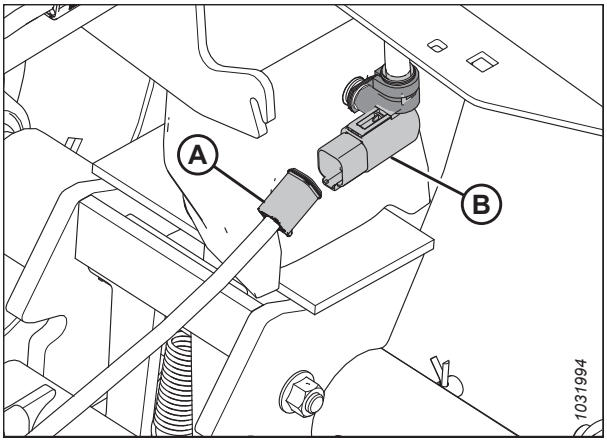


Figure 3.299: Tow-Bar Electrical Connection

17. Remove lynch pin (A), then push back on latch (B) to free the tow-bar.

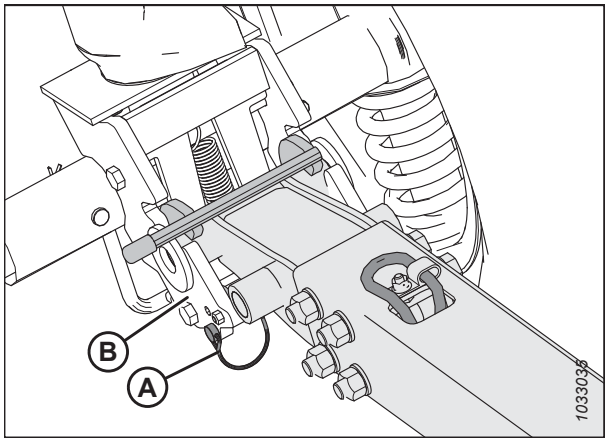


Figure 3.300: Tow-Bar and Left Transport Pivot

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 226*.

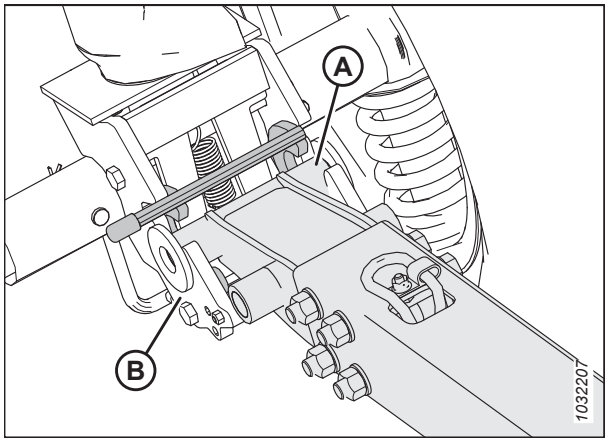


Figure 3.301: Tow-Bar and Left Transport Pivot

Storing Tow-Bar

The tow bar can be stored in the backtube 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).

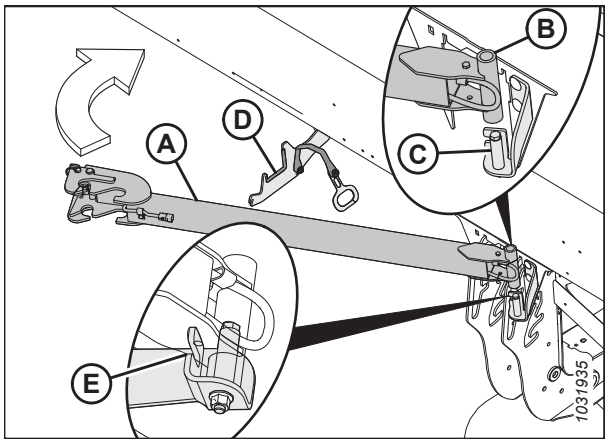


Figure 3.302: Tow-Bar Extension Storage

3. Secure tow-bar extension by hooking strap handle (A) onto notch in cradle (B).

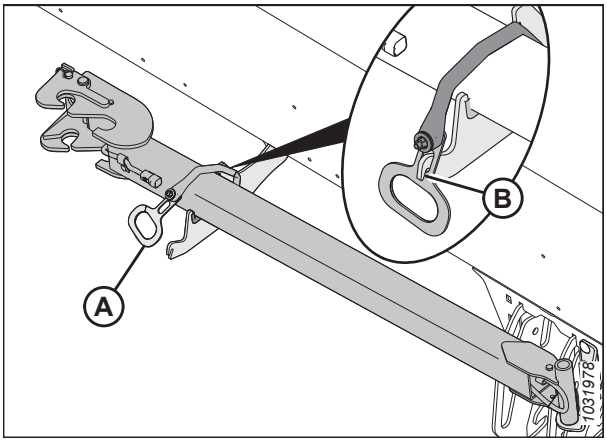


Figure 3.303: Tow-Bar Extension Storage

Tow-bar

4. Open left endshield. For instructions, refer to *Opening Header Endshields, page 39*.

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.

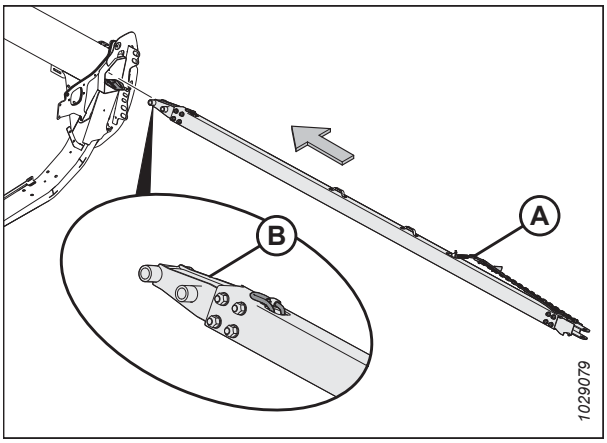


Figure 3.304: Hitch End

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 40*.

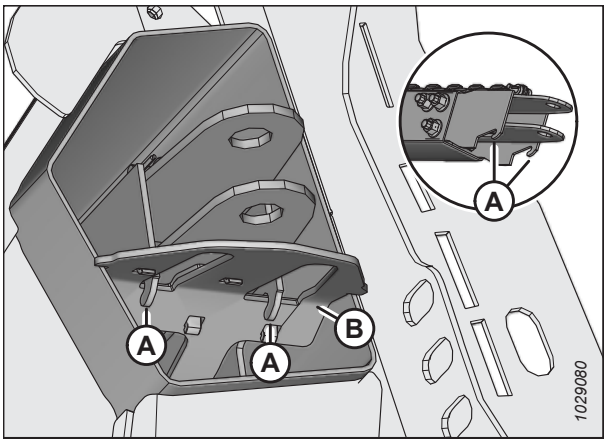


Figure 3.305: Clevis End Retainer Hooks

Moving Front (Left) Wheels into Field Position

This procedure explains how to move the wheels to the highest storage position, but you may want 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 tow-bar has been 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.

DANGER

Ensure 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 safety props. For instructions, refer to the combine operator's manual.
5. Turn left transport wheel assembly (A) 90° in the direction shown.

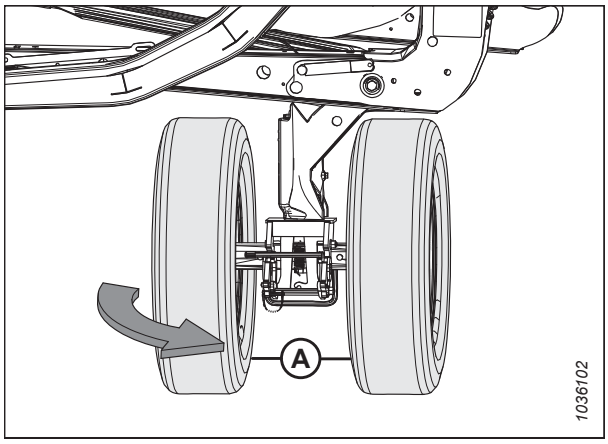


Figure 3.306: Left Transport Wheels in Transport Mode

6. Remove lynch pin (A). Pull handle (B) to engage latch (C)—this will prevent the transport wheel assembly from rotating.

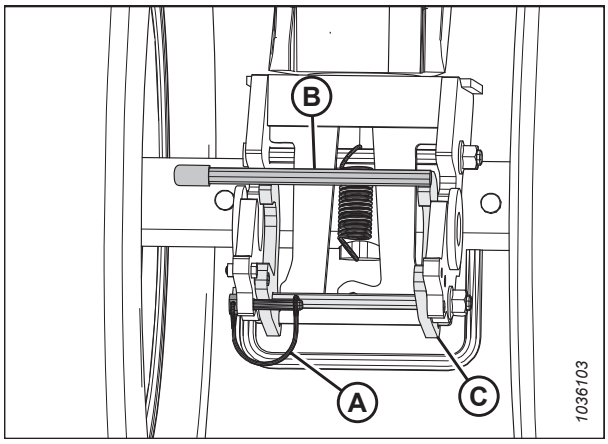


Figure 3.307: Left Transport Wheels – Rotation Lock Latch Disengaged

7. Secure latch (B) with lynch pin (A).

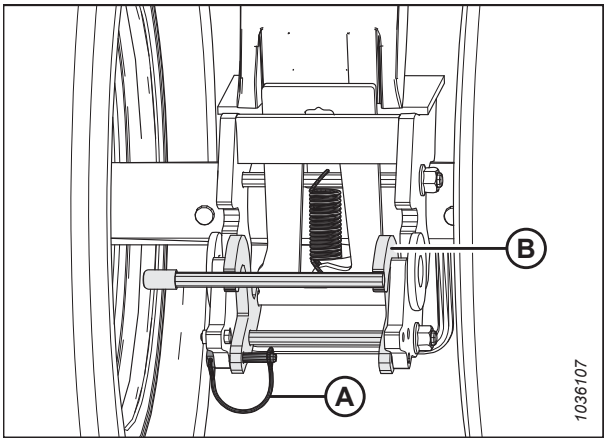


Figure 3.308: Left Transport Wheels – Rotation Lock Latch Engaged

8. To unlock the pivot, use your foot to apply pressure to bolt (B) while pushing handle (A) downward.

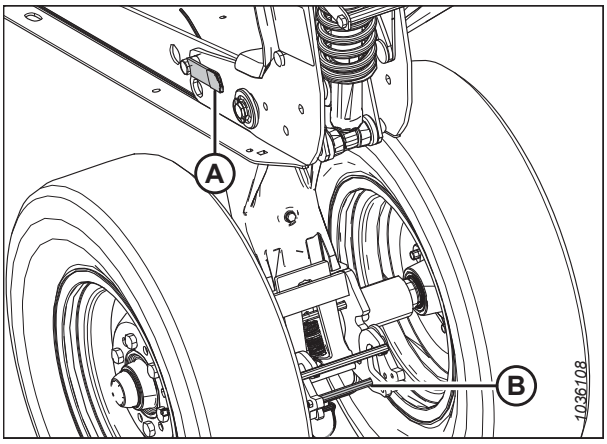


Figure 3.309: Left Transport Wheels – Pivot Released

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.

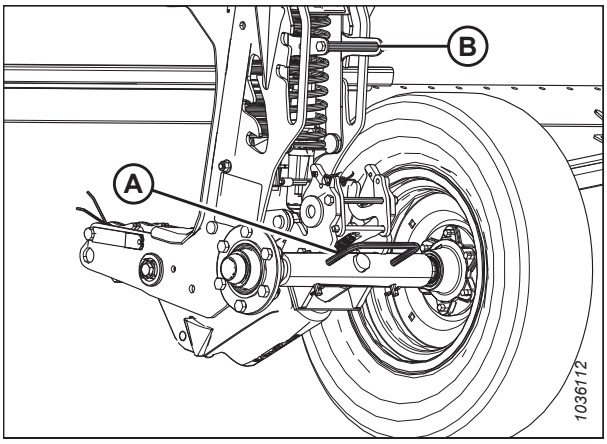


Figure 3.310: Left Transport Wheels in Highest Storage Position

10. Ensure that pin (A) is visible at the highest storage position in plate (B).

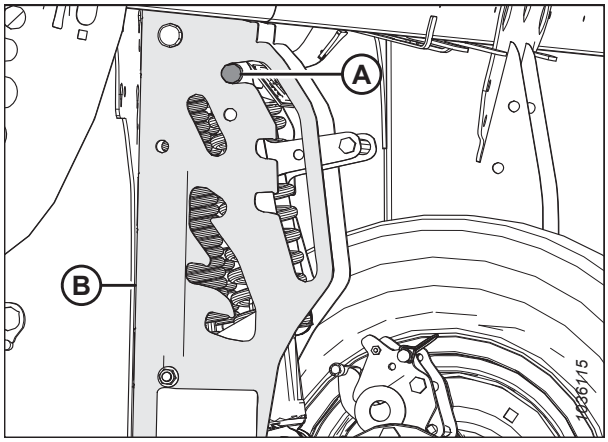


Figure 3.311: Left Transport Wheel Pivot Pin in Highest Storage Position

Moving Rear (Right) Wheels into Field Position

This procedure demonstrates how to move the wheels to the highest storage position, but you may want 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 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.

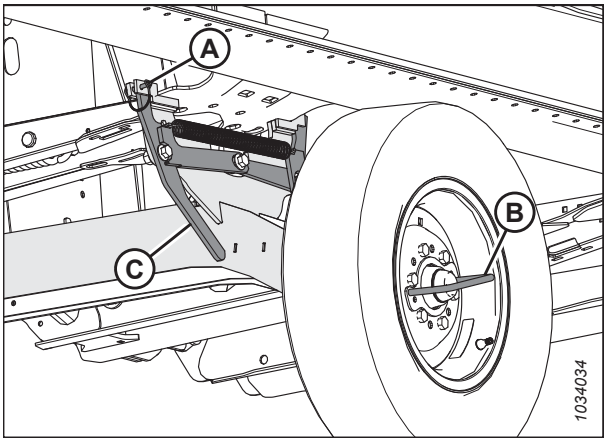


Figure 3.312: Right Transport Axle Latched in Transport Position

9. Lift and rotate right transport axle (A) in the direction shown using the wheel handle.

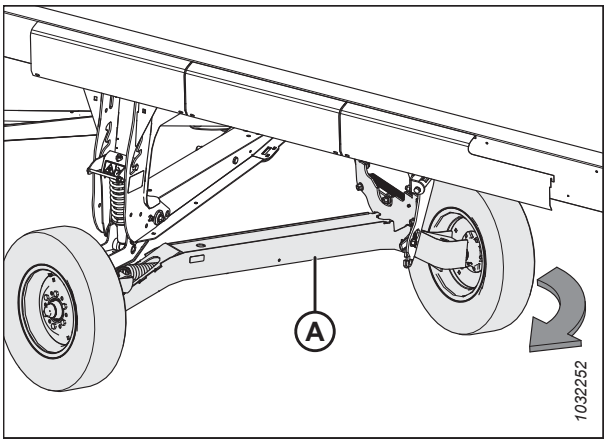


Figure 3.313: Right Transport Axle Rotation

10. Using wheel handle (A), lift and position right transport axle (B) to field support (C) to engage the latch.

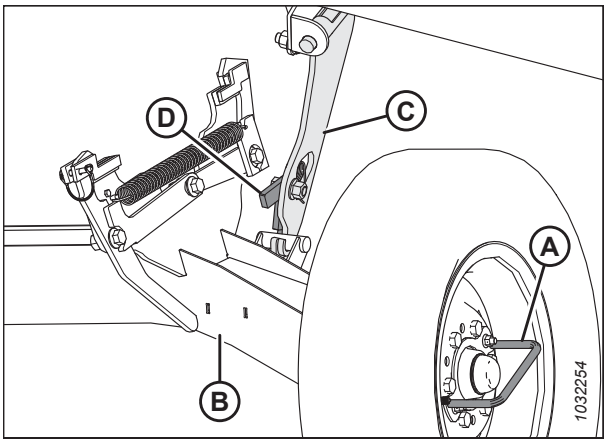


Figure 3.314: Right Transport Axle Latched in Field Position

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.

12. Adjust the skid shoe position at the right transport leg to match the other skid shoes. For instructions, refer to *Adjusting Inner Skid Shoes, page 118*.

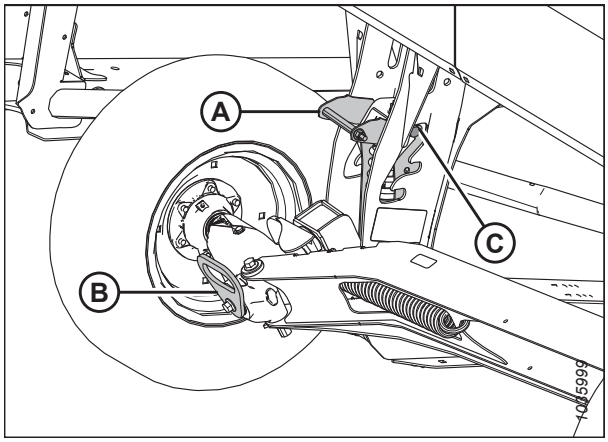


Figure 3.315: Right Transport Wheels in Highest Storage Position

3.14.4 Converting from Field to Transport Position (Option)

The header needs to be converted to the transport position when being towed to a new location.

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.

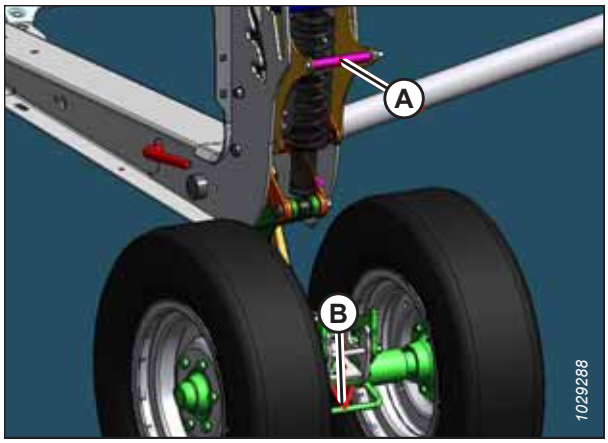


Figure 3.316: Gauge Wheel

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 3.317: Gauge Wheel

8. Remove clevis pin (A) securing latch.
9. Push pivot handle (B) up to unlock wheel assembly.

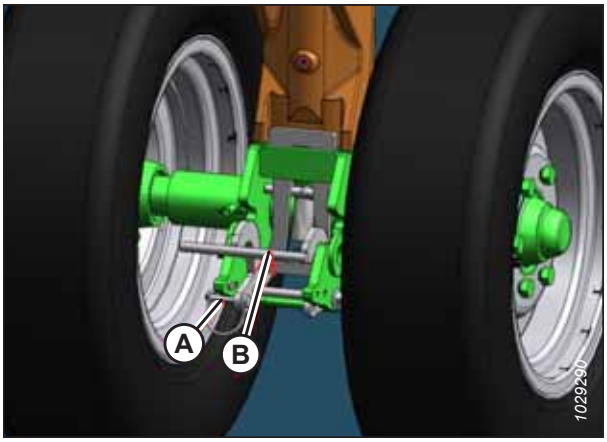


Figure 3.318: Gauge Wheel

10. Turn front wheel assembly clockwise, 90°.

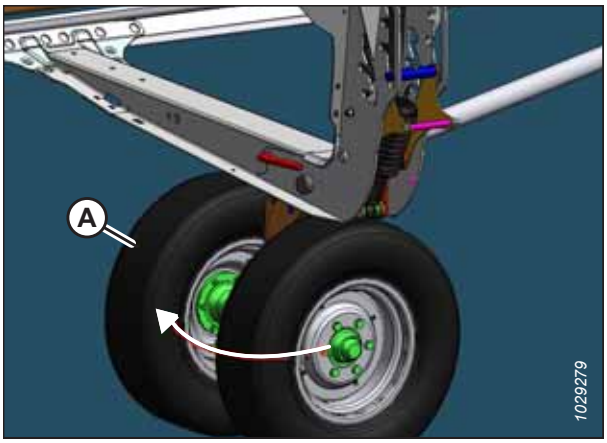


Figure 3.319: Gauge Wheel

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. Fully raise the skid shoe at the right transport axle. For instructions, refer to *Adjusting Inner Skid Shoes, page 118*.
2. 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.
3. Pull suspension handle (A) outward and push down on axle pivot handle (B).

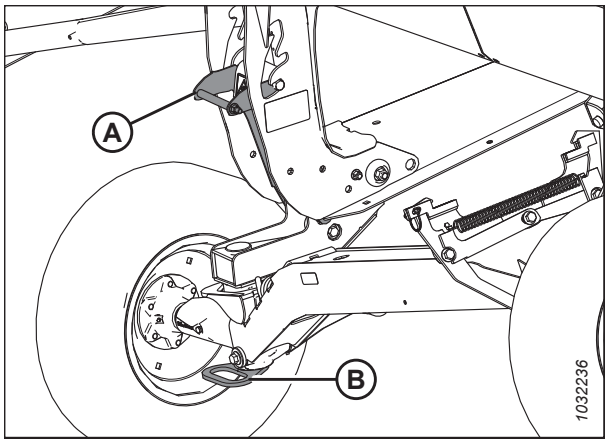


Figure 3.320: Gauge Wheels

4. Push down on latch (A) at right field support (B) to unlock.

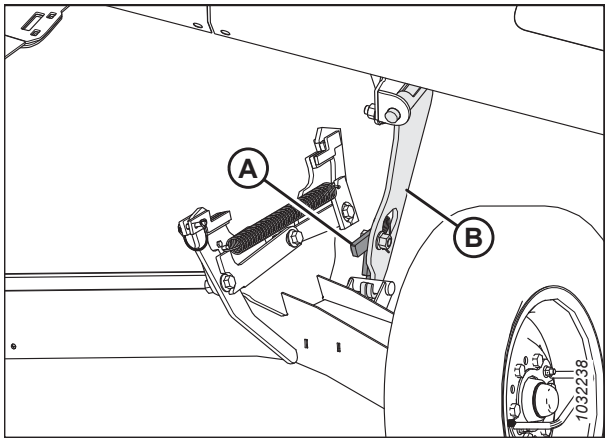


Figure 3.321: Right Field Support

5. Lift wheel handle (A) to remove right transport axle (B) from right field support (C), then lower right transport axle to the ground.

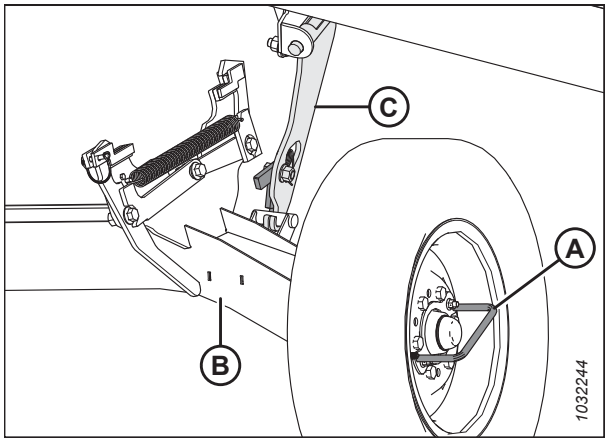


Figure 3.322: Right Field Support

6. Use wheel handle and rotate right transport axle (A) under the header frame.

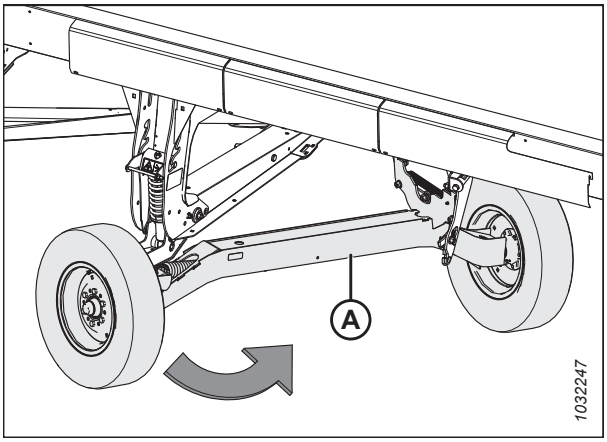


Figure 3.323: Right Transport Axle

7. Remove clevis pin (A) from right transport axle latch.
8. Lift right transport axle with wheel handle (B) until latch engages.
9. Push down on wheel handle (B) to verify latch is engaged.
10. Secure latch by reinstalling clevis pin (A).

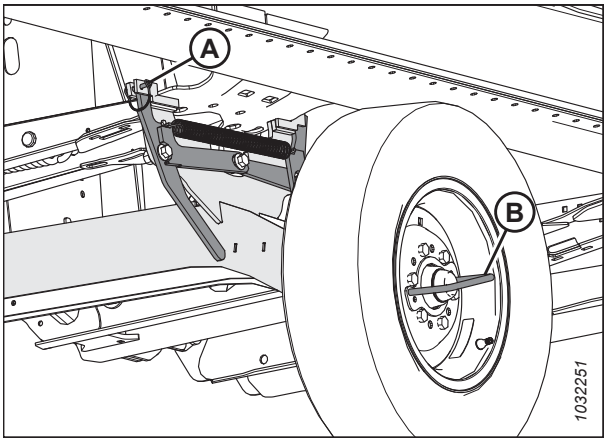


Figure 3.324: Right Transport Axle

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).

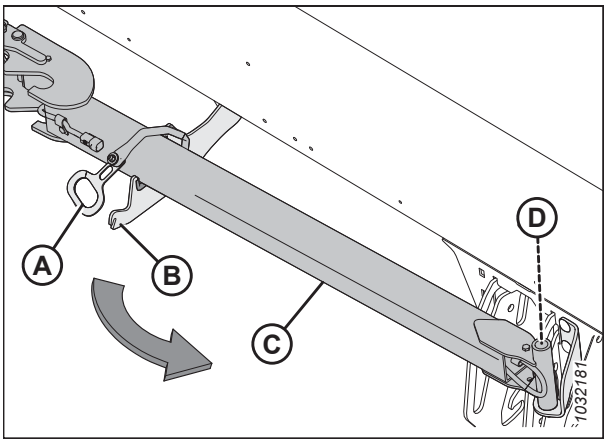


Figure 3.325: Tow-Bar Extension in Storage

Tow-Bar

4. Open left endshield. For instructions, refer to *Opening Header Endshields, page 39*.

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.

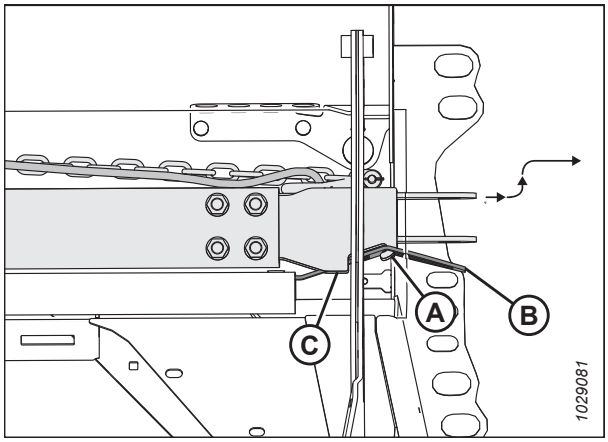


Figure 3.326: Tow-Bar in Storage

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 235*.

3. If installing a tow-bar and extension, proceed to Step *4, page 237*. If installing tow-bar only, proceed to Step *18, page 238*.

Figure 3.327: 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.

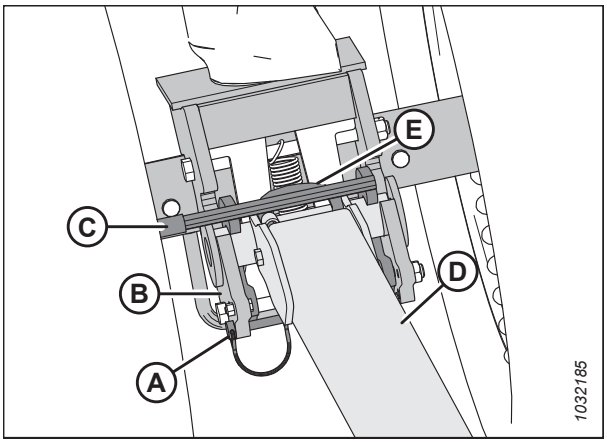


Figure 3.328: Tow-Bar Extension to Left Transport Pivot

8. Connect extension wiring harness (A) to left transport pivot harness (B).

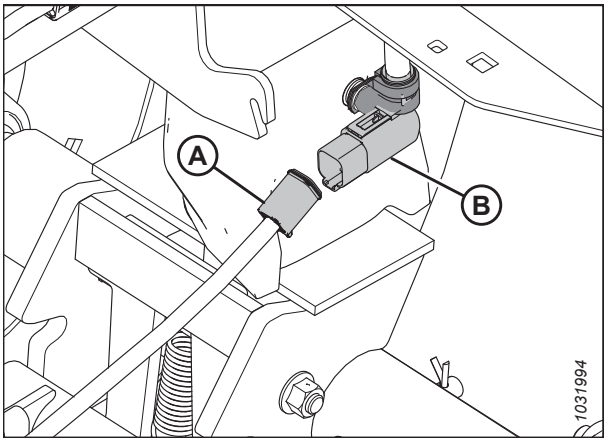


Figure 3.329: Tow-Bar Electrical Connection

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.

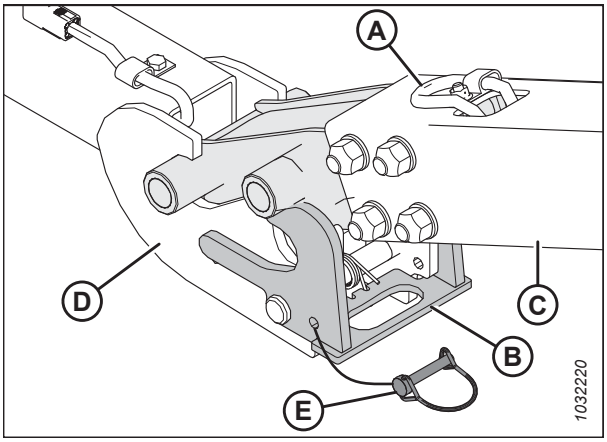


Figure 3.330: Tow-Bar to Extension

13. Connect tow-bar harness (A) to extension harness (B).
14. Reinstall lynch pin (C) to latch to secure tow-bar.

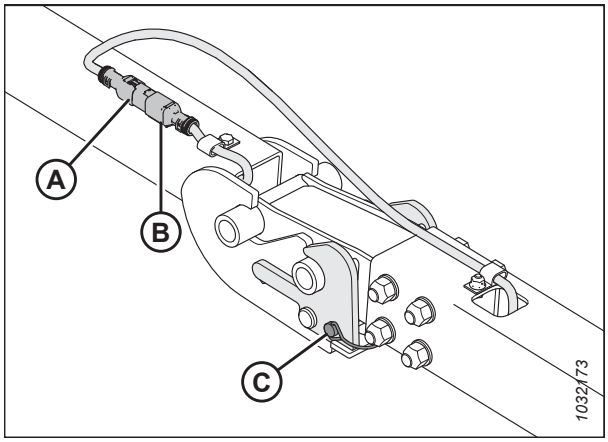


Figure 3.331: Tow-Bar / Extension Harness

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.

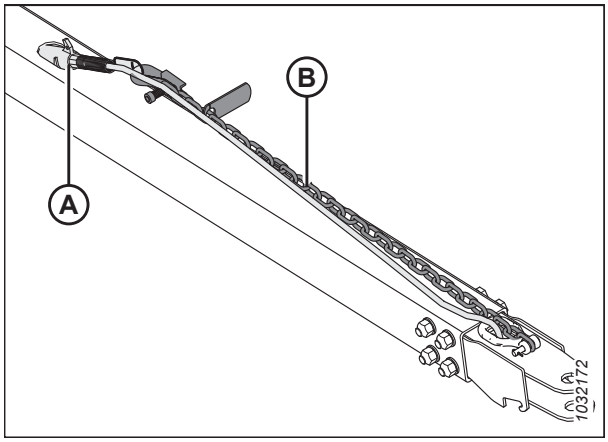


Figure 3.332: Tow-Bar Wiring Harness

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).

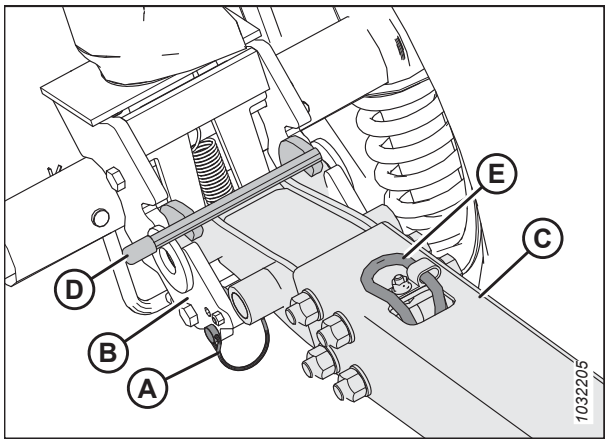


Figure 3.333: Tow-Bar and Left Transport Pivot

22. Connect extension wiring harness (A) to left transport pivot harness (B).

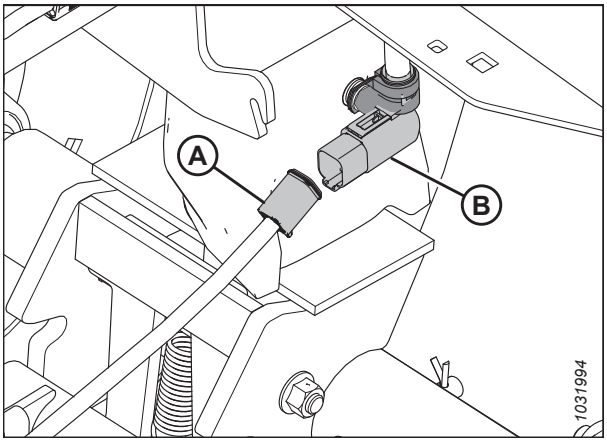


Figure 3.334: Tow-Bar Electrical Connection

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.

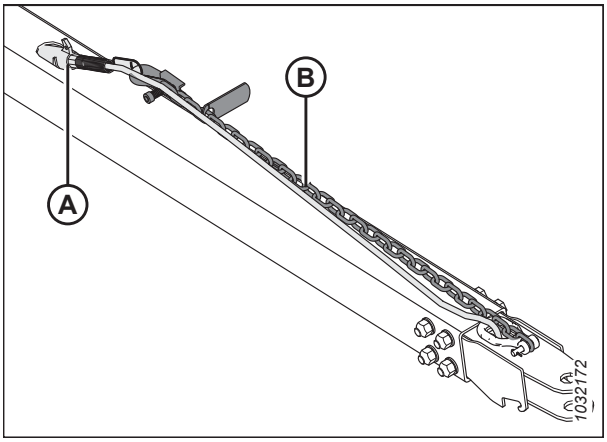


Figure 3.335: Tow-Bar Wiring Harness

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 242*) 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 242*).

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 241* 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 245*.		
End of Season	Refer to *4.2.4 Equipment Servicing – End-of-Season, page 246*.		
10 Hours or Daily (Whichever Occurs First)			
✓	Hydraulic hoses and lines; refer to *4.2.5 Checking Hydraulic Hoses and Lines, page 247*[72]		
✓	Knife sections, guards, and hold-downs; refer to *4.8 Knife, page 306*[72]		
✓	Tire pressure; refer to *4.15.3 Checking Tire Pressure, page 436*[72]		
♦	Feed draper rollers; refer to *Every 10 Hours, page 248*		
✓	Axle bolt torque; refer to *4.15.2 Checking Transport Assembly Bolt Torque, page 434*		
25 Hours			
✓	Hydraulic oil level at reservoir; refer to *4.4.1 Checking Oil Level in Hydraulic Reservoir, page 268*[72]		
♦	Knifeheads; refer to *Every 25 Hours, page 249*[72]		
50 Hours or Annually			
♦	Driveline and driveline universals; refer to *Every 50 Hours, page 250*		

72. MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine.

♦	Upper cross auger right bearing; refer to *Every 50 Hours, page 250*																	
♦	Upper cross auger sliding hubs; refer to *Every 50 Hours, page 250*																	
♦	Upper cross auger center support and U-joint; refer to *Every 50 Hours, page 250*																	
♦	Float module auger pivots; refer to *Every 50 Hours, page 250*																	
♦	Feed draper roller bearings, 3 locations; refer to *Every 50 Hours, page 250*																	
♦	Reel drive chain (If chain is dry at next oiling interval – consider decreasing oiling interval.); refer to *Every 50 Hours, page 250*																	
▲	Knife drive box lubricant (first 50 hours only); refer to *Changing Oil in Knife Drive Box, page 341*																	
▲	Header drive main gearbox lubricant (first 50 hours only); refer to *Changing Oil in Header Drive Main Gearbox, page 263*																	
▲	Header drive completion gearbox lubricant (first 50 hours only); refer to *Changing Oil in Header Drive Completion Gearbox, page 266*																	
✓	Auger to pan and feed draper clearance; refer to *4.7.1 Adjusting Feed-Auger-to-Pan Clearance, page 284*																	
✓	Main gearbox lubricant level; refer to *Checking Oil Level in Header Drive Main Gearbox, page 262*																	
✓	Completion gearbox lubricant level; refer to *Checking Oil Level in Header Drive Completion Gearbox, page 264*																	
✓	Reel drive chain tension; refer to *4.14.1 Reel Drive Chain, page 421*																	
✓	Reel finger/cutterbar clearance; refer to *4.13.1 Reel-to-Cutterbar Clearance, page 389*																	
✓	Wheel bolt torque; refer to *4.15.1 Checking Wheel Bolt Torque, page 434*																	
✓	Knife drive box lubricant level; refer to *Checking Oil Level in Knife Drive Box , page 340*																	
✓	Knife drive box mounting bolts; refer to *Checking Mounting Bolts, page 341*																	

100 Hours or Annually (Whichever Occurs First)																		
♦	Auger drive chain; refer to *Every 100 Hours, page 254*																	
♦	Float pivots; refer to *Every 100 Hours, page 254*																	
♦	Float spring tensioners; refer to *Every 100 Hours, page 254*																	
250 Hours or Annually (Whichever Occurs First)																		
♦	Reel shaft bearings; refer to *Every 250 Hours, page 256*																	
♦	Reel drive U-joint; refer to *Every 250 Hours, page 256*																	
▲	Hydraulic oil filter; refer to *4.4.4 Changing Oil Filter, page 270*																	
500 Hours or Annually (Whichever Occurs First)																		
♦	Gauge wheel / slow speed transport wheel bearings; refer to *Every 500 Hours, page 257*																	
✓	Header drive main gearbox chain tension; refer to *4.6.5 Adjusting Chain Tension – Main Gearbox, page 281*																	
✓	Header drive completion gearbox chain tension; refer to *4.6.6 Adjusting Chain Tension – Completion Gearbox, page 282*																	
1000 Hours or 3 Years (Whichever Occurs First)																		
▲	Knife drive box lubricant; refer to *Changing Oil in Knife Drive Box, page 341*																	
▲	Header drive main gearbox lubricant; refer to *Changing Oil in Header Drive Main Gearbox, page 263*																	
▲	Header drive completion gearbox lubricant; refer to *Changing Oil in Header Drive Completion Gearbox, page 266*																	
▲	Hydraulic oil; refer to *4.4.3 Changing Oil in Hydraulic Reservoir, page 269*																	

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 268*
5 Hours	Check for loose hardware and tighten to required torque.	*7.1 Torque Specifications, page 479*
10 Hours	Check auger drive chain tension.	*Checking Feed Auger Drive Chain Tension – Thorough Method, page 288*
10 Hours	Check knife drive box mounting bolts.	*Checking Mounting Bolts, page 341*
10 Hours	Grease the feed draper bearings.	*Every 10 Hours, page 248*
50 Hours	Change float module gearbox oil.	*Changing Oil in Header Drive Main Gearbox, page 263*
50 Hours	Change float module hydraulic oil filter.	*4.4.4 Changing Oil Filter, page 270*
50 Hours	Change knife drive box lubricant.	*Changing Oil in Knife Drive Box, page 341*
50 Hours	Check gearbox chain tension.	*4.6.5 Adjusting Chain Tension – Main Gearbox, page 281* and *4.6.6 Adjusting Chain Tension – Completion Gearbox, page 282*

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 248*.
2. Perform all annual maintenance tasks. For instructions, refer to *4.2.1 Maintenance Schedule/Record, page 242*.

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 479*.

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.

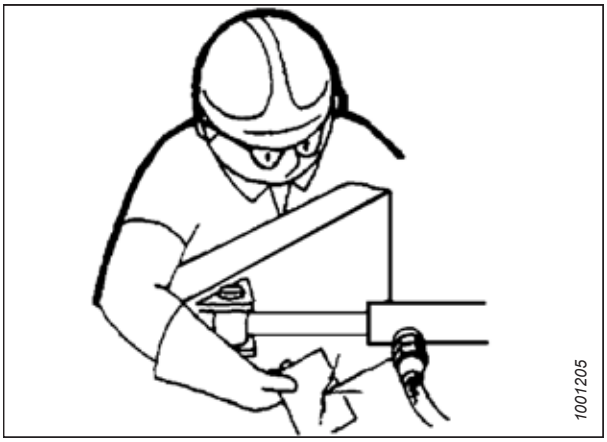


Figure 4.2: Testing for Hydraulic Leaks

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 242*.

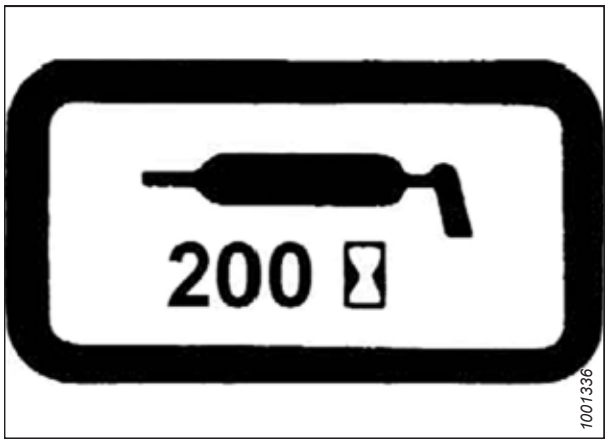


Figure 4.3: Grease Interval Decal

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.

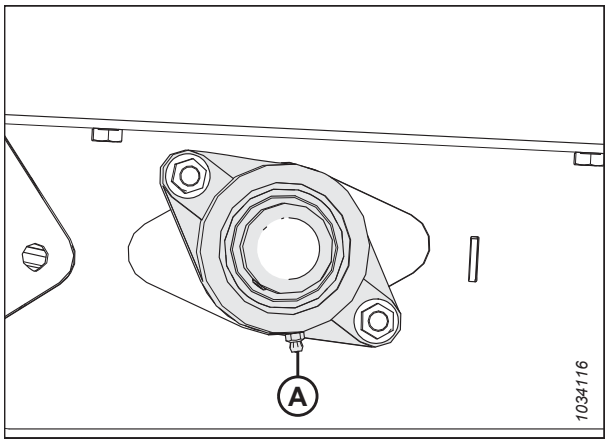


Figure 4.4: Feed Draper Drive Roller

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.

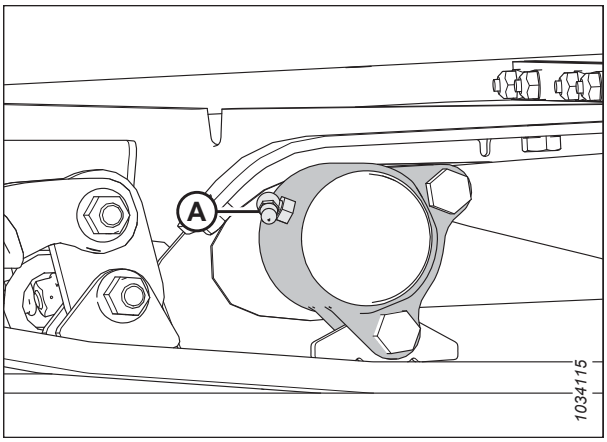


Figure 4.5: Feed Draper Idler Roller

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 308*.

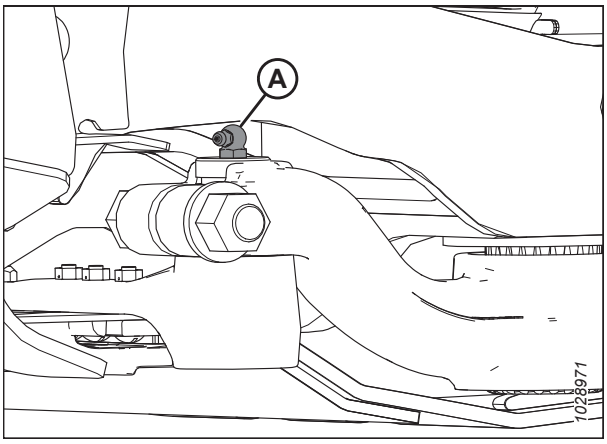


Figure 4.6: Knifehead

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.

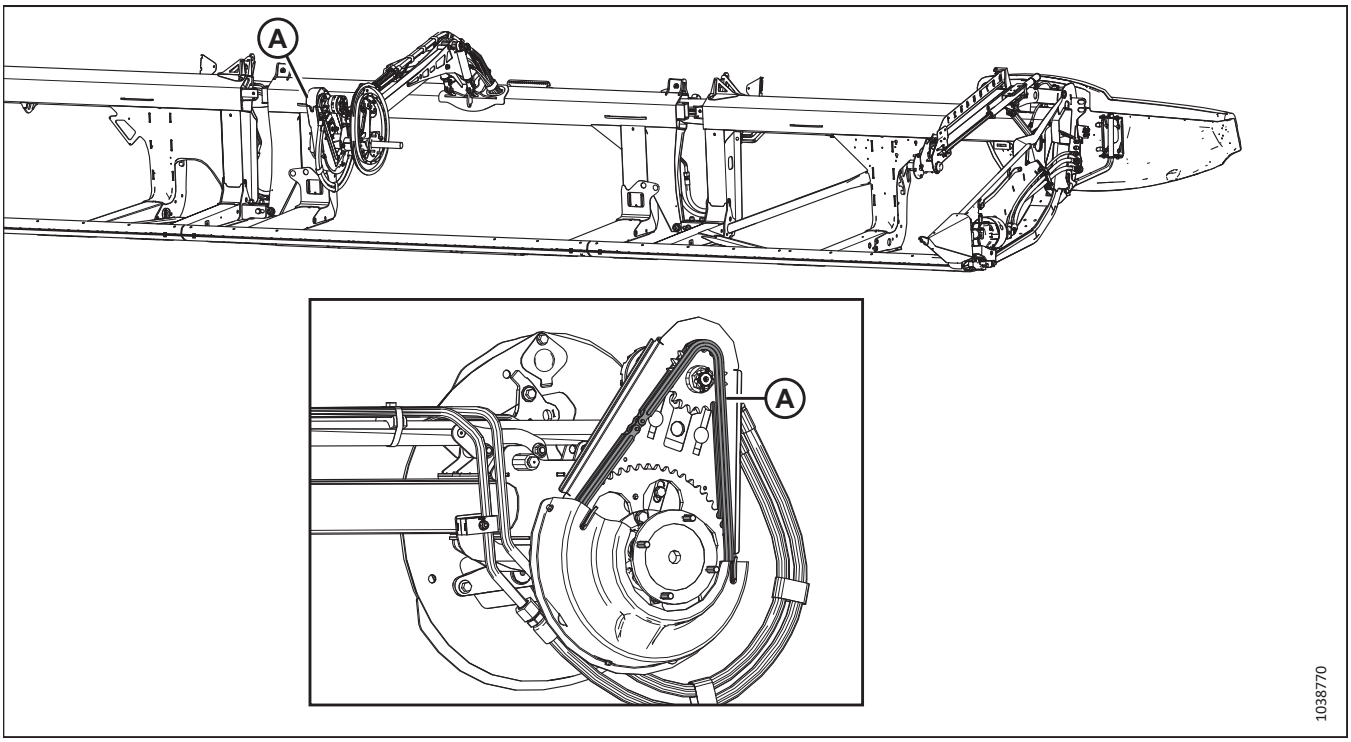


Figure 4.7: Reel

A - Reel Drive Chain. To lubricate, refer to *4.3.3 Lubricating Reel Drive Chain, page 260*.

IMPORTANT:

Use chain oil that has a viscosity of 100-150 sCt at 40°C (typically medium to heavy chain oil) or mineral oil Sae 20W50 that has no detergents or solvents.

NOTE:

If chain is dry at next oiling interval, decrease the oiling interval.

Use high temperature extreme pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

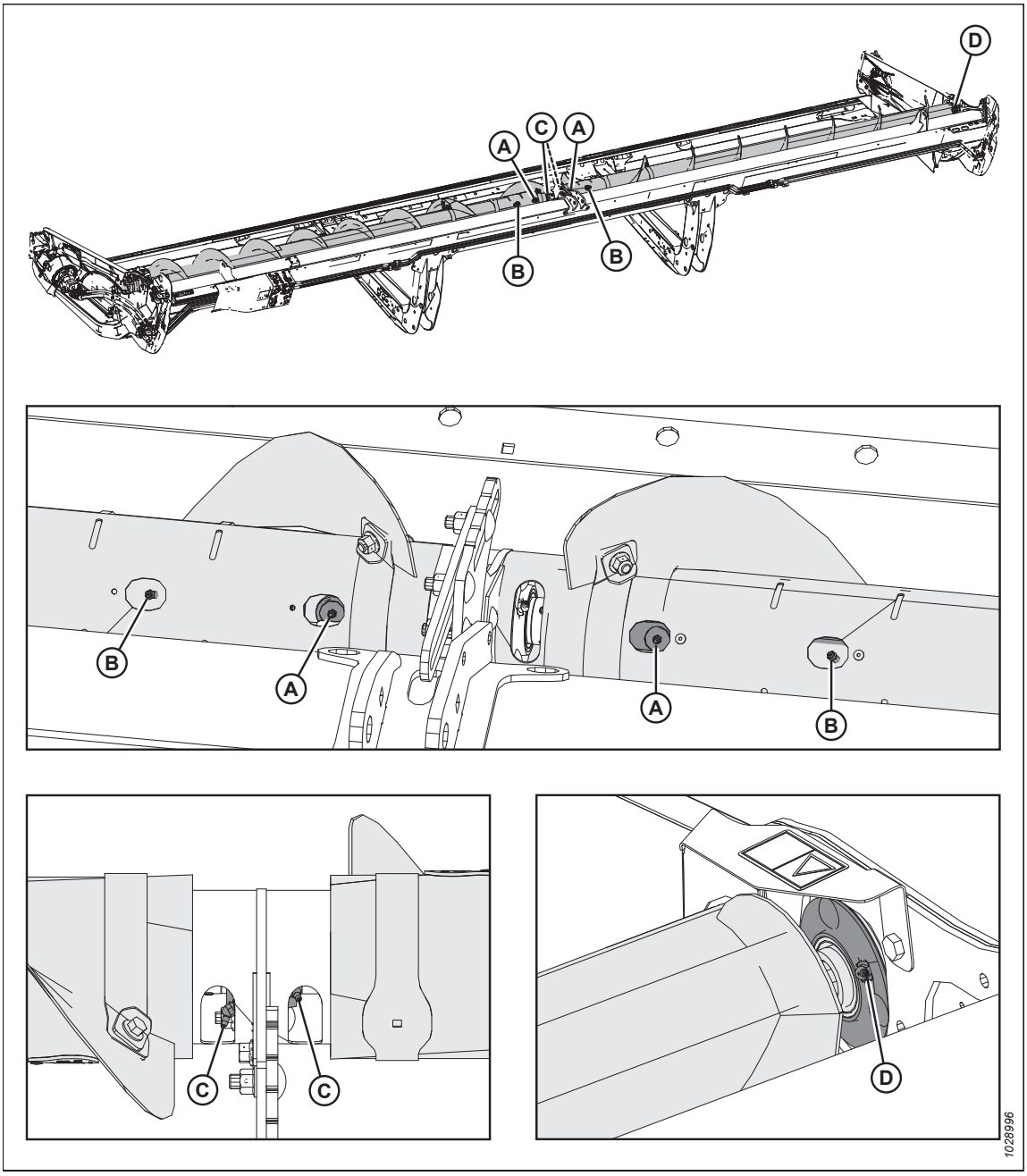


Figure 4.8: Two-Piece Upper Cross Auger

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.

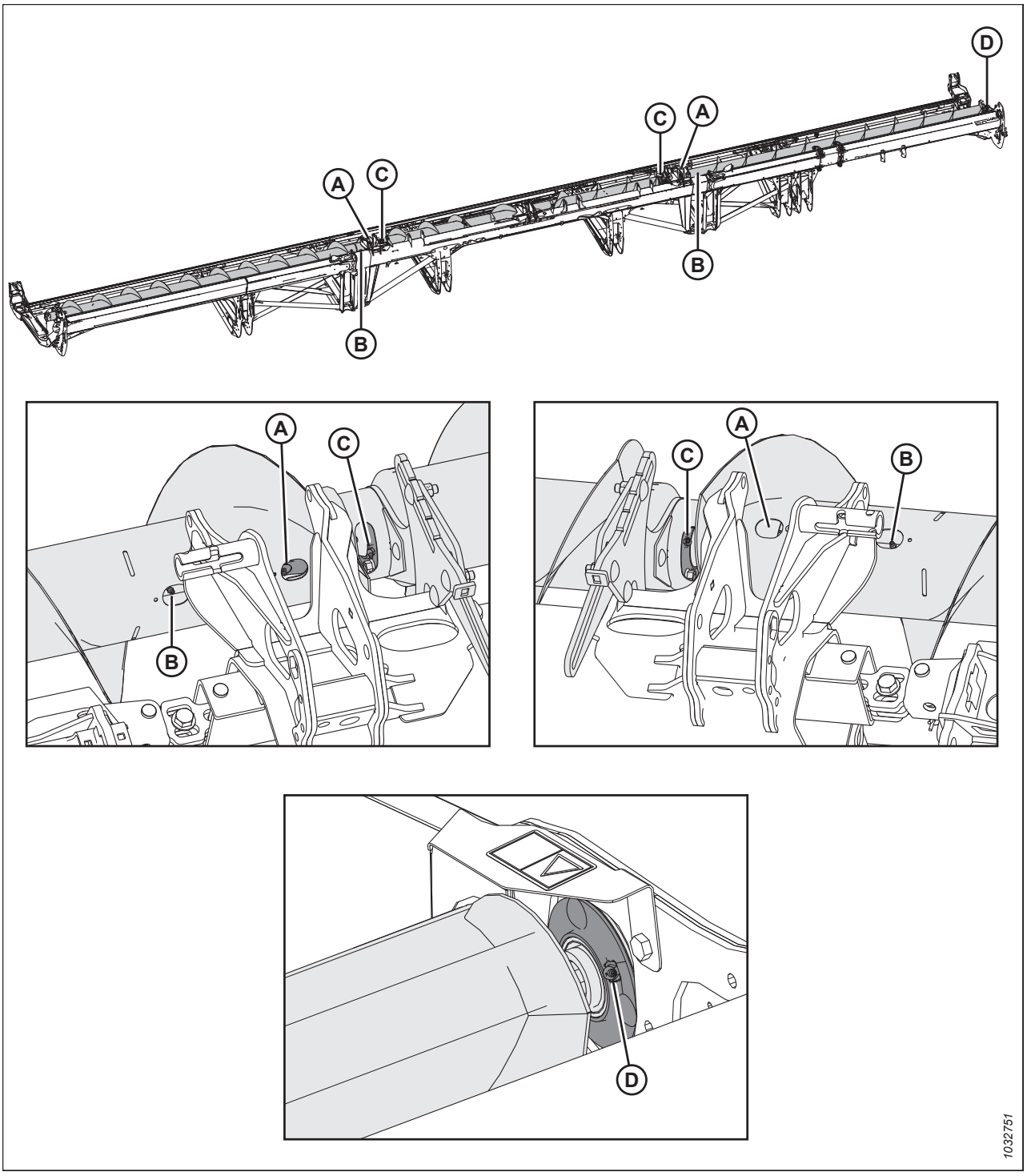


Figure 4.9: Three-Piece Upper Cross Auger

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.

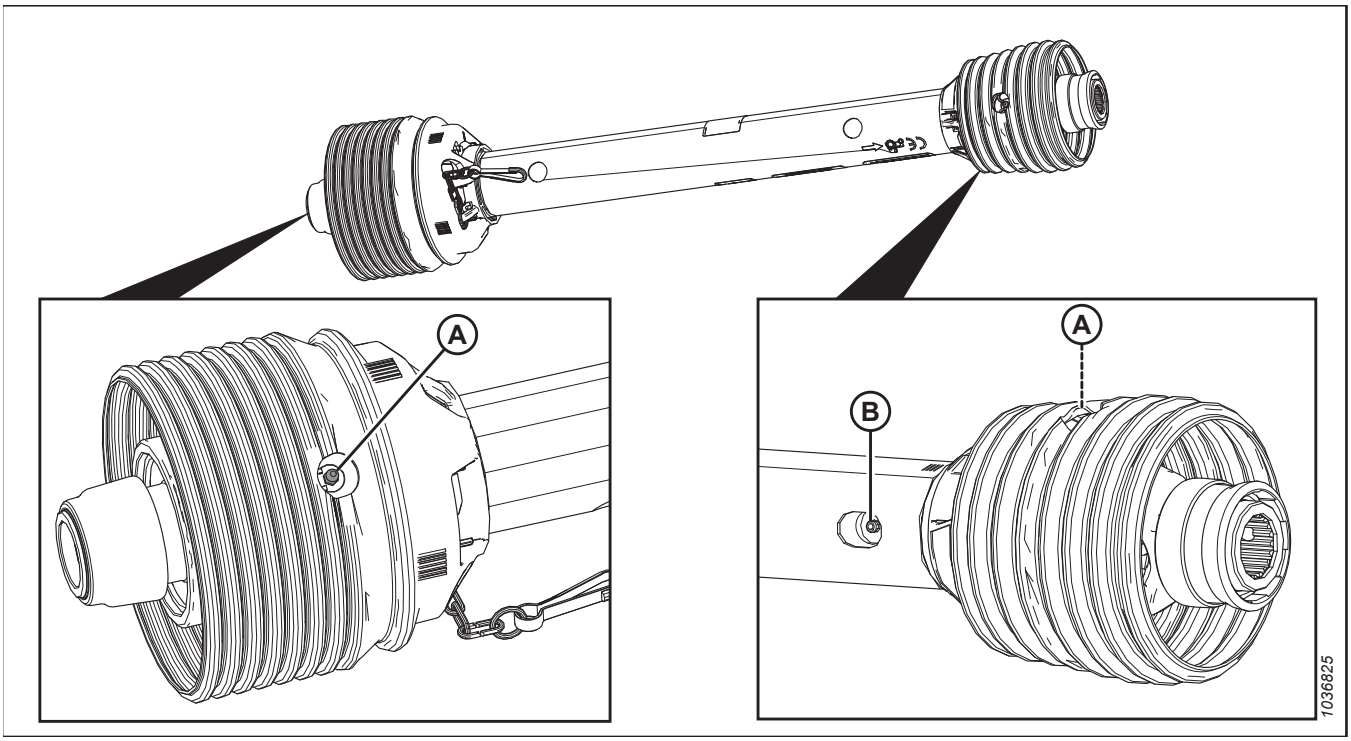


Figure 4.10: FM200

A - Driveline Universal (Two Places)

B - Driveline Slip Joint[73]

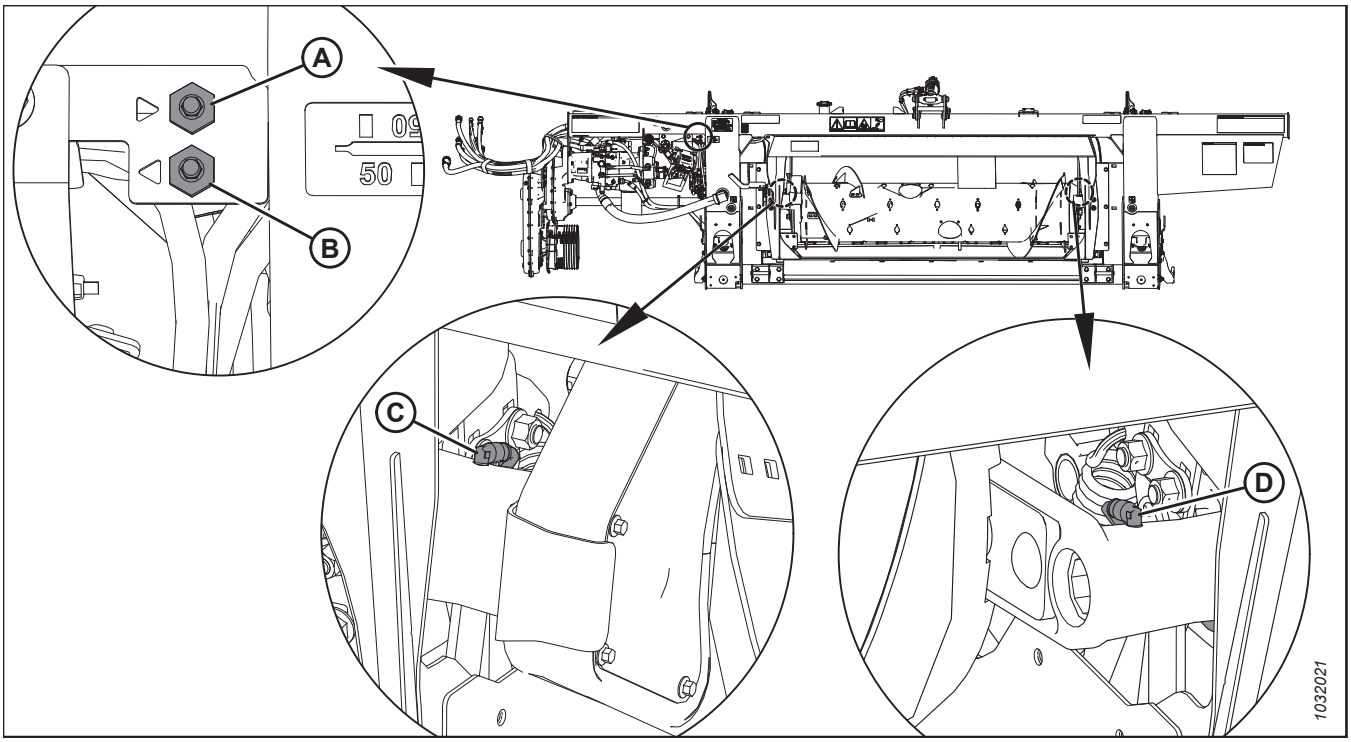


Figure 4.11: FM200

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)

73. 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.

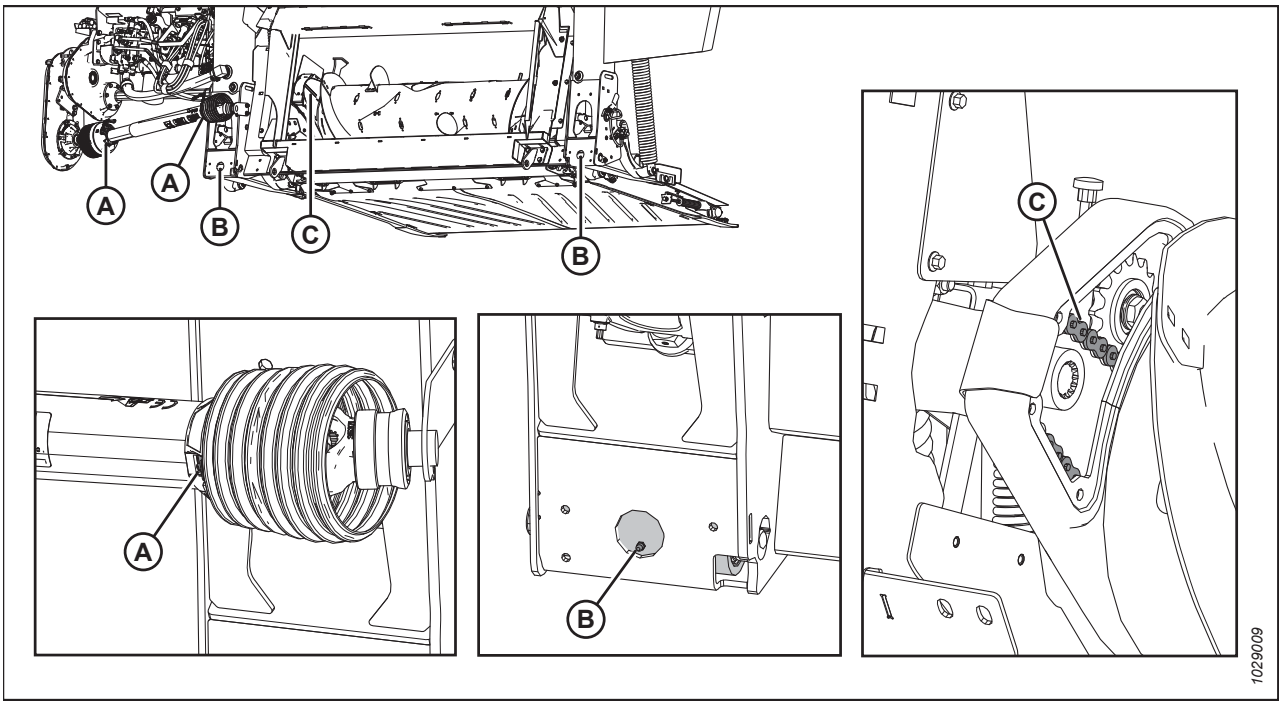


Figure 4.12: FM200

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 261*.

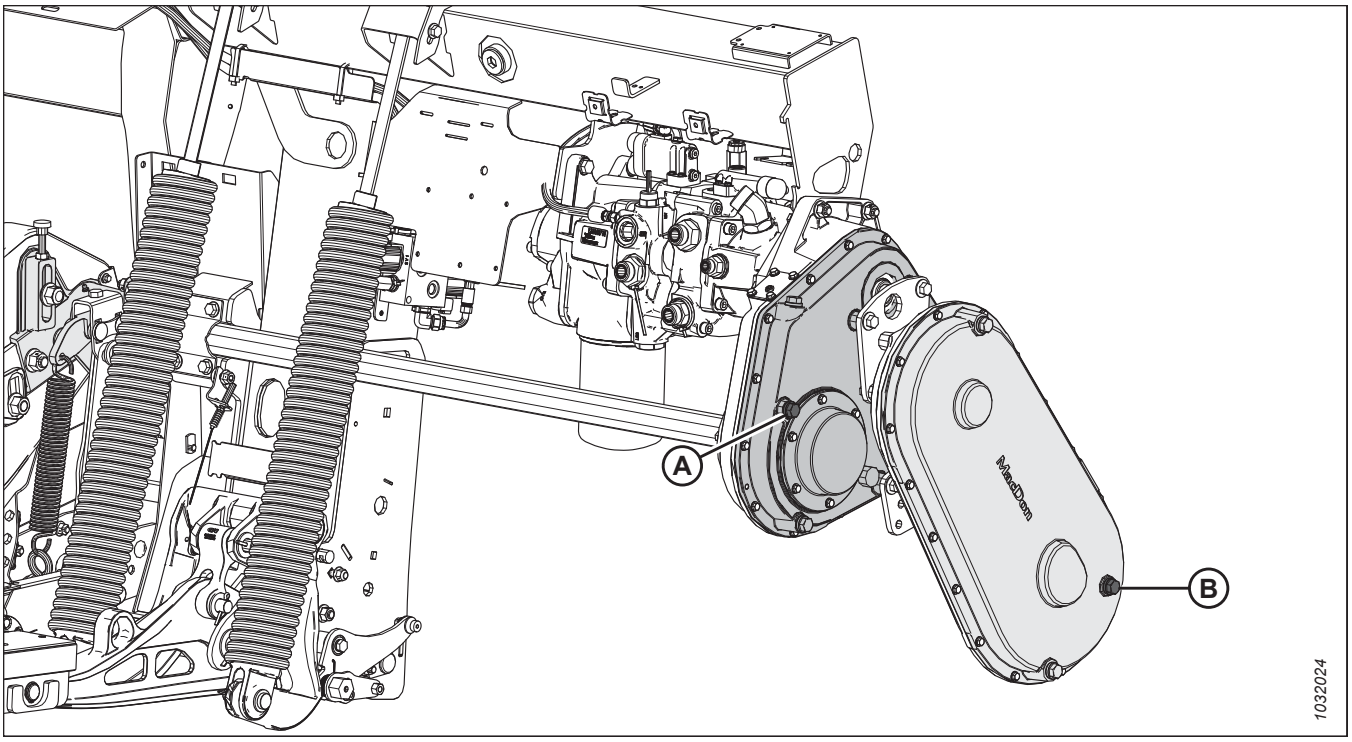


Figure 4.13: FM200

A - Main Gearbox Oil Level. To lubricate, refer to *4.3.5 Lubricating Header Drive Main Gearbox, page 262*.
B - Completion Gearbox Oil Level. To lubricate, refer to *4.3.6 Lubricating Header Drive Completion Gearbox, page 264*.

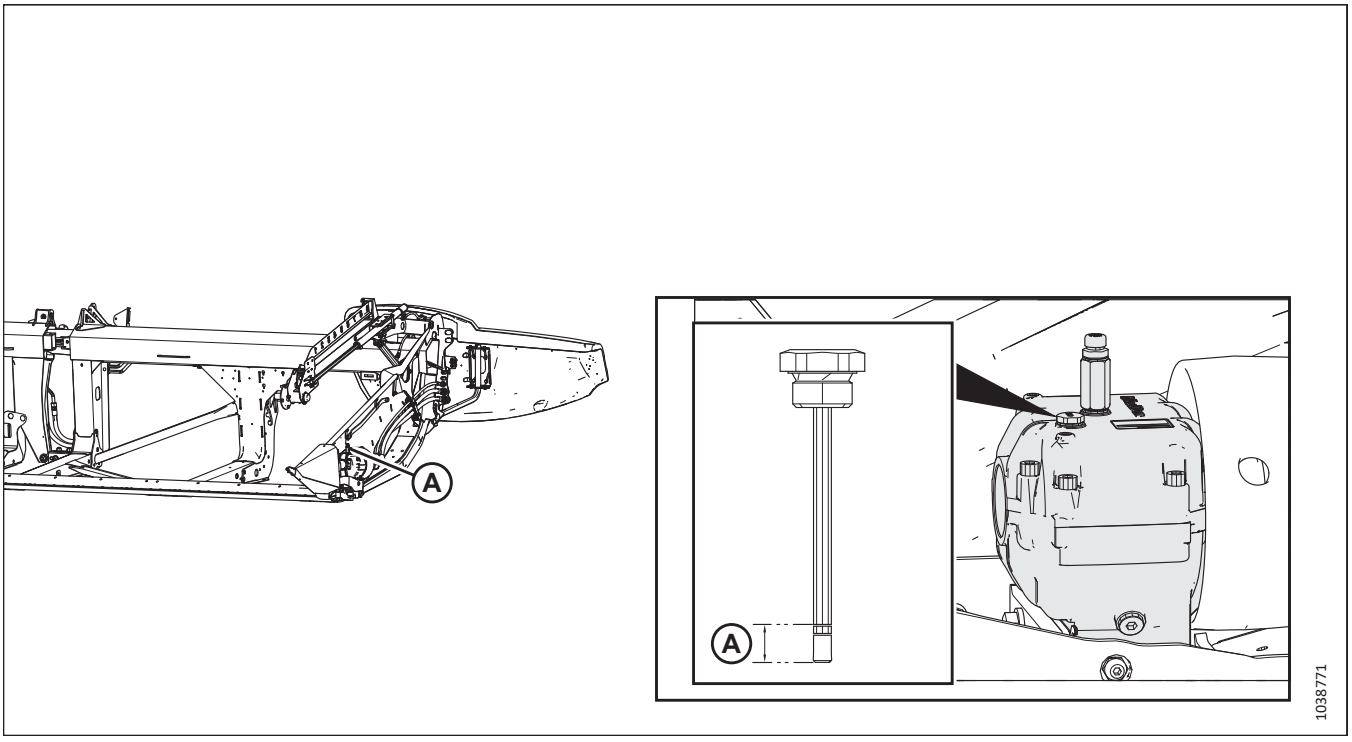


Figure 4.14: Knife Drive Box

B - Knife Drive Box Oil Level. To lubricate, refer to *Checking Oil Level in Knife Drive Box , page 340*.

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.

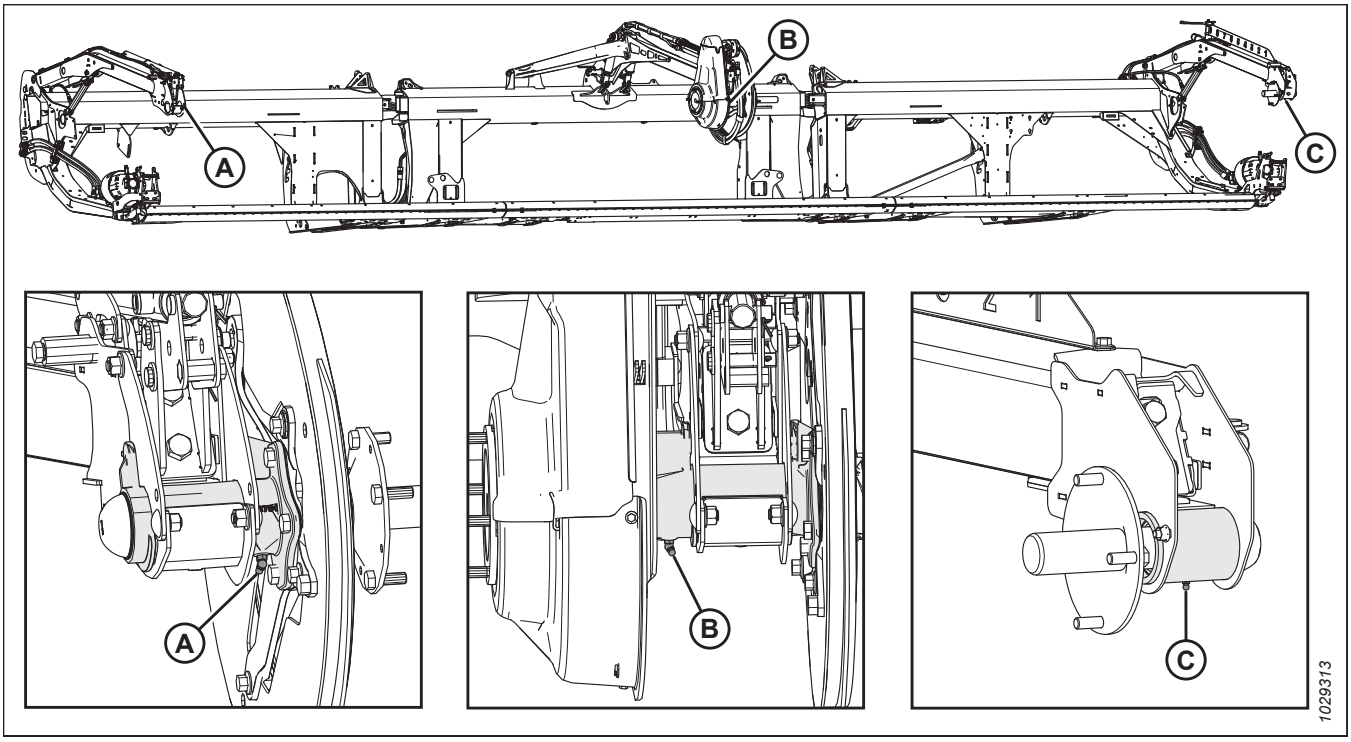


Figure 4.15: Reel

A - Reel Right Bearing (One Place) **B - Reel Center Bearing (One Place)** **C - Reel Left Bearing (One Place)**

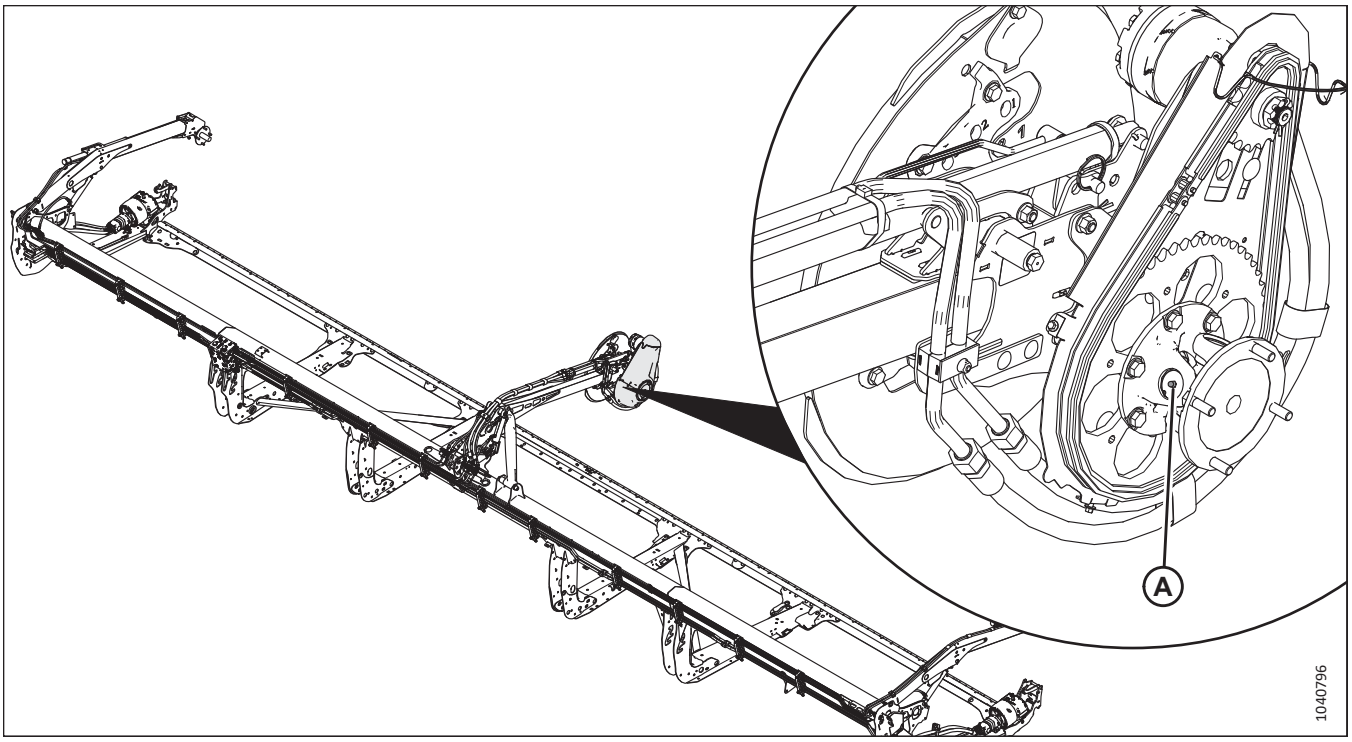


Figure 4.16: Reel

A - Reel U-joint (One Place)[74]

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.

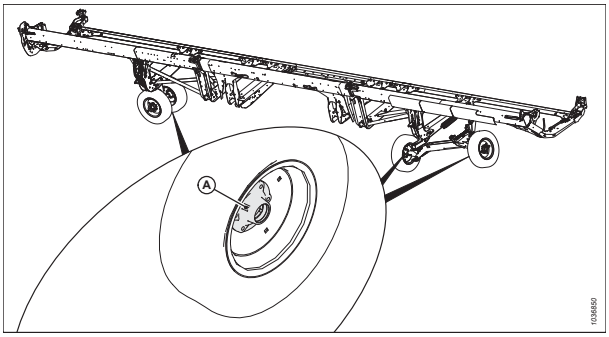


Figure 4.17: Every 500 Hours

A - Wheel Bearings (Four Places)

74. 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 242*.

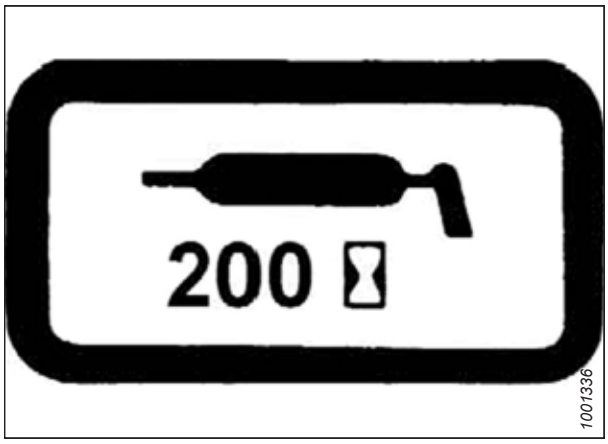


Figure 4.18: Greasing Interval Decal

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.

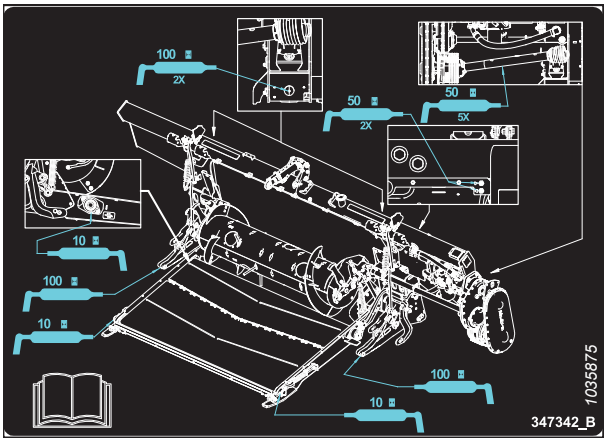


Figure 4.19: FM200 Grease Point Layout Decal

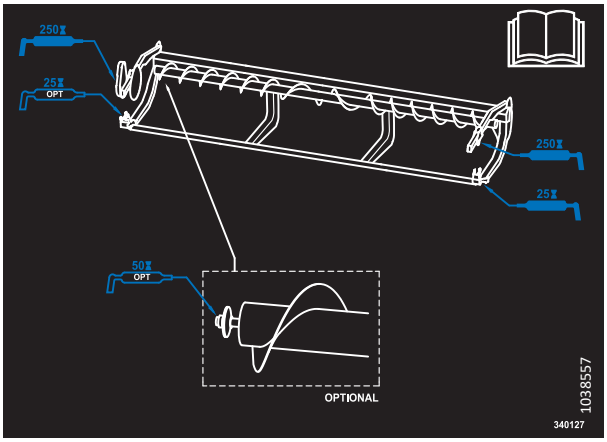


Figure 4.20: Grease Point Decal for Single-Knife Header with One-Piece Upper Cross Auger

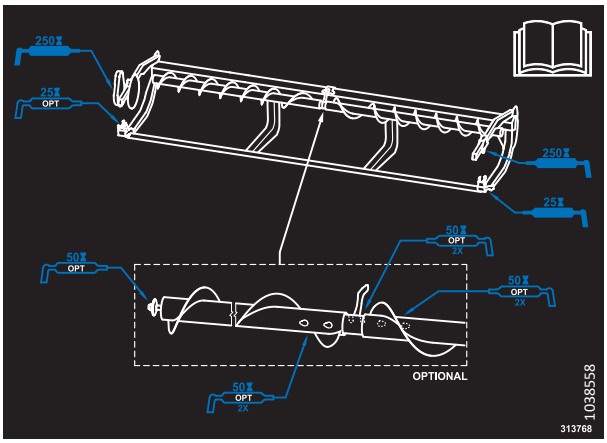


Figure 4.21: Decal for Single-Knife Header with Two-Piece Upper Cross Auger

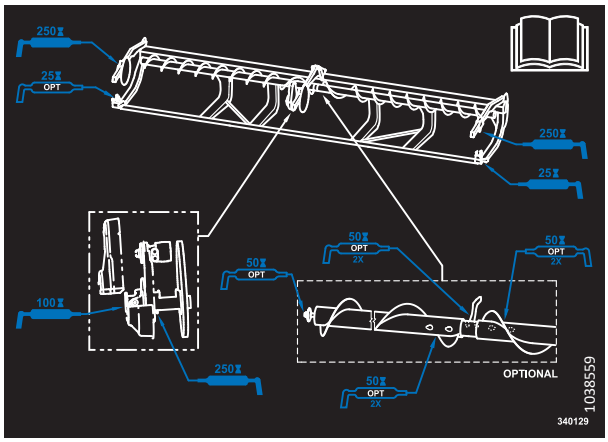


Figure 4.22: Decal for Double-Knife Header with Two-Piece Upper Cross Auger

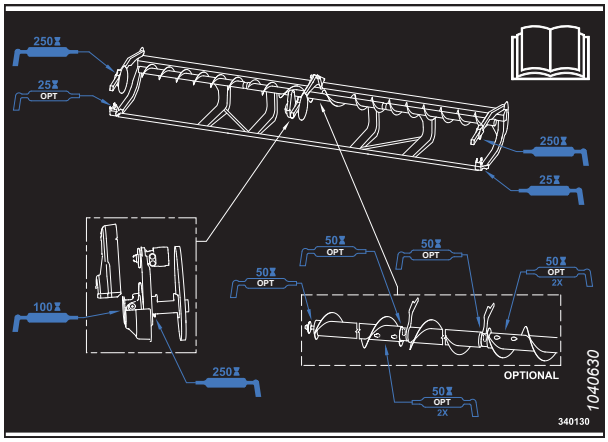


Figure 4.23: Decal for Double-Knife Header with Three Piece Upper Cross Auger

4.3.3 Lubricating Reel Drive Chain

Lubrication protects the chain and drive sprockets against wear.

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

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

IMPORTANT:

Do **NOT** use grease or motor oils to lubricate reel drive chain.

1. Remove the reel drive cover. For instructions, refer to *Removing Reel Drive Cover, page 46*.

IMPORTANT:

Use a chain oil with a viscosity of 100–150 sCt at 40°C (104°F) (typically medium to heavy chain oil) or a mineral oil (SAE 20W50) that has no detergents or solvents.

2. Apply a liberal amount of chain oil with an oil can, brush, or aerosol to the inside of chain (A) while manually rotating reel to cover all of the chain.
3. Reinstall the reel drive cover. For instructions, refer to *Installing Reel Drive Cover, page 48*.

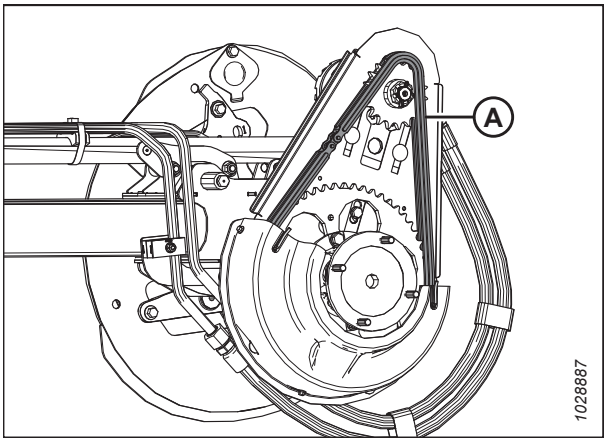


Figure 4.24: Drive Chain – Double-Reel Drive Shown

DANGER

Ensure that all bystanders have cleared the area.

4. Start the engine. For instructions, refer to the combine operator's manual.
5. Run the header and reel for a few minutes so the oil will spread into the 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).

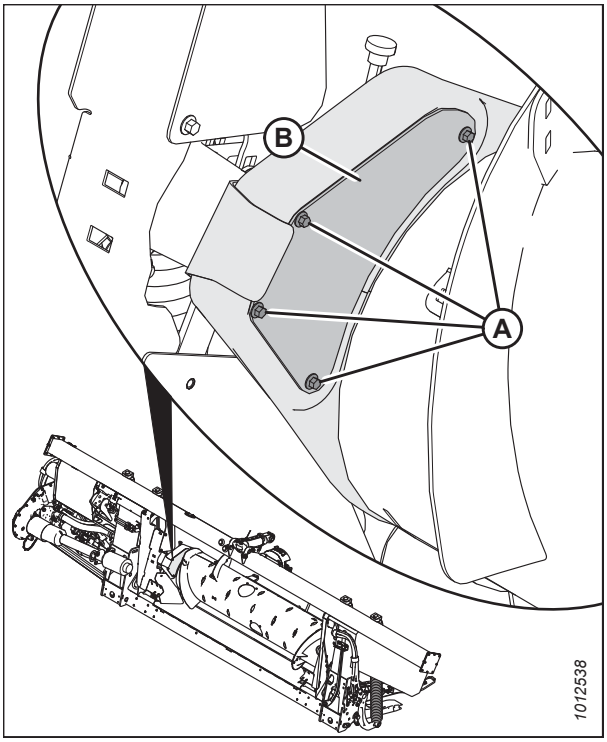


Figure 4.25: Auger Drive Inspection Panel

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.

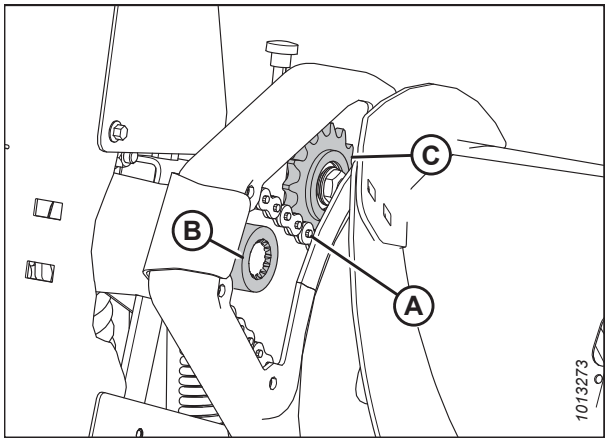


Figure 4.26: Auger Drive Chain

4. Reinstall metal inspection panel (B). Secure the panel with four bolts (A).

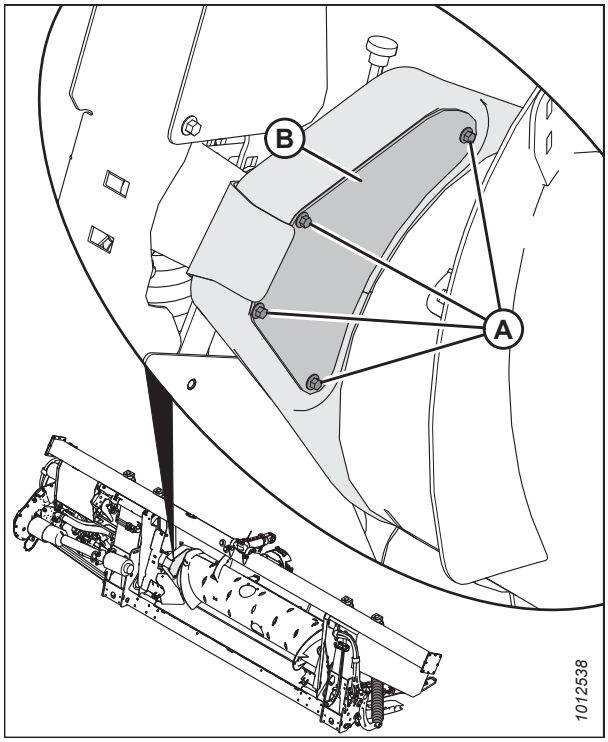


Figure 4.27: Auger Drive Inspection Panel

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 263*.
5. Reinstall oil level plug (A).

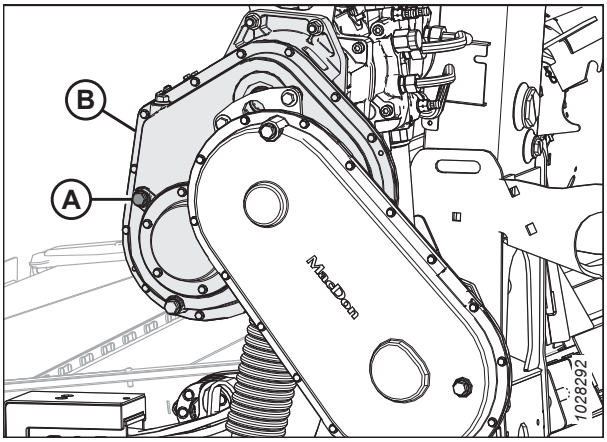


Figure 4.28: Header Drive Main Gearbox

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).

   NOTE:

   The oil drain plug is magnetic. Ensure the magnetic plug is installed in the oil drain position.

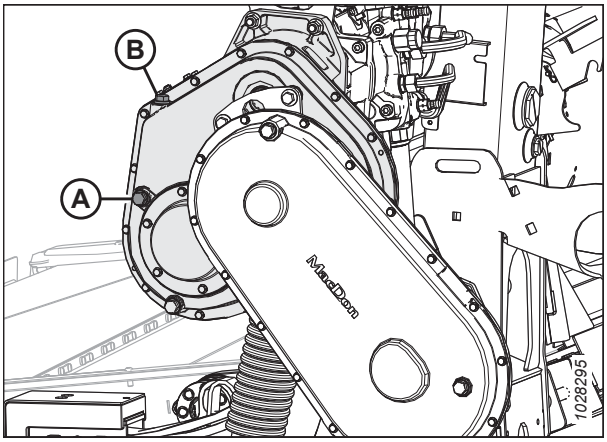


Figure 4.29: Header Drive Main Gearbox

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

Ensure that 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]) 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).
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).

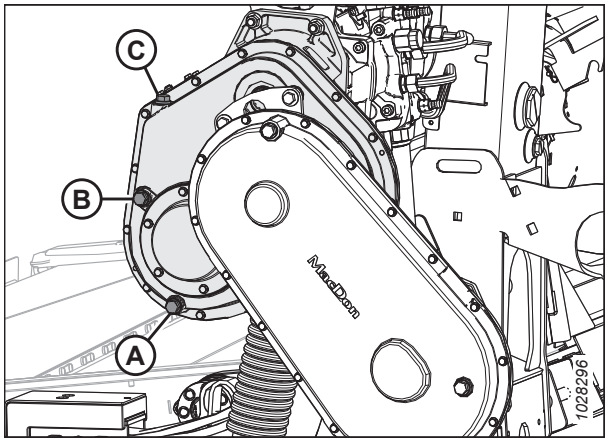


Figure 4.30: Header Drive Main Gearbox

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 the completion gearbox. The oil should be at the level of the port.
4. If there is an insufficient amount of oil in the completion gearbox, add oil through filler plug (B). For instructions, refer to *Adding Oil to Header Drive Completion Gearbox, page 265*.
5. Reinstall oil level plug (A).

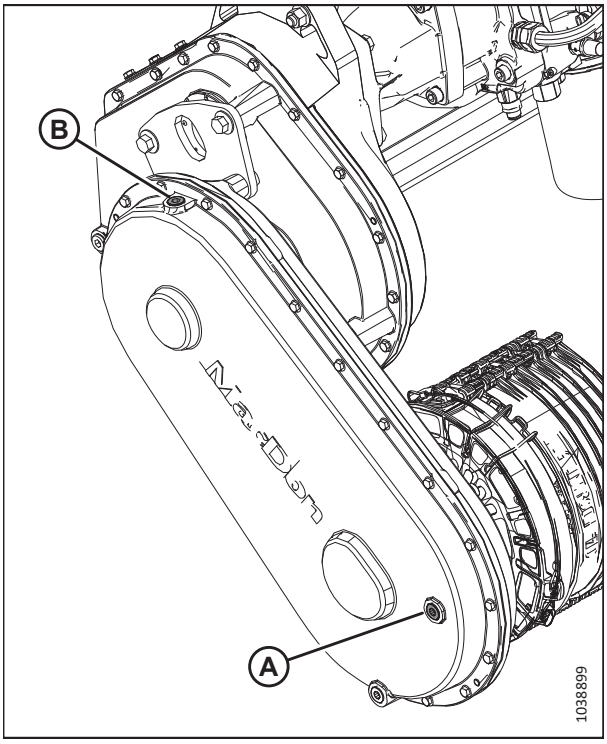


Figure 4.31: Header Drive Completion Gearbox

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).

   NOTE:

   The oil drain plug is magnetic. Ensure the magnetic plug is installed in the oil drain position.

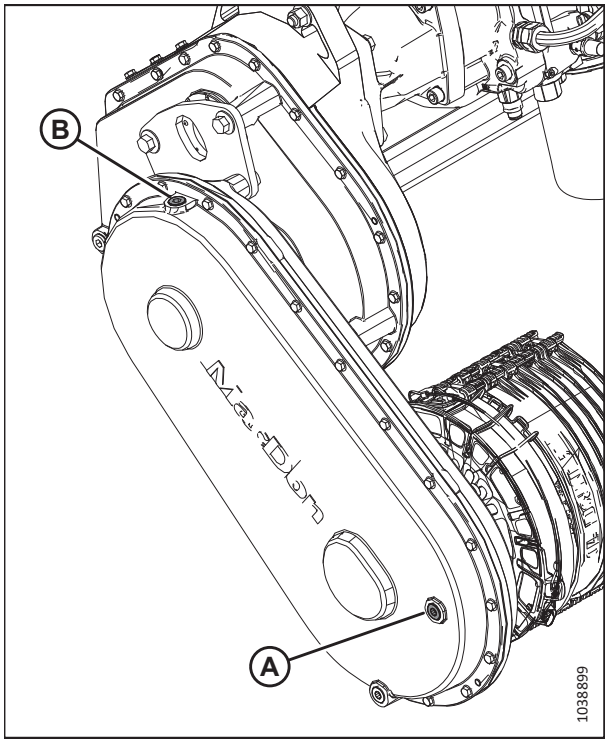


Figure 4.32: Header Drive Completion Gearbox

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.

DANGER

Ensure that 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]) 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).

   IMPORTANT:

   The oil drain plug is magnetic. Ensure that the magnetic plug is installed in oil drain position (A), not in oil level check position (B).

8. Remove oil level plug (B).
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).

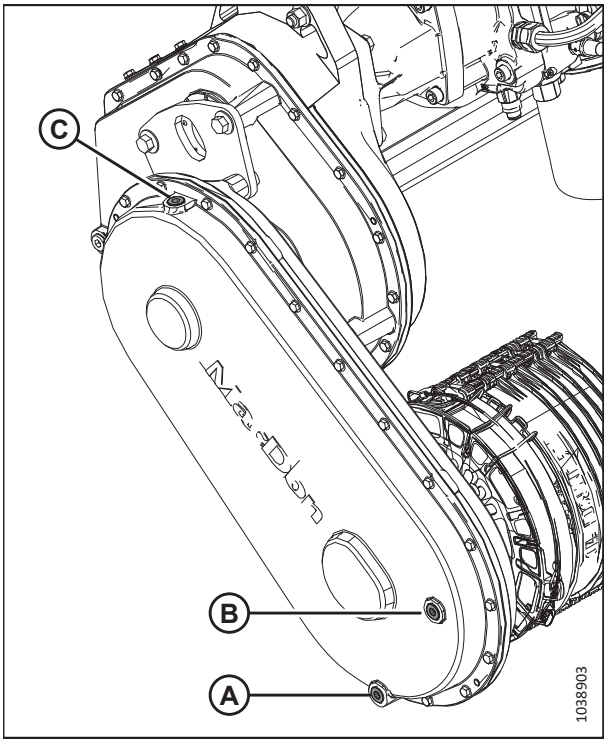


Figure 4.33: Header Drive Completion Gearbox

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

The oil level in the header's hydraulic oil reservoir can be inspected via the sight glass on 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.

NOTE:

The hydraulic oil level should be inspected when the hydraulic oil is cold.

1. Start the engine.
2. Lower the header to the ground.
3. Fully retract the center-link.
4. Shut down the engine, and remove the key from the ignition.
5. Ensure that the oil is at the appropriate level for the terrain as follows:
   - **Level terrain (1):** Lower sight (A) should be full and upper sight (B) should be empty.
   - **Sloped terrain (2):** Lower sight (A) should be full and upper sight (B) should be, at most, half-full.

   NOTE:

   It may be necessary to slightly reduce the oil level when the ambient temperatures exceeds 5°C (95°F); this will prevent overflow at the breather tube.

   NOTE:

   The sloped terrain oil level specification can be referred to even when the header is being operated in level terrain, as long as the Filler Neck Extension kit (B6057) is installed.

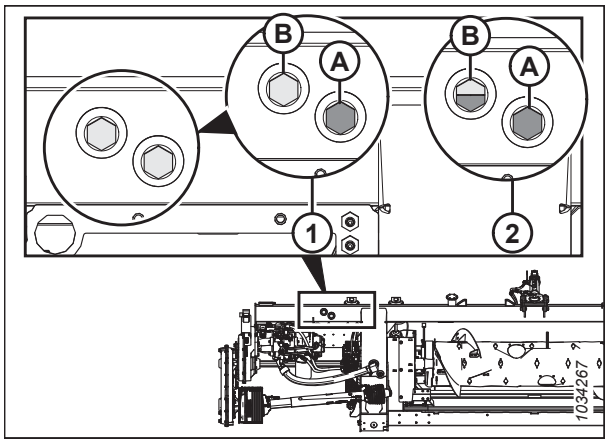


Figure 4.34: Oil Level Sight Glasses

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).

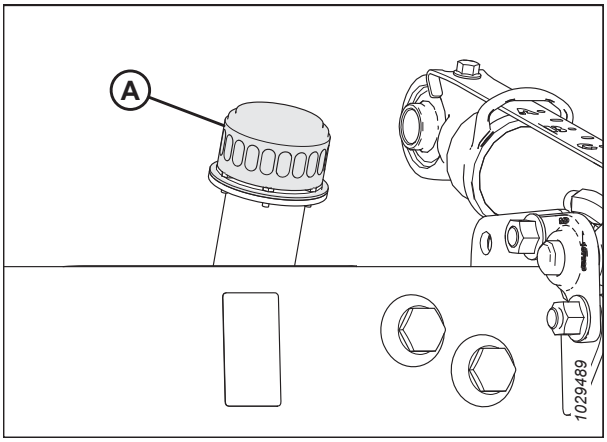


Figure 4.35: Oil Reservoir Filler Cap

CAUTION

The oil reservoir may be under pressure; remove the cap slowly.

3. Turn filler cap (A) clockwise to remove it.
4. Fill the hydraulic oil reservoir with warm oil (approximately 21°C [70°F]) until the appropriate fill level is reached. For instructions, refer to *4.4.1 Checking Oil Level in Hydraulic Reservoir, page 268* 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 268*.

4.4.3 Changing Oil in 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 the 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 container with a capacity of at least 50 L (13 gal) under both oil drain plugs (A).
5. Remove oil drain plugs (A) with a 7/8 in. hex socket. Allow the oil to drain completely.
6. Replace oil drain plugs (A).
7. If necessary, change the oil filter. For instructions, refer to *4.4.4 Changing Oil Filter, page 270*.
8. Add oil to the reservoir. For instructions, refer to *4.4.2 Adding Oil to Hydraulic Reservoir, page 268*.

   NOTE:

   The hydraulic oil tank capacity is approximately 95 L (25 gal).

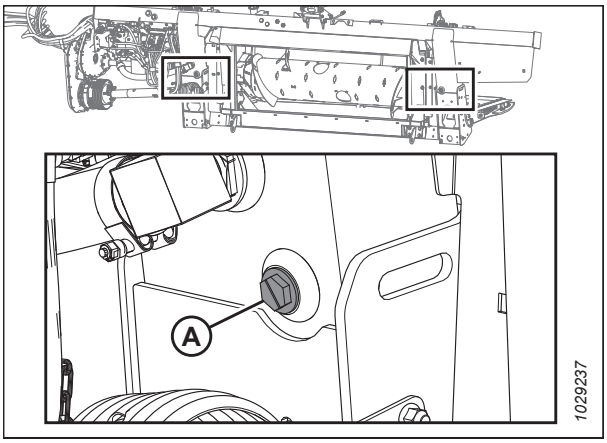


Figure 4.36: Reservoir Drain

4.4.4 Changing Oil Filter

The hydraulic oil filter removes solid contaminants that may interfere with the operation of the header's hydraulic system. The oil filter will need to be changed periodically.

Use filter kit (MAC320360) to replace the filter.

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.

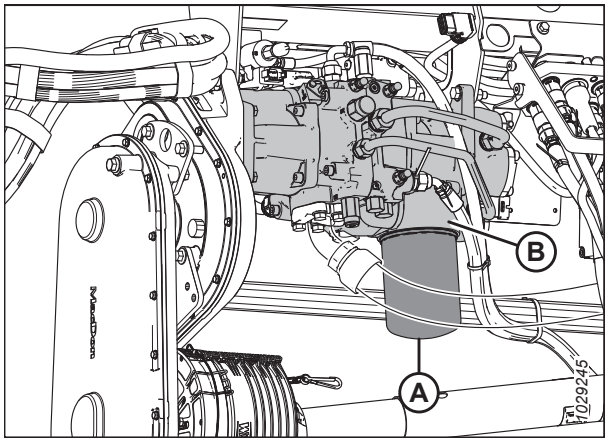


Figure 4.37: FM200 Integrated Pump

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 from the ignition 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.

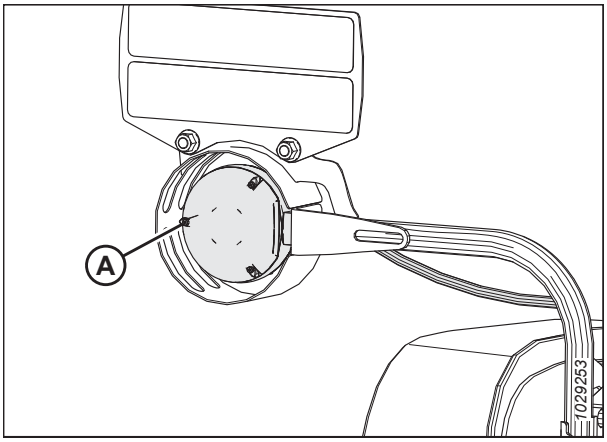


Figure 4.38: Left Clearance Light

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.

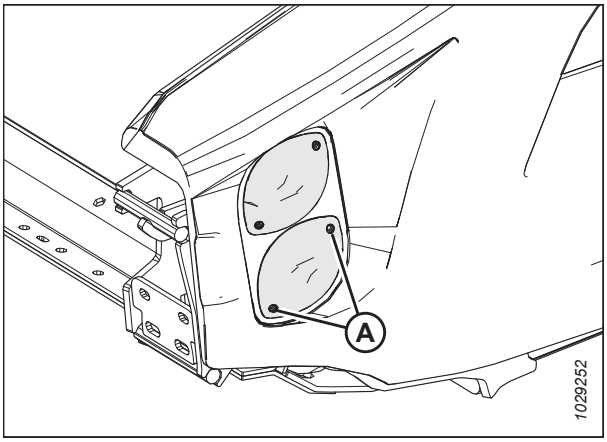


Figure 4.39: Optional Slow Speed Transport – Red and Amber Lights

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

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.

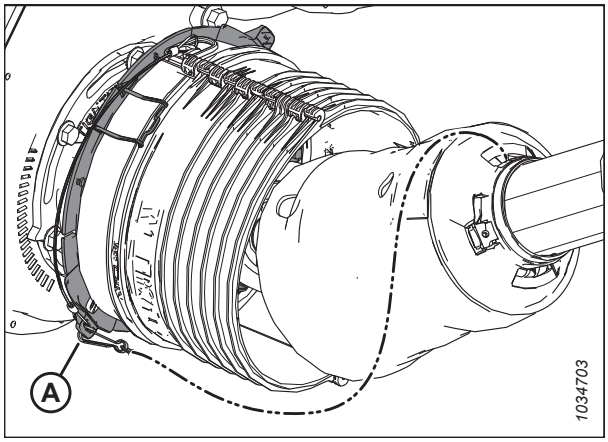


Figure 4.40: Driveline Shield

6. Pry clips (A) up to release shield (B).

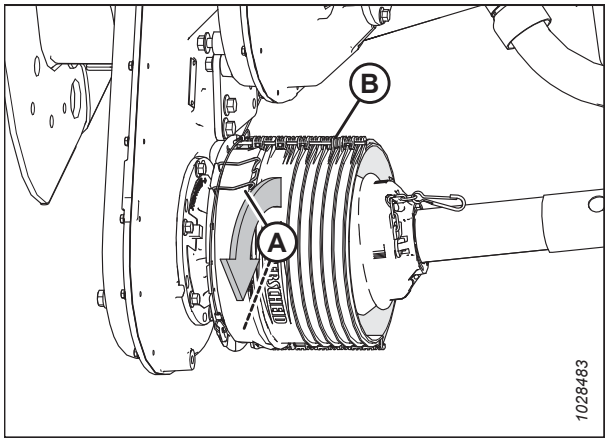


Figure 4.41: Driveline Shield

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.

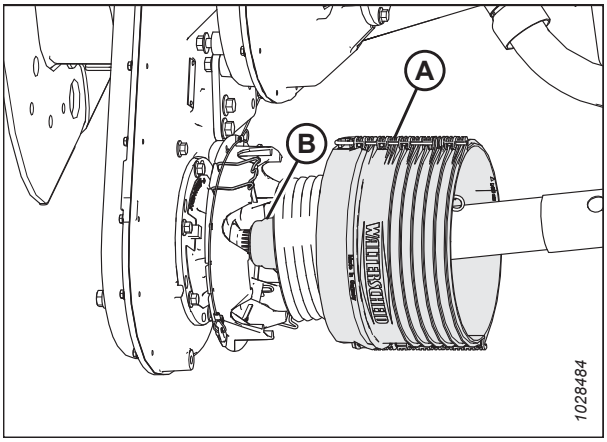


Figure 4.42: Driveline Shield

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).

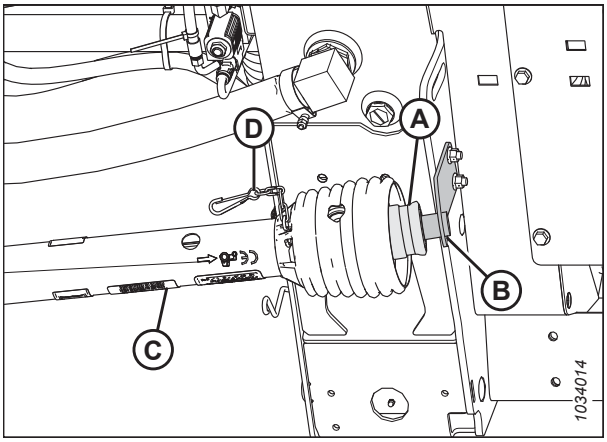


Figure 4.43: Driveline Shield

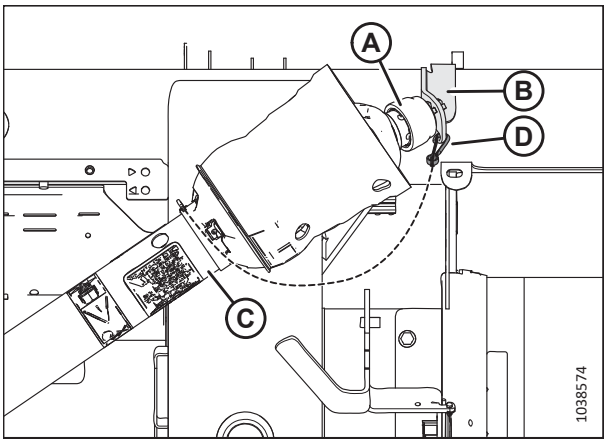


Figure 4.44: Optional Side-Hill Driveline Shield

4.6.2 Installing Driveline

The driveline transfers power from the combine PTO to the header's float module completion gearbox. It will need to be installed on 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.

IMPORTANT:

If the driveline has been disassembled, ensure that the two halves are in phase before the driveline is installed on the header and combine. The image illustrates correct phasing (A) and incorrect phasing (B).

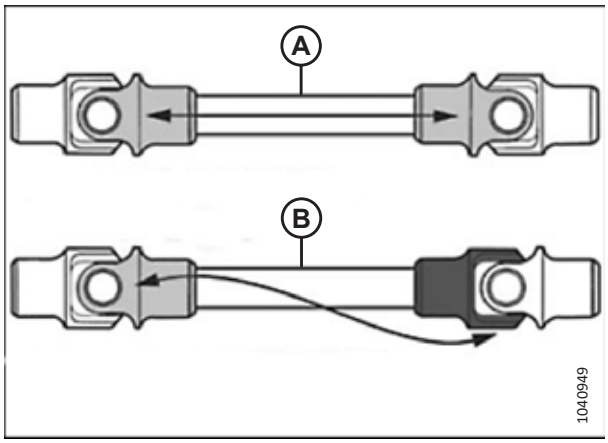


Figure 4.45: Determining Driveline Phase

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. Position driveline support bracket (A) (supplied with the driveline) on the left inside of the float module as shown. Secure the bracket with two M10, 30 mm bolts and flange nuts (B).

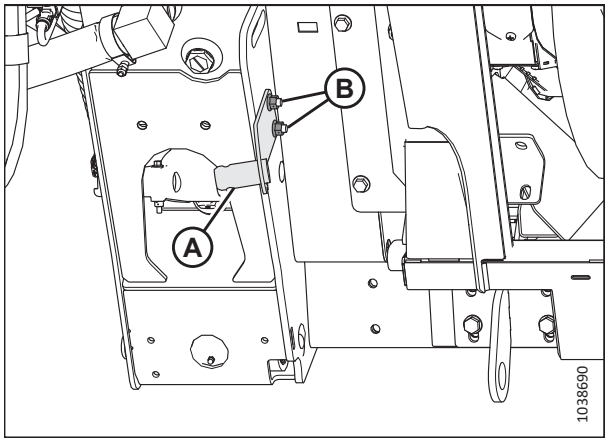


Figure 4.46: Driveline Support Bracket

6. On the end of driveline (D) which has arrow (C) pointing toward the collar, pull back quick disconnect collar (A).
7. Slide the yoke onto support bracket (B).
8. Connect safety chain (E) to the support bracket.

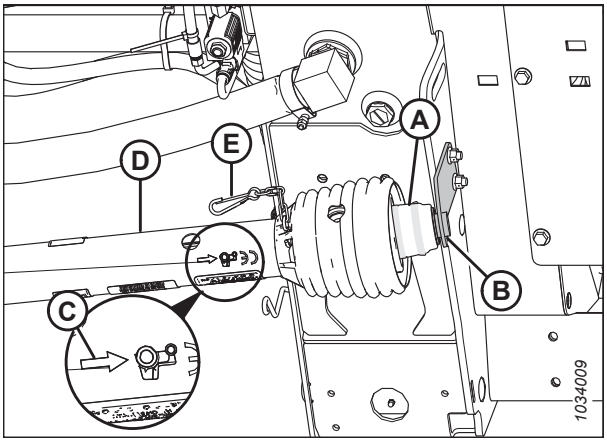


Figure 4.47: Driveline Shield

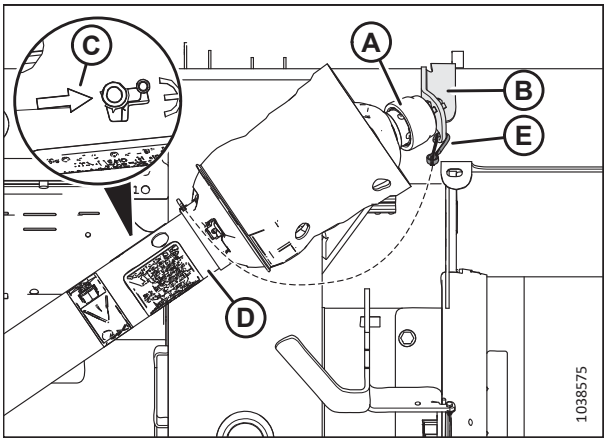


Figure 4.48: Optional Side-Hill Driveline Shield

9. Pry clips (A) up to release shield (B).

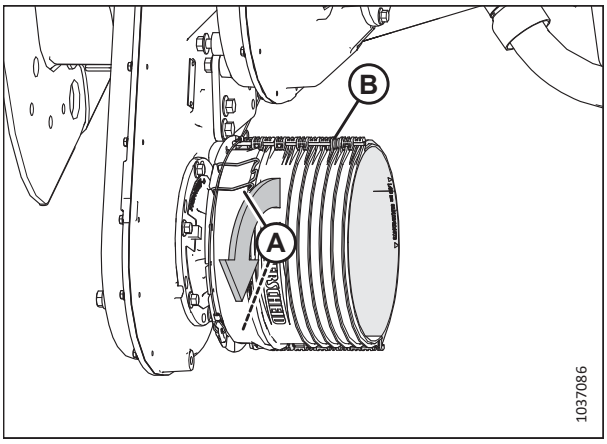


Figure 4.49: Driveline Shield

10. Slide the driveline through shield (A). Pull back the quick disconnect collar (B) to release the driveline yoke.

11. Slide the driveline onto the gearbox shaft until it locks onto the shaft.

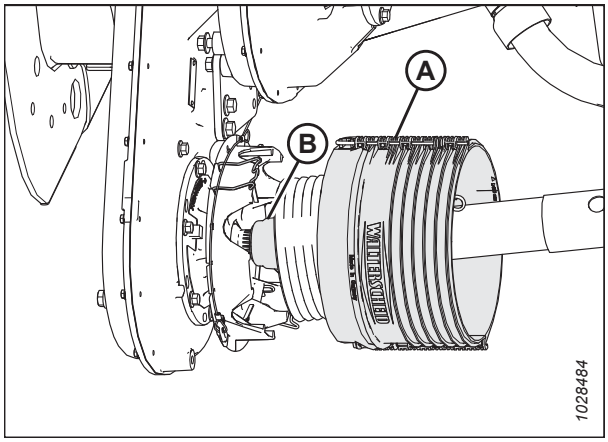


Figure 4.50: Driveline Shield

12. Slide the shield towards the gearbox until clips (A) secure shield (B).

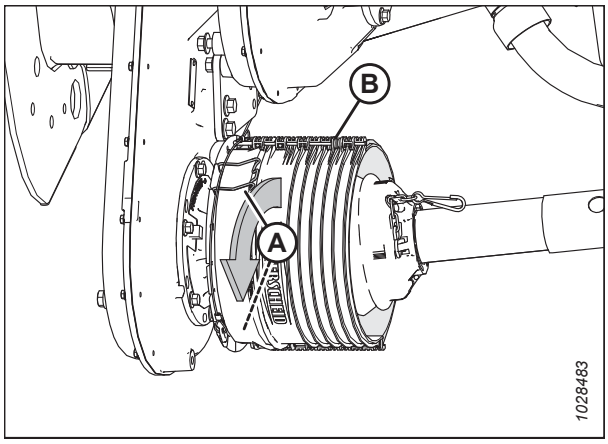


Figure 4.51: Driveline Shield

13. Attach driveline safety chain (A) to the slot on the aluminum plate.

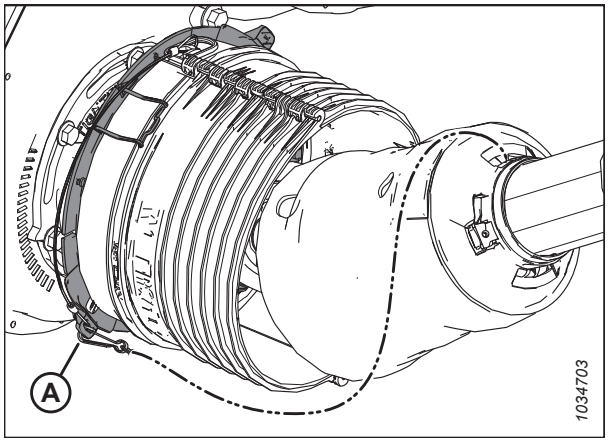


Figure 4.52: Driveline Shield

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).

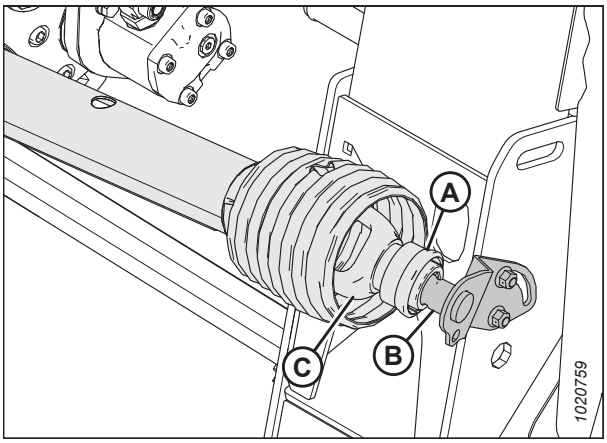


Figure 4.53: Combine End of Driveline

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 4.54: Separated Driveline

4. Use a slotted screwdriver to release grease fitting/lock (A).

Figure 4.55: 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.

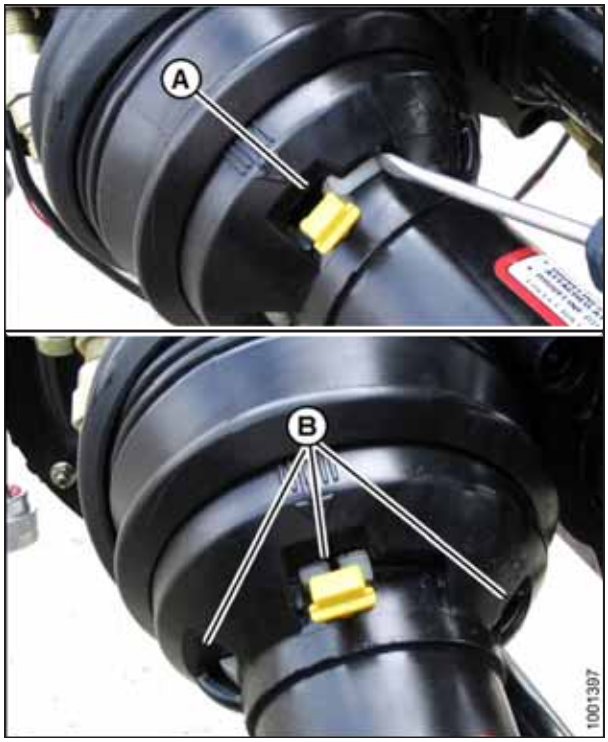


Figure 4.56: Driveline Guard

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 4.57: Driveline Guard

2. Push the guard onto the ring until the locking ring is visible in slots (A).

Figure 4.58: Driveline Guard

3. Use a slotted screwdriver to rotate ring (A) clockwise.

Figure 4.59: Driveline Guard

4. Push grease fitting (A) back into the guard.

Figure 4.60: 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.

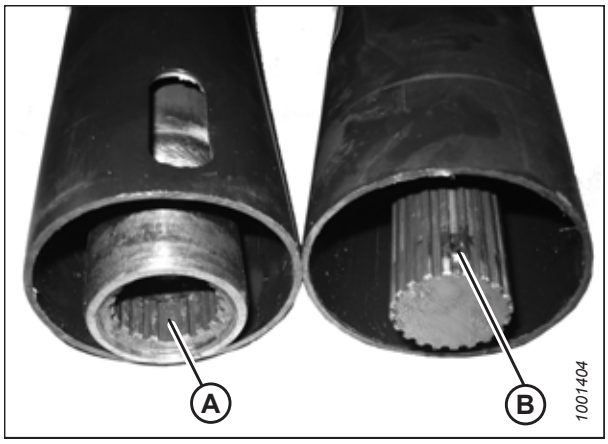


Figure 4.61: Driveline

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).

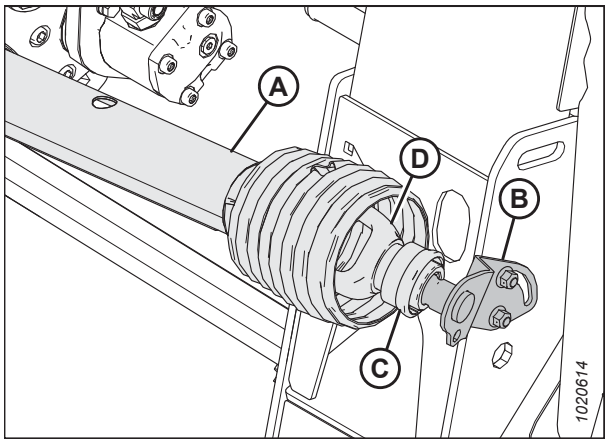


Figure 4.62: Combine End of Driveline

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.

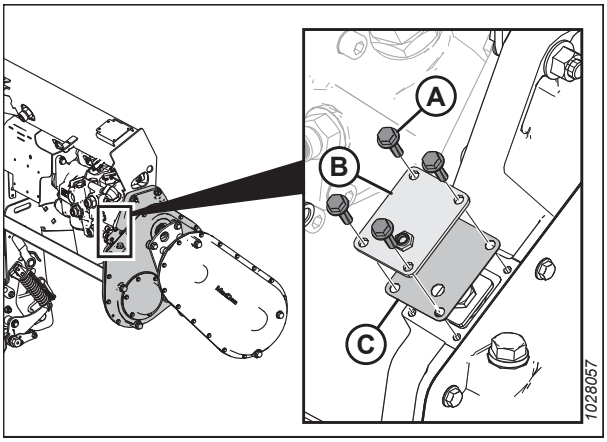


Figure 4.63: Main Gearbox Chain Tensioner Cover

2. Remove retainer plate (A).
3. Tighten bolt (B) to 250 Ncm (22 lbf·in).
4. Loosen bolt (B) by 3 flats (1/2 turn).

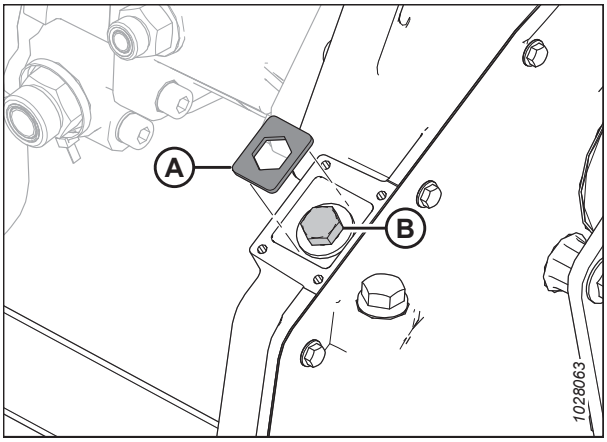


Figure 4.64: Main Gearbox Chain Tensioner

5. If necessary, turn bolt (B) slightly until retainer plate (A) can be installed.

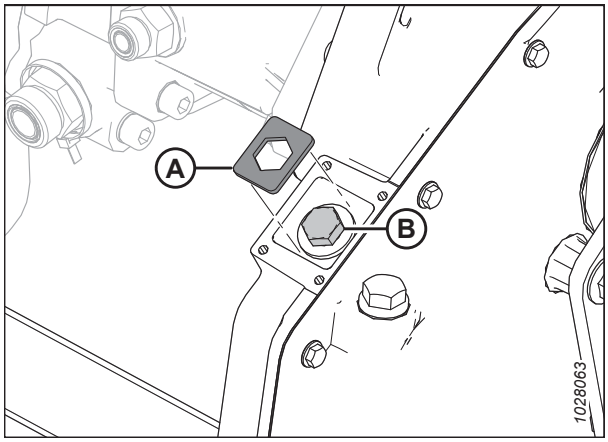


Figure 4.65: Main Gearbox Chain Tensioner

6. Reinstall chain adjusting cover (B) and gasket (C).
7. Install four bolts (A). Torque the hardware to 9.5 Nm (84 lbf·in).

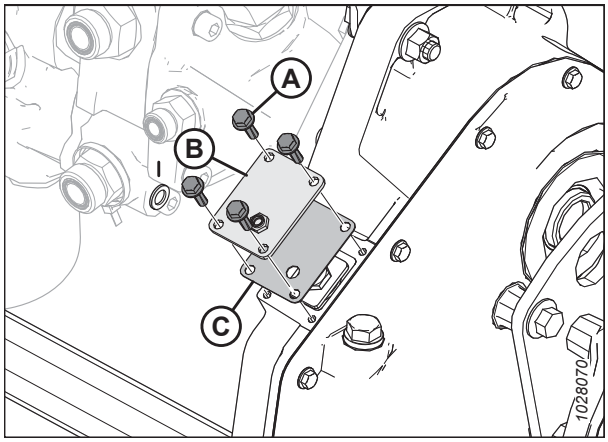


Figure 4.66: Main Gearbox Chain Tensioner Cover

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, page 272*.

5. Remove three bolts (A) that secure input driveline guard base (B).

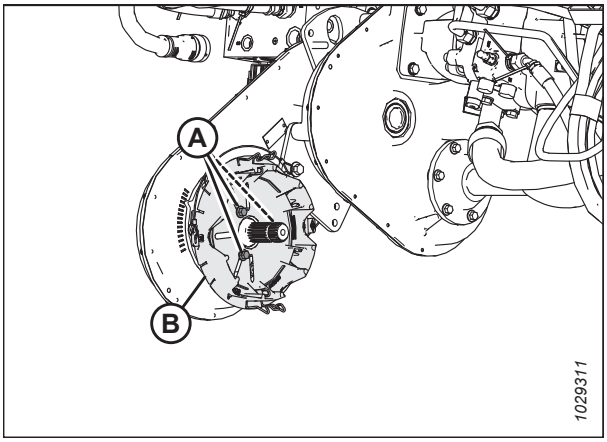


Figure 4.67: Completion Gearbox Chain Tensioner Cover

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 (221 lbf·in).

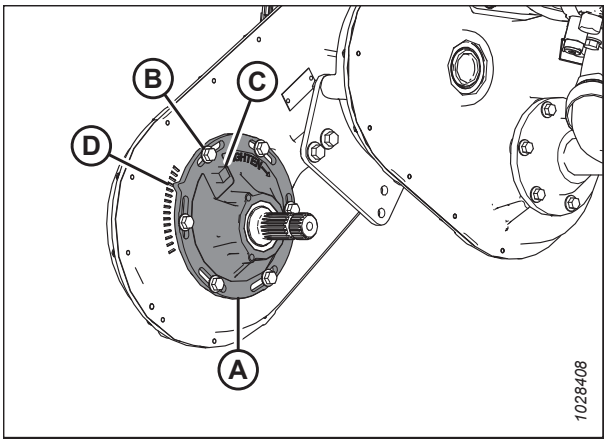


Figure 4.68: Completion Gearbox Chain Tensioner Cover

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, page 274*.

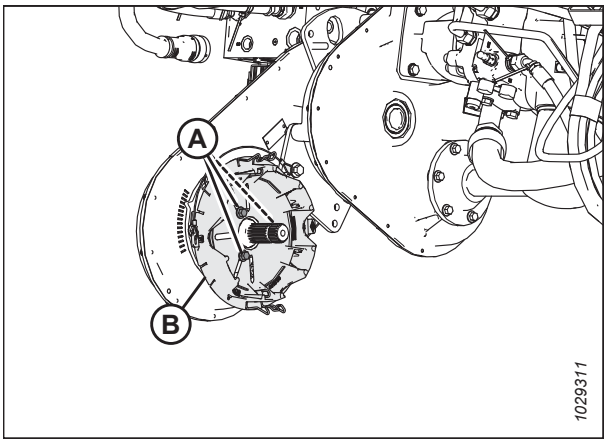


Figure 4.69: Completion Gearbox Chain Tensioner Cover

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

There must be adequate clearance between the feed auger and the pan on the float module to ensure smooth crop feeding.

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 of the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Check that the float lock linkage is on the down stops (washer [A] cannot be rotated) at both locations.

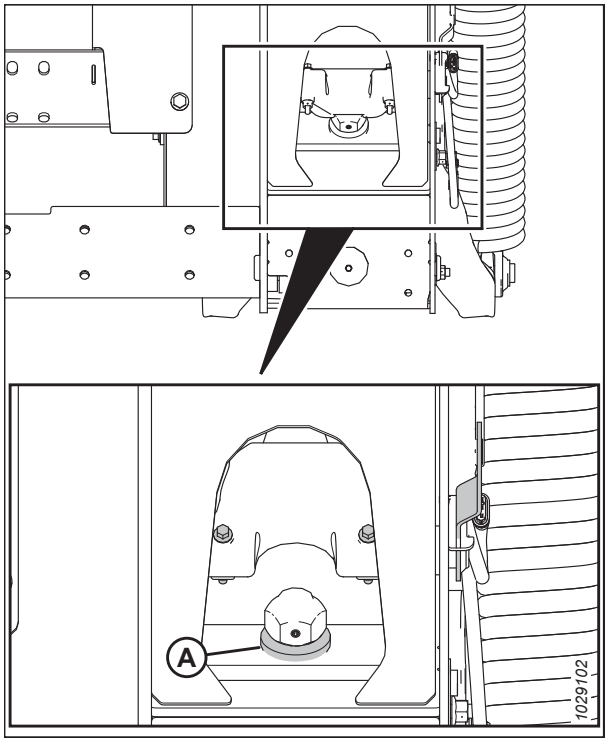


Figure 4.70: Down Stop Washer

4. Before adjusting the auger-to-pan clearance, check the auger float position to determine how much clearance is required:

   IMPORTANT:

   Ensure that bolts (A) are set at the same location on both ends of the header to prevent damage to the machine during operation.

   - If bolt head (A) is closest to floating symbol (B), the auger is in the floating position.

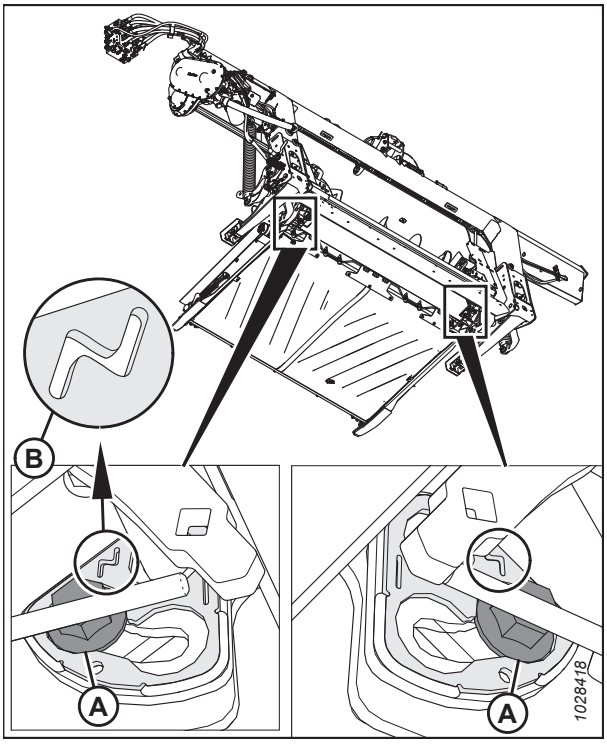


Figure 4.71: Floating Position

   - If bolt head (A) is closest to fixed symbol (B), the auger is in the fixed position.

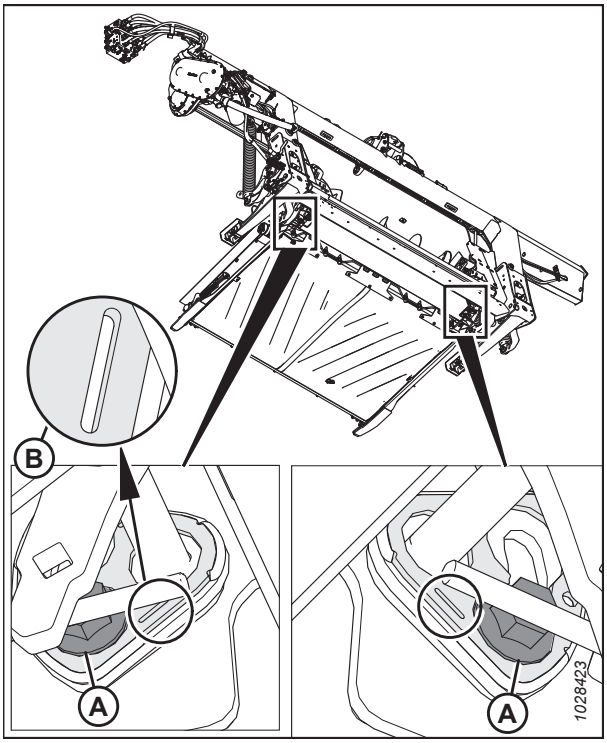


Figure 4.72: Fixed Position

5. Check clearance (C) between the feed auger flighting and the pan.
   - If the feed auger is in the fixed position, the clearance should be 24–28 mm (15/16–1 1/8 in.).
   - If the feed auger is in the floating position, the clearance should be 11.5–15.5 mm (7/16–5/8 in.).
6. If the clearance requires adjustment, loosen two nuts (B) and rotate the auger to position the flighting over the feed pan.
7. 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 the clearance to 24–28 mm (15/16–1 1/8 in.).
   - If the feed auger is in the floating position, set the 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.
8. Repeat Step *5, page 286* and Step *7, page 286* 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.
9. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 96 Nm (70 lbf·ft).
10. Rotate the feed auger and double-check clearances.

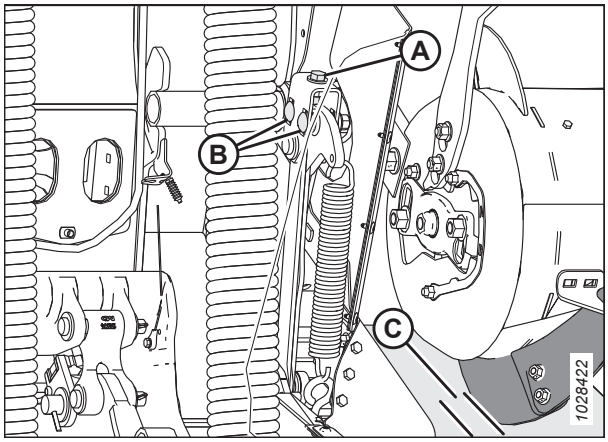


Figure 4.73: Auger Clearance

4.7.2 Checking 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 286*
- *Checking Feed Auger Drive Chain Tension – Thorough Method, page 288*

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

Ensure that 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 288*) 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 37*.
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.

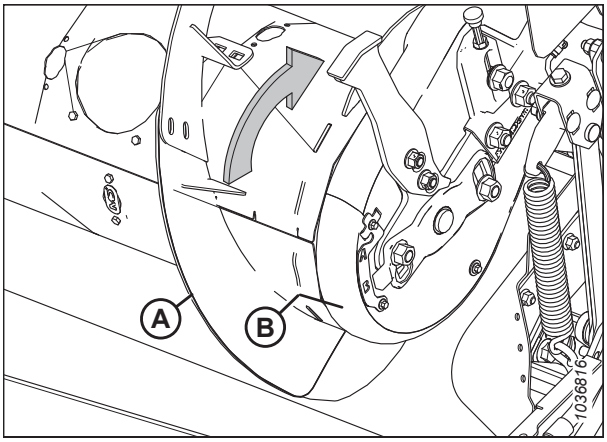


Figure 4.74: Feed Auger Drive

8. Rotate auger (A) by hand in the forward direction until it cannot turn anymore. The marked line will split.

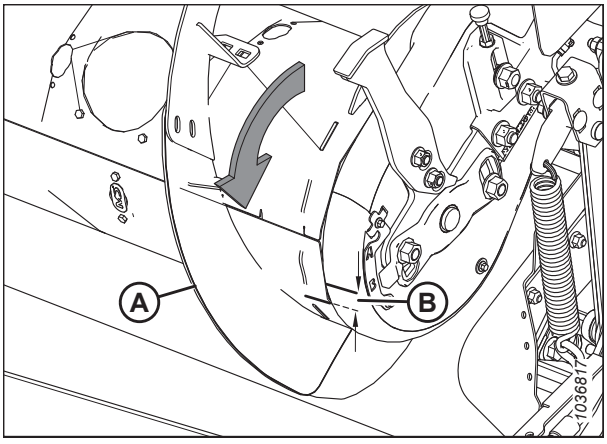


Figure 4.75: Feed Auger Drive

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. For instructions, refer to *4.7.5 Adjusting Feed Auger Drive Chain Tension, page 296*.

   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. For instructions, refer to *4.7.5 Adjusting Feed Auger Drive Chain Tension, page 296*.

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

Ensure that 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 286*) 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 37*.
5. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 55*.
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 the bottom cover.
11. Rotate bottom cover (F) forward to remove.

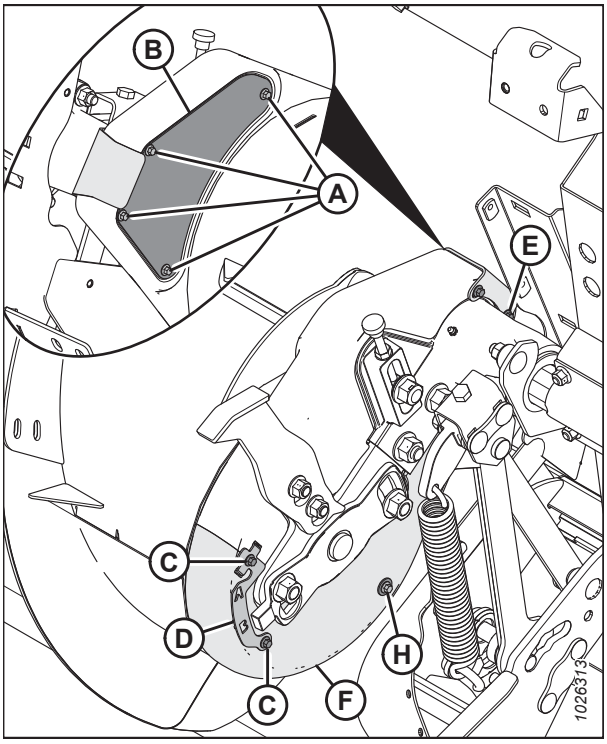


Figure 4.76: Feed Auger Drive – Rear View

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 296*.

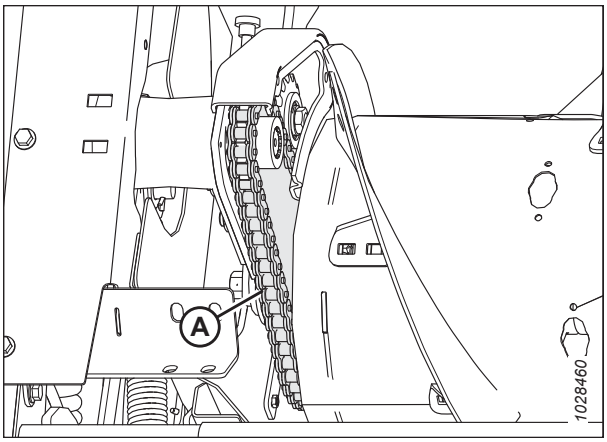


Figure 4.77: Feed Auger Chain – Rear View

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).

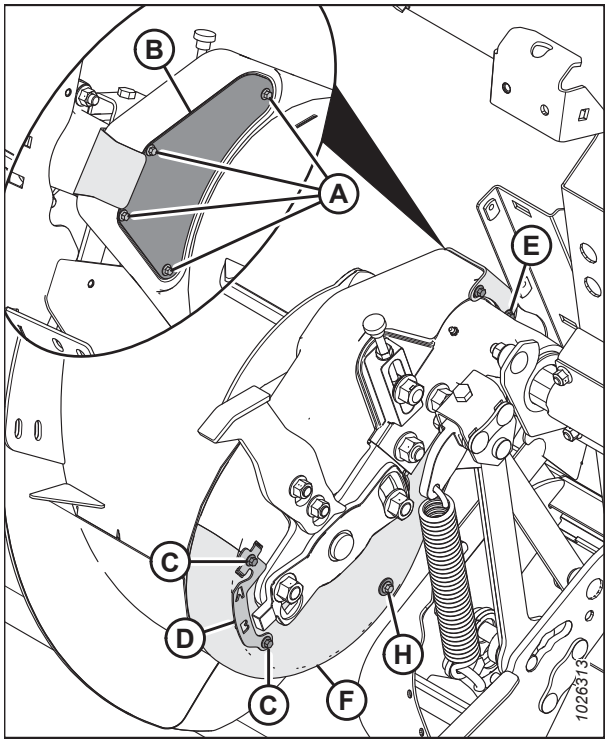


Figure 4.78: Feed Auger Drive – Rear View

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 (MAC220317).

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 55*.

3. Place wooden blocks (A) under the auger to prevent the auger from dropping onto the feed draper and damaging it.

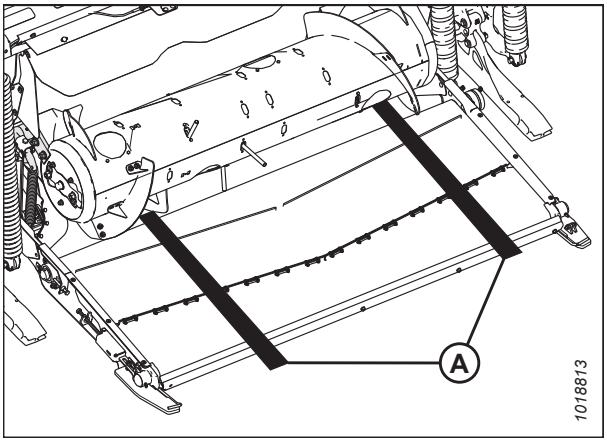


Figure 4.79: Blocks under the Auger

4. Loosen two bolts (A) and remove bumper (B). Repeat on the opposite side.

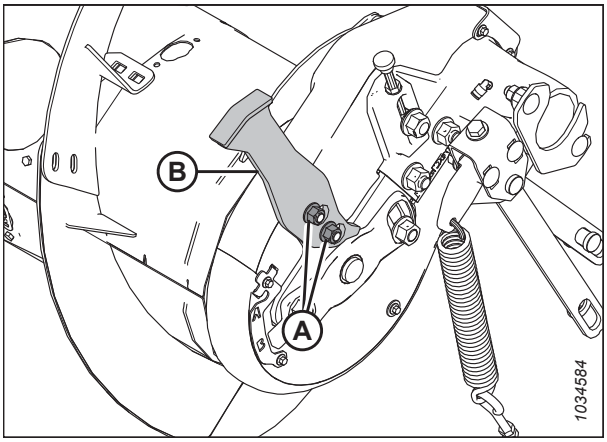


Figure 4.80: Auger Bumper – Left Side

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.

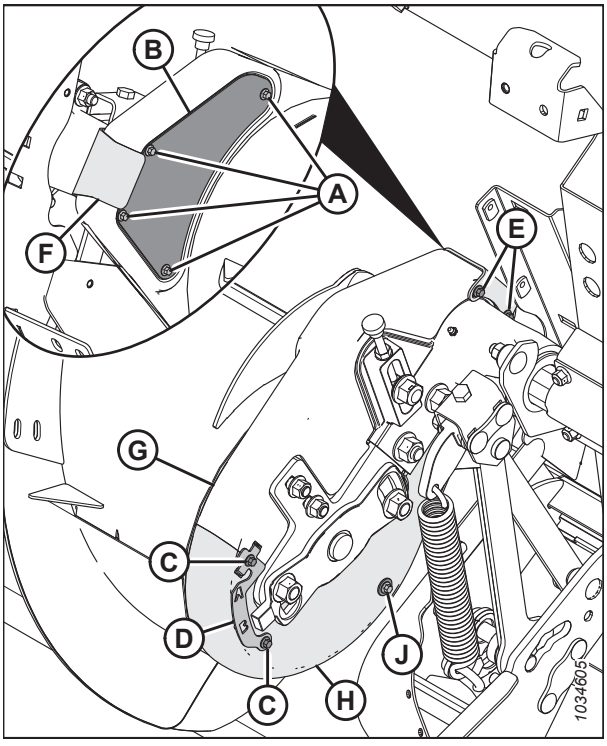


Figure 4.81: Auger Drive

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).

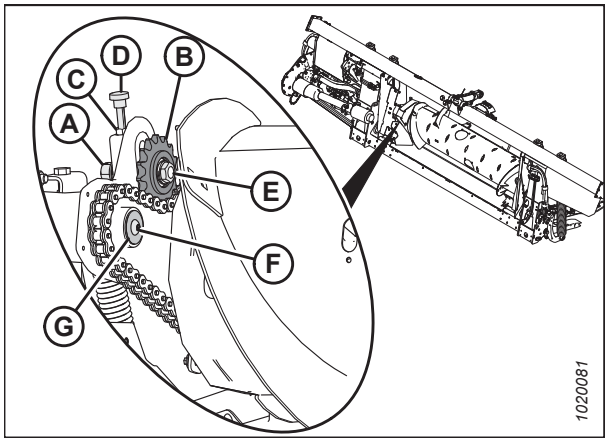


Figure 4.82: Auger Drive

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.

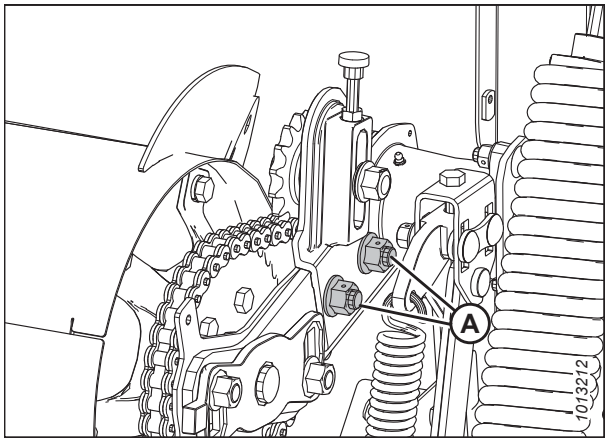


Figure 4.83: Auger Support Arm

14. Using a pry bar at location (A) between support arm (C) and auger pivot (B), pry the auger to the right.

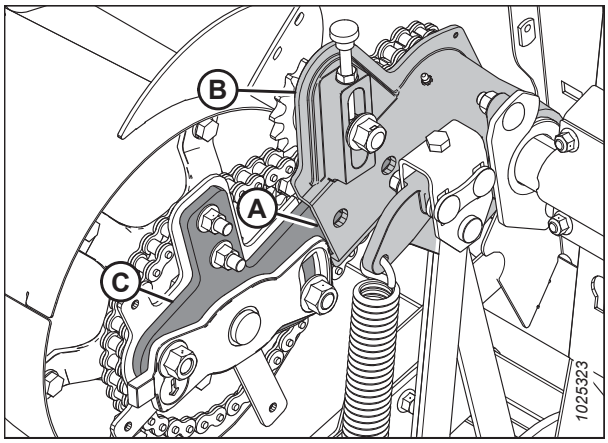


Figure 4.84: Auger

15. Remove drive sprocket (A) and chain (B) from spline shaft.

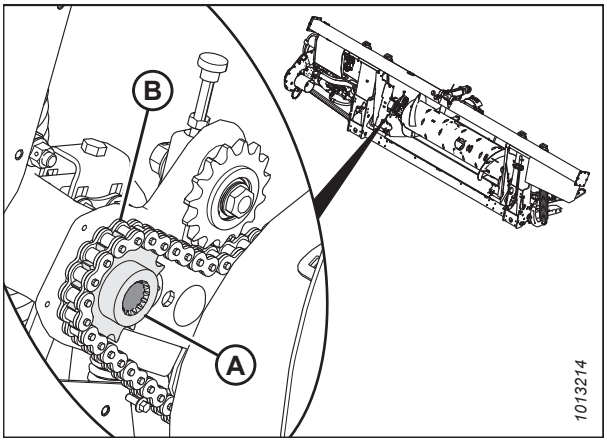


Figure 4.85: Auger Drive

16. Maneuver auger (A) sideways and forward so that endless chain (B) can be removed from the auger.

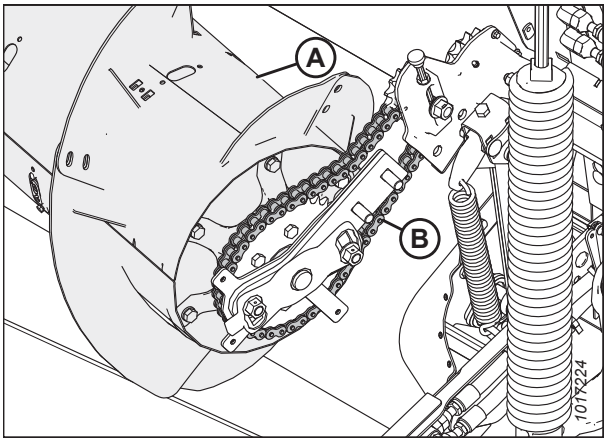


Figure 4.86: Auger Drive

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).

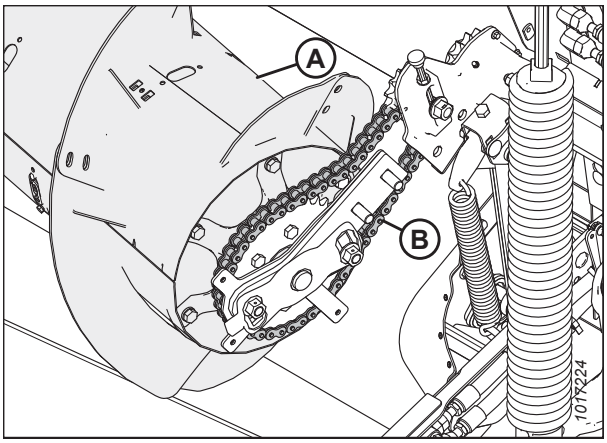


Figure 4.87: Auger Drive

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.

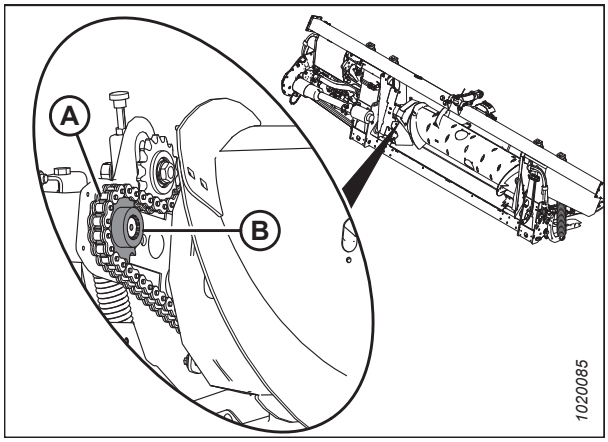


Figure 4.88: Auger Drive

3. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to threads of screw (A).
4. Install washer (B) and secure it with screw (A).

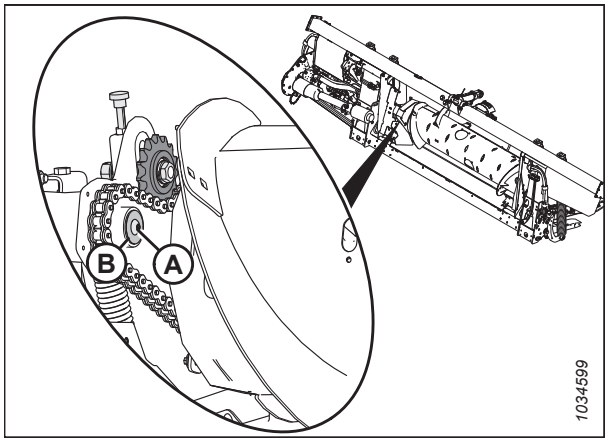


Figure 4.89: Auger Drive

5. Slide the auger drum assembly toward the casting, and then reinstall two bolts and nuts (A).

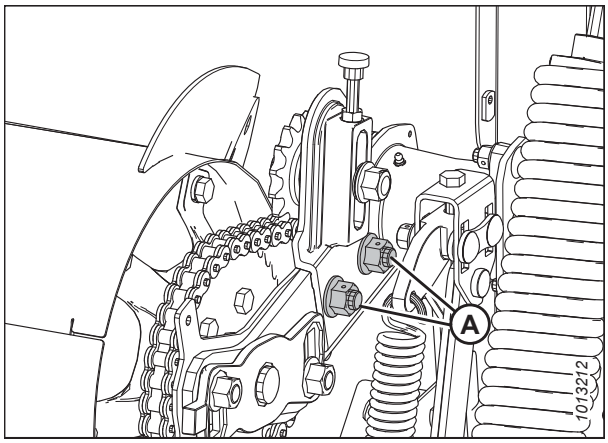


Figure 4.90: Auger Drive

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).

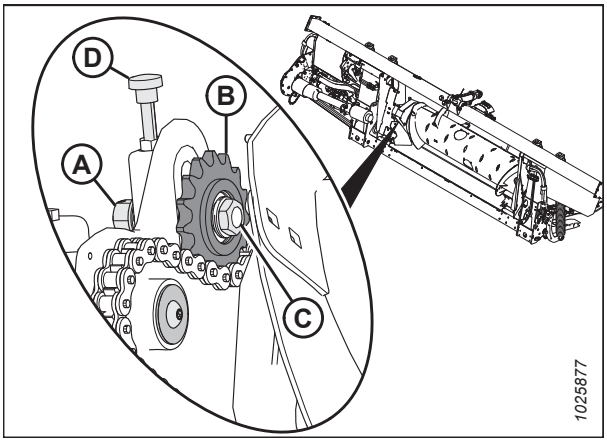


Figure 4.91: Auger Drive

9. Tighten jam nut (A).

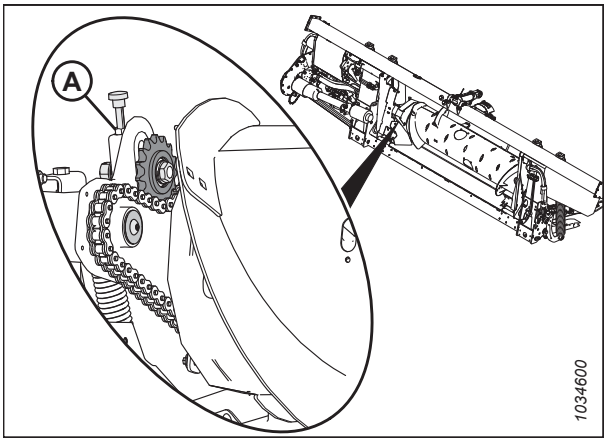


Figure 4.92: Auger Drive

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).

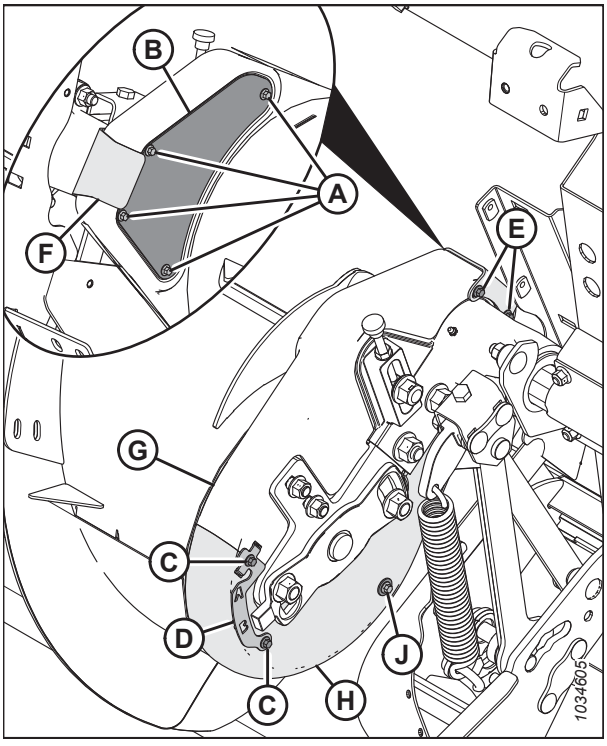


Figure 4.93: Auger

14. Remove wooden blocks (A) from the feed draper.

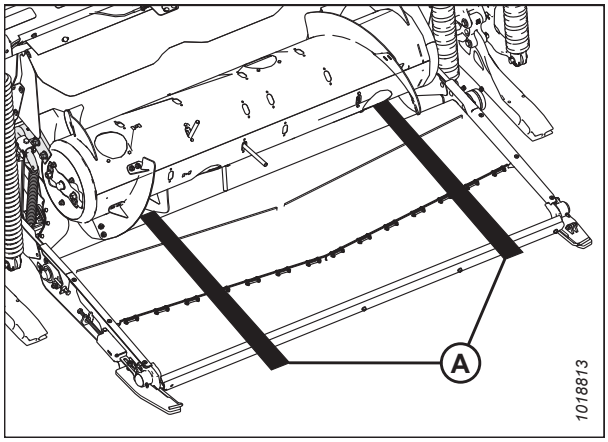


Figure 4.94: Blocks under the Auger

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

Ensure that 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 37*.
5. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 55*.
6. Shut down the engine, and remove the key from the ignition.

7. Remove four bolts (A) and inspection panel (B) to view chain.

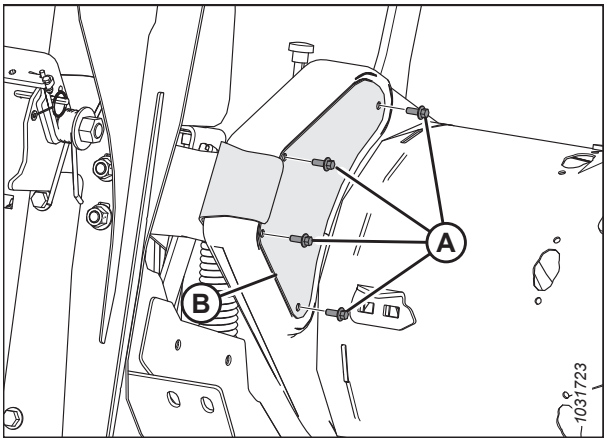


Figure 4.95: Left Side of Auger Drive – Rear View

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.

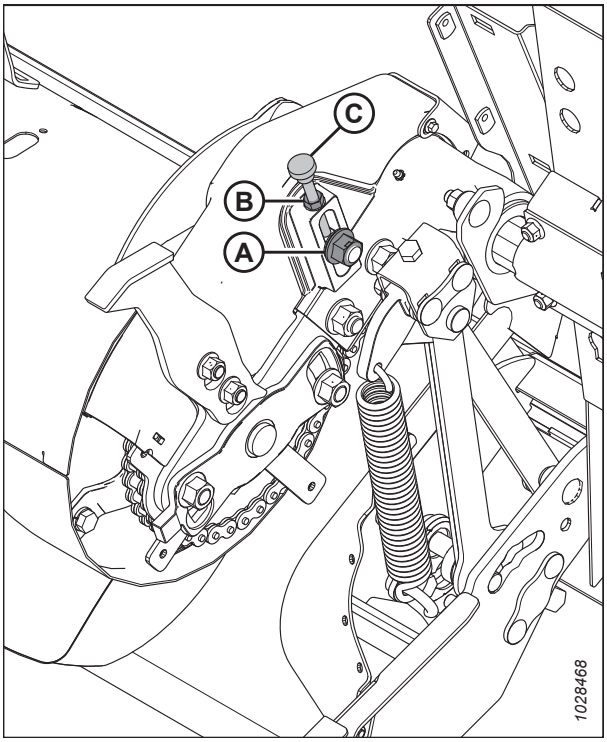


Figure 4.96: Left Side of Auger Drive – Front View

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.

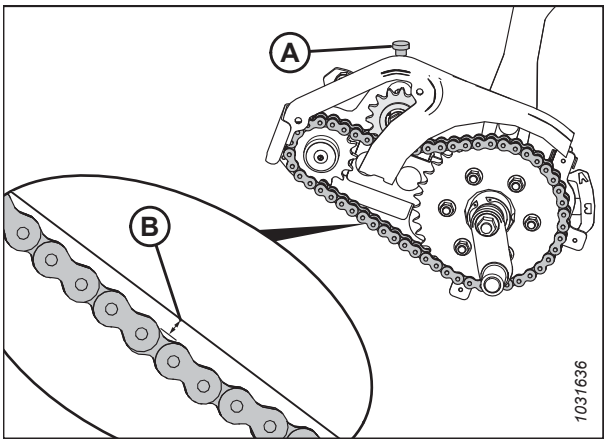


Figure 4.97: Feed Auger Chain Deflection

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.

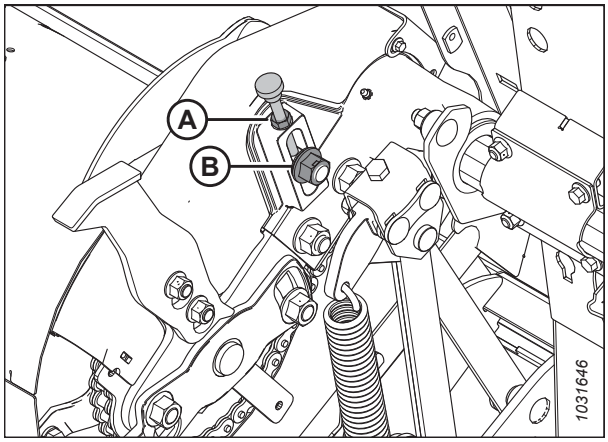


Figure 4.98: Feed Auger Chain – Front View

15. Install inspection panel (B) and secure with four bolts (A).
16. Torque bolts (A) to 3.5 Nm (30 lbf·in).

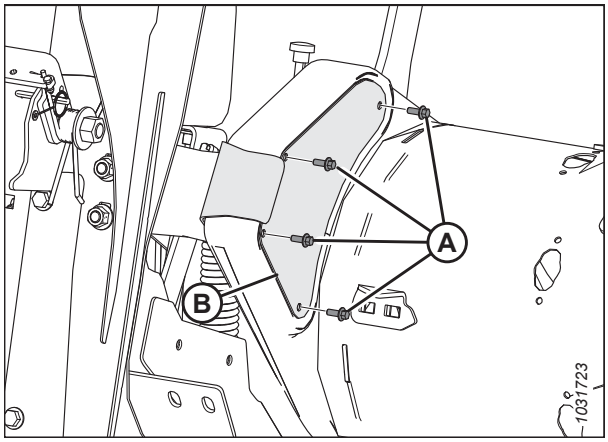


Figure 4.99: Left Side of Auger Drive – Rear View

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 84* 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 of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

Ensure that all bystanders have cleared the area.

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:

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 37*.
5. Locate the access cover closest to the finger to be removed. Remove and retain bolts (A) and access cover (B).

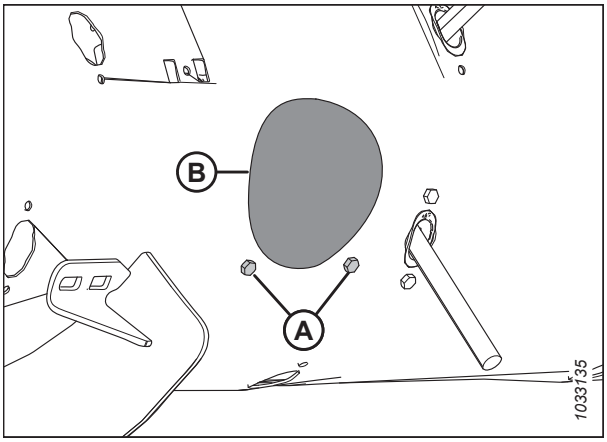


Figure 4.100: Auger Access Hole Cover

6. Remove hairpin (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.

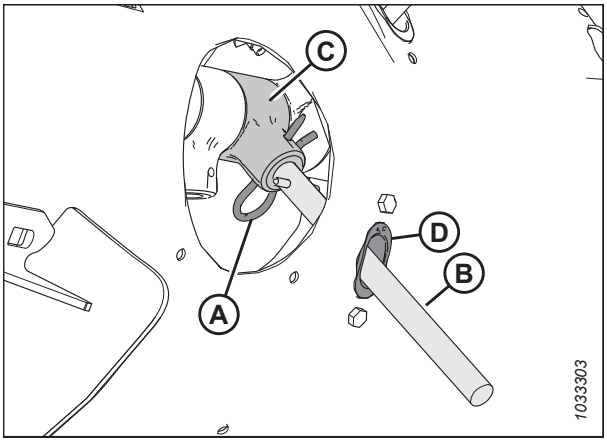


Figure 4.101: Auger Finger

8. Remove and retain two bolts (A) and the tee nuts (not shown) securing finger guide (B) to the auger. Remove guide (B).

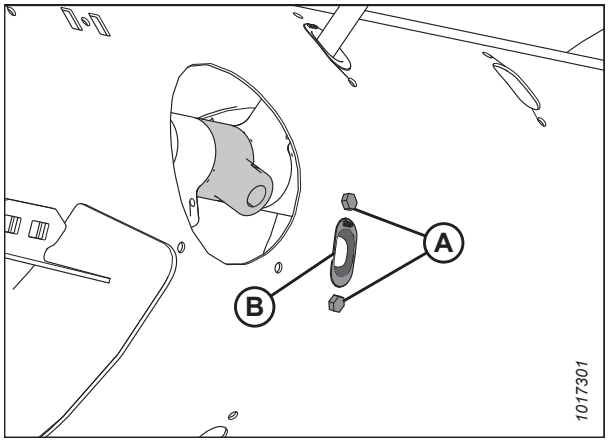


Figure 4.102: Auger Finger Hole

9. Place plug (A) in 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.

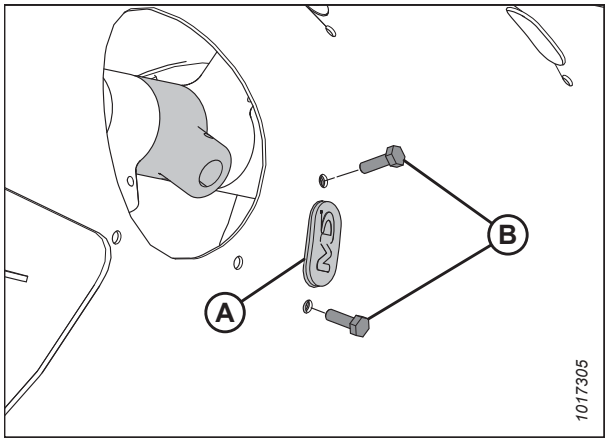


Figure 4.103: Plug Installed in Auger

10. Secure access cover (B) 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 you are reusing bolts (A), apply medium-strength threadlocker (Loctite® 243 or equivalent) to the threads of the bolts before you install them.

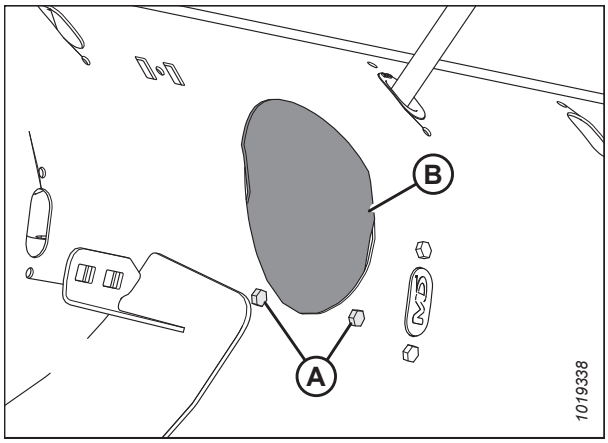


Figure 4.104: Auger Access Hole Cover

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 of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

WARNING

Ensure that all bystanders have cleared the area.

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:

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 37*.
4. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain the parts for reinstallation.

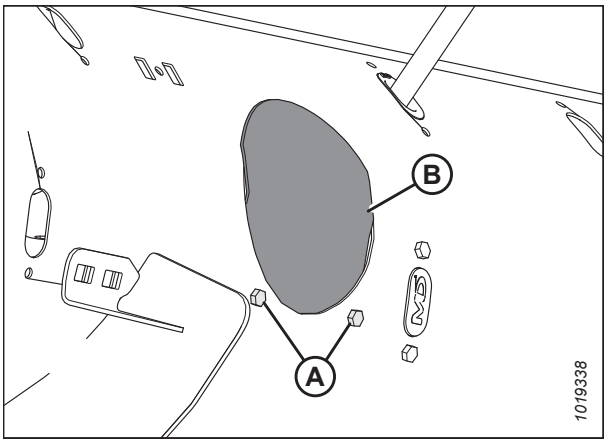


Figure 4.105: Auger Access Hole Cover

5. Remove two bolts (B), tee nuts (not shown), and plug (A).

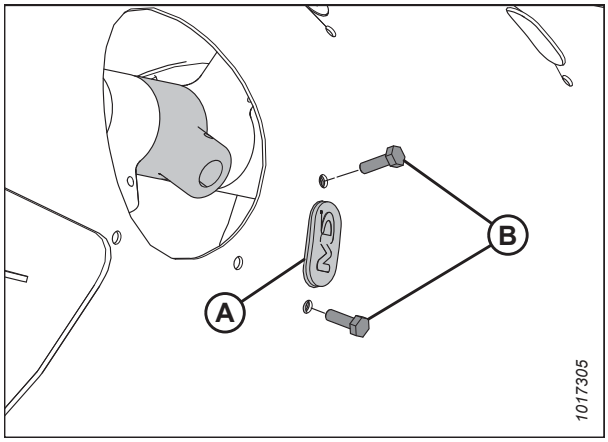


Figure 4.106: Auger Finger Hole

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).

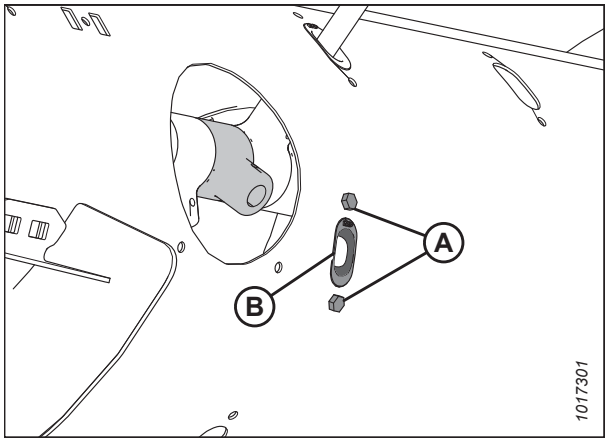


Figure 4.107: Auger Finger Hole

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.

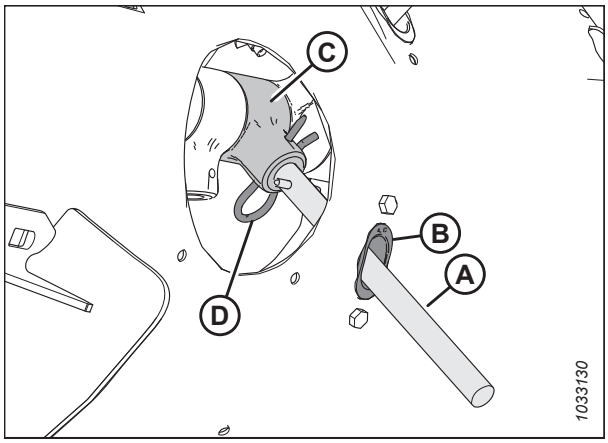


Figure 4.108: Auger Finger

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.

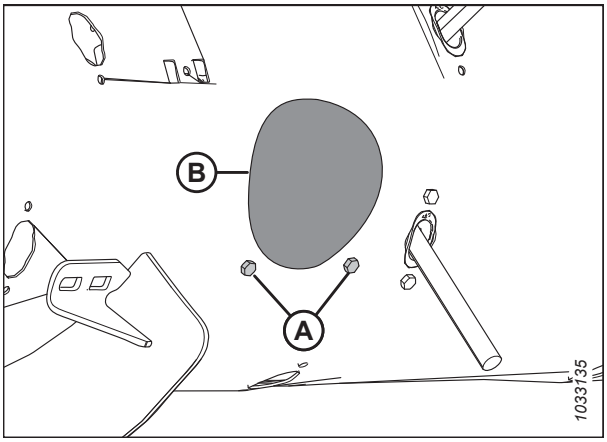


Figure 4.109: Auger Access Hole Cover

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

Ensure that 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 37*.
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 304*.
7. Disengage the reel safety props. For instructions, refer to *Disengaging Reel Safety Props, page 38*.

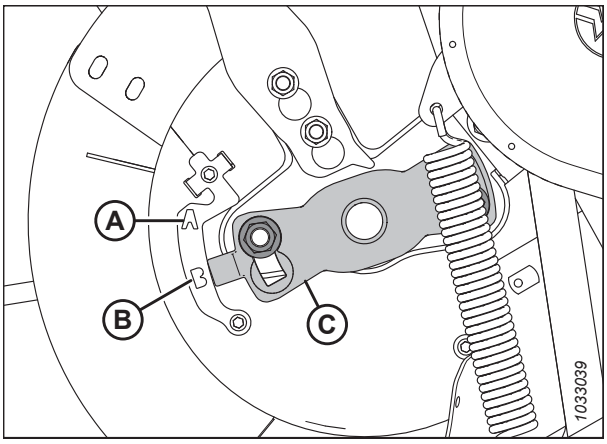


Figure 4.110: Auger Tine Timing – Left Side of Auger Shown

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

Ensure that 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 37*.
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.

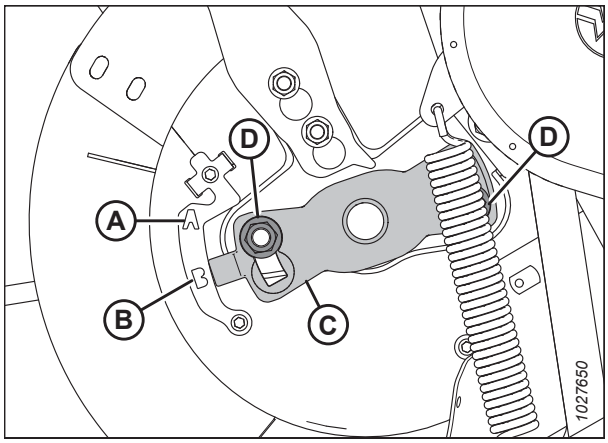


Figure 4.111: Auger Tine Timing Indicator

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.

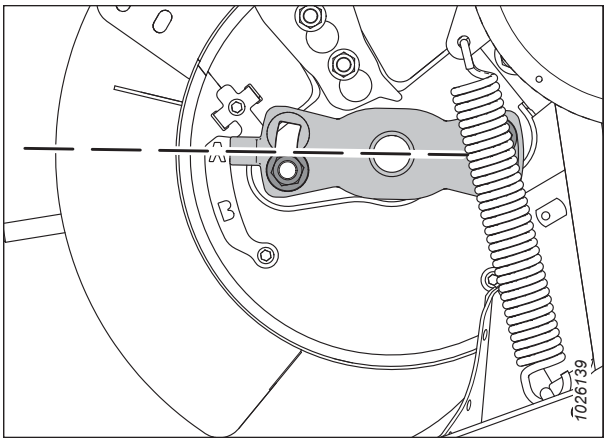


Figure 4.112: Auger Position A

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.

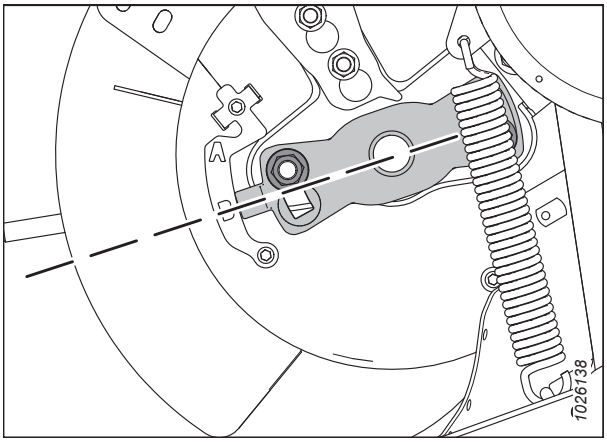


Figure 4.113: Auger Position B

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 38*.

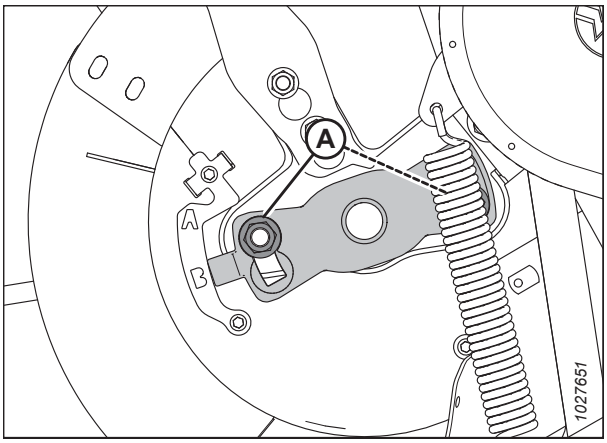


Figure 4.114: Auger Tine Timing Indicator

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 241*.

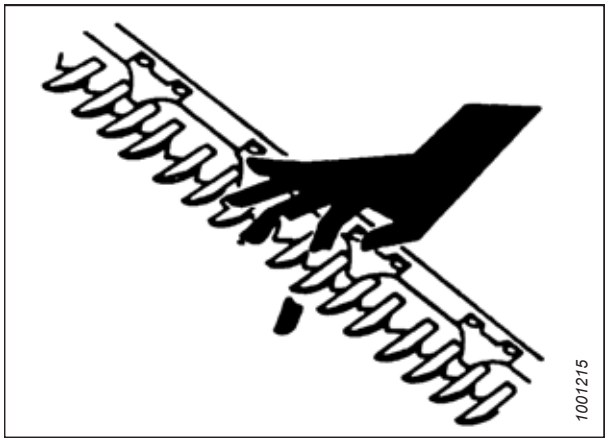


Figure 4.115: Cutterbar Hazard

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 bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

Wear heavy gloves when working around or handling knives.

1. Raise the reel fully.
2. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.
3. Shut down the engine, and remove the key from the ignition.

4. If a hold-down is present, Loosen nuts (A) that hold hold-down (B) to access the knife section that is being replaced.

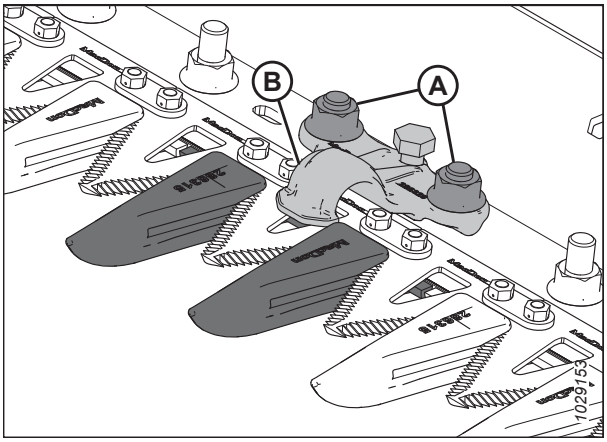


Figure 4.116: Cutterbar

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).

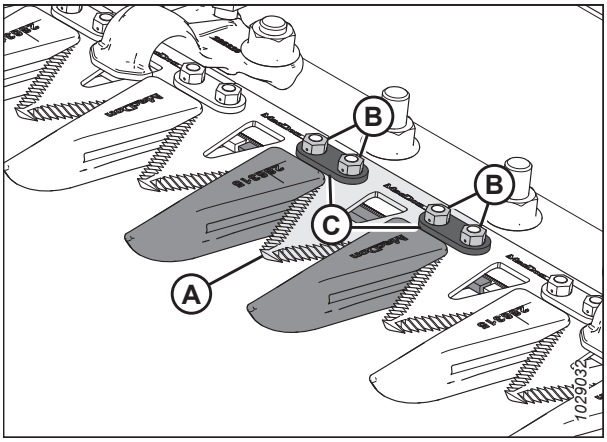


Figure 4.117: Cutterbar

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 (B) 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 321* or *Checking Hold-Down – Short Knife Guards, page 334*.

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 from the ignition 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 39*.
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).

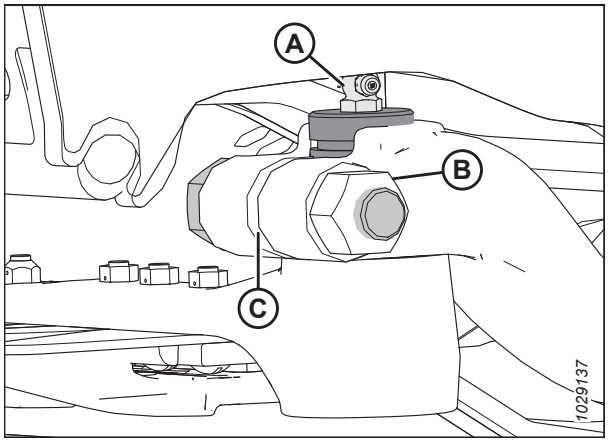


Figure 4.118: Knifehead

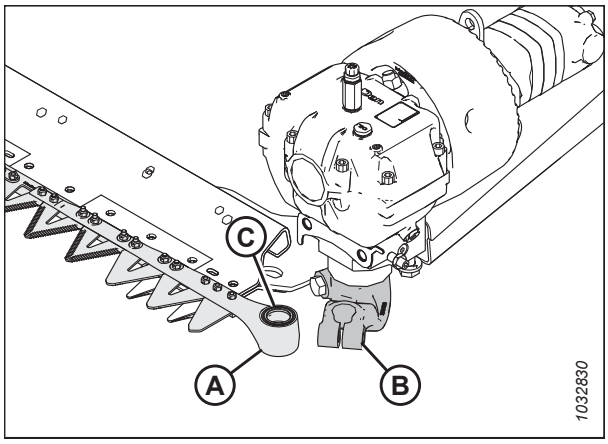


Figure 4.119: Left Knifehead

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 from the ignition 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 37*.
4. Remove the knife. For instructions, refer to *4.8.2 Removing Knife, page 307*.

   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.

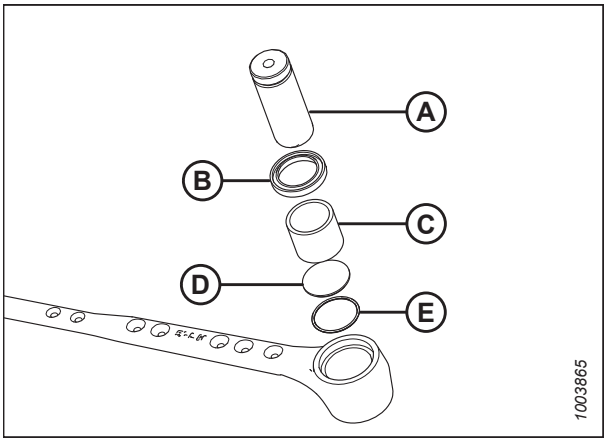


Figure 4.120: Knifehead Bearing Assembly

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.

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. 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.

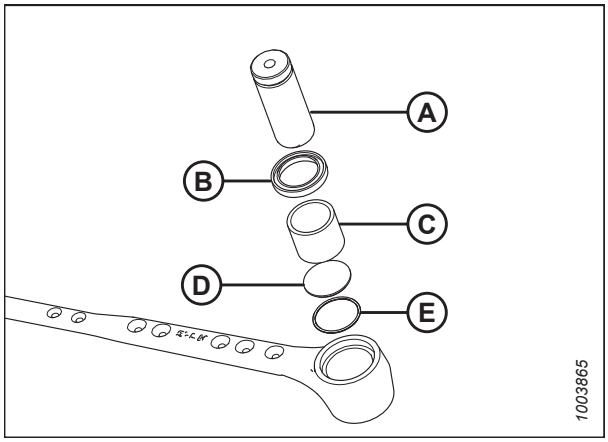


Figure 4.121: Knifehead Bearing Assembly

4. Install the knife. For instructions, refer to *4.8.5 Installing Knife, page 310*.

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 from the ignition 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. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
3. Grease the knifehead bearing.
4. Install knife assembly (A).

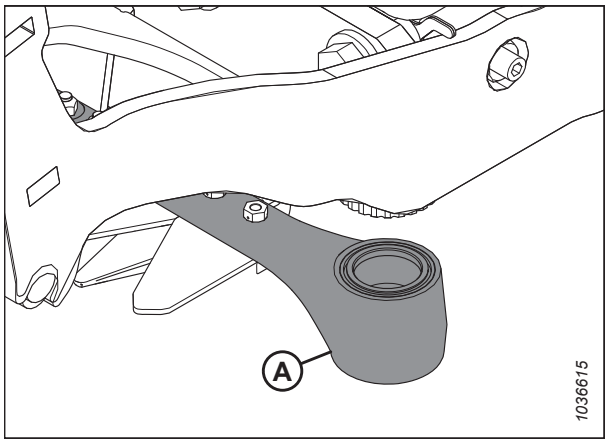


Figure 4.122: Knife Drive Box

5. Install knifehead pin (A) through the drive arm and into the knifehead.
6. Position knifehead pin (A) so that groove (B) is 2 mm (5/64 in.) above the drive arm.

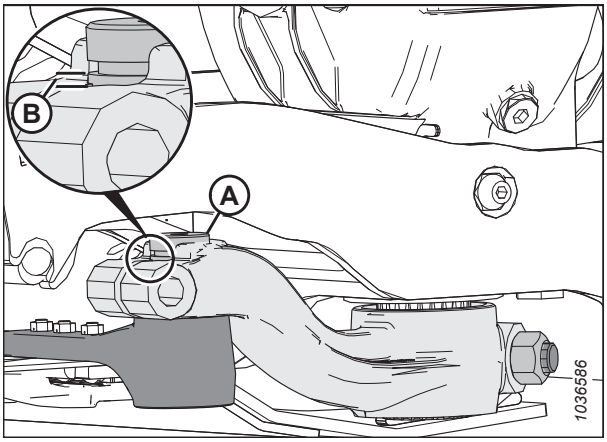


Figure 4.123: Knifehead

7. Secure the knifehead pin with M16 x 85 mm bolt (A) and nut (B). Install the bolt from the inboard side of the arm. Torque the bolt to 220 Nm (162 lbf·ft).
8. Rotate the flywheel attached to the knife drive box to manually stroke knife arm (A) to the inside limit of travel. Ensure that there is still 0.2–1.2 mm (1/64–3/64 in.) of clearance (C) between the drive arm and the knifehead.
9. If no adjustment is required, proceed to Step *10, page 311*. If the drive arm requires adjustment, contact the Dealer.

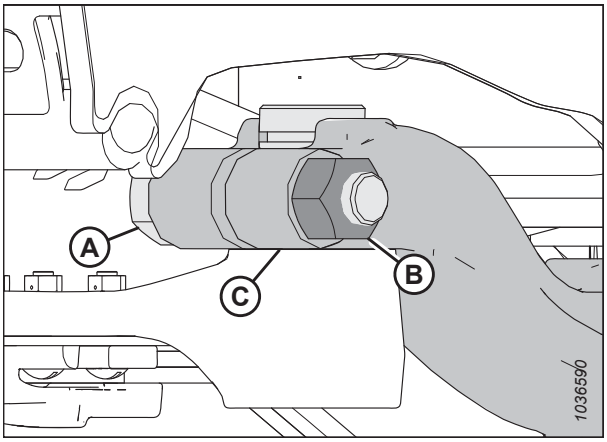


Figure 4.124: Knifehead

10. Reinstall grease fitting (A). Apply grease to the fitting until the knifehead has a slight downward movement.

    IMPORTANT:

    Do **NOT** overgrease the knifehead. Overgreasing the knifehead can result in knife misalignment, which excessive heating of the guards and strains the knife drive motor. If overgreasing occurs, remove the grease fitting to release the pressure.

    NOTE:

    If air is trapped in the bearing cavity, the knifehead will begin to move down before it has filled with grease.

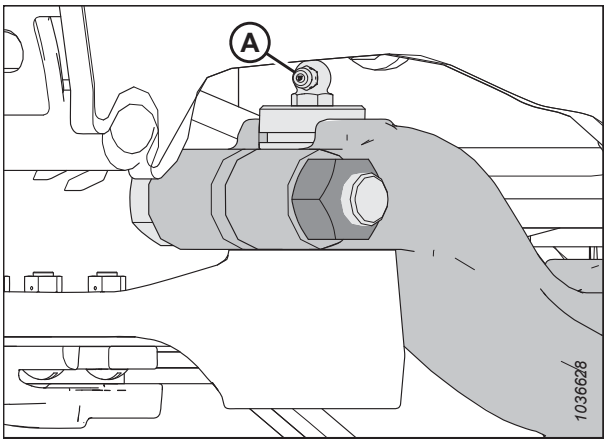


Figure 4.125: Knifehead

11. Move the knife drive arm to the mid-stroke position. Ensure that the knifeback bar doesn't contact the front of first guard (A).

12. If the knifeback bar contacts the front of the first guard, remove bolts (B), move the guard forward, and reinstall the bolts. Torque the bolts to 85 Nm (63 lbf·ft). If the necessary clearance (zero contact between the back bar and the front of the first guard) is not achievable, install additional shims a between the knife drive box and the mounting plate. Contact the Dealer for more information.

13. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

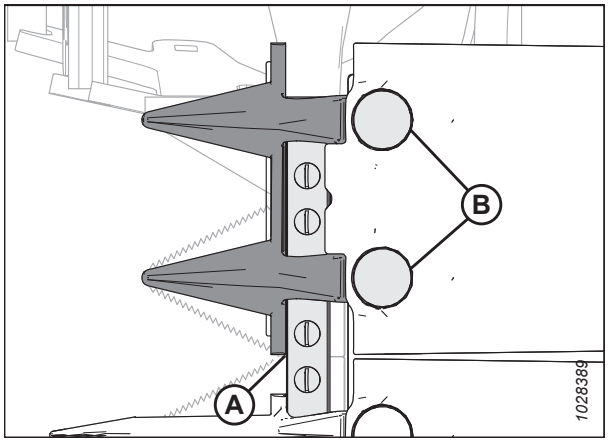


Figure 4.126: First Knife Guard – View from below Knife

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).

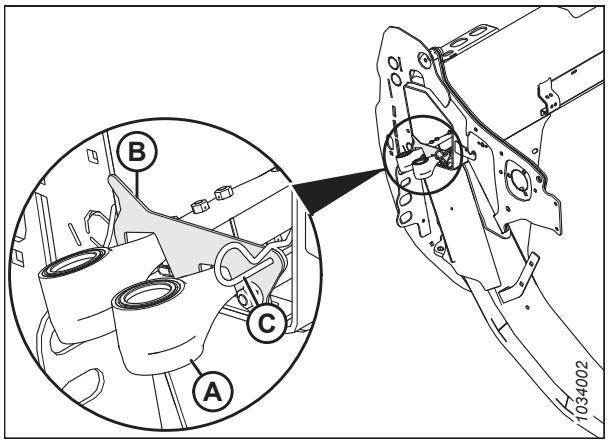


Figure 4.127: Spare Knives

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.

NOTE:

A Four-Point Guard kit can be used to replace knife guards. They are ideal for use in rocky conditions, or for harvesting shatter-prone crops such as lentils. Refer to the header parts catalog for more information.

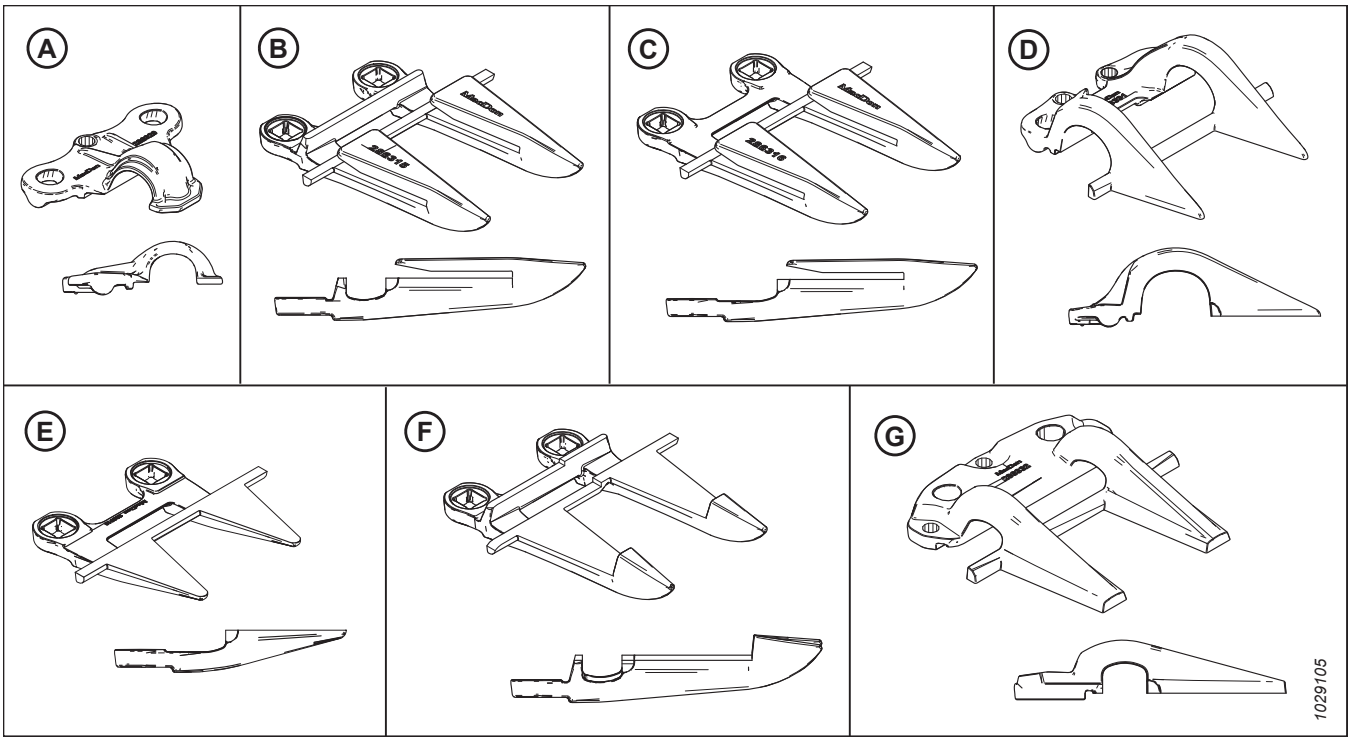


Figure 4.128: Guard and Hold-Down Types Used in Pointed Knife Guard Configurations

A - Pointed Hold-Down (MAC286329)
B - Pointed Knife Guard (MAC286315)
C - Pointed-End Knife Guard (without Wear Bar) (MAC286316)[75]
D - PlugFree™ End Hold-Down (MAC286331)
E - PlugFree™ End Knife Guard (without Wear Bar) (MAC286319)[76]
F - Pointed Center Knife Guard (MAC286317)[77]
G - Pointed Center Hold-Down (MAC286332)[77]

Guards are configured differently on different headers. When replacing pointed guards and hold-downs, ensure you use the correct replacement sequence for your header. Refer to the relevant procedure:

- *Pointed Knife Guard Configuration on Single-Knife Headers, page 314*
- *Pointed Knife Guard configuration on Double-Knife Header – D235, page 315*
- *Pointed Knife Guard Configuration on Double-Knife Header – D241, page 316*
- *Pointed Knife Guard Configuration on Double-Knife Header – D245, page 317*

75. Installed in positions 2, 3, and 4 on drive side(s). Refer to *Replacing Pointed Knife Guards, page 320*.
76. Installed in position 1 on drive side(s). Single-knife headers use standard guard (MAC286318) on the right end.
77. Double-knife headers only.

Pointed Knife Guard Configuration 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.

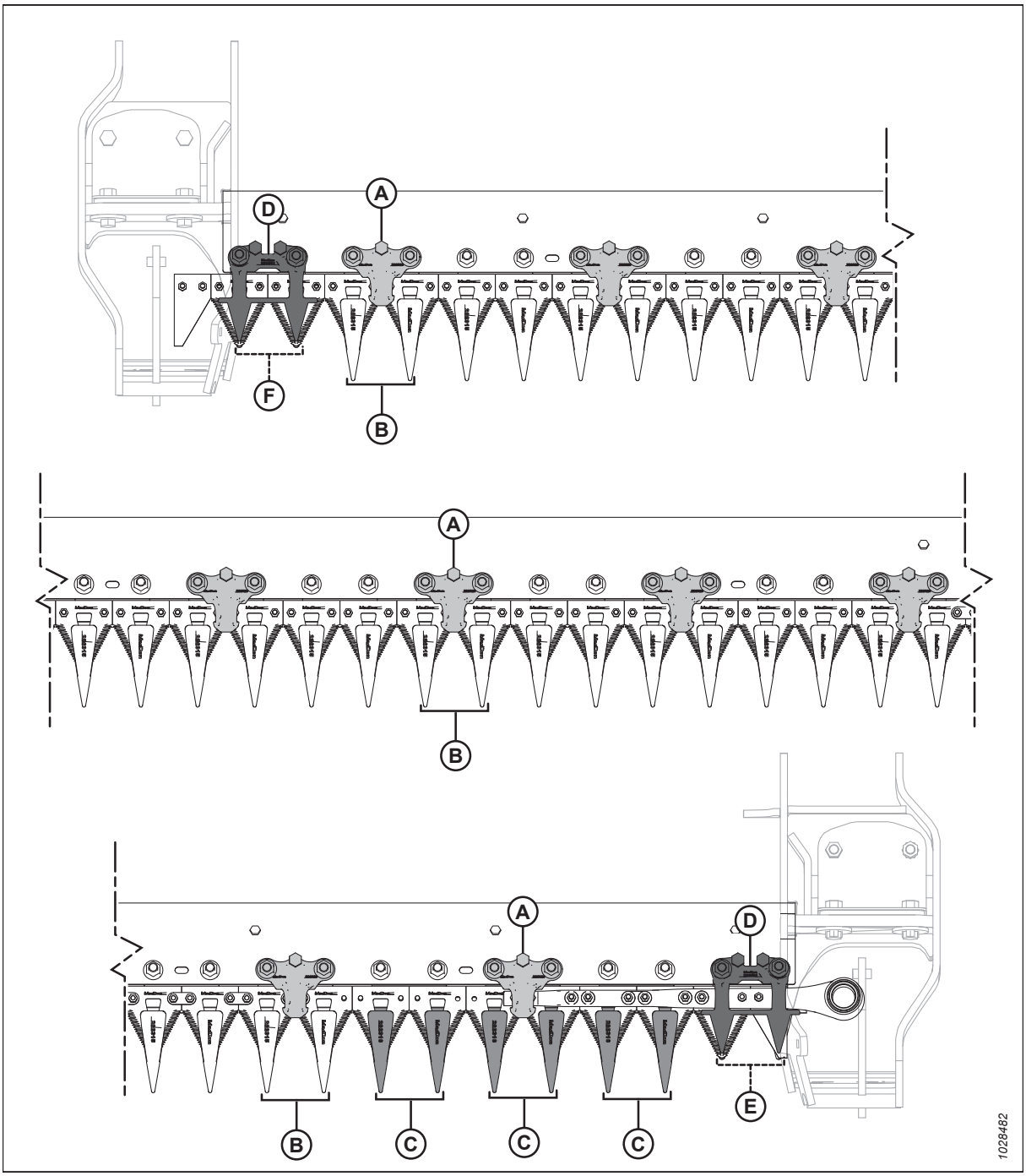


Figure 4.129: Pointed Knife Guard and Hold-Down Locations – Single-Knife Headers

A - Pointed Hold-Down (MAC286329)
B - Pointed Knife Guard (MAC286315)
C - Pointed End Knife Guard (without Wear Bar) (MAC286316)
D - Short Knife Hold-Down (MAC286331)
E - Short Knife Guard (without Wear Bar) (MAC286319)
F - Short Knife Guard (MAC286318)

Pointed Knife Guard configuration on Double-Knife Header – D235

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.

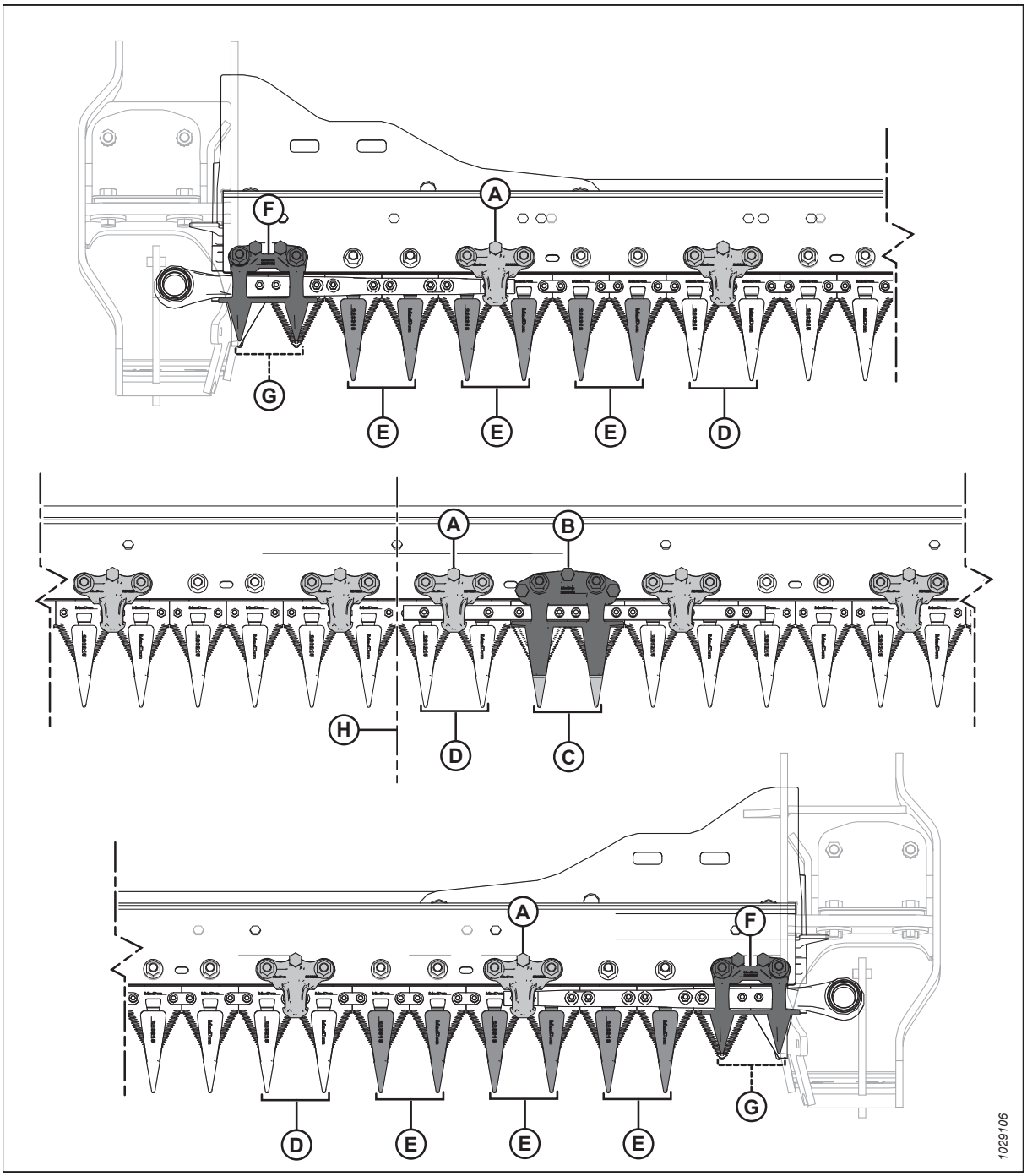


Figure 4.130: Pointed Guard and Hold-Down Locations

A - Pointed Hold-Down (MAC286329)[78]
B - Pointed Center Hold-Down (MAC286332)
C - Pointed Center Knife Guard (MAC286317)
D - Pointed Knife Guard (MAC286315)
E - Pointed End Knife Guard (without Wear Bar) (MAC286316)
F - Short Knife Hold-Down (MAC286331)
G - Short Knife Guard (without Wear Bar) (MAC286319)
H - Center of Header

78. There should always be a hold down on the guard to the right of the center guard, regardless of the pattern.

Pointed Knife Guard Configuration on Double-Knife Header – D241

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.

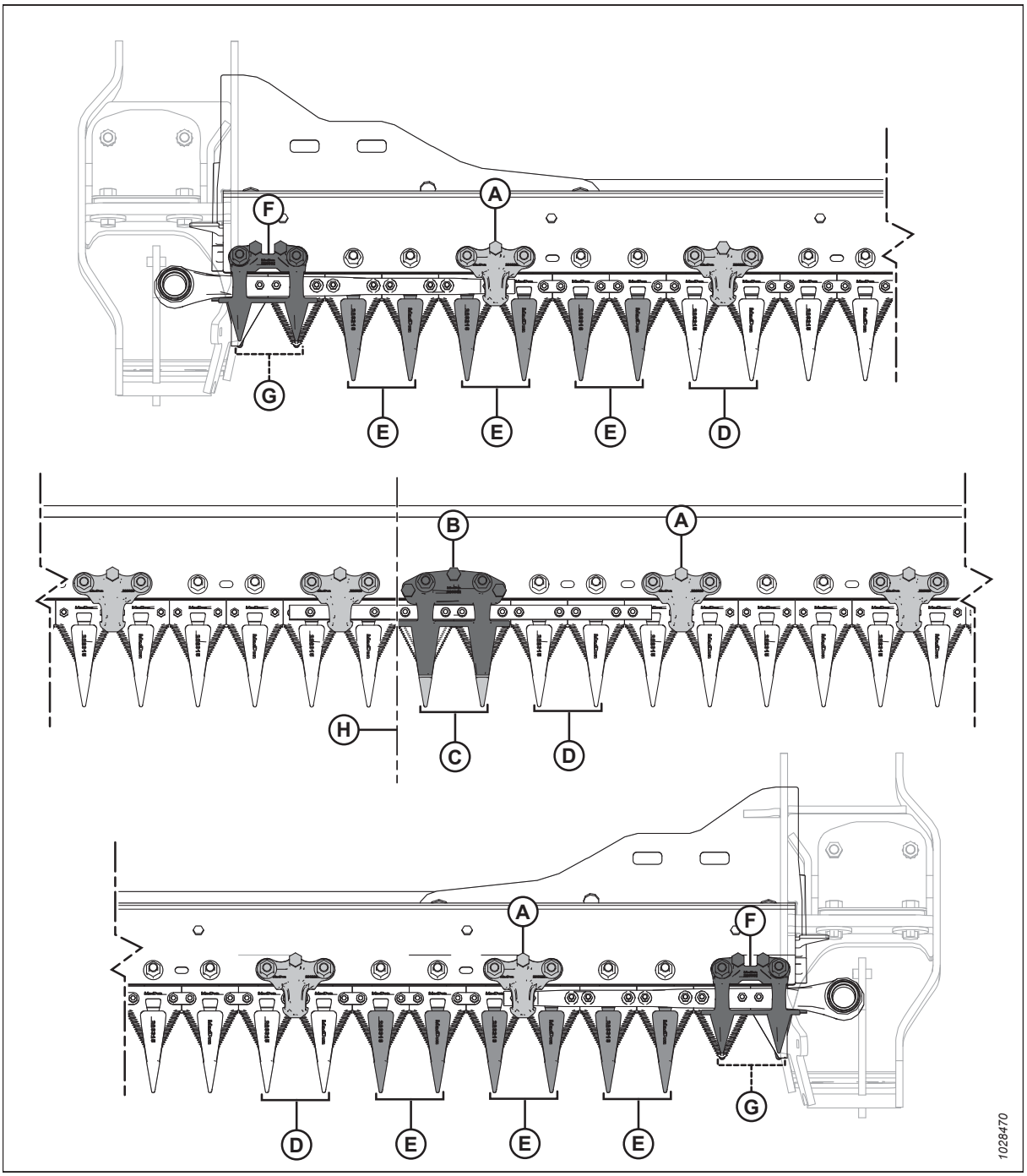


Figure 4.131: Pointed Knife Guard and Hold-Down Locations

A - Pointed Hold-Down (MAC286329)[79]
B - Pointed Center Hold-Down (MAC286332)
C - Pointed Center Knife Guard (MAC286317)
D - Pointed Knife Guard (MAC286315)
E - Pointed End Knife Guard (without Wear Bar) (MAC286316)
F - Short Knife Hold-Down (MAC286331)
G - Short Knife Guard (without Wear Bar) (MAC286319)
H - Center of Header

79. There should always be a hold down on the guard to the right of the center guard, regardless of the pattern.

Pointed Knife Guard Configuration on Double-Knife Header – D245

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.

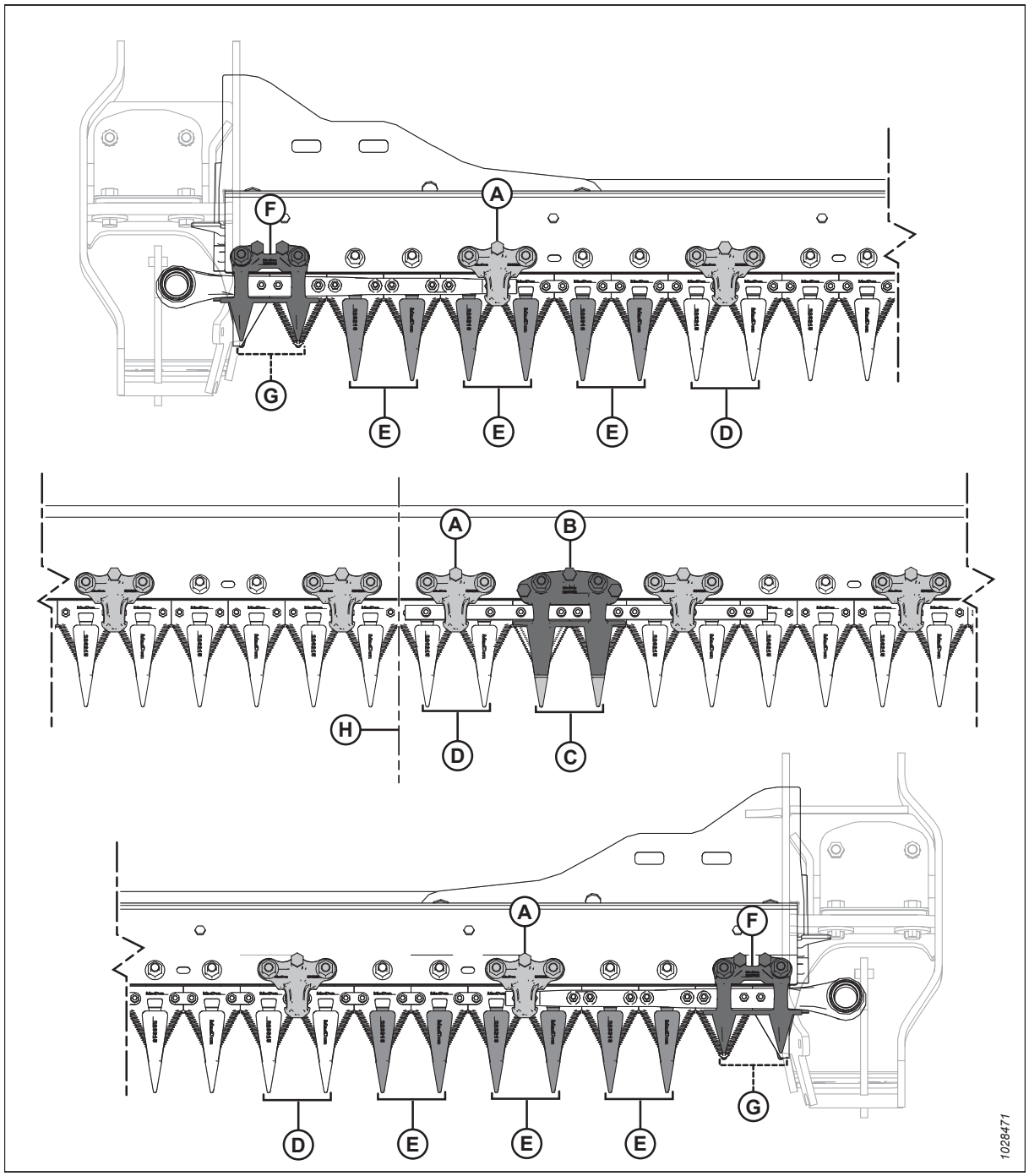


Figure 4.132: Pointed Guard and Hold-Down Locations

A - Pointed Hold-Down (MAC286329)[80]
B - Pointed Center Hold-Down (MAC286332)
C - Pointed Center Knife Guard (MAC286317)
D - Pointed Knife Guard (MAC286315)
E - Pointed End Knife Guard (without Wear Bar) (MAC286316)
F - Short Knife Hold-Down (MAC286331)
G - Short Knife Guard (without Wear Bar) (MAC286319)
H - Center of Header

80. There should always be a hold down on the guard to the right of the center guard, regardless of the pattern.

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 (MAC286705) available from your MacDon Dealer to correct the issue.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. To adjust the guard tips upwards, position the tool as shown and pull up.

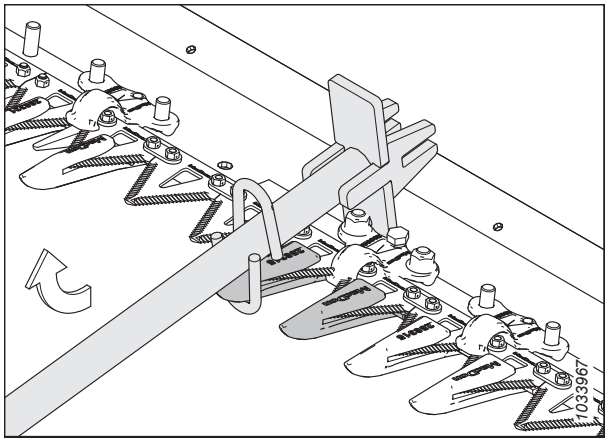


Figure 4.133: Upward Adjustment – Pointed Guard

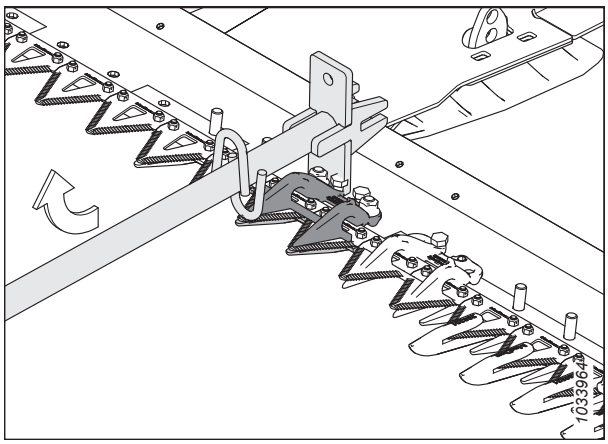


Figure 4.134: Upward Adjustment – Short Knife Guard

5. To adjust the guard tips downwards, position the tool as shown and push down.

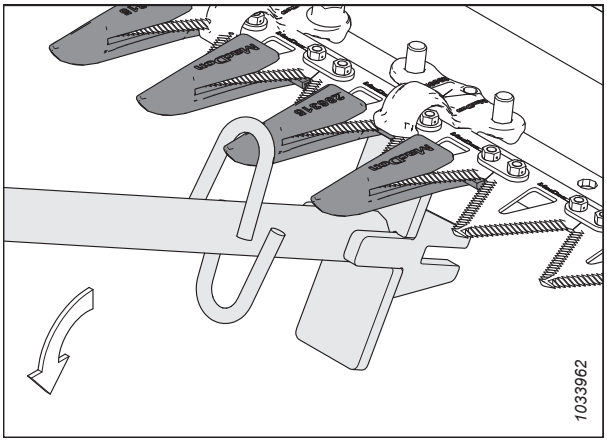


Figure 4.135: Downward Adjustment – Pointed Guard

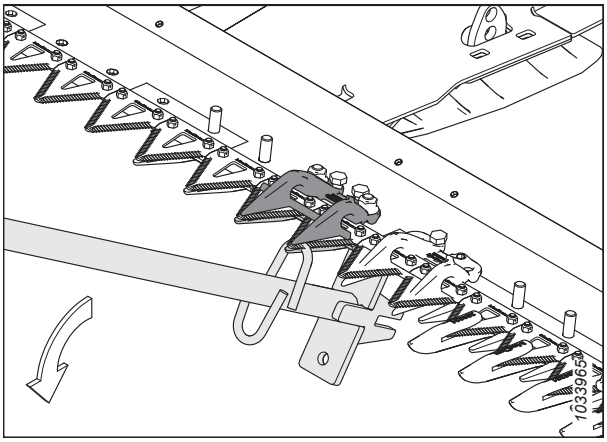


Figure 4.136: Downward Adjustment – Short Knife Guard

6. To adjust the guard bar, position the tool as shown, then push down or pull up on the tool accordingly.

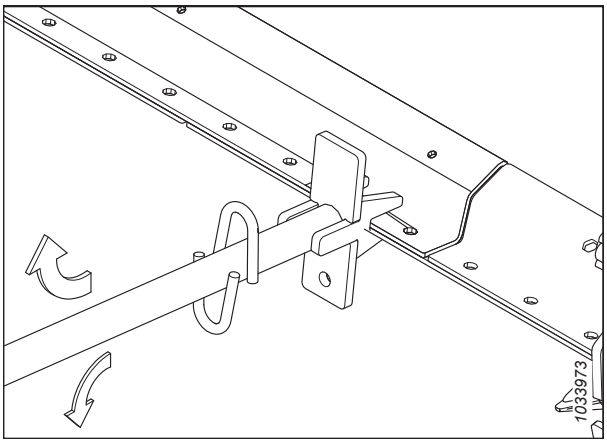


Figure 4.137: Guard Bar Adjustment – No Guards

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 of the machine, always stop the engine and remove the key from the ignition 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

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 312*.

NOTE:

A Four-Point Guard kit can be used to replace knife guards. They are ideal for use in rocky conditions, or for harvesting shatter-prone crops such as lentils. Refer to the header parts catalog for more information.

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 that the proper replacement guards are installed at these locations.

IMPORTANT:

Double-knife headers: A pointed center knife guard is 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 323*.

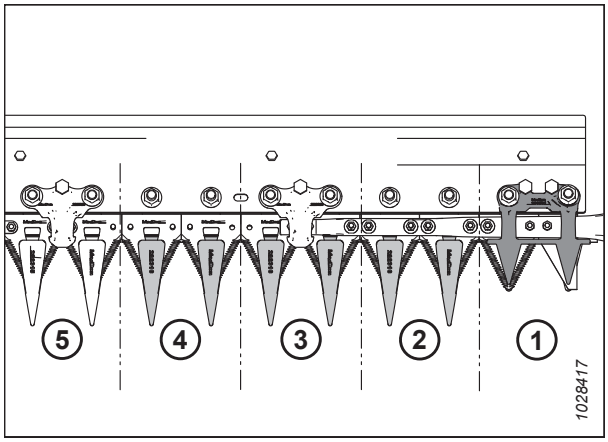


Figure 4.138: Drive Side Pointed Knife Guards

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 37*.
4. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
5. Rotate the flywheel attached to the knife drive box to manually stroke the knife until the knife sections are spaced midway between the guards.
6. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

7. Remove two nuts and bolts (B) securing pointed knife guard (A) and hold-down (C) (if applicable) to the cutterbar.
8. Remove pointed knife guard (A), hold-down (C), and the plastic wearplate. Discard the pointed knife guard.

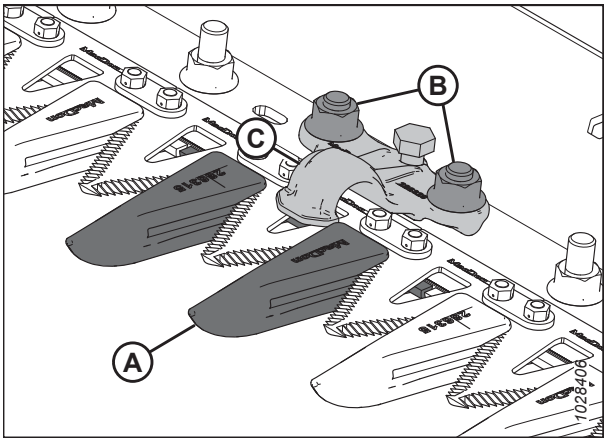


Figure 4.139: Pointed Knife Guards

9. Position plastic wearplate (A) and replacement pointed knife guard (B) under the cutterbar.

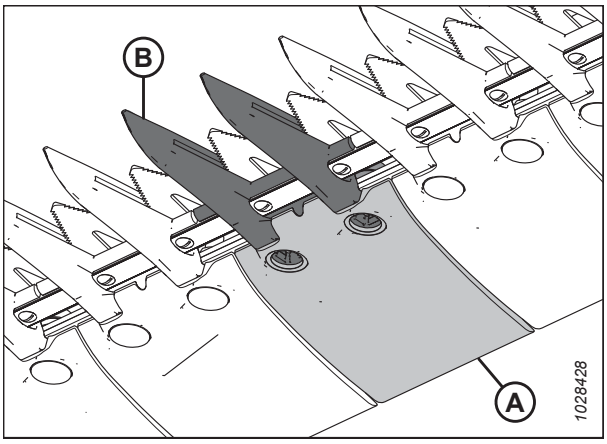


Figure 4.140: Pointed Knife Guard and Wearplate

10. Position hold-down (A) (if applicable), and loosen adjustment bolt (C) so that it is not protruding from the bottom of the hold-down.
11. Secure the pointed knife guard, wearplate, and hold-down (if applicable) with two bolts and nuts (B). Tighten the nuts to 85 Nm (63 lbf·ft).
12. If there is a hold-down at this location, proceed with adjustment. For instructions, refer to *Adjusting Hold-Down – Pointed Knife Guards, page 322*.

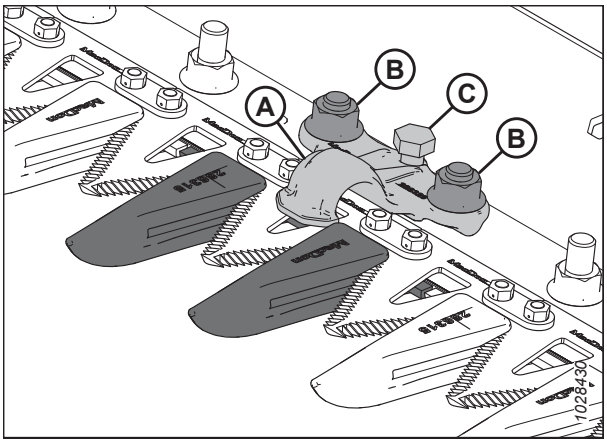


Figure 4.141: Pointed Knife Guards

Checking Hold-Down – Pointed Knife Guards

The pointed knife guard hold-downs prevent the knife sections on the cutterbar from lifting off of the guards, while still allowing the knife to slide. The hold-downs will need to be inspected to ensure that there is adequate clearance between the hold-downs and knife sections.

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 326*.

NOTE:

Align the guards prior to adjusting the hold-down. For instructions, refer to *Adjusting Knife Guards and Guard Bar, page 318*.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

Wear heavy gloves when working around or handling knives.

1. Start the engine.
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 37*.
5. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
6. Rotate the flywheel attached to the knife drive box to manually stroke the knife to position knife section (A) under hold-down (B).
7. 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.).
8. If adjustment is required, refer to *Adjusting Hold-Down – Pointed Knife Guards, page 322*.
9. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

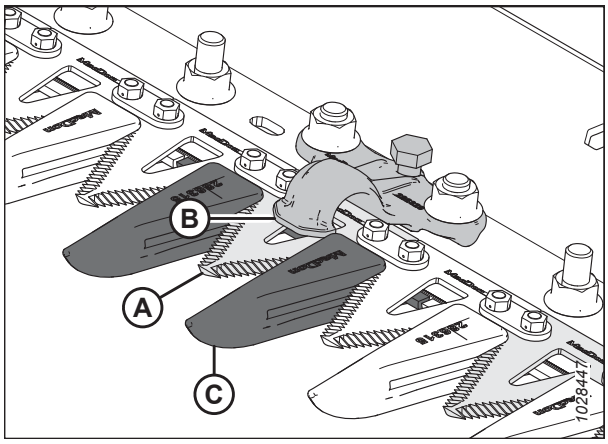


Figure 4.142: Pointed Hold-Down

Adjusting Hold-Down – Pointed Knife Guards

If a pointed or four point knife guard hold-down is binding its knife, the hold-down will need to be adjusted.

This procedure applies to standard hold-downs. To adjust the center hold-down on double-knife headers, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 327*.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

Wear heavy gloves when working around or handling knives.

1. Align the guards. For instructions, refer to *Adjusting Knife Guards and Guard Bar, page 318*.
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 37*.
5. 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).
6. Recheck the hold down clearance. Refer to *Checking Hold-Down – Pointed Knife Guards, page 321*. Repeat this procedure as needed.

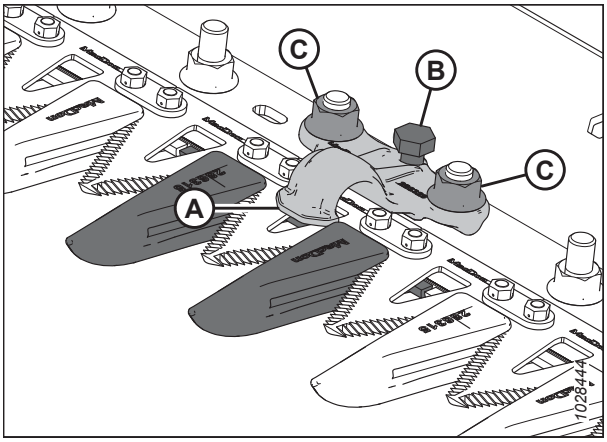


Figure 4.143: Pointed Hold-Down

7. 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.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Remove two nuts and bolts (C) securing guard (A) and hold-down (B) to the cutterbar.
5. Remove guard (A), plastic wearplate, and hold-down (B).

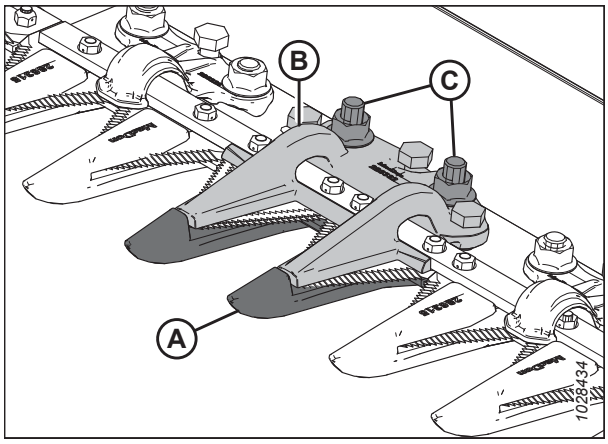


Figure 4.144: Pointed Center Knife Guard

IMPORTANT:

Ensure the replacement guard is the correct guard with offset cutting surfaces (A).

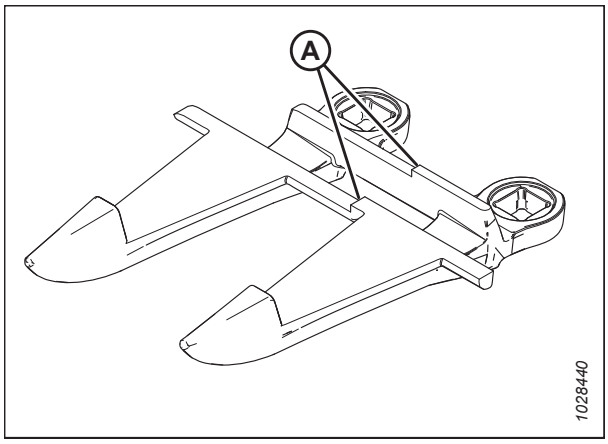


Figure 4.145: Pointed Center Knife Guard

6. 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.

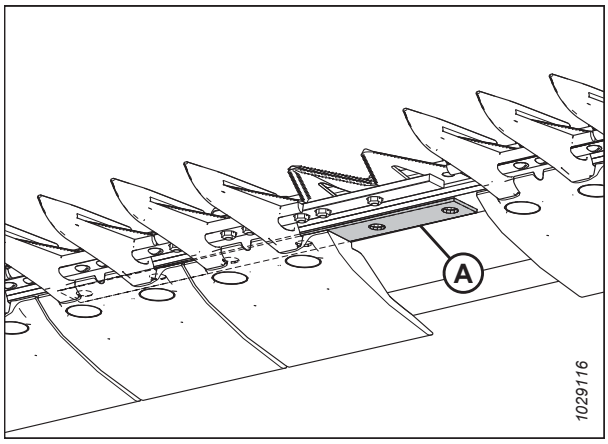


Figure 4.146: Cutterbar

7. Position plastic wearplate (A) and new guard (B) under the cutterbar.

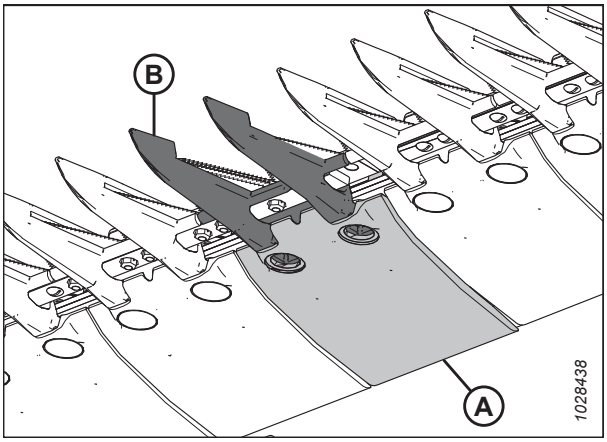


Figure 4.147: Pointed Center Knife Guard and Wearplate

8. Thread three adjustment bolts (A) so they are protruding 4 mm (5/32 in.) from the bottom of pointed center hold-down (B).

9. Position center hold-down (B) onto the cutterbar.

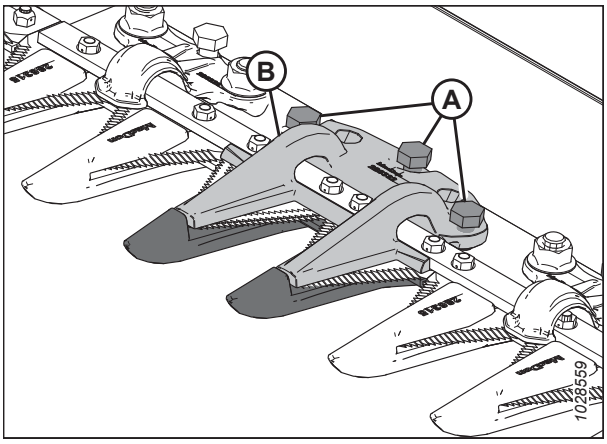


Figure 4.148: Pointed Center Knife Guard

10. 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.

11. Adjust the hold-down until the clearance is acceptable.

    - For adjustment instructions, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 327*.
    - For clearance specifications, refer to *Checking Center Hold-Down – Pointed Knife Guards, page 326*.

12. Tighten nuts (B) to 85 Nm (63 lbf·ft).

13. Recheck the clearance.

    - If the clearance is acceptable, the installation of the hold-down is complete.
    - If the clearance is unacceptable, repeat Step *11, page 325* to Step *13, page 325* until the clearance is satisfactory.

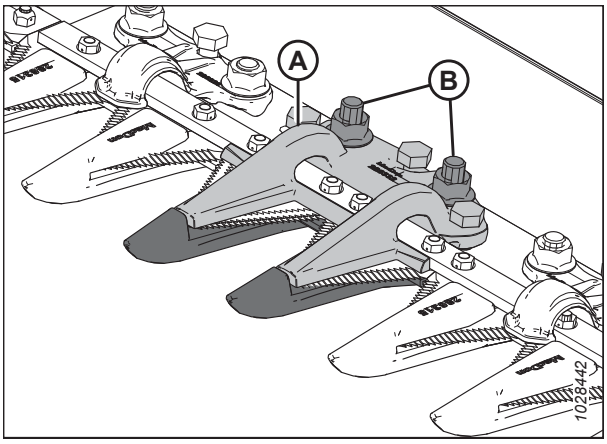


Figure 4.149: Pointed Center Knife Guard

Checking Center Hold-Down – Pointed Knife Guards

The pointed center knife guard hold-down prevent the center knife section on the cutterbar from lifting off of the guard, while still allowing the knife to slide. The center hold-down will need to be inspected to ensure that there is adequate clearance between the hold-down and the center knife section.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
5. Rotate the flywheel attached to the knife drive box to manually stroke the knife fully inboard until the knife sections are under hold-down (A). Repeat this step to move the other knife.
6. 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.)
7. If adjustment is required, refer to *Adjusting Center Hold-Down – Pointed Knife Guards, page 327*.
8. If no adjustment is required, tighten nuts (D) to 85 Nm (63 lbf·ft).
9. Recheck clearance after tightening nuts, and adjust if necessary.
10. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

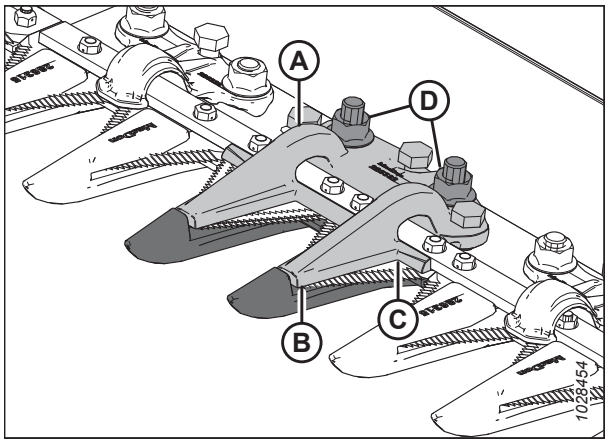


Figure 4.150: Pointed Center Hold-Down

Adjusting Center Hold-Down – Pointed Knife Guards

If the pointed center knife guard hold-down is binding its knife, the center hold-down will need to be adjusted.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Loosen mounting hardware (B).
5. Turn adjuster bolts (A) as follows:
   - To increase the clearance, turn adjuster bolts (A) clockwise (tighten).
   - To decrease the clearance, turn adjuster bolts (A) counterclockwise (loosen).
6. To adjust clearance at tip only, adjust using only center (rear) adjustment bolt (C).
   - To increase the clearance, turn adjuster bolt (C) counterclockwise (loosen).
   - To decrease the clearance, turn adjuster bolt (C) clockwise (tighten).
7. Tighten nuts (B) to 85 Nm (63 lbf·ft).
8. Recheck the center guard clearance. Refer to *Checking Center Hold-Down – Pointed Knife Guards, page 326*. Repeat this procedure as needed.
9. Run the header at low engine speed, and listen for noise caused by insufficient clearance.

   IMPORTANT:

   Insufficient hold-down clearance will result in the knife and the guards overheating.

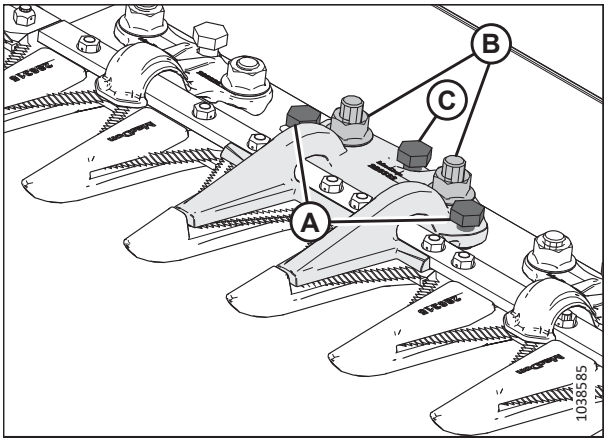


Figure 4.151: Pointed Center Hold-Down

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:

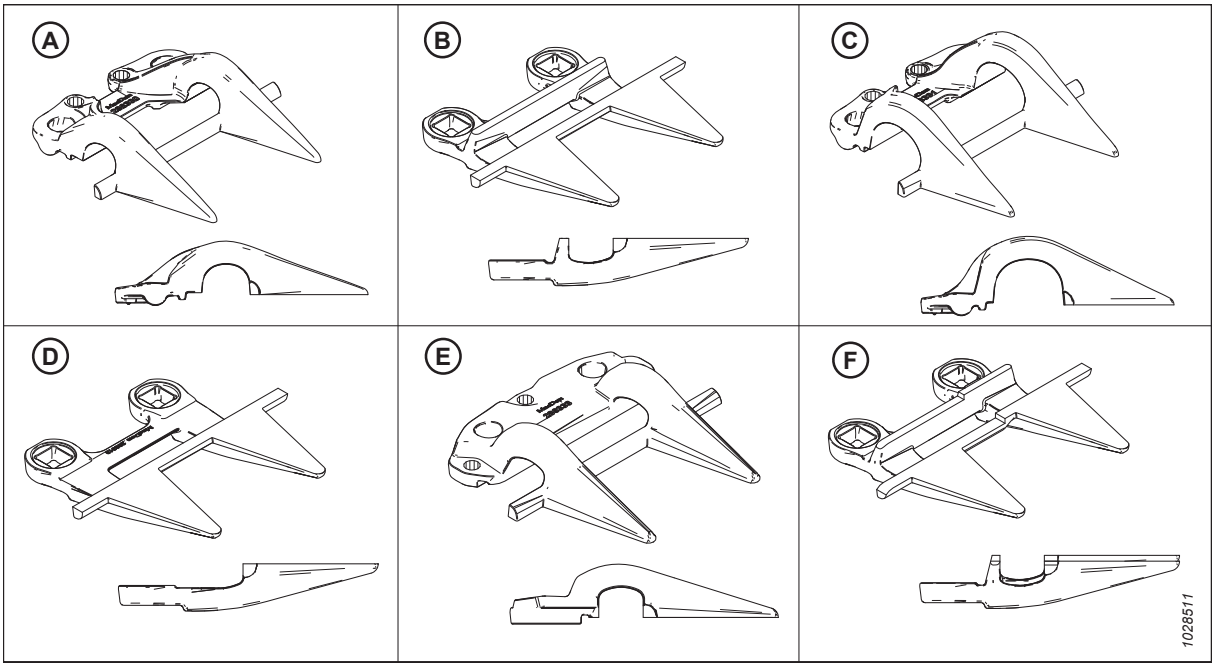


Figure 4.152: Guard and Hold-Down Types used in Short Knife Guard Configurations

A - PlugFree™ Hold-Down (MAC286330)
B - PlugFree™ Knife Guard (MAC286318)
C - PlugFree™ End Hold-Down (MAC286331)[81]
D - PlugFree™ End Knife Guard (without Wear Bar) (MAC286319)[82]
E - PlugFree™ Center Hold-Down (MAC286333)[83]
F - PlugFree™ Center Knife Guard (MAC286320)[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 Guard Configuration on Single-Knife Headers, page 329*
- *Short Knife Guard Configuration on Double-Knife Headers – All Sizes Except D241), page 330*
- *Short Knife Guard configuration on Double-Knife Header – D241, page 331*

81. Installed in positions 1–3 on drive side(s); installed in position 1 at right end of single-knife headers.
82. Installed in positions 1–4 on drive side(s). Single-knife headers use standard guard (MAC286318) on the right end.
83. Double-knife headers only.

Short Knife Guard Configuration on Single-Knife Headers

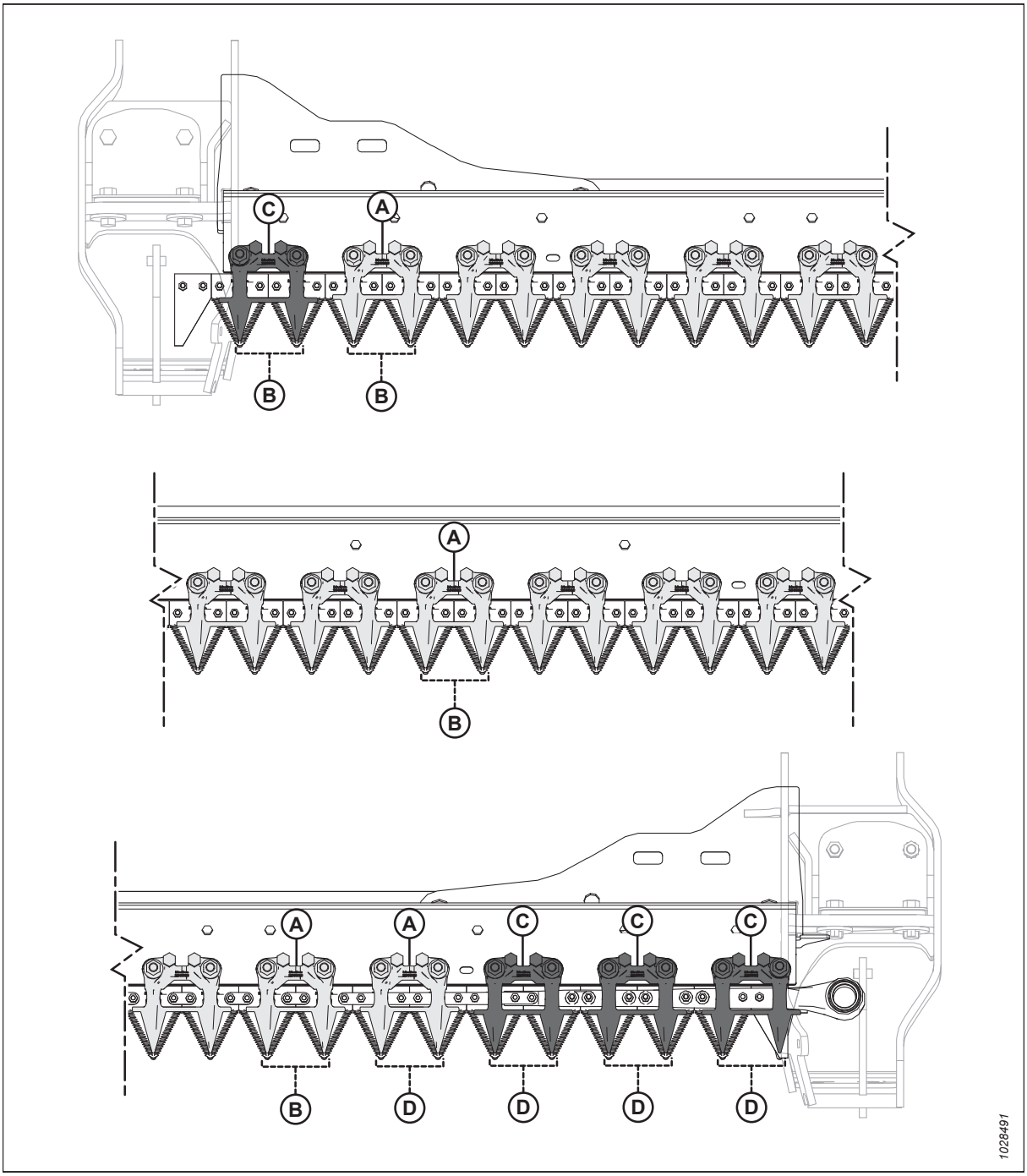


Figure 4.153: Short Knife Guard and Hold-Down Locations – Single-Knife Headers

A - Short Knife Hold-Down (MAC286330)
B - Short Knife Guard (MAC286318)
C - Short Knife End Hold-Down (x4) (MAC286331)
D - Short Knife End Knife Guard (without Wear Bar) (x5) (MAC286319)

Short Knife Guard Configuration on Double-Knife Headers – All Sizes Except D241)

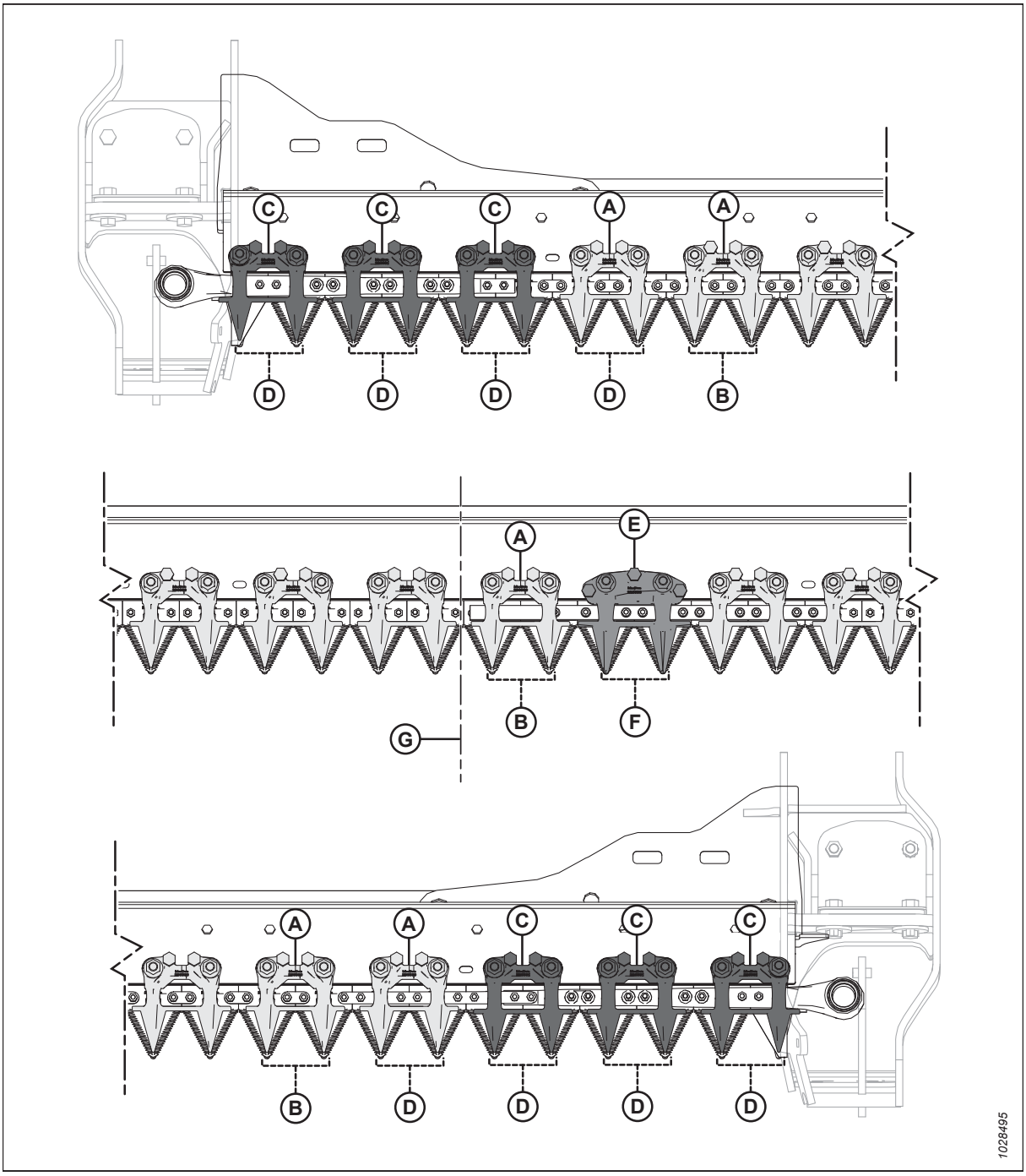


Figure 4.154: Short Knife Guard and Hold-Down Locations – Double-Knife Headers

A - Short Knife Hold-Down (MAC286330)
B - Short Knife Guard (MAC286318)
C - Short Knife End Hold-Down (x6) (MAC286331)
D -Short Knife End Knife Guard (without Wear Bar) (x8) (MAC286319)
E - Short Knife Center Hold-Down (MAC286333)
F - Short Knife Center Knife Guard (MAC286320)
G - Center of Header

Short Knife Guard configuration on Double-Knife Header – D241

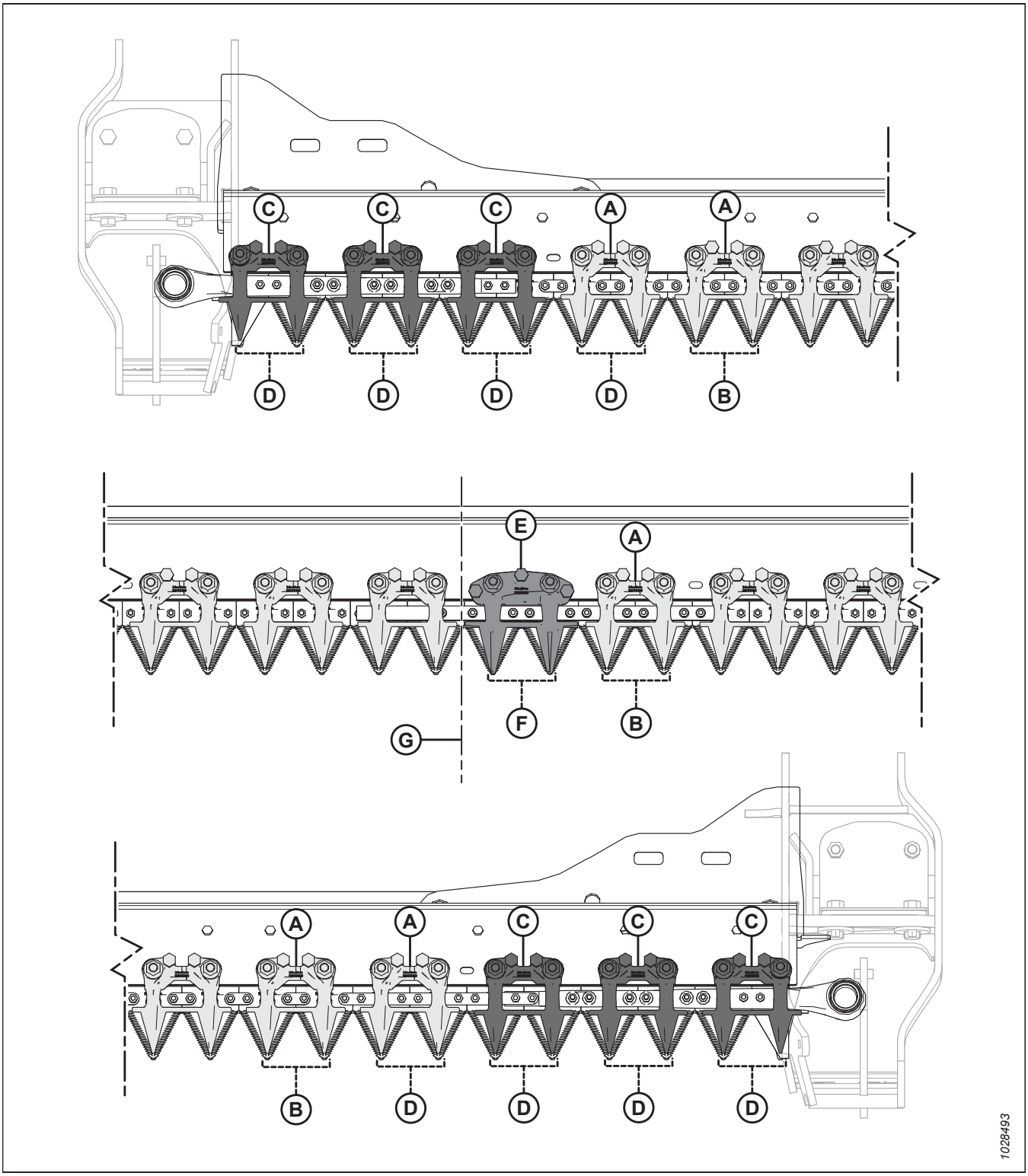


Figure 4.155: Short Knife Guard and Hold-Down Locations – D241 Double-Knife Header

A - Short Knife Hold-Down (MAC286330)
B - Short Knife Guard (MAC286318)
C - Short Knife End Hold-Down (x6) (MAC286331)
D - Short Knife End Knife Guard (without Wear Bar) (x8) (MAC286319)
E - Short Knife Center Hold-Down (MAC286333)
F - Short Knife Center Knife Guard (MAC286320)
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.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 335*.

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 37*.
4. Remove two nuts and bolts (A) securing short knife guard (B) and hold-down (C) to the cutterbar.
5. Remove short knife guard (B), hold-down (C), and the plastic wearplate.

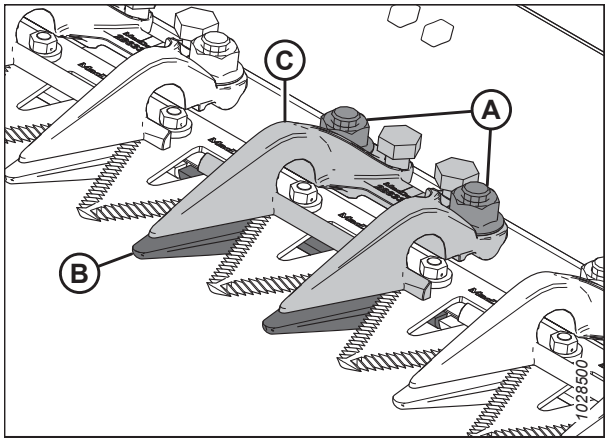


Figure 4.156: Short Knife Guards

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.

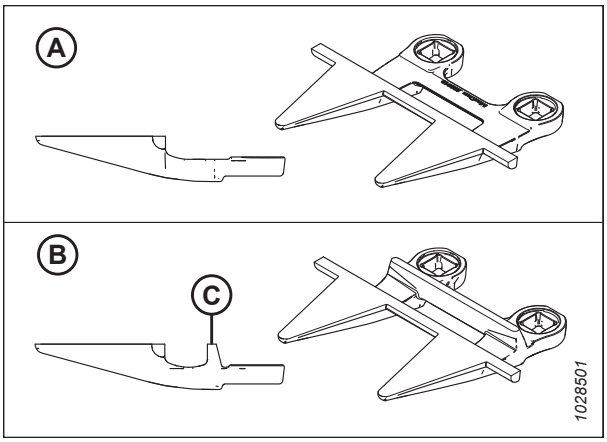


Figure 4.157: End Knife Guard and Short Knife Guards

A - End Knife Guard (MAC286319)
B - Short Knife Guard (with wear bar [C]) (MAC286318)

6. Position plastic wearplate (A) and replacement short knife guard (B) under the cutterbar.

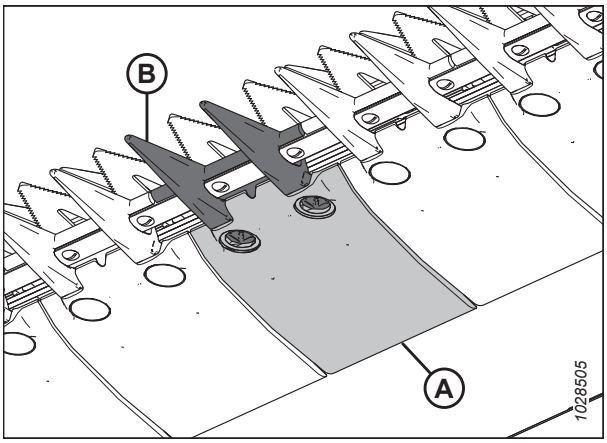


Figure 4.158: Short Knife Guard and Wearplate

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. Secure 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 334*.
   - For clearance specifications, refer to *Checking Hold-Down – Short Knife Guards, page 334*.
10. Tighten nuts (C) to 85 Nm (63 lbf·ft).

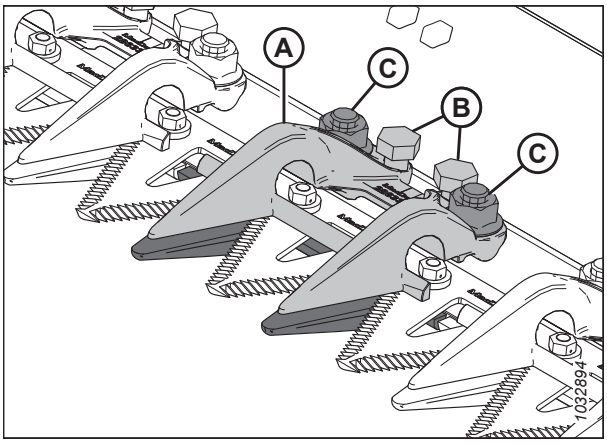


Figure 4.159: Short Knife Guard

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 333* to Step *11, page 333* until the clearance is satisfactory.

Checking Hold-Down – Short Knife Guards

The short knife guard hold-downs prevent the knife sections on the cutterbar from lifting off of the guards, while still allowing the knife to slide. The hold-downs will need to be inspected to ensure that there is adequate clearance between the hold-downs and knife sections.

To check the center hold-down on double-knife headers, refer to *Checking Center Hold-Down – Short Knife Guards, page 338*.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
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 334*.

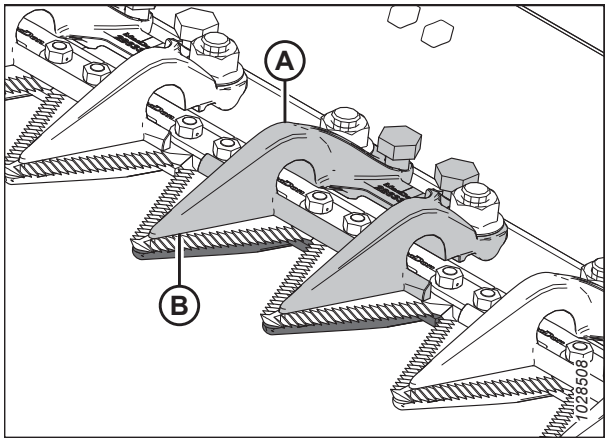


Figure 4.160: Short Knife Guards

Adjusting Hold-Down – Short Knife Guards

If a short knife guard hold-down is binding its knife, the hold-down will need to be adjusted.

To adjust the center hold-down on double-knife headers, refer to *Adjusting Center Hold-Down – Short Knife Guards, page 338*.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Adjust the hold-down clearance as follows:
   a. To decrease the clearance, turn adjuster bolts (A) clockwise.
   b. To increase the 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.

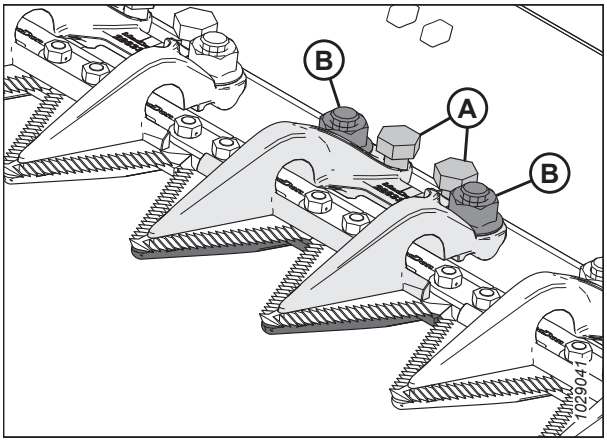


Figure 4.161: Short Knife Guard Hold-Down

5. Recheck clearances, and make further adjustments if necessary.
6. 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 of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Remove two nuts and bolts (C) securing center knife guard (A) and hold-down (B) to the cutterbar.
5. Remove center knife guard (A), plastic wearplate, and hold-down (B).

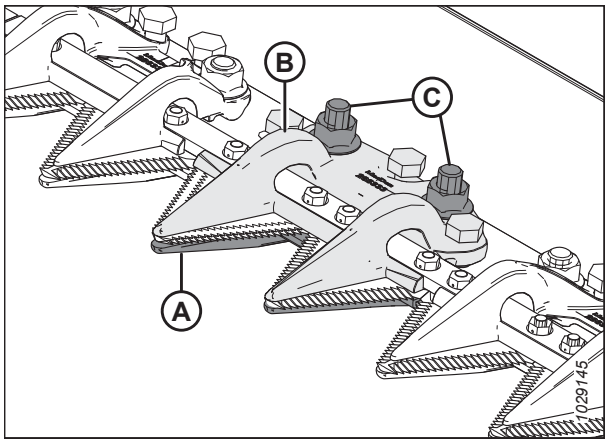


Figure 4.162: Center Knife Guard

IMPORTANT:

Ensure the replacement center knife guard is the correct guard with offset cutting surfaces (A).

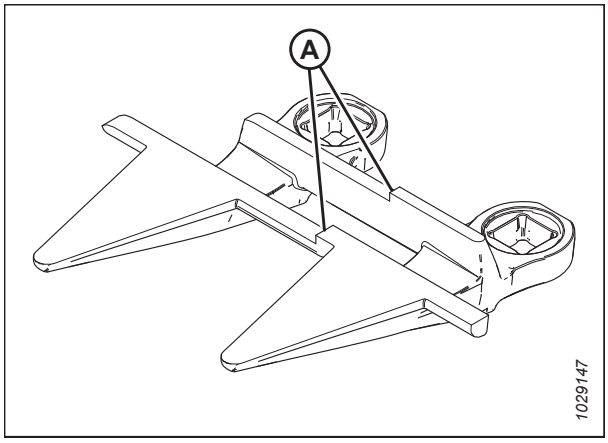


Figure 4.163: Center Knife Guard

6. 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.

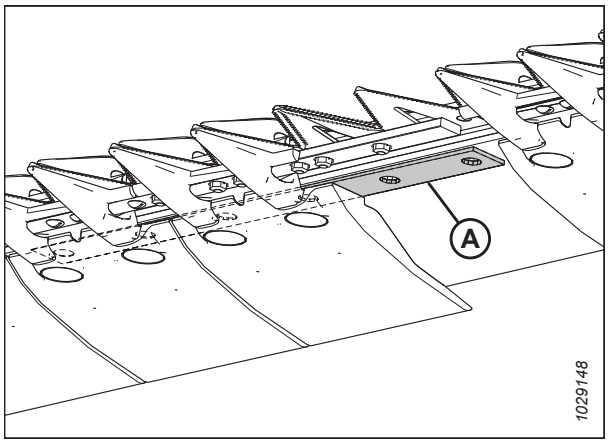


Figure 4.164: Cutterbar

7. Position plastic wearplate (A) and new center knife guard (B) under the cutterbar.

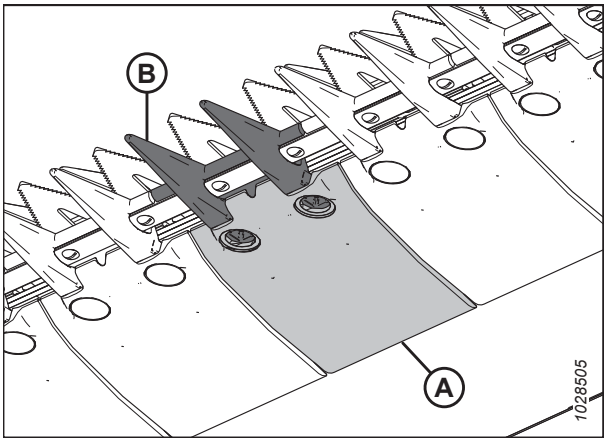


Figure 4.165: Center Knife Guard and Wearplate

8. Thread three adjustment bolts (A) so they are protruding 4 mm (5/32 in.) from the bottom of center hold-down (B).
9. Position center hold-down (B) onto the cutterbar.

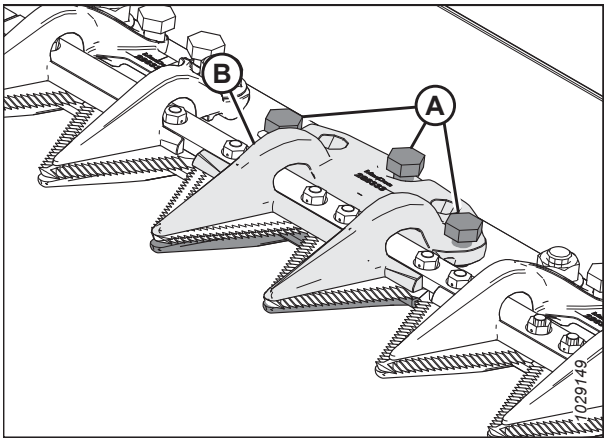


Figure 4.166: Center Knife Guard

10. 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.

11. Adjust the hold-down until the clearance is acceptable.
    - For adjustment instructions, refer to *Adjusting Center Hold-Down – Short Knife Guards, page 338*.
    - For clearance specifications, refer to *Checking Center Hold-Down – Short Knife Guards, page 338*.
12. Tighten nuts (B) to 85 Nm (63 lbf·ft).
13. Recheck the clearance.
    - If the clearance is acceptable, the installation of the hold-down is complete.
    - If the clearance is unacceptable, repeat Step *11, page 337* to Step *13, page 337* until the clearance is satisfactory.

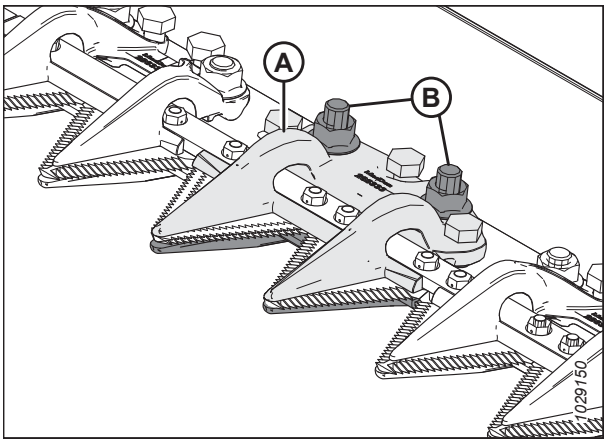


Figure 4.167: Center Knife Guard

Checking Center Hold-Down – Short Knife Guards

The short center knife guard hold-down prevent the center knife section on the cutterbar from lifting off of the guard, while still allowing the knife to slide. The center hold-down will need to be inspected to ensure that there is adequate clearance between the hold-down and the center knife section.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
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. Use a feeler gauge to measure the clearance between hold-down (A) and the knife section. Ensure that 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 338*.
7. If no adjustment is required, tighten nuts (D) to 85 Nm (63 lbf·ft).
8. Recheck the clearances. Repeat this procedure as needed.

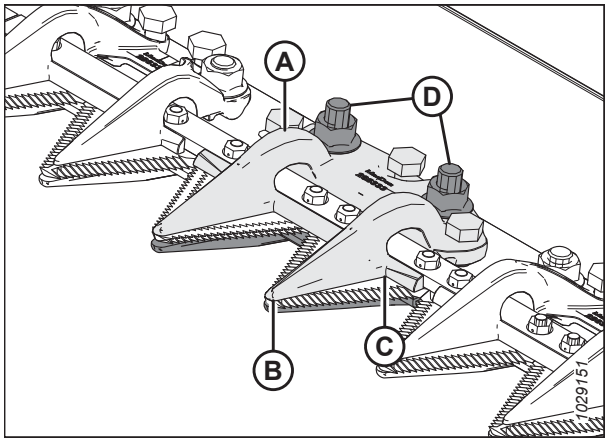


Figure 4.168: Center Knife Guard Hold-Down

Adjusting Center Hold-Down – Short Knife Guards

If a short knife guard hold-down is binding its knife, the hold-down will need to be adjusted.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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

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 37*.
4. Loosen mounting hardware (B).
5. Turn adjuster bolts (A) as follows:
   - To increase the clearance, turn adjuster bolts (A) clockwise (tighten).
   - To decrease the clearance, turn adjuster bolts (A) counterclockwise (loosen).
6. To adjust the clearance at the tip of the knife, turn adjustment bolt (C) as follows:
   - To increase the clearance, turn adjuster bolt (C) counterclockwise (loosen).
   - To decrease the clearance, turn adjuster bolt (C) clockwise (tighten).
7. Tighten nuts (B) to 85 Nm (63 lbf·ft).
8. Run the header at low engine speed, listening for noise caused by insufficient clearance. Readjust the knives as necessary.

   IMPORTANT:

   Insufficient hold-down clearance will result in the knife and guards overheating.

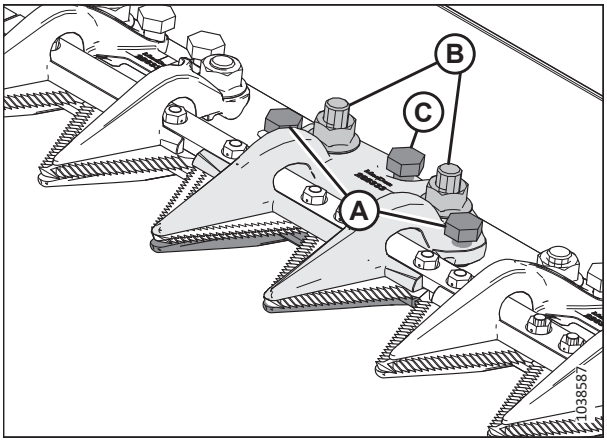


Figure 4.169: Center Hold-Down

4.9 Knife Drive System

The knife drive system transforms pumped hydraulic pressure into a mechanical motion that strokes 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

The knife drive box is driven by a hydraulic motor and converts rotational motion into the reciprocating motion of the knife.

Single-knife headers have a knife drive box (A) and motor (B) on the left side of the header; double-knife headers have a knife drive box and motor at each end.

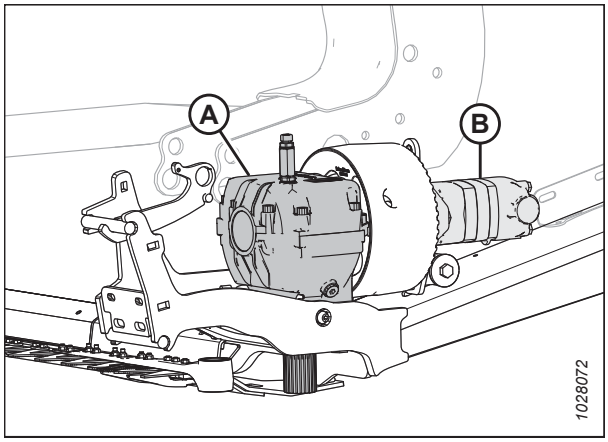


Figure 4.170: Left Knife Drive Box Shown – Right Similar

Checking Oil Level in Knife Drive Box

There must be a sufficient level of oil in each knife drive box for the knife drive to work correctly. The knife drive's oil level can be inspected using the dipstick installed in each knife drive.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition before making adjustments to the machine.

1. Lower the header fully.
2. Adjust the header angle so that the top of the knife drive box is level with the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
5. Ensure that the header is level.

6. Remove oil level dipstick (A). Check the oil level. The oil level must be within range (B), between the lines near the bottom of the dipstick.

7. Reinstall oil level dipstick (A). Tighten the dipstick to 23 Nm (204 lbf·in).

8. If the header has two knife drives, repeat this procedure to check the oil level on the other knife drive.

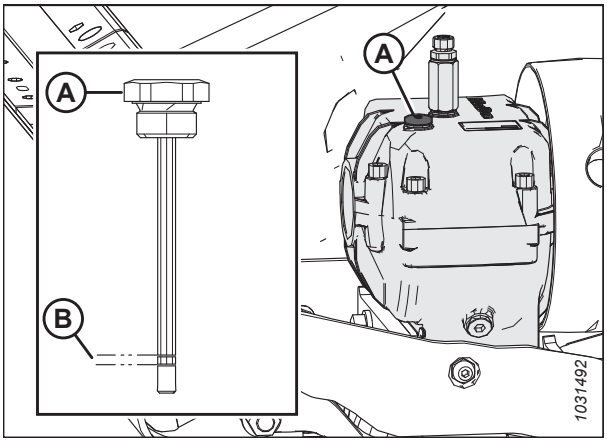


Figure 4.171: Knife Drive Box

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).

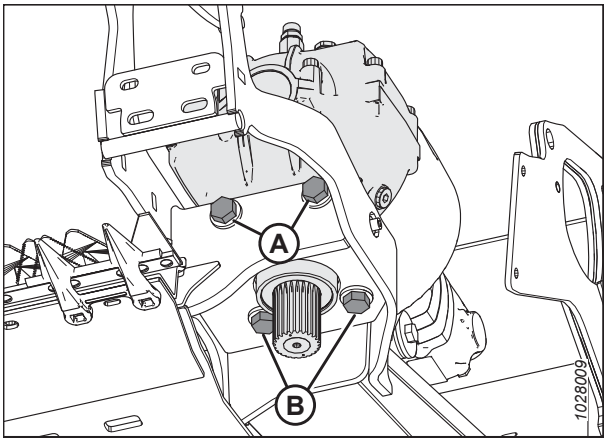


Figure 4.172: Knife Drive Box – View from Below

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 from the ignition before making adjustments to the machine.

1. Raise the header fully.

2. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.

3. Place a container large enough to hold approximately 1.5 L (0.4 US gal) under the knife drive box to collect the oil.
4. Remove dipstick (A) and drain plug (C).
5. Allow the oil to drain from the knife drive box and into the container placed below it.
6. Reinstall drain plug (C).
7. 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.
8. Check that the oil level is within range (B).
9. Close the endshield. For instructions, refer to *Closing Header Endshields, page 40*.

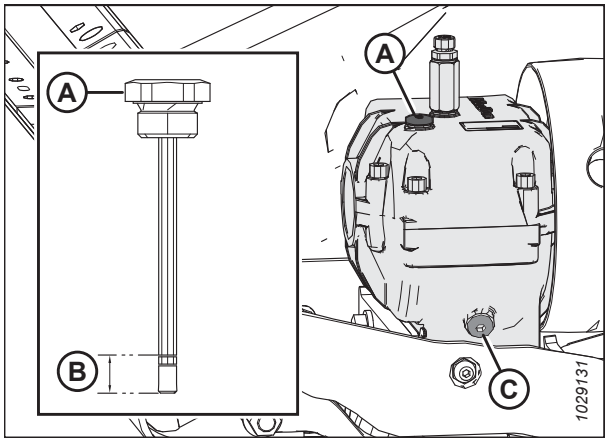


Figure 4.173: Knife Drive Box

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

The feed draper on the float module delivers harvested crop into the combine's feeder house. If the feed draper is torn, cracked, or missing slats, it will need to be replaced.

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. On the underside of the feed deck, rotate latch (A) to unlock handle (B).
2. Repeat the previous step on the other side of the feed deck.

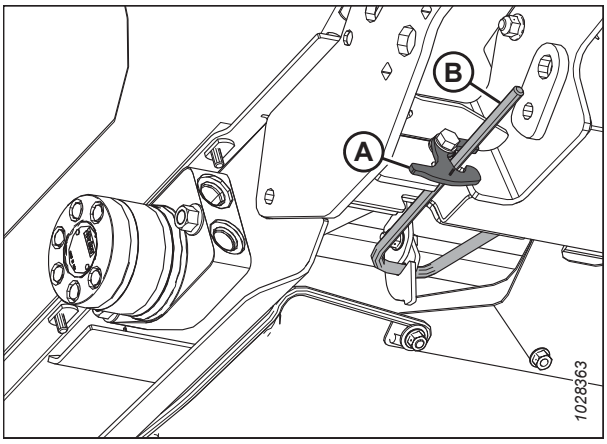


Figure 4.174: Underside of Feed Deck

3. Hold pan (A) and rotate handle (B) downward to release the pan.

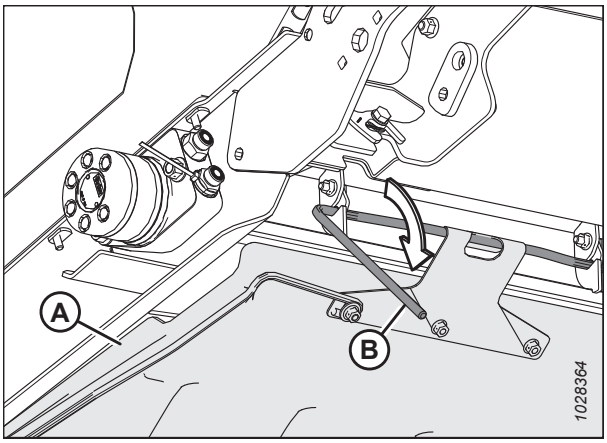


Figure 4.175: Underside of Feed Deck

4. Lower feed deck pan (A).

   NOTE:

   Lowering the feed deck pan improves access to the hardware securing the feed draper.

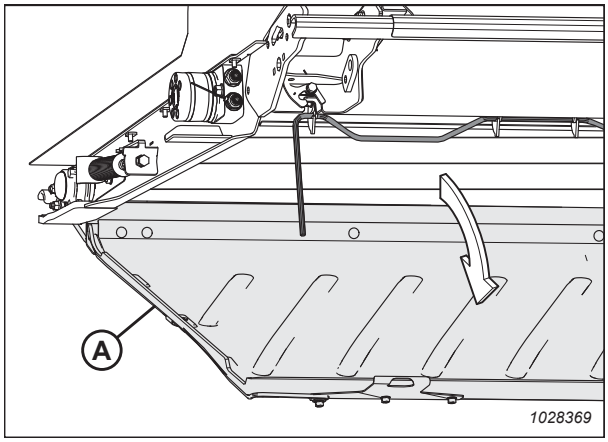


Figure 4.176: Feed Deck Pan

5. Raise the header fully.
6. Raise the reel fully.
7. Shut down the engine, and remove the key from the ignition.
8. Engage the header safety props. For instructions, refer to the combine operator's manual.
9. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.
10. Remove five countersunk screws (A) and retainer (B).
11. Remove one button head screw and washer (C).
12. Flip mid-filler (D) over.
13. Repeat Steps *10, page 344* to *12, page 344* on the other side of the feed deck.

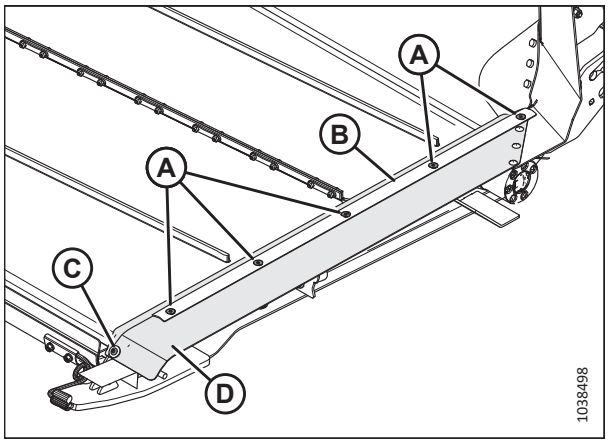


Figure 4.177: Draper Seal

14. Locate the feed draper tensioner. Loosen jam nut (A). Turn bolt (B) counterclockwise to relieve the tension on the draper.
15. Repeat the previous step on the right side of the deck.
16. Move the idler roller back inside the cutout in the frame.

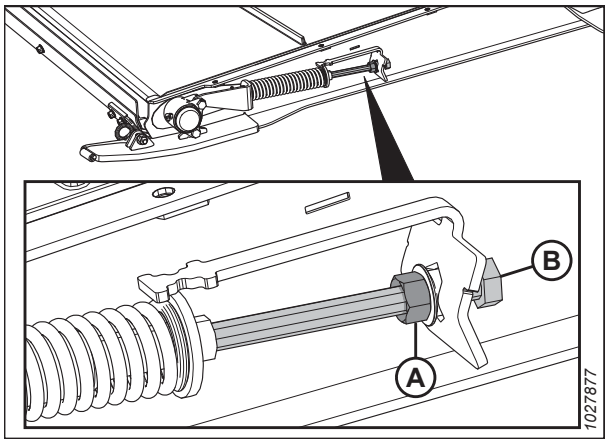


Figure 4.178: Feed Draper Tensioner

17. Remove nuts and screws (A). Remove draper connector straps (B).

18. Pull the draper from the deck.

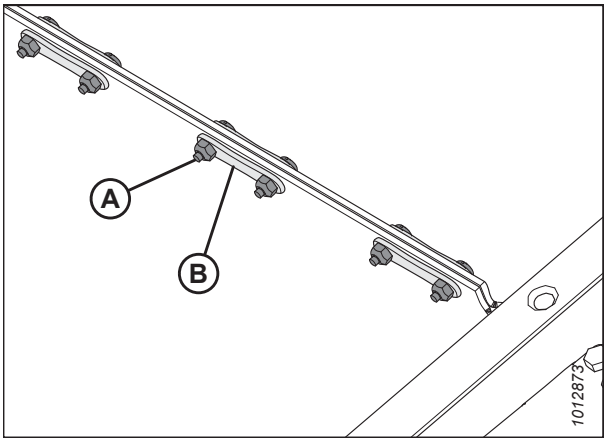


Figure 4.179: Draper Connector

19. Install the new draper over drive roller (A). Ensure that the draper guides fit into drive roller grooves (B).

20. Pull the draper along the bottom of the feed deck and over idler roller (C).

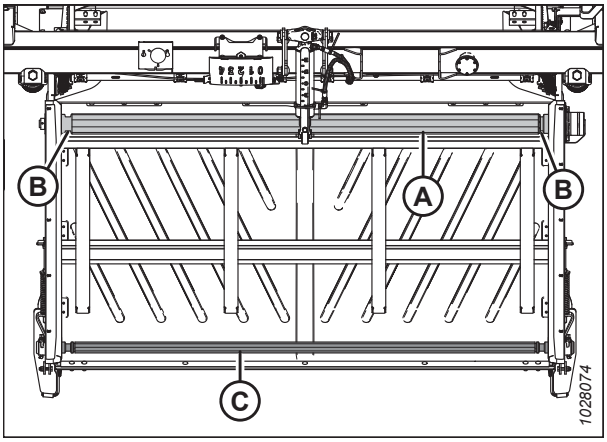


Figure 4.180: Float Module Feed Draper

21. Connect the draper joint with connector straps (B). Secure the straps with nuts and screws (A).

    IMPORTANT:

    Ensure that the screw heads face towards the rear of the deck. Tighten the screws **only** until the ends of the screws are flush with the nuts.

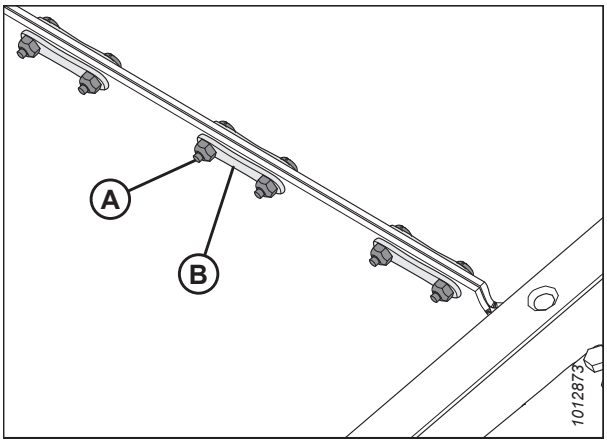


Figure 4.181: Draper Connector Straps

22. Move the idler roller back to the operating position.
23. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the threads of hardware (A).
24. On the side of the feed deck on which the casting dropped when the hardware was removed, reinstall hardware (A) to secure idler roller casting (B) to the frame.
25. Repeat the previous two steps on the opposite side of the feed deck.
26. Tighten bolt (A) to 12 Nm (106 lbf·in).

    IMPORTANT:

    Do **NOT** fully tighten bolt (A).
27. Adjust the draper tension. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 347*.
28. Position mid-filler (D) as shown. Reinstall retainer (B).
29. Secure the retainer and mid-filler with one button head screw and washer (C) and five countersunk screws (A).
30. Repeat the previous two steps on the opposite side of the feed deck.
31. Raise feed deck pan (A).

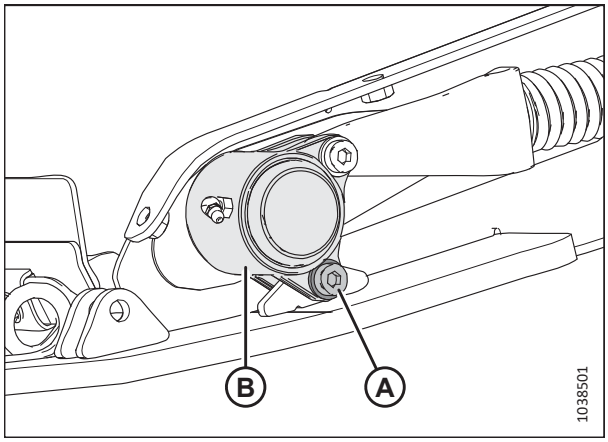


Figure 4.182: Idler Roller Bearing Casting

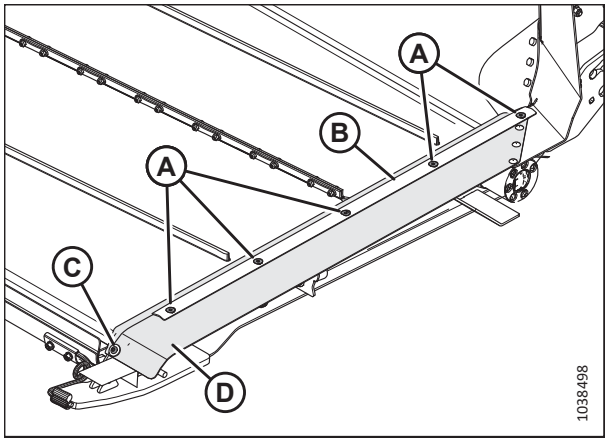


Figure 4.183: Draper Seal

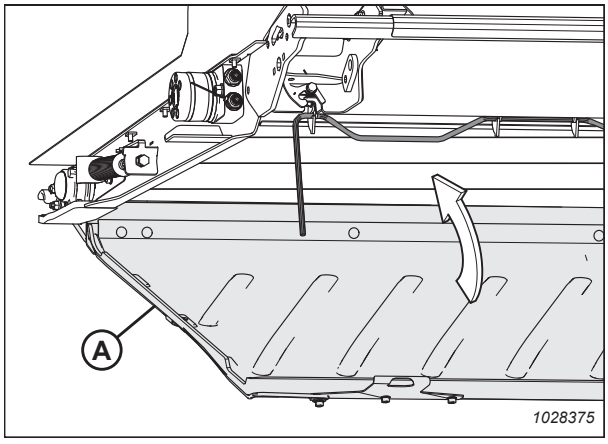


Figure 4.184: Feed Deck Pan

32. Engage lock handle (A) in three feed deck pan hooks (B).

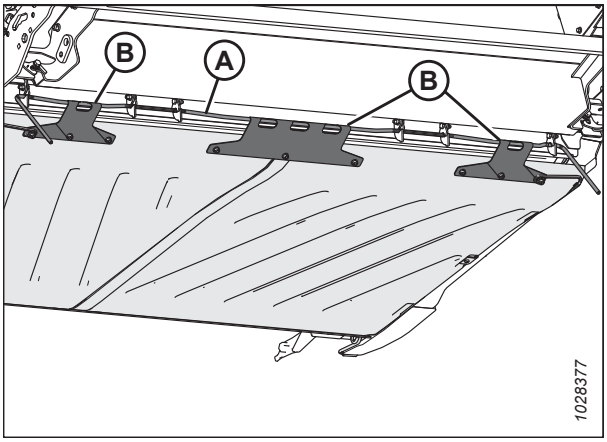


Figure 4.185: Underside of Feed Deck Pan

33. Rotate handles (A) upward to bring the feed deck pan into the locked position.

    NOTE:

    Ensure that all three deck pan hooks (B) are secured on the lock handle.

34. Hold the feed deck pan in place and rotate latch (C) to lock handle (A).

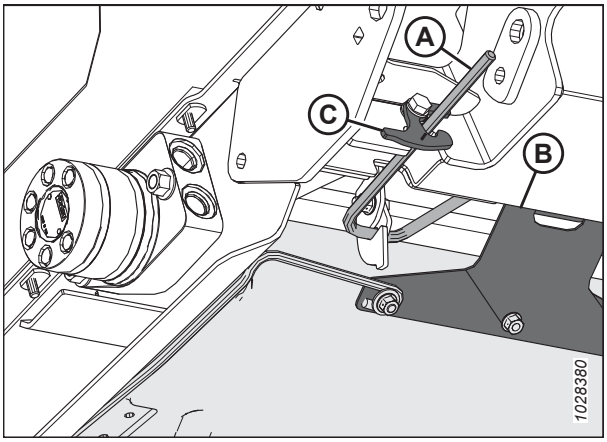


Figure 4.186: Underside of Feed Deck Pan

4.10.2 Checking and Adjusting Feed Draper Tension

In order for the draper to operate correctly, it must be tensioned properly. The tension on the draper will need to be inspected and, if necessary, adjusted.

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:

The illustrations in this procedure show the left side of the header; the right side is similar.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props.

Checking feed draper tension

4. Ensure that 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 disc (A) will vary after the draper tracking is adjusted.

6. If adjustment is necessary, proceed to Step *7, page 348*.

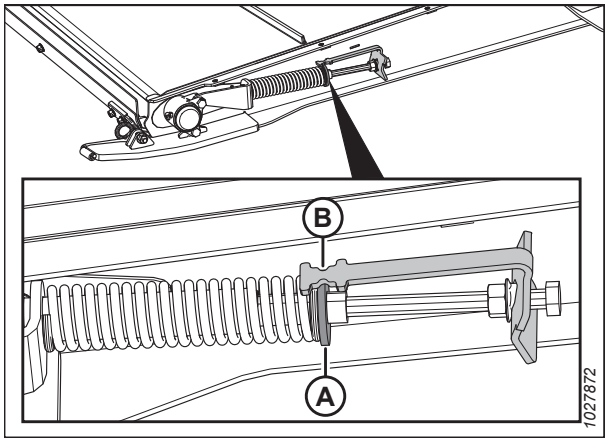


Figure 4.187: Feed Draper Tensioner

Adjusting feed draper tension

7. Adjust the draper tension by loosening jam nut (A) and turning bolt (B) clockwise to increase the tension on the draper or counterclockwise to decrease the tension on the draper. Retainer disc (C) should be in the middle of indicator (D).

   IMPORTANT:

   For small tension adjustments, only one side of the draper needs to be adjusted. For larger tension adjustments, and to prevent uneven draper tracking, both sides of the draper will need to be adjusted.

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 is 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 that flange nut (E) is tight against the indicator bracket.

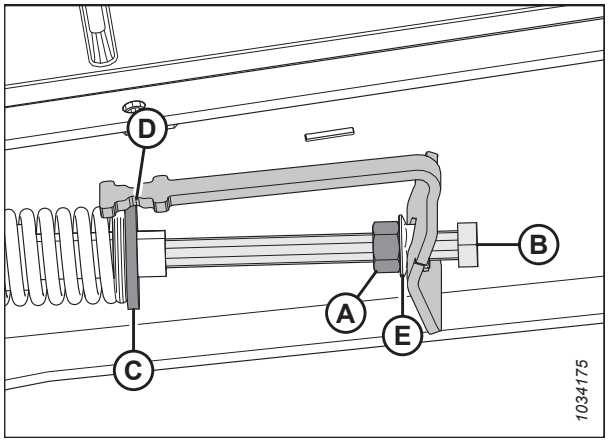


Figure 4.188: Feed Draper Tensioner – Left Side

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 37*.
6. Engage the header safety props. For instructions, refer to the combine operator's manual.
7. Locate the feed draper tensioner. Loosen jam nut (A). Turn bolt (B) counterclockwise to relieve the tension on the draper.

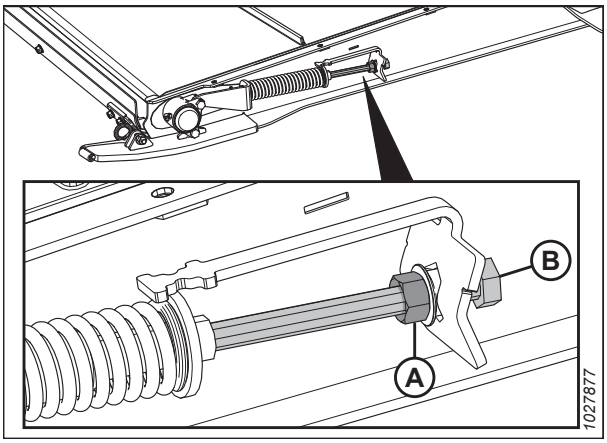


Figure 4.189: Feed Draper Tensioner

8. Remove nuts and screws (A). Remove draper connector straps (B).
9. Lift the sides of the draper to expose the rollers.

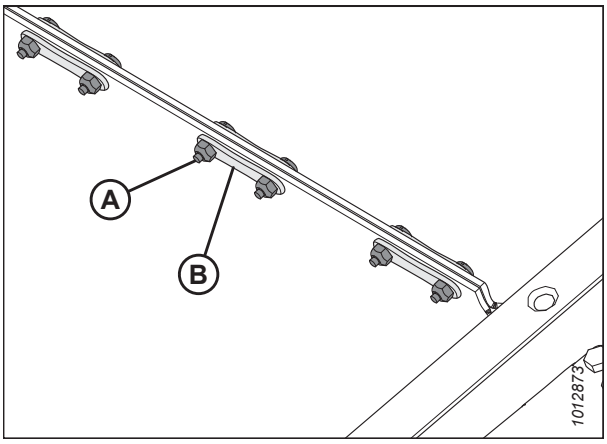


Figure 4.190: Draper Connector

10. On the right side of the deck, remove two nuts (A) and bolts from drive roller bearing housing (B).

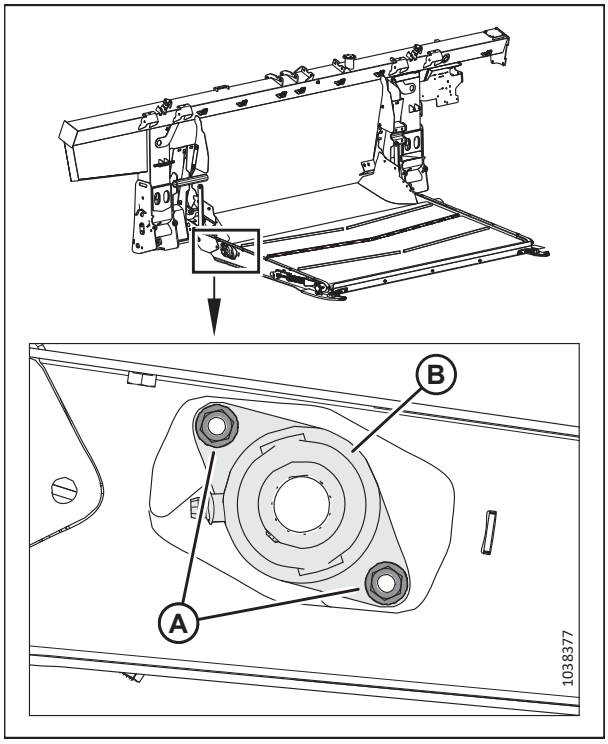


Figure 4.191: Drive Roller Bearing

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).

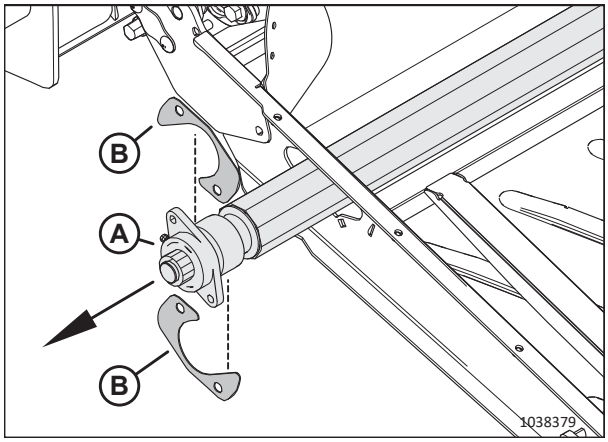


Figure 4.192: Drive Roller

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).

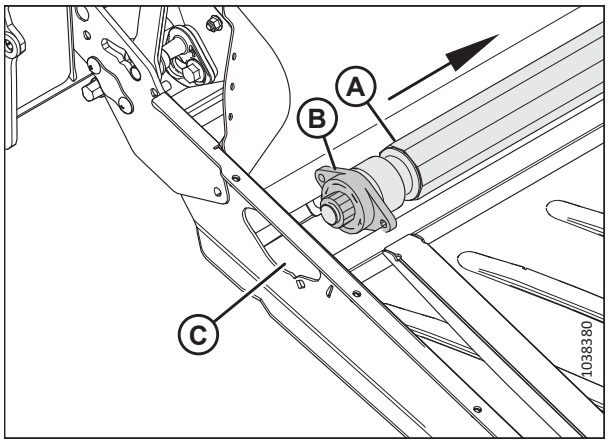


Figure 4.193: Drive Roller

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).

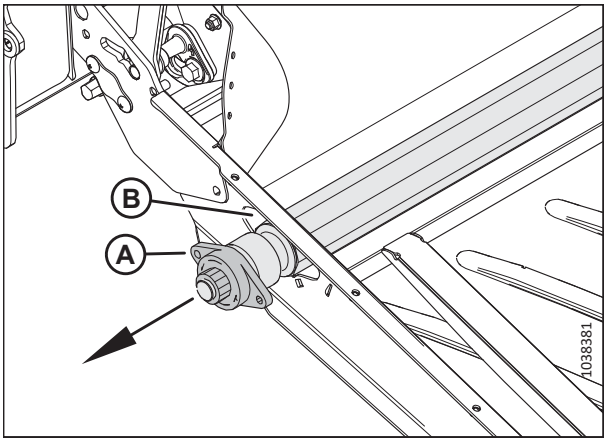


Figure 4.194: Drive Roller – Bearing End

3. Slide the left end of drive roller (A) onto spline of motor (B).

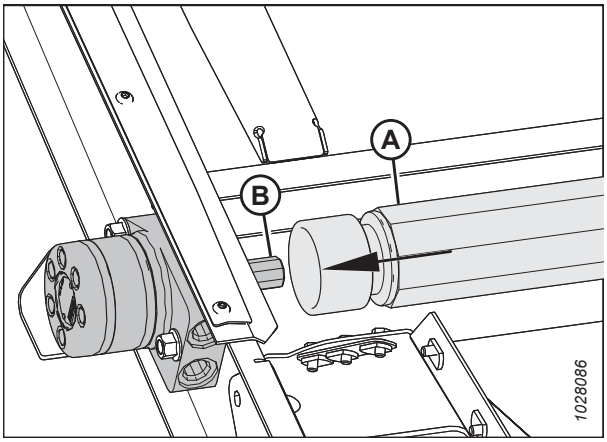


Figure 4.195: Feed Draper Motor

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 (C).
7. Install the feed deck draper. For instructions, refer to *4.10.1 Replacing Feed Draper, page 343*.
8. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 347*.

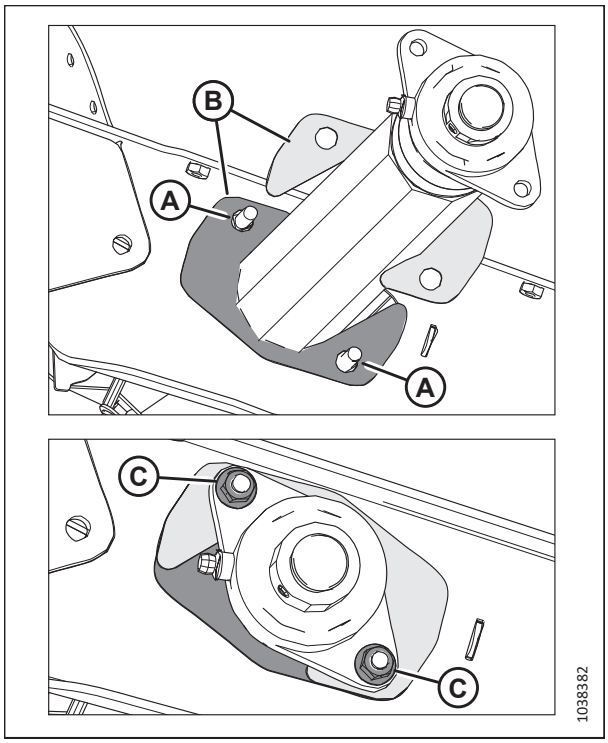


Figure 4.196: Drive Roller – Bearing End

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 37*.
5. Engage the header safety props. For instructions, refer to the combine operator's manual.

6. Locate the feed draper tensioner. Loosen jam nut (A). Turn bolt (B) counterclockwise to relieve the tension on the draper.

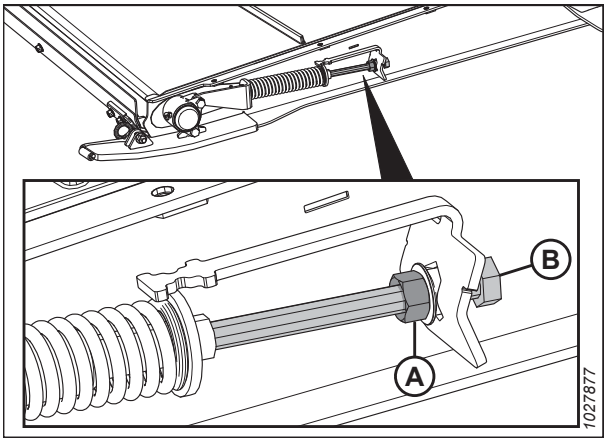


Figure 4.197: Feed Draper Tensioner

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.

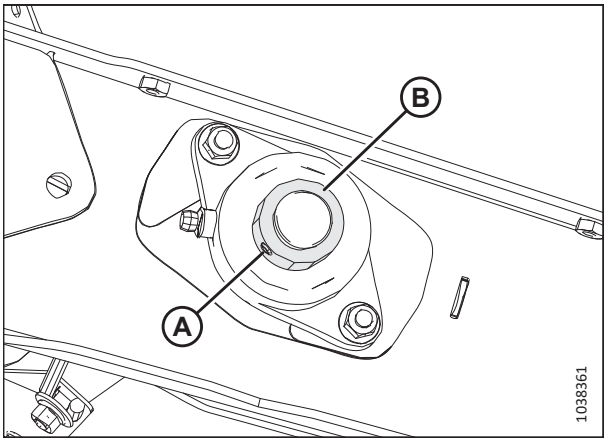


Figure 4.198: Feed Draper Drive Roller Bearing

9. Remove two nuts (A).

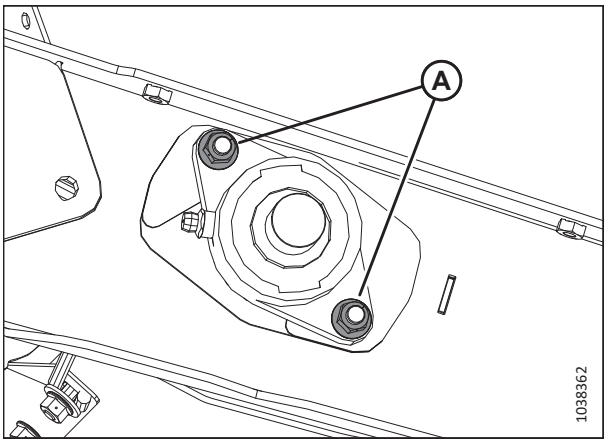


Figure 4.199: Feed Draper Drive Roller Bearing

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 349*.

11. Inspect both covers (B) for damage. If they are damaged, replace them with the parts in kit MAC347553.

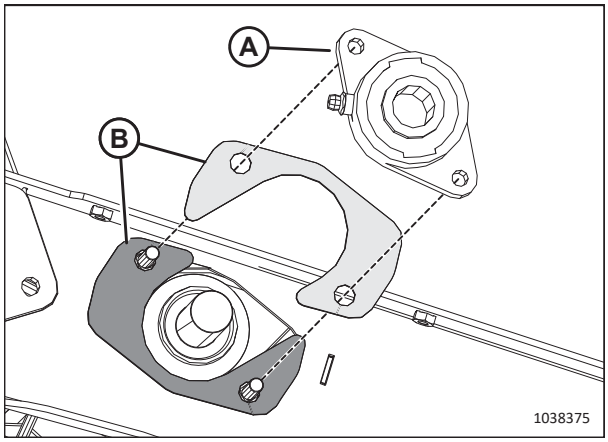


Figure 4.200: Feed Draper Drive Roller Bearing

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 347*.

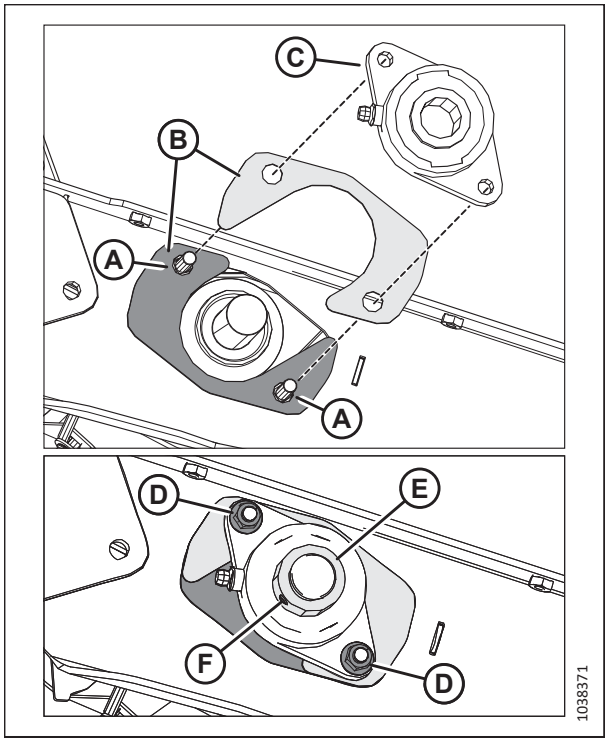


Figure 4.201: Feed Draper Drive Roller Bearing

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

The feed draper idler roller needs to be removed when being repaired or replaced.

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 37*.
5. Engage the header safety props. For instructions, refer to the combine operator's manual.
6. Locate the feed draper tensioner. Loosen jam nut (A). Turn bolt (B) counterclockwise to relieve the tension on the draper.

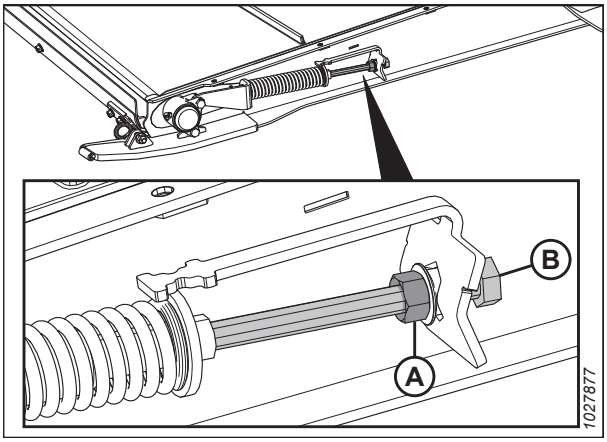


Figure 4.202: Feed Draper Tensioner

7. Remove nuts and screws (A). Remove draper connector straps (B).
8. Separate the draper.
9. Lower the front of the feed deck.

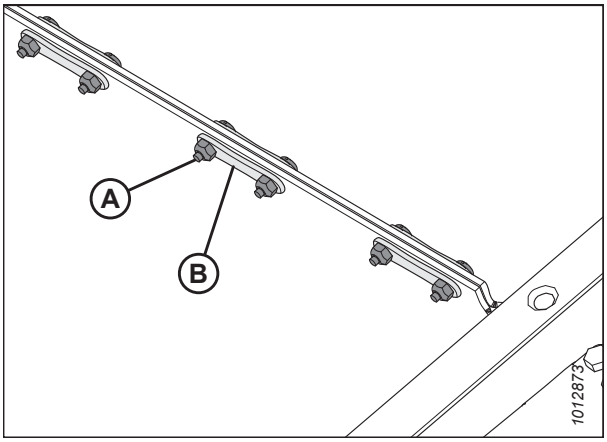


Figure 4.203: Draper Connector

10. Remove dust cap (A) and nut (B) from bearing housing (C).

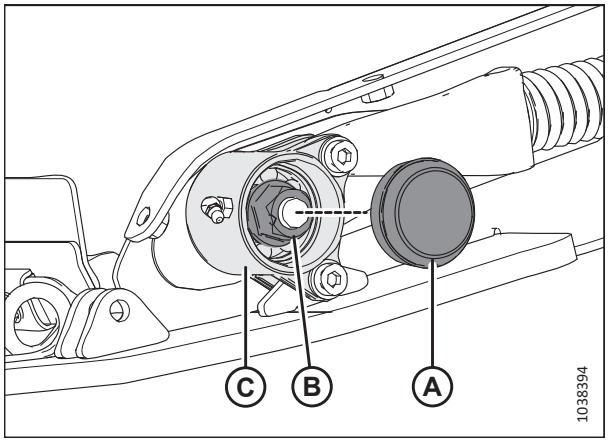


Figure 4.204: Idler Roller Bearing Housing

11. Remove the following hardware from location (A) that secures the bearing housing to the deck skid and tensioner.
12. Remove bearing housing (B) from the idler roller.
13. Repeat Step *10, page 356* to Step *12, page 356* on the opposite side of the feed deck.

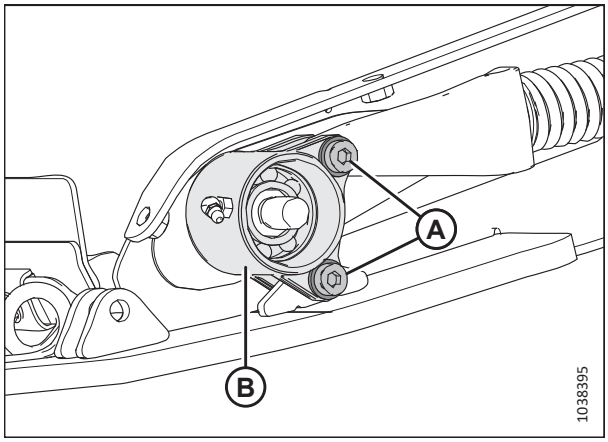


Figure 4.205: Idler Roller Bearing Housing

14. On one side of the deck frame, remove nut (A) and cover (B).

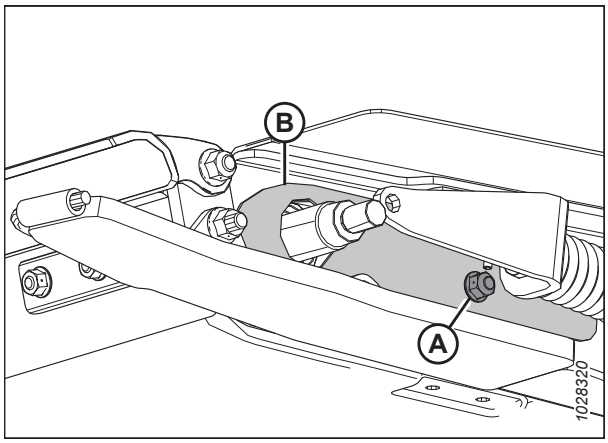


Figure 4.206: Idler Roller Cover

15. Slide idler roller (A) out through the cutout in the deck frame.

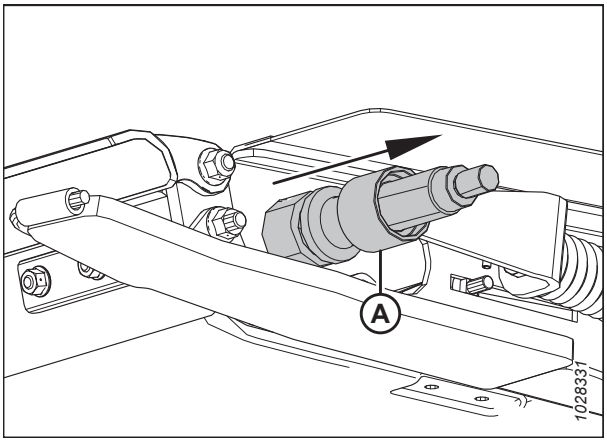


Figure 4.207: Idler Roller

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.

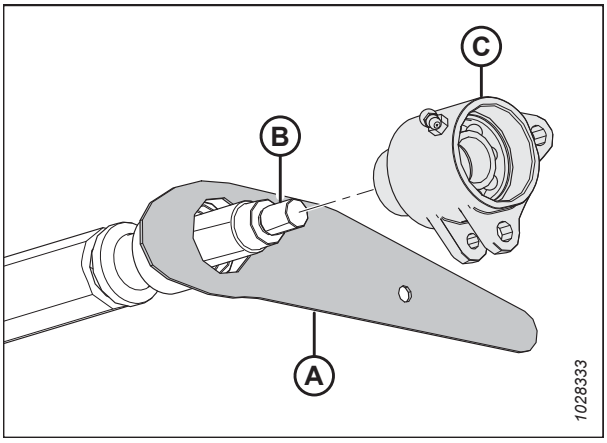


Figure 4.208: Idler Roller

4. After the bearing and both seals are seated around the shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).

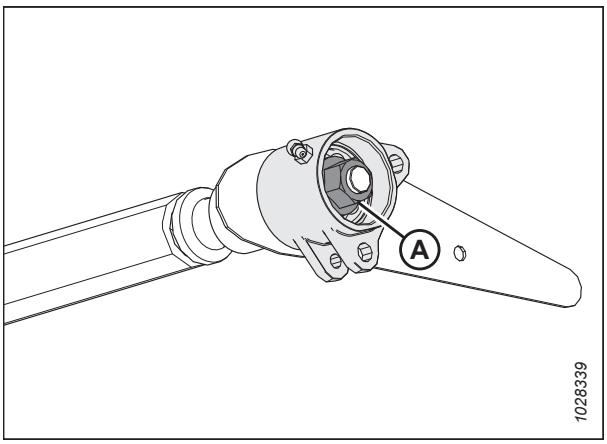


Figure 4.209: Left Idler Roller Bearing

5. Slide idler roller (A) through the cutout in the deck frame.

   NOTE:

   The right end of the idler roller should protrude from the right deck frame.

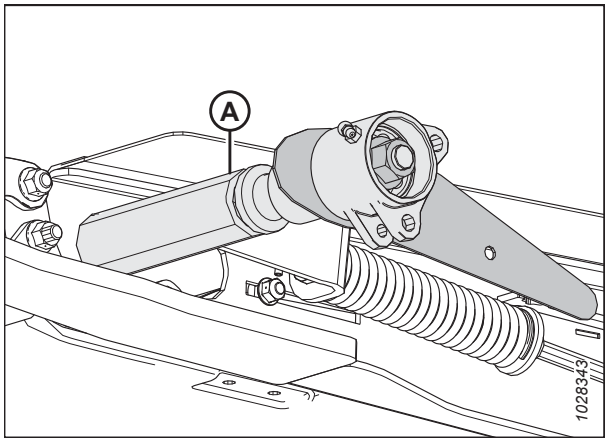


Figure 4.210: Feed Deck – Left Side

6. Install the bolt from inside of the feed deck to secure idler cover (A).
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.

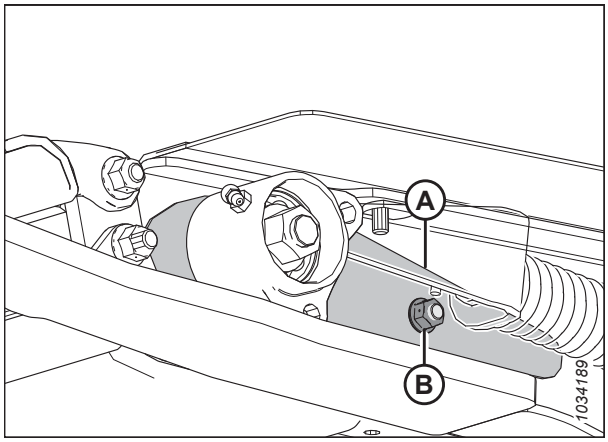


Figure 4.211: Idler Cover – Left Side

8. On the right side of the deck frame, brush the opposite end of the idler roller shaft (A) with oil.
9. 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.

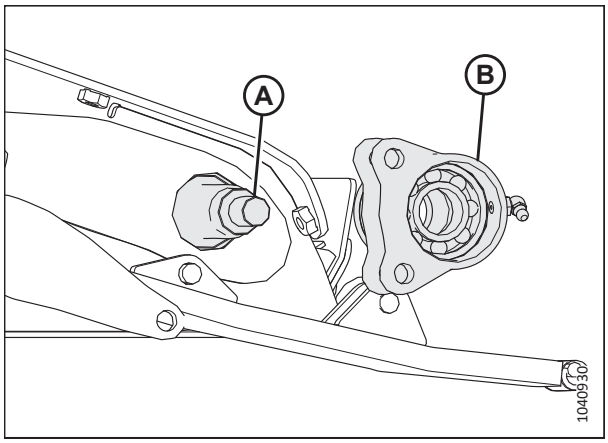


Figure 4.212: Feed Deck – Right Side

10. After the bearing and both seals are seated around the right shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).

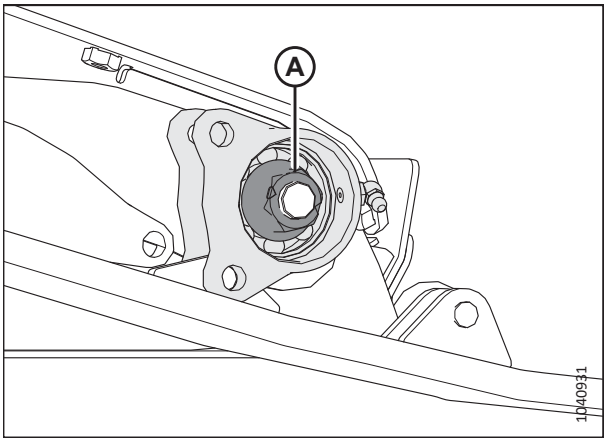


Figure 4.213: Feed Deck – Right Side

11. Rotate idler roller housing (A) until the holes in the lower tabs align with the hole in welded tab (B).
12. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then secure roller housing to welded tab at location (C) with socket head bolt, washer, and nut.
13. Align the hole in cast support (D) with the holes in the upper tab on idler roller housing (A).
14. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then secure the cast support to the roller housing at location (E) with socket head bolt, washer, and nut.
15. Tighten bolts (C) and (E) to 12 Nm (106 lbf·in).

    IMPORTANT:

    Do **NOT** overtighten bolts (C) and (E).

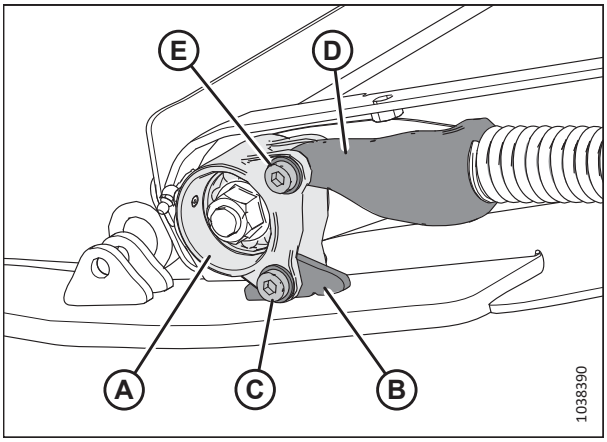


Figure 4.214: Left Idler Roller Bearing

16. Fill the bearing cavity with grease, and install dust cap (A).
17. Check that the grease fitting is working. Grease the feed draper idler roller bearing until grease comes out of the seal. Wipe any excess grease from area after greasing.
18. Repeat Step *11, page 359* to Step *17, page 359* on the right side of the feed draper idler roller.

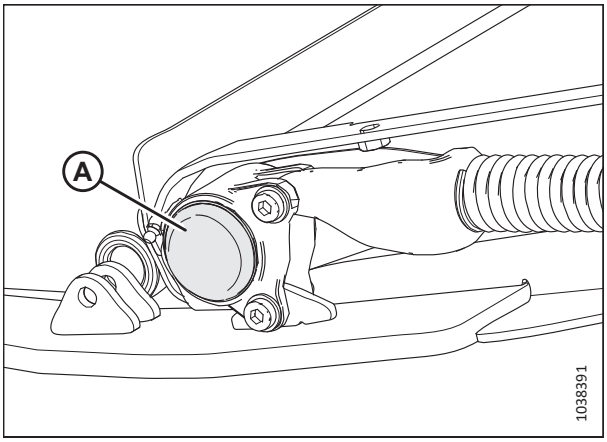


Figure 4.215: Feed Deck – Left Side

19. Close the feed draper and secure it with connector straps (B), screws (A), and nuts.
20. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 347*.

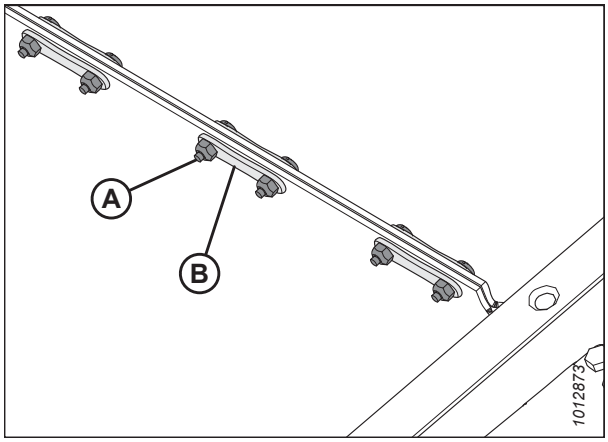


Figure 4.216: Draper Connector

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 37*.
5. Engage the header safety props. For instructions, refer to the combine operator's manual.
6. Locate the feed draper tensioner. Loosen jam nut (A). Turn bolt (B) counterclockwise to relieve the tension on the draper.

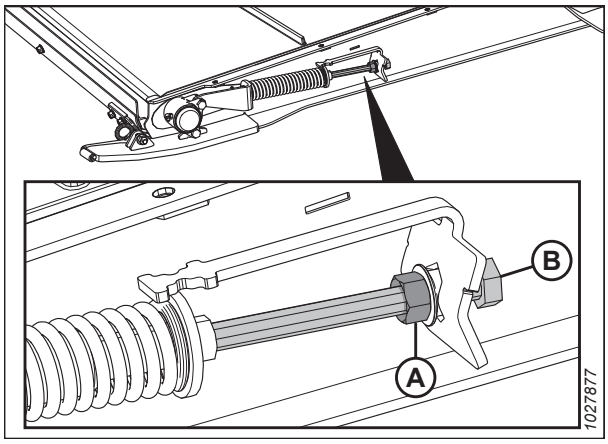


Figure 4.217: Feed Draper Tensioner

7. Remove the socket head bolts, washers, and nuts (A) that secure the bearing housing to the deck skid and tensioner
8. Remove dust cap (B).

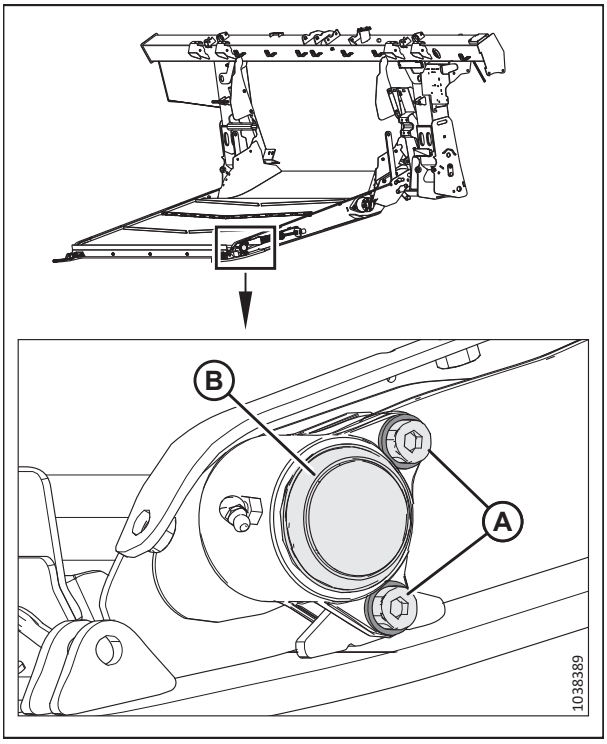


Figure 4.218: Left Idler Roller Bearing

9. 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 355*.

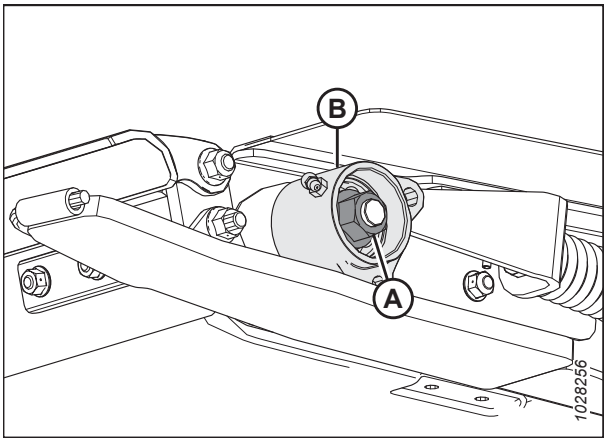


Figure 4.219: Idler Roller Bearing – Left Side

10. Secure housing (D), and remove internal retaining ring (A), bearing (B), and two seals (C).
11. Apply oil to the bore before assembling the parts.
12. Install seals (C) into housing (D).

    NOTE:

    Ensure the flat side of the seal is facing inward.

13. Pack bearing (B) with grease and install as shown.
14. Install retaining ring (A).

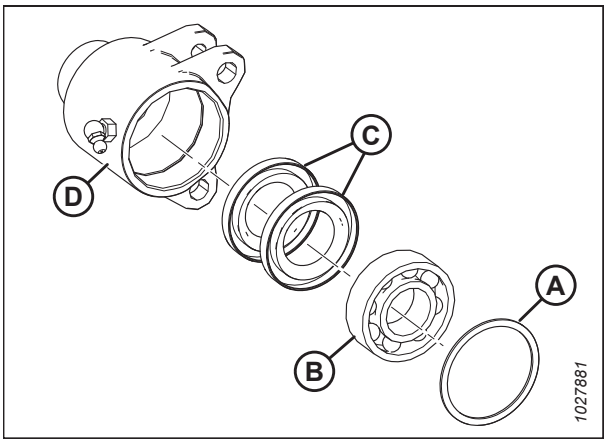


Figure 4.220: Bearing Assembly

15. Brush idler roller shaft (A) with oil.

16. 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.

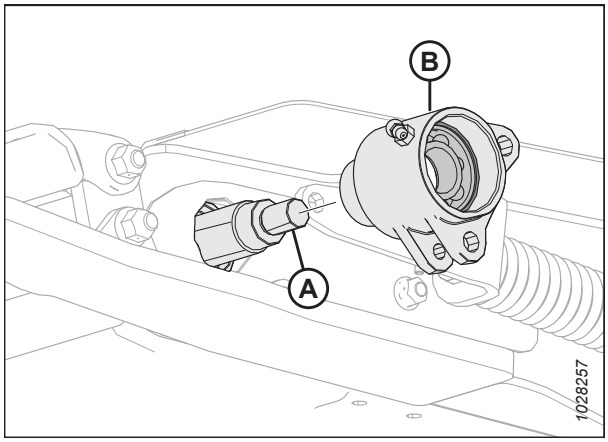


Figure 4.221: Idler Roller Bearing – Left Side

17. After the bearing and both seals are seated around the shaft, install nut (A) and torque it to 81 Nm (60 lbf·ft).

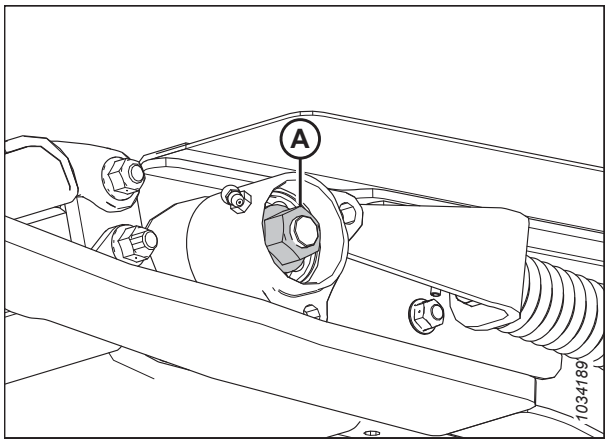


Figure 4.222: Idler Roller Bearing – Left Side

18. Rotate idler roller housing (A) until the holes in the lower tabs aligns with the hole in welded tab (B).

19. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert socket head bolt, washer, and nut at location (C).

20. Align the hole in cast support (D) with the holes in the upper tab on idler roller housing (A).

21. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads, and then insert socket head bolt, washer, and nut at location (E).

22. Tighten bolts (C) and (E) to 12 Nm (106 lbf·in).

    IMPORTANT:

    Do **NOT** overtighten bolts (C) and (E).

23. Repeat Step to Step *22, page 362* on the opposite side.

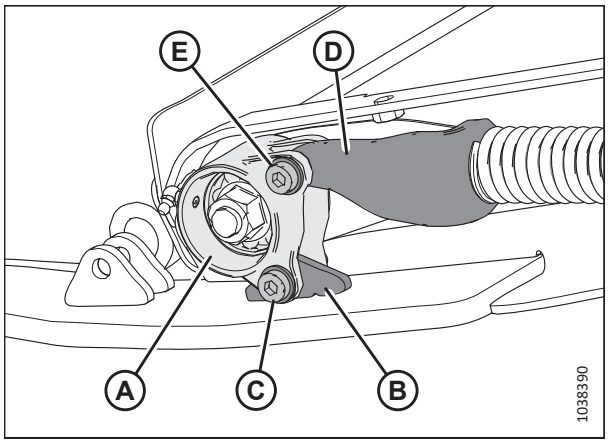


Figure 4.223: Idler Roller Bearing – Left Side

24. Fill the bearing cavity with grease, and install dust cap (A) on both ends of the idler roller.
25. Check that the grease fitting is working.
26. Repeat Step *24, page 363* to Step *25, page 363* on the opposite side.
27. Tension the feed draper. For instructions, refer to *4.10.2 Checking and Adjusting Feed Draper Tension, page 347*.

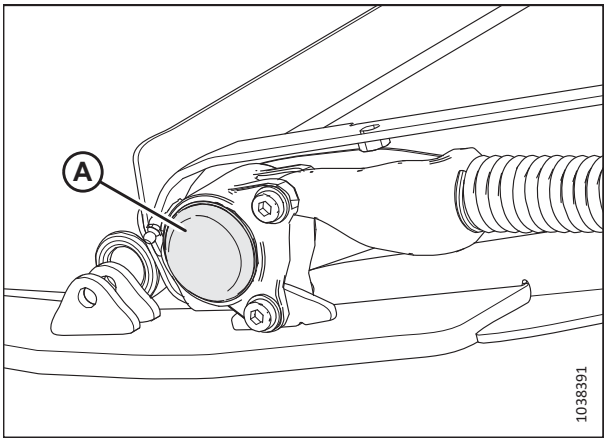


Figure 4.224: Feed Deck – Left Side

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. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props. For instructions, refer to the combine operator's manual.
4. On the underside of the feed deck, rotate latch (A) to unlock handle (B). Repeat this step at the opposite end of the feed deck.

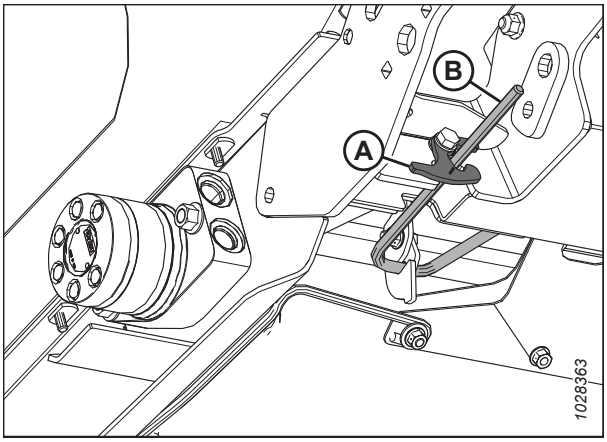


Figure 4.225: Underside of Feed Deck

5. Hold pan (A) and rotate handle (B) downward to release the pan.

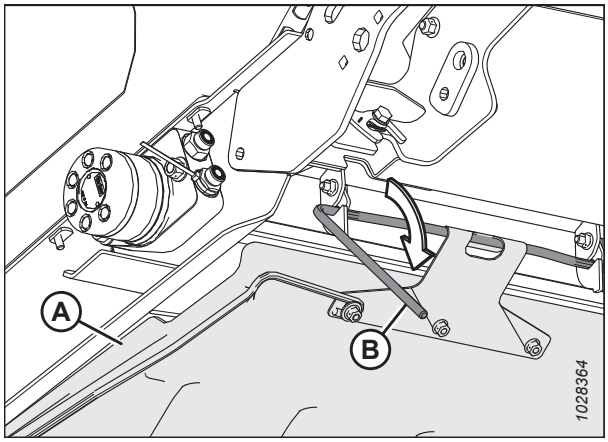


Figure 4.226: Underside of Feed Deck

6. Lower feed deck pan (A).

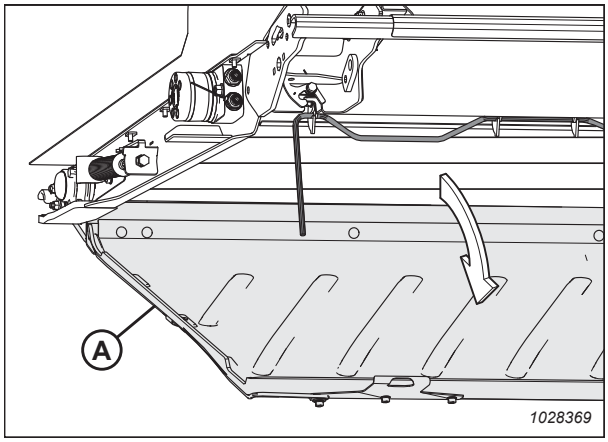


Figure 4.227: Feed Deck Pan

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).

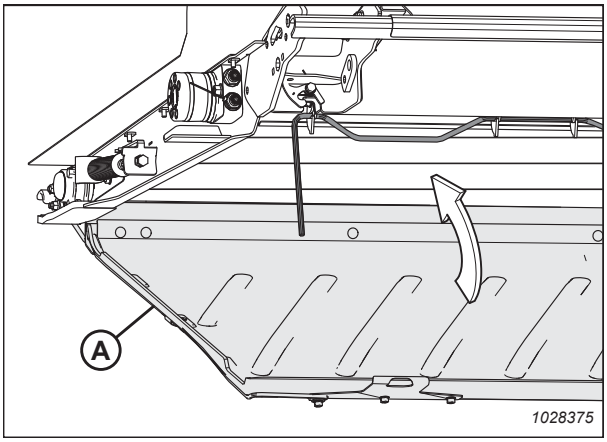


Figure 4.228: Feed Deck Pan

2. Engage lock handle (A) in three feed deck pan hooks (B).

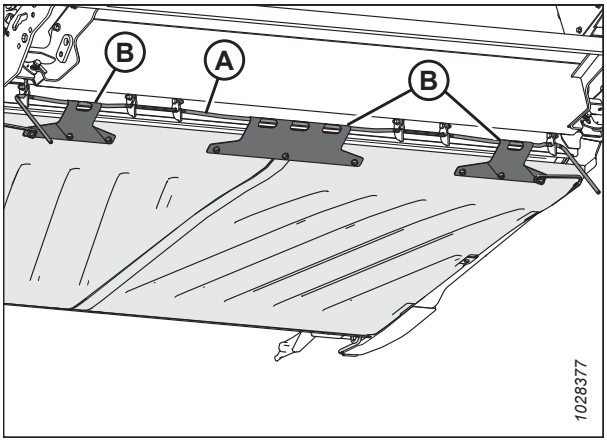


Figure 4.229: Underside of Feed Deck Pan

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).

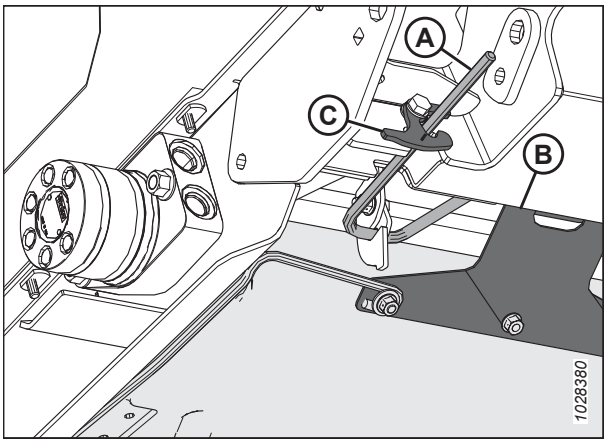


Figure 4.230: Underside of Feed Deck Pan

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. For instructions, refer to the combine operator's manual.
4. Before operation, ensure both link holder hooks (A) are engaged on the float module under the feed deck as shown.

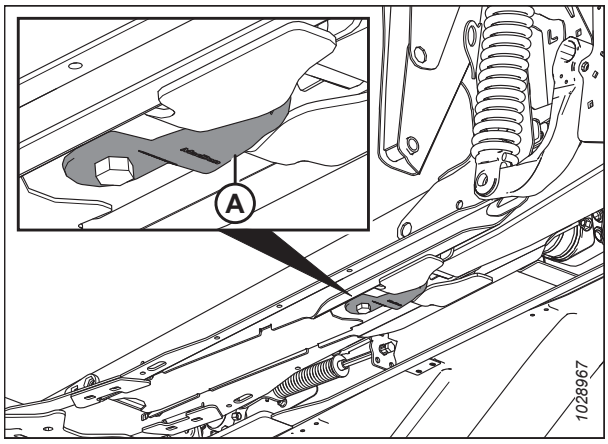


Figure 4.231: Feed Deck – View from Below

- Undamaged link holder hook (A)
- Damaged/broken link holder hook (B)
- Stretched link holder (not shown)

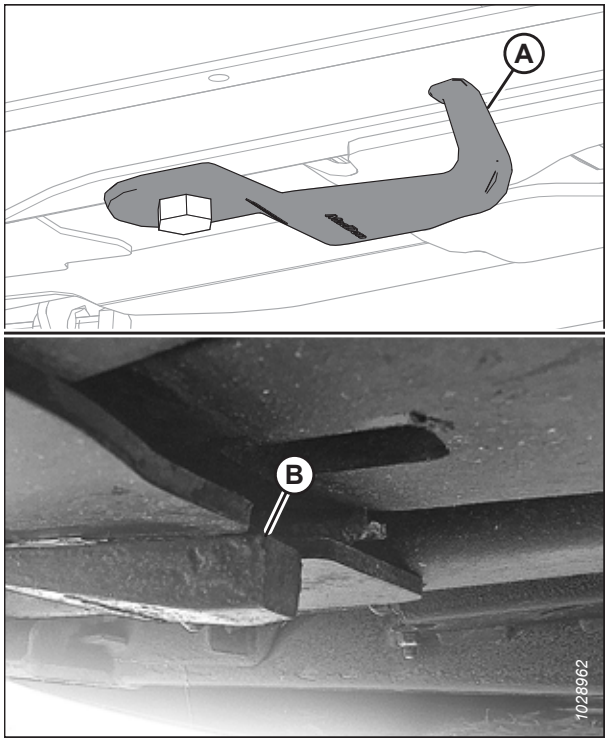


Figure 4.232: Link Holder Hooks

NOTE:

To move hook (A) to the storage position, loosen bolt (B) and rotate the hook 90°.

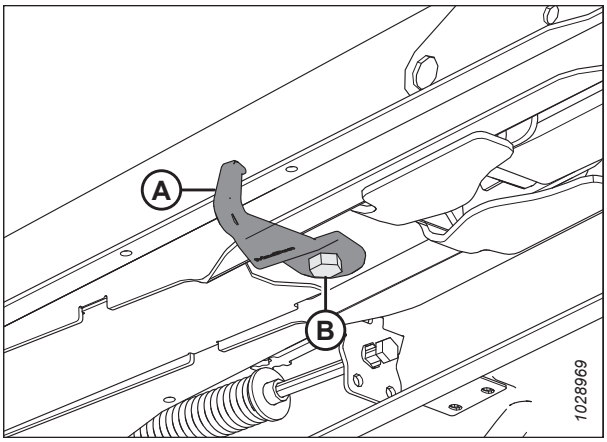


Figure 4.233: Link Holder Hook in Storage Position

4.11 Stripper Bars

Stripper bars are installed into the float module opening to improve feeding in crops such as rice. They may need to be removed, depending on the desired float module configuration.

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 55*.
2. Remove four bolts and nuts (A) securing stripper bar (B) to the float module frame, and remove the stripper bar.
3. Repeat the previous step at the opposite side of the float module.

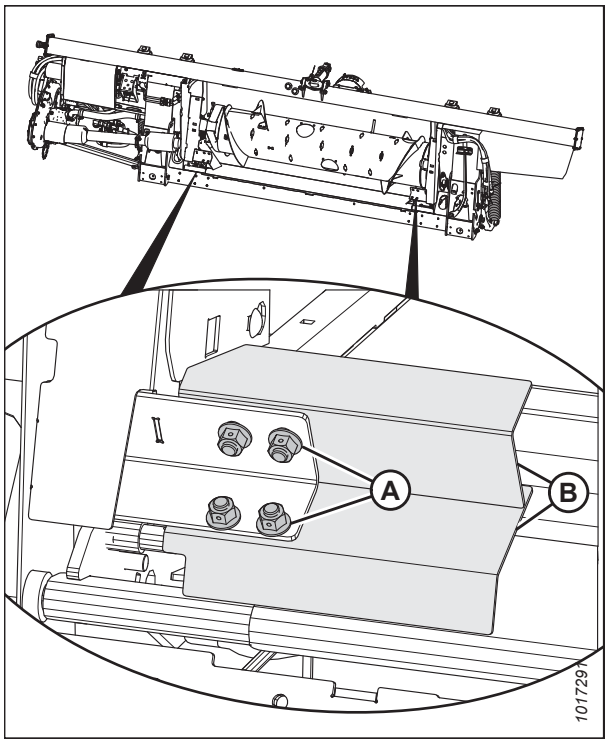


Figure 4.234: Stripper Bars

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 55*.

2. Position stripper bar (B) as shown so the notch is at the corner of the frame.
3. Secure stripper bar (B) to the float module with four bolts and nuts (A). Ensure the nuts face the combine.

   NOTE:

   If the lower bolts and nuts are too difficult to install, install the upper two bolts only.
4. Repeat Step *2, page 369* and Step *3, page 369* at the opposite side of the float module.

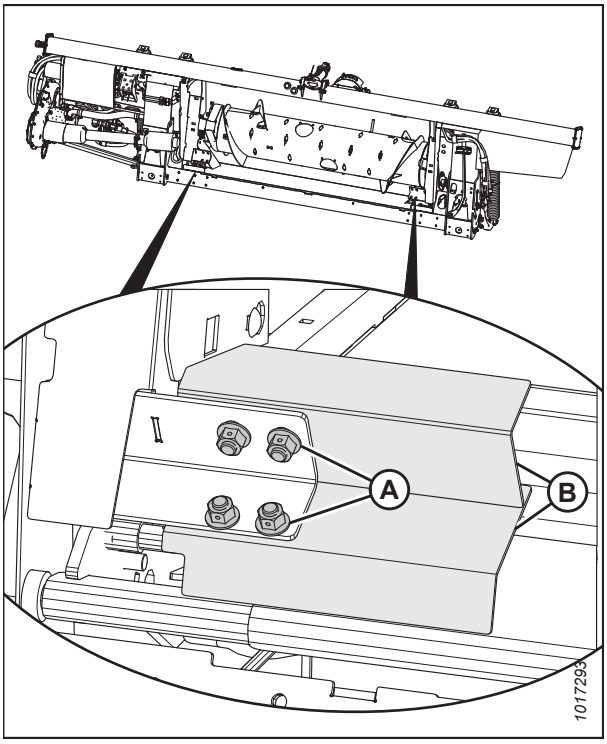


Figure 4.235: Stripper Bars

4.11.3 Replacing Feeder Deflectors on New Holland CR Combines

Wide feeder deflectors are used with New Holland CR combines only. The existing feeder deflectors will need to be removed and replaced with the new deflectors.

1. Detach the header from the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 55*.
2. Remove two bolts and nuts (B) securing feed deflector (A) to the float module frame. Remove the feeder deflector.
3. Position replacement feeder deflector (A) as shown. Secure the feeder deflector with bolts and nuts (B). Ensure that the nuts face the combine. Do **NOT** tighten the nuts yet.

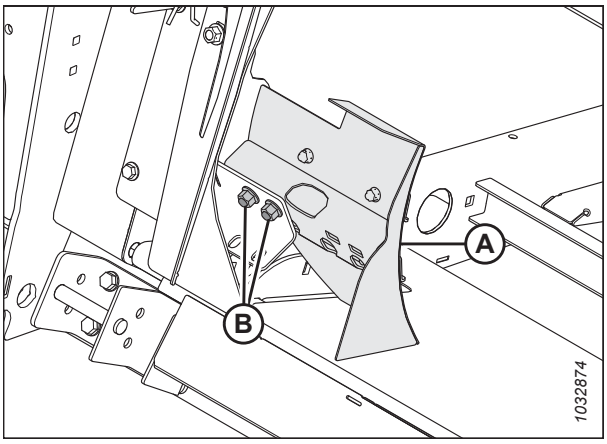


Figure 4.236: Feed Deflector

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 this procedure to install the other deflector.
7. Attach the header to the combine. For instructions, refer to *3.6 Header Attachment/Detachment, page 55*.
8. After attaching the header to the combine, fully extend the center-link and check the gap between the deflector and pan. Ensure that the gap is 4–6 mm (5/32–1/4 in.).

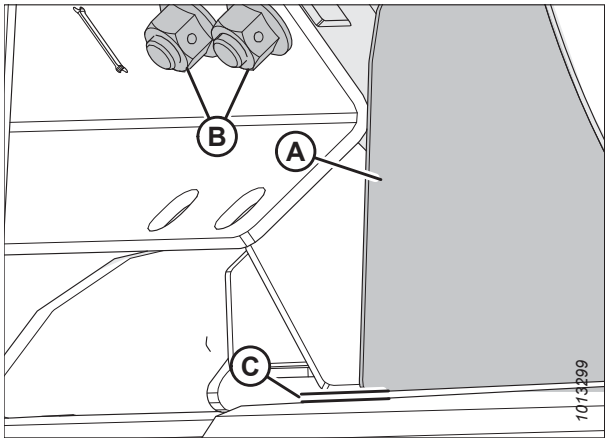


Figure 4.237: Pan and Deflector Distance

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. For instructions, refer to the combine operator's manual.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.

WARNING

Ensure that 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 375*.

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.

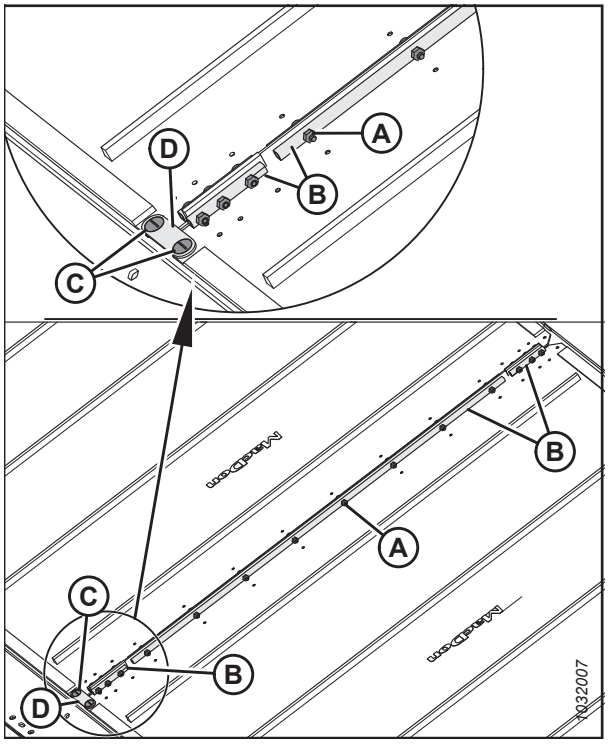


Figure 4.238: Draper Connectors

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. For instructions, refer to the combine operator's manual.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.
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 (84 lbf·in).

14. Adjust the draper tension. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 375*.

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.

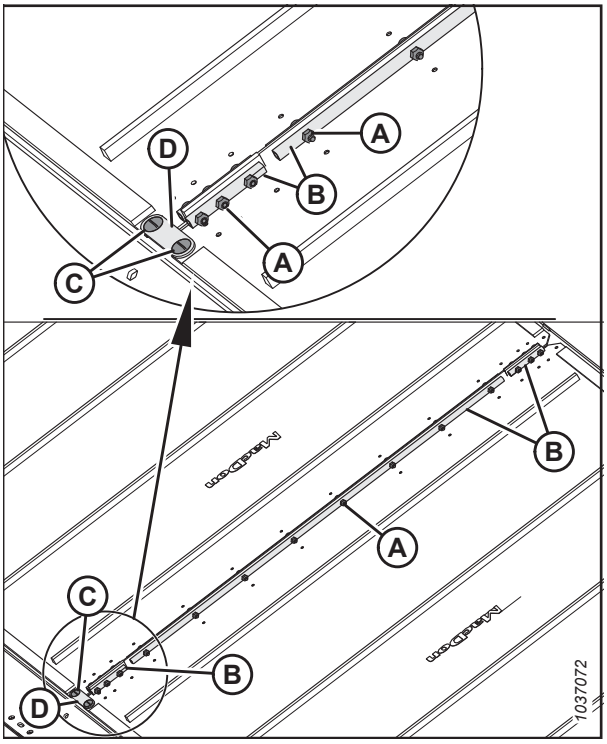


Figure 4.239: Draper Connectors

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 the draper and the cutterbar is set to 1–3 mm (0.04–0.12 in.).

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

    NOTE:

    Take measurements at deck supports (A) when the header is in the working position. Depending on the size of the header, there will be two, three, or four supports per deck.

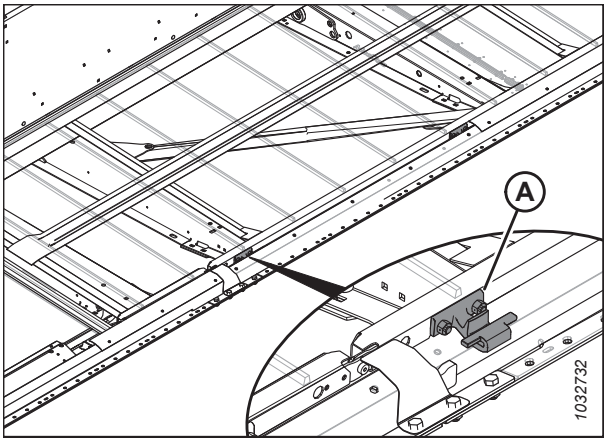


Figure 4.240: Draper Deck Supports

2. Check that clearance (A) between draper (B) and metal seal (C) is 0–2 mm (0.004–0.08 in.).
3. Relieve the tension on the draper. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 375*.

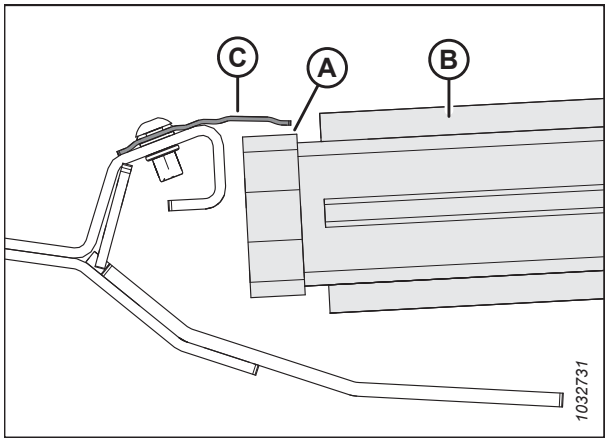


Figure 4.241: Draper Seal

4. Lift front edge of draper (A) past cutterbar (B) to expose the deck support.
5. Measure and note the thickness of the draper belt.

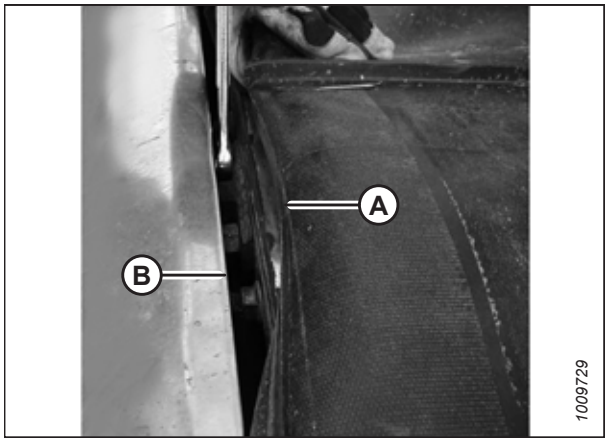


Figure 4.242: Deck Support

NOTE:

The deck is shown with the draper removed.

6. Loosen two lock nuts (A) on deck support (B) one half-turn **ONLY**.
7. 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.

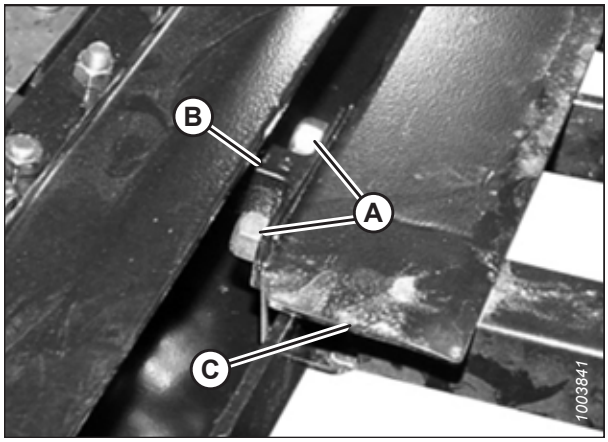


Figure 4.243: Deck Support

Number of Deck Supports (B)

Model	Quantity
6.1 m (20 ft.)	4
7.6– 9.1 m (25–30 ft.)	6
10.7–12.2 m (35–40 ft.)	8
13.7 m (45 ft.)	10

8. Use a feeler gauge that is the same thickness as the draper belt, plus 1 mm (0.04 in.). Slide the feeler gauge along deck (A) under metal seal (C) in order to properly set the gap.

9. To create a seal, adjust deck (A) so that clearance (B) between metal seal (C) and the deck is the same thickness as the draper belt plus 1 mm (0.04 in.).

   NOTE:

   To check the clearance at a draper roller, begin measuring from the roller tube, **NOT** the deck.

10. Tighten deck support hardware (D).

11. Recheck gap (B) with the feeler gauge. For instructions, refer to Step *8, page 375*.

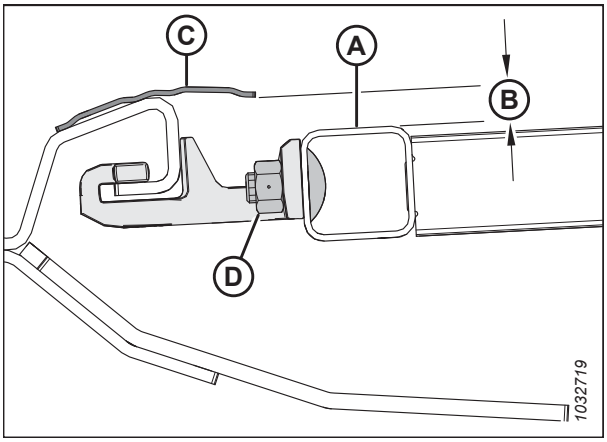


Figure 4.244: Deck Support

4.12.4 Adjusting Side Draper Tension

The tension on the drapers can be adjusted using the draper tension adjusters on the end of each draper.

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.

IMPORTANT:

The draper tension is set at the factory, and should not require adjustment. If adjustment is necessary, ensure that the tension is set so that the draper does not slip or sag below the cutterbar. Excessive tension on the draper can damage the draper drive and rollers.

1. Ensure that tension indicator (A) covers the inboard half of the window.

DANGER

Ensure that all bystanders have cleared the area.

2. Start the engine.

3. Raise the header fully.

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

5. Engage the header safety props. For instructions, refer to the combine operator's manual.

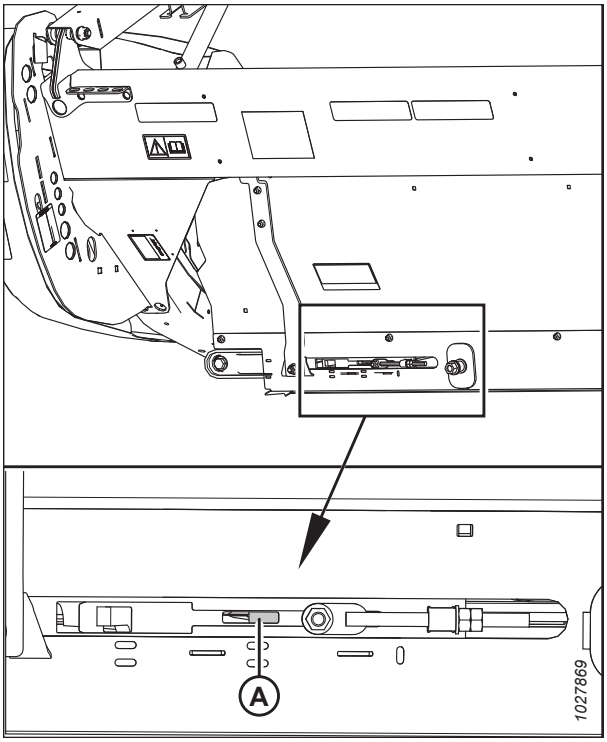


Figure 4.245: Checking Left Tension Adjuster

6. Ensure that the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) of the drive roller.

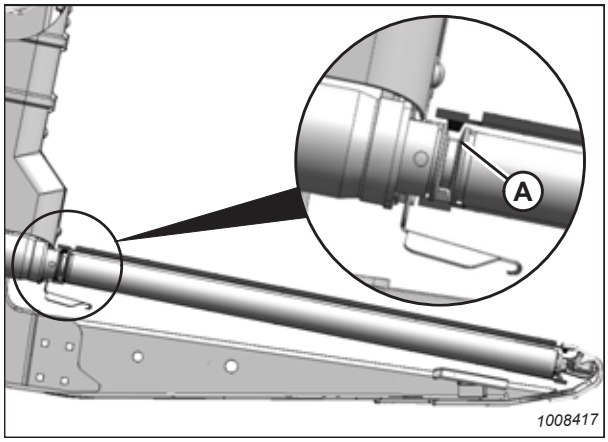


Figure 4.246: Drive Roller

7. Ensure that idler roller (A) is between guides (B).

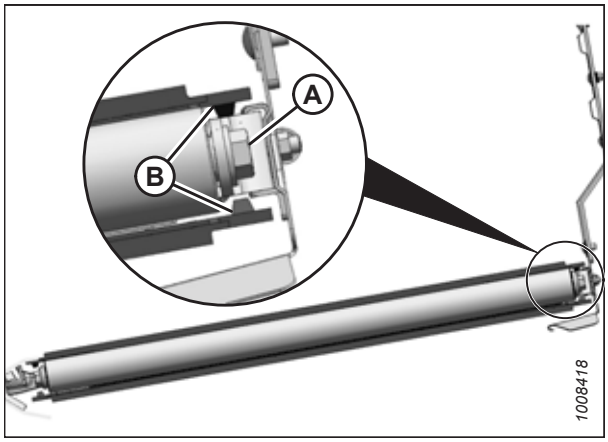


Figure 4.247: Idler Roller

IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

8. Turn adjuster bolt (A) clockwise to increase the tension on the draper; turn bolt (A) counterclockwise to decrease the tension on the draper. 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 when the tension indicator is not visible.

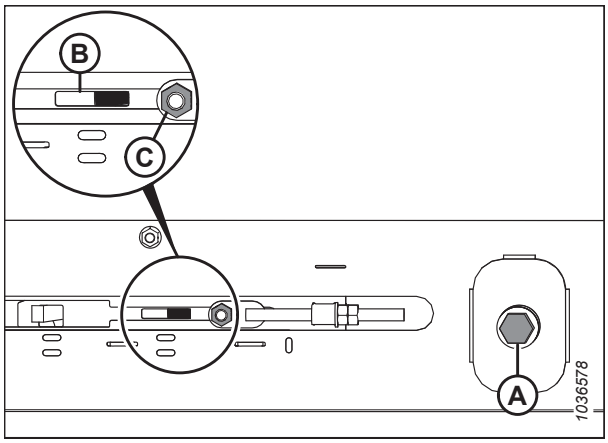


Figure 4.248: Adjusting Left Tensioner

4.12.5 Adjusting Side Draper Tracking

To ensure that the side drapers rotate smoothly without rubbing the side of the header frame, the side draper tracking may need to be adjusted.

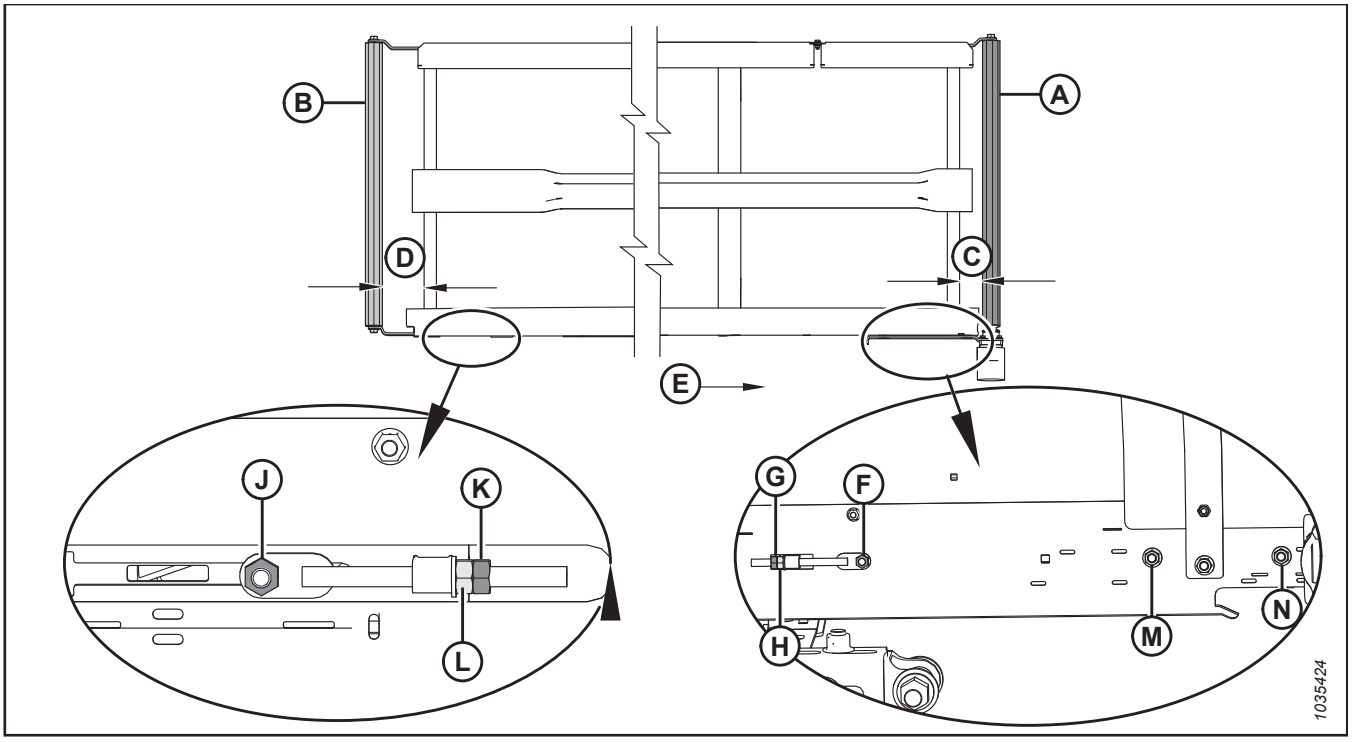


Figure 4.249: Draper Tracking Adjustments – Left Draper

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:

Draper Tracking

Tracking Tendency	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 , *page 377* and Figure *4.249, page 377*) 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 , *page 377* and Figure *4.249, page 377*) 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 has been adjusted, the drive roller is likely not in line with 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 faulty 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 380*
   - *4.12.11 Replacing Side Draper Drive Roller Bearing, page 385*

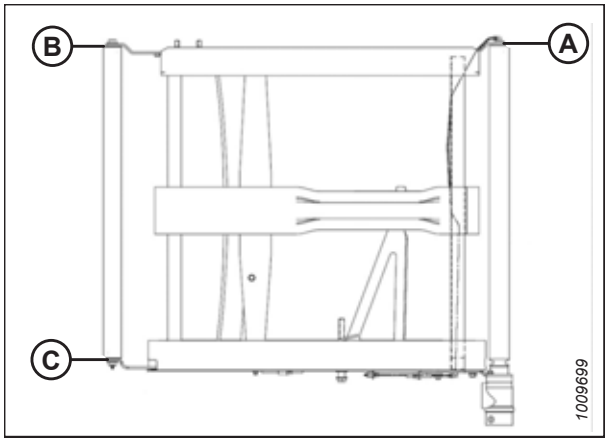


Figure 4.250: Roller Arms

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

Ensure 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. Raise the header fully.
3. Raise the reel fully.
4. Shut down the engine, and remove the key from the ignition.
5. Engage the header safety props. For instructions, refer to the combine operator's manual.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.
7. Loosen the draper by turning adjuster bolt (A) counterclockwise until the adjuster bolt runs out of adjustment and hits a hard stop.

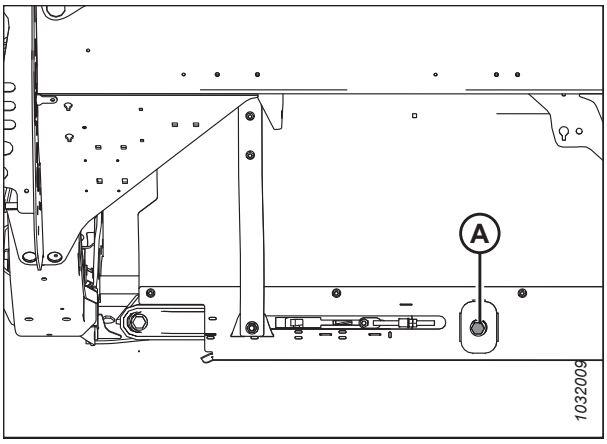


Figure 4.251: Tensioner – Left Side Shown

8. Remove screws (C), bridge connector (D), and nuts from the front end of the draper joint.
9. Remove nuts and screws (A) and tube connectors (B) from the draper joint.
10. Pull the draper off the idler roller.

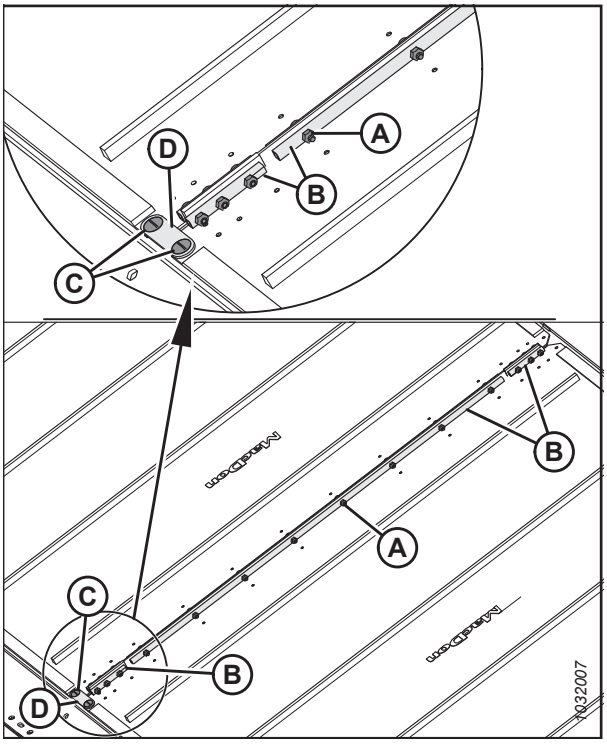


Figure 4.252: Draper Connectors

11. Remove bolt (A) and washer from the idler roller at the back of the header deck.
12. Remove bolt (B) and washer from the idler roller at the front of the header deck.
13. Spread roller arms (C) and (D), and remove the idler roller.

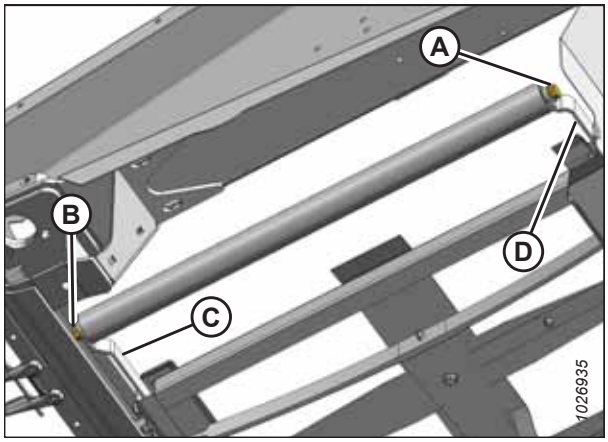


Figure 4.253: Idler Roller

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 378*.
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.

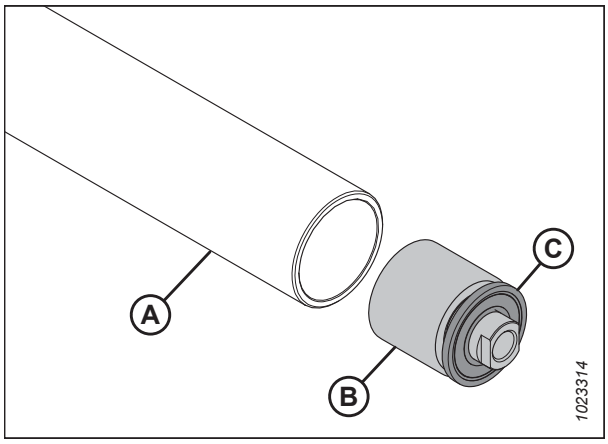


Figure 4.254: Idler Roller Bearing and Seal

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.

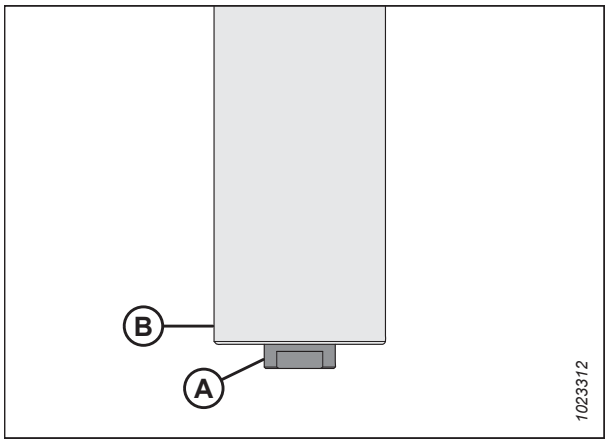


Figure 4.255: Idler Roller

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).

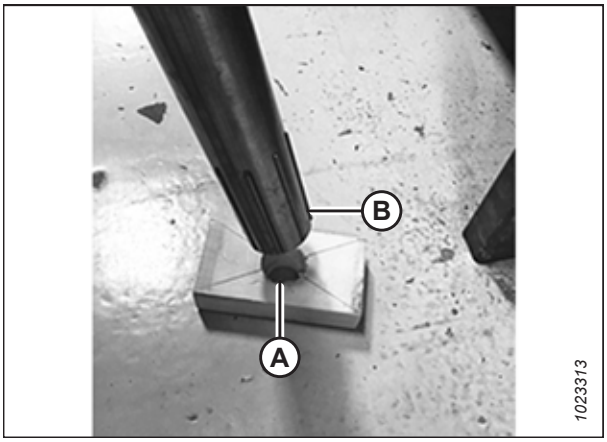


Figure 4.256: Idler Roller

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.

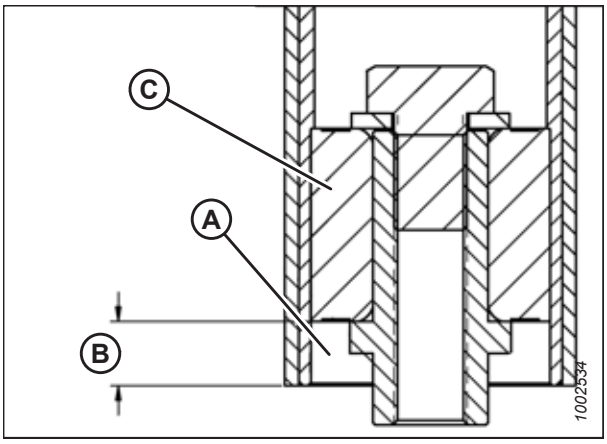


Figure 4.257: Idler Roller Bearing

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 382*.

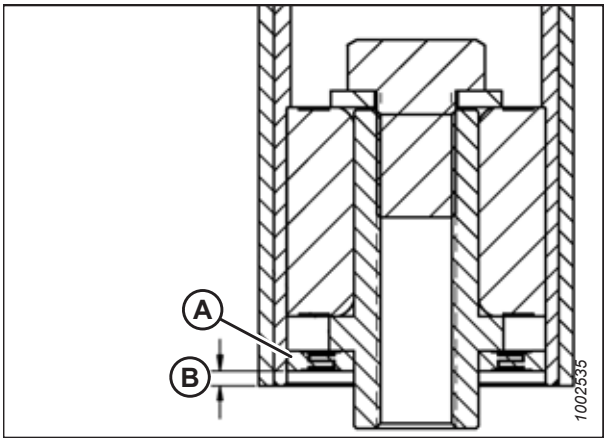


Figure 4.258: Idler Roller Bearing

4.12.9 Installing Side Draper Deck Idler Roller

The side draper deck has a roller on each end of the deck. One is the idler roller and one is the drive roller. If the idler roller is worn or damaged, it will need to be replaced.

1. Install idler roller (A) between idler arms (B).
2. Secure the roller with two bolts and washers (C). Tighten the bolts to 95 Nm (70 lbf·ft).

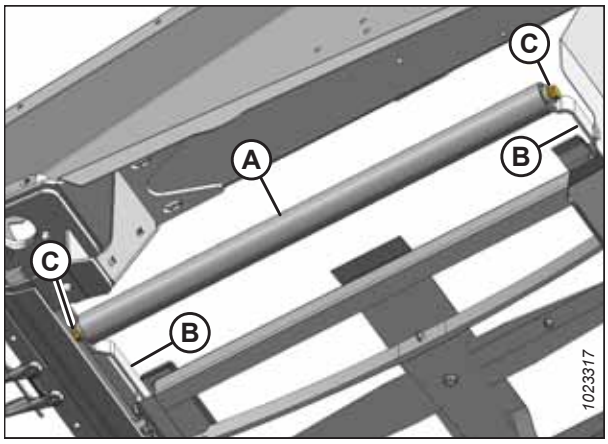


Figure 4.259: Idler Roller

3. Secure the ends of the draper with tube connectors (B) and screws and nuts (A).

   IMPORTANT:

   Install the screws so that the heads face inboard.

   NOTE:

   The two short tube connectors are attached at the front and rear of the draper.

4. Install bridge connector (D) using screws (C) and the nuts at the front end of the draper joint.

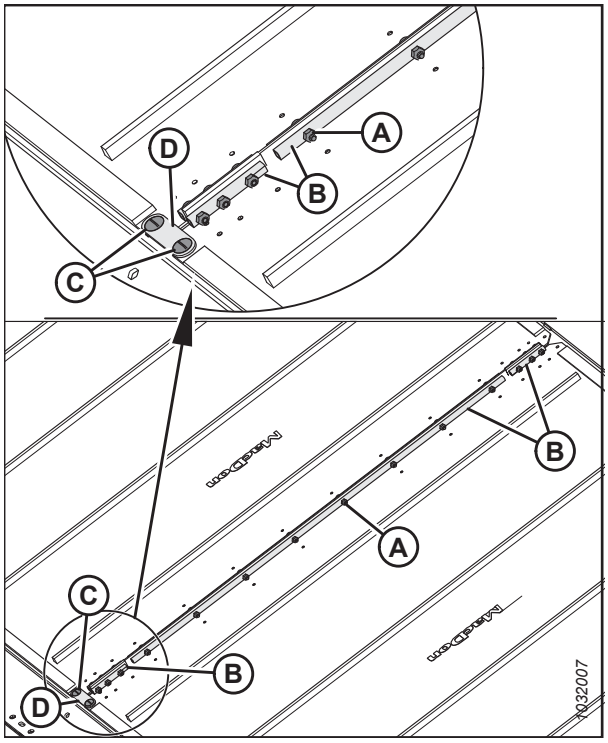


Figure 4.260: Draper Connector

5. Tighten the draper by turning adjuster bolt (A) clockwise. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 375*.
6. Disengage the reel and header safety props.

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine.
8. Fully lower the header and the reel.
9. Engage the header. Ensure that the side drapers track correctly. For instructions on adjusting the drapers, refer to *4.12.4 Adjusting Side Draper Tension, page 375*.

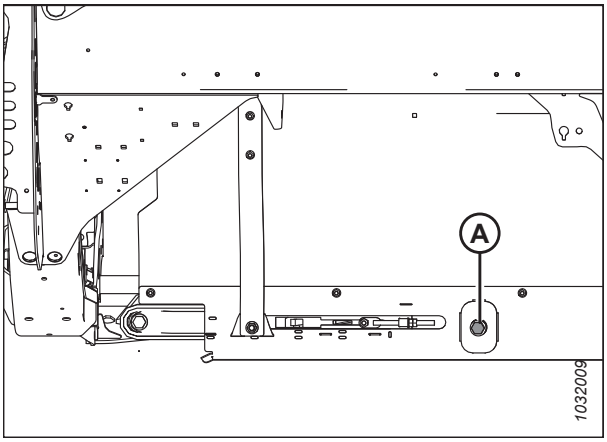


Figure 4.261: Draper Tensioner

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

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Raise the header fully.
3. Raise the reel fully.
4. If the draper connector is not visible, engage the header until the connector is accessible at the outboard end of the deck.
5. Shut down the engine, and remove the key from the ignition.
6. Engage the reel safety props. For instructions, refer to *Engaging Reel Safety Props, page 37*.
7. Engage the header safety props. For instructions, refer to the combine operator's manual.

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.

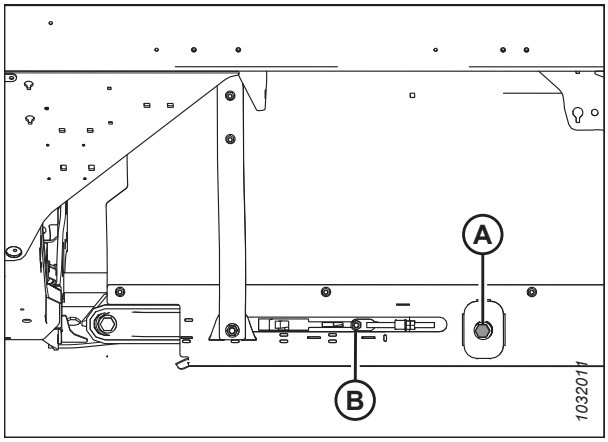


Figure 4.262: Draper Tensioner

9. Remove nuts and screws (A), and tube connectors (B) from the draper joint.
10. Remove screws (C), bridge connector (D), and the nuts from the front end of the draper joint.
11. Pull the draper off the drive roller.

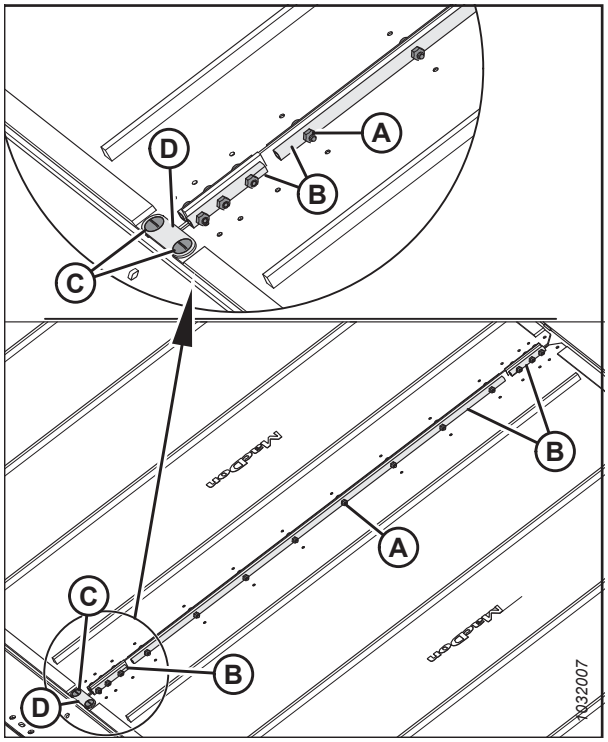


Figure 4.263: Draper Connectors

12. Align the set screws with guard hole (A). Remove the two set screws securing the motor to 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.

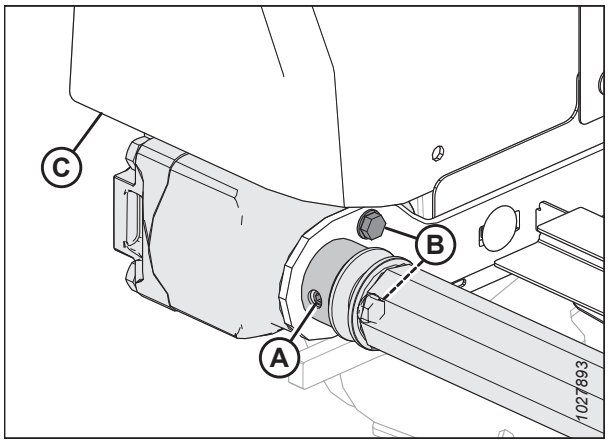


Figure 4.264: Drive Roller

NOTE:

It may be necessary to pry between the roller and bracket (A) to remove the roller from shaft.

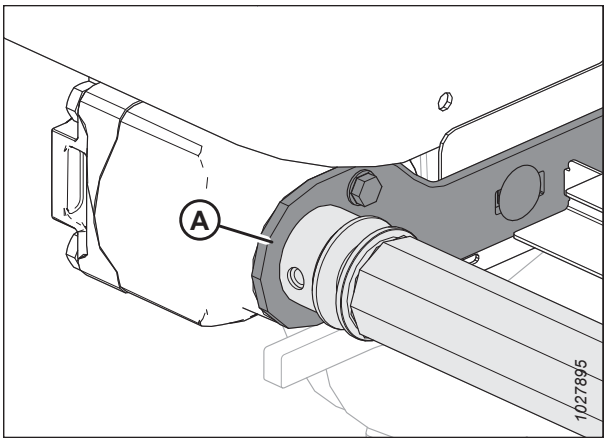


Figure 4.265: Drive Roller

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).

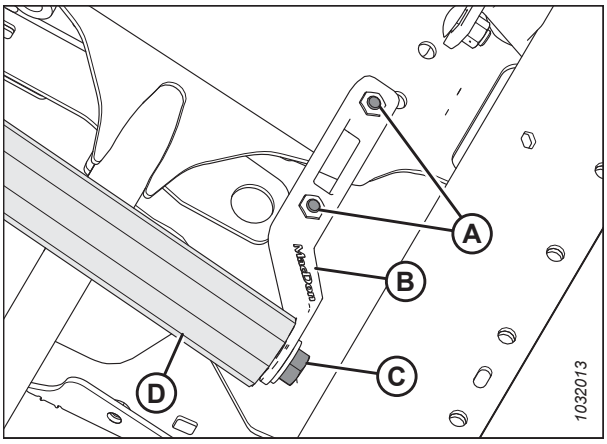


Figure 4.266: Drive Roller

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 383*.

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.

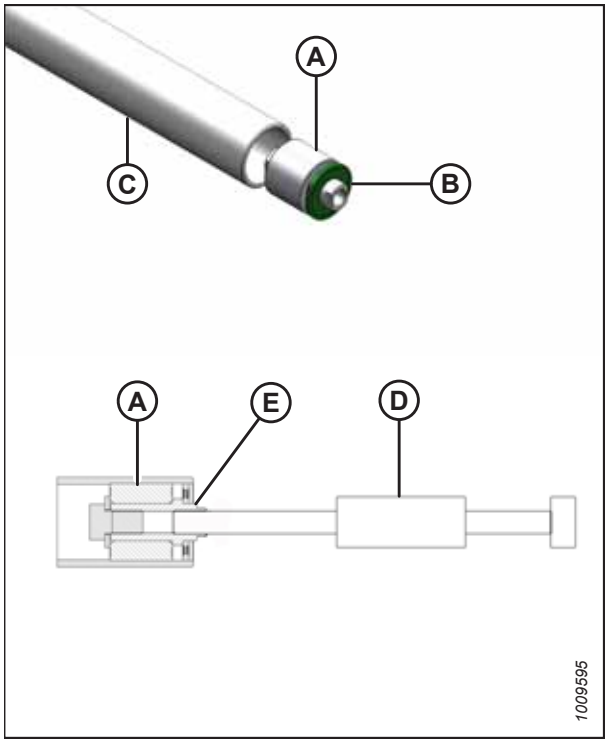


Figure 4.267: Roller Bearing

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.

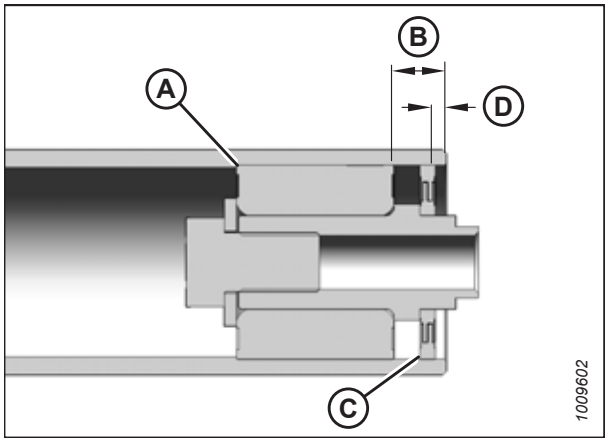


Figure 4.268: Roller Bearing

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).

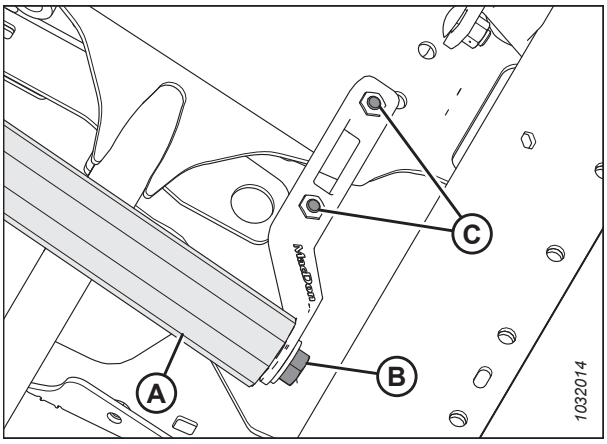


Figure 4.269: Drive Roller

6. Secure the motor to the roller support with two bolts (B). Torque the bolts to 27 Nm (239 lbf·in).
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.

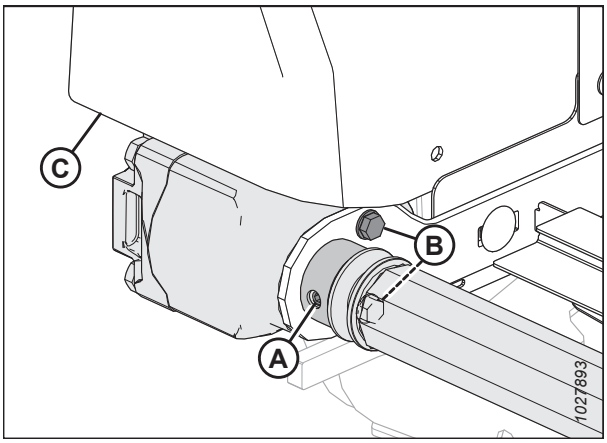


Figure 4.270: Drive Roller

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.

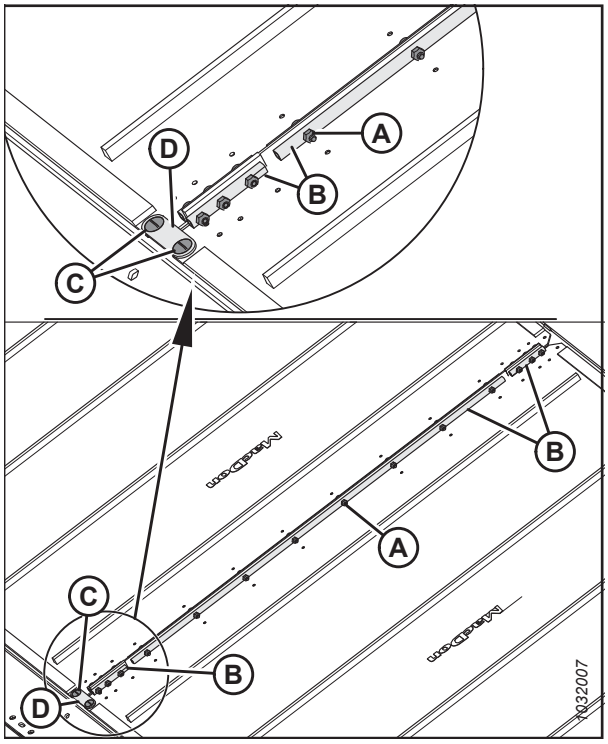


Figure 4.271: Draper Connector

11. Tighten the draper by turning adjuster bolt (A) clockwise. For instructions, refer to *4.12.4 Adjusting Side Draper Tension, page 375*.

12. Disengage the reel and header safety props. For instructions, refer to *Disengaging Reel Safety Props, page 38*.

DANGER

Ensure 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 377*.

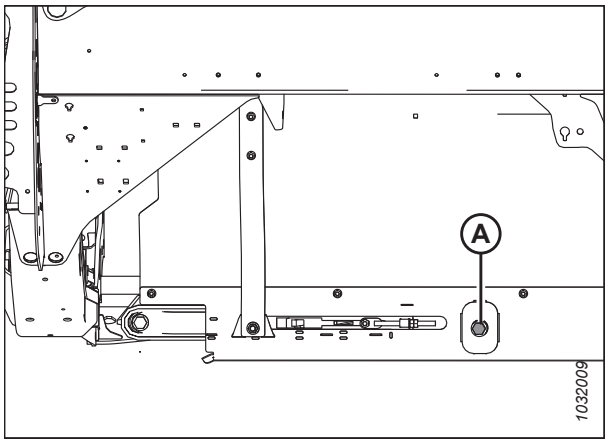


Figure 4.272: Draper Tensioner – Left Side Shown

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 the machine or opening the drive covers, refer to *4.1 Preparing Machine for Servicing, page 241*.

4.13.1 Reel-to-Cutterbar Clearance

There must be sufficient clearance between the reel fingers and the cutterbar to ensure 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 the header can be operated.

Measure clearance (A) between the tip of the reel finger and the guard: guard (B) or short guard (C), depending on the configuration of the header. Compare the measurement to the specifications listed in the table below:

Finger to Guard/Cutterbar Clearance – Single Reel

Header	End Panels
D225	25 mm (1 in.)

Finger to Guard/Cutterbar Clearance – Double Reel

Header	End Panels	Beside Center Arm
D230 D235 D241 D245	20 mm (0.80 in.)	20 mm (0.80 in.)

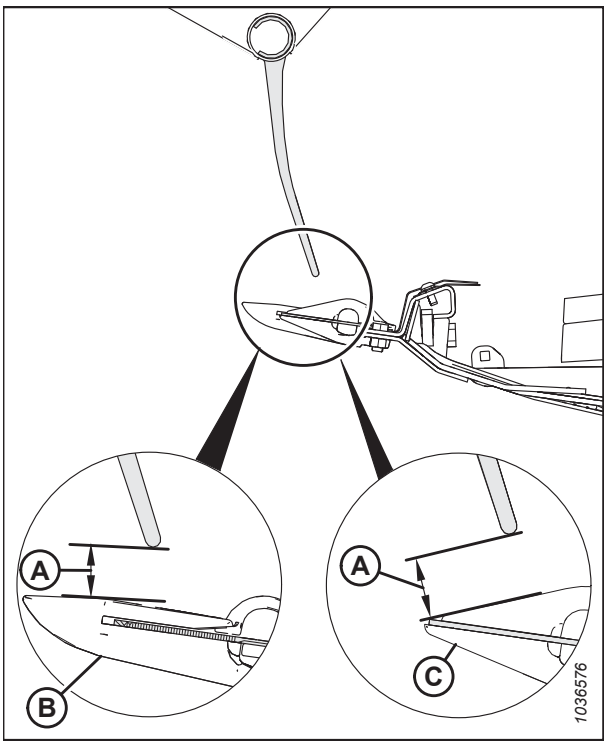


Figure 4.273: Finger Clearance

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

Ensure 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. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.
4. Adjust the reel fore-aft position until sensor support (B) hides the number seven on fore-aft indicator (A).
5. Shut down the engine, and remove the key from the ignition.

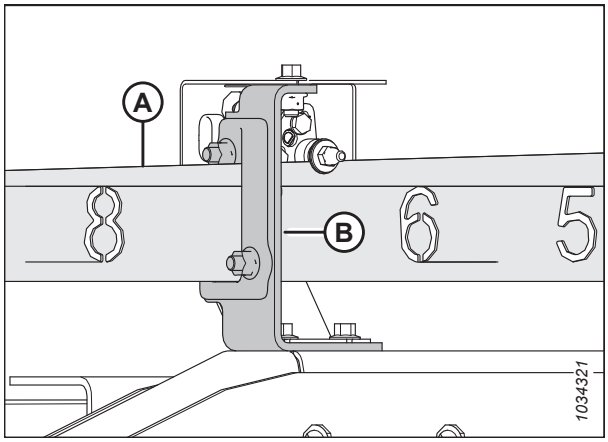


Figure 4.274: Fore-Aft Position

6. Rotate the reel by hand until a tine tube is directly above the cutterbar.
7. Measure and record clearance (A) from the finger tip to the top of pointed guard (B), or short guard (C). For clearance specifications, refer to *4.13.1 Reel-to-Cutterbar Clearance, page 389*.

   For measurement locations, refer to:

   - Figure *4.276, page 391* – single reel
   - Figure *4.277, page 391* – double reel
8. Adjust the reel clearance, if required. For instructions, refer to *Adjusting Reel-to-Cutterbar Clearance, page 391*.

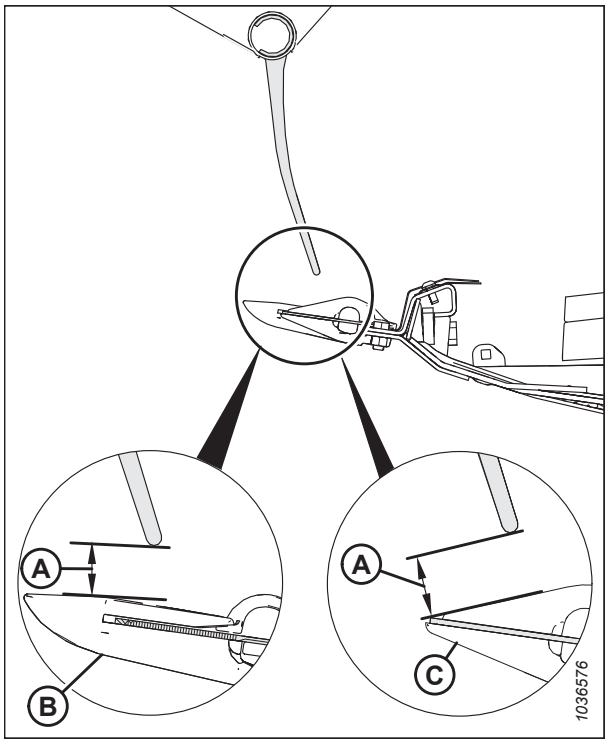


Figure 4.275: Measurement from Finger Tip to Guard

Single-reel measurement locations (A): Outer ends of the reel (two places).

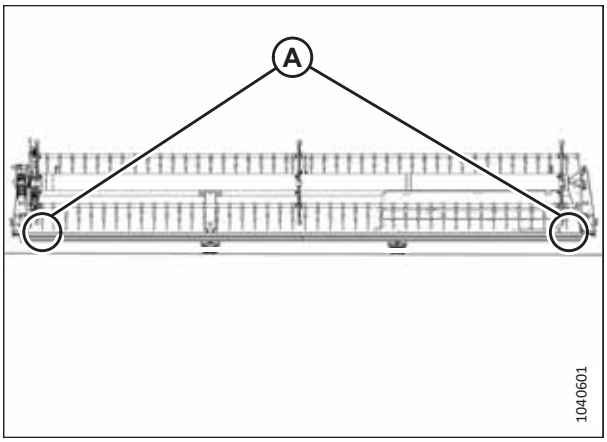


Figure 4.276: Single-Reel Measurement Locations

Double-reel measurement location (A): Both ends of both reels (four places).

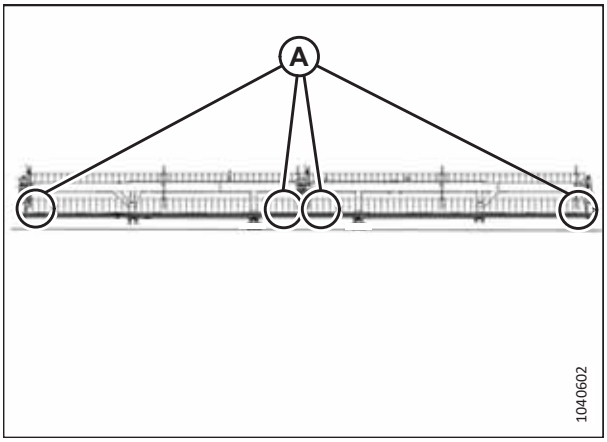


Figure 4.277: Double-Reel Measurement Locations

Adjusting Reel-to-Cutterbar Clearance

If the clearance between the reel fingers and the cutterbar is insufficient, it will need to be adjusted so that damage to the equipment does not occur.

NOTE:

This procedure can be performed with the reel fore-aft cylinders in either the standard position or the canola-harvesting position, as long as the fore-aft cylinders remain in that position for the duration of the procedure.

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

Ensure that all bystanders have cleared the area.

1. Measure the reel-to-cutterbar clearance. For instructions, refer to *Measuring Reel Clearance, page 389*.
2. Start the engine.

3. Adjust the reel fore-aft position until the **7** on fore-aft indicator (A) is hidden by sensor support (B).

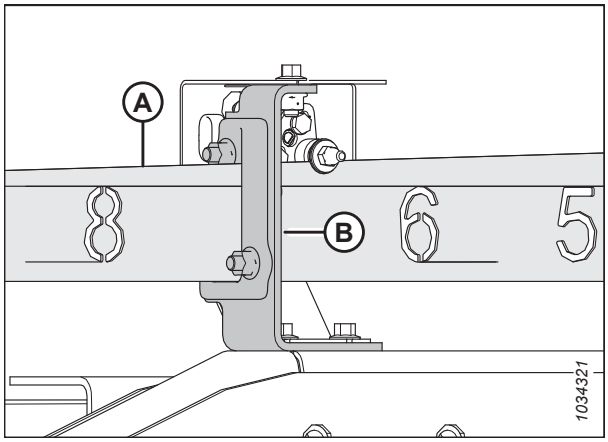


Figure 4.278: Fore-Aft Position

4. Position the header so that the cutterbar is 254–356 mm (10–14 in.) off the ground.
5. Lower the reel fully, and continue holding the control button down to phase the cylinders.
6. Shut down the engine, and remove the key from the ignition.
7. 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 needed:
      - To increase the clearance between the reel fingers and the cutterbar, turn cylinder rod (B) out of the clevis.
      - To decrease the clearance between the reel fingers and the cutterbar, turn cylinder rod (B) into the clevis.
   c. Tighten bolt (A).
8. Repeat Step *7, page 392* on the opposite side of the header.

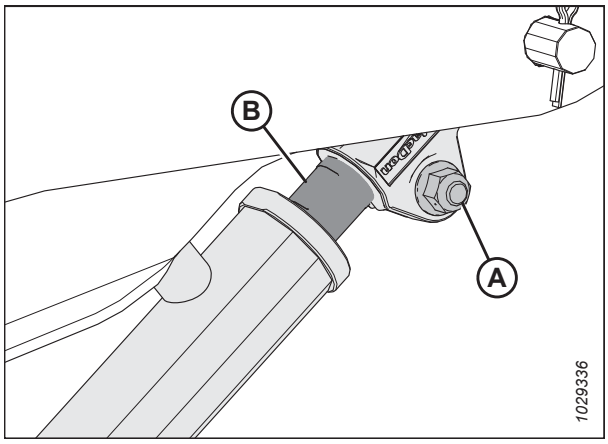


Figure 4.279: Outside Arm Cylinder

9. Loosen bolts (A) on both center arm cylinders.

10. Adjust the clearance as follows:

    IMPORTANT:

    Adjust both cylinder rods equally.

    - To increase the clearance between the reel fingers and the cutterbar, turn cylinder rods (D) out of the clevis.
    - To decrease the clearance between the reel fingers and the cutterbar, turn cylinder rods (D) into the clevis.

11. Ensure that distance measurement (B) is identical on both cylinders.

    NOTE:

    Distance measurement (B) runs from the center of mounting pins (C) to the tops of the notches in cylinder rods (D).

12. Ensure that both mounting pins (C) are **NOT** able to be rotated by hand. If one of the mounting pins is can be rotated, adjust cylinder rods (D) as needed:

    - 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.

13. Tighten bolts (A).

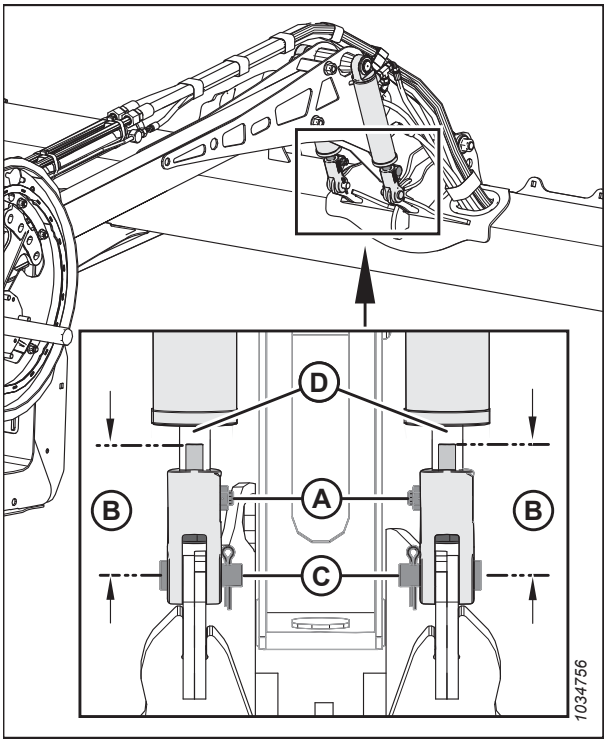


Figure 4.280: Center Arm Cylinders

DANGER

Ensure that all bystanders have cleared the area.

14. Start the engine.

15. Raise the reel fully.

16. Lower the reel fully, and continue holding the control button down to phase the cylinders.

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

18. Check the reel-to-cutterbar clearance measurements again. If necessary, repeat the adjustment procedures.

19. Move the reel back to ensure that the steel end fingers do not contact the deflector shields.

20. If the reel fingers contact the deflector shields, adjust the reel upward to maintain the clearance at all reel fore-aft positions. If contact still occurs after the reel is adjusted, trim the steel end fingers as needed.

21. Periodically check for evidence of contact during operation. Adjust the reel-to-cutterbar clearance as needed.

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 from the ignition 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.

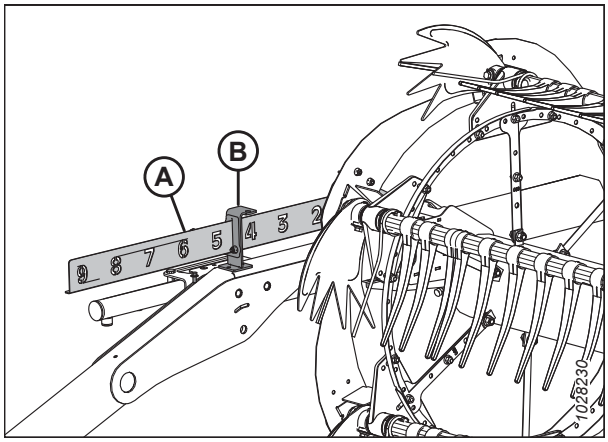


Figure 4.281: Fore-Aft Position Indicator

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.

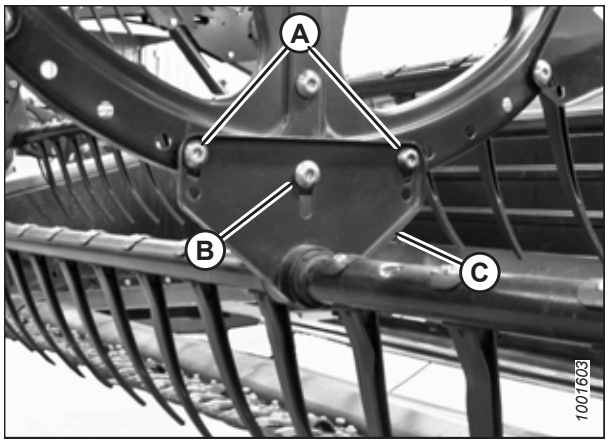


Figure 4.282: Center Reel Disc

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. Start the engine.
2. Lower the reel fully.
3. Lower the header fully.
4. Shut down the engine, and remove the key from the ignition.

Single-reel headers

5. Loosen bolt (A) on brace (B) at both ends of the reel.
6. Move the forward end of reel support arm (C) laterally as needed to center the reel.
7. Tighten bolts (A). Torque the bolts to 359 Nm (265 lbf·ft).

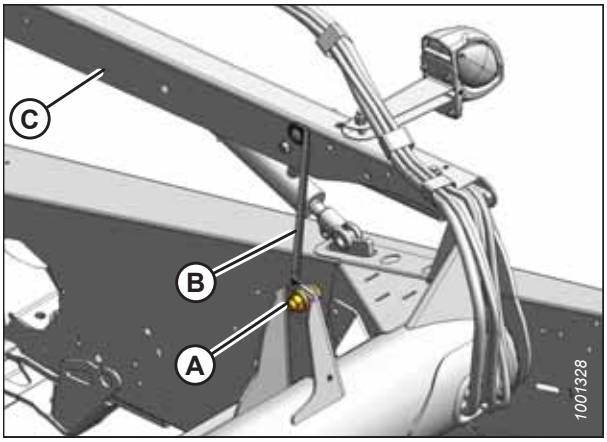


Figure 4.283: Reel Outboard Support Arm

Double-reel headers

8. 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.

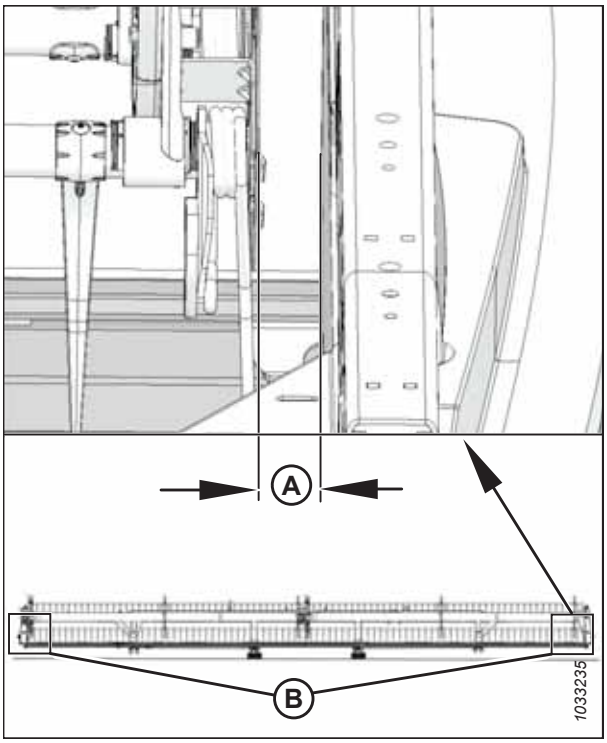


Figure 4.284: Centering Reel

9. Loosen bolt (A) on brace (B) at the center support arm.
10. Move the forward end of reel support arm (C) laterally as needed to center the reel.
11. Tighten bolt (A). Torque the bolt to 457 Nm (337 lbf·ft).

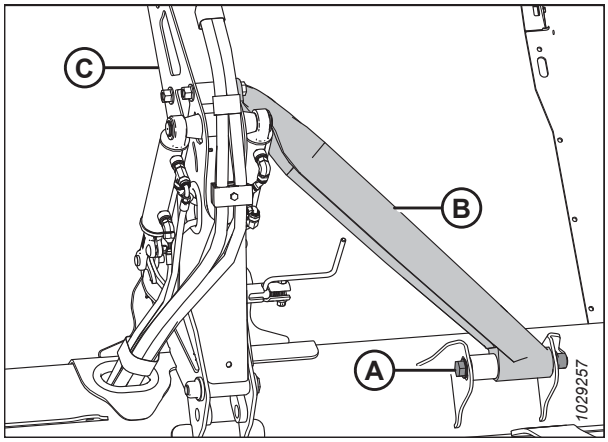


Figure 4.285: Double-Reel Center Support Arm

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.

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 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 37*.
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 400*.

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 397* (remove tine tube arms [B] from the tine tubes as necessary).

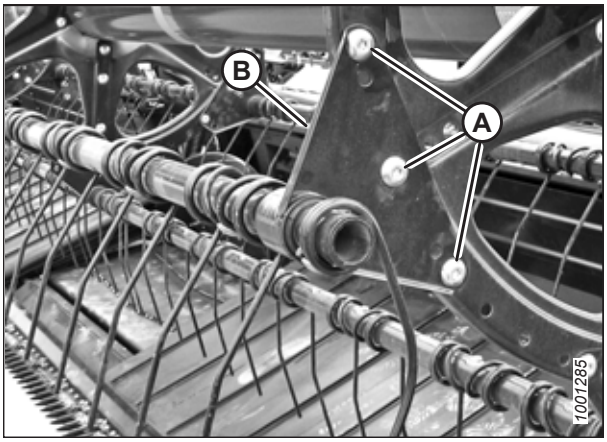


Figure 4.286: Tine Tube Arm

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 396*.

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 405*.
3. Attach the fingers to the tine tube with bolts and nuts (B).

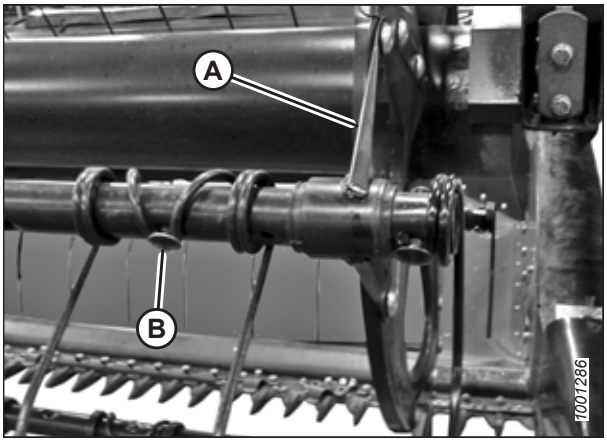


Figure 4.287: Tine Tube

Removing Plastic Fingers

Plastic reel fingers are secured to the tine tube with a single Torx® screw.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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.

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 37*.
5. Remove screw (A) using a Torx® Plus 27 IP socket wrench.

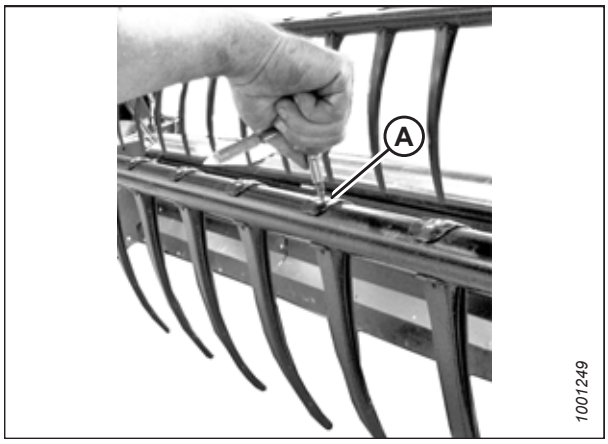


Figure 4.288: Removing Plastic Finger

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 398*.

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 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.

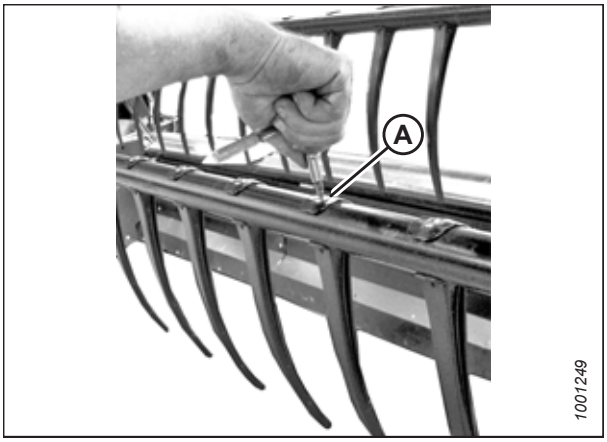


Figure 4.291: Installing Plastic Finger

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.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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.

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 37*.

   NOTE:

   If replacing only the cam end bushing, proceed to Step *10, page 401*.

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.

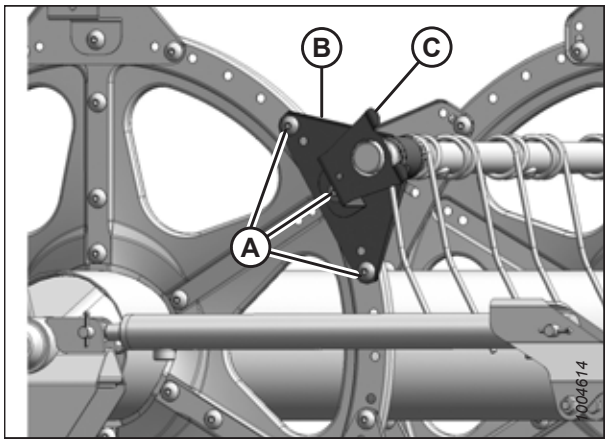


Figure 4.292: Tail End

7. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

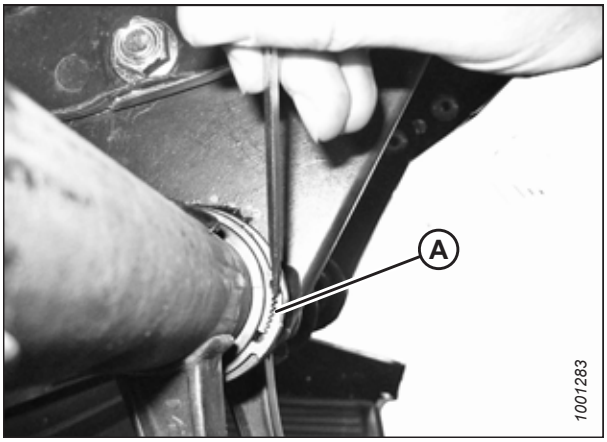


Figure 4.293: Bushing Clamp

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 necessary, remove the next finger, so that the arm can slide off of the bushing. Refer to the following procedures as needed:

   - *Removing Plastic Fingers, page 398*
   - *Removing Steel Fingers, page 396*

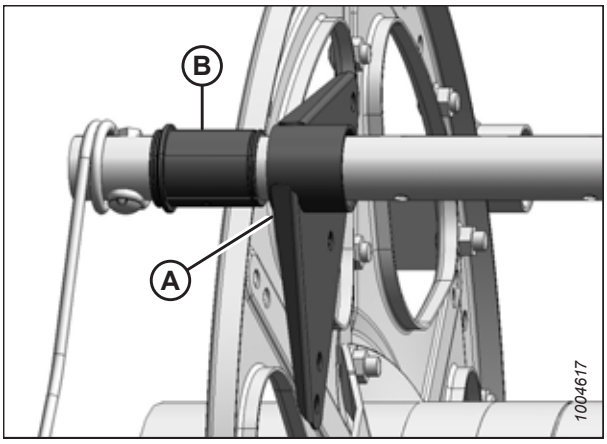


Figure 4.294: Bushing

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.

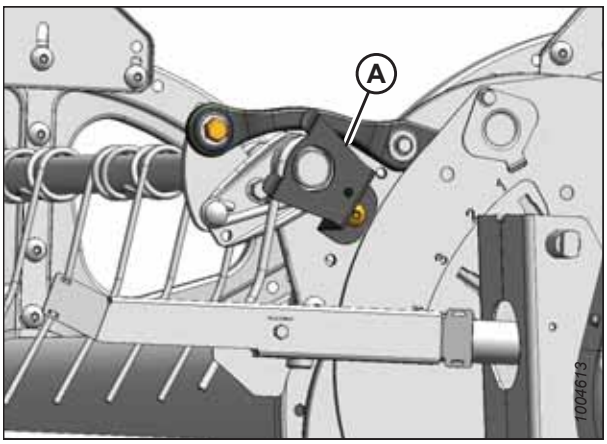


Figure 4.295: Cam End

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.

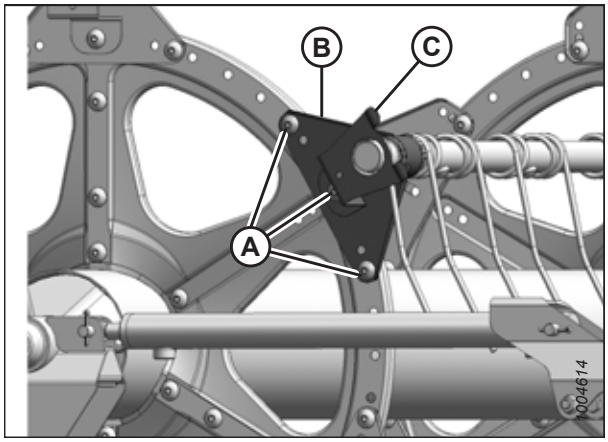


Figure 4.296: Tail End

Tine tube reinforcing kit

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.

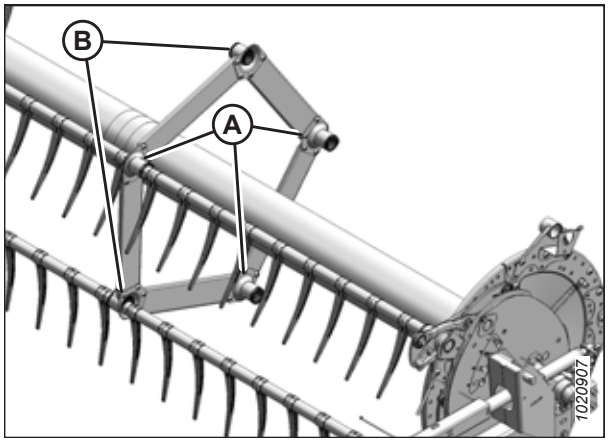


Figure 4.297: Tine Tube Supports

14. Remove bolt (A) from the cam linkage so tine tube (B) is free to rotate.

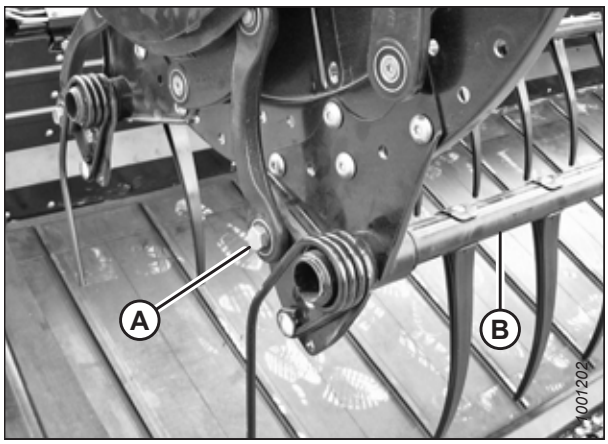


Figure 4.298: Cam End

15. Release bushing clamps (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamps off the bushings.

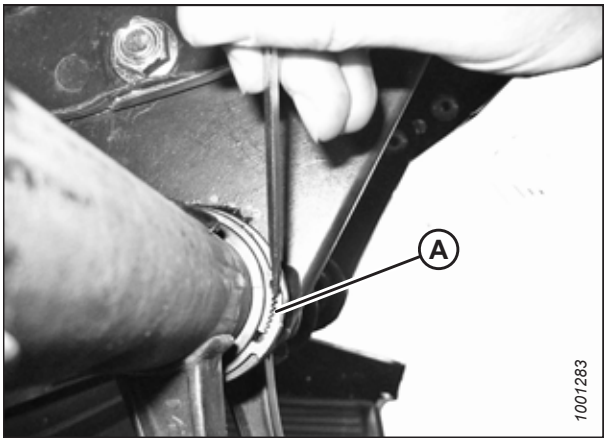


Figure 4.299: Bushing Clamp

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 398*
    - *Removing Steel Fingers, page 396*

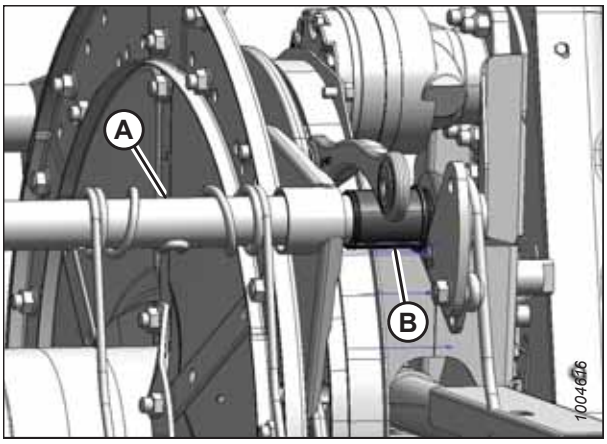


Figure 4.300: Cam End

Tine tube reinforcing kit bushings

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 398* or *Removing Steel Fingers, page 396*.

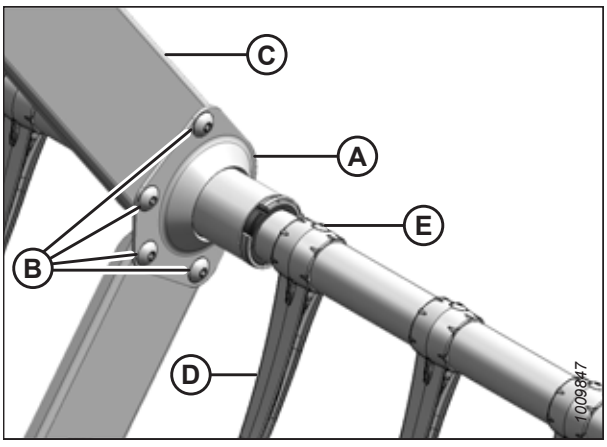


Figure 4.301: Tine Tube Support

21. Release bushing clamps (A) using a small screwdriver to separate the serrations.

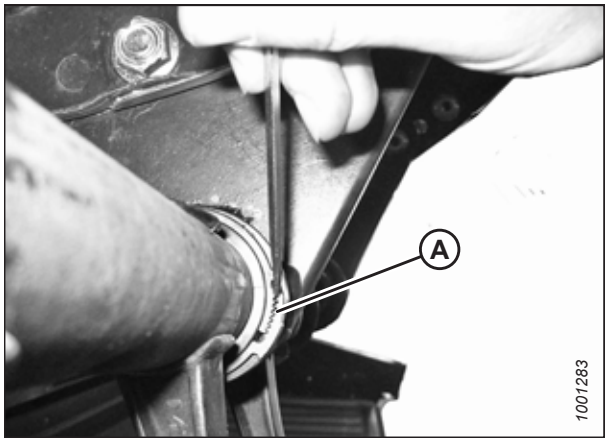


Figure 4.302: Bushing Clamp

22. Move clamps (A) off the bushings.

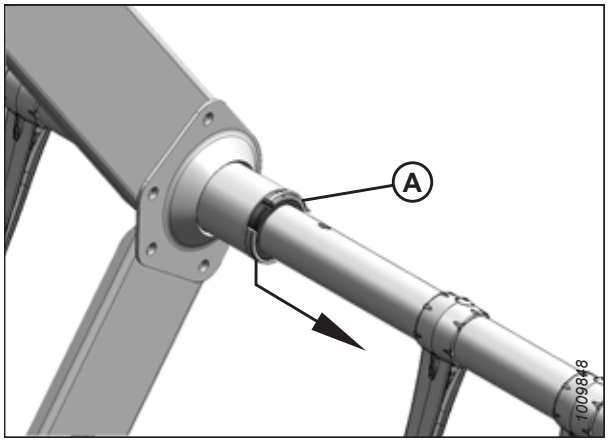


Figure 4.303: Tine Tube Reinforcing Kit Bushing Clamp

23. On each reel, there are three right-facing supports (A). Slide the support off bushing halves (B).

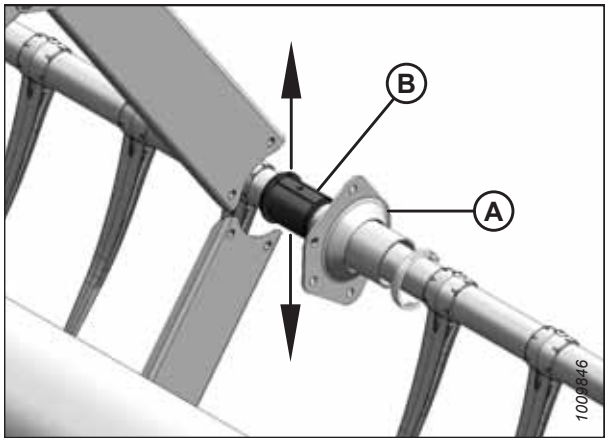


Figure 4.304: Tine Tube Reinforcing Kit Support

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.

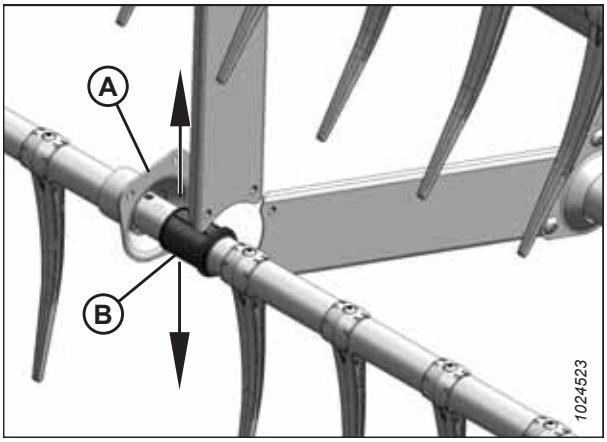


Figure 4.305: Tine Tube Reinforcing Kit Opposite Support

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 400* have been completed.

DANGER

To prevent bodily injury or death from the unexpected start-up of the machine, always stop the engine and remove the key from the ignition 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.

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.

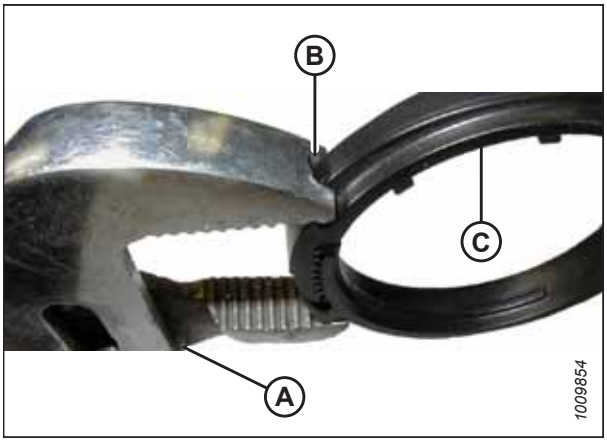


Figure 4.306: Modified Channel Lock Pliers

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 that the bushings at those locations slide into the support.

4. Reinstall the previously removed fingers. Refer to the following procedures as needed:

   - *Removing Plastic Fingers, page 398*
   - *Removing Steel Fingers, page 396*

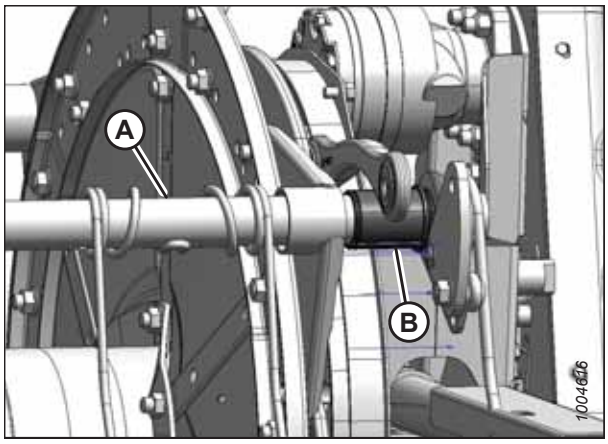


Figure 4.307: Cam End

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.

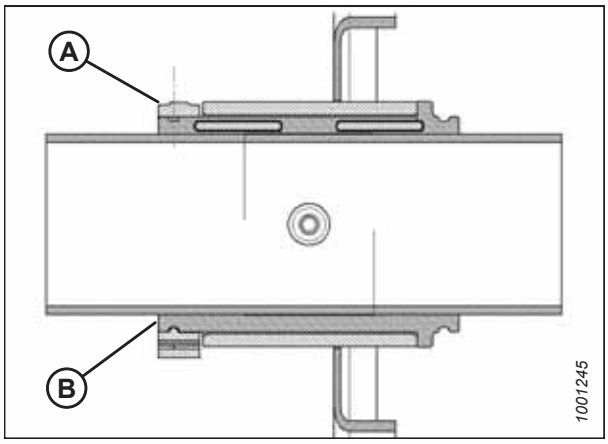


Figure 4.308: Bushing

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.

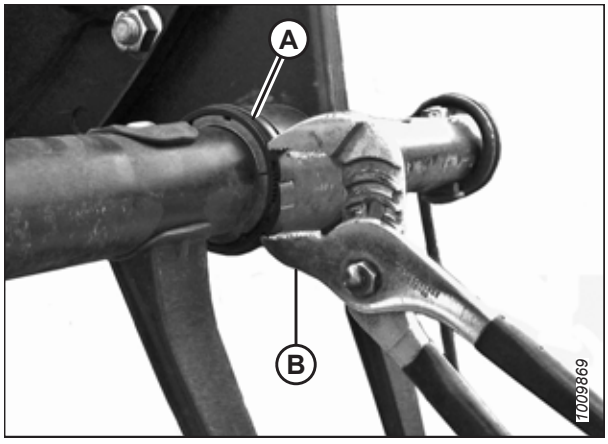


Figure 4.309: Installing Clamp

8. Line up tine tube (B) with the cam arm and install bolt (A). Torque the bolt to 165 Nm (120 lbf·ft).

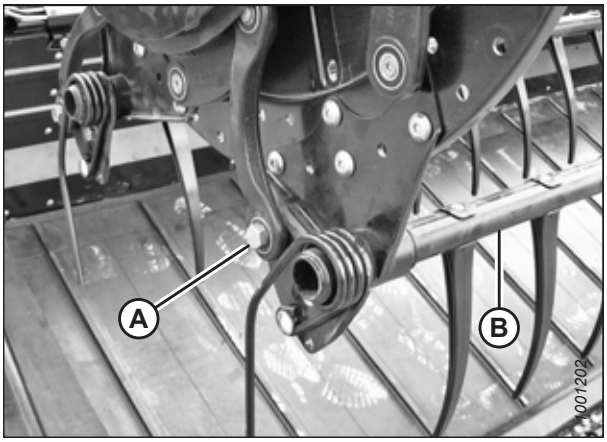


Figure 4.310: Cam End

9. Install bolts (A) securing tine tube arm (B) to the center disc.
10. Install tine tube arm (B) and endshield support (C) onto the tail end of the reel at the applicable tine tube location. Secure the support with bolts (A).

    NOTE:

    There are no endshields on the center discs.

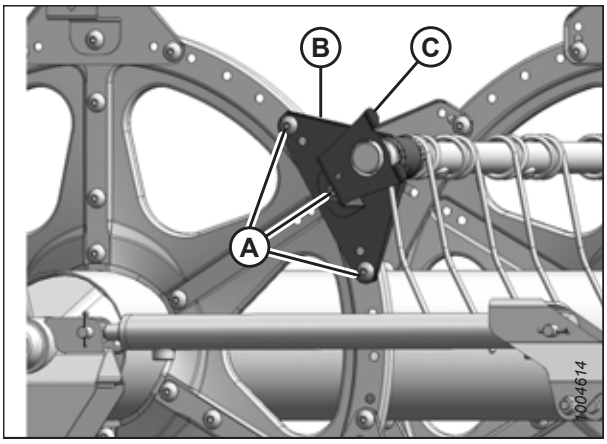


Figure 4.311: Tail End

11. Install endshield support (A) at the applicable tine tube location at the cam end of the reel.
12. Reinstall the reel endshields. For instructions, refer to *4.13.6 Reel Endshields, page 411*.

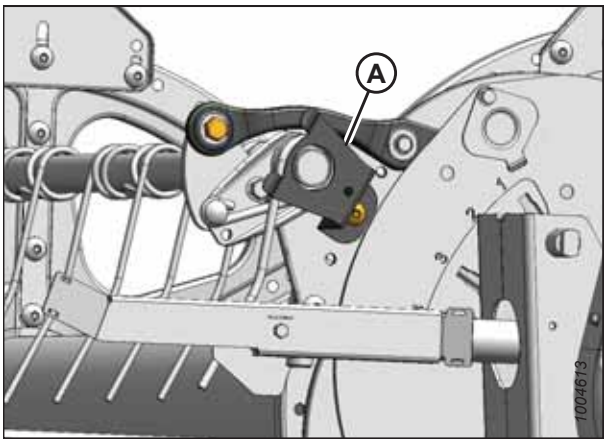


Figure 4.312: Cam End

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). Position the tine tube against the disc at its original location.
15. Reinstall the previously removed fingers. For instructions, refer to:
    - *Removing Plastic Fingers, page 398*
    - *Removing Steel Fingers, page 396*

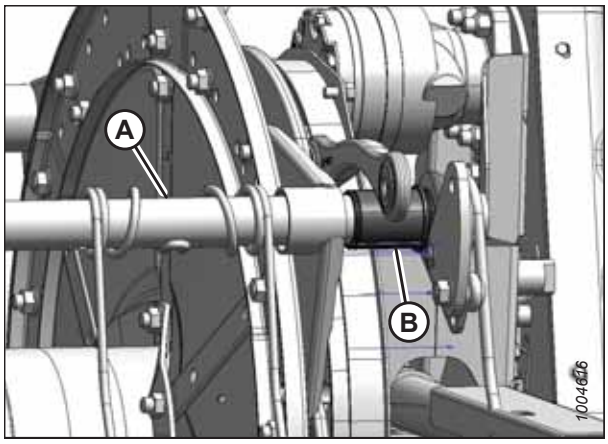


Figure 4.313: Cam End

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.

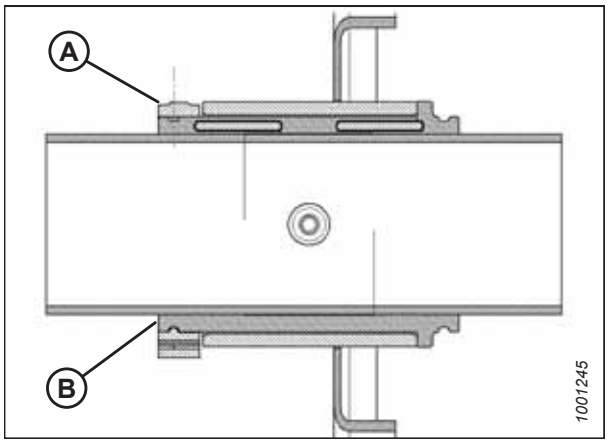


Figure 4.314: Bushing

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.

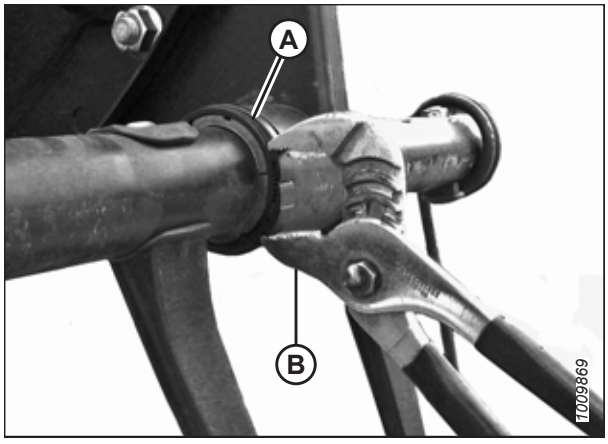


Figure 4.315: Installing Clamp

19. Install bolts (A) securing tine tube arm (B) to the center disc.

20. Install tine tube arm (B) and endshield support (C) onto the tail end of the reel at the applicable tine tube location. Secure the support with bolts (A).

    NOTE:

    There are no endshields on the center discs.

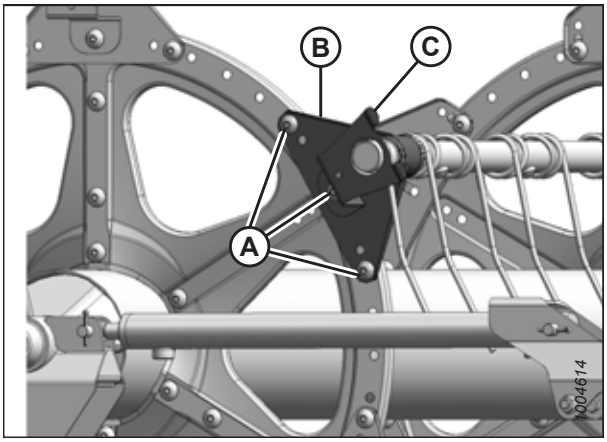


Figure 4.316: Tail End

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.

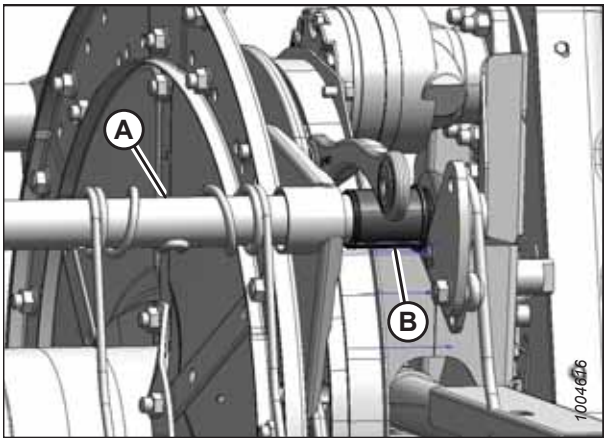


Figure 4.317: Cam End

22. On each reel, there are three right-facing supports (A). Slide the support onto bushing (B).

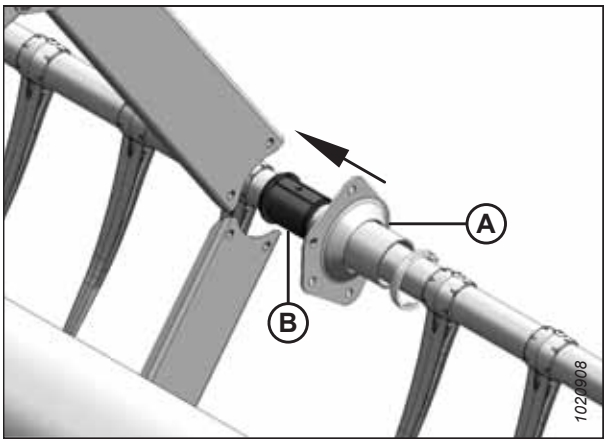


Figure 4.318: Tine Tube Reinforcing Kit Support – Option

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.

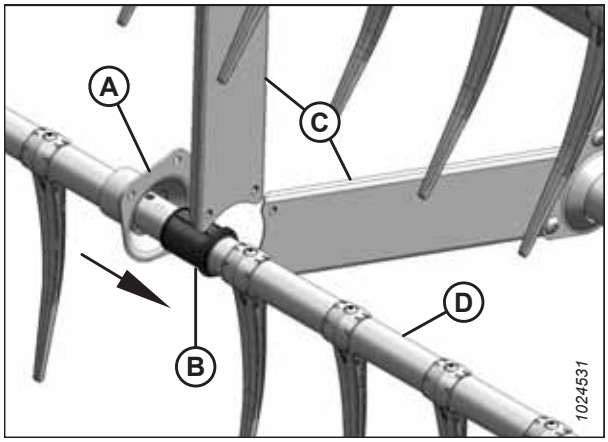


Figure 4.319: Tine Tube Reinforcing Kit Opposite Support – Option

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.

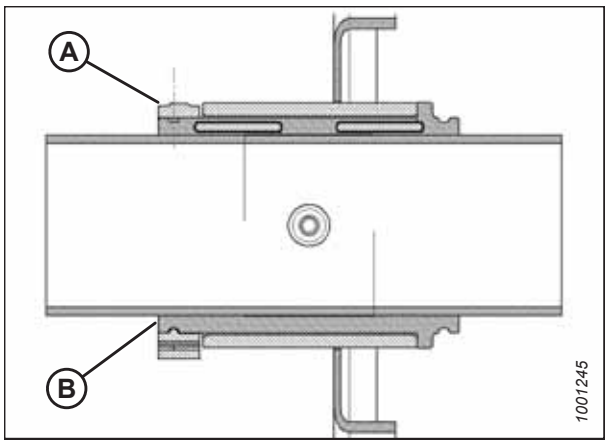


Figure 4.320: Bushing

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.

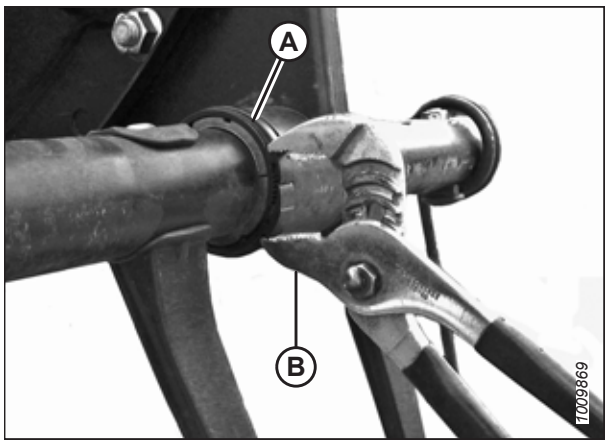


Figure 4.321: Installing Clamp

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 399*
    - *Installing Steel Fingers, page 397*

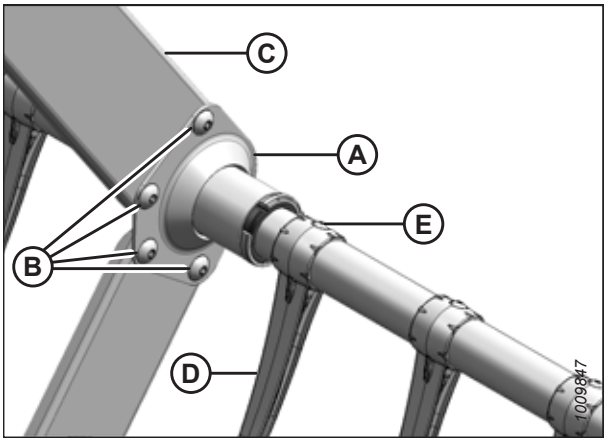


Figure 4.322: Tine Tube Reinforcing Kit Support – Option

29. Reattach channels (C) to two left-facing supports (A) on each reel with screws (B) and nuts. Torque the 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 399*
    - *Installing Steel Fingers, page 397*

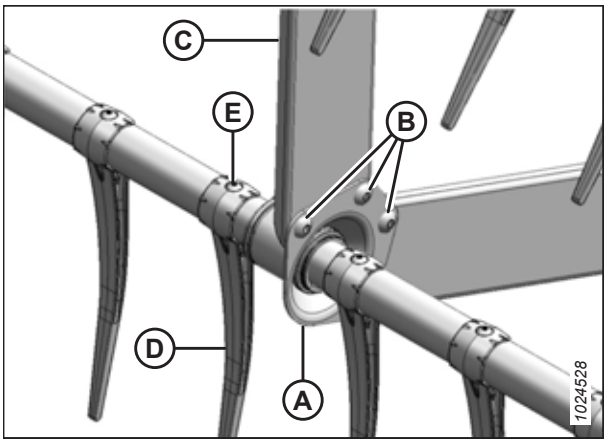


Figure 4.323: Tine Tube Reinforcing Kit Opposite Support – Option

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.

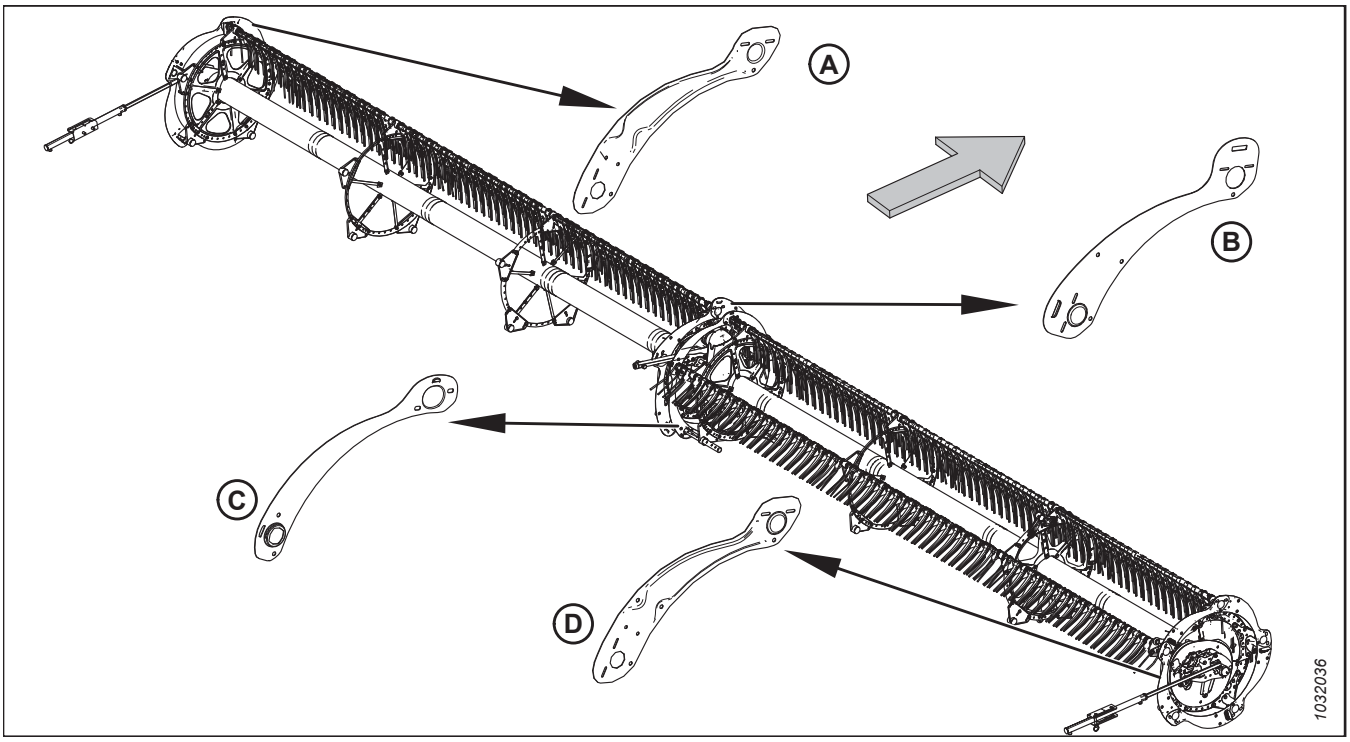


Figure 4.324: Reel Endshields

A - Tail End, Outboard (MAC311695)
B - Cam End, Inboard (MAC273823)
C - Tail End, Inboard (MAC311795)
D - Cam End, Outboard (MAC311694)

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, except where noted.

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 arrows in the illustrations in this procedure indicate the front of the header.

NOTE:

Retain all removed parts unless directed to do otherwise.

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

3. Rotate the reel manually until reel endshield requiring replacement (A) is accessible.
4. Remove three bolts (B).

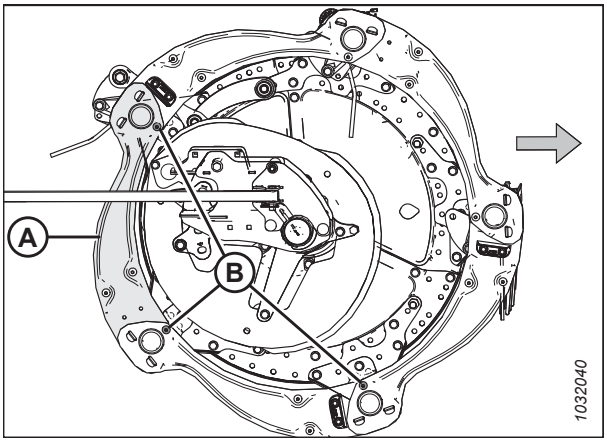


Figure 4.325: Reel Endshields – Outboard Cam End

5. Remove two screws and nuts (A). Remove the outboard cam deflector.
6. Lift the end of reel endshield (B) off of support (C).

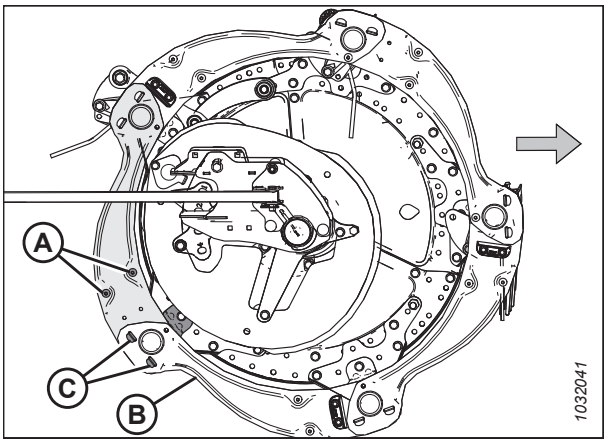


Figure 4.326: Reel Endshields – Outboard Cam End

7. Remove the reel endshield from supports (A).

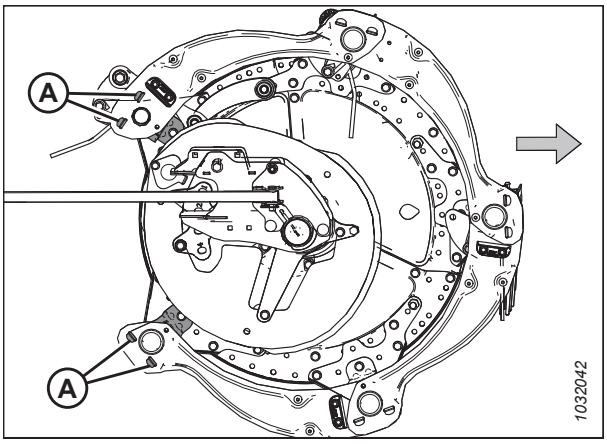


Figure 4.327: Reel Endshield Removed – Outboard Cam End

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), the outboard cam deflector, and the nuts (removed in Step *5, page 413*) on the new reel endshield.
13. Tighten all of the installed hardware.

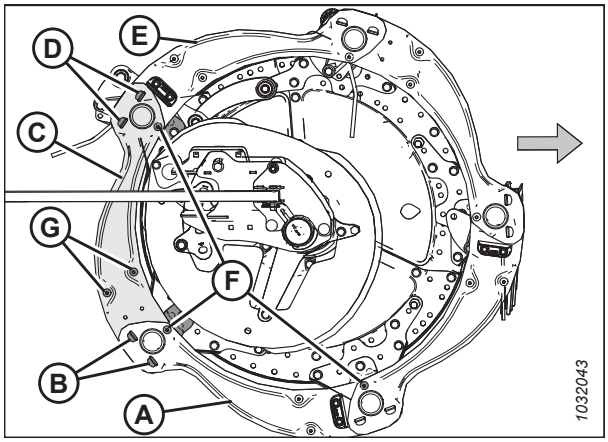


Figure 4.328: Reel Endshields – Outboard Cam End

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 412*.

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).

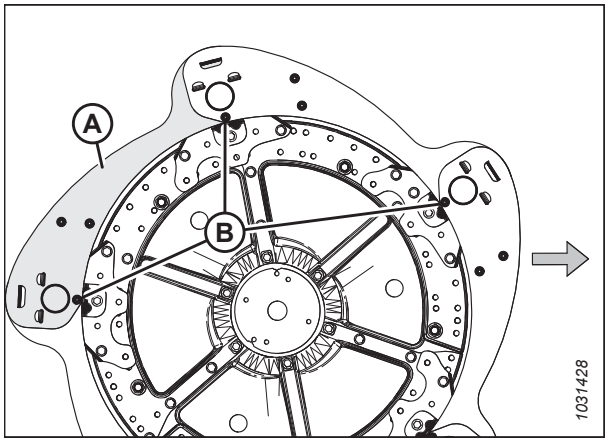


Figure 4.329: Reel Endshields – Inboard Cam End

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).

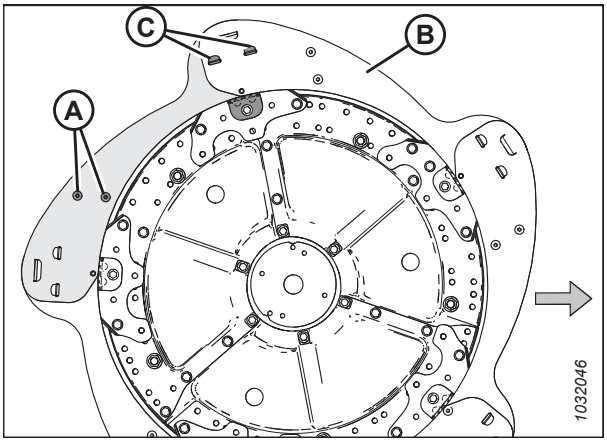


Figure 4.330: Reel Endshields – Inboard Cam End

8. Remove the reel endshield from supports (A).

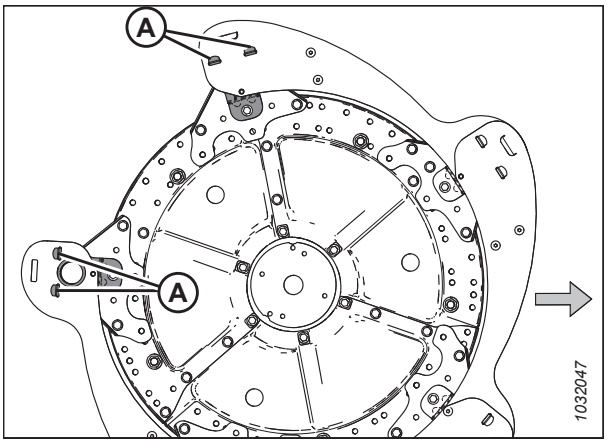


Figure 4.331: Reel Endshield Removed – Inboard Cam End

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 415*) on the new reel endshield.
14. Tighten all hardware.

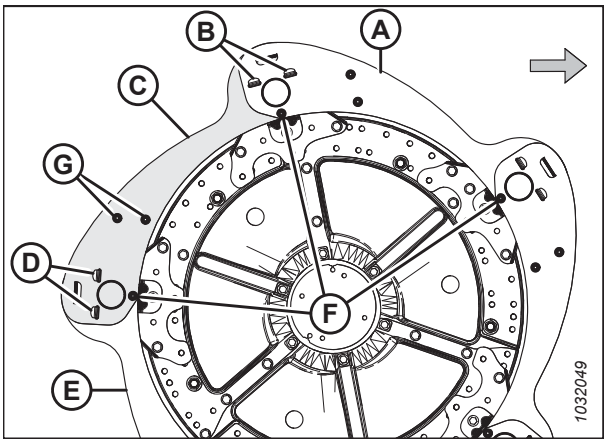


Figure 4.332: Reel Endshields – Inboard Cam End

Replacing Reel Endshields at Outboard Tail End

If the reel endshield is 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. 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).

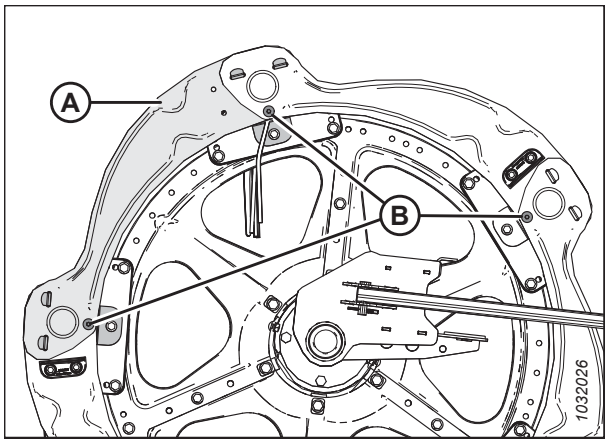


Figure 4.333: Reel Endshields – Outboard Tail End

6. Lift the end of reel endshield (A) off support (B).

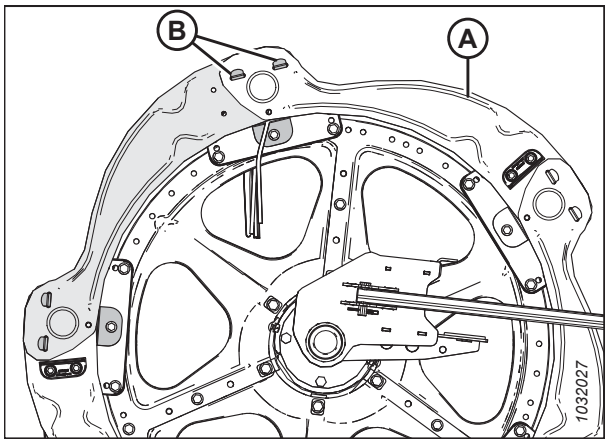


Figure 4.334: Reel Endshields – Outboard Tail End

7. Remove the reel endshield from supports (A).
8. Remove the reel paddle, if it is installed on the reel endshield.

   NOTE:

   Reel end paddles (B) are installed alternately on the reel endshields.

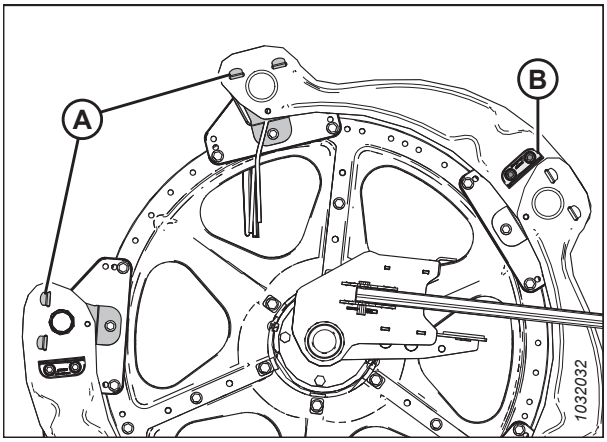


Figure 4.335: Reel Endshield Removed – Outboard Tail End

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) on other support (E) over the existing reel endshield.
12. Reinstall three bolts (D).
13. Reinstall the paddle (removed in Step *8, page 417*) onto the new reel endshield if previously installed.
14. Tighten all of the installed hardware.

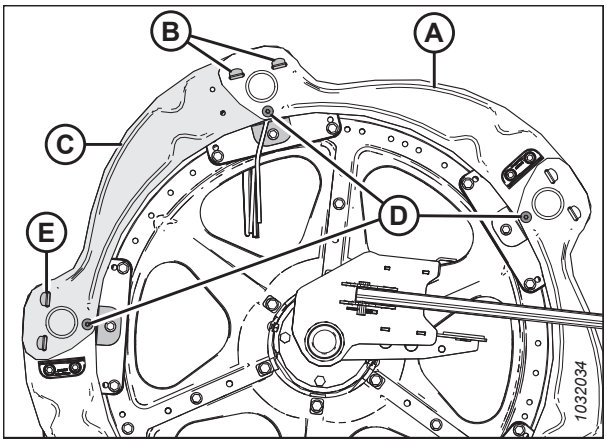


Figure 4.336: Reel Endshields – Outboard Tail End

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.

NOTE:

Retain all removed parts, unless directed to do otherwise.

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 and nuts (B).

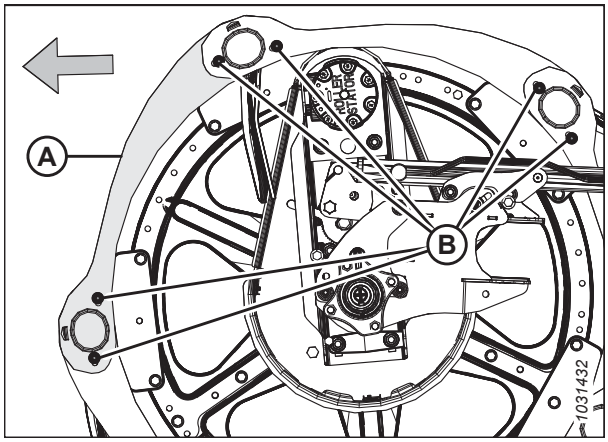


Figure 4.337: Reel Endshields – Inboard Tail End

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.

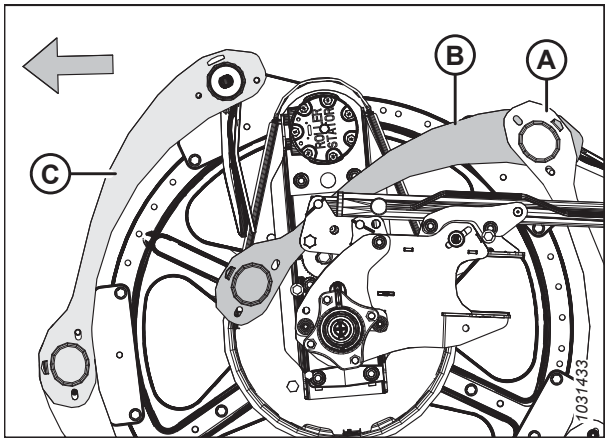


Figure 4.338: Reel Endshields – Inboard Tail End

8. Remove M10 bolt (A), nut (B), and end finger retainer (C) from the tine tube securing the bushing and tail end finger.
9. Remove endshield bushing (D).
10. Remove and discard damaged reel endshield (E).

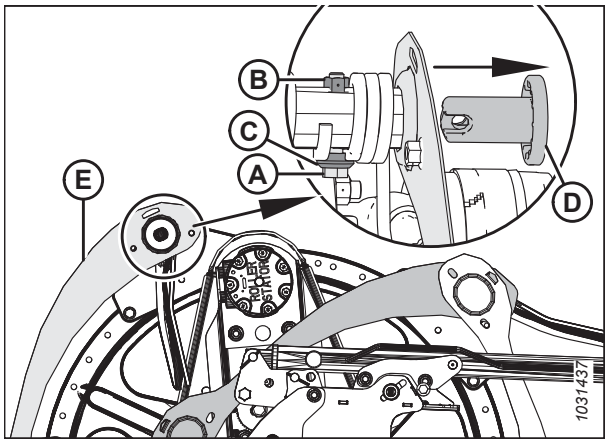


Figure 4.339: Reel Endshields – Inboard Tail End

11. Position new reel endshield (A) as shown. Insert the endshield tab into neighboring endshield (B).
12. Position the other end of new endshield (A) on the tine tube. Secure the endshield with bushing (C).

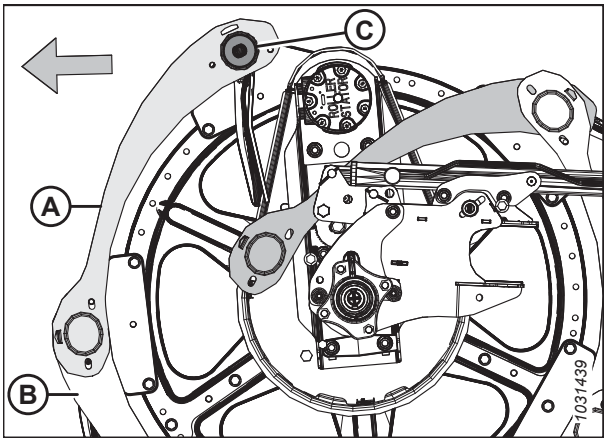


Figure 4.340: Reel Endshields – Inboard Tail End

13. Position tail end finger (A) as shown.
14. Secure tail end finger (A) and the bushing (installed in Step *12, page 419*) with M10 bolt (B), end finger retainer (C), and nut (D).

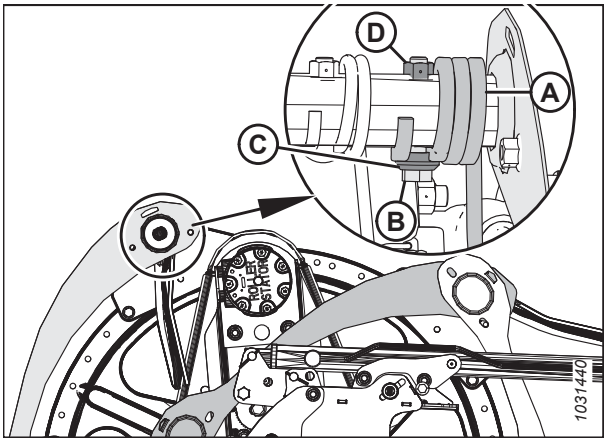


Figure 4.341: Reel Endshields – Inboard Tail End

15. Rotate reel endshield (A) upward. Engage tabs (B) on both ends.
16. Secure the reel endshields using six M10 screws and nuts (C).
17. Torque nuts (C) to 35 Nm (26 lbf·ft).

    IMPORTANT:

    Do **NOT** overtighten the nuts.

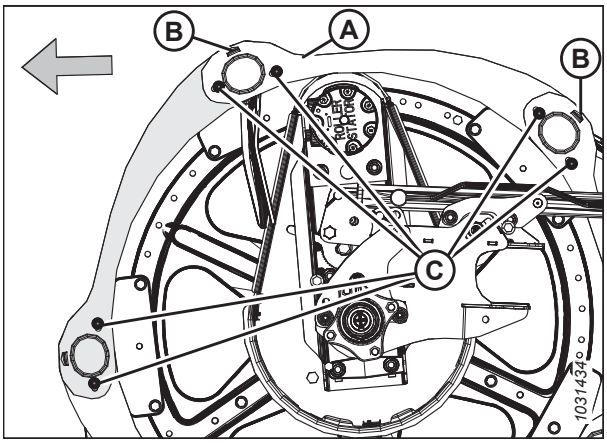


Figure 4.342: Reel Endshields – Inboard Tail End

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 the reel endshields to support (A).
6. Remove bolts (C) from support (A) and from the two adjacent supports.

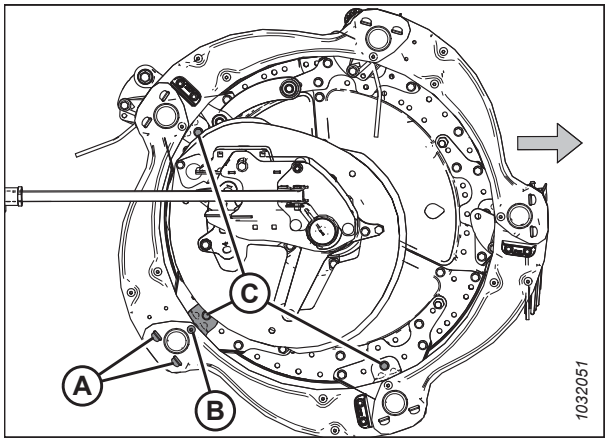


Figure 4.343: Reel Endshield Supports

7. Move reel endshields (A) and support (B) away from the tine tube. Remove the support from the endshields.
8. Insert the tabs of new support (B) into the slots in reel endshields (A). Ensure that the tabs engage both reel endshields.

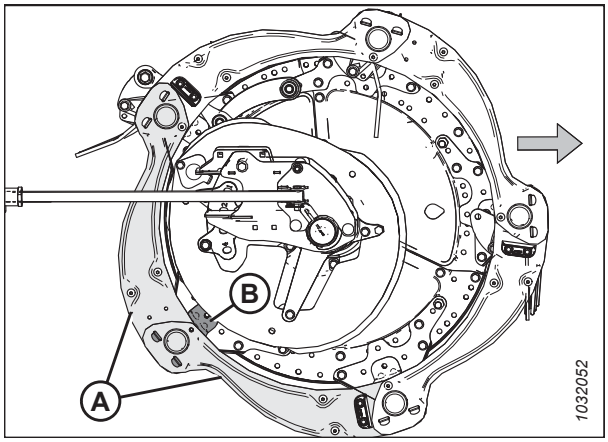


Figure 4.344: Reel Endshield Supports

9. Secure support (A) to the disc sector with bolt and nut (B). Do **NOT** tighten the hardware yet.
10. Secure reel endshields (C) to support (A) with bolt and nut (D). Do **NOT** tighten the hardware yet.
11. Reattach the other supports with bolts and nuts (E).
12. Ensure that there is adequate clearance between the tine tube and the reel endshield support.
13. Torque the nuts to 27 Nm (20 lbf·ft).

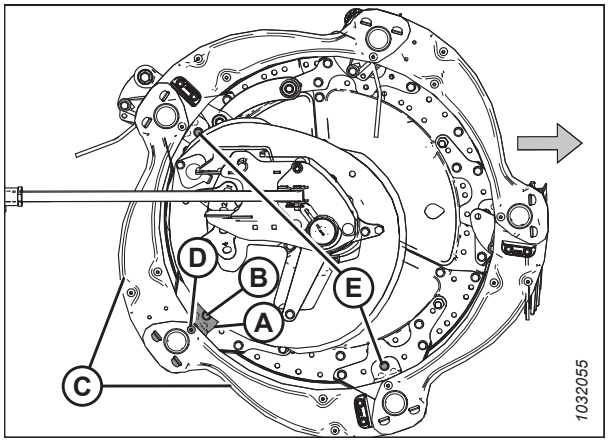


Figure 4.345: Reel Endshield Supports

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.

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 from the ignition 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 46*.
6. Open the endshield. For instructions, refer to *Opening Header Endshields, page 39*.
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.

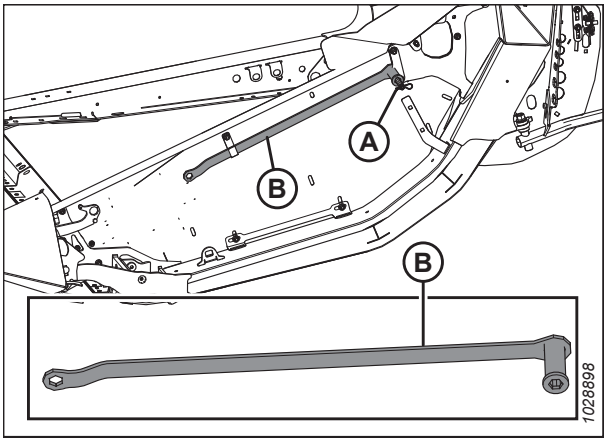


Figure 4.346: Multi-Tool Storage Location

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.

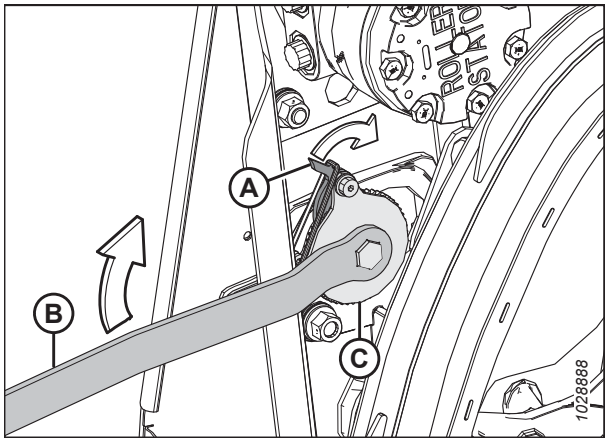


Figure 4.347: Reel Drive

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 from the ignition 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 39*.
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.

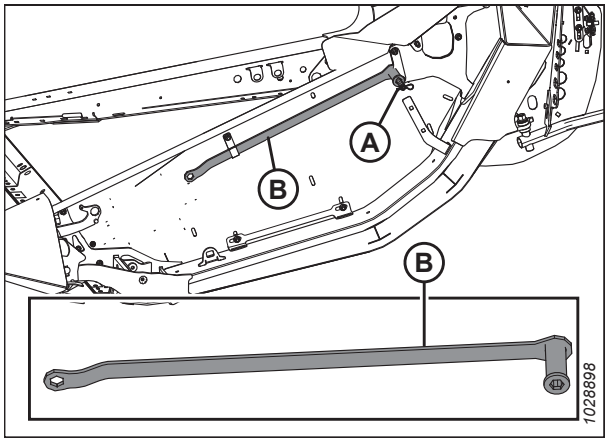


Figure 4.348: Multi-Tool Storage Location – Left Side

5. Place multi-tool (A) onto chain tensioner (B).

   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.

6. Rotate multi-tool (A) downward until the chain is tight.

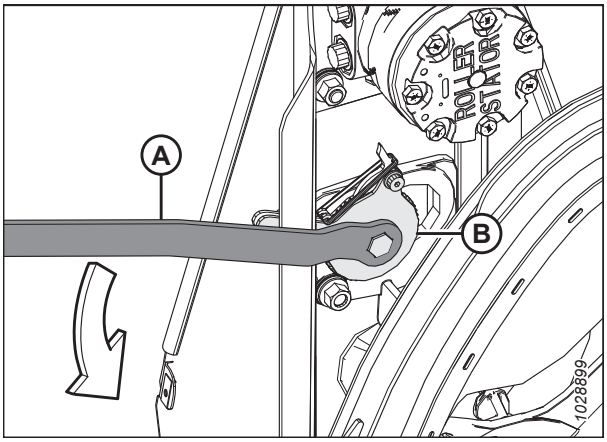


Figure 4.349: Reel Drive

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.

   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.

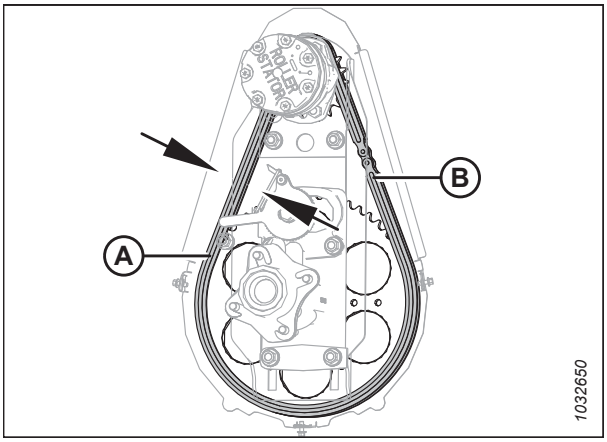


Figure 4.350: Reel Drive

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 40*.

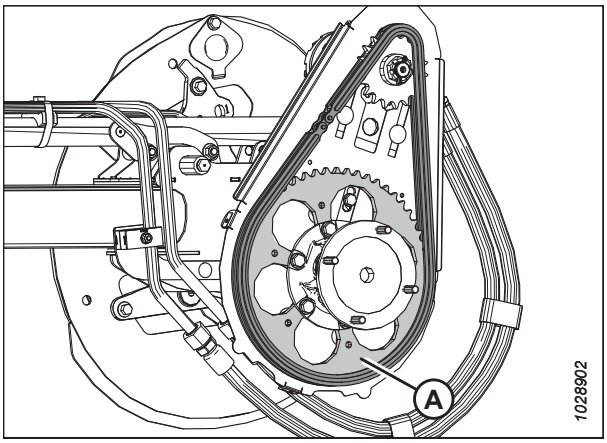


Figure 4.351: Reel Drive

4.14.2 Reel Drive Sprocket

The reel drive sprocket is attached to the reel drive motor.

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 46*.
3. Loosen reel drive chain (A). For instructions, refer to *Loosening Reel Drive Chain, page 421*.
4. Remove reel drive chain (A) from reel drive sprocket (B).

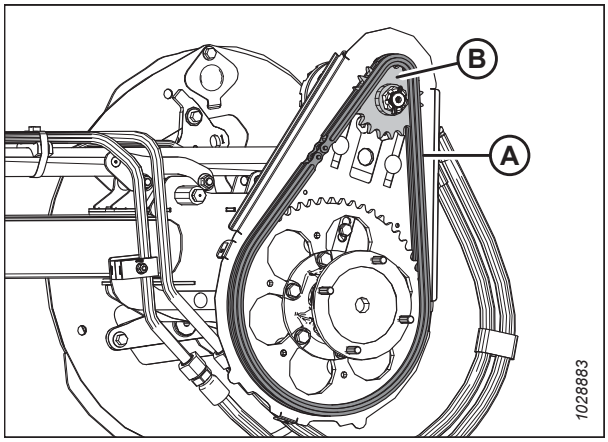


Figure 4.352: Single Sprocket

5. Remove the 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.

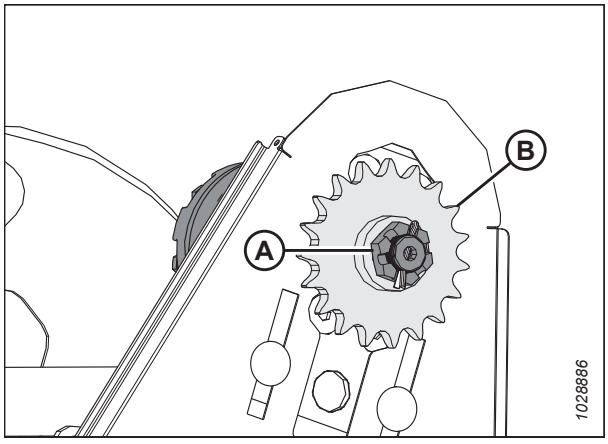


Figure 4.353: Single Sprocket

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 (106 lbf·in).
3. Install the cotter pin. If necessary, tighten slotted nut (A) to the next slot to install the cotter pin.

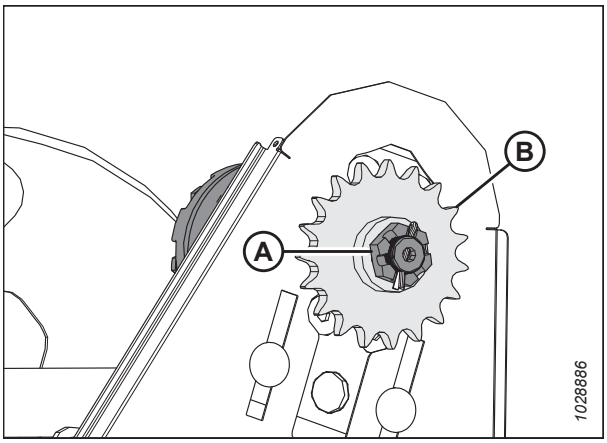


Figure 4.354: Single Sprocket

4. Install drive chain (A) onto drive sprocket (B).
5. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 422*.
6. Reinstall the reel drive cover. For instructions, refer to *Installing Reel Drive Cover, page 48*.

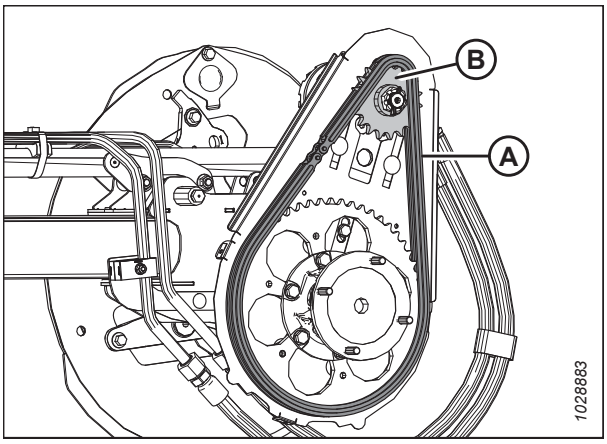


Figure 4.355: Single Sprocket

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 39*.
3. Loosen the reel drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 421*.

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.

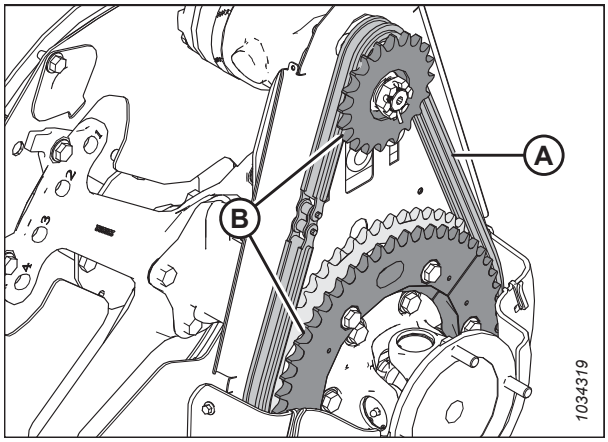


Figure 4.356: Reel Drive Sprocket

5. Tighten the reel drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 422*.

4.14.4 Double-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 248*.

Replace the U-joint if severely worn or damaged. For instructions, refer to *Removing Double-Reel Drive U-Joint, page 426*.

Removing Double-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 46*.
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.

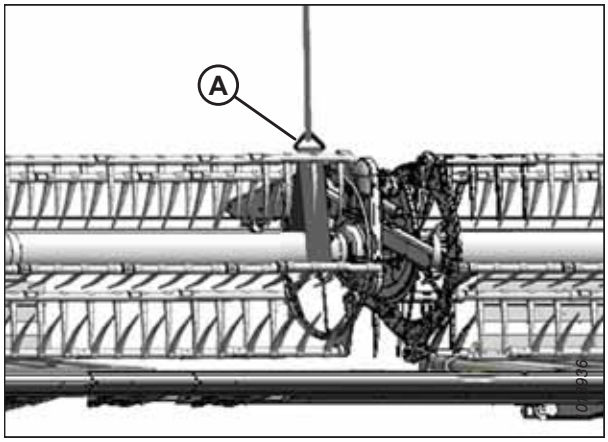


Figure 4.357: Supporting Reel

4. Remove four bolts (A) securing the reel tube to U-joint flange (B), and move the reel sideways.

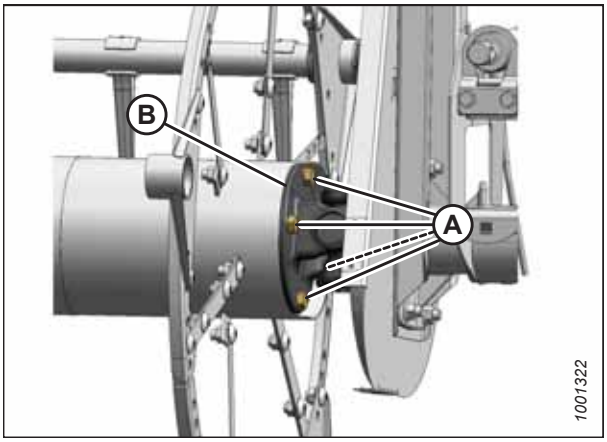


Figure 4.358: U-Joint

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.

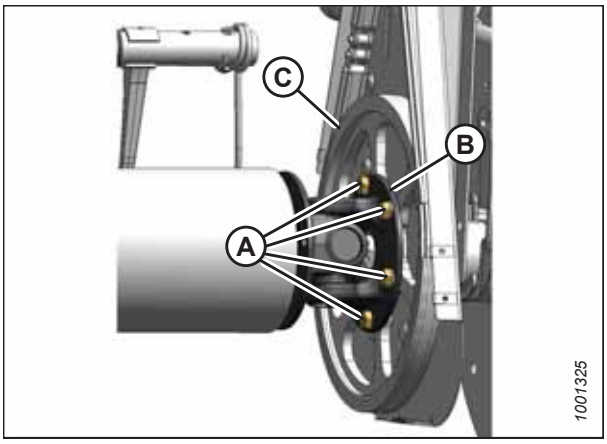


Figure 4.359: U-Joint

Installing Double-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.

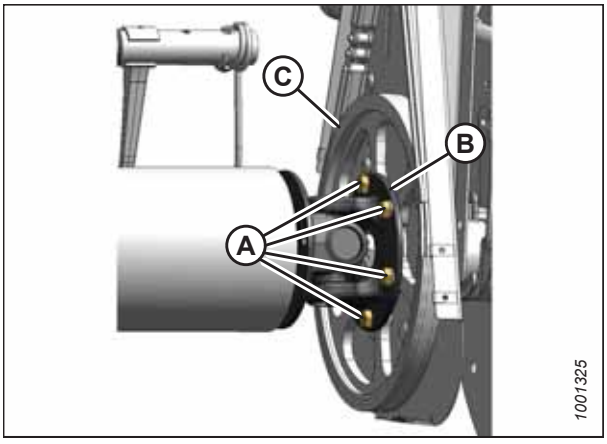


Figure 4.360: U-Joint

3. Position the reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
4. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
5. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to four 1/2 in. bolts (A). Install the bolts in the flange.
6. Torque the ten bolts to 110 Nm (81 lbf·ft).

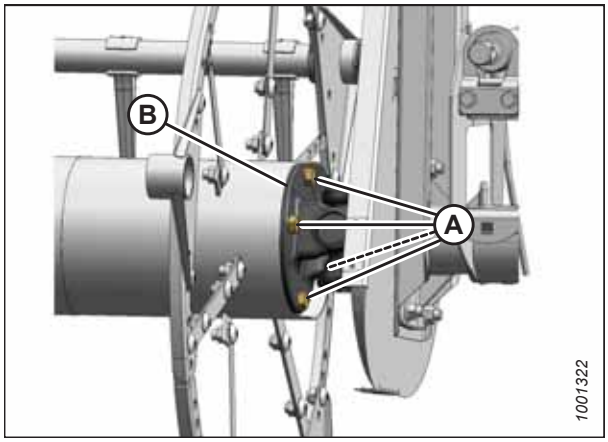


Figure 4.361: U-Joint

7. Remove sling (A) from the reel.
8. Install the drive cover. For instructions, refer to *Installing Reel Drive Cover, page 48*.

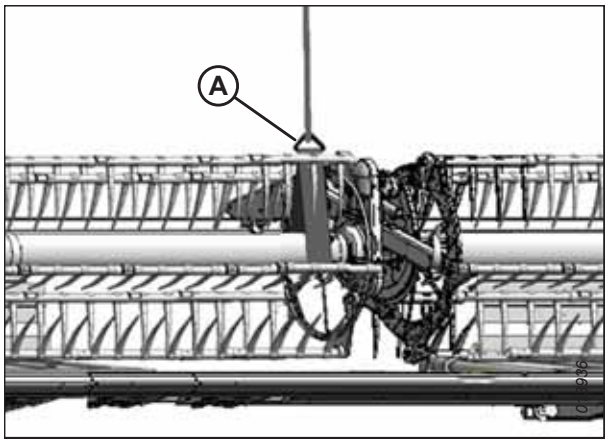


Figure 4.362: Supporting Reel

4.14.5 Reel Drive Motor

The reel drive motor is used on the reel drive system on double-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

Follow this procedure to remove the reel drive motor if it has an issue. 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 421*.
3. Remove the drive sprocket. For instructions, refer to *Removing Reel Drive Single Sprocket, page 424*.

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.

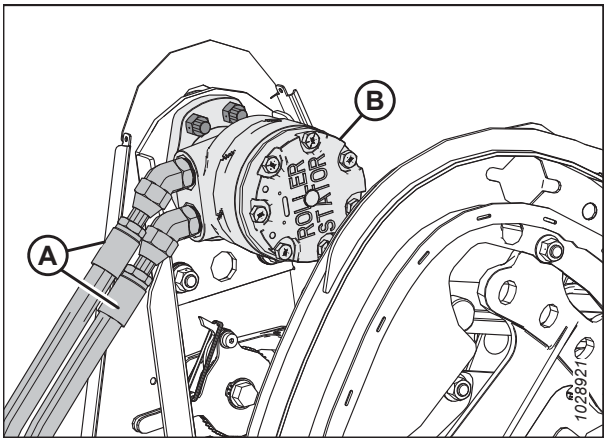


Figure 4.363: Reel Motor and Hoses

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.

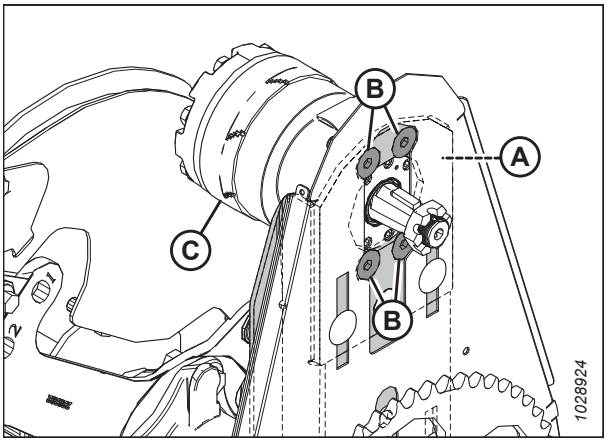


Figure 4.364: Reel Drive Motor Mounting Screws

Installing Reel Drive Motor

Follow this procedure to install the reel drive motor. If problems occur 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.

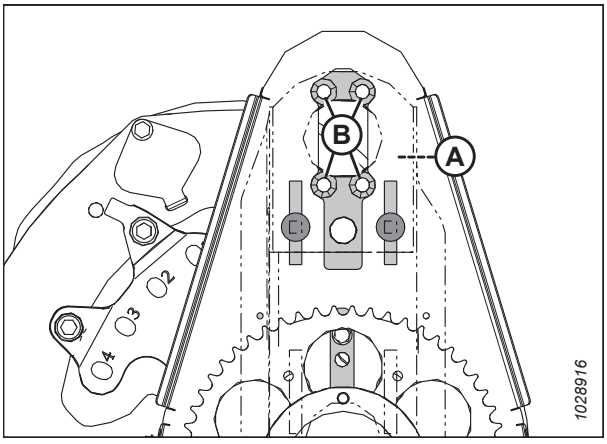


Figure 4.365: Reel Drive Motor Mounting Holes

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 a new motor is being installed, install the hydraulic fittings (not shown) from the original motor on the new motor.

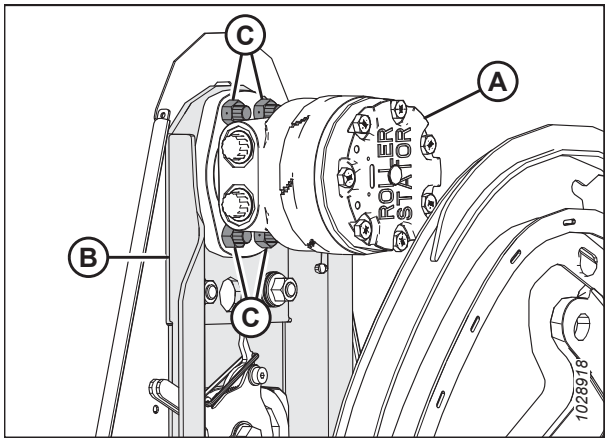


Figure 4.366: Reel Drive Motor

5. Align the keyway in sprocket (B) with the key on the motor shaft. Slide the sprocket onto the shaft. Secure it with slotted nut (A).
6. Torque slotted nut (A) to 12 Nm (106 lbf·in).
7. Install the cotter pin. If necessary, tighten castle nut (A) to the next slot to install the cotter pin.

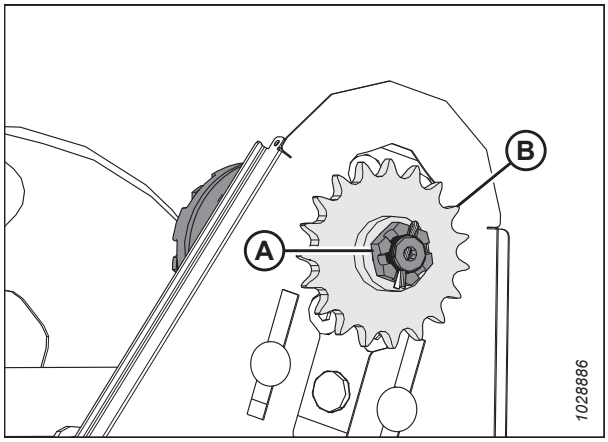


Figure 4.367: Reel Drive

8. Install drive chain (A) onto drive sprocket (B).

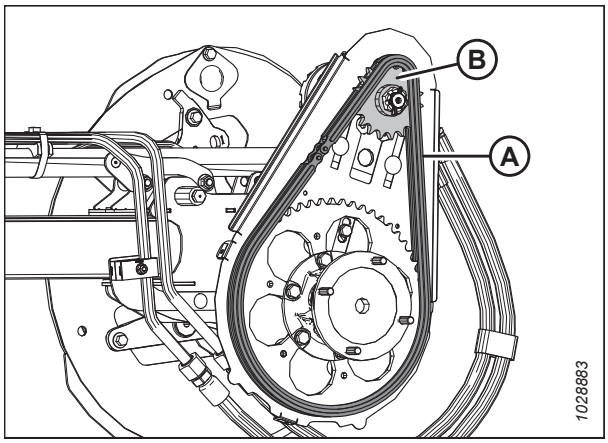


Figure 4.368: Reel Drive

9. If mounting hardware (A) was loosened for this procedure, ensure that there are three stacked Belleville washers installed as shown on each bolt (B).

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]).

12. Back each nut (A) off by 3/4 turn.

13. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 422*.

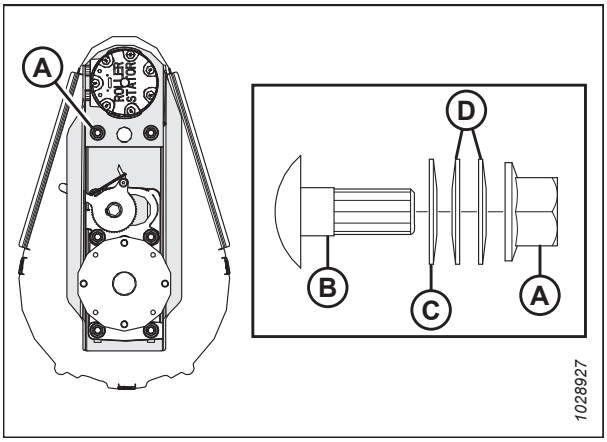


Figure 4.369: Reel Drive Motor Mount

14. Remove the caps or plugs from the ports and lines. Connect hydraulic lines (A) to hydraulic fittings (B) on motor (C).

    IMPORTANT:

    Ensure that hydraulic lines (A) are installed in their original locations.

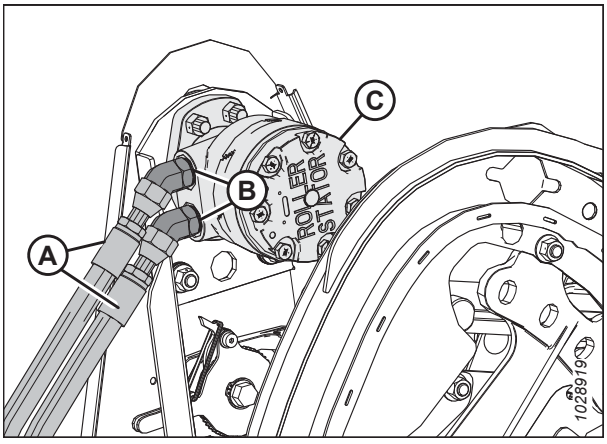


Figure 4.370: Reel Motor and Hoses

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 from the ignition 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 46*.

3. Loosen the drive chain. For instructions, refer to *Loosening Reel Drive Chain, page 421*.

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.

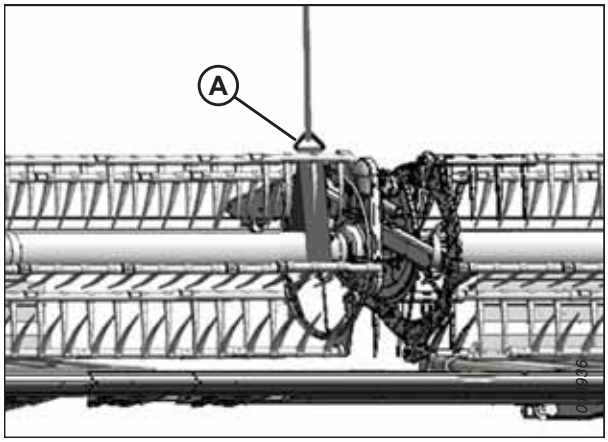


Figure 4.371: Supporting Reel

5. Remove four bolts (A) securing the reel tube to U-joint flange (B).

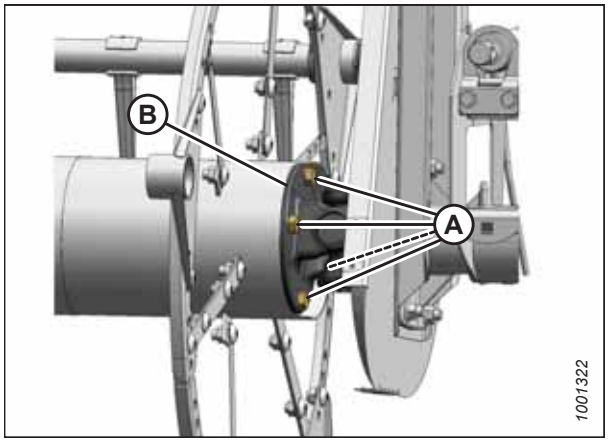


Figure 4.372: U-Joint

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). Slip the chain onto the sprockets.

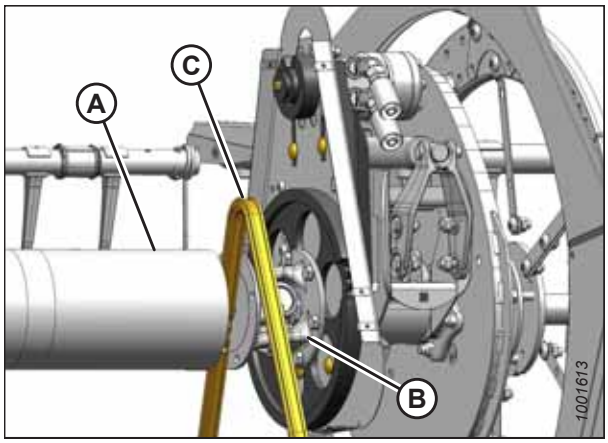


Figure 4.373: Replacing Chain

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).

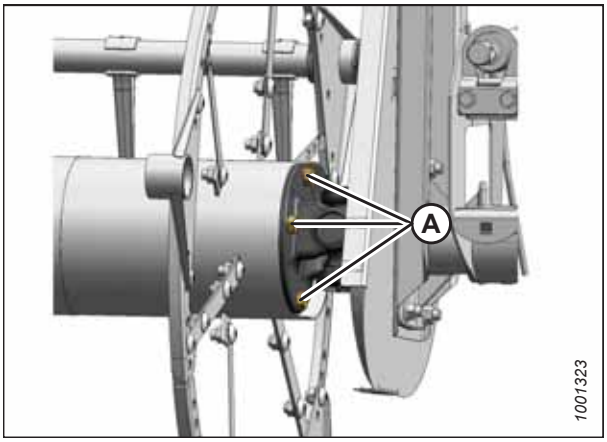


Figure 4.374: U-Joint

13. Remove temporary reel sling (A).
14. Tighten the drive chain. For instructions, refer to *Tightening Reel Drive Chain, page 422*.
15. Reinstall the reel drive cover. For instructions, refer to *Installing Reel Drive Cover, page 48*.

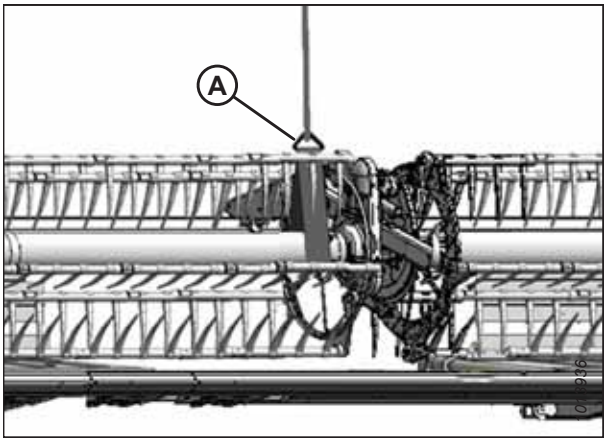


Figure 4.375: Supporting Reel

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 117* 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 from the ignition 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.

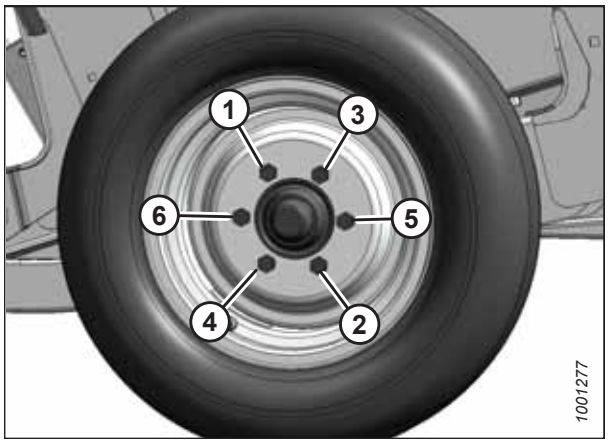


Figure 4.376: Bolt Tightening Sequence

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 from the ignition before making adjustments to the machine.

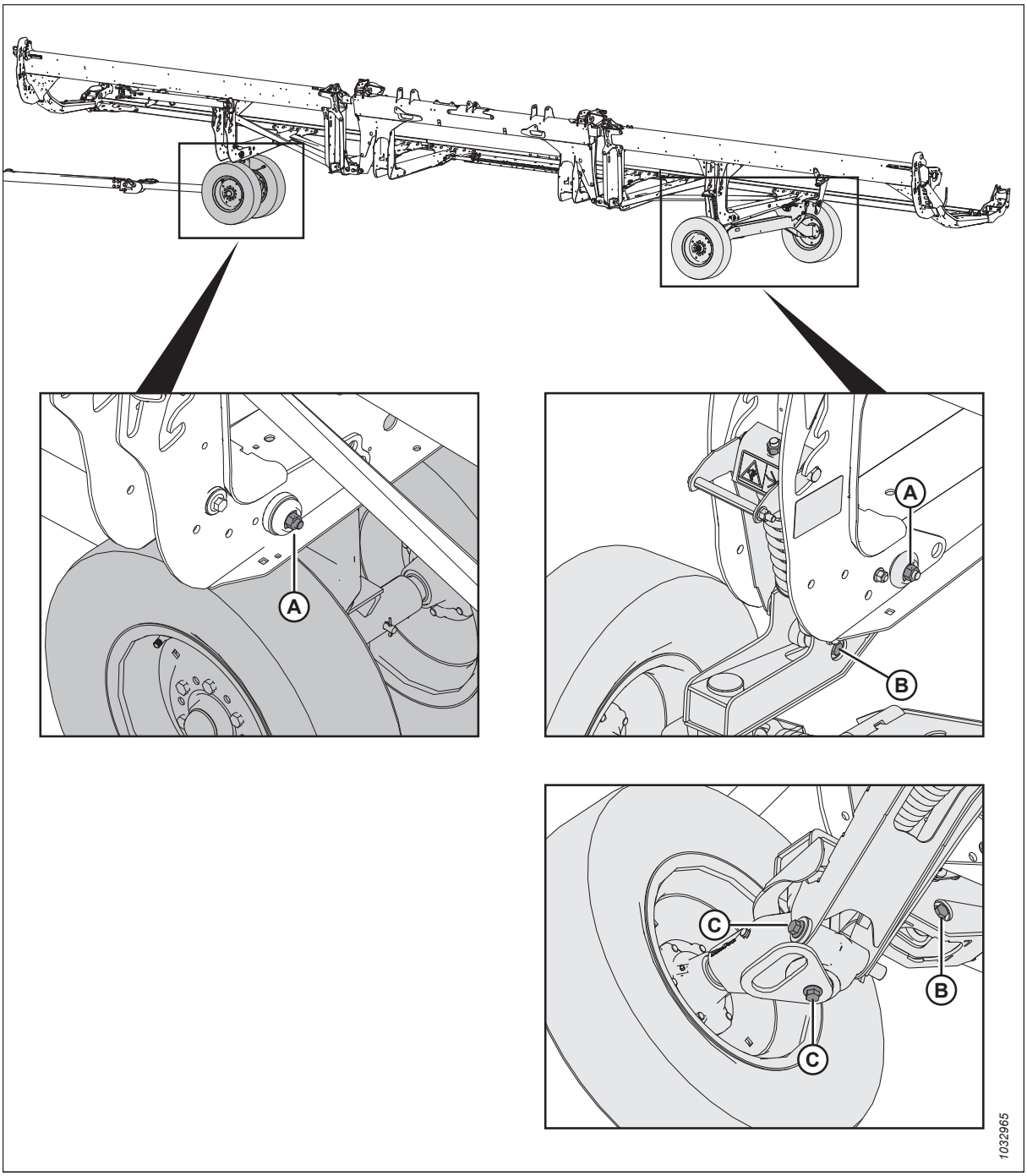


Figure 4.377: Transport Assembly Bolts

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.**

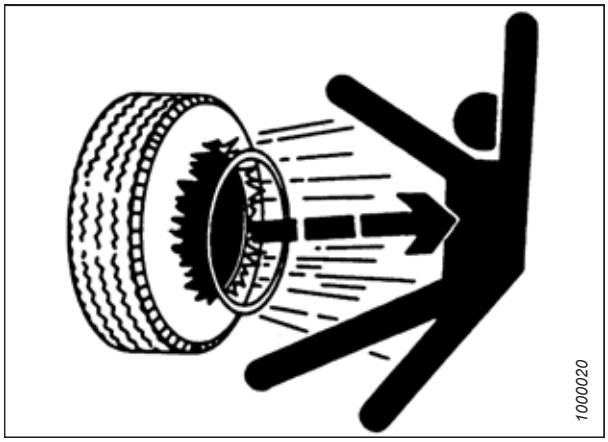


Figure 4.378: Inflation Warning

- **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 , *page 436*.
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.

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 for reinstallation.

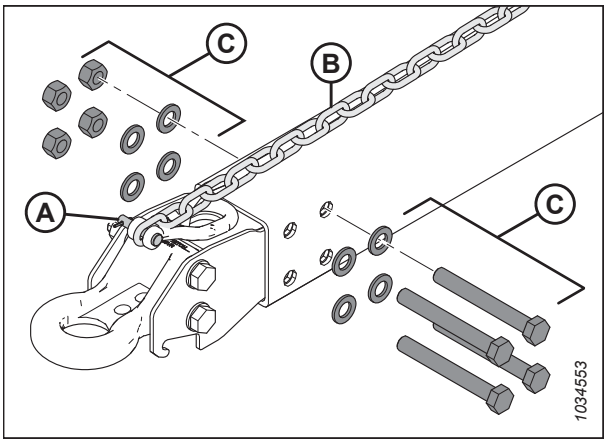


Figure 4.379: Removing Pintle Towing Adapter

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.

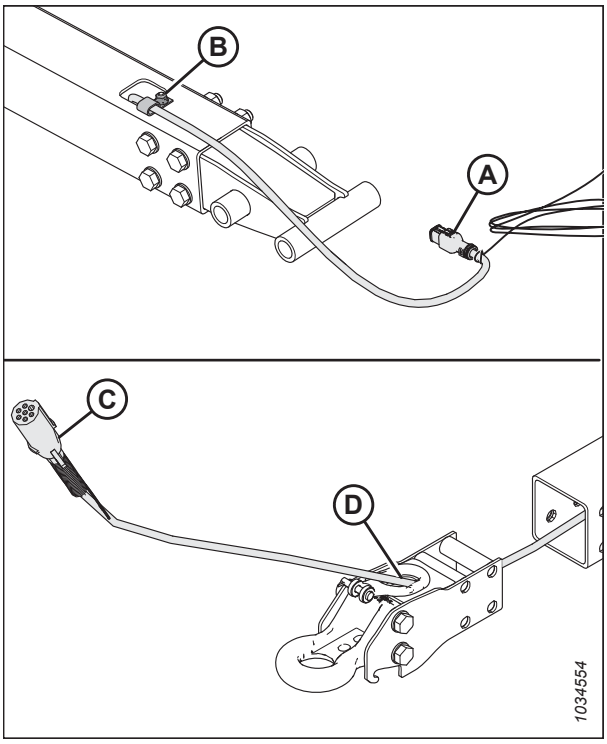


Figure 4.380: Removing Pintle Towing Adapter

6. Retrieve the clevis adapter. 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 48 cm (18 7/8 in.) past P-clip (D).
9. Secure the harness in the P-clip with the bolt removed in Step *6, page 438*.

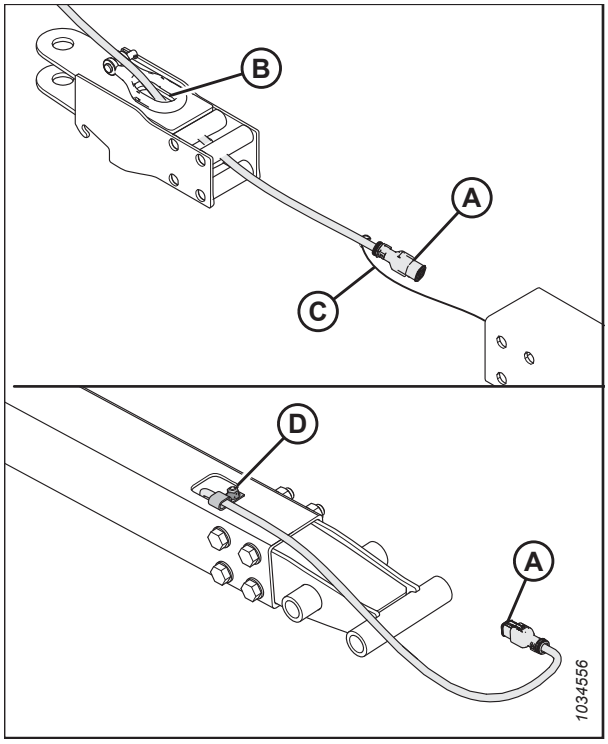


Figure 4.381: Installing Clevis Ring Adapter

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.

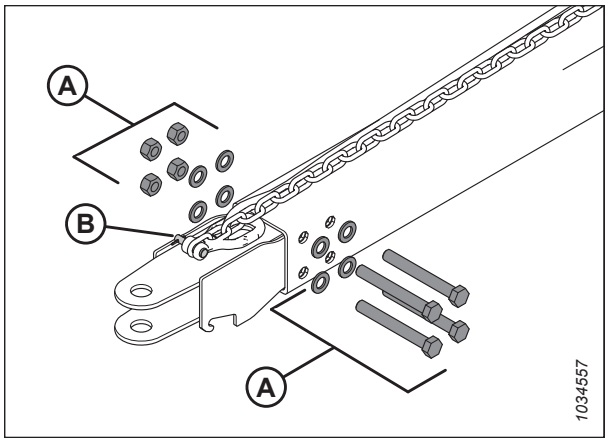


Figure 4.382: Installing Clevis Ring Adapter

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 into the clevis adapter. Secure the pin with the lynch pin.

    NOTE:

    The pins are not shown in the illustration.

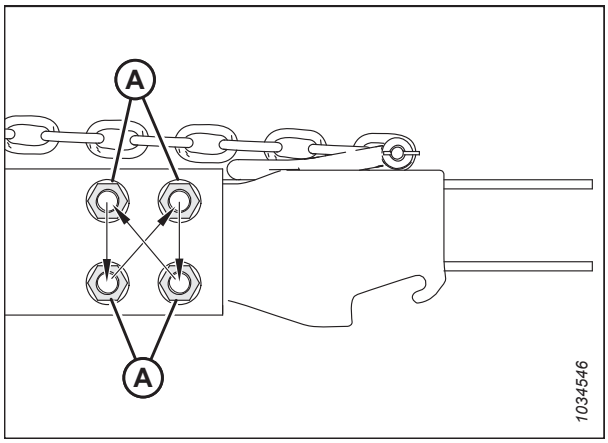


Figure 4.383: Torque Sequence

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 for reinstallation.

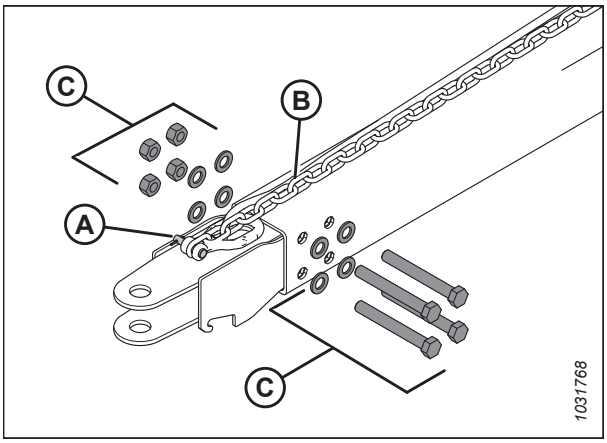


Figure 4.384: Removing Clevis Adapter

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.

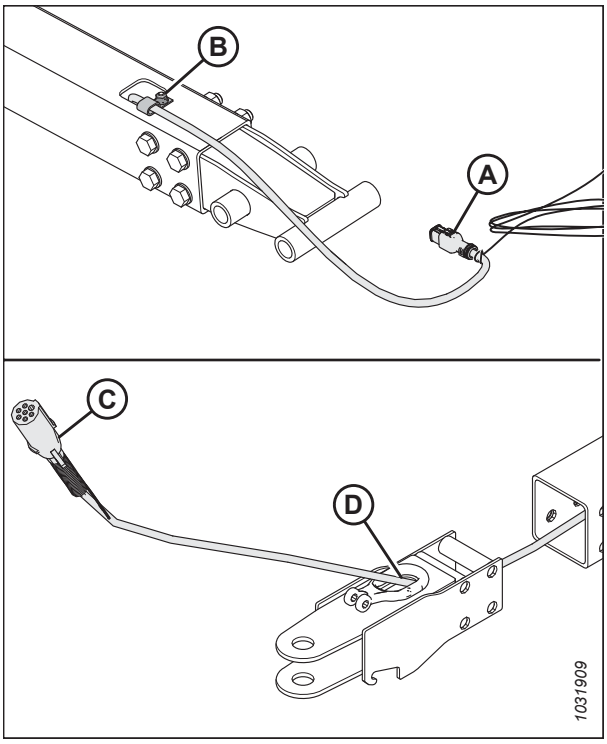


Figure 4.385: Removing Clevis Towing Adapter

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. Gently pull the harness through the tow-bar with the pull line at the transport end.
8. Ensure that transport end (A) of the harness extends 48 cm (18 7/8 in.) past P-clip (D).
9. Secure the harness in the P-clip with the bolt removed in Step *4, page 439*.

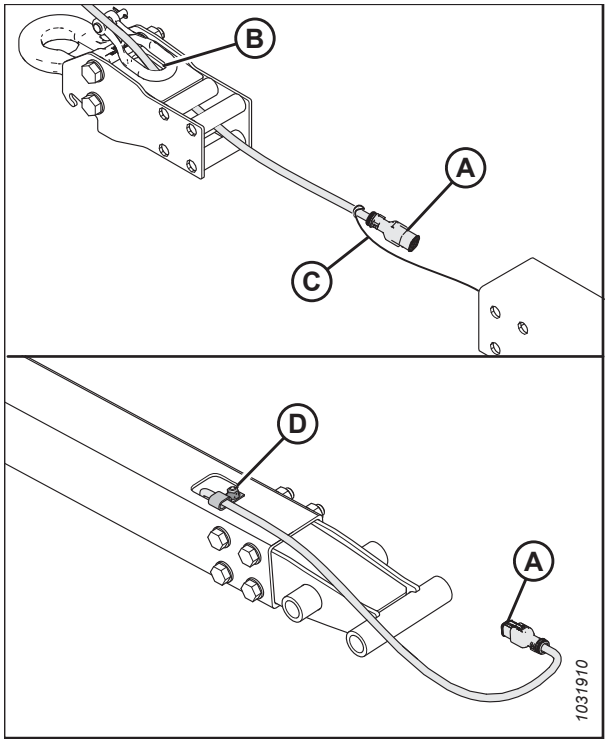


Figure 4.386: Installing Pintle Ring Adapter

10. Reinstall 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.

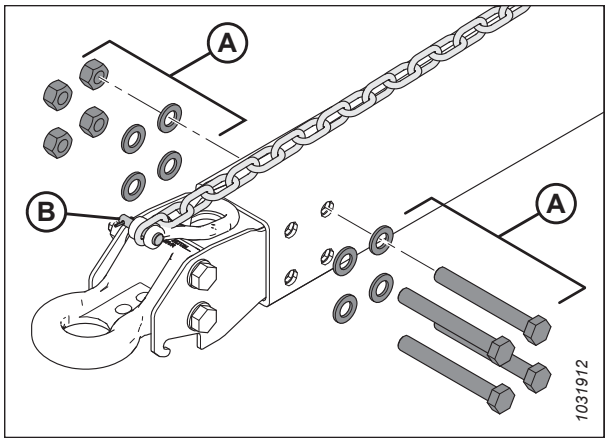


Figure 4.387: Installing Pintle Ring Adapter

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 into the pintle ring adapter. Secure the pin with the lynch pin.

    NOTE:

    The pins are not shown in the illustration.

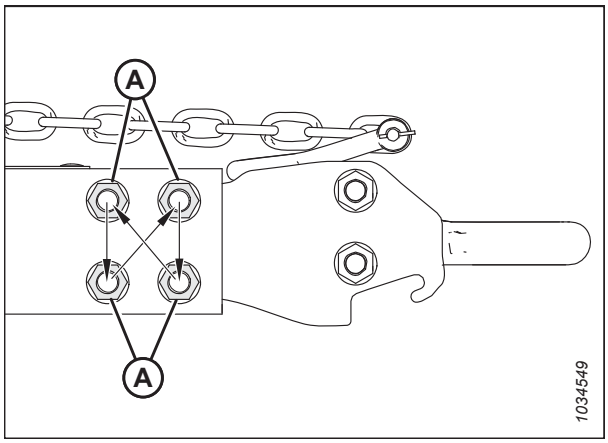


Figure 4.388: Torque Sequence

4.16 VertiBlade™ Vertical Knife – Option

The optional vertical knife kit is a vertical crop cutter that is mounted to each end of the header. The vertical knife slices through tangled, shatter-prone crops such as canola to reduce seed loss.

4.16.1 Replacing Vertical Knife Sections

The VertiBlade™ Vertical Knife kit includes a service kit that supplies four replacement knife sections. Follow these instructions to replace a damaged knife section.

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

Install vertical knife guards before attaching or removing vertical knives. Wear heavy gloves when working around or handling knives.

1. Raise the header 153–254 mm (6–10 in.) off of the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the safety props.
4. Open the header endshields.
5. Detach the vertical knife from the header. Set it aside.
6. Remove retaining pin (A) from the knife guard.
7. Remove the knife guard using handle (B).

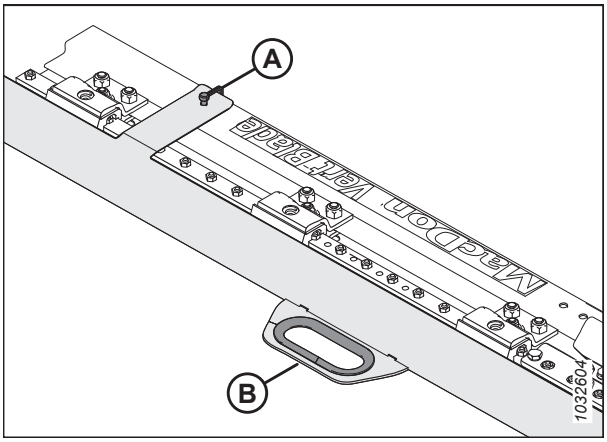


Figure 4.389: Vertical Knife Guard

8. Remove three bolts (A) securing milling bar (B) to the blade bracket and knife section assembly (C). Tilt milling bar (B) upward. Slide assembly (C) out.

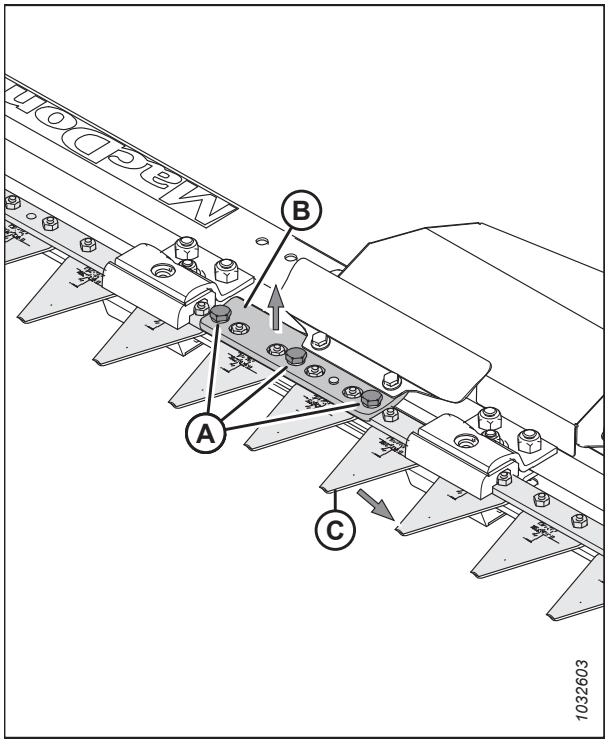


Figure 4.390: Vertical Knife – Guard Removed

NOTE:

If you cannot tilt milling bar (A) upwards enough to slide knife section assembly (B) out, remove two bolts (C) securing hood (D) to the vertical knife assembly. Loosen two nuts (E) to loosen slide rail (F). Milling bar (A) should now be loose enough to tilt upward.

IMPORTANT:

You should not need to loosen clip hardware (G) and clips (H) to slide the knife section assembly out. If you need to loosen this hardware, follow Step *13, page 443* to properly tighten the hardware when it is reinstalled. Overtightening this hardware can cause the motor to overheat, melt plastic components, or burn out. Undertightening the hardware can cause debris to plug the knives.

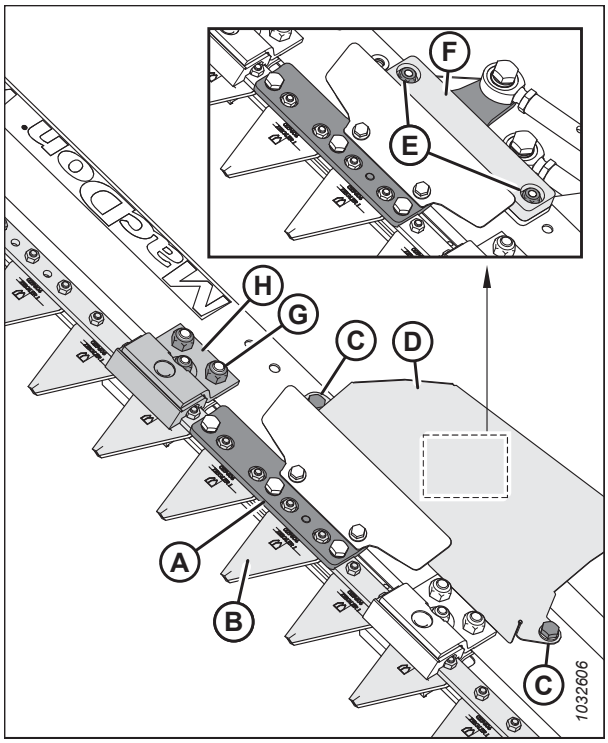


Figure 4.391: Vertical Knife – Guard Removed

9. Remove two screws (A) and nuts (B) securing knife section (C) to bracket (D).
10. Apply medium-strength threadlocker (Loctite® 243 or an equivalent) to two new screws (A) (MAC313790).
11. Secure new knife section (C) (MAC313788) to bracket (D) using two screws (A) and nuts (B) (MAC313789).
12. Tighten nuts (B) to 7 Nm (62 lbf·in).

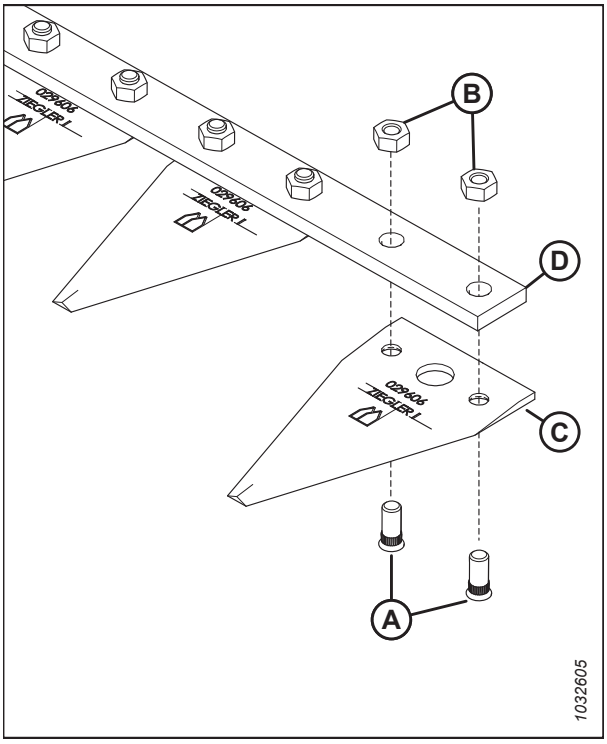


Figure 4.392: Knife Section Assembly

13. If you loosened clip hardware (A), (B), and clips (C), tighten the hardware as follows:
    a. Tighten M8 nut (A) so that gap (D) at the tip of knife sections (E) does **NOT** exceed 3 mm (1/8 in.).
    b. Ensure that clips (C) do **NOT** clamp the knife too tightly.

       NOTE:

       Excessively tight clips restrict the movement of the knife.

    c. Tighten two M10 nuts (B) to 50 Nm (37 lbf·ft).
14. Reinstall the remaining components and the knife guard. Installation is the reverse of removal.

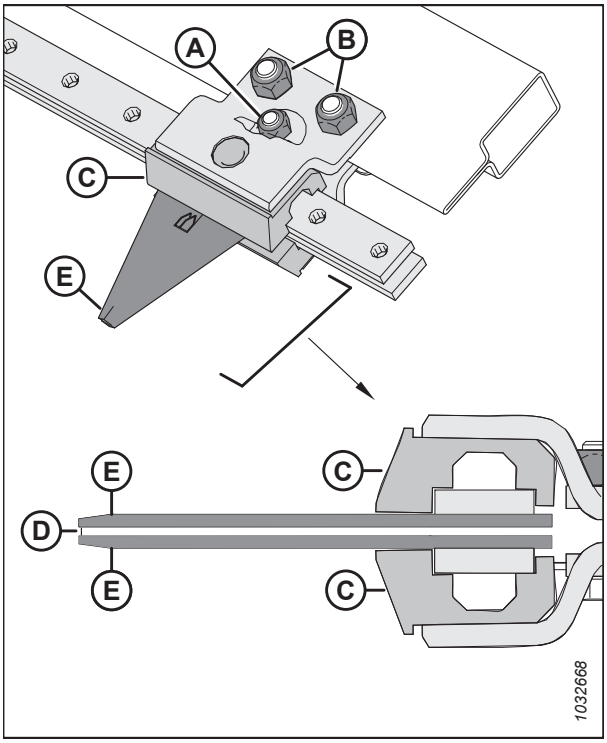


Figure 4.393: Gap Between Clip and Knife Section

4.16.2 Lubricating Vertical Knife

Each vertical knife has two lubrication points, which can be accessed by removing the knife's service panel.

Use high temperature high temperature extreme pressure (EP2) performance lubricant with 1% max molybdenum disulphide (NLGI Grade 2) lithium base to lubricate the vertical knives.

Lubricate vertical knife push rods (A) after they are first installed and every 50 operating hours thereafter.

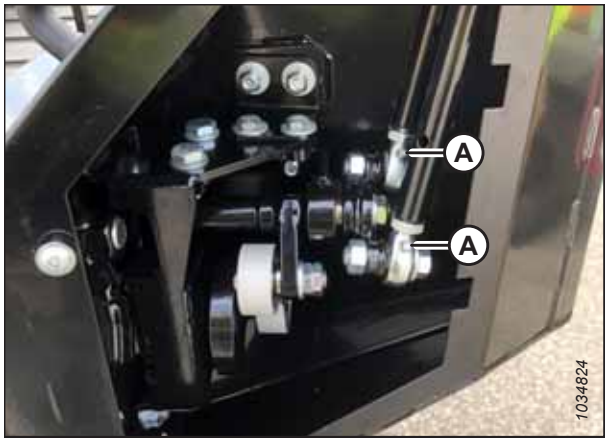


Figure 4.394: Grease Zerks on Vertical Knife Push Rods

To lubricate the vertical knife push rods, follow these steps:

NOTE:

Some parts have been removed from the illustrations for clarity.

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. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Remove screws (A). Remove access cover (B).

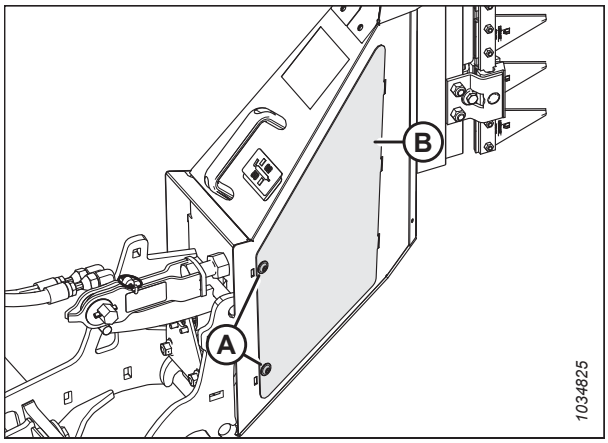


Figure 4.395: Vertical Knife Access Cover

4. Apply grease to two push rod grease zerks (A).

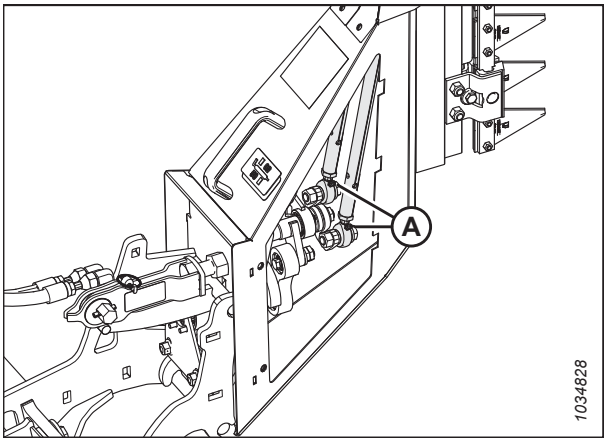


Figure 4.396: Grease Zerks on Vertical Knife Push Rods

5. Reinstall access cover (B). Secure the cover with screws (A).
6. Repeat this procedure to lubricate the other vertical knife.

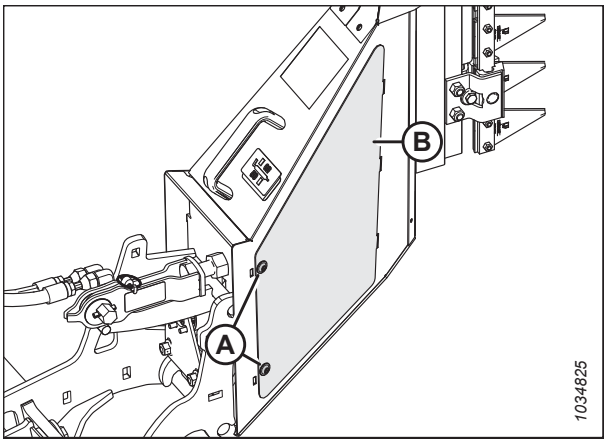


Figure 4.397: Vertical Knife Access Cover

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 (B7022) contains 10 lifters. Order the following number of kits depending on header size:

- 7.6 m (25 ft.) – 3 kits
- 9.1 m (30 ft.) – 3 kits
- 10.6 m (35 ft.) – 4 kits
- 12.5 m (41 ft.) –4 kits
- 13.7 m (45 ft.) – 5 kits

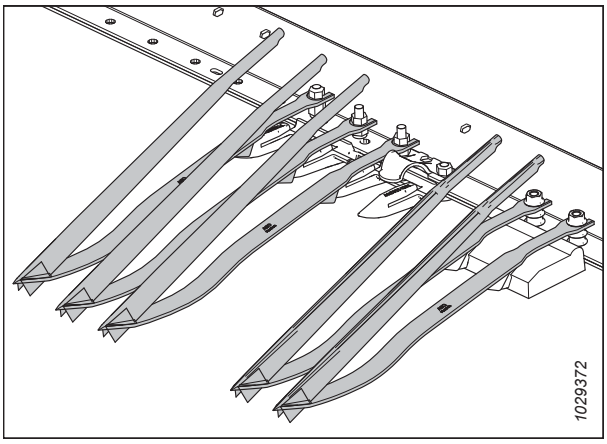


Figure 5.1: Grain Crop Lifter Kit

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.

B7023

NOTE:

D225 headers use one B7023 kit only.

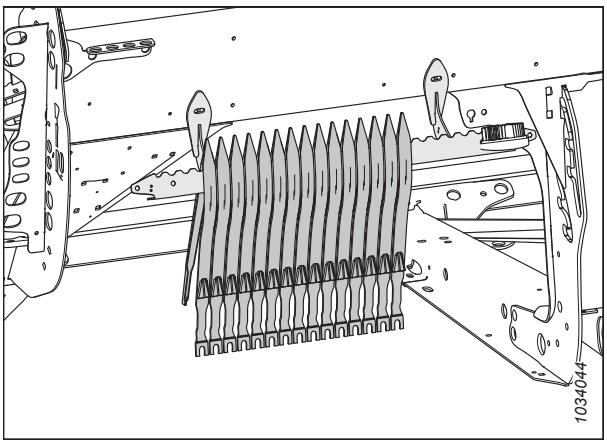


Figure 5.2: Crop Lifter Rack kit – Left Side

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.

B7030

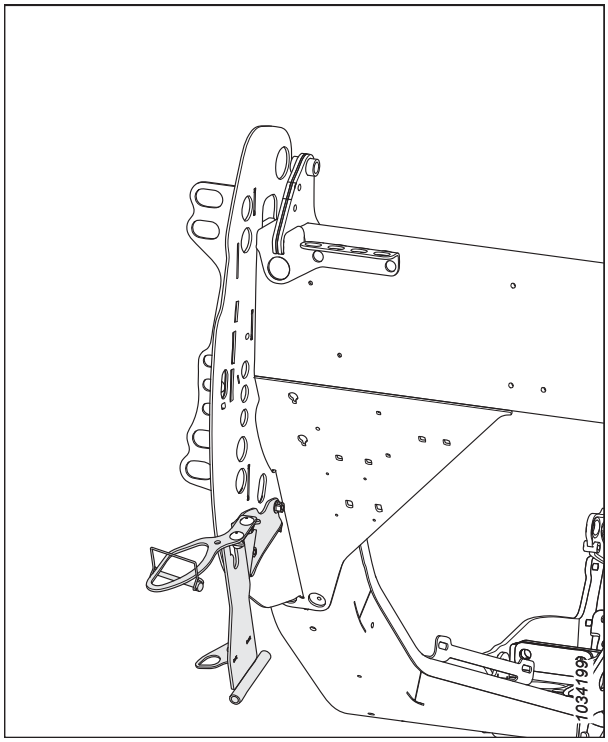


Figure 5.3: Divider Storage Bracket Kit – B7030

5.1.4 Floating Crop Dividers

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.

B7346

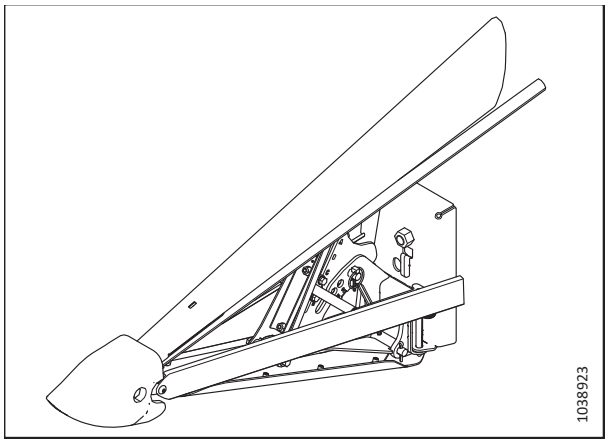


Figure 5.4: Floating Crop Divider

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:

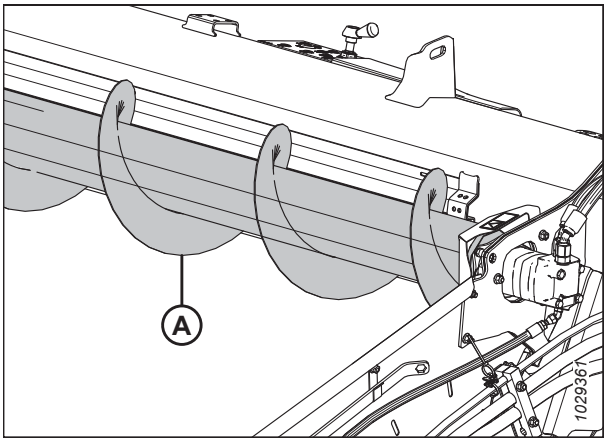


Figure 5.5: Upper Cross Auger

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 size:

- 7.6 m (25 ft.) – B6413 (two piece)
-
- 9.1 m (30 ft.) – B6414 (two piece)
- 10.6 m (35 ft.) – B6415 (two piece)
- 12.5 m (41 ft.) – B6416 (two piece)
- 13.7 m (45 ft.) – B6418 (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 size:

- 7.6 m (25 ft.) – B7272 (two piece)
- 9.1 m (30 ft.) – B7117 (two piece)
- 10.6 m (35 ft.) – B7118 (two piece)
- 12.5 m (41 ft.) – B7120 (two piece)
- 13.7 m (45 ft.) – B7121 (three piece)

5.1.6 Lodged Crop Reel Finger Kit

The steel fingers attach to the ends of every other tine bar and help clear material in heavy, hard-to-cut crops such as lodged rice.

NOTE:

The Lodged Crop Reel Finger kit is not compatible with wide draper deflectors.

Each kit contains three fingers for the cam end and three fingers for the tail end of the reel. Hardware and installation and adjustment instructions are included with the kit.

B7230

Figure 5.6: Lodged Crop Finger

5.1.7 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.

B7238

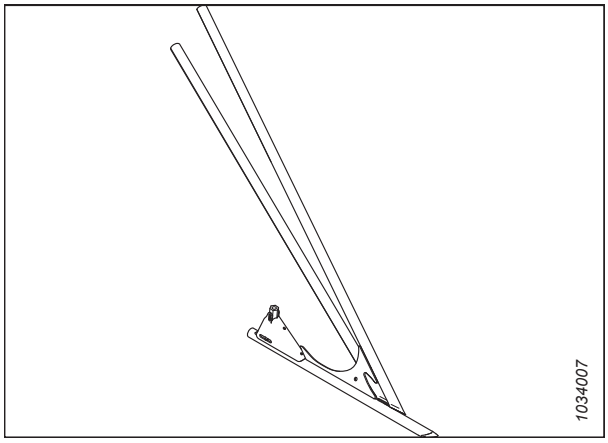


Figure 5.7: Left Rice Divider Rod Kit

5.1.8 Sunflower Attachment

This kit allows (with pointed guards only), to be converted to a sunflower header.

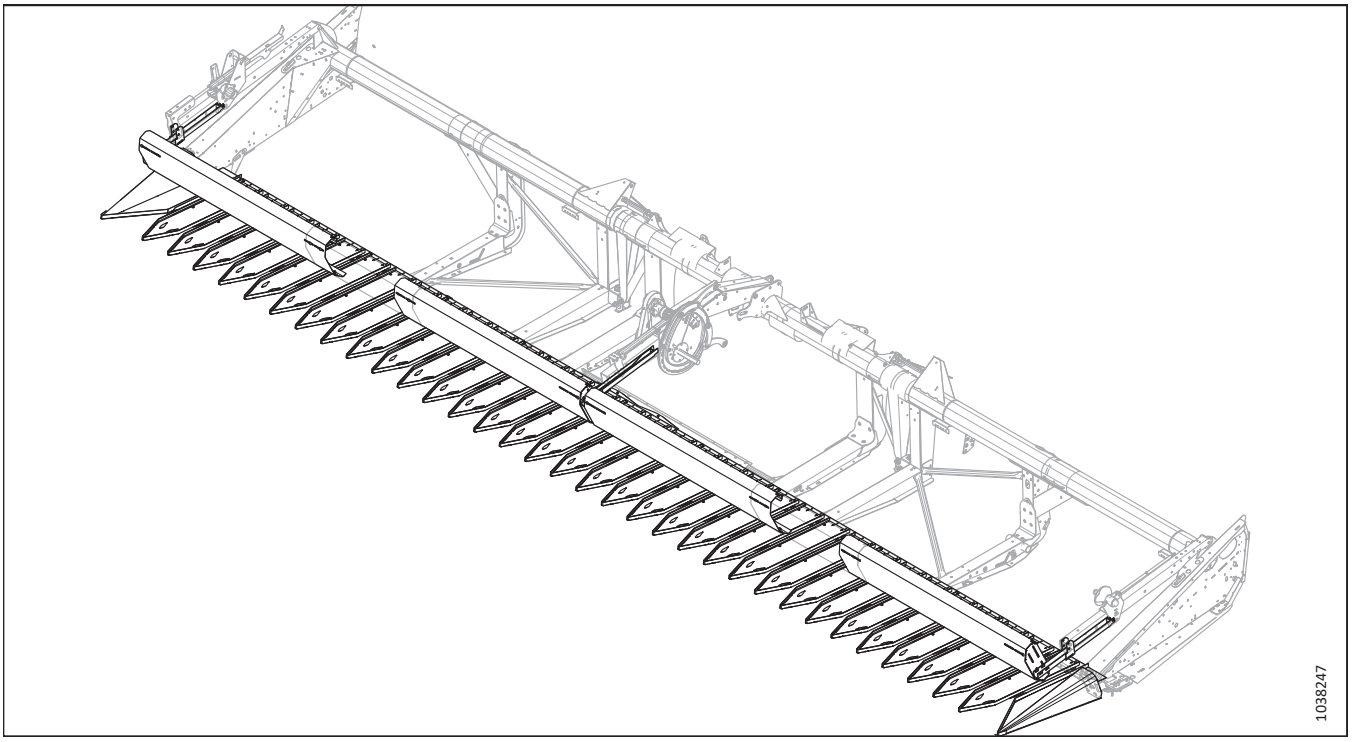


Figure 5.8: Sunflower Attachment

Order the Sunflower Attachment Kit according to header size:

- 9.1 m (30 ft.) – C2086
- 10.6 m (35 ft.) – C2087
- 12.5 m (41 ft.) – C2088

The collector contains: Base Kit, Pan, and Deflectors

Base Kit – contains common brackets, end dividers, cutterbar pan supports, lean bar components, and hardware B7302

Pan Kit – contains five pans per kit (two spares). Order the number of kits depending on headers size B7303

- 9.1 m (30 ft.) – The base kit contains enough pans for 9.1 m (30 ft.) headers. No additional pan kits are required.
- 10.6 m (35 ft.) – 1 kit
- 12.5 m (41 ft.) – 2 kits
- 13.7 m (45 ft.) – 3 kits

Deflectors – contains lean bar panels and additional cutterbar pan supports:

- 9.1 m (30 ft.) – B7304
- 10.6 m (35 ft.) – B7305
- 12.5 m (41 ft.) – B7306
- 13.7 m (45 ft.) – B7307

5.1.9 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.

B7029

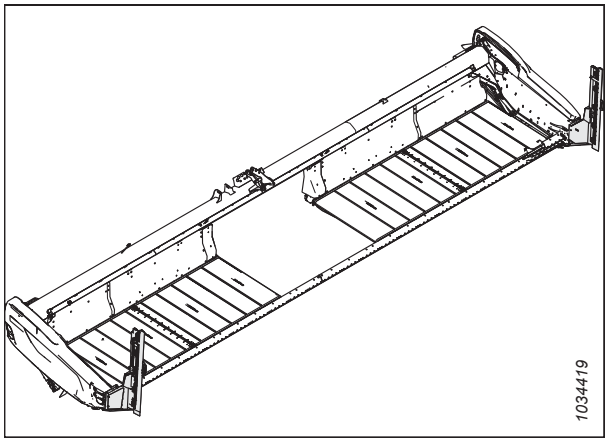


Figure 5.9: VertiBlade™ Vertical Knife Kit

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.

Order one of the following based on your header size:

- 7.6 m (25 ft.) – B7276
- 9.1 m (30 ft.) – B7127
- 10.6 m (35 ft.) – B7128
- 12.5 m (41 ft.) – B7130
- 13.7 m (45 ft.) – B7195

Installation instructions are included in 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:

- 7.6–12.5 m (25–41 ft.) — B7122
- 13.7 m (45 ft.) — B7123

NOTE:

Installation instructions are included in the kits.

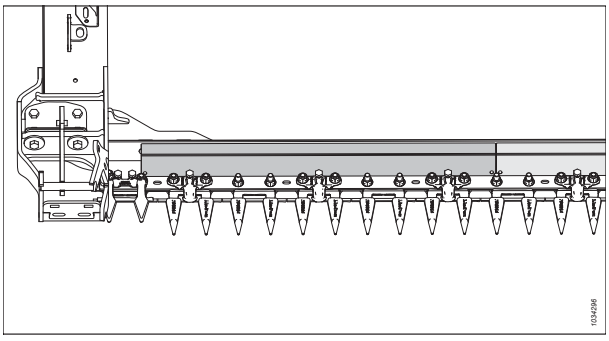


Figure 5.10: Rock Retarder Kit

5.2.2 Four-Point Knife Guard

Four-point guards provide increased knife protection in very rocky conditions, and can improve header performance with shatter-prone crops by reducing side-to-side crop motion.

Four-point knife guard kits are available for all 2 Series header sizes. Refer to the Parts Catalog or contact your Dealer for part numbers.

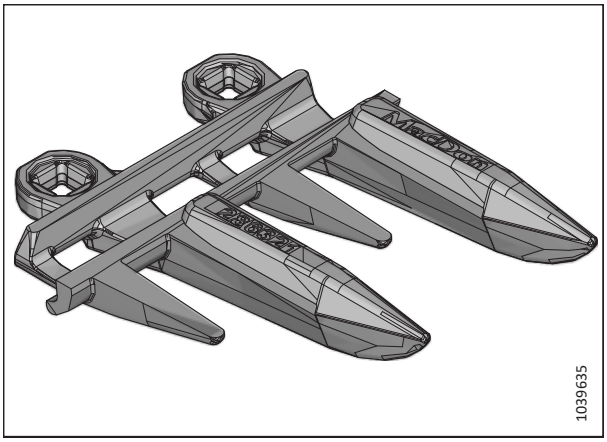


Figure 5.11: Four-Point Knife Guard

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 10 V Sensor Adapter Kit

This kit is for New Holland CR/CX combines that use 10 V sensors.

B7241

This kit is for the following New Holland 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.

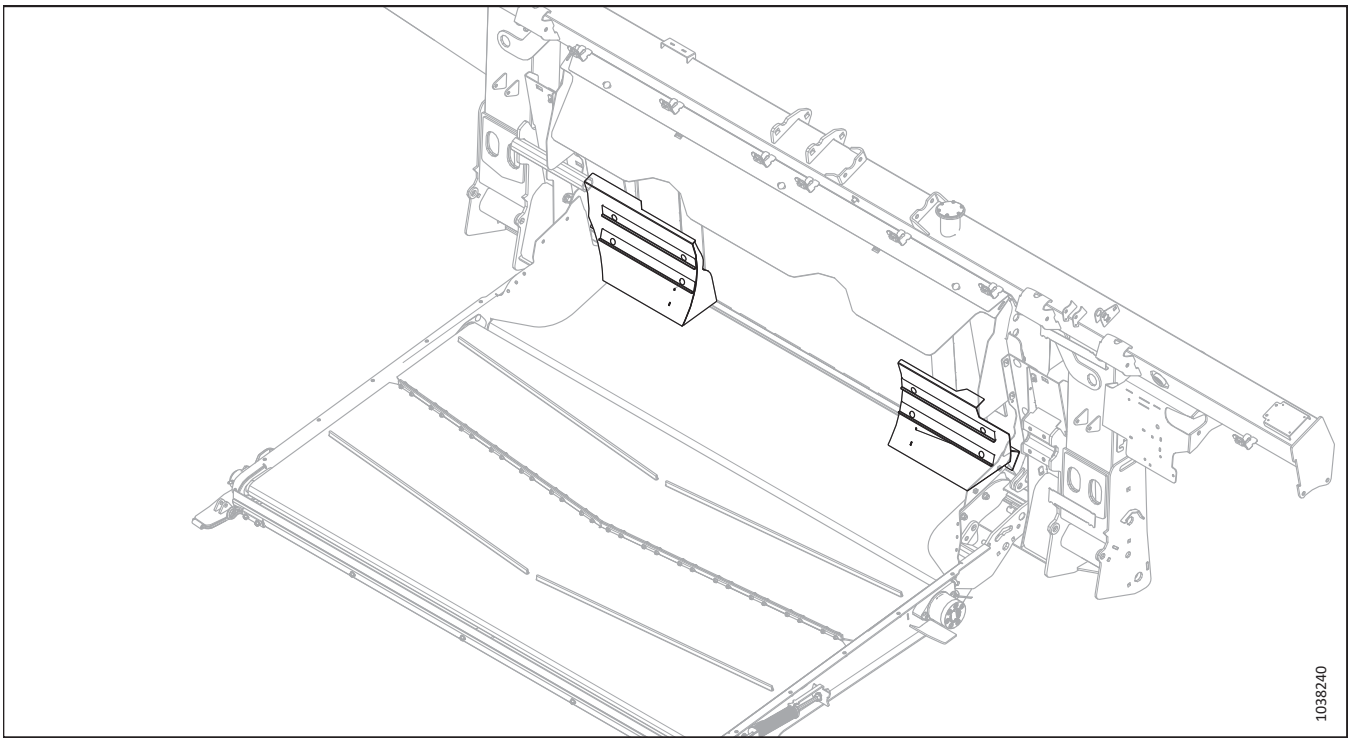


Figure 5.12: Crop Deflectors

Combine Feeder House Size	Bundle Number
Ultra Narrow	B7314
Narrow	B7347
Medium	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.

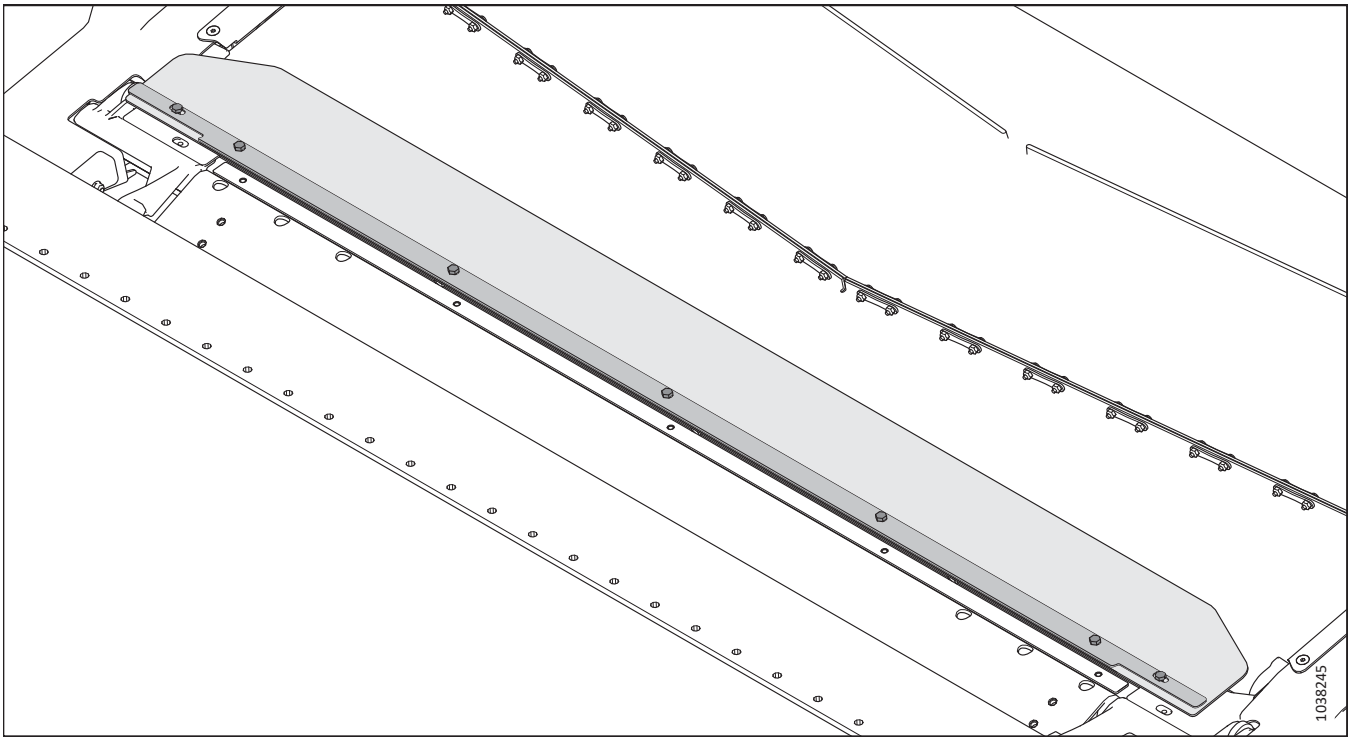


Figure 5.13: Extended Center Filler

B6450

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 84* for a list of flighting combinations.

B6400

NOTE:

Installation instructions are included in the kit.

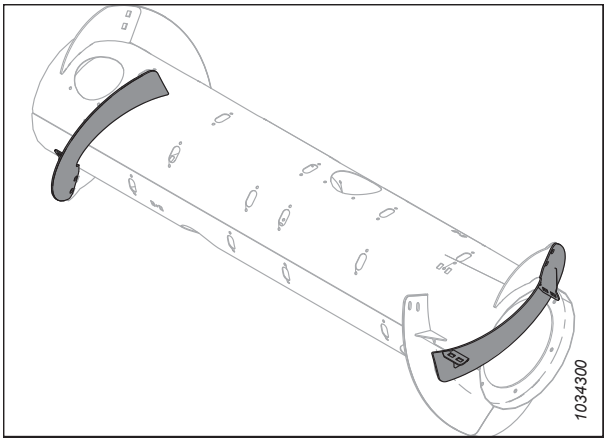


Figure 5.14: Feed Auger High-Wear Flighting Extension Kit

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.

B7031

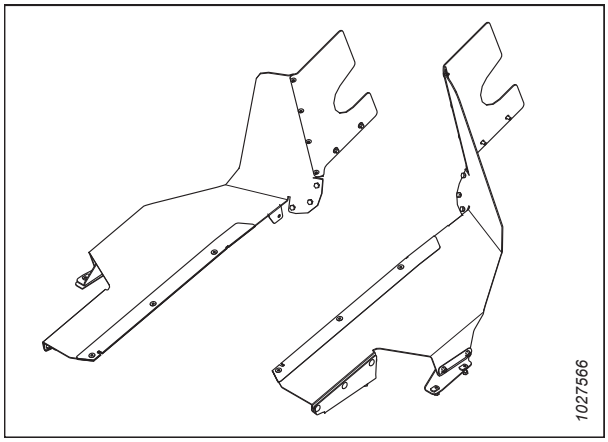


Figure 5.15: Full Interface Filler Kit

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°.

B6057

NOTE:

Installation instructions are included in the kit.

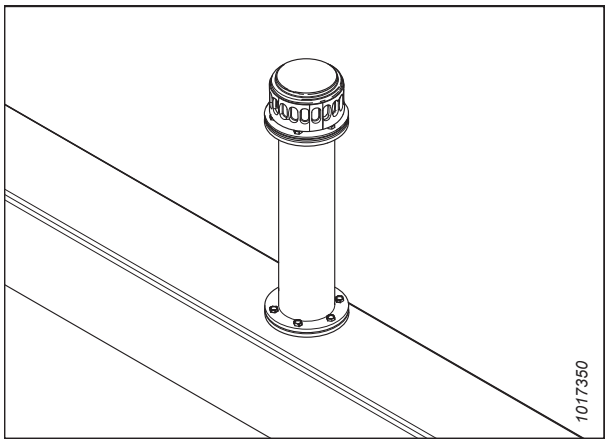


Figure 5.16: Hydraulic Reservoir Extension Kit

5.3.7 Lateral Tilt Plug Kit

This kit allows the combine lateral tilt to work with Auto Header Height Control (AHHC).

B7196

Not recommended for slopes over 10% grade.

NOTE:

Installation instructions are included in the kit.

Figure 5.17: Lateral Tilt Plug

5.3.8 Stripper Bars Kit

Stripper bars improve feeding in certain crops such as rice. They are **NOT** recommended in cereal crops.

Select the stripper bars kit based on combine feeder house width. For information, refer to Table , *page 457*.

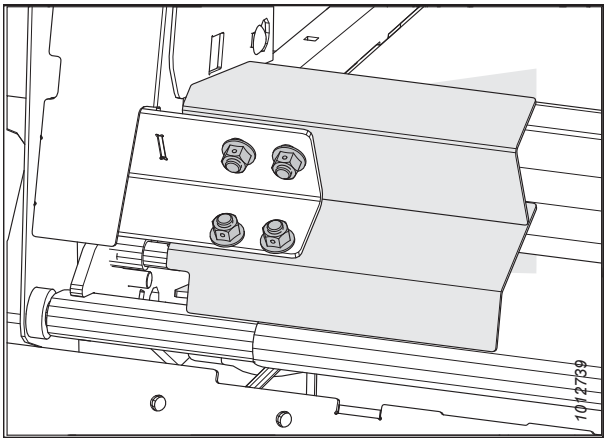


Figure 5.18: Stripper Bar

NOTE:

Installation instructions are included in the kits.

Stripper Bar Configurations and Recommendations

Bundle	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.)
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 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 one of the following according to header size:

- 9.1 m (30 ft.) – C2050
- 10.6 m (35 ft.) – C2050
- 12.5 m (41 ft.) – C2050
- 13.7 m (45 ft.) – C2050

C2048 consists of

- Stabilizer Wheels / Slow Speed Transport Base Kit – B6288
- Wheels and Tires – B6275
- Short Tow Pole – B7391

C2050 consists of

- Stabilizer Wheels / Slow Speed Transport Base Kit – B6288
- Wheels and Tires – B6275
- Long Tow Pole – B7392

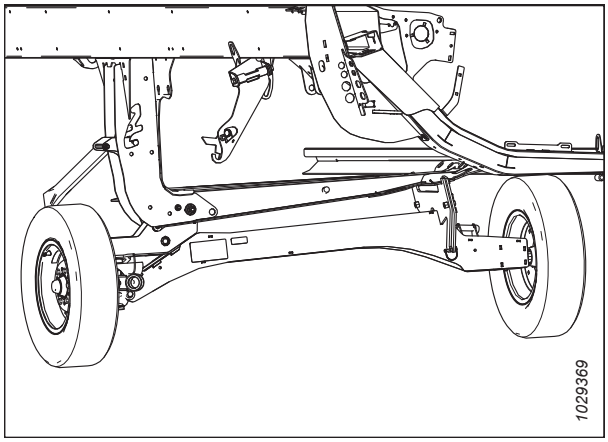


Figure 5.19: EasyMove™ Transport System

NOTE:

The EasyMove™ Transport System is not compatible with D225 headers.

5.4.2 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.

MAC311972

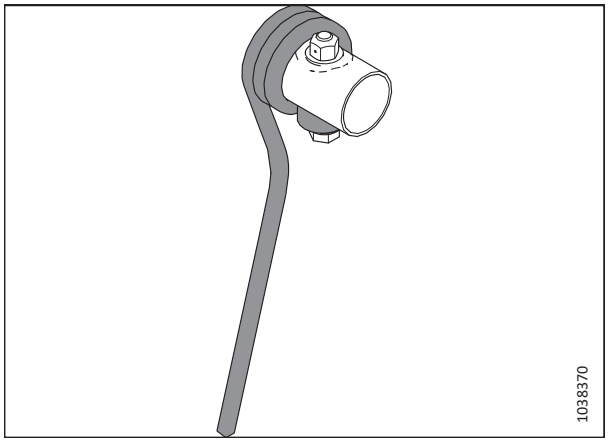


Figure 5.20: Inboard Steel End Finger

5.4.3 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.

MAC311959

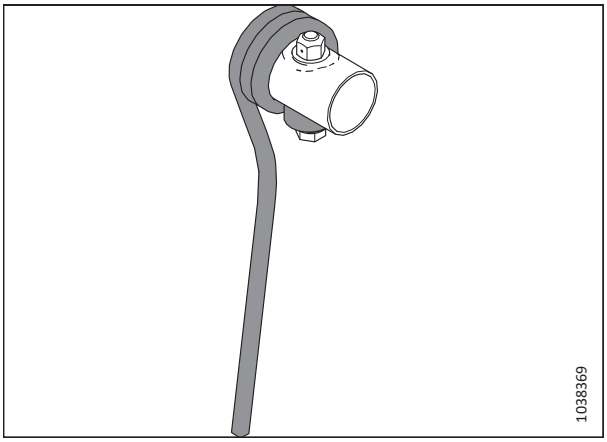


Figure 5.21: Outboard Steel End Finger

5.4.4 Steel Reel 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.

Order one of the following based on your header size:

- 4.6 m (15 ft.), Single Reel, 6 bat – MAC360676
- 4.6 m (15 ft.), Single Reel, 9 bat – MAC360677
- 6.1 m (20 ft.), Single Reel, 6 bat – MAC360678
- 6.1 m (20 ft.), Single Reel, 9 bat – MAC360685
- 7.6 m (25 ft.), Single Reel, 6 bat – MAC360679
- 7.6 m (25 ft.), Single Reel, 9 bat – MAC360680
- 9.1 m (30 ft.), Double Reel, 5 bat – MAC311054
- 9.1 m (30 ft.), Double Reel, 6 bat – MAC311055
- 10.6 m (35 ft.), Double Reel, 5 bat – MAC311068
- 10.6 m (35 ft.), Double Reel, 6 bat – MAC311069

Installation instructions are included in the kit.

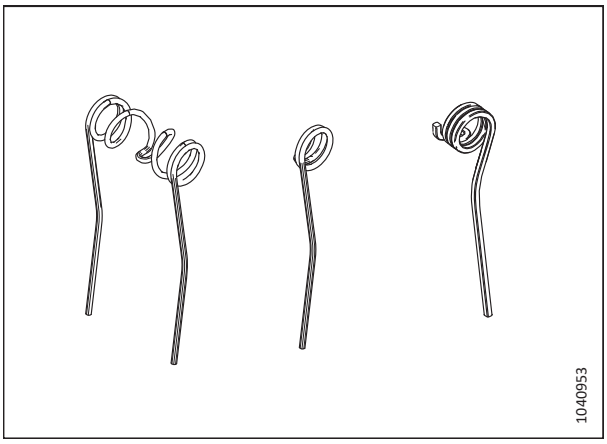


Figure 5.22: Steel Reel Finger

5.4.5 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.

B7028

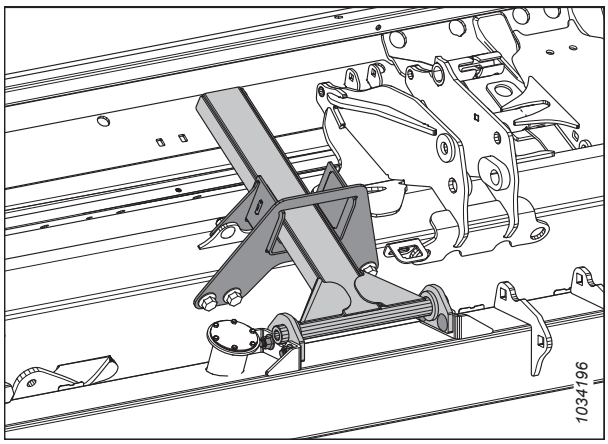


Figure 5.23: Side Hill Stabilizer Kit

5.4.6 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.

C2051

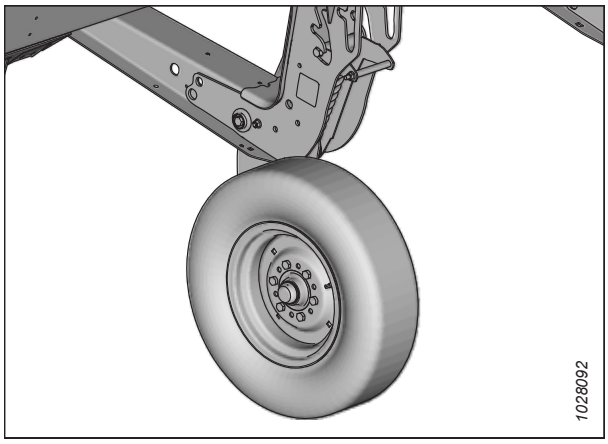


Figure 5.24: Stabilizer Wheel Kit

5.4.7 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.

B6801

NOTE:

Installation instructions are included in the kit.

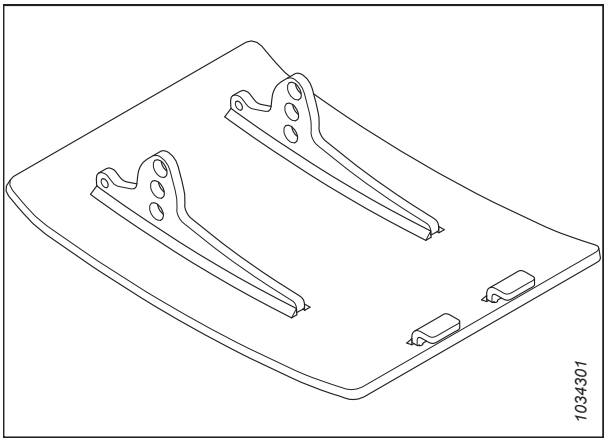


Figure 5.25: Steel Skid Shoes Kit

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.

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 off Ground, page 115* • *3.9.2 Cutting on Ground, page 118*
Header angle too low	Increase header angle	*3.9.4 Header Angle, page 131*
Reel too high	Lower reel	*3.9.10 Reel Height, page 139*
Reel too far back	Move reel forward	*3.9.11 Reel Fore-Aft Position, page 144*
Ground speed too fast for reel speed	Increase reel speed or reduce ground speed	• *3.9.5 Reel Speed, page 133* • *3.9.6 Ground Speed, page 135*
Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	*3.9.12 Reel Tine Pitch, page 152*
Reel fingers not lifting crop sufficiently	Install crop lifters	MacDon Dealer
Symptom: Heads shattering or breaking off		
Reel speed too fast	Reduce reel speed	*3.9.5 Reel Speed, page 133*
Reel too low	Raise reel	*3.9.10 Reel Height, page 139*
Ground speed too fast	Reduce ground speed	*3.9.6 Ground Speed, page 135*
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)	*3.9.8 Knifehead Shield, page 137*
Symptom: Strips of uncut material		
Guards plugged with debris	Install short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 328*
Broken knife sections	Replace broken sections	*4.8.1 Replacing Knife Section, page 306*
Symptom: Excessive bouncing at normal field speed		

Troubleshooting – Crop Loss at Cutterbar (continued)

Problem	Solution	Refer to
Float set too light	Adjust header float	*3.9.3 Header Float, page 120*
Symptom: Divider rod running down standing crop		
Divider rods too long	Remove divider rod	*3.9.14 Crop Dividers, page 159*
Symptom: Crop not being cut at ends		
Reel not frowning or not centered in header	Adjust reel horizontal position or reel frown	• *3.9.11 Reel Fore-Aft Position, page 144* • *4.13.2 Reel Frown, page 394*
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 322* or • *Adjusting Hold-Down – Short Knife Guards, page 334*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	*4.8 Knife, page 306*
Header is not level	Level the header	*3.11 Leveling Header, page 217*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position and/or finger pitch	• *3.9.11 Reel Fore-Aft Position, page 144* • *3.9.12 Reel Tine Pitch, page 152*
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 328* • 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 159*
Symptom: Cut grain falling ahead of the cutterbar		
Ground speed too slow	Increase ground speed	*3.9.6 Ground Speed, page 135*
Reel speed too slow	Increase reel speed	*3.9.5 Reel Speed, page 133*
Reel too high	Lower reel	*3.9.10 Reel Height, page 139*
Cutterbar too high	Lower cutterbar	• *3.9.1 Cutting off Ground, page 115* • *3.9.2 Cutting on Ground, page 118*
Reel too far forward	Move reel back on arms	*3.9.11 Reel Fore-Aft Position, page 144*

Troubleshooting – Crop Loss at Cutterbar (continued)

Problem	Solution	Refer to
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 424*
Worn or broken knife components	Replace components	*4.8 Knife, page 306*

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.

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 322* • *Adjusting Hold-Down – Short Knife Guards, page 334*
Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	• *Replacing Pointed Center Knife Guard – Double-Knife, page 323* • *Replacing Pointed Knife Guards, page 320* • *Replacing Center Knife Guard – Double-Knife, page 335* • *Replacing Short Knife Guards or End Knife Guards, page 332* • *4.8.1 Replacing Knife Section, page 306*
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 138*
Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	• *3.9.5 Reel Speed, page 133* • *3.9.6 Ground Speed, page 135*
Reel fingers not lifting crop properly ahead of knife	Adjust reel position/finger pitch	• *3.9.11 Reel Fore-Aft Position, page 144* • *3.9.12 Reel Tine Pitch, page 152*
Cutterbar too high	Lower cutting height	*3.9.1 Cutting off Ground, page 115* or *3.9.2 Cutting on Ground, page 118*
Header angle too flat	Steepen header angle	*3.9.4 Header Angle, page 131*
Cutting edge of guards not close enough or parallel to knife sections	Align guards	*Adjusting Knife Guards and Guard Bar, page 318*
Tangled/tough-to-cut crop	Install short knife guards	MacDon Dealer • *Adjusting Hold-Down – Pointed Knife Guards, page 322* or *Adjusting Hold-Down – Short Knife Guards, page 334*

Troubleshooting – Cutting Action and Knife Components (continued)

Problem	Solution	Refer to
Reel too far back	Move the reel forward	*3.9.11 Reel Fore-Aft Position, page 144*
Symptom: Knife plugging		
Reel too high or too far forward	Lower the reel or move reel rearward	• *3.9.10 Reel Height, page 139* • *3.9.11 Reel Fore-Aft Position, page 144*
Ground speed too high	Decrease the ground speed	*3.9.6 Ground Speed, page 135*
Improper knife hold-down adjustment	Adjust the hold-down	*Adjusting Hold-Down – Pointed Knife Guards, page 322* or *Adjusting Hold-Down – Short Knife Guards, page 334*
Dull or broken knife section	Replace knife section	*4.8.1 Replacing Knife Section, page 306*
Bent or broken guards	Align or replace the guards	*Adjusting Knife Guards and Guard Bar, page 318*
Reel fingers not lifting crop properly ahead of knife	Adjust the reel position/finger pitch	• *3.9.11 Reel Fore-Aft Position, page 144* • *3.9.12 Reel Tine Pitch, page 152*
Steel pick-up fingers contacting knife	Increase the reel clearance to cutterbar or adjust “frown”	• *4.13.2 Reel Frown, page 394*
Float too heavy	Adjust the springs for lighter float	*Checking and Adjusting Header Float, page 121*
Mud or dirt build-up on cutterbar	Raise the cutterbar by lowering skid shoes	*3.9.2 Cutting on Ground, page 118*
Mud or dirt build-up on cutterbar	Flatten the header angle	*3.9.4 Header Angle, page 131*
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 138*
Symptom: Excessive header vibration		
Knife hold-down not adjusted properly	Adjust hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 322* or *Adjusting Hold-Down – Short Knife Guards, page 334*
Excessive knife wear	Replace knife	• *4.8.2 Removing Knife, page 307* • *4.8.5 Installing Knife, page 310*
Loose or worn knifehead pin or drive arm	Tighten or replace parts	*4.8.1 Replacing Knife Section, page 306*

Troubleshooting – Cutting Action and Knife Components (continued)

Problem	Solution	Refer to
Knife hold-down not adjusted properly	Adjust hold-down	• *Adjusting Hold-Down – Pointed Knife Guards, page 322* • *Adjusting Center Hold-Down – Pointed Knife Guards, page 327* • *Adjusting Hold-Down – Short Knife Guards, page 334* • *Adjusting Center Hold-Down – Short Knife Guards, page 338*
Excessive knife wear	Replace knife	• *4.8.2 Removing Knife, page 307* • *4.8.5 Installing Knife, page 310*
Loose or worn knifehead pin or drive arm	Tighten or replace parts	*4.8.1 Replacing Knife Section, page 306*
Symptom: Excessive vibration of float module and header		
Incorrect knife speed	Adjust knife speed	*Checking Knife Speed, page 138*
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 322* or • *Adjusting Hold-Down – Short Knife Guards, page 334*
Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	*3.9.2 Cutting on Ground, page 118*
Float is set too heavy	Adjust float springs for lighter float	*Checking and Adjusting Header Float, page 121*
Bent or broken guard	Straighten or replace the guard	• *4.8.7 Pointed Knife Guards and Hold-Downs, page 312* or • *4.8.8 Short Knife Guards and Hold-Downs, page 328*
Header angle too steep	Flatten the header angle	*3.9.4 Header Angle, page 131*
Symptom: Knife back breakage		
Bent or broken guard	Straighten or replace the guard	• *4.8.7 Pointed Knife Guards and Hold-Downs, page 312* or • *4.8.8 Short Knife Guards and Hold-Downs, page 328*

Troubleshooting – Cutting Action and Knife Components (continued)

Problem	Solution	Refer to
Worn knifehead pin	Replace the knifehead pin	• *4.8.3 Removing Knifehead Bearing, page 308* and • *4.8.4 Installing Knifehead Bearing, page 309*
Dull knife	Replace the knife	• *4.8.2 Removing Knife, page 307* and • *4.8.5 Installing Knife, page 310*
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.

Troubleshooting – Reel Delivery

Problem	Solution	Refer to
Symptom – Reel not releasing material in normal standing crop		
Reel speed too fast	Reduce the reel speed	*3.9.5 Reel Speed, page 133*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 139*
Reel tines too aggressive	Reduce the cam setting	*3.9.12 Reel Tine Pitch, page 152*
Reel too far back	Move the reel forward	*3.9.11 Reel Fore-Aft Position, page 144*
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 152*
Symptom – Wrapping on reel end		
Reel tines too aggressive	Reduce the cam setting	*3.9.12 Reel Tine Pitch, page 152*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 139*
Reel speed too fast	Reduce the reel speed	*3.9.5 Reel Speed, page 133*
Reel not centered in header	Center the reel in the header	*4.13.3 Centering Reel, page 394*
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 152*
Reel too far forward	Move the reel back to match the reel cam setting	*3.9.11 Reel Fore-Aft Position, page 144*
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 55*
Reel drive chain disconnected or broken	Connect/replace the chain	*4.14.6 Replacing Drive Chain, page 431*
Symptom – Reel motion uneven under no load		
Excessive slack in reel drive chain	Tighten the chain	*Tightening Reel Drive Chain, page 422*
Symptom – Reel motion is uneven or stalls in heavy crops		
Reel speed too fast	Reduce the reel speed	*3.9.5 Reel Speed, page 133*

Troubleshooting – Reel Delivery (continued)

Problem	Solution	Refer to
Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	*3.9.12 Reel Tine Pitch, page 152*
Reel too low	Raise the reel	*3.9.10 Reel Height, page 139*
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
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 424* • Install Two Speed Kit (MAC311882)
Symptom – Plastic fingers cut at tip		
Insufficient reel to cutterbar clearance	Increase the clearance	*4.13.1 Reel-to-Cutterbar Clearance, page 389*
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, page 118*
Reel digging into ground with reel speed slower than ground speed	Decrease the header tilt	*3.9.4 Header Angle, page 131*
Reel digging into ground with reel speed slower than ground speed	Move the reel aft	*3.9.11 Reel Fore-Aft Position, page 144*
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, page 118*
Reel digging into ground with reel speed faster than ground speed	Decrease the header tilt	*3.9.4 Header Angle, page 131*
Reel digging into ground with reel speed faster than ground speed	Move the reel aft	*3.9.11 Reel Fore-Aft Position, page 144*
Symptom – Plastic fingers bent close to tine tube		

Troubleshooting – Reel Delivery (continued)

Problem	Solution	Refer to
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 219*
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 219*

6.4 Troubleshooting Header and Drapers

Use the following tables to determine the header and draper problems and the recommended repair procedure.

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	*3.9.7 Side Draper Speed, page 135*
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 347*
Drive or idler roller wrapped with material	Loosen the draper and clean the rollers	*4.10.2 Checking and Adjusting Feed Draper Tension, page 347*
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 347*
Roller bearing seized	Replace the roller bearing	*Replacing Feed Draper Idler Roller Bearing, page 360*
Low hydraulic oil	Fill the combine hydraulic oil reservoir to the full level	Combine operator's manual
Incorrect relief setting at flow control valve	Adjust the relief setting	MacDon Dealer
Symptom: Side Draper stalling		
Material not feeding evenly off knife	Lower the reel	*3.9.10 Reel Height, page 139*
Material not feeding evenly off knife	Install short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 328*
Symptom: Hesitation in the flow of bulky crop		
Header angle too low	Increase the header angle	*3.9.4 Header Angle, page 131*
Material overload on drapers	Increase the side draper speed	*3.9.7 Side Draper Speed, page 135*
Material overload on drapers	Install an upper cross auger	*5.1.5 Full Length Upper Cross Auger, page 449*

Troubleshooting – Header and Drapers (continued)

Problem	Solution	Refer to
Material overload on drapers	Add flighting extensions	MacDon Dealer
Symptom: Drapers back-feed		
Drapers running too slow in heavy crop	Increase the draper speed	*3.9.7 Side Draper Speed, page 135*
Symptom: Crop is thrown across the opening and under opposite side draper		
Drapers running too fast in light crop	Reduce the draper speed	*3.9.7 Side Draper Speed, page 135*
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 (MAC172381)	*3.12 Unplugging Cutterbar, page 219*

6.5 Cutting Edible Beans

Use the following tables to determine the cause of any cutting edible bean problems and the recommended solutions.

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, page 118*
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 120*
Reel too high with cylinders fully retracted	Adjust the reel height	*3.9.10 Reel Height, page 139*
Finger pitch not aggressive enough	Adjust the finger pitch	*3.9.12 Reel Tine Pitch, page 152*
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 144*
Header angle too shallow	Adjust the header angle	*Adjusting Header Angle from Combine, page 133*
Header angle too shallow	Increase the header angle by fully retracting lift cylinders (if cutting on ground)	*Adjusting Header Angle from Combine, page 133*
Reel too slow	Adjust the reel speed to be marginally faster than ground speed	*3.9.5 Reel Speed, page 133*
Ground speed too fast	Lower the ground speed	*3.9.6 Ground Speed, page 135*
Skid shoes too low	Raise the skid shoes to the highest setting	*3.9.2 Cutting on Ground, page 118*
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 121*
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 217*

Troubleshooting – Cutting Edible Beans (continued)

Problem	Solution	Refer to
Worn or damaged knife sections	Replace the sections or replace the knife	*4.8 Knife, page 306*
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 328*
Pushing of crop debris on the ground	Install the short knife guards	*4.8.8 Short Knife Guards and Hold-Downs, page 328*
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 138* or *Checking Knife Speed, page 138*
Symptom: Excessive losses at dividers		
Divider rod running down crop and shattering the pods	Remove the divider rod	*3.9.14 Crop Dividers, page 159*
Vines and plants build up on the endsheet	Install the divider rod	*3.9.14 Crop Dividers, page 159*
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 152*
Reel too high	Lower the reel	*3.9.10 Reel Height, page 139*
Minimum reel clearance to cutterbar setting too high	Adjust the minimum reel height with cylinders fully retracted	*4.13.1 Reel-to-Cutterbar Clearance, page 389*
Reel too far forward	Reposition the reel	*3.9.11 Reel Fore-Aft Position, page 144*
Symptom: Crop wrapping around reel		
Reel too low	Raise the reel	*3.9.10 Reel Height, page 139*
Symptom: Reel shattering pods		
Reel too far forward	Reposition the reel	*3.9.11 Reel Fore-Aft Position, page 144*
Reel speed too high	Reduce the reel speed	*3.9.5 Reel Speed, page 133*

Troubleshooting – Cutting Edible Beans (continued)

Problem	Solution	Refer to
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 152*
Symptom: Cutterbar guards breaking		
Float insufficient (float setting too heavy)	Increase the float (adjust to lighter float setting)	*3.9.3 Header Float, page 120*
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		
Header too heavy	Readjust the float to make the header lighter	*3.9.3 Header Float, page 120*
Header angle too steep	Decrease the header angle	*3.9.4 Header Angle, page 131*
Guards plug with debris or and soil	Install the short knife guard	*4.8.8 Short Knife Guards and Hold-Downs, page 328*
Insufficient support for the header	Install the center skid shoes	*3.9.2 Cutting on Ground, page 118*
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 139*
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 144*
Symptom: Cutterbar pushing soil		

Troubleshooting – Cutting Edible Beans (continued)

Problem	Solution	Refer to
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	*3.9.7 Side Draper Speed, page 135*
Finger pitch too slow	Increase the finger pitch	*3.9.12 Reel Tine Pitch, page 152*

Chapter 7: Reference

The procedures and information in this chapter can be referred to as needed.

7.1 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to 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.
- Refer to 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

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

7.1.1 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

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** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

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

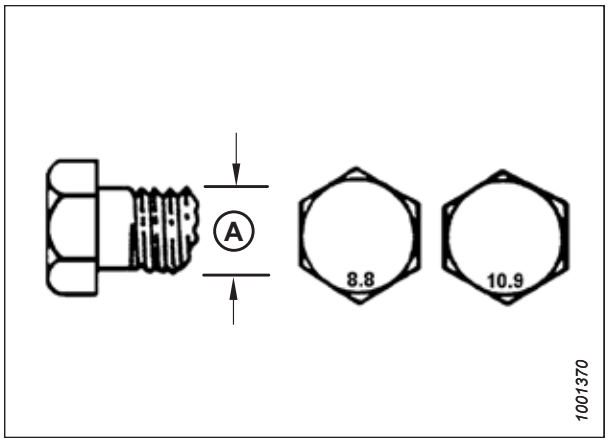


Figure 7.1: Bolt Grades

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

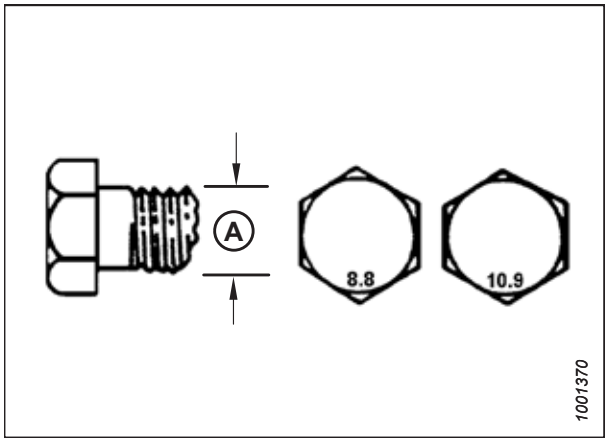


Figure 7.2: Bolt Grades

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

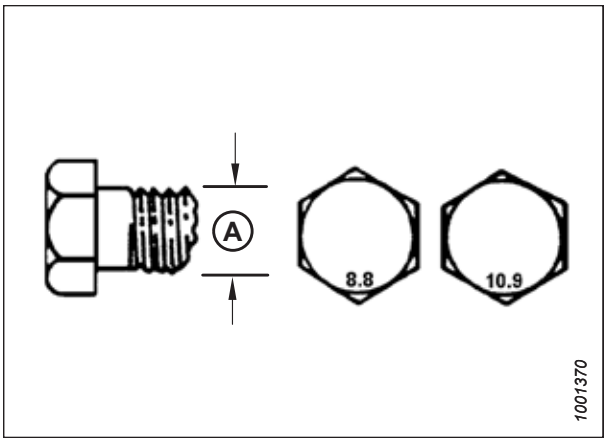


Figure 7.3: Bolt Grades

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

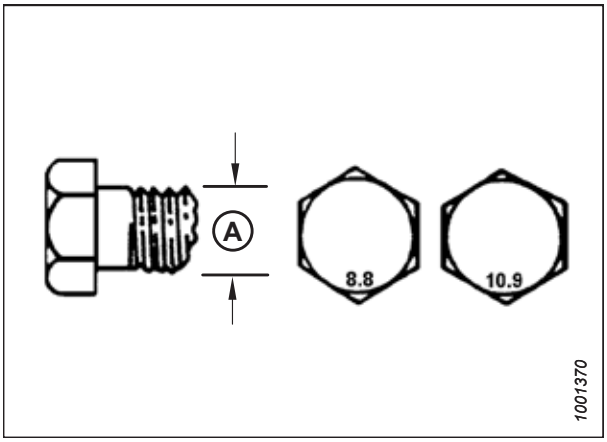


Figure 7.4: Bolt Grades

7.1.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

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** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

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	–	–	–	–

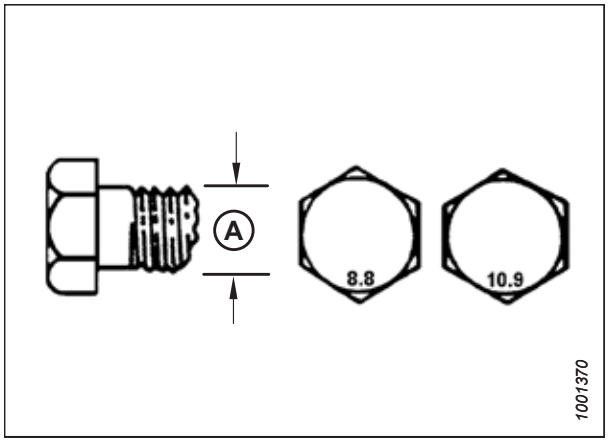


Figure 7.5: Bolt Grades

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, refer to the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or 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. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

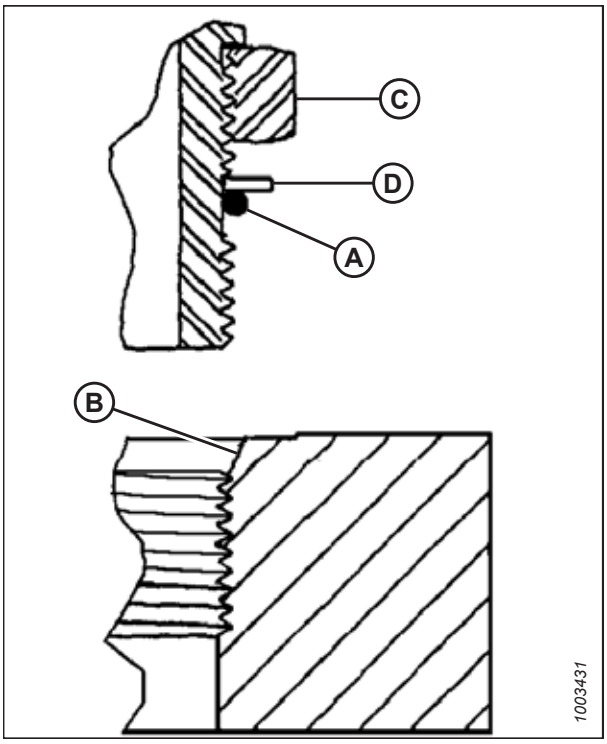


Figure 7.6: Hydraulic Fitting

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. Verify the final condition of the fitting.

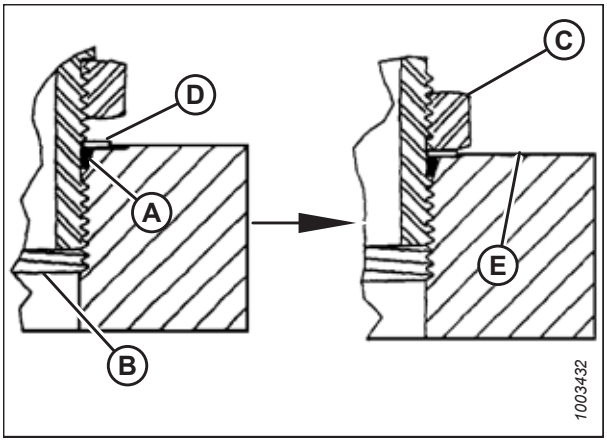


Figure 7.7: Hydraulic Fitting

O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[84]	
		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

7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. 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 defects.
2. Ensure 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 *, page 485*.
6. Verify the final condition of the fitting.

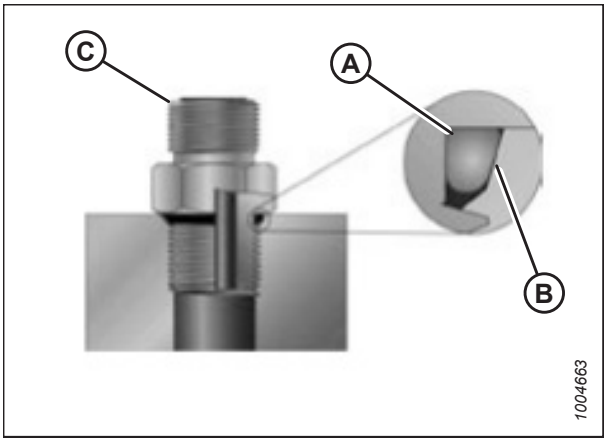


Figure 7.8: Hydraulic Fitting

84. Torque values shown are based on lubricated connections as in reassembly.

O-Ring Boss (ORB) Hydraulic Fittings – Non-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
-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, refer to the value specified in the procedure instead.

Torque values are shown in the Table *, page 486*.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

Figure 7.9: Hydraulic Fitting

85. 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 , page 486.

   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. Verify the final condition of the fitting.

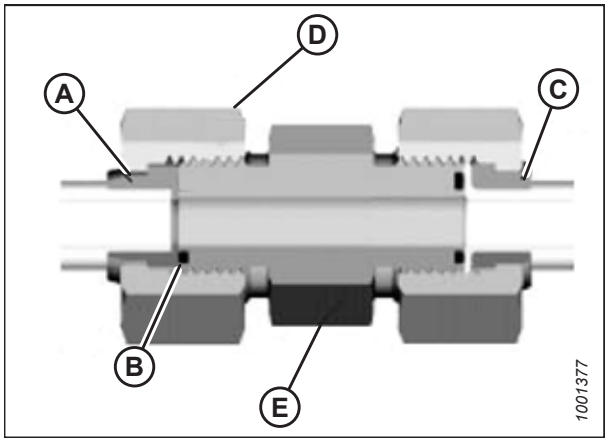


Figure 7.10: Hydraulic Fitting

O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[86]	
			Nm	lbf·ft
-3	Note[87]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[87]	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[87]	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, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

86. Torque values and angles shown are based on lubricated connection as in reassembly.
87. O-ring face seal type end not defined for this tube size.

1. 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.
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 , *page 487*. Ensure 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 loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect 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 over-torquing may not be evident until the fittings are disassembled and inspected.

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.

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)
Chain oil	Chain oil with a viscosity of 100–150 sCt at 40°C (104°F) or mineral oil SAE 20W-50 that has no detergents or solvents	Chain oil is formulated to provide good wear protection and resistance to foaming. It protects the chain and drive sprockets against wear.	Reel drive chain	—

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