



MacDon®

FD1 Series FlexDraper® Combine Header

**IMPORTANT: PAGES 28 AND
29 HAVE BEEN UPDATED
SINCE THIS MANUAL WAS
PUBLISHED.**

Operator's Manual

214065 Revision A

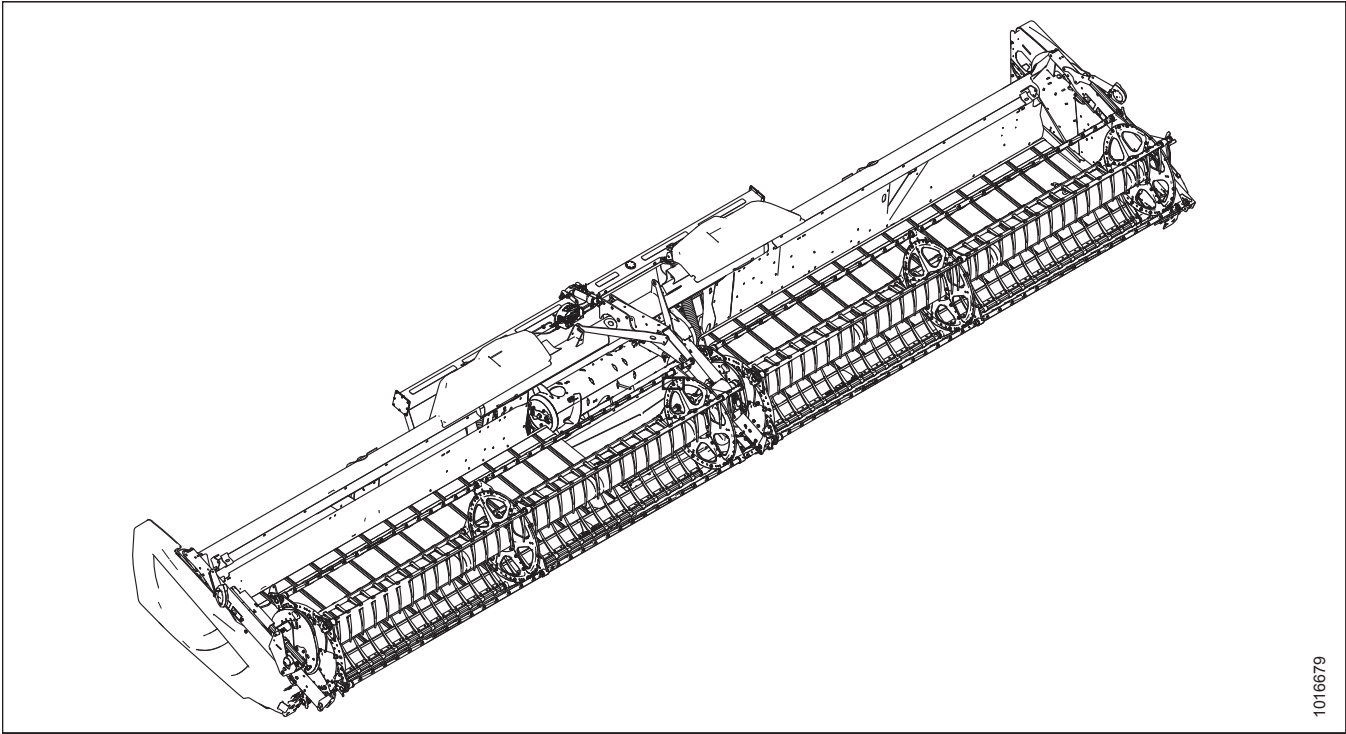
2017 Model Year

Original Instruction

Featuring MacDon FLEX-FLOAT Technology™

The harvesting specialists.


FD1 Series FlexDraper® Header for Combines



1016679

Published: February 2017

Declaration of Conformity

 EC Declaration of Conformity			
[1] MacDon MacDon Industries Ltd. 680 Moray Street, Winnipeg, Manitoba, Canada R3J 3S3		[4] As per shipping document	
[2] Combine Header		[5] September 19, 2016	
[3] MacDon FD1 Series		[6] _____ Christoph Martens Product Integrity	

EN	BG	CZ	DA
We, [1] Declare, that the product: Machine Type: [2] Name & Model: [3] Serial Number(s): [4] fulfills 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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germany) hartmut.hartmann@prodoku.com	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: Хартмут Хартман Wersener Holz 2a D-49504 Lotte (Германия) hartmut.hartmann@prodoku.com	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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Německo) hartmut.hartmann@prodoku.com	Vi, [1] erklærer, at produktet: Maskintype [2] Navn og model: [3] Serienummer (-numre): [4] Opfylder alle bestemmelser i direktiv 2006/42/EF. Anvendte harmoniserede standarder, som henviser 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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Tyskland) hartmut.hartmann@prodoku.com

DE	ES	ET	FR
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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Deutschland) hartmut.hartmann@prodoku.com	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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germany) hartmut.hartmann@prodoku.com	Meie, [1] deklareerime, et toode Seadme tüüp: [2] Nimi ja mudel: [3] Seerianumbrid: [4] vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele. Kasutatud on järgnevald 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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Saksamaa) hartmut.hartmann@prodoku.com	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 : Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Allemagne) hartmut.hartmann@prodoku.com

The Harvesting Specialists **MacDon**

EC Declaration of Conformity

<p>IT</p> <p>Noi, [1] Dichiaro 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.</p> <p>Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germania) hartmut.hartmann@prodoku.com</p>	<p>HU</p> <p>Mi, [1] Ezennel kijelentő, hogy a következő termék: Gép típusa: [2] Név és modell: [3] Számszám(ok): [4] teljesíti a következő irányelv összes vonatkozó előírását: 2006/42/EK.</p> <p>Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint:</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Németország) hartmut.hartmann@prodoku.com</p>	<p>LT</p> <p>Mes, [1] Pareiškiam, kad šis produktas: Mašinos tipas: [2] Pavadinimas ir modelis: [3] Serijos numeris (-iai): [4] atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.</p> <p>Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklaracijos vieta ir data: [5] Asmens tapatybės duomenys ir parašas asmens, įgaliojantis sudaryti šią deklaraciją: [6] Vardas ir pavardė asmens, kuris įgaliojantis sudaryti šią techninį failą: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Vokietija) hartmut.hartmann@prodoku.com</p>	<p>LV</p> <p>Mēs, [1] Deklarēju, ka produkts: Mašīnas tips: [2] Nosaukums un modelis: [3] Sērijas numurs(-i): [4] atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.</p> <p>Piemēroti šādi saskaņotie standarti, kā minēts 7. pantā 2. punktā:</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Vācija) hartmut.hartmann@prodoku.com</p>
<p>NL</p> <p>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.</p> <p>Geharmoniseerde normen toegepast, zoals vermeld in Artikel 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Duitsland) hartmut.hartmann@prodoku.com</p>	<p>PO</p> <p>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.</p> <p>Zastosowaliśmy następujące (zharmonizowane) normy zgodnie z artykułem 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Niemcy) hartmut.hartmann@prodoku.com</p>	<p>PT</p> <p>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.</p> <p>Normas harmonizadas aplicadas, conforme referido no Artigo 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Alemanha) hartmut.hartmann@prodoku.com</p>	<p>RO</p> <p>Noi, [1] Declaram, că următorul produs: Tipul mașinii: [2] Denumirea și modelul: [3] Număr (numere) serie: [4] corespunde tuturor dispozițiilor esențiale ale directivei 2006/42/EC.</p> <p>Au fost aplicate următoarele standarde armonizate conform articolului 7(2):</p> <p>EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Data și locul declarației: [5] Identitatea și semnătura persoanei împuternicite pentru întocmirea declarației: [6] Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germania) hartmut.hartmann@prodoku.com</p>
<p>RS</p> <p>Mi, [1] Izjavljujem da proizvod Tip mašine: [2] Naziv i model: [3] Serijski broj(ovi): [4] Ispunjava sve relevantne odredbe direktive 2006/42/EC. Korišćen su usklađeni standardi kao što je navedeno u članu 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009 Datum i mesto izdavanja deklaracije: [5] Identitet i potpis lica ovlašćenog za sastavljanje deklaracije: [6] Ime i adresa osobe ovlašćene za sastavljanje tehničke datoteke: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Nemačka) hartmut.hartmann@prodoku.com</p>	<p>SE</p> <p>Mi, [1] Intygat att produkten: Maskintyp: [2] Namn och modell: [3] Serienummer: [4] uppfyller alla relevanta villkor i direktivet 2006/42/EG. Harmoniserade 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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Tyskland) hartmut.hartmann@prodoku.com</p>	<p>SI</p> <p>Mi, [1] izjavljam, 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, pooblaščenega za pripravo izjave: [6] Ime in naslov osebe, pooblaščenega za pripravo tehnične datoteke: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Nemčija) hartmut.hartmann@prodoku.com</p>	<p>SK</p> <p>My, [1] týmto prehlasujem, že tento výrobok: Typ zariadenia: [2] Názov a model: [3] Výrobné číslo: [4] splňa príslušné ustanovenia a základné požiadavky smernice č. 2006/42/ES. Použitá harmonizované normy, ktoré sa uvádzajú v článku 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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Nemecko) hartmut.hartmann@prodoku.com</p>

1020815



EC Declaration of Conformity

[1] **MacDon**
MacDon Industries Ltd.
680 Moray Street,
Winnipeg, Manitoba, Canada
R3J 3S3

[4] As per shipping document

[5] September 19, 2016

[2] Float Module

[3] MacDon FM100

[6] _____
Christoph Martens
Product Integrity

EN	BG	CZ	DA
We, [1] Represented by Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Germany HRN 31002, Amtsgericht Zweibrücken Declare, that the product: Machine Type: [2] Name & Model: [3] Serial Number(s): [4] to which the declaration, fulfills all relevant provisions and essential requirements of the following directive: 2006/42/EC, via self-certification. For the relevant implementation of the provisions of the Directives, the following (harmonized) standards have been applied: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Other standards: see Operator's Manual Place and date of declaration: [5] Name and signature of authorized person: [6]	Ние, [1] Представявани от Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Германия HRN 31002, Amtsgericht Zweibrücken Декларираме, че следният продукт: тип машина: [2] Наименование и модел: [3] сериен номер(а): [4] вписан в декларацията, отговаря на всички приложими разпоредби и съществени изисквания на следните директива: 2006/42/ЕО & 2004/108/ЕО, чрез самостоятелно сертифициране. За съответното изпълнение на разпоредбите на тези Директиви са приложени следните (хармонизирани) стандарти: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Други стандарти: вижте Ръководството за оператора място и дата на декларацията: [5] Име и подпис на упълномощеното лице: [6]	My [1] Zastoupení Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Německo HRN 31002, Amtsgericht Zweibrücken Prohlašujeme, že produkt: Typ zařízení: [2] Název a model: [3] Sériové číslo (Sériová čísla): [4] splňuje všechna relevantní ustanovení a základní požadavky následujících směrnic: 2006/42/EC, na základě vlastní certifikace V případě relevantních implementací ustanovení směrnice byly použity následující (harmonizované) normy: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Ostatní normy: viz Návod k obsluze Místo a a datum prohlášení: [5] Jméno a podpis pověřené osoby: [6]	Vi, [1] Repræsenteret af Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Tyskland HRN 31002, Amtsgericht Zweibrücken Erklære, at produktet: Maskintype: [2] Navn og model: [3] Serienummer (-numre): [4] hvortil erklæringen gælder, opfylder alle relevante bestemmelser og obligatoriske krav i følgende direktiv: 2006/42/EF, via selvcertificering. For relevant implementering af bestemmelserne i direktiverne er følgende (harmoniserede) standard blevet gjort gældende: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Andre standarder: Se operatørmanualen Sted og dato for erklæringen: [5] Den bemyndigede persons navn og underskrift: [6]
Wir, [1] Vorgestellt von Molitor AgroTec GmbH, Schwarzwald Straße 67 66482 Zweibrücken / Deutschland HRN 31002, Amtsgericht Zweibrücken Erklären, dass das Produkt: Maschinentyp: [2] Name & Modell: [3] Seriennummer(n): [4] die entsprechenden Vorschriften und wichtigen Anforderungen der folgenden Direktive entspricht/entsprechen: 2006/42/EC, über Selbstzertifizierung. Für die entsprechende Umsetzung der Bestimmungen der Direktiven wurden folgende (harmonisierten) Normen angewendet: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Weitere Normen: Siehe Betriebshandbuch Ort und Datum der Erklärung: [5] Name und Unterschrift der berechtigten Person: [6]	Nosotros, [1] Representado por Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Alemania HRN 31002, Amtsgericht Zweibrücken Declaramos que el producto: Tipo de máquina: [2] Nombre y modelo: [3] Números de serie: [4] con lo cual la declaración, cumple con todas las disposiciones relevantes y los requerimientos fundamentales de las siguientes directiva: 2006/42/EC, mediante autocertificación. Para la implementación pertinente de las disposiciones de las directivas, se han aplicado los siguientes estándares (armonizados): EN ISO 4254-1:2013 EN ISO 4254-7:2008 Otros estándares: Consulte el Manual del operador. Lugar y fecha de la declaración: [5] Nombre y firma de la persona autorizada: [6]	Meie, [1] keda esindab Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Saksamaa HRN 31002, Zweibrücken kohalik kohus, Deklareerime käesolevaga, et toode: Seadme tüüp: [2] Nimi ja mudel: [3] Seerianumber: [4] täidab kõik järgnevat direktiiv asjakohased nõuded ja tingimused: 2006/42/EÜ. Nimetatud direktiivide nõuete järgimisel on rakendatud alltoodud (harmoneeritud) standardeid: EN ISO 4254-1:2013 EN ISO 4254-7:2008 Muud standardid: vt kasutusjuhendit Deklaratsiooni koostamise koht ja aeg: [5] Volitatud isiku nimi ja allkiri: [6]	Nous, [1] Représenté par Molitor AgroTec GmbH, Schwarzwald Strasse 67 66482 Zweibrücken / Allemagne HRN 31002, Amtsgericht Zweibrücken Déclarons, que le produit: Type de machine: [2] Nom et modèle: [3] Numéro(s) de série: [4] par la présente déclaration, remplit toutes les dispositions et exigences essentielles de directive suivantes : 2006/42/EC, par une auto-certification. Pour la mise en œuvre adéquate des dispositions des directives, les normes (harmonisées) suivantes ont été appliquées : EN ISO 4254-1:2013 EN ISO 4254-7:2008 Autres normes: consultez le manuel d'utilisation Lieu et date de la déclaration: [5] Nom et signature de la personne autorisée: [6]

The Harvesting Specialists

MacDon

1020818

EC Declaration of Conformity

<p>IT</p> <p>Noi, [1] Dichiaro 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.</p> <p>Utilizzo degli standard armonizzati, come indicato nell'Articolo 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Germania) hartmut.hartmann@prodoku.com</p>	<p>HU</p> <p>Mi, [1] Ezennel kijelentő, hogy a következő termék: Gép típusa: [2] Név és modell: [3] Számszám(ok): [4] teljesíti a következő irányelv összes vonatkozó előírását: 2006/42/EK.</p> <p>Az alábbi harmonizált szabványok kerültek alkalmazásra a 7(2) cikkely szerint: EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>A nyilatkozattétel ideje és helye: [5] Azon személy kitétele és aláírása, aki jogosult a nyilatkozat elkészítésére: [6] Azon személy neve és aláírása, aki felhatalmazott a műszaki dokumentáció összeállítására: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Németország) hartmut.hartmann@prodoku.com</p>	<p>LT</p> <p>Mes, [1] Pareiškiam, kad šis produktas: Mašinos tipas: [2] Pavadinimas ir modelis: [3] Serijos numeris (-iai): [4] atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.</p> <p>Naudojami harmonizuoti standartai, kai nurodoma straipsnyje 7(2): EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>Deklaracijos vieta ir data: [5] Asmens tapatybės duomenys ir parašas asmens, įgaliojantis sudaryti šią deklaraciją: [6] Vardas ir pavardė asmens, kuris įgaliojantis sudaryti šią techninį failą: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Vokietija) hartmut.hartmann@prodoku.com</p>	<p>LV</p> <p>Mēs, [1] Deklarēju, ka produkts: Mašīnas tips: [2] Nosaukums un modelis: [3] Sērijas numurs(-i): [4] atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.</p> <p>Piemēroti šādi saskaņotie standarti, kā minēts 7. pantā 2. punktā: EN ISO 4254-1:2013 EN ISO 4254-7:2009</p> <p>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: Hartmut Hartmann Wersener Holz 2a D-49504 Lotte (Vācija) hartmut.hartmann@prodoku.com</p>
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1020819

Introduction

This instructional manual contains information on the FD1 Series FlexDraper® and the FM100 Combine Float Module. It must be used in conjunction with your combine operator's manual.

The FD1 Series FlexDraper® is specially designed to work well in all straight cut conditions, whether cutting on or above the ground, using a three-piece flexible frame to closely follow ground contours.

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. If you require more detailed service information, a technical manual is available from your MacDon Dealer.

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

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. A manual storage case is located inside the header left endshield.

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

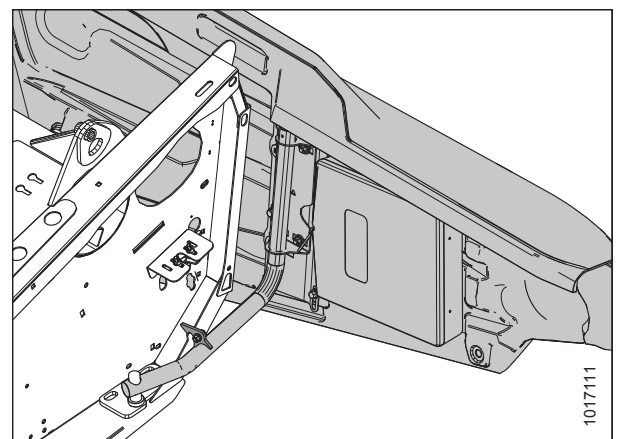


Figure 1. Manual Storage Location

Model and Serial Number

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

NOTE:

Right and left designations are determined from the operator's position, facing forward.

FlexDraper® Header

Header

Model: _____

Serial

Number: _____

Year: _____

The serial number plate (A) is located in the upper corner on the left endsheet.

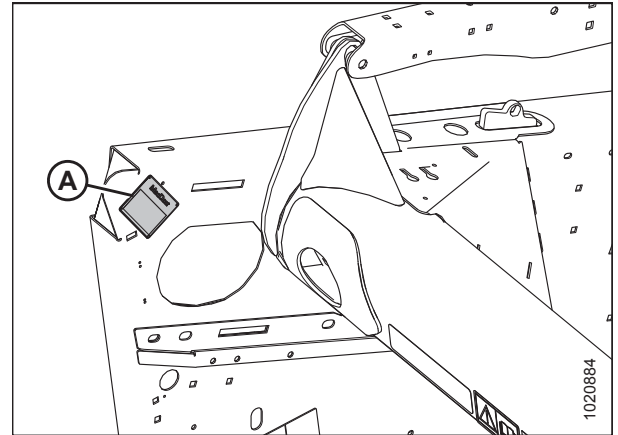


Figure 2. Header, Left Side Endshield

Combine Float Module

Float Module

Model: _____

Serial

Number: _____

Year: _____

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

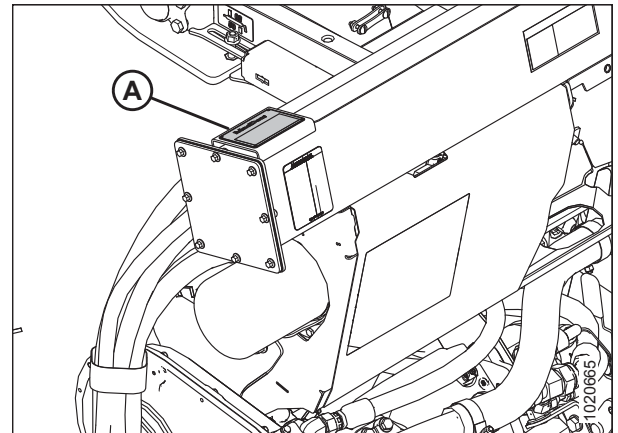


Figure 3. Float Module

Slow Speed Transport / Stabilizer Wheel Option

Serial

Number: _____

Year: _____

The serial number plate (A) is located on the right axle assembly.

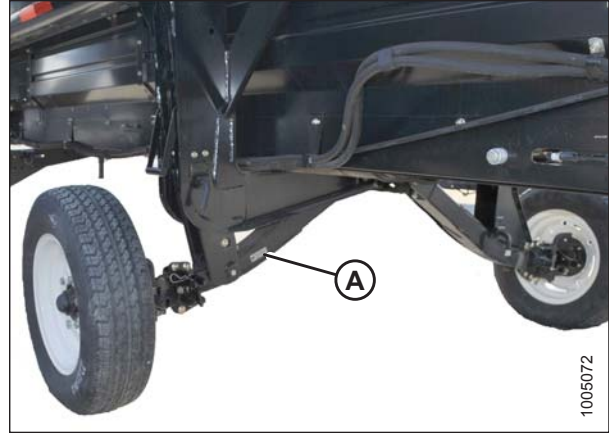


Figure 4. Transport/Stabilizer Option

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1 Safety

1.1 Safety Alert Symbols

This 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. The appropriate signal word for each situation has been selected using the following guidelines:



DANGER

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



WARNING

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



CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for 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
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against loud noises.

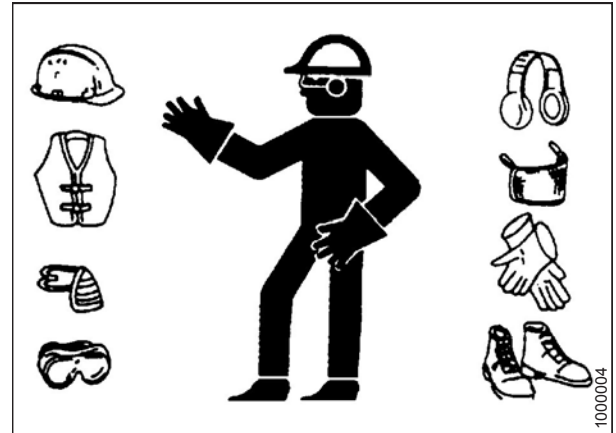


Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

- Provide a first aid kit for use in case of emergencies.
- Keep a fire extinguisher on the machine. Be sure fire extinguisher is properly maintained. Be familiar with its proper use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when Operator is tired or in a hurry. Take time to consider safest way. Never ignore warning signs of fatigue.

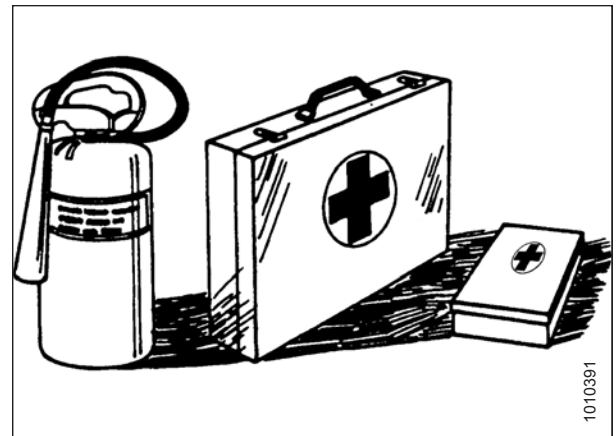


Figure 1.4: Safety Equipment

SAFETY

- Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet 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 engine is running.
- Do **NOT** modify machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten machine's life.
- To avoid bodily injury or death from unexpected startup of machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

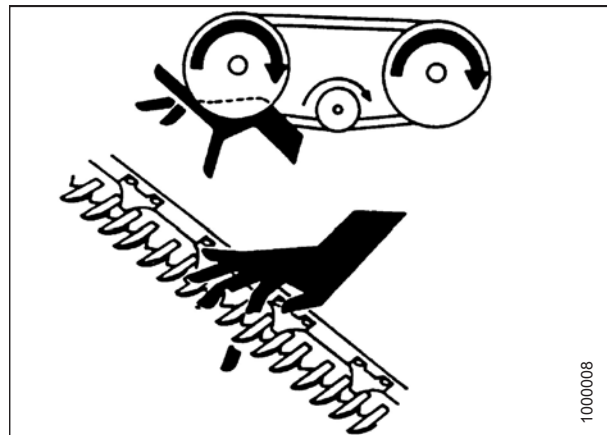


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining machine:

- Review operator's manual and all safety items before operation and/or maintenance of machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
 - Keep service areas clean and dry
 - Be sure electrical outlets and tools are properly grounded
 - Use adequate lighting for job at hand
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting machine.
- Make sure 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 area of bystanders, especially children, when carrying out any maintenance, repairs or, adjustments.
- Install transport lock or place safety stands under frame before working under machine.
- If more than one person is servicing machine at same time, be aware that rotating a driveline or other mechanically-driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on machine.
- Wear heavy gloves when working on knife components.



Figure 1.8: Safety around Equipment

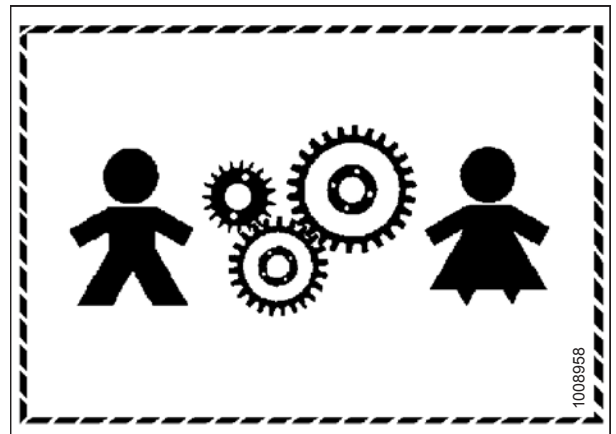


Figure 1.9: Equipment NOT Safe for Children

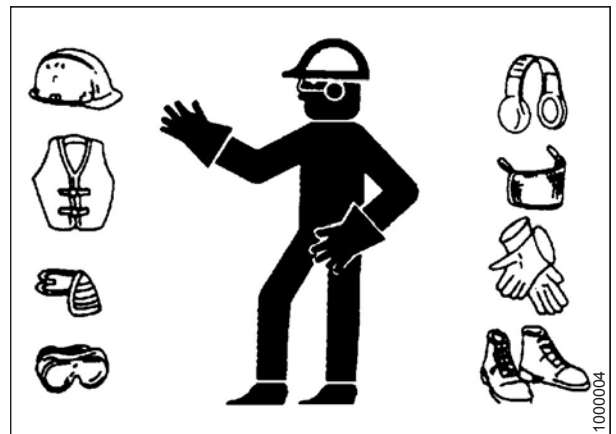


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

- Always place all hydraulic controls in Neutral before dismounting.
- Make sure that all components in 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 will fail suddenly and create hazardous and unsafe conditions.

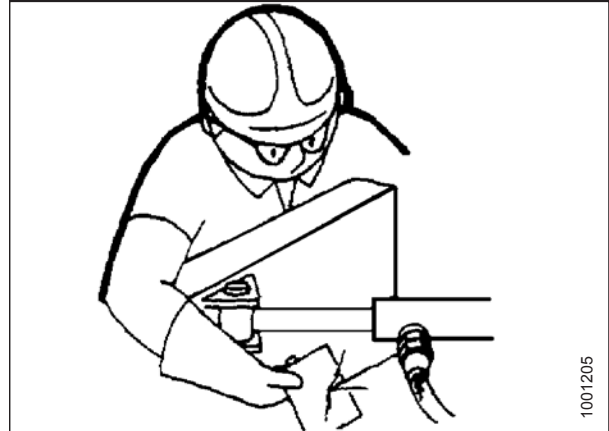


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic leaks. Use a piece of cardboard as a backstop instead of 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

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

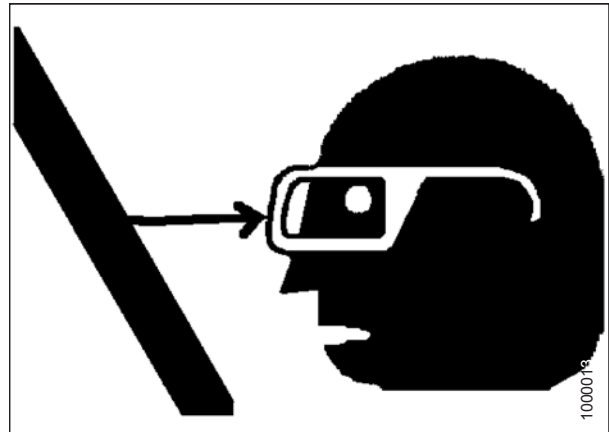


Figure 1.13: Safety around Equipment

1.6 Safety Signs

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure repair part also bears current safety sign.
- Replacement safety signs are available from your Dealer Parts Department.

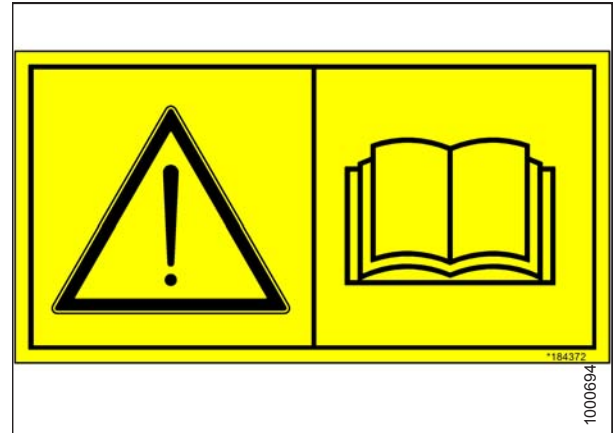


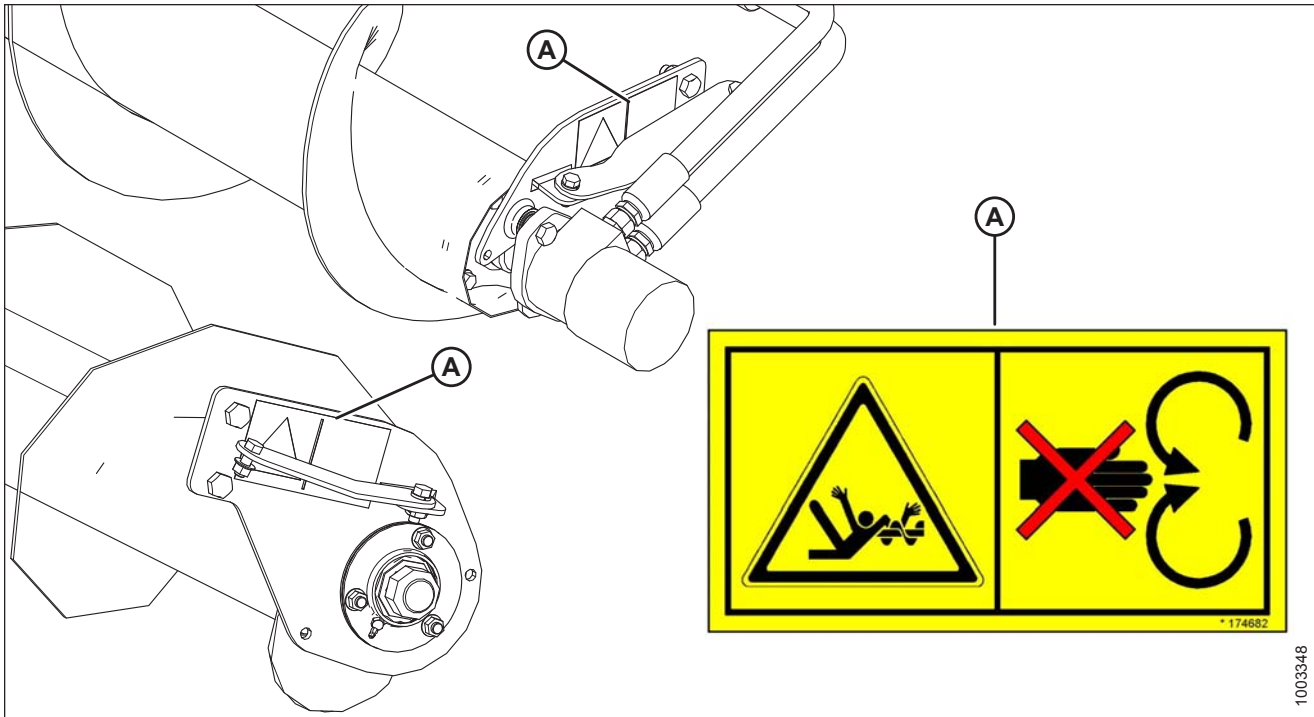
Figure 1.14: Operator's Manual Decal

1.6.1 Installing Safety Decals

1. Clean and dry installation area.
2. Decide on exact location before you remove decal backing paper.
3. Remove smaller portion of split backing paper.
4. Place sign in position and slowly peel back remaining paper, smoothing sign as it is applied.
5. Prick small air pockets with a pin and smooth out.

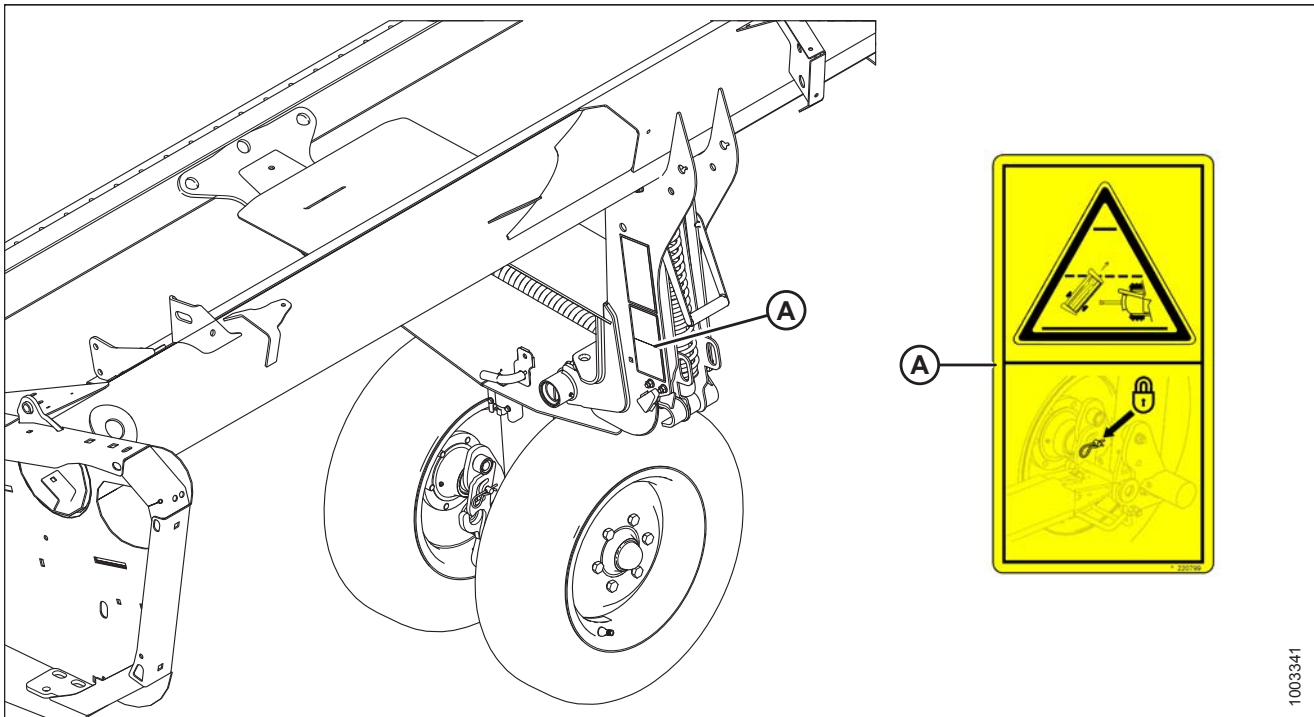
1.7 Safety Decal Locations

Figure 1.15: Upper Cross Auger



A - MD #174682

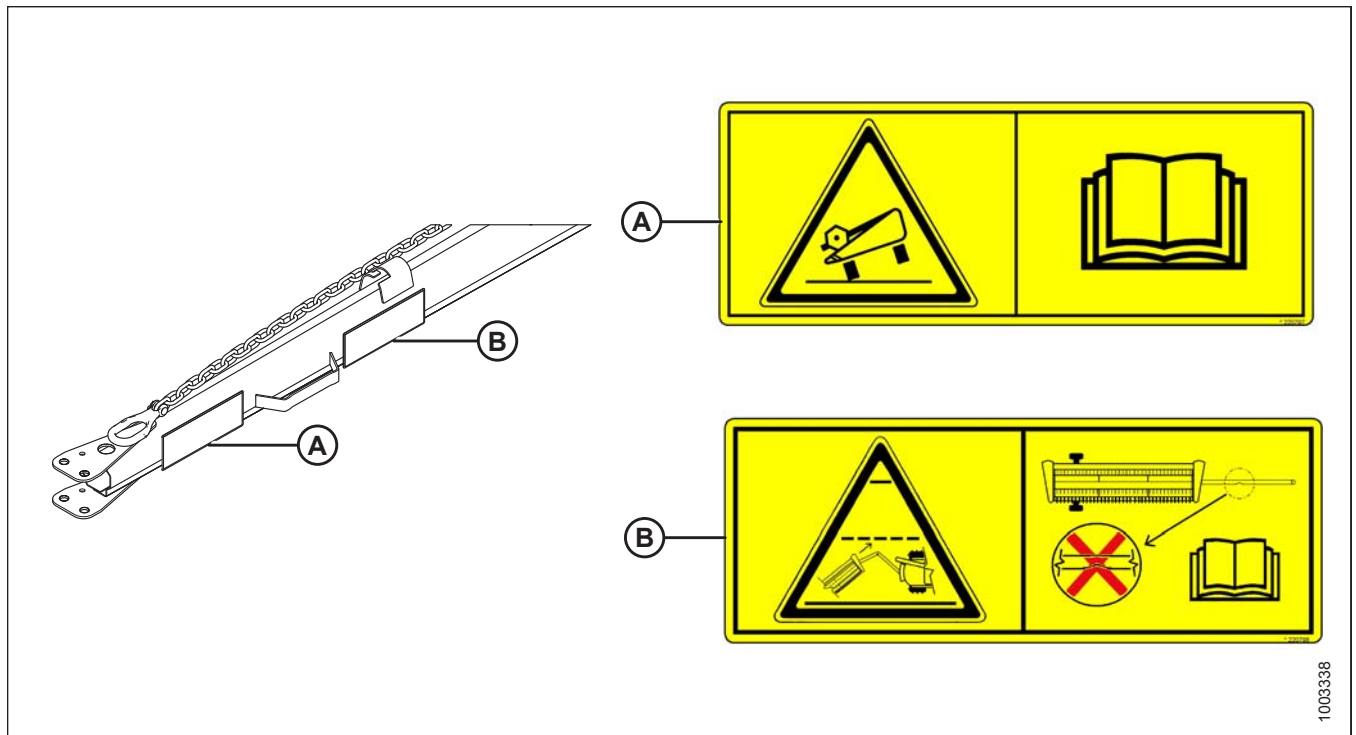
Figure 1.16: Slow Speed Transport



A - MD #220799

SAFETY

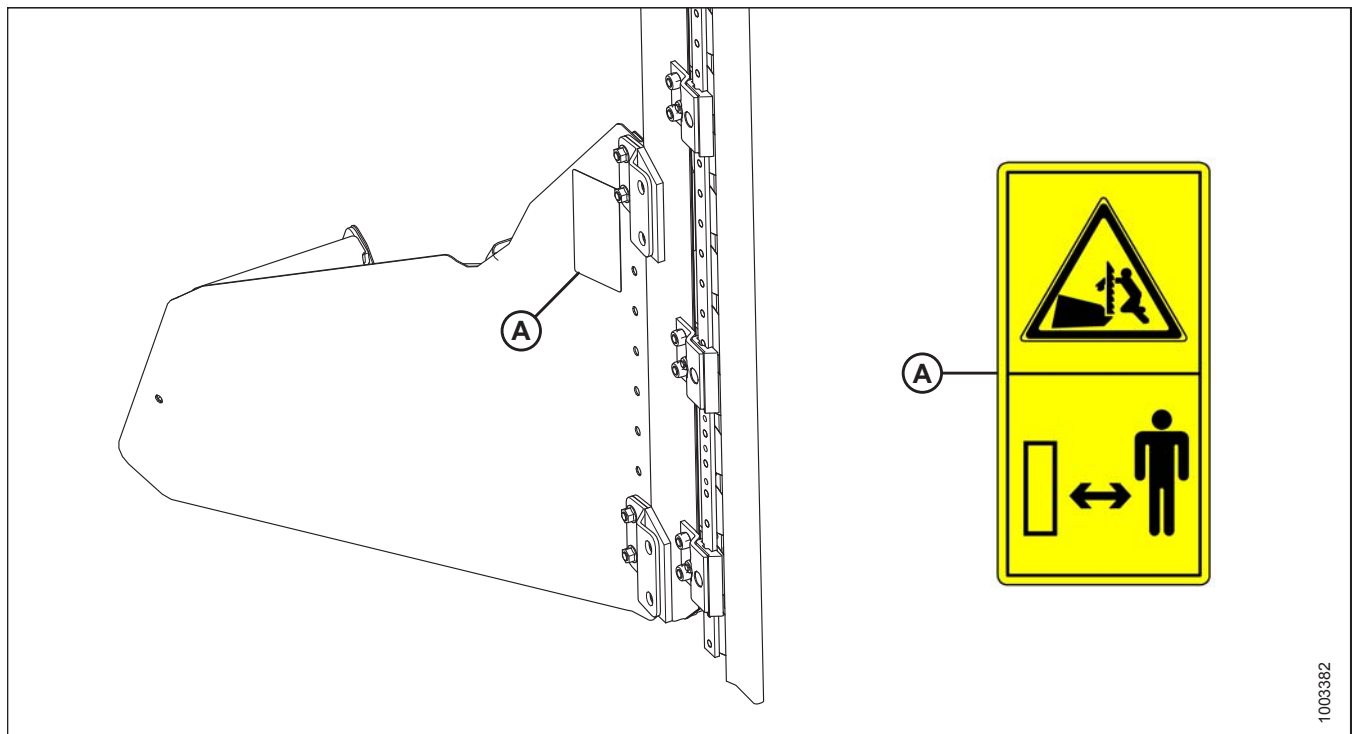
Figure 1.17: Slow Speed Transport Tow-Bar



A - MD #220797

B - MD #220798

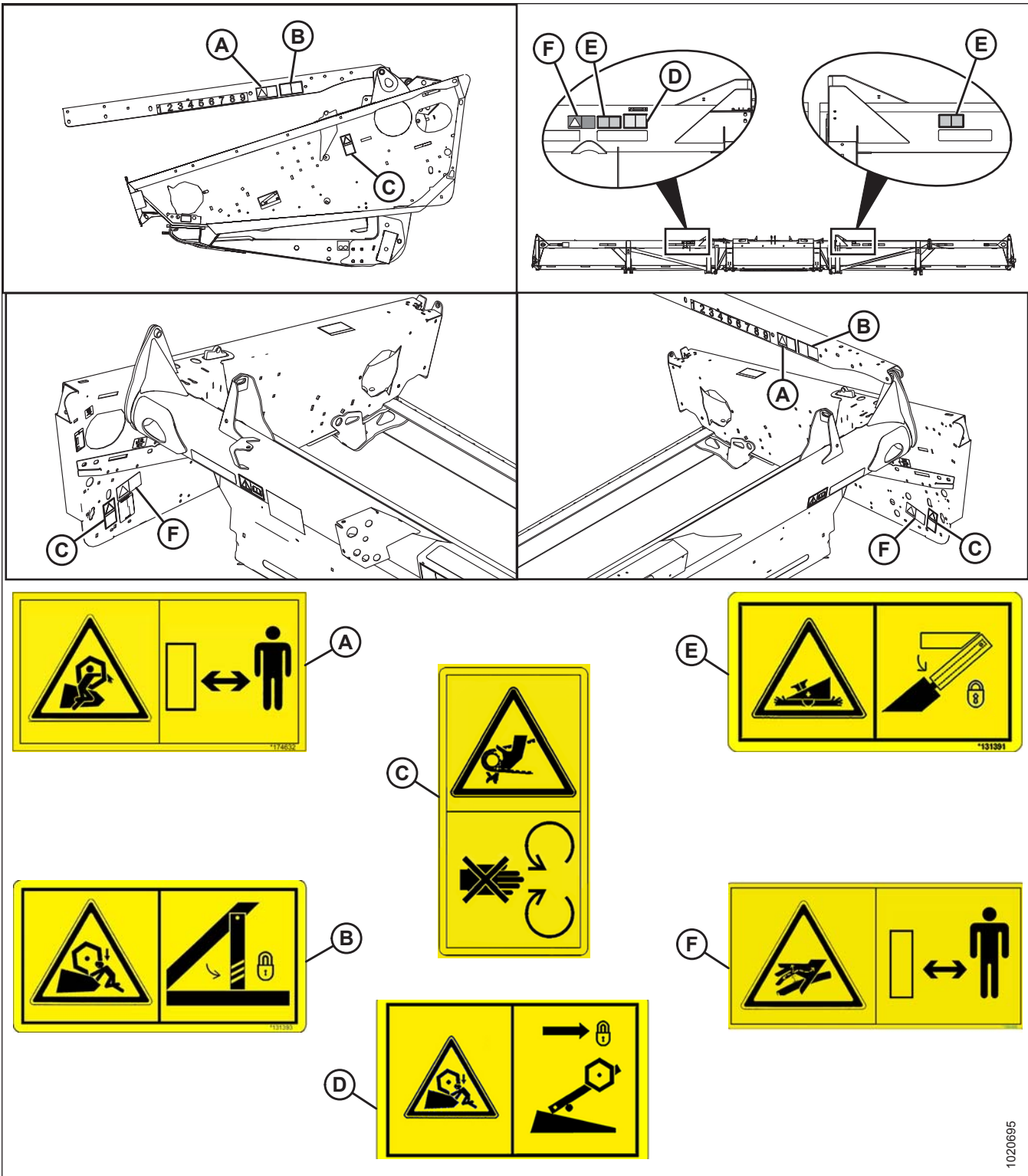
Figure 1.18: Vertical Knife



A - MD #174684

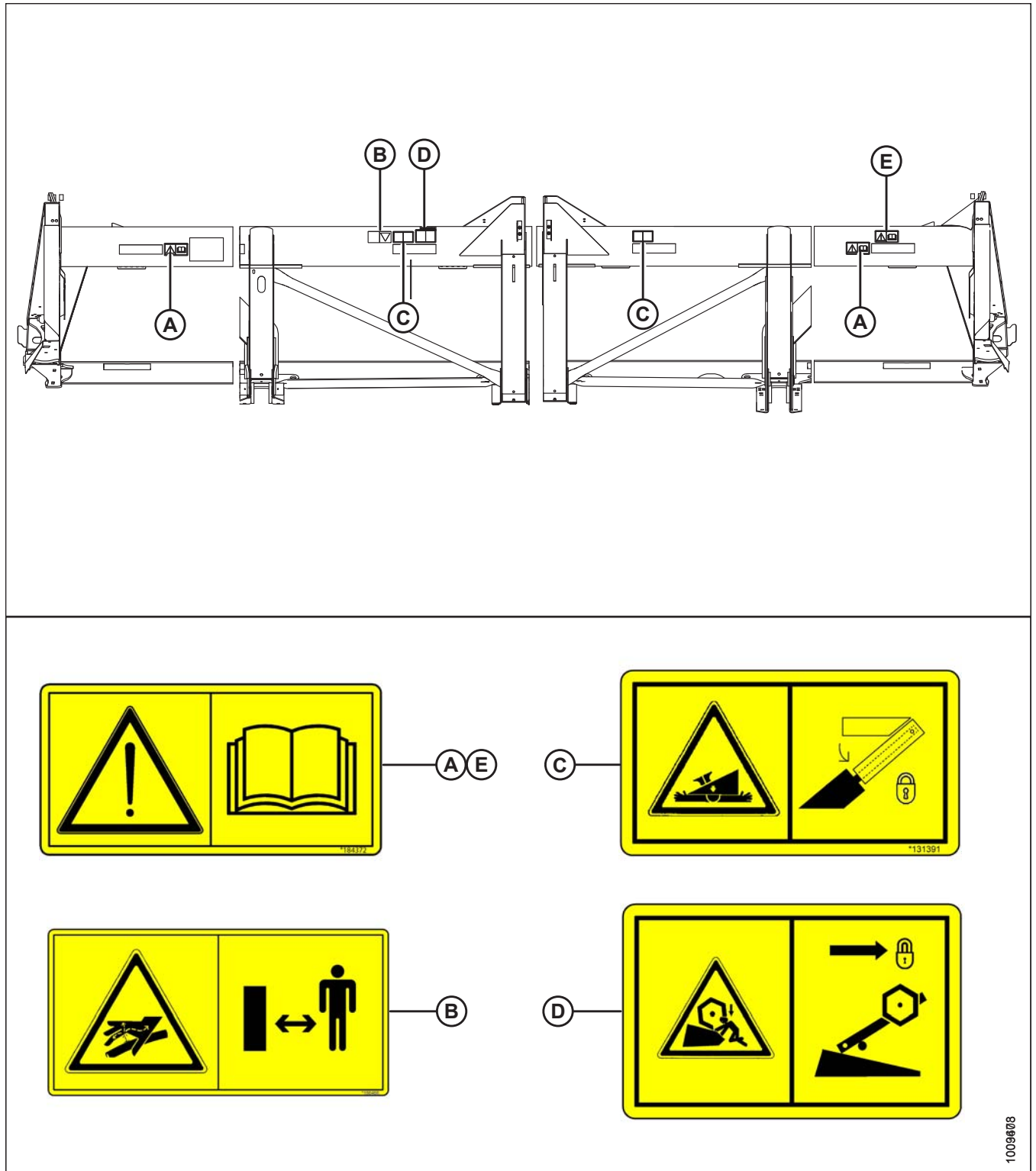
SAFETY

Figure 1.19: Endsheets, Reel Arms, and Backsheet



SAFETY

Figure 1.20: Backtube



A - MD #184372
D - MD #131392

B - MD #166466
E - MD #184372 (Split Frame)

C - MD #131391

1.8 Understanding Safety Signs

MD #113482

General hazard pertaining to machine operation and servicing

CAUTION

To avoid 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 machine before starting engine and during operation.
- Keep riders off the machine.
- Keep all shields in place and stay clear of moving parts.
- Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
- Stop the engine and remove the key before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of header or reel before servicing in the raised position (refer to the header operator's manual).
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

MD #131391

Crushing hazard

DANGER

- Rest header on ground or engage safety props before going under unit.



Figure 1.21: MD #113482

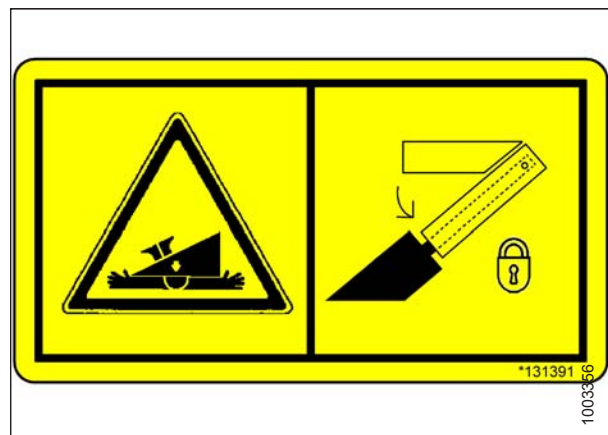


Figure 1.22: MD #131391

SAFETY

MD #131392

Crushing hazard

WARNING

- To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.

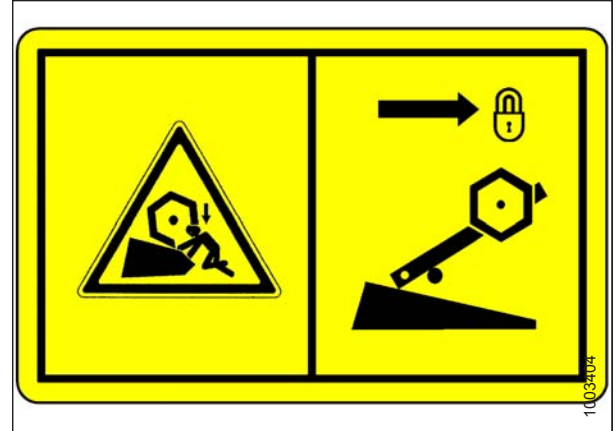


Figure 1.23: MD #131392

MD #131393

Reel hazard

WARNING

- To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.



Figure 1.24: MD #131393

MD #166466

High pressure oil hazard

WARNING

- Do not go near leaks.
- High pressure oil easily punctures skin causing serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.



Figure 1.25: MD #166466

SAFETY

MD #174436

High pressure oil hazard

WARNING

- Do not go near leaks.
- High pressure oil easily punctures skin causing serious injury, gangrene, or death.
- If injured, seek emergency medical help. Immediate surgery is required to remove oil.
- Do not use finger or skin to check for leaks.
- Lower load or relieve hydraulic pressure before loosening fittings.



Figure 1.26: MD #174436

MD #174632

Reel entanglement hazard

CAUTION

- To avoid injury from entanglement with rotating reel, stand clear of header while machine is running.



Figure 1.27: MD #174632

MD #184372

General hazard pertaining to machine operation and servicing

CAUTION

To avoid 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 annually.
- Ensure that all safety signs are installed and legible.
- Make certain everyone is clear of machine before starting engine and during operation.
- Keep riders off the machine.
- Keep all shields in place and stay clear of moving parts.

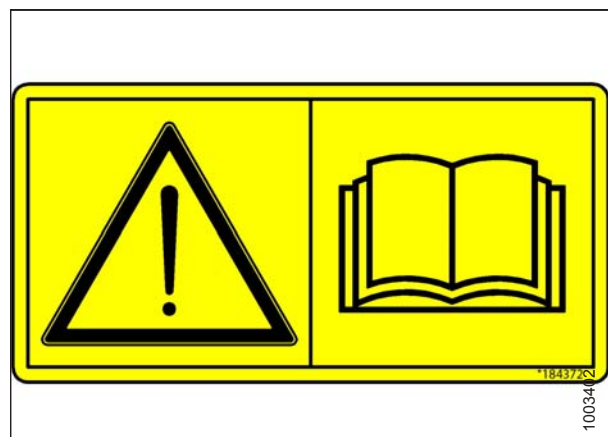


Figure 1.28: MD #184372

SAFETY

- Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
- Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of raised unit before servicing in the raised position.
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

MD #184422

Keep shields in place hazard

WARNING

- Do not place hand.
- To avoid injury, stop the engine and remove the key before opening power drive system shield.
- Keep all shields in place.



Figure 1.29: MD #184422

MD #220797

Tipping hazard in transport mode

WARNING

- Read the operator's manual for more information on potential tipping or roll-over of header while transporting.

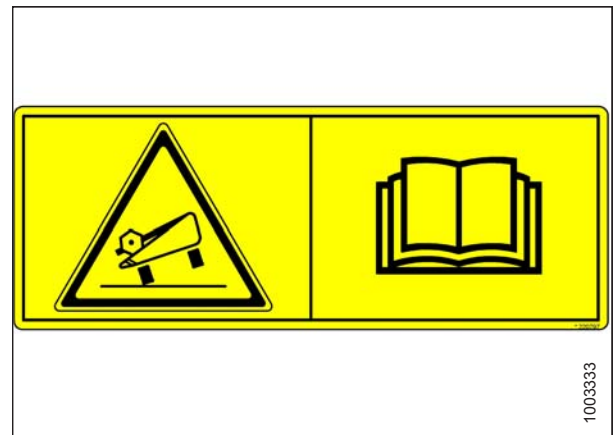


Figure 1.30: MD #220797

SAFETY

MD #220798

Loss of control hazard in transport

CAUTION

- Do not tow the header with a dented or otherwise damaged tow pole (the circle with the red X shows a dent in the pole).
- Consult the operator's manual for more information.



Figure 1.31: MD #220798

MD #220799

Transport/roading hazard

WARNING

- Ensure tow-bar lock mechanism is locked.



Figure 1.32: MD #220799

MD #279085

Auger entanglement hazard

WARNING

- To avoid injury from rotating auger, stand clear of auger while machine is running.



Figure 1.33: MD #279085

2 Product Overview

2.1 Definitions

The following terms and acronyms may be used in this manual.

Term	Definition
AHHC	Automatic Header Height Control
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined vehicle gross weight
D1 Series header	MacDon D120, D125, D130, D135, D140, or D145 combine draper header from D1 model number series
DK	Double knife
DKD	Double-knife drive
DDD	Double-draper drive
DR	Double reel
FD1 Series header	MacDon FD130, FD135, FD140, or FD145 combine FlexDraper® header from the FD1 Series model number series
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and fitting has been tightened to a point where fitting is no longer loose
FFFT	Flats from finger tight
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts crop and feeds it into an attached combine
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
HDS	Hydraulic deck shift
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
MDS	Mechanical deck shift
n/a	Not applicable

PRODUCT OVERVIEW

Term	Definition
Nut	An internally threaded fastener that is designed to be paired with a bolt
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
ORB	O-ring boss: A style of fitting commonly used in port opening on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes This style of fitting is also commonly called ORS, which stands for O-ring seal
rpm	Revolutions per minute
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
SDD	Single-drawer drive
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf-ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism

2.2 Specifications

The following symbol and letters are used in Table 2.1, page 19 and Table 2.2, page 22:

- **S**: standard
- **O_F**: optional (factory installed)
- **O_D**: optional (dealer installed)
- **—** : not available

| FD1 | FM100 | Attachments

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

Table 2.1 Header Specifications

Cutterbar			
Effective cutting width (distance between crop divider points)			
30-foot header		30 foot (914.4 cm [360 in.])	S
35-foot header		35 foot (1066.8 cm [420 in.])	S
40-foot header		40 foot (1219.2 cm [480 in.])	S
45-foot header		45 foot (1371.6 cm [540 in.])	S
Cutterbar lift range		Varies with combine model	S
Knife			
Single-knife drive (all sizes): hydraulic motor to C-belt to enclosed heavy duty (MD) knife drive box.			O _F
Double knife drive (35-foot and smaller): hydraulic motor to two B-belts to enclosed heavy duty (MD) knife drive boxes.			O _F
Double knife drive (40- and 45-foot): two hydraulic motors to C-belts, non-timed, to enclosed heavy duty (MD) knife drive boxes.			O _F
Knife stroke		76 mm (3 in.)	S
Single-knife speed (strokes per minute) ¹	30 foot	1200–1400 spm	S
	35 foot	1100–1300 spm	S
	40 foot	1050–1200 spm	S
Double-knife speed (strokes per minute) ¹	40, 45 foot	1100–1400 spm	S
Knife Sections			
Over-serrated / solid / bolted / 9 serrations per inch			S
Knife overlap at center (double-knife headers)		3 mm (1/8 in.)	S
Guards and Hold-Downs			
Guard: pointed / forged / double heat treated (DHT) Hold-down: sheet metal / adjustment bolt			S

1. Under normal cutting conditions, knife speed taken at the knife drive pulley should be set between 600 and 640 rpm (1200 and 1280 spm). If set to low side of chart, you could experience knife stalling.

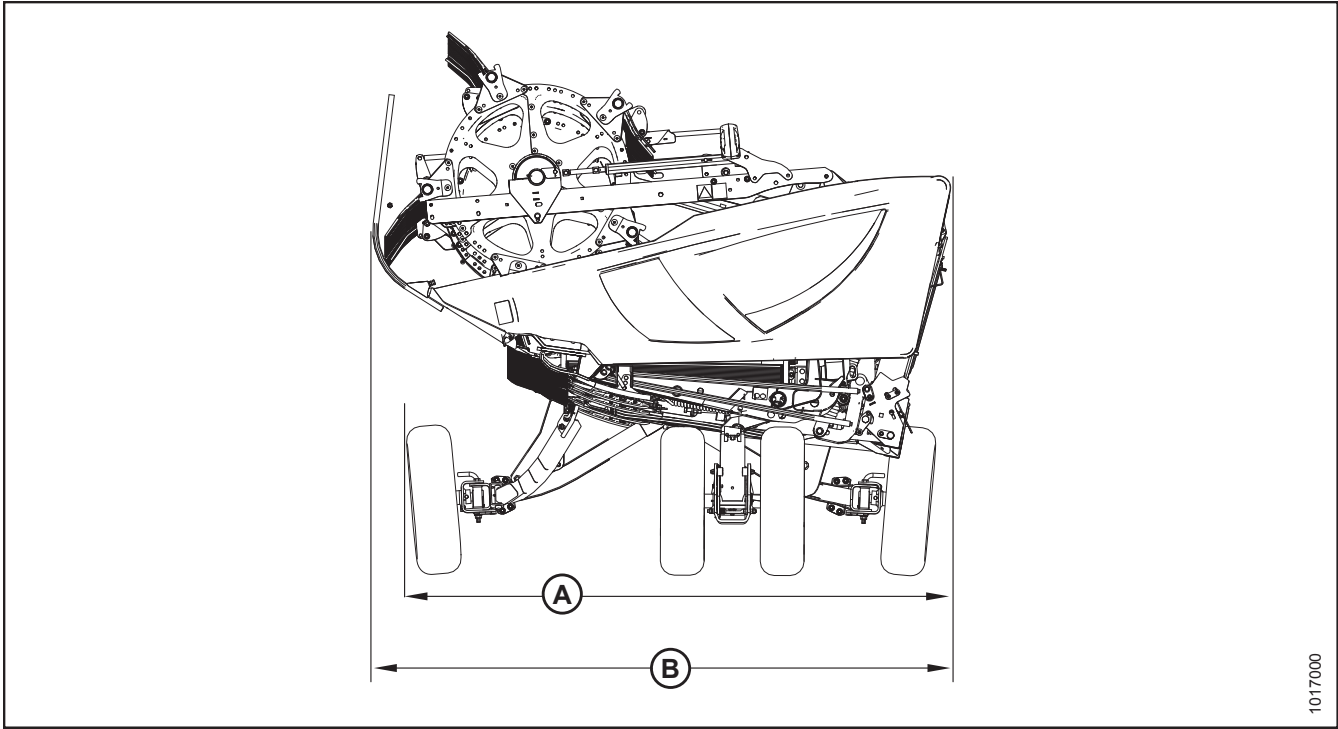
PRODUCT OVERVIEW

Table 2.1 Header Specifications (continued)

Guard Angle (Cutterbar on Ground)				
Center-link retracted			2.0 Degrees	S
Center-link extended			7.4 Degrees	S
Conveyor (Draper) and Decks				
Draper width			1057 mm (41-19/32 in.)	S
Draper drive			Hydraulic	S
Draper speed: FM100 Float Module controlled			193 m/min. (0–635 fpm)	S
PR15 Pick-Up Reel				
Quantity of tine tubes			5-, 6-, or 9-tine tubes	
Center tube diameter			203 mm (8 in.)	S
Finger tip radius	Factory-set		800 mm (31-1/2 in.)	S
	Adjustment range		766–800 mm (30-3/16 – 31-1/2 in.)	S
Effective reel diameter (via cam profile)			1650 mm (65 in.)	S
Finger length			290 mm (11 in.)	S
Finger spacing (staggered on alternate bats)			150 mm (6 in.)	S
Reel drive			Hydraulic	S
Reel speed (adjustable from cab, varies with combine model)			0–67 rpm	S
Frame and Structure				
Header width	Field mode		Cut width + 384 mm (15-1/8 in.)	S
	Transport position - reel fore-aft fully retracted (shortest center-link)	(A) Long dividers installed (refer to Figure 2.1, page 21)	2684 mm (106 in.)	-
		(B) Long dividers removed (refer to Figure 2.1, page 21)	2500 mm (98 in.)	-

PRODUCT OVERVIEW

Figure 2.1: Header Width



PRODUCT OVERVIEW

Table 2.2 Header Attachments

FM100 Float Module				S
Feed draper		Width	2000 mm (78-11/16 in.)	S
		Speed	107–122 m/min (350–400 fpm)	S
Feed auger		Width	1660 mm (65-5/16 in.)	S
		Outside diameter	559 mm (22 in.)	S
		Tube diameter	356 mm (14 in.)	S
		Speed (varies with combine model)	190 rpm	S
Oil reservoir capacity			75 liters (20 US gallons)	S
Oil type			DURATRAN™	—
Driveline overall length ²	Case, New Holland	Maximum (extended)	1230 mm (48-7/16 in.)	O _F
		Minimum (compressed)	603 mm (23-3/4 in.)	
	Challenger, Gleaner, John Deere, CLAAS, Massey Ferguson	Maximum (extended)	1262 mm (49-11/16 in.)	
		Minimum (compressed)	916 mm (36-1/16 in.)	
	John Deere 9650/9660	Maximum (extended)	775 mm (30-1/2 in.)	
		Minimum (compressed)	880 mm (34-5/8 in.)	
Upper Cross Auger				O _D
Outside diameter			305 mm (12 in.)	—
Tube diameter			152 mm (6 in.)	—
Stabilizer Wheel / Slow Speed Transport				O _D
Wheels			15 in.	—
Tires			P205/75 R-15	—

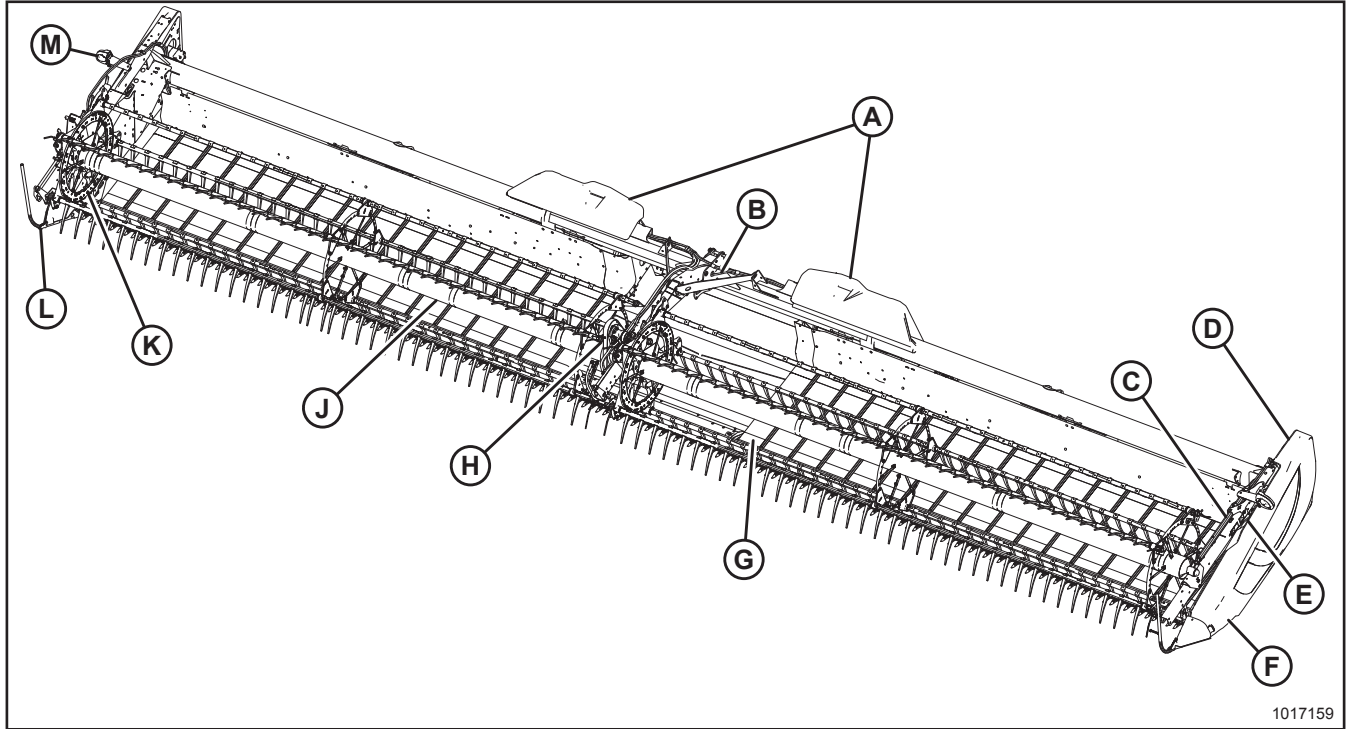
Weight		
Estimated weight range – base header, no float module – variances are due to different package configurations.		
30-foot header		1981–2178 kg (6746–6971 lb.)
35-foot header		2181–2480 kg (7167–7430 lb.)
40-foot header	North America frame	2352–2593 kg (7589–7789 lb.)
	Export frame	3549 kg (7824 lb.)
45-foot header	North America frame	3728 kg (8218 lb.)
	Export frame	3744 kg (8253 lb.)

2. Subtract 265 mm (10-7/16 in.) for length between yoke pins.

2.3 Component Identification

2.3.1 FD1 Series FlexDraper®

Figure 2.2: FD1 Series FlexDraper® Components



1017159

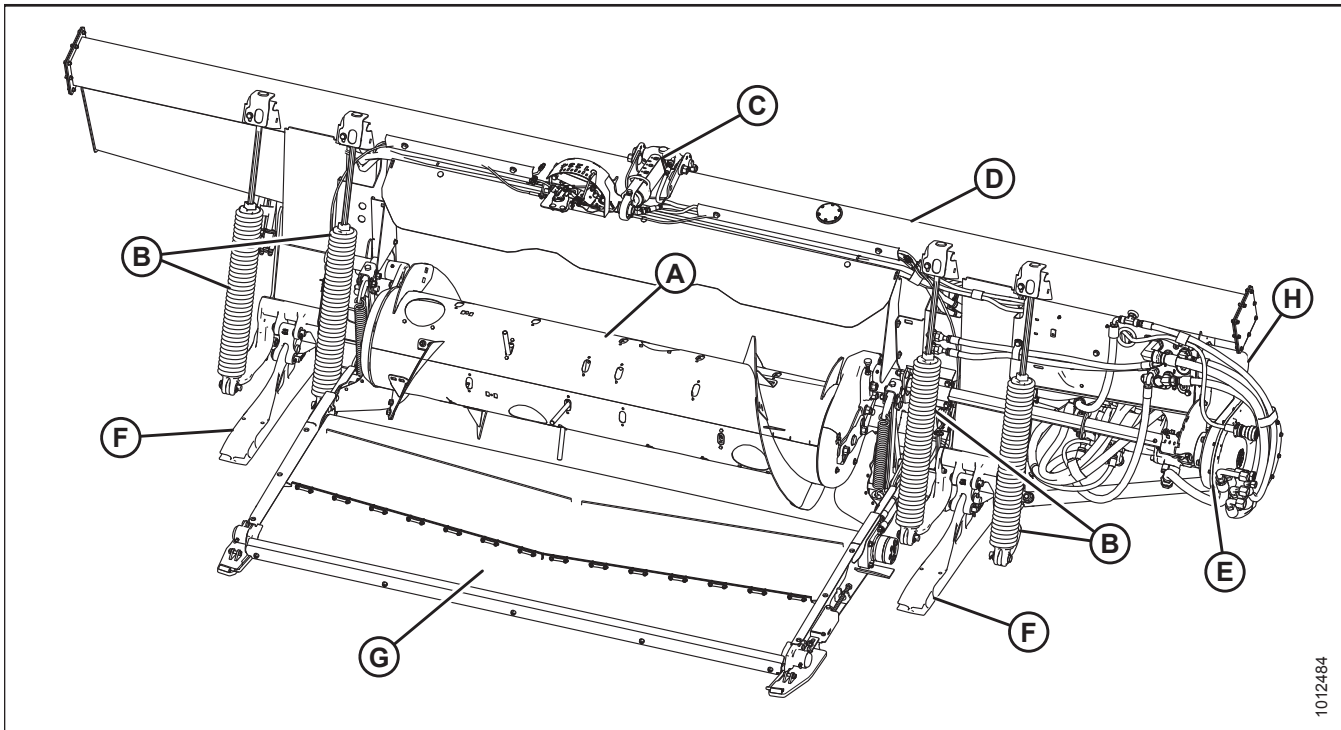
A - Wing Float Linkage
D - Endshield
G - Side Draper
K - Reel Endshield

B - Center Reel Arm
E - Reel Lift Cylinder
H - Center Reel Drive
L - Crop Divider

C - Reel Fore-Aft Cylinder
F - Knife Drive Box (Inside Endshield)
J - Pick-up Reel
M - Header Light

2.3.2 FM100 Float Module

Figure 2.3: Header Side of FM100 Float Module



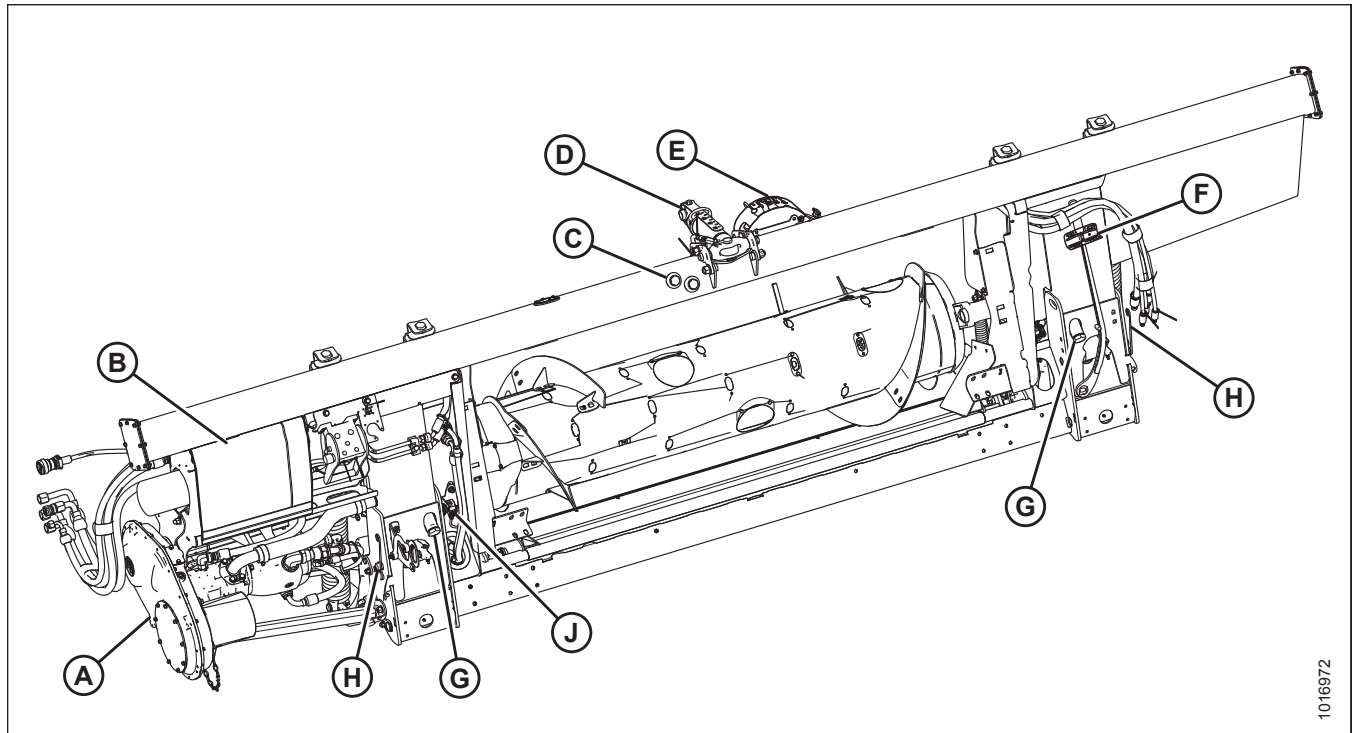
A - Feed Auger
D - Hydraulic Reservoir
G - Feed Draper

B - Header Float Springs
E - Gearbox
H - Hydraulic Filter

C - Center-Link
F - Header Support Arms

PRODUCT OVERVIEW

Figure 2.4: Combine Side of FM100 Float Module



A - Float Module Gearbox
D - Center-Link
G - Drain Tube (x2)

B - Hydraulic Compartment Cover
E - Header Height Control Indicator
H - Float Lock Handle (x2)

C - Reservoir Oil Level Sight Glass
F - Torque Wrench
J - Auto Header Height Control (AHHC) Sensor

3 Operation

3.1 Owner/Operator Responsibilities

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 anyone 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 also 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

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 combine seat.
- Check the operation of all controls in a safe, clear area before starting work.
- Do NOT allow riders on the combine.

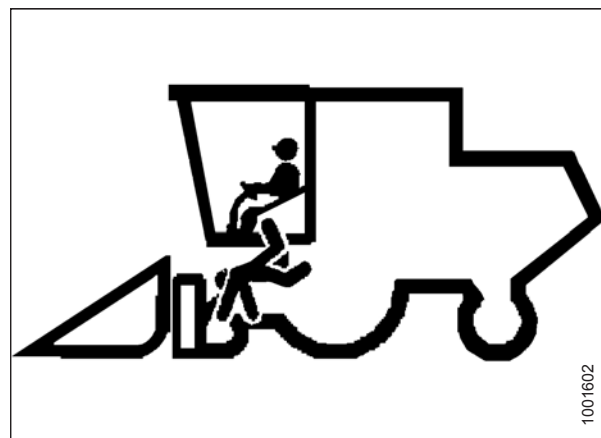


Figure 3.1: No Riders

CAUTION

- Never start or move the machine until you are sure all bystanders have cleared the area.
- Avoid travelling over loose fill, rocks, ditches, or holes.
- Drive slowly through gates and doorways.
- When working on inclines, travel uphill or downhill whenever possible. Be sure to keep transmission in gear when travelling downhill.
- Never attempt to get on or off a moving machine.
- Do NOT leave operator's station while the engine is running.
- To avoid bodily injury or death from 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 proper shutdown procedure. Refer to [3.4 Shutting down the Machine, page 39](#).
- Operate only in daylight or good artificial light.

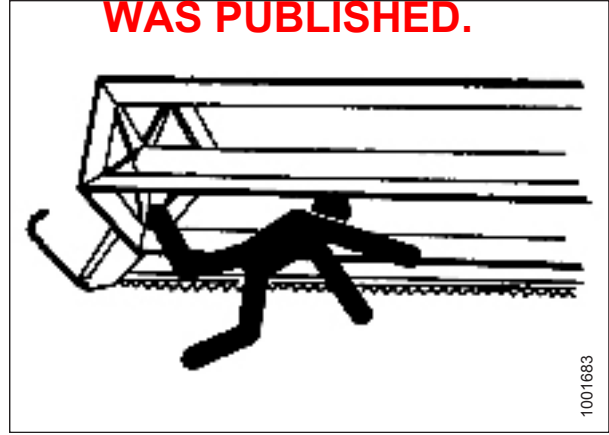


Figure 3.2: Bystander Safety

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. Refer to your combine operator's manual for instructions.

DANGER

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

3.2.2 Reel Safety Props

The reel safety props, located on the reel support arms, prevent the reel from unexpectedly lowering.

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:

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

Engaging Reel Safety Props

Engage the reel safety props whenever you intend to work on or around a raised reel. When engaged, the reel safety props prevent the reel from falling unexpectedly.

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. Raise the reel fully.
2. Shut down the engine, and remove the key from the ignition.
3. Move reel safety props (A) to the engaged position (as shown). **The prop MUST be placed on the top surface of raised lug (B), making contact with the cylinder mount, to ensure positive engagement.**

NOTE:

Keep pivot bolt (C) sufficiently tight so that the prop remains in the stored position when not in use, but can still be engaged using hand force.

4. Repeat the previous step on the opposite side of the header.

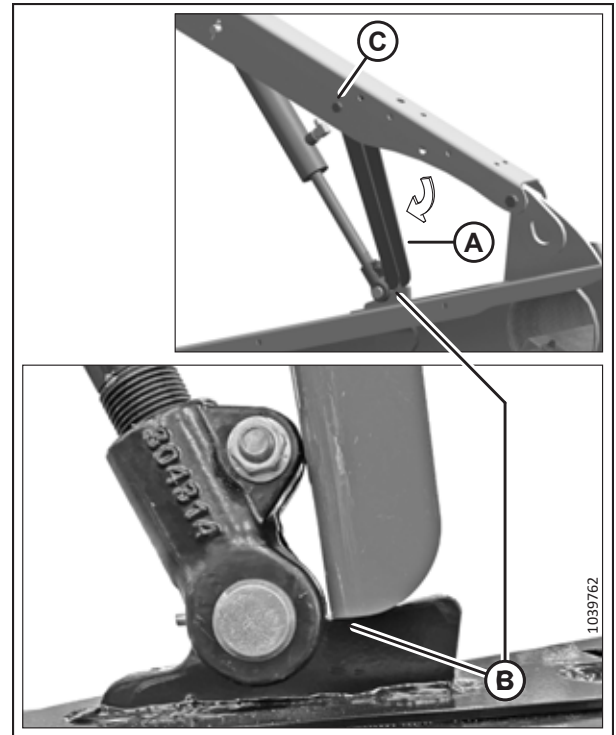


Figure 3.3: Engaged Reel Safety Prop – Left Shown

3. Use handle (A) to move lock rod to inboard position (B), which engages pin (C) under prop.
4. Lower reel until safety props contact the outer arm cylinder mounts and the center arm pins.

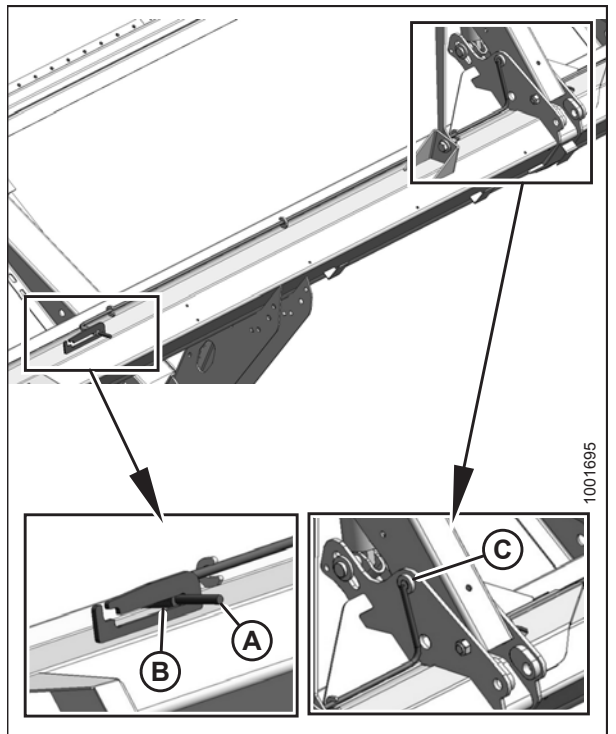


Figure 3.4: Reel Safety Prop – Center Arm

**THE CONTENT ON THIS PAGE
HAS CHANGED SINCE THIS
MANUAL (214065 REVISION A)
WAS PUBLISHED.**

OPERATION

Disengaging Reel Safety Props

1. Raise the reel to maximum height.
2. Move the reel safety props (A) back inside the reel arms.

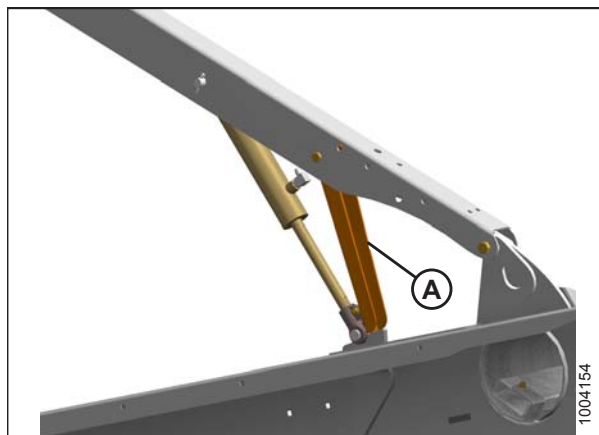


Figure 3.5: Reel Safety Prop – Left Side

3. Use the handle (B) to move the lock rod (A) to the outboard position.

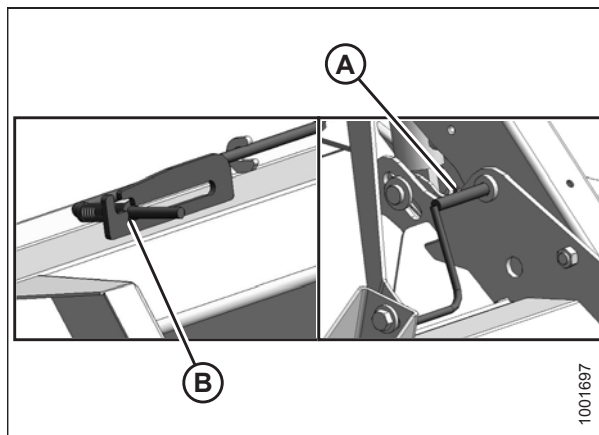


Figure 3.6: Reel Safety Prop – Center Arm

3.2.3 Endshields

A hinged, polyethylene endshield is fitted on each end of the header.

Opening Endshields

1. Push release lever (A) located on the backside of the endshield to unlock the shield.
2. Pull endshield open using handle depression (B).

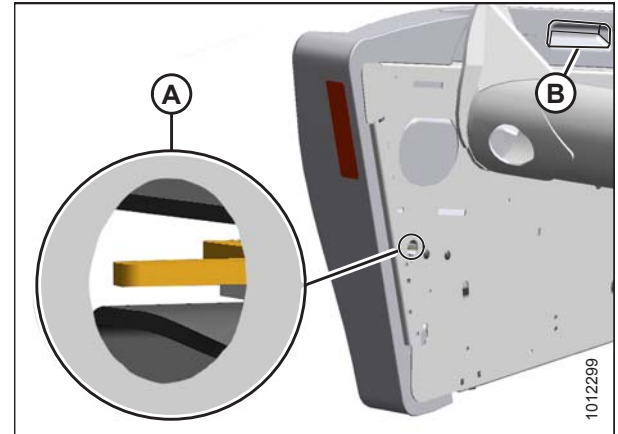


Figure 3.7: Left Endshield

3. Pull endshield at handle depression (A). Endshield is retained by a hinge tab (B) and will open in direction (C).

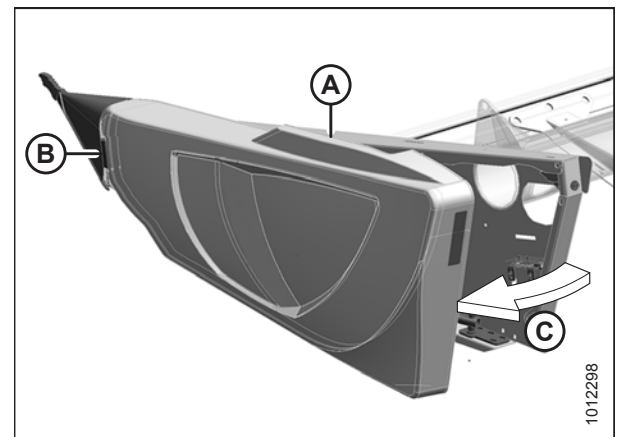


Figure 3.8: Left Endshield

4. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.
5. Engage safety latch (B) on hinge arm to secure the shield in fully-open position.

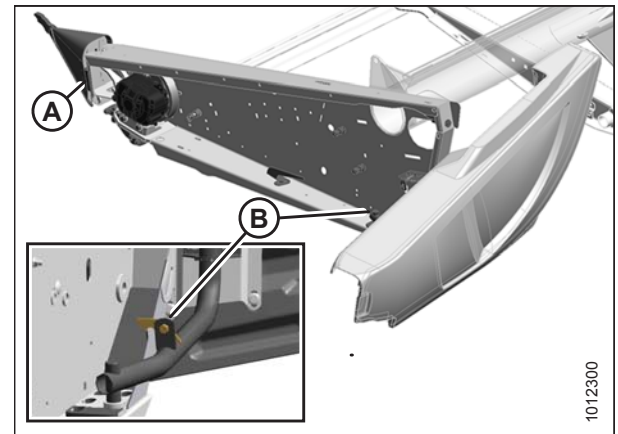


Figure 3.9: Left Endshield

OPERATION

Closing Endshields

1. Disengage lock (B) to allow endshield to move.
2. Insert front of endshield behind hinge tab (A) and into divider cone.

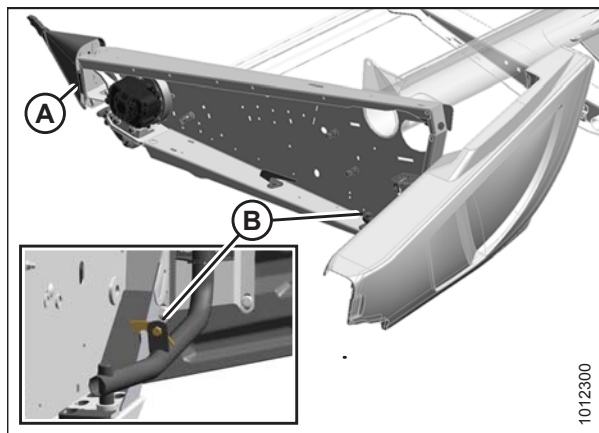


Figure 3.10: Left Endshield

3. Swing endshield in direction (A) into closed position. Engage lock with a firm push.
4. Check that endshield is locked.

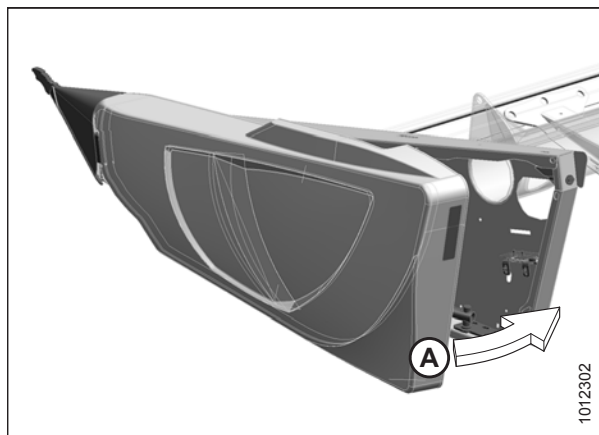


Figure 3.11: Left Endshield

OPERATION

Checking and Adjusting Endshields

Endshields are subject to expansion or contraction caused by large temperature variations. The position of the top pin and lower latch can be adjusted to compensate for dimensional changes.

1. Check gap (X) between front end of shields and header frame and compare to the values in Table 3.1, page 33.

Table 3.1 Endshield Gap at Various Temperatures

Temperature in Degrees °C (°F)	Gap (X) in mm (in.)
7 (45)	13–18 (1/2 – 23/32)
18 (65)	10–15 (3/8 – 19/32)
29 (85)	7–12 (9/32 – 15/32)
41 (105)	4–9 (5/32 – 11/32)

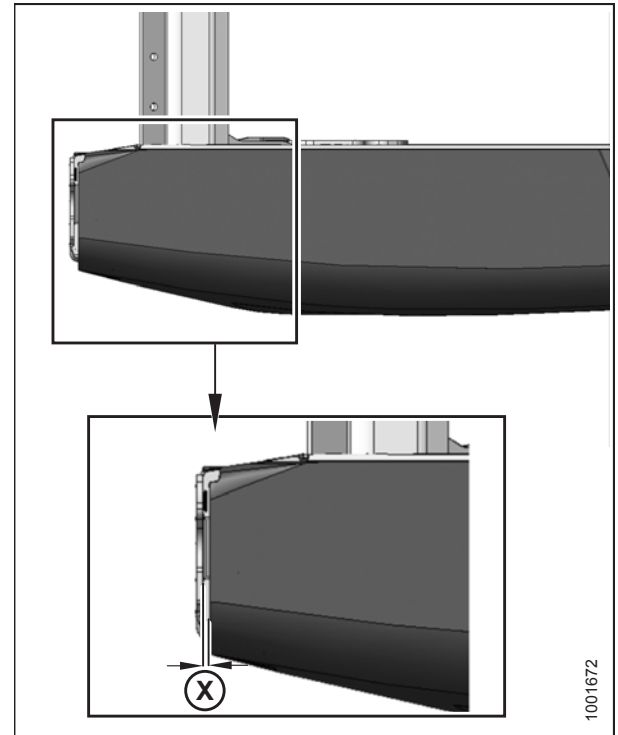


Figure 3.12: Gap between Endshield and Header Frame

NOTE:

If adjustment is required, follow these steps:

2. Loosen the four bolts (A) on the support tube bracket (B).

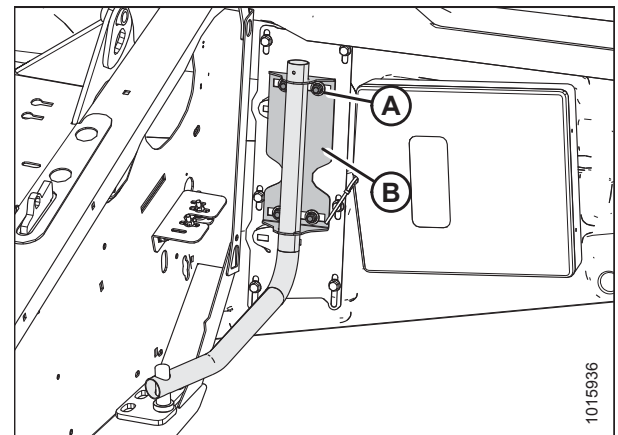


Figure 3.13: Left Endshield Support Tube

OPERATION

3. Loosen the three bolts (A) on latch assembly (B).
4. Adjust latch assembly (B) to achieve the desired gap between the front end of shield and header frame in accordance with Table 3.1, page 33.
5. Tighten the three bolts (A) on the latch assembly.
6. Tighten the four bolts on the support tube bracket.
7. Close endshield.

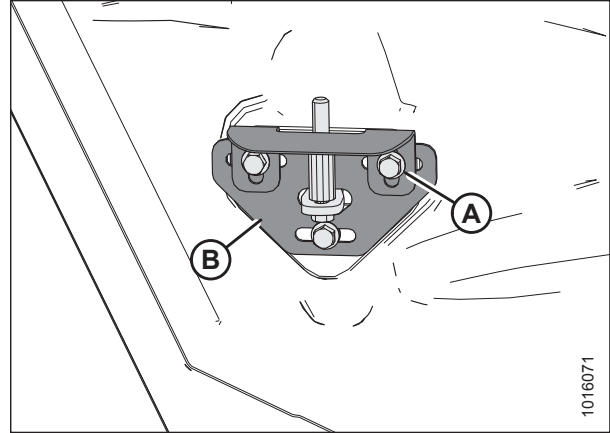


Figure 3.14: Left Endshield Latch Assembly

Removing Endshields

1. Fully open endshield. Refer to [Opening Endshields, page 31](#).
2. Engage lock (A) to prevent endshield movement.
3. Remove self-tapping screw (B).
4. Slide endshield upwards and remove from hinge arm.
5. Place endshield away from work area.

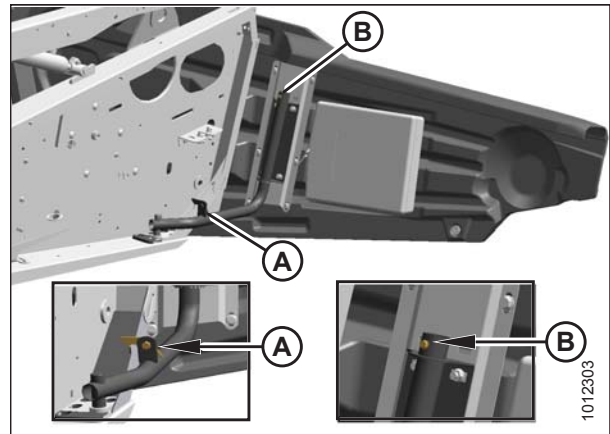


Figure 3.15: Left Endshield

Installing Endshields

1. Guide endshield onto hinge arm and slowly slide it downwards.
2. Install self-tapping screw (B).
3. Disengage lock (A) to allow endshield movement.
4. Close endshield. Refer to [Closing Endshields, page 32](#).

NOTE:

Endshields may expand or contract when subjected to large temperature changes. Top pin and lower latch bracket positions can be adjusted to compensate for dimensional changes. Refer to [Checking and Adjusting Endshields, page 33](#).

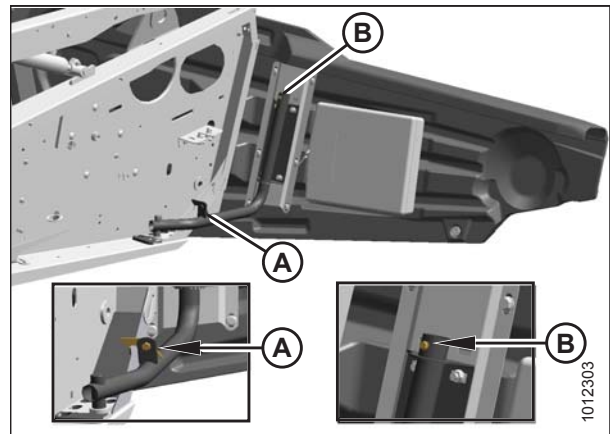


Figure 3.16: Left Endshield

3.2.4 Linkage Covers

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

Removing Linkage Covers

1. Remove screw (A) and lift outboard end of cover (B).

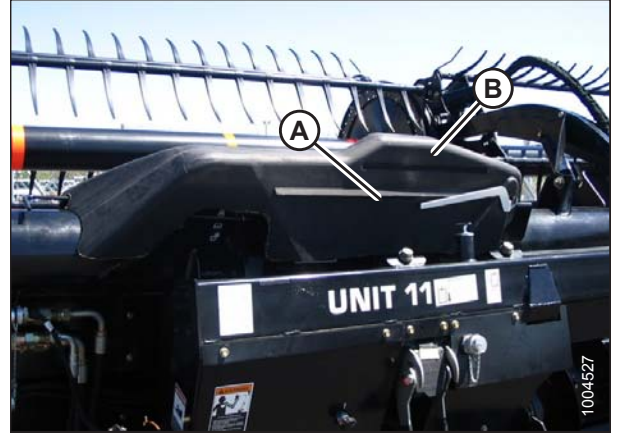


Figure 3.17: Linkage Cover

2. Rotate cover (A) upward until inboard end can be lifted off.

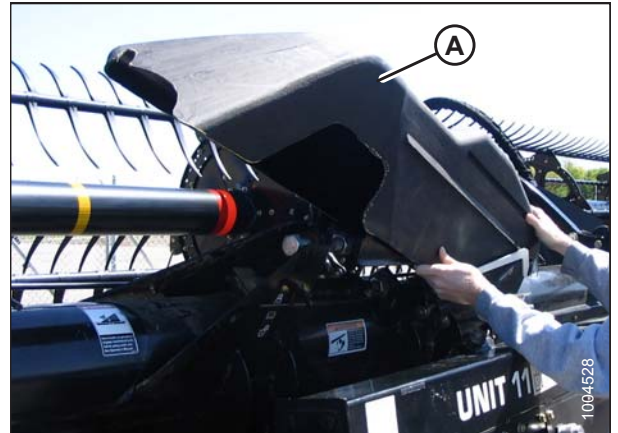


Figure 3.18: Linkage Cover

OPERATION

Installing Linkage Covers

1. Position inboard end of cover (A) over linkage and behind indicator bar (B).
2. Lower cover until secure and against header tube.

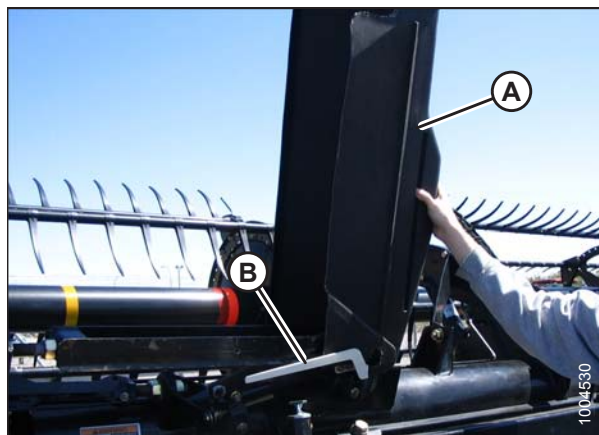


Figure 3.19: Linkage Cover

3. Install screw (A) to hold cover (B) in place.

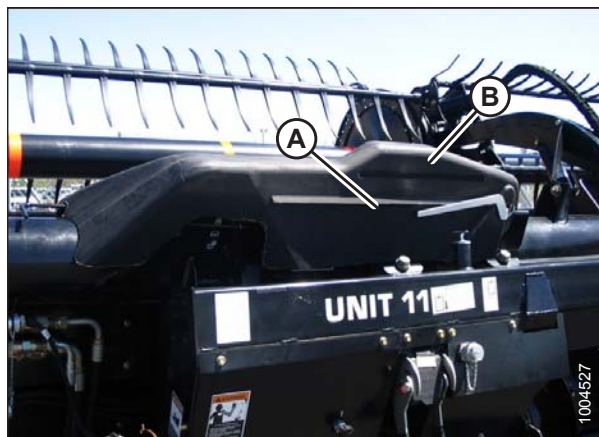


Figure 3.20: Linkage Cover

3.2.5 Daily Start-Up Check

⚠ CAUTION

- Clear the area of other persons, pets, etc. 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 with slip-resistant soles.
- Remove foreign objects from the machine and surrounding area.
- Carry with you any protective clothing and personal safety devices that could be necessary through the day. Do NOT take chances. You may need a hard hat, protective glasses or goggles, heavy gloves, a respirator or filter mask, or wet weather gear.
- Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.

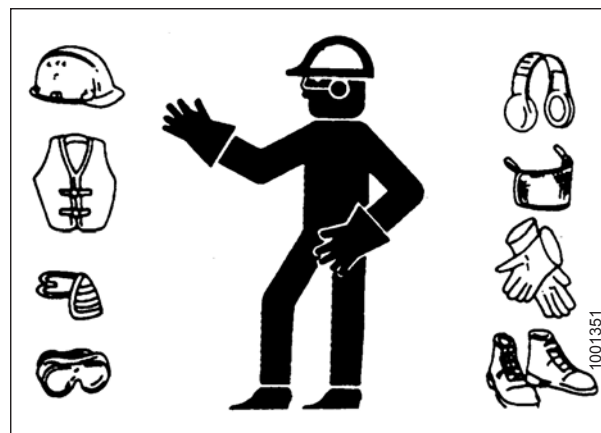


Figure 3.21: Safety Devices

Complete the following tasks each day before start-up:

1. Check the machine for leaks and any parts that are missing, broken, or not working correctly.

NOTE:

Use proper procedure when searching for pressurized fluid leaks. Refer to [5.3.5 Checking Hydraulic Hoses and Lines, page 331](#).

2. Clean all lights and reflective surfaces on the machine.
3. Perform all daily maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 326](#).

3.3 Break-in Period

CAUTION

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

NOTE:

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

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:

Reels and side drapers will not operate until oil flow fills the lines.

2. Refer to [5.3.2 Break-In Inspection, page 329](#) and perform all the specified tasks.

3.4 Shutting down the Machine



DANGER

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

To shut down, and before leaving the combine seat for any reason, follow these steps:

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

3.5 Cab Controls

CAUTION

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

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 Setup

3.6.1 Header Attachments

Several attachments to improve the performance of your header are available as options that can be installed by your MacDon Dealer. Refer to [6 Options and Attachments, page 487](#) for descriptions of available items.

3.6.2 Header Settings

Table [3.2, page 42](#) provides a guideline for setting up the FD1 FlexDraper® Header; however, the suggested settings can be changed to suit various crops and conditions not covered in the table.

Refer also to [3.6.4 Reel Settings, page 47](#).

For FM100 auger configurations, refer to [4.1 Float Module Feed Auger Configurations, page 251](#).

Table 3.2 FD1 Series / FM100 Combine Header Recommended Settings

Crop Type	Stubble Height mm (in.)	Crop Condition	Divider Rods	Draper Speed Setting ³	Header Angle ⁴⁵	Reel Cam	Reel Speed % ⁶	Reel Position	Skid Shoe Position	Stabilizer Wheels ⁷	Upper Cross Auger	Auger Finger Timing
Cereals	102 (<4)	Light	Off	8	B – C	3	10–15	6 or 7	Up or middle	Storage	Not required	B
		Normal	On	7		2	10				Recom- mended	A or B
		Heavy				3 or 4	5–10	4 or 5			Not required	B
		Lodged	Off			4	10–15	6 or 7			Middle or down	As required
	Normal	On	7	2	10	Recom- mended	A or B					
	Heavy			3 or 4	5–10	4 or 5	Not required	B				
	Lodged	Off		D	5–10	6 or 7	Not applicable	As required	Not required	B		
	Light	Off	A	10–15	7				Storage	Recom- mended	A A or B A	
	Normal	On	B – C	2		10						A or B
	Heavy			3 or 4		5–10						4 or 5
	Lodged	Off		B – C	2	5–10	6 or 7	Up or middle				Storage
	Light	On	7			D			4 or 5			
Normal												
Heavy												
Lodged												
Peas	On ground	Light	On	7	B – C	2	5–10	6 or 7	Up or middle	Storage	Recom- mended	A A or B A
		Normal					4 or 5					
		Heavy										
		Lodged										
Lentils	On ground	Light	On	8	B – C	2	5–10	6 or 7	Up or middle	Storage	Not required	B
		Normal		7			D					
		Heavy										
		Lodged										

3. Setting on FM100 draper control.
4. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
5. Cutting height is controlled with a combination of skid shoes and header angle.
6. Percentage above ground speed.
7. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

OPERATION

Table 3.2 FD1 Series / FM100 Combine Header Recommended Settings (continued)

Crop Type	Stubble Height mm (in.)	Crop Condition	Divider Rods	Draper Speed Setting ⁸	Header Angle ⁹ ₁₀	Reel Cam	Reel Speed % ¹¹	Reel Position	Skid Shoe Position	Stabilizer Wheels ¹²	Upper Cross Auger	Auger Finger Timing
Canola	102–203 (4–8)	Light	On	7	A	2	5–10	6 or 7	Down	As required	Recommended	A
		Normal		8	B – C	1	10	3 or 4	Middle or down			
		Heavy							Down			
		Lodged		7	D	2	5–10	6 or 7	Not applicable			
	Light	On	7	A	2	5–10						
	Normal		8	B – C	1 or 2	10	3 or 4					
	Heavy							2 or 3	5–10			
	Lodged		7	D	D	2	10	5–10				
Light	Rice divider rod ¹³	4	D	B – C					5–10			
Normal					D	3	10	6 or 7		Middle or down	As required	Not required
Heavy			4	B – C					5–10			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			
Normal							B – C	10		6 or 7	Not applicable	As required
Heavy	D	4	5–10	6 or 7					Not applicable			
Lodged					Rice divider rod ¹³	4	D	3		5–10	6 or 7	Not applicable
Light	A	10–15	6 or 7	Not applicable					As required			

8. Setting on FM100 draper control.
9. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
10. Cutting height is controlled with a combination of skid shoes and header angle.
11. Percentage above ground speed.
12. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.
13. Available from your Dealer. Rice divider rod not required on both ends of header.

Table 3.2 FD1 Series / FM100 Combine Header Recommended Settings (continued)

Crop Type	Stubble Height mm (in.)	Crop Condition	Divider Rods	Draper Speed Setting ¹⁴	Header Angle ^{15,16}	Reel Cam	Reel Speed % ¹⁷	Reel Position	Skid Shoe Position	Stabilizer Wheels ¹⁸	Upper Cross Auger	Auger Finger Timing
Delta Rice	51–152 (2–6)	Light	Off	6	D	2 or 3	10–15	6 or 7	Middle or down	As required	Not required	B
		Normal			B – C		10					
		Heavy			D	3 or 4	5–10	4 or 5				
		Lodged			A	2 or 3	10–15	6 or 7	Not applicable	As required	Not required	B
	152+ (6 +)	Light	Off	6	B – C		10					
		Normal			D	3 or 4	5–10	4 or 5				
		Heavy			D	2	5–10	6 or 7	Up or middle	Storage	Not required	B
		Lodged			B – C		5–10					
Edible Beans	On ground	Light	On	8	D	2	5–10	6 or 7	Middle or down	As required	Not required	B
		Normal		7	B – C		10					
		Heavy			D	2	5–10					
		Lodged			B – C		5–10					
	51–153 (2–6)	Light	On	8	B – C	2	5–10	6 or 7	Middle or down	As required	Not required	B
		Normal		7	A		10					
		Heavy			B – C		5–10					
		Lodged			D		5–10		Down			

14. Setting on FM100 draper control.
15. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height.
16. Cutting height is controlled with a combination of skid shoes and header angle.
17. Percentage above ground speed.
18. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain and to minimize bouncing.

3.6.3 Optimizing Header for Straight Combining Canola

Ripe canola can be straight combined, but most varieties are very susceptible to shelling and subsequent seed loss. This section provides recommended attachments, settings, and adjustments to optimize FD1 FlexDraper® Headers for straight combining canola.

Recommended Attachments

The optimization process includes the following modifications to the header:

- Installing a full-length upper cross auger
- Installing vertical knives
- Installing short center reel braces

NOTE:

Each kit includes installation instructions and the necessary hardware. Refer to [6 Options and Attachments, page 487](#).

Recommended Settings

Optimizing the header requires adjustments to the following settings:

- Moving the reel fore-aft cylinders to the alternative aft location. Refer to [Repositioning Fore-Aft Cylinders on Non-European Configured Headers, page 85](#).
- Adjusting reel fore-aft position. Refer to [Adjusting Reel Fore-Aft Position, page 85](#).
- Adjusting reel height so that fingers just engage the crop. Refer to [3.7.10 Reel Height, page 79](#).
- Setting reel cam to position 1. Refer to [Adjusting Reel Cam, page 98](#).
- Setting reel speed equal to ground speed and increase as required. Refer to [3.7.6 Reel Speed, page 73](#).
- Set the side draper speed to position nine on FM100 control valve. Refer to [3.7.8 Draper Speed, page 75](#).
- Adjust finger timing to early position. Refer to [Adjusting Auger Finger Timing, page 376](#).
- Set auger to floating position. Refer to [3.7.15 Setting Auger Position, page 106](#).
- Back off auger spring tension. Refer to [Checking and Adjusting Feed Auger Springs, page 46](#).

OPERATION

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

1. Raise header to full height.
2. Shut down the combine, and remove the key from the ignition.
3. Engage header lift cylinder safety props.
4. Check the thread length protruding past the nut (B). Length should be 22–26 mm (7/8–1 in.).

If adjustment is required, follow these steps:

5. Loosen upper jam nut (A) on spring tensioner.
6. Turn lower nut (B) until the thread (C) protrudes 22–26 mm (7/8–1 in.).
7. Tighten jam nut (A).
8. Repeat Steps 5, [page 46](#) to 7, [page 46](#) for opposite side.

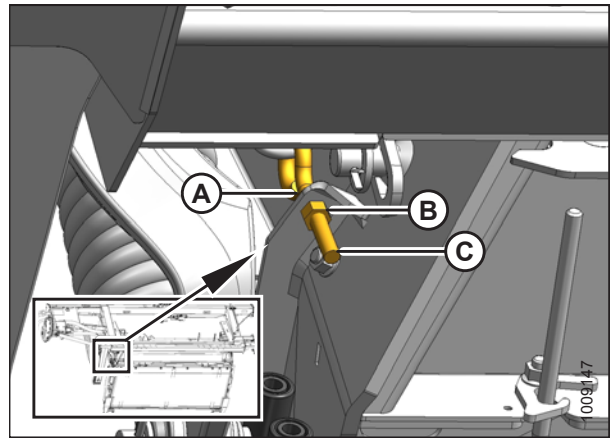
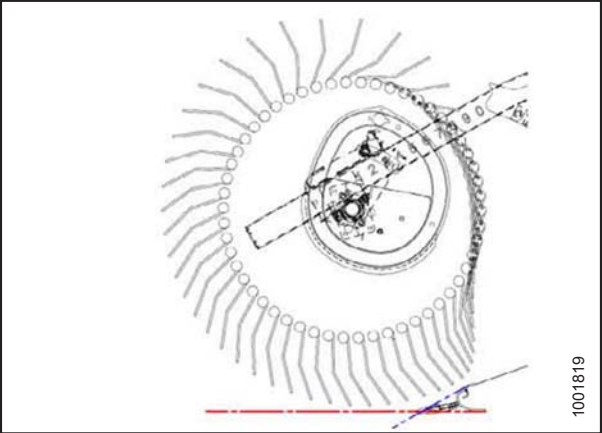
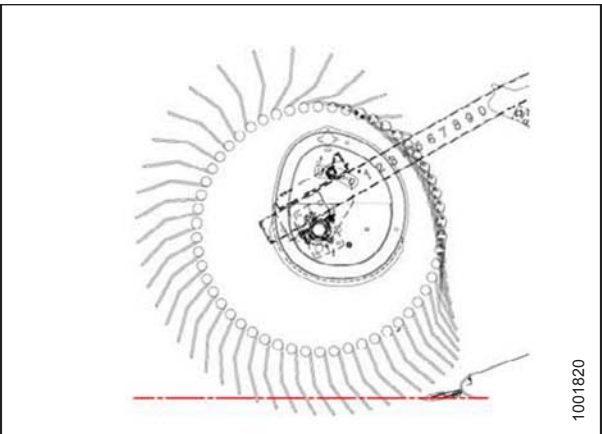


Figure 3.22: Spring Tensioner

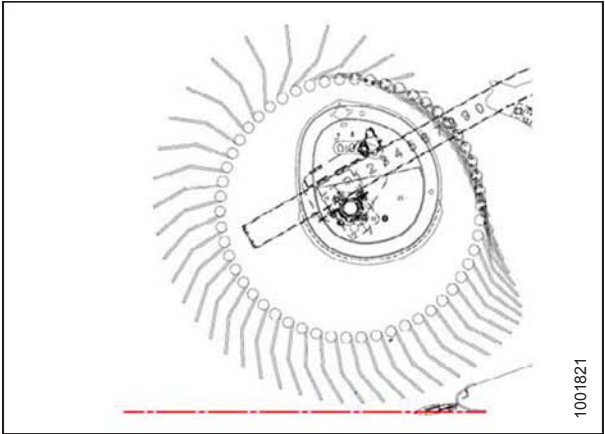
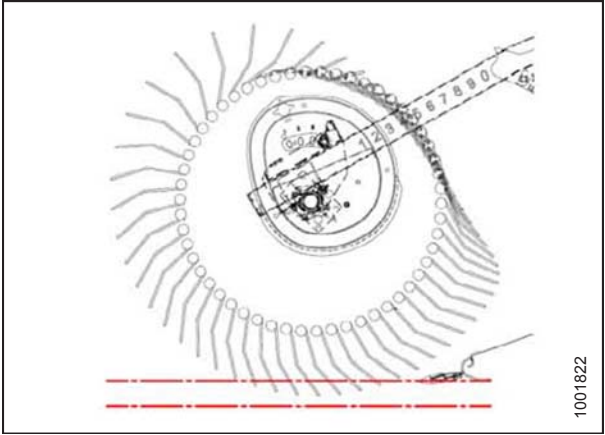
3.6.4 Reel Settings

Table 3.3 FD1 Series Recommended Reel Settings

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

OPERATION

Table 3.3 FD1 Series Recommended Reel Settings (continued)

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

NOTE:

- Adjust the reel forward to get closer to the ground while tilting the header back. Fingers/tines will dig into the ground at extreme reel-forward positions, so adjust skid shoes or header angle to compensate. Adjust the reel rearwards 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 behind 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 (minimum area of exposed draper between the reel and the header backsheet) occurs with the reel in the furthest aft position.
- Maximum crop carrying capacity (maximum area of exposed draper between the reel and the header backsheet) occurs with the reel in the furthest 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. Refer to Table 3.3, page 47.

3.7 Header Operating Variables

Satisfactory function of the header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss and increases productivity. As well, proper adjustments and timely maintenance will increase the length of service you receive from your machine.

The variables listed in Table 3.4, [page 49](#) 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 adjustments have been preset at the factory, but the settings can be changed to suit crop conditions.

Table 3.4 Operating Variables

Variable	Refer to
Cutting height	3.7.1 Cutting off the Ground, page 49 , 3.7.2 Cutting on the Ground, page 54
Header float	3.7.3 Header Float, page 55
Header angle	3.7.5 Header Angle, page 72
Reel speed	3.7.6 Reel Speed, page 73
Ground speed	3.7.7 Ground Speed, page 74
Reel height	3.7.10 Reel Height, page 79
Reel fore-aft position	3.7.11 Reel Fore-Aft Position, page 84
Reel tine pitch	3.7.12 Reel Tine Pitch, page 96
Crop divider rods	3.7.13 Installing Crop Dividers, page 99
Feed auger configurations	4.1 Float Module Feed Auger Configurations, page 251

3.7.1 Cutting off the Ground

Header design allows you to cut crop above the ground in relation to the desired stubble height. Cutting height will vary depending on the type of crop, crop conditions, etc.

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 system produces even stubble height and greatly reduces operator fatigue.

Cutting height is controlled using a combination of the combine header height control and a stabilizer wheel system (or stabilizer / slow speed transport wheel system).

If stabilizer wheels are installed, refer to [Adjusting Stabilizer Wheels, page 52](#) to change the wheel position.

If stabilizer / slow speed transport wheels are installed, refer to [Adjusting Stabilizer / Slow Speed Transport Wheels, page 50](#) to change the wheel position.

OPERATION

Adjusting Stabilizer / Slow Speed 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 stabilizer / slow speed transport wheels.

⚠ DANGER

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

1. Raise the header so the stabilizer wheels are off the ground. Shut down engine and remove the key.
2. Remove the hairpin (A) from the latch on the right wheel assembly.
3. Disengage the latch (B), lift the wheel out of the hook, and place on the ground as shown. (This reduces weight of assembly and makes adjusting the wheel position easier.)
4. Lift the left wheel slightly to support the weight, and the pull handle (C) upwards to release the lock.
5. Lift the left wheel to the desired height and engage the support channel into the slot (D) in the upper support.
6. Push down on the handle (C) to lock.
7. Lift the right wheel back into the field position and ensure the latch (B) is engaged.
8. Secure the latch with hairpin (A).
9. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
10. Lift the wheels to the desired height, and engage the support channel into the slot (B) in the upper support.
11. Push down on the handle (A) to lock.

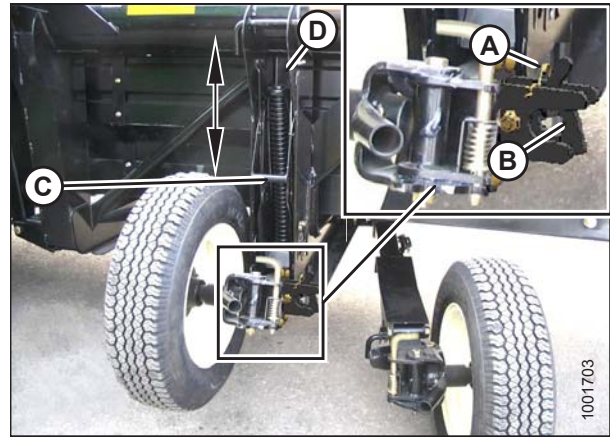


Figure 3.23: Right Wheel

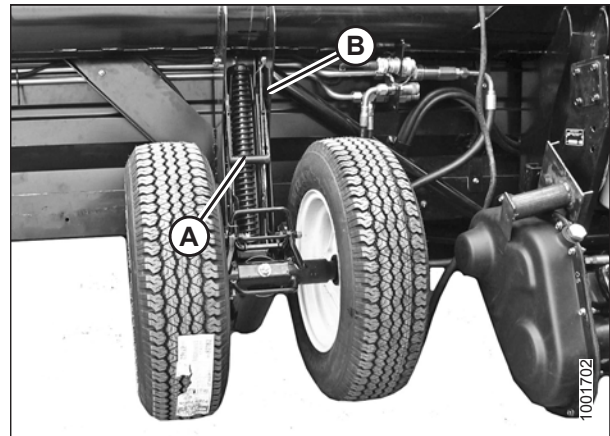


Figure 3.24: Left Wheel

OPERATION

12. Lower the header to the desired cutting height using the combine controls and check the load indicator (A).

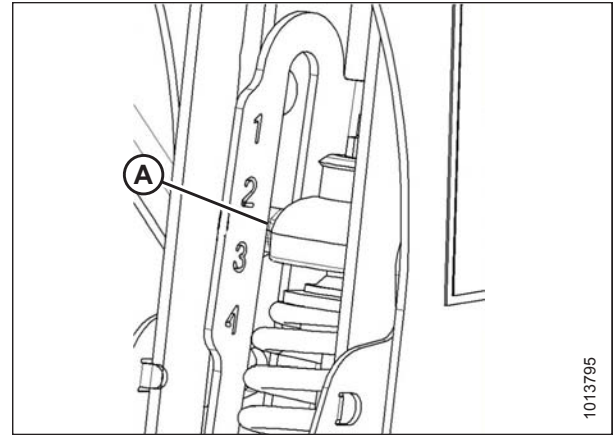


Figure 3.25: Load Indicator

IMPORTANT:

Continuous operation with excessive spring compression (i.e., load indicator reading greater than 4 or a compressed length [A] less than 295 mm [11-5/8 in.]) can result in damage to the suspension system.

13. Adjust the header angle to the desired working angle with the machine's header angle controls. If header angle is not critical, set it to mid-position.
14. Use the combine's auto header height control (AHHC) to automatically maintain cutting height. Refer to [3.8 Auto Header Height Control \(AHHC\)](#), page 108 and your combine operator's manual for details.

NOTE:

The height sensor on the FM100 Float Module must be connected to the combine header control module in the cab.

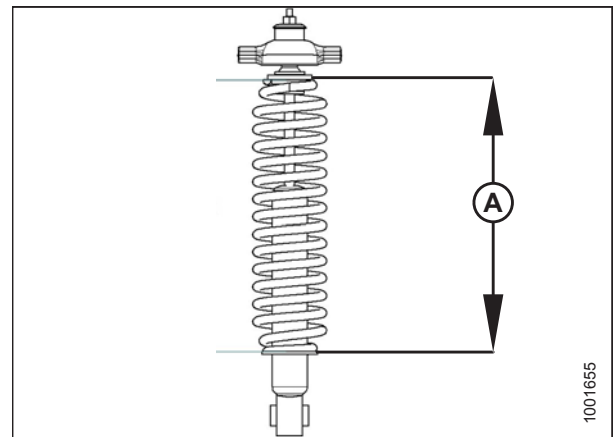


Figure 3.26: Spring Compression

OPERATION

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 [3.6.2 Header Settings, page 41](#) for recommended use in specific crops and crop conditions.

DANGER

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

1. Raise the header until the stabilizer wheels are off the ground. Shut down engine and remove the key.
2. Support the wheel weight by lifting slightly with one hand on handle (B), and pull up on the handle (A) to release the lock.
3. Lift the wheel using handle (B), and engage the support channel into the center slot (C) in the upper support.
4. Push down on the handle (A) to lock.

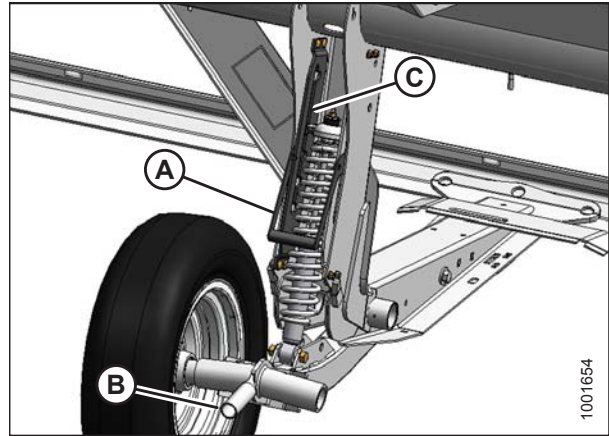


Figure 3.27: Stabilizer Wheel

5. Lower the header to the desired cutting height using the combine controls and check the load indicator (A).

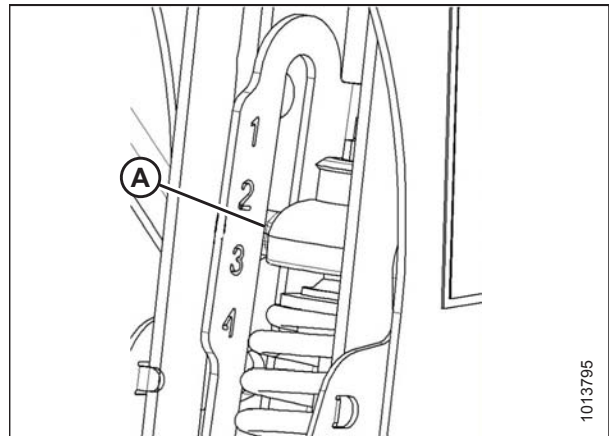


Figure 3.28: Load Indicator

OPERATION

IMPORTANT:

Continuous operation with excessive spring compression (i.e., load indicator reading greater than 4 or a compressed length less than 295 mm [11-5/8 in.]) (A) can result in damage to the suspension system.

6. Adjust the header angle to the desired working angle with the machine's header angle controls. If header angle is not critical, set it to mid-position.
7. Use the combine's Auto Header Height Control (AHHC) to automatically maintain cutting height. Refer to [3.8 Auto Header Height Control \(AHHC\)](#), page 108 and your combine operator's manual for details.

NOTE:

The height sensor on the FM100 Float Module must be connected to the combine height control system in the cab.

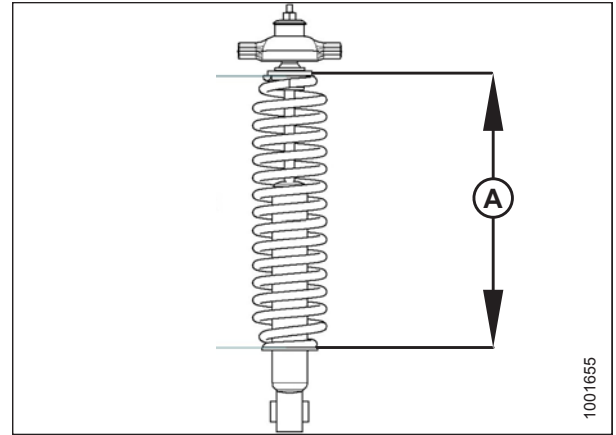


Figure 3.29: Spring Compression

3.7.2 Cutting on the Ground

Header design allows you to cut crop at ground level with the header on the ground. Cutting height will vary depending on what kind of crop, crop 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 floats the header over the surface to compensate for ridges, trenches, and other variations in ground contour to prevent the cutterbar from pushing into the ground or leaving uncut crop.

Refer to the following for additional information:

- [Adjusting Inner Skid Shoes, page 54](#)
- [Adjusting Outer Skid Shoes, page 55](#)
- [3.7.5 Header Angle, page 72](#)
- [3.7.3 Header Float, page 55](#)

Also refer to [3.6.2 Header Settings, page 41](#).

Adjusting Inner Skid Shoes



DANGER

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

1. Raise header to full height, engage safety props.
2. Shut off the engine, and remove key.
3. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). Refer to the following:
 - [Adjusting Stabilizer Wheels, page 52](#)
 - [Adjusting Stabilizer / Slow Speed Transport Wheels, page 50](#)
4. Remove the lynch pin (A) from each skid shoe.
5. Hold the shoe (B) and remove the pin (C) by disengaging from the frame and pulling away from the shoe.
6. Raise or lower the skid shoe (B) to achieve the desired position using the holes in the support (D) as a guide.
7. Install the pin (C), engage in frame, and secure with lynch pin (A).
8. Check that all of the skid shoes are adjusted to the same position.
9. 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.
10. Check the header float. Refer to [3.7.3 Header Float, page 55](#).

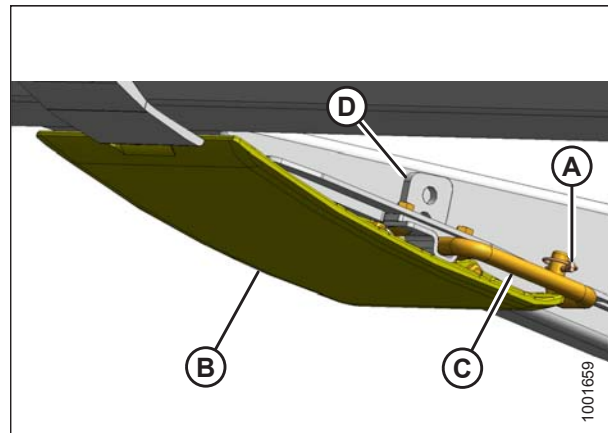


Figure 3.30: Inner Skid Shoe

Adjusting Outer Skid Shoes

DANGER

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

1. Raise the header to its full height, engage the safety props.
2. Shut off the engine, and remove the key from the ignition.
3. Raise the stabilizer wheels or slow speed transport wheels fully (if installed). Refer to the following:
 - [Adjusting Stabilizer Wheels, page 52](#)
 - [Adjusting Stabilizer / Slow Speed Transport Wheels, page 50](#)
4. Remove the lynch pin (A) from each skid shoe (B).
5. Hold the shoe (B) and remove the pin (C) by disengaging from the frame and pulling away from the shoe.
6. Raise or lower the skid shoe (B) to achieve the desired position using the holes in the support (D) as a guide.
7. Reinstall pin (C), engage in frame, and secure with lynch pin (A).
8. Check that all of the skid shoes are adjusted to the same position.
9. Check the header float. Refer to [3.7.3 Header Float, page 55](#).

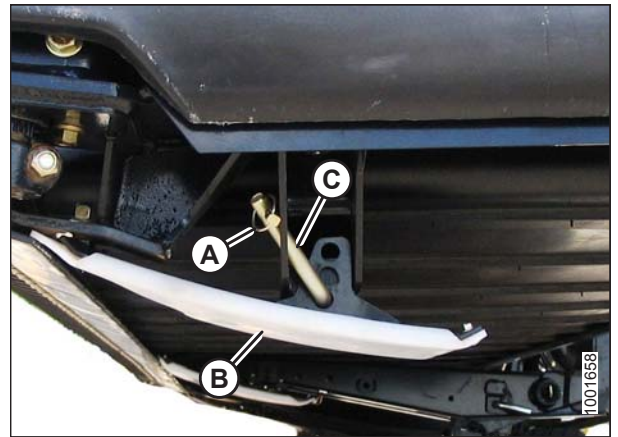


Figure 3.31: Outer Skid Shoe

3.7.3 Header Float

The header float system reduces the ground pressure at the cutterbar allowing the header to more easily follow the ground and quickly respond to sudden ground contour changes or obstacles.

Header float is indicated on the float indicator (A). The values 0 to 4 represent the force of the cutterbar on the ground with 0 being the minimum and 4 being the maximum.

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. Refer to [Checking and Adjusting Header Float, page 56](#).

The FD1 Series combine header performs best with minimum ground pressure under normal conditions. Readjust the float if adding optional attachments that affect the weight of the header.

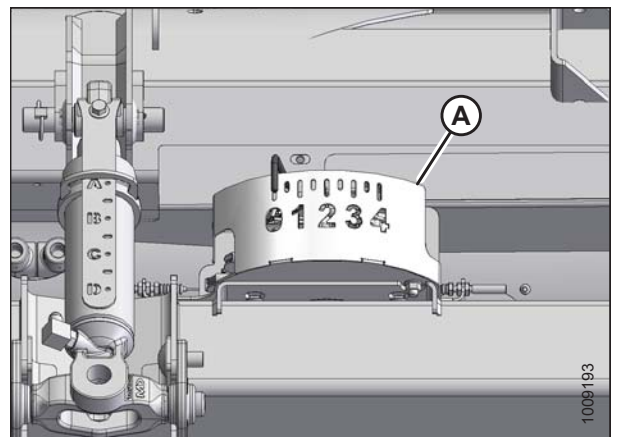


Figure 3.32: Float Indicator

OPERATION

1. Set the float for cutting on the ground as follows:
 - a. Ensure the header float locks are disengaged. Refer to [Locking/Unlocking Header Float, page 61](#).
 - b. Lower feeder house using the combine header controls until the float indicator (A) reaches the desired float value (cutterbar ground force). Set the float indicator to 2 initially and adjust as necessary.

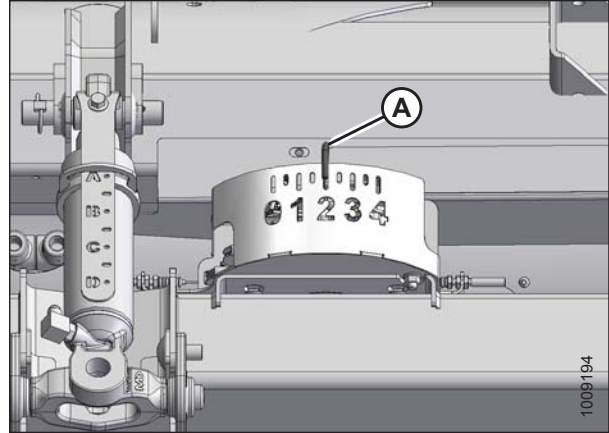


Figure 3.33: Cutting on the Ground

2. Set the float for cutting off the ground as follows:
 - a. Set up the stabilizer wheels. Refer to [3.7.1 Cutting off the Ground, page 49](#).
 - b. Note the float value on the float indicator and maintain this value during operation (disregard minor fluctuations on the indicator).

Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for ridges, trenches, and other variations in ground contour. If the header float is not set properly, it may cause the cutterbar to push into the ground or leave uncut crop. This procedure describes how to check header float and adjust to the factory-recommended settings.

DANGER

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

1. Level the header and float module. If the header and float module are not level, perform the following checks before adjusting the float:

IMPORTANT:

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

- Park the combine on a level surface.
 - Check that the combine feeder house is level. Refer to your combine operator's manual for instructions.
 - Check that the top of the float module is level with the combine axle.
 - Ensure the combine tires are inflated equally.
2. Adjust header so that the cutterbar is 150–254 mm (6–10 in.) off the ground.
 3. Extend the header angle hydraulic cylinder (A) to B 1/2 on indicator (A).

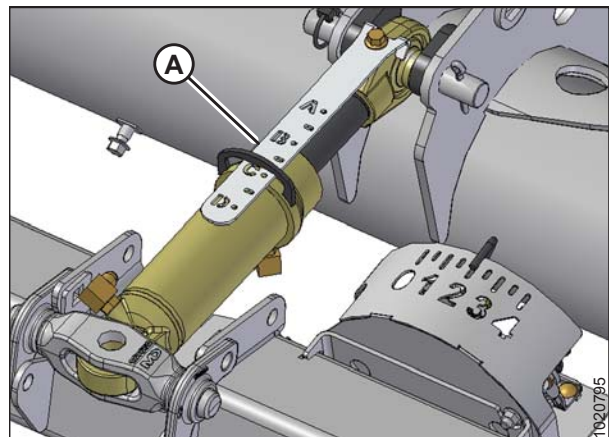


Figure 3.34: Center-Link

OPERATION

4. Adjust the reel fore-aft position to between 5 and 6 on the position indicator decal (A) located on the reel right arm.
5. Lower the reel fully.
6. Shut down the combine, and remove the key from the ignition.

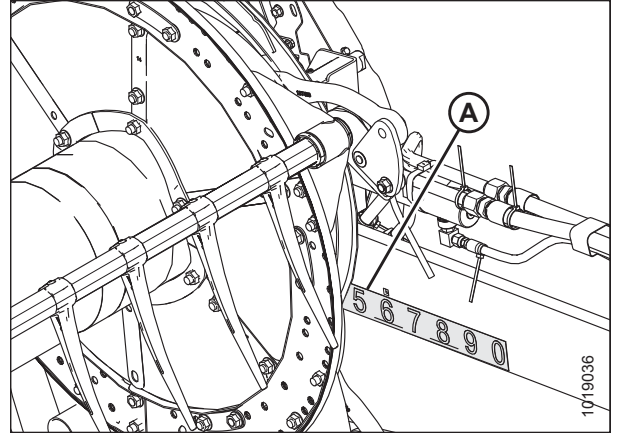


Figure 3.35: Fore-Aft Position

7. Place wing lock spring handles (A) in the LOCKED (upper) position.

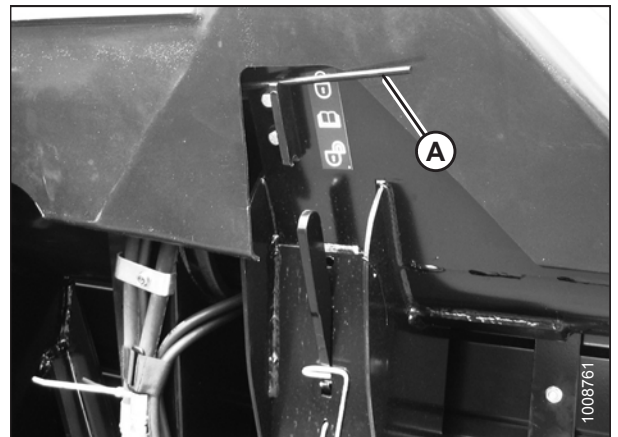


Figure 3.36: Wing Lock Spring Handle in Lock Position

OPERATION

8. Disengage both header float locks by pulling the float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (UNLOCK).

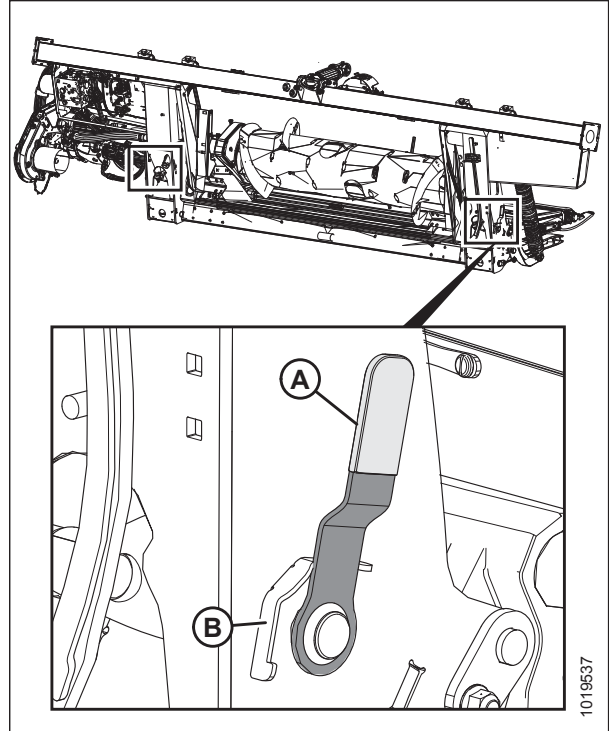


Figure 3.37: Header Float Lock (in Locked Position)

9. Place stabilizer wheels and slow speed transport wheels (if equipped) in storage position as follows:
 - a. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
 - b. Lift the wheels to the desired height, and engage the support channel into the slot (B) in the upper support.
 - c. Push down on the handle (A) to lock.

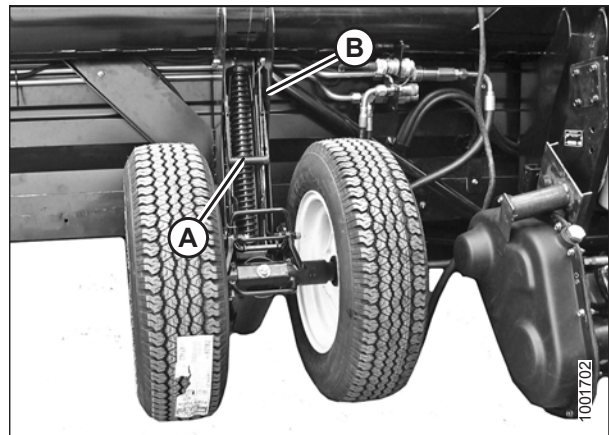


Figure 3.38: Left Wheel

OPERATION

10. Remove the supplied torque wrench (A) from its storage position at the right side of the float module frame. Pull in the direction shown to disengage the wrench from the hook.

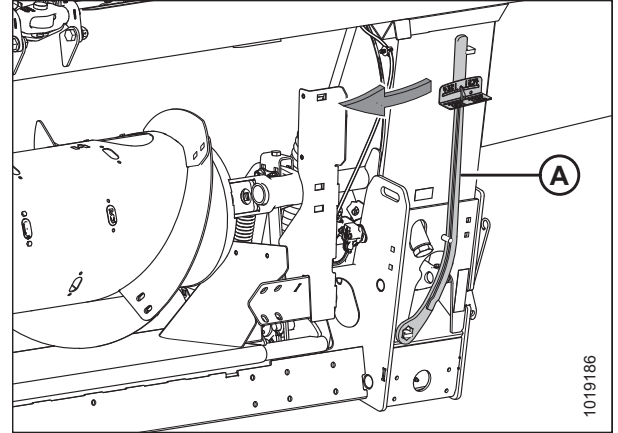


Figure 3.39: Torque Wrench Storage Location

11. Place the supplied torque wrench (A) onto the float lock (B). Note the position of the wrench for checking left or right side.
12. Push down on wrench to rotate bell crank (C) forward.

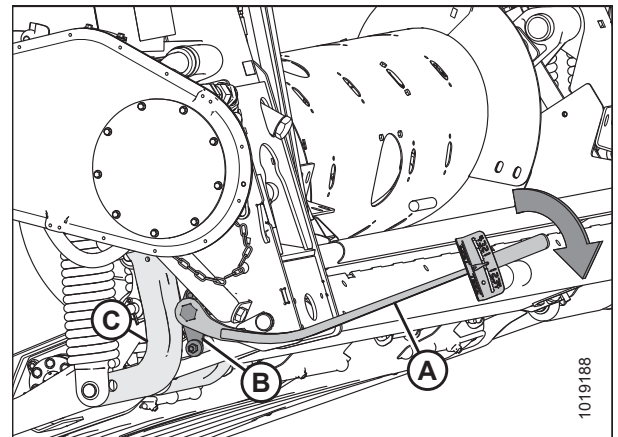


Figure 3.40: Left Side

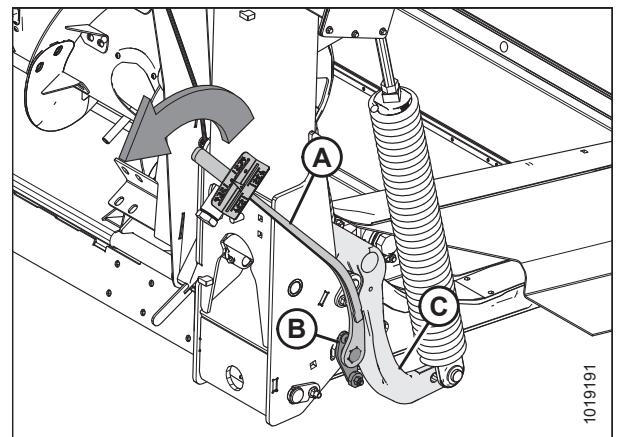


Figure 3.41: Right Side

OPERATION

13. Push down on the wrench until indicator (A) reaches a maximum reading and then begins to decrease. Note the maximum reading. Repeat at opposite side.

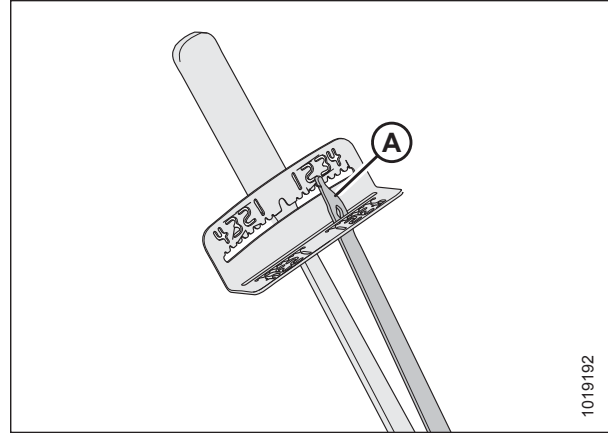


Figure 3.42: Indicator

14. Use the following table as a guide for float settings:
 - If reading on the wrench is high, the header is heavy
 - If reading on the wrench is low, the header is light

Table 3.5 Float Settings

Header Size (feet)	Indicator Reading	
	Cutting on the Ground	Cutting off the Ground
30 and 35	1-1/2 to 2	2 to 2-1/2
40 and 45	2 to 2-1/2	2-1/2 to 3

15. Before adjusting the float spring adjustment bolts (A), rotate the spring locks (B) by loosening bolts (C).
16. To increase float (decrease header weight), turn both adjustment bolts (A) on the left side clockwise. Repeat adjustment at opposite side.
17. To decrease float (increase header weight), turn left side adjustment bolts (A) counterclockwise. Repeat at opposite side.
18. Adjust the float so the wrench readings are equal on both sides of the header.

NOTE:

For 40- and 45-foot double-knife headers: adjust the float so the wrench readings are equal at both sides, and then loosen both right side spring bolts two turns.

19. Lock adjustment bolts (A) with spring locks (B). Ensure bolt heads (A) engaged in the spring lock cutouts. Tighten bolts (C) to secure spring locks in place.

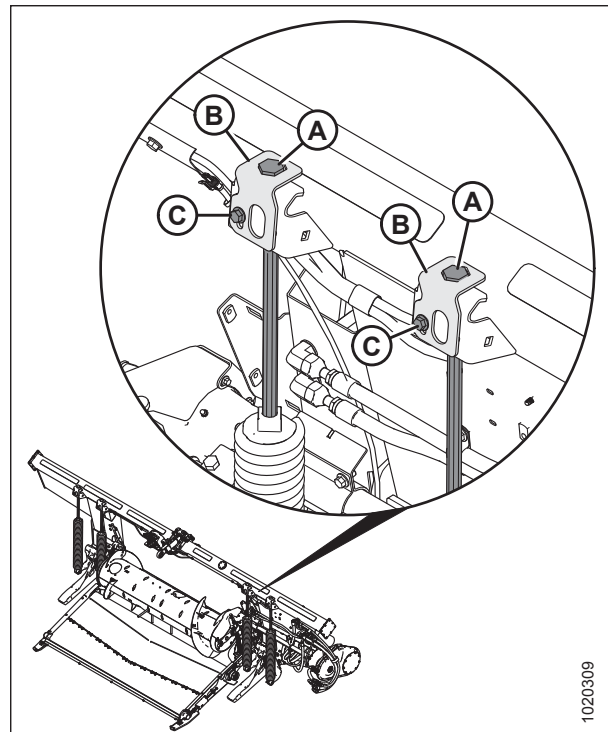


Figure 3.43: Float Adjustment (Left Side Shown)

OPERATION

20. Use the following guidelines when adjusting float:

- Turn each bolt pair equally. Refer to Step 13, [page 60](#), and repeat torque wrench reading procedure.
- Set header float as light as possible without causing excessive bouncing to prevent knife component breakage, soil scooping, or soil build-up at the cutterbar in wet conditions.
- Use a slower ground speed with a light float setting, if necessary, to avoid excessive bouncing and leaving a ragged cut.
- Use the stabilizer wheels in conjunction with header float to minimize bouncing at the header ends and to control cut height when cutting off the ground. Refer to [Adjusting Stabilizer Wheels, page 52](#).

NOTE:

If adequate header float cannot be achieved using all of the available adjustments, an optional heavy duty spring is available. See your MacDon Dealer or refer to the parts catalog for ordering information.

21. Proceed to [Adjusting Wing Balance, page 70](#).

Locking/Unlocking Header Float

Two header float locks—one on each side of the float module—lock and unlock the header float system.

IMPORTANT:

The float locks must be engaged when the header is being transported with the float module attached so there is no relative movement between the float module and the header. The float locks also must be locked when detaching from the combine to enable the feeder house to release the float module.

To **disengage (unlock) float locks**, pull the float lock handle (A) into position (B) (UNLOCK). In this position, the header is unlocked, and can float with respect to the float module.

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

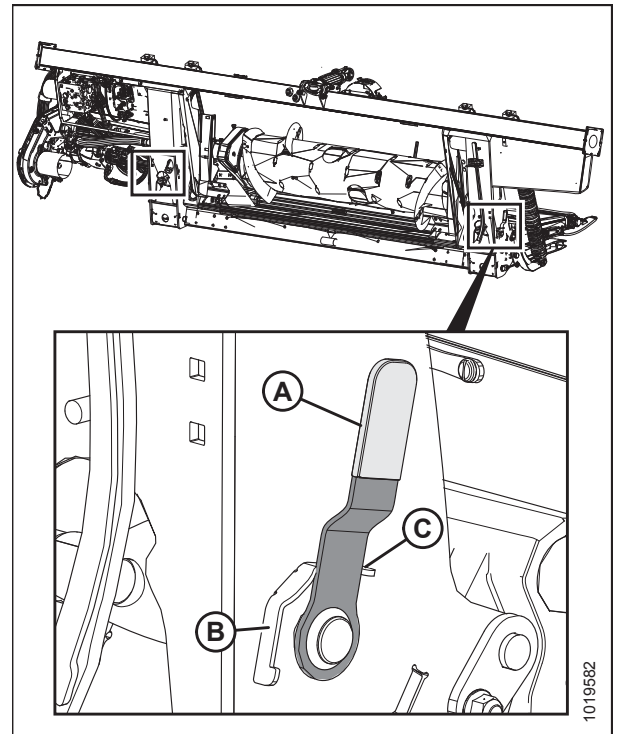


Figure 3.44: Float Lock (in Locked Position)

OPERATION

Locking/Unlocking Header Wings

The FD1 is designed to operate with the cutterbar on the ground. The three sections move independently to follow the ground contours. In this mode, each wing is **unlocked** and is free to move up and down.

The FD1 can also be operated as a rigid header with the cutterbar straight. A typical application is in cereals when cutting above the ground. In this mode, the wing is **locked**.

Operating in Flex Mode

In flex mode, the three sections will be **unlocked** and will move independently to follow the ground contours.

Unlock the wings as follows:

1. Move spring handle (A) in the lower slot to unlock the wing. The unlocking should be audible.
2. If the lock link does not disengage, move the wing by raising and lowering the header, changing the header angle, or driving the combine until it disengages.

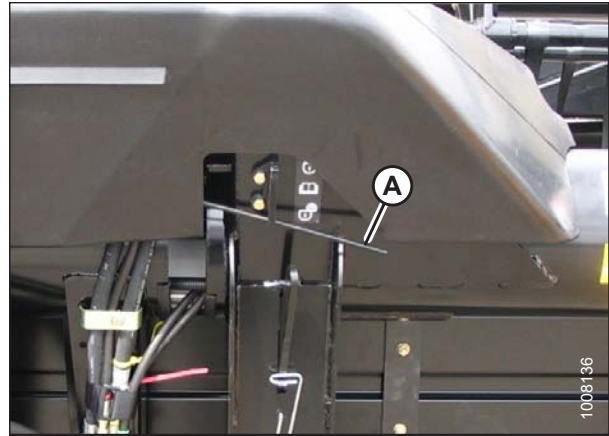


Figure 3.45: Wing Lock

NOTE:

The following steps are only required if the above has not worked.

3. Remove the linkage cover. Refer to [Removing Linkage Covers, page 35](#).
4. Retrieve the supplied torque wrench (A) that is stored on the float module frame on the right side.

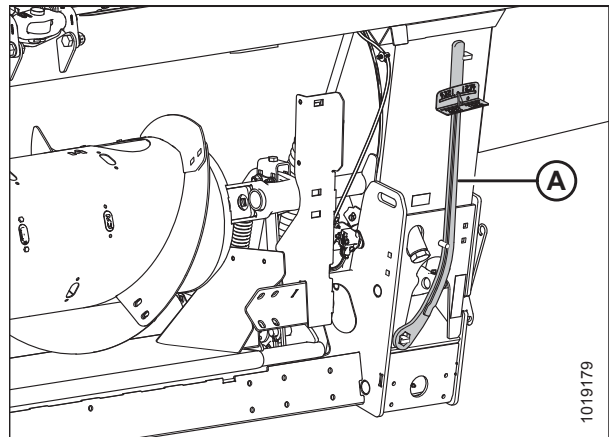


Figure 3.46: Torque Wrench

OPERATION

5. Place the torque wrench (A) on bolt (B) and use it to move the wing until the lock disengages.
6. Replace the torque wrench (A) and reinstall the linkage cover.
7. If necessary, balance the wing. Refer to [3.7.4 Checking and Adjusting Header Wing Balance](#), page 65.

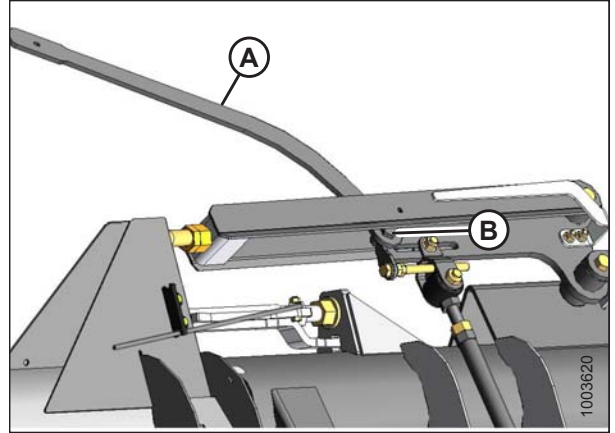


Figure 3.47: Torque Wrench on Wing Nut

Operating in Rigid Mode

The three sections will be **locked** and operate as a rigid cutterbar.

Lock the wings as follows:

1. If the lock link does not engage, move the wing by raising and lowering the header, changing the header angle, or driving the combine until it engages.
2. Move spring handle (A) in the upper slot to lock the wing. The locking should be audible.
3. If the lock link does not engage, move the wing by raising and lowering the header, changing the header angle, or driving the combine until it engages.

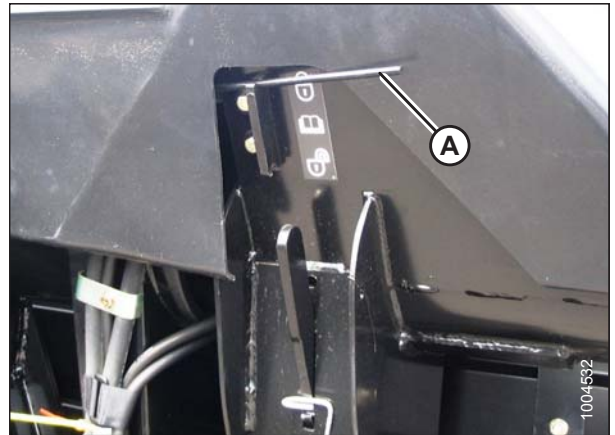


Figure 3.48: Wing Lock

NOTE:

The following steps are only required if the above has not worked.

OPERATION

4. Remove the linkage cover. Refer to [Removing Linkage Covers, page 35](#).
5. Retrieve the supplied torque wrench (A) that is stored on the float module frame on the right side.

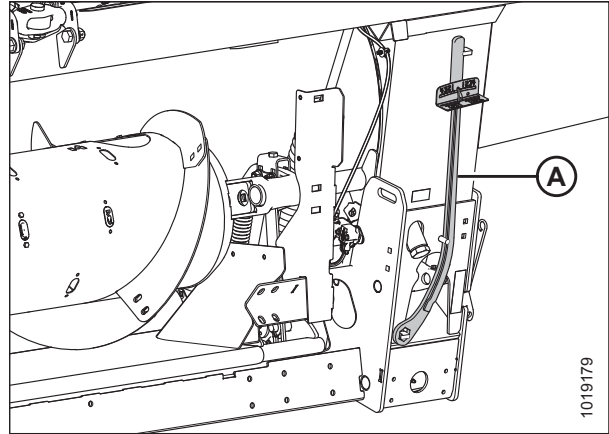


Figure 3.49: Torque Wrench

6. Place the torque wrench (A) on bolt (B) and use it to move the wing until the lock engages.
7. Replace the torque wrench (A) and reinstall the linkage cover. The wings will not move relative to the header.

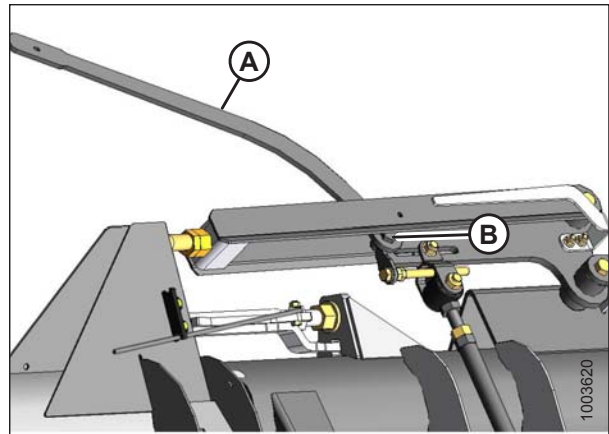


Figure 3.50: Header Wing

3.7.4 Checking and Adjusting Header Wing Balance

IMPORTANT:

Before proceeding, the header float must be set properly. Refer to [Checking and Adjusting Header Float, page 56](#).

The header wing balance allows the wings to react to changing ground conditions. If set too light, the wings will bounce or not follow ground contours, leaving uncut crop. If set too heavy, the end of the header will dig into the ground. After the header float has been set, the wings must be balanced for the header to follow the ground contours properly.

Checking Wing Balance

This procedure describes how to check the balance of each wing.

IMPORTANT:

To ensure correct wing balance readings, make sure the header float is set properly before proceeding. Refer to [Checking and Adjusting Header Float, page 56](#).

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

If a header wing has a tendency to be in a smile (A) or a frown (B) position, wing balance may require adjusting. Perform the following steps to verify if the wings are not balanced, and the degree of imbalance:

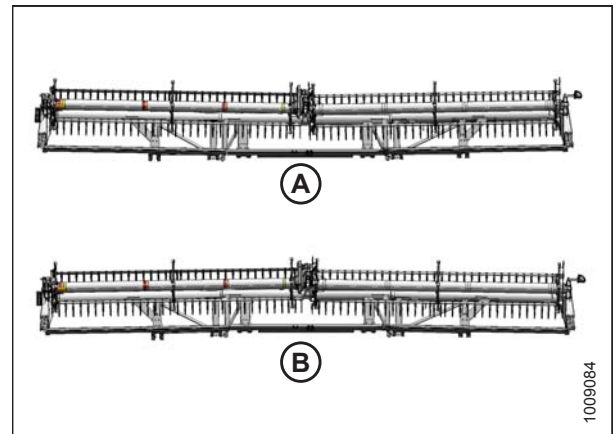


Figure 3.51: Wing Imbalance

1. Adjust the reel fore-aft position to between 5 and 6 on the position indicator decal (A) located on the reel right arm.
2. Lower the reel fully.

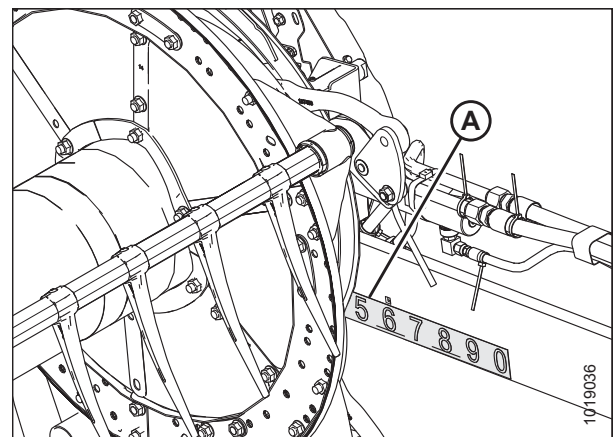


Figure 3.52: Fore-Aft Position

OPERATION

3. Adjust the center-link (A) so that indicator (B) is between **B** and **C** on gauge (C).
4. Park combine on level ground and raise header until cutterbar is 152–254 mm (6–10 in.) off the ground.
5. Shut down the combine, and remove the key from the ignition.
6. If installed, move stabilizer/transport wheels so that they are supported by header. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

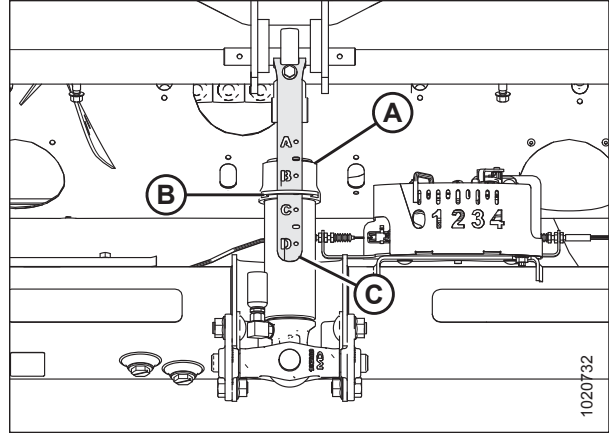


Figure 3.53: Center-Link

7. Remove linkage cover (A) by removing bolt (B) and rotating cover upward until inboard end can be lifted off.

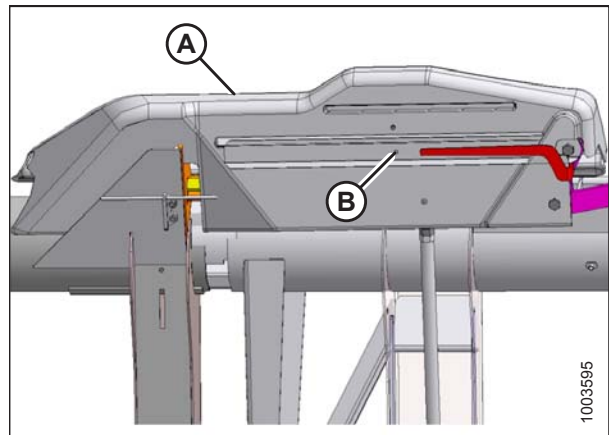


Figure 3.54: Linkage Cover

NOTE:

Refer to the decal (A) inside each linkage cover.

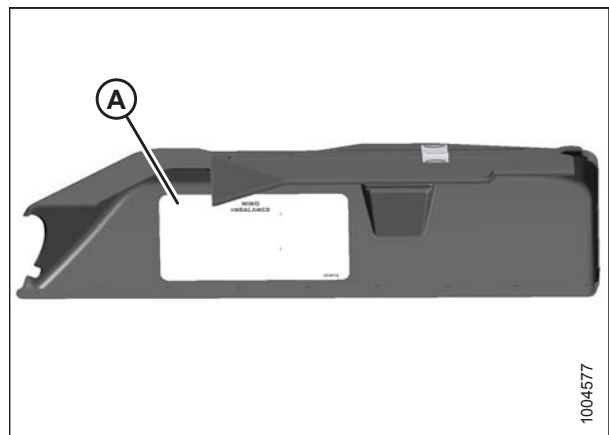


Figure 3.55: Linkage Cover

OPERATION

- Unlock the wings by moving spring handles (A) to lower (UNLOCK) position.

NOTE:

If lock link does not engage lower slot, move with the torque wrench until lock link moves into slot.

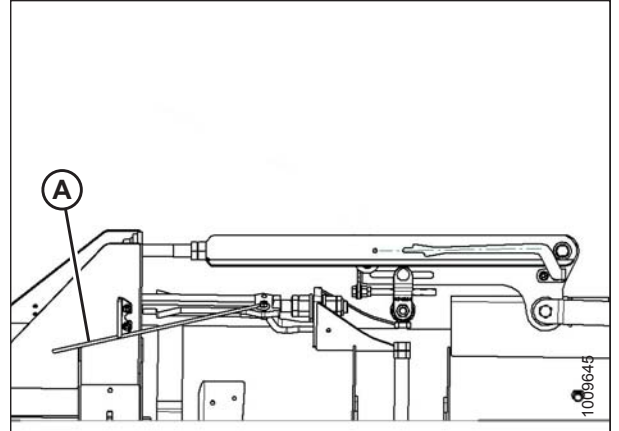


Figure 3.56: Wing Lock in UNLOCK Position

- Retrieve wrench (A) from float module right leg.

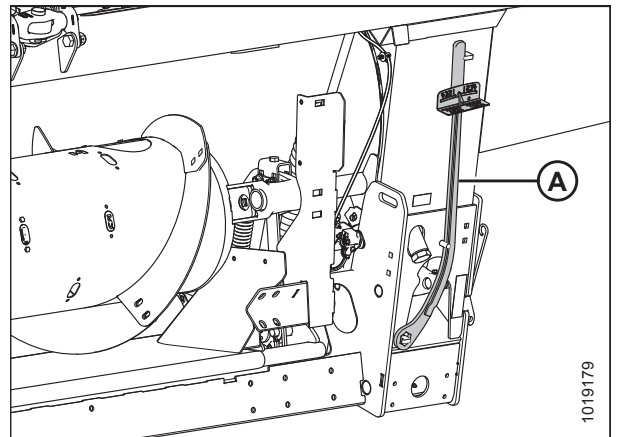


Figure 3.57: Torque Wrench

- Place torque wrench (A) onto bolt (B).

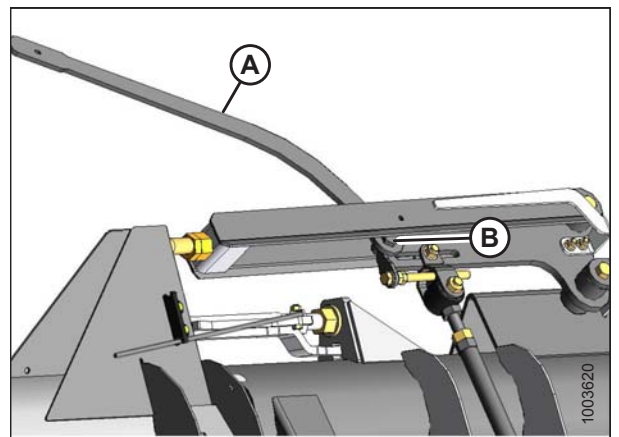


Figure 3.58: Balance Linkage

OPERATION

11. Check that pointer (D) is properly positioned as follows:

- Use wrench (A) to move bell crank (B) so that lower edge of bell crank is parallel to top-link (C).
- Check that pointer (D) is lined up with the top-link (C). Bend pointer if necessary.

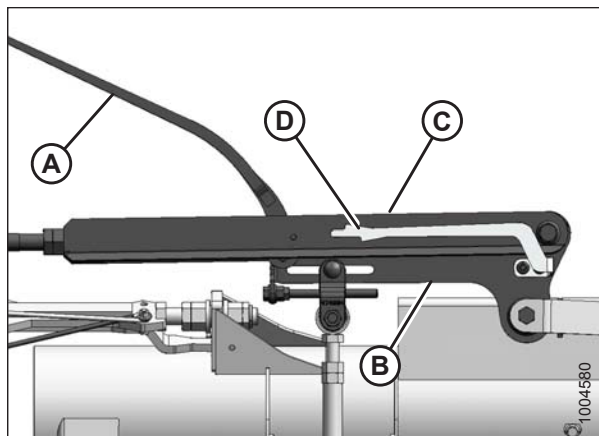


Figure 3.59: Balance Linkage

12. Move wing upward with torque wrench (A) until the pointer's lower alignment tab (C) lines up with the upper edge of the top-link (B). Observe the indicator reading (D) on wrench and record it.

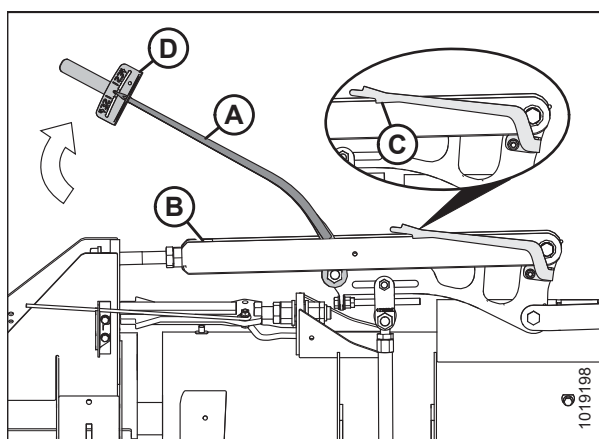


Figure 3.60: Balance Linkage

13. Move wing downward with torque wrench (A) until the pointer's upper alignment tab (C) lines up with the lower edge of the top-link (B). Observe indicator reading (A) on the wrench and record it.

- If the difference between the readings is 0.5 or less, the wing is balanced and no further adjustment is required. To reinstall the linkage cover, refer to Steps [14, page 69](#) and [15, page 70](#).
- If the difference between the readings is more than 0.5, the wing is not balanced. Refer to [Adjusting Wing Balance, page 70](#).

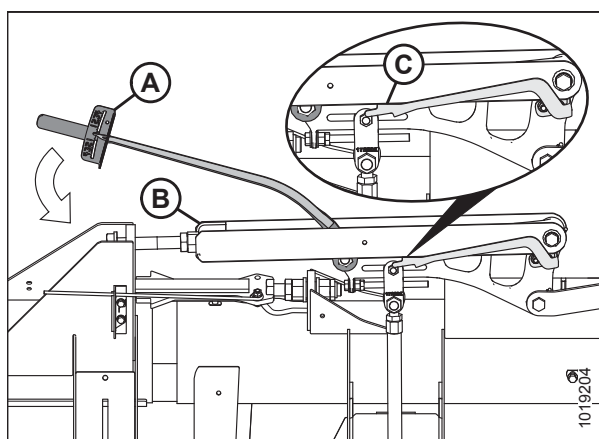


Figure 3.61: Balance Linkage

OPERATION

- If the indicator range is as shown, the wing is too light.

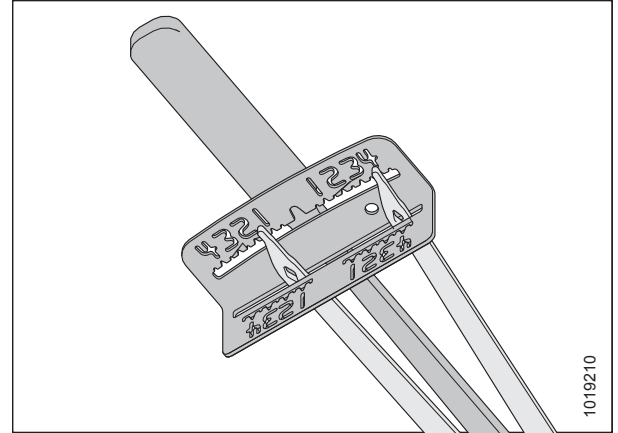


Figure 3.62: Wrench Indicator

- If the indicator range is as shown, the wing is too heavy.

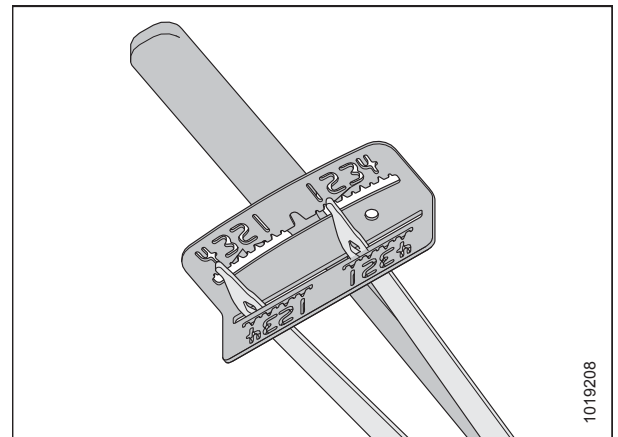


Figure 3.63: Wrench Indicator

14. If no adjustment is required, place wrench (A) back onto the float module right leg.

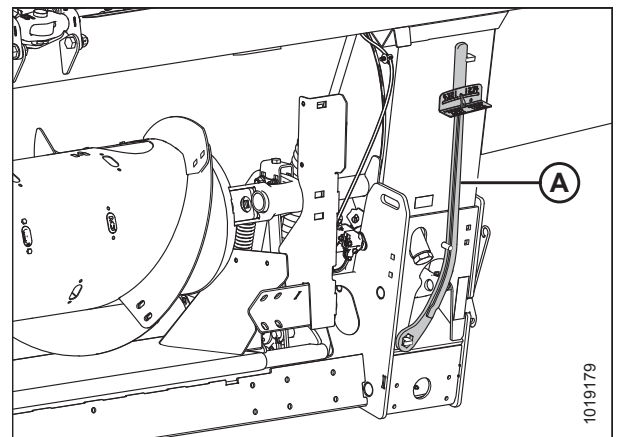


Figure 3.64: Torque Wrench

OPERATION

15. If no adjustment is required, reinstall linkage cover (A) and secure it with bolt (B). If adjustment is required, refer to [Adjusting Wing Balance, page 70](#).

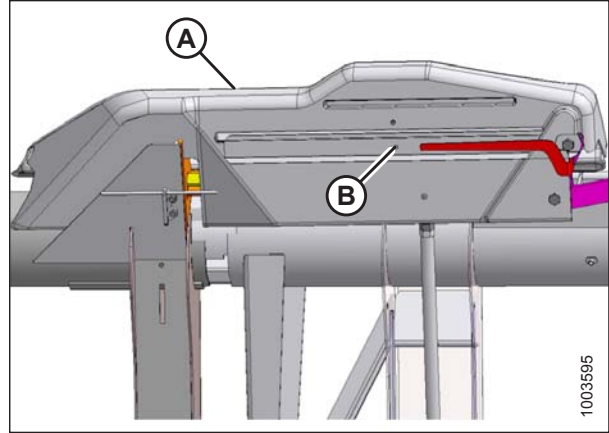


Figure 3.65: Linkage Cover

Adjusting Wing Balance

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

This procedure describes how to adjust the balance of each wing. Before proceeding, refer to [Checking Wing Balance, page 65](#) to determine if adjustments are necessary.

IMPORTANT:

To ensure correct wing balance readings, make sure the header float is set properly before proceeding. Refer to [Checking and Adjusting Header Float, page 56](#). The float module must be sitting level before performing any adjustments.

1. Place torque wrench (A) on bolt (B).

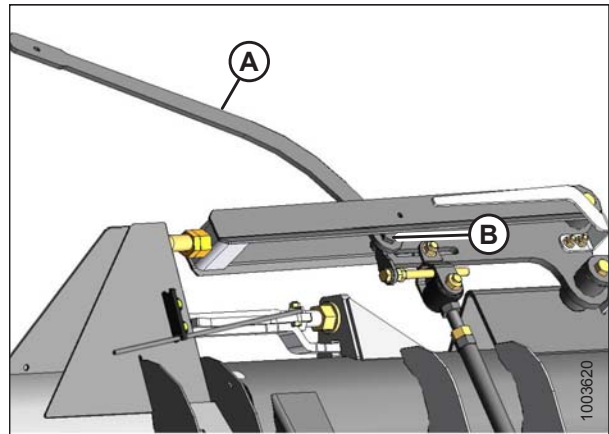


Figure 3.66: Balance Linkage (Left Side)

OPERATION

2. Loosen the clevis bolt (A) for the wing requiring adjustment as determined by the wing balance check.

NOTE:

Do **NOT** loosen any other hardware.

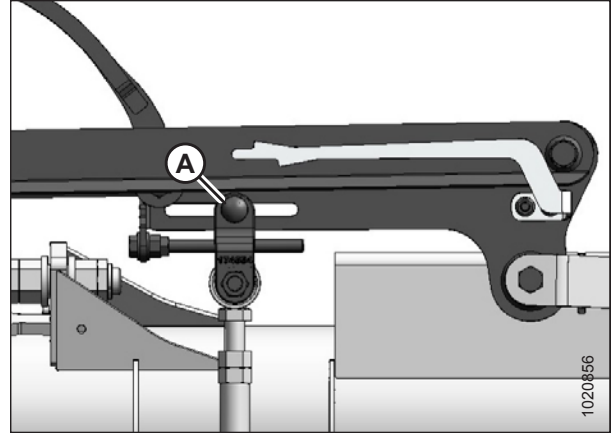


Figure 3.67: Balance Linkage (Left Side)

3. Recheck the wing balance. Refer to [Checking Wing Balance, page 65](#).
4. If necessary, perform the following adjustments:
 - If the wing is too heavy, turn adjuster bolt (B) to move clevis (C) outboard (D).
 - If the wing is too light, turn adjuster bolt (B) to move clevis (C) inboard (E).
5. Adjust clevis (C) position if necessary until indicator readings are within one increment.
6. Tighten clevis bolt (A).

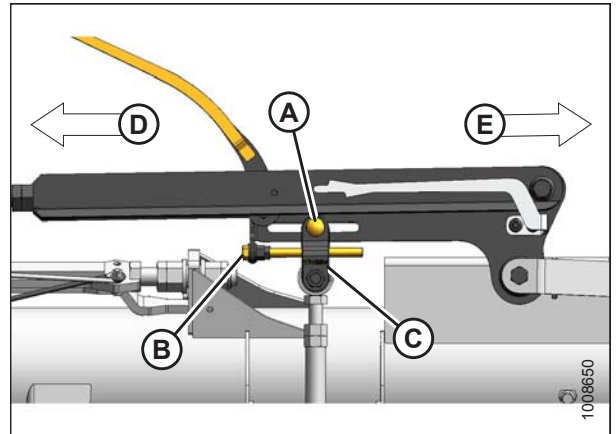


Figure 3.68: Balance Linkage (Left Side)

7. Move handle (A) to the upper LOCK position.
8. If lock does not engage, move the wing up and down with torque wrench until it locks. When locked, there will be some movement in the linkage.
9. If the cutterbar is not straight when wings are in lock mode, then further adjustments are required. Contact your MacDon Dealer.

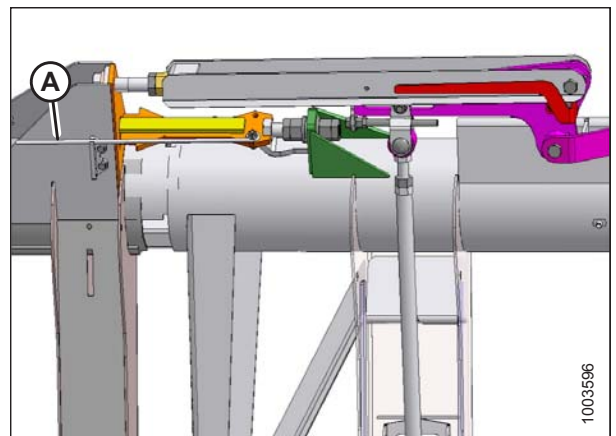


Figure 3.69: Wing Lock in Lock Position

OPERATION

10. Return the torque wrench (A) to its storage location on the float module frame.

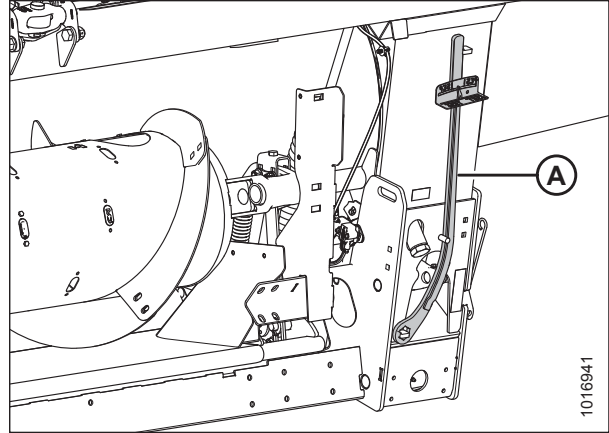


Figure 3.70: Torque Wrench

11. Reinstall linkage cover (A) and secure it with bolt (B).

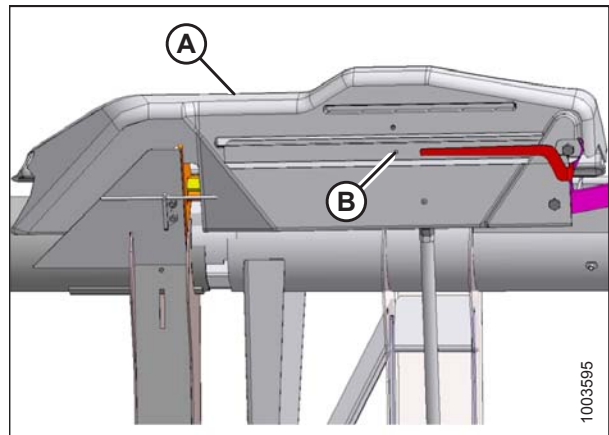


Figure 3.71: Linkage Cover

3.7.5 Header Angle

Header angle is adjustable to accommodate different crop conditions and/or soil types.

Header angle (A) controls the distance (B) between the knife and the ground and is a critical component for effective cutting on the ground. Adjusting the center-link determines the position of the knife and guards and pivots the header at the point of skid shoe/ground contact (C).

Header angle (A) is equal to guard angle (D) which is the angle between the upper surface of the guards and the ground.

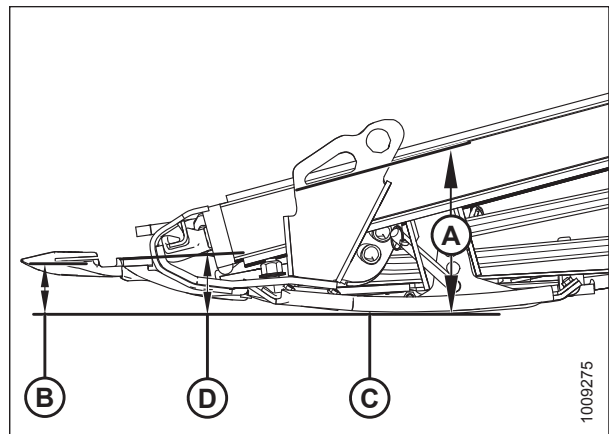


Figure 3.72: Header Angle

OPERATION

Adjusting Header Angle

Header angle can be adjusted using the center-link between the combine and the header.

Refer to your combine operator's manual for adjustment details.

3.7.6 Reel Speed

Reel speed is one of the factors that determines how crop is moved from the cutterbar onto the drapers.

The reel performs best when it appears to be driven by the ground. It should move the cut crop evenly through the cutterbar and onto the drapers without bunching and with minimal disturbance.

In standing crop, reel speed should be slightly higher than, or equal to, 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.

Slower reel speeds can be used with nine-bat reels, which is advantageous in shatter-prone crops.

NOTE:

For more information about converting a six-bat reel to a nine-bat reel for 30- and 35-ft. headers. Refer to [6.2.4 PR15 Tine Tube Reel Conversion Kit, page 489](#).

For recommended reel speeds in specific crops and conditions, refer to [3.6.2 Header Settings, page 41](#).

The reel speed is adjustable using the controls in the combine cab. Refer to your combine operator's manual for adjustment details.

Optional Reel Drive Sprockets

Optional reel drive sprockets for use in special crop conditions are available as an alternative to the factory-installed sprocket.

The header is factory-equipped with a 19-tooth reel drive sprocket which is suitable for most crops. Other sprockets are available that provide more torque to the reel in heavy cutting conditions or allow for higher reel speeds in light crops when operating at increased ground speeds. Refer to [Table 3.6, page 73](#), and contact your MacDon Dealer for ordering information.

Table 3.6 Optional Reel Drive Sprockets

Machine Hydraulics	Combine	Application	Optional Drive Sprocket
13.79–14.48 MPa (2000–2100 psi)	Gleaner Transverse Rotary	Combining down rice	10 tooth
17.24 MPa (2500 psi)	Lexion 500, 700 Series, Challenger Axial Rotary		12 tooth
20.68 MPa (3000 psi)	NH CR, CX, Case IH 7010, 8010, 7120, 8120, 88 Series		14 tooth
Low flow (under 11 gpm)	—	Combining light crops above 16 km/hr (10 mph)	21 tooth

For installation details, refer to [5.16.3 Reel Drive Sprocket, page 471](#).

OPERATION

3.7.7 Ground Speed

Operating at the proper ground speed will result in cleanly cut crops and evenly distributed material into the combine.

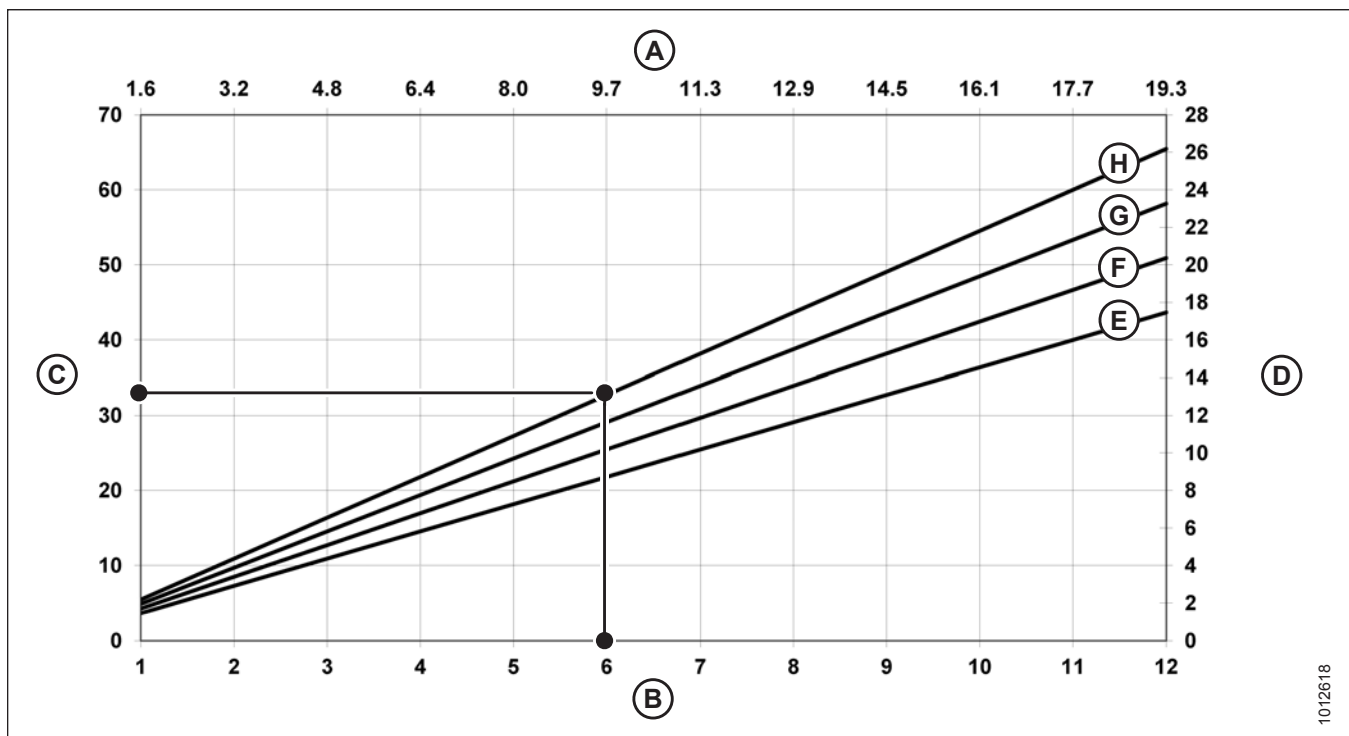
Reduce ground speed in difficult cutting conditions to reduce loads on cutting components and drives.

Use lower ground speeds in very light crops (e.g., 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 as required.

Higher ground speeds may require heavier float settings to prevent excessive bouncing that causes uneven cutting and possible damage to the cutting components. Increase ground pressure first before increasing the float. If ground speed is increased, draper and reel speeds should generally be increased to handle the extra material.

Figure 3.73, [page 74](#) illustrates the relationship between ground speed and area cut for the various sized headers.

Figure 3.73: Ground Speed vs Acres



A - Kilometers/Hour
D - Hectares/Hour
G - 40-Footer

B - Miles/Hour
E - 30-Footer
H - 45-Footer

C - Acres/Hour
F - 35-Footer

Example: A 40-foot header operating at a ground speed of 9.7 km/h (6 mph) would produce a cut area of approximately 11.3 hectares (28 acres) in one hour.

3.7.8 Draper Speed

Correct draper speed is an important factor for achieving good flow of the cut crop away from the cutterbar.

The side drapers and feed draper operate independently of each other, therefore, the speeds are controlled differently. The side draper speed is adjusted with a manually adjustable control valve that is mounted on the float module. The float module feed draper speed is fixed to the combine feeder house speed and cannot be independently adjusted.

Adjust the draper speed to achieve efficient crop feeding onto the float module feed draper. Refer to [Adjusting Header Draper Speed, page 75](#).

Adjusting Header 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 crops and crop conditions.

The 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 set by using the flow control valve on the float module which regulates the flow to the draper hydraulic motors.

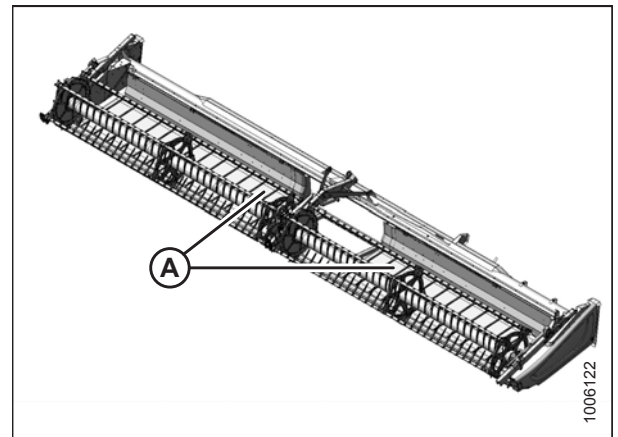


Figure 3.74: Side Drapers

To access the flow control valve, pull bottom of compartment cover (A) to open.

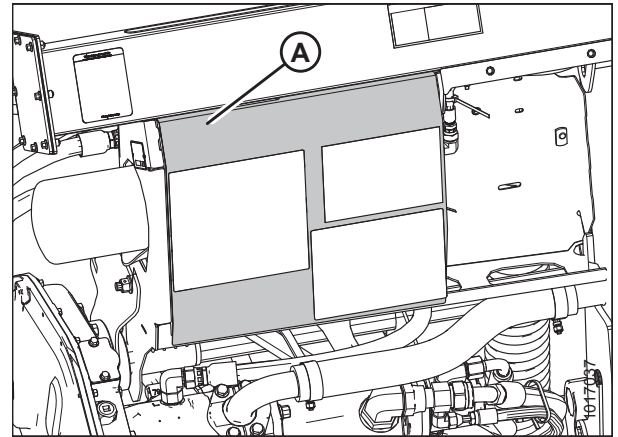


Figure 3.75: Hydraulic Compartment Cover

OPERATION

The flow control valve (A) has settings from 0–9 on the barrel to indicate the draper speed. The flow control valve is factory-set to 6 which should be sufficient for normal crop feeding.

To change the draper speed, shut down the combine and rotate the flow control valve dial to adjust the control.

Refer to one of the following for recommended draper speed settings:

- [3.6.2 Header Settings, page 41](#)
- [3.6.3 Optimizing Header for Straight Combining Canola, page 45](#)

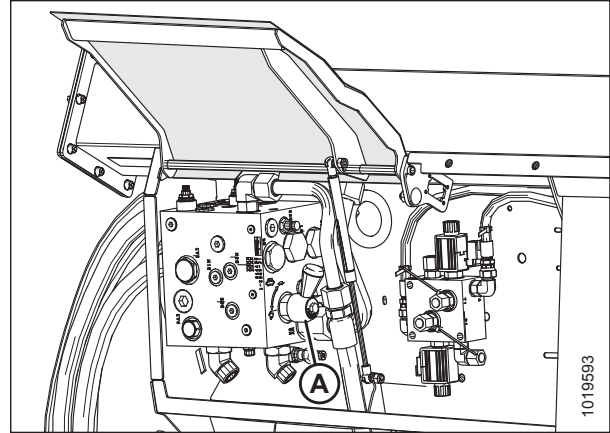


Figure 3.76: Flow Control Valve (Parts Removed for Clarity)

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.

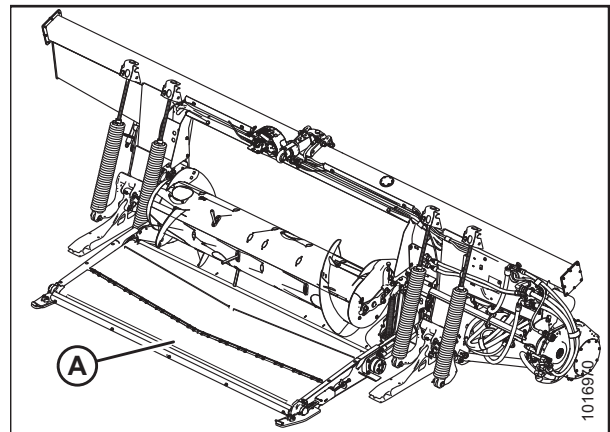


Figure 3.77: FM100 Float Module

3.7.9 Knife Speed Data

The header knife drive is powered by the FM100 hydraulic pump which is driven by the combine feeder house. There is no separate adjustment to control the knife speed.

IMPORTANT:

For variable speed feeder houses, the rpm values shown at right represent the MINIMUM feeder house speeds.

Table 3.7 Feeder House Speed

Combine	Feeder House Speed (rpm)
John Deere	490
Case IH	580
Gleaner	625
Massey Ferguson	625
Challenger	625
New Holland	580
Lexion ¹⁹	420

IMPORTANT:

Ensure the knife speed is within the range of rpm values in Table 3.8, page 77. Refer to *Checking Knife Speed*, page 78.

IMPORTANT:

Under normal cutting conditions, knife speed taken at the knife drive pulley should be set between 600–640 rpm (1200–1280 spm). If set to low side of chart, you could experience knife stalling.

Table 3.8 FD1 Header Knife Speed

Header Size (ft)	Recommended Knife Drive Speed Range (rpm)	
	Single-Knife Drive	Double-Knife Drive
30	600–700	—
35	550–650	—
40	525–600	550–700
45	—	550–700

19. The rear shaft speed on Lexion combines is 420 rpm (speed shown on cab display monitor also will be 420). The output shaft speed is actually 750 rpm.

Checking Knife Speed

DANGER

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

1. Stop the combine engine and remove the key from the ignition.
2. Open the left endshield (A). Refer to [Opening Endshields, page 31](#).



Figure 3.78: Left Endshield

WARNING

Check to be sure all bystanders have cleared the area.

3. Start the combine engine, engage the header drive, and run the combine at operating rpm.
4. Run adapter and header for 10 minutes to warm up oil to 38°C (100°F).
5. Measure the rpm of the knife drive box pulley (A) with a hand-held tachometer.
6. Shut down the combine.
7. Compare pulley rpm measurement with the rpm values in the knife speed chart. Refer to [3.7.9 Knife Speed Data, page 77](#).
8. Contact your MacDon Dealer if the pulley rpm measurement exceeds the specified rpm range for your header.

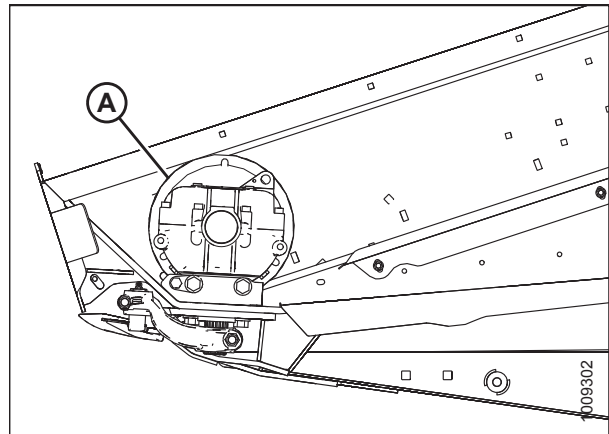


Figure 3.79: Knife Drive Pulley

3.7.10 Reel Height

Crop type and crop condition determine the operating height of the reel. Set the reel height and fore-aft position to carry material past the knife and onto the drapers with minimal damage to the crop. Refer to [3.7.11 Reel Fore-Aft Position, page 84](#).

The reel height can be controlled manually using switches inside the combine cab, or assigned to button presets on the ground speed lever (GSL). Refer to your combine operator's manual for instructions on controlling reel height or setting up auto reel height presets.

Table 3.9 Reel Height

Crop Condition	Reel Position
Lodged rice	Lowered (also change reel speed and/or cam setting)
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 being pushed down by the tine tubes

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 cutterbar

Refer to [3.6.2 Header Settings, page 41](#) to determine recommended reel heights for specific crops and crop conditions.

IMPORTANT:

Maintain adequate clearance to prevent fingers contacting the knife or the ground. Refer to [5.15.1 Reel Clearance to Cutterbar, page 442](#).

Checking and Adjusting Reel Height Sensor

The output voltage range of the auto reel height sensor can be checked from inside the combine or manually at the sensor. For in-cab instructions, refer to the combine operator's manual. To check the voltage range manually, refer to the following procedure.



DANGER

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



CAUTION

Check to be sure all bystanders have cleared the area.

IMPORTANT:

Ensure reel height is properly set before adjusting reel height sensor. Refer to [5.15.1 Reel Clearance to Cutterbar, page 442](#).

OPERATION

IMPORTANT:

To measure the output voltage of the reel height sensor, the combine needs to be turned ON and supplying power to the sensor. Always engage the combine parking brake and stay away from the reel.

Table 3.10 Reel Height Sensor Voltage Limits

Combine Type	Voltage Range	
	X Voltage	Y Voltage
Case New Holland	0.5–0.9 V	4.1–4.5 V
John Deere	4.1–4.5 V	0.5–0.9 V
CLAAS	4.1–4.5 V	0.5–0.9 V

NOTE:

For CLAAS Combines: To avoid a collision of the reel with the cab, the machine is equipped with an automatic reel height limitation. Some CLAAS combines have an automatic shutoff feature that engages when the automatic reel height limitation is reached. When raising the header by more than 80 percent, the reel is automatically lowered. The automatic lowering of the reel can be manually overridden, and a warning will appear on the CEBIS terminal.

1. Engage the combine parking brake.
2. Start the combine engine and lower reel fully.
3. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range X. Refer to Table 3.10, page 80 for range requirements.
4. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (B).
5. Stop the combine engine and remove key.
6. Adjust length of threaded rod (A) to modify voltage range X.
7. Repeat checking and adjusting until voltage range X is within the range specified.

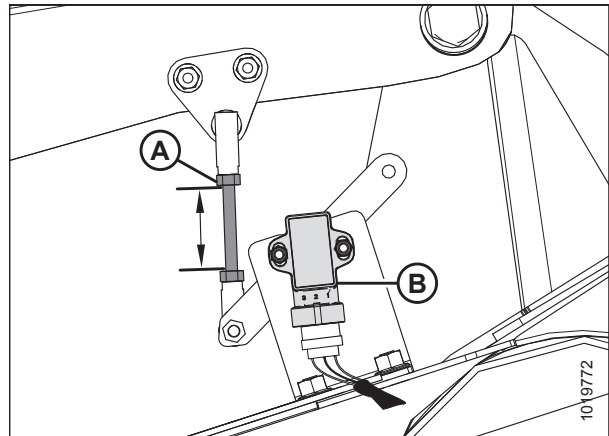


Figure 3.80: Reel Height Sensor – Right Reel Arm (Reel Down)

OPERATION

8. Start the combine engine, and raise the reel fully.
9. Use the combine display or a voltmeter (if measuring the sensor manually), to measure voltage range Y. Refer to Table 3.10, page 80 for range requirements.
10. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (A).
11. Stop the combine engine and remove key.
12. Loosen two M5 hex nuts (B) and rotate sensor (A) to achieve voltage range Y.
13. Repeat checking and adjusting until voltage range Y is within the range specified.
14. Start the combine engine and lower reel fully.
15. Recheck voltage range X and ensure it is still within the range specified. Adjust if required.

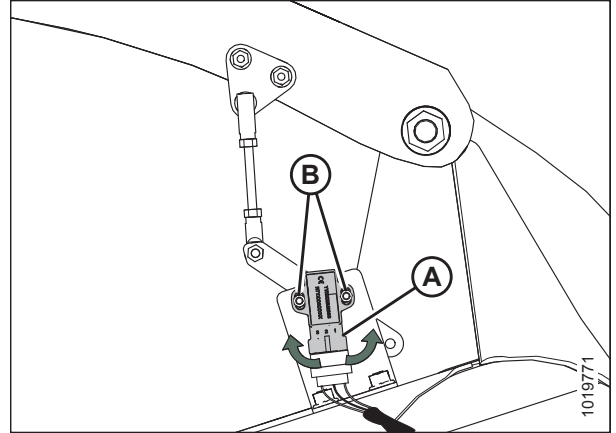


Figure 3.81: Reel Height Sensor – Right Reel Arm (Reel Up)

Replacing Reel Height Sensor

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Start engine and lower reel fully.
2. Stop engine and remove key.
3. Disconnect sensor from harness.
4. Remove two hex head bolts (A) from sensor arm (B). Retain hardware for reinstallation.

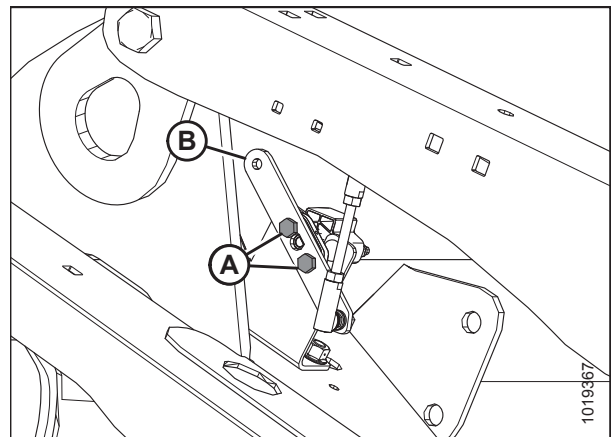


Figure 3.82: Reel Height Sensor – Right Reel Arm

OPERATION

5. Remove two nyloc nuts and bolts (A) from reel height sensor and remove sensor.
6. Install new sensor (B) in sensor bracket and attach using retained bolts and nyloc nuts.

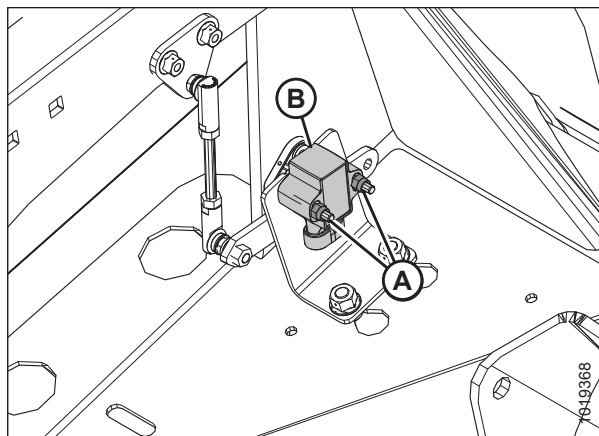


Figure 3.83: Reel Height Sensor – Right Reel Arm

7. Connect sensor arm (B) using retain hex head bolts (A).
8. Connect sensor to harness.

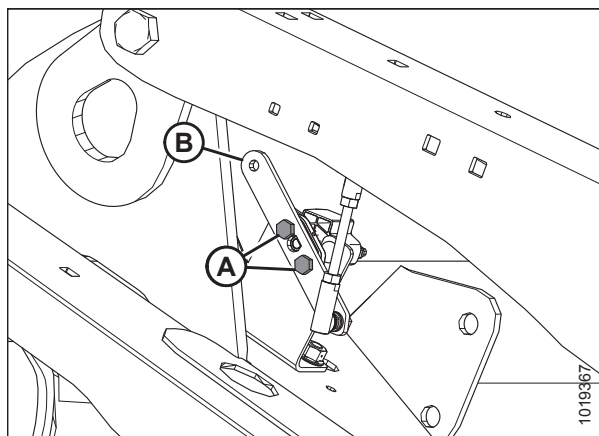


Figure 3.84: Reel Height Sensor – Right Reel Arm

OPERATION

9. Check that sensor arm and the threaded rod are parallel. If not, Loosen two center lock flange nuts (A), and adjust sensor mounting bracket (B) until the threaded rod (C) is parallel with the sensor arm (D). Tighten center lock flange nuts.
10. Check the sensor voltage range. Refer to [Checking and Adjusting Reel Height Sensor](#), page 79.

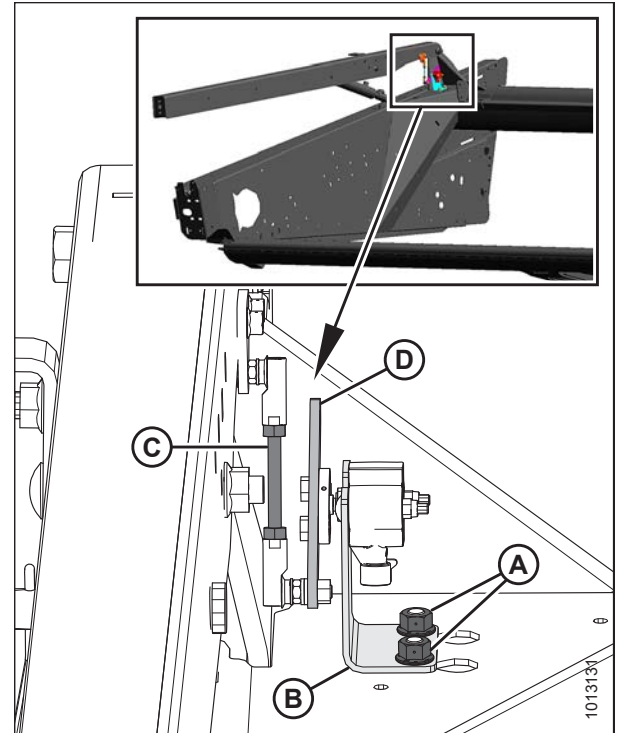


Figure 3.85: Reel Height Sensor – Right Reel Arm (Front View)

3.7.11 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for achieving the best results in adverse conditions. The reel position is factory-set for normal conditions, but it can be adjusted forwards or backwards as required using the controls inside the cab.

The reel on **non-European** configured headers can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the header's reel arms to accommodate certain crop conditions. Refer to [Repositioning Fore-Aft Cylinders on Non-European Configured Headers, page 85](#).

The reel on **European** configured headers can be moved approximately 67 mm (2.6 in.) farther aft by repositioning the fore-aft cylinders on the header's reel arms to accommodate certain crop conditions. Refer to [Repositioning Fore-Aft Cylinders on European Configured Headers, page 89](#).

If the combine is equipped with the Multi-Crop Rapid Reel Conversion option, refer to [Repositioning Fore-Aft Cylinders on Non-European Configured Headers with Multi-Crop Rapid Reel Conversion Option, page 93](#).

NOTE:

The Multi-Crop Rapid Reel Conversion option is not available for European configured headers.

Decal (A) is attached to the right reel support arm for identifying reel position. The aft edge of the cam disc (B) is the reel fore-aft position marker.

For straight standing crop, center the reel over the cutterbar (4–5 on decal).

For crops that are down, tangled, or leaning, it may be necessary to move the reel ahead of the cutterbar (lower number on decal).

NOTE:

If experiencing difficulty picking up flattened crop, adjust to a steeper header angle. Refer to [3.7.5 Header Angle, page 72](#) for adjustment instructions. Adjust reel position only if header angle adjustments are not satisfactory.

For recommended reel positions in specific crops and crop conditions, refer to [3.6.2 Header Settings, page 41](#).

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 [3.7.12 Reel Tine Pitch, page 96](#) for adjustment details.

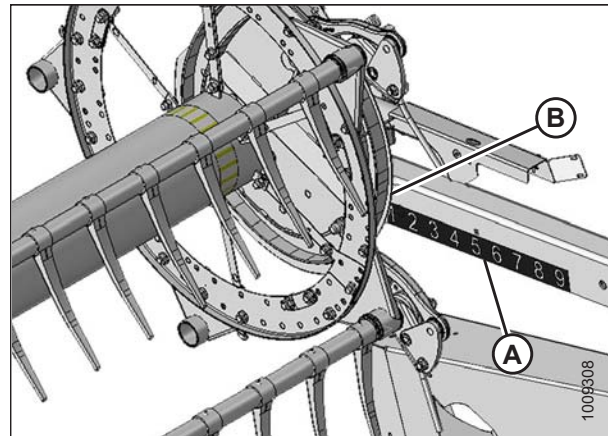


Figure 3.86: Fore-Aft Decal

OPERATION

Adjusting Reel Fore-Aft Position

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 the decal (A) as a reference.
3. Check the reel clearance to cutterbar after making changes to the cam setting. Refer to the following for measurement and adjustment procedures:
 - [5.15.1 Reel Clearance to Cutterbar, page 442](#)
 - [5.15.2 Reel Frown, page 446](#)

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.

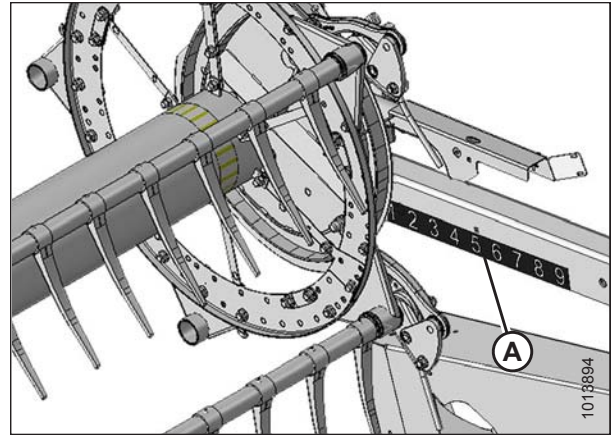


Figure 3.87: Fore-Aft Decal

Repositioning Fore-Aft Cylinders on Non-European Configured Headers

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

NOTE:

B5605 (Short Brace Kit For Center Reel Arm) must be installed before repositioning fore-aft cylinders.

If the Multi-Crop Rapid Reel Conversion option is installed, refer to [Repositioning Fore-Aft Cylinders on Non-European Configured Headers with Multi-Crop Rapid Reel Conversion Option, page 93](#).

NOTE:

The Multi-Crop Rapid Reel Conversion option is not available for European configured FD1 headers.

For instructions for repositioning the fore-aft cylinders on an European configured header, refer to [Repositioning Fore-Aft Cylinders on European Configured Headers, page 89](#).



DANGER

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

Reposition the center reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustration for improved clarity.

OPERATION

1. Position reel fully aft with support arms horizontal.
2. Stop engine and remove key.
3. Remove four bolts (A) securing cylinder bracket (B) to reel arm.
4. Push/pull reel until bracket (B) lines up with the fore/aft set of holes (C).
5. Reinstall four bolts (A) to secure bracket (B) to reel arm at new position.

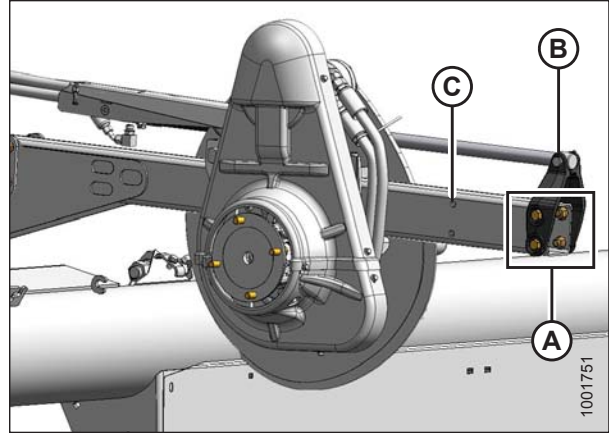


Figure 3.88: Right Arm – Forward Position

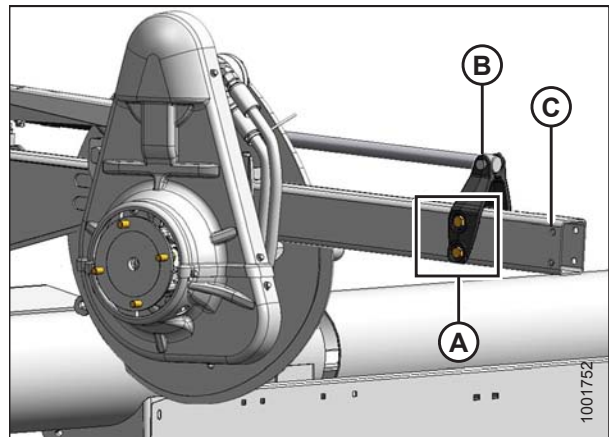


Figure 3.89: Right Arm – Rearward Position

Reposition the right reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustrations for improved clarity.

OPERATION

1. Remove four bolts (A) securing cylinder bracket (B) to the reel arm.
2. Push reel back until bracket (B) lines up with the aft set of holes (C).
3. Reinstall the four bolts (A) to secure bracket to reel arm at new position.

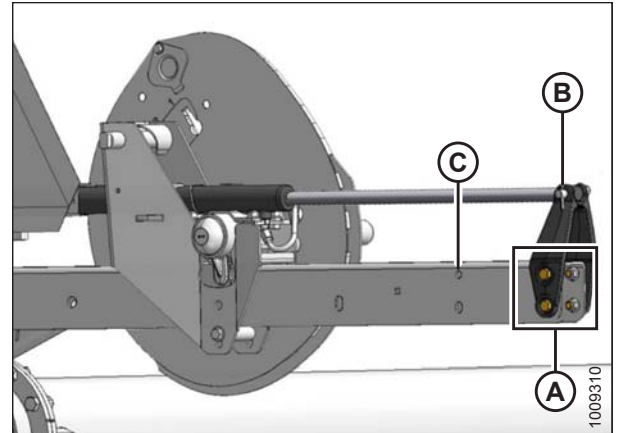


Figure 3.90: Right Reel Arm Cylinder in Forward Position

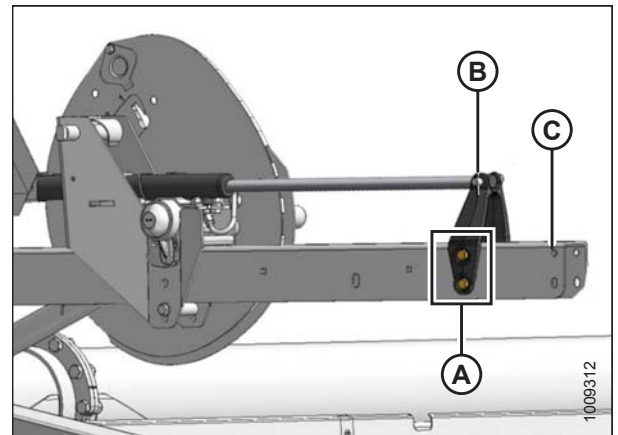


Figure 3.91: Right Reel Arm Cylinder in Aft Position

Reposition the left reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustrations for improved clarity.

OPERATION

1. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
2. Remove four bolts (D) securing bracket/light assembly (C) to reel arm and remove bracket/light assembly.
3. Remove cable tie (not shown) securing harness to bracket/light assembly (C) or to reel arm (if necessary).
4. Swivel light to working position as shown.

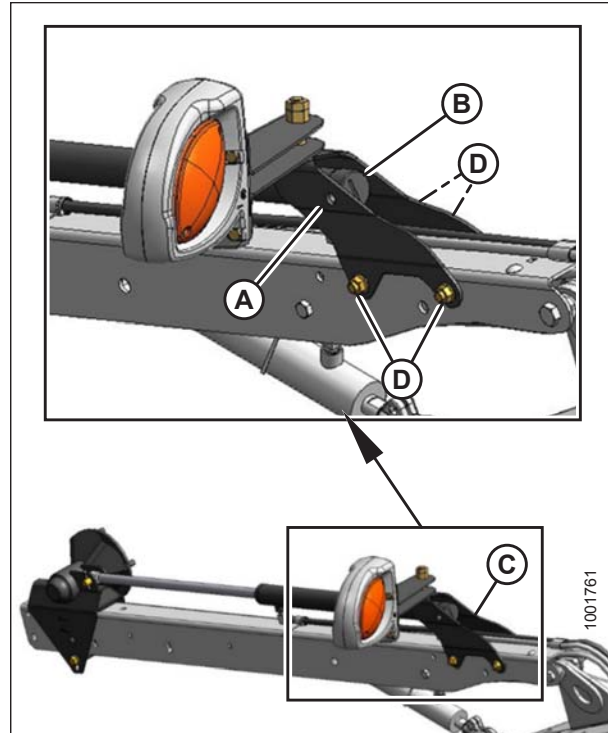


Figure 3.92: Left Arm – Forward Position

5. Reposition bracket/light assembly (C) onto reel arm as shown, and secure using four bolts (D). Tighten bolts.
6. Push reel back and reinstall cylinder (B) onto bracket/light assembly (C) using pin (A). Secure pin with cotter pin.
7. Secure light harness to bracket/light assembly (C) or to reel arm using plastic cable tie (not shown).
8. Check reel clearance to backsheet, upper cross auger (if installed), and reel braces.
9. Adjust reel tine pitch (if required). For adjustment procedures, refer to .

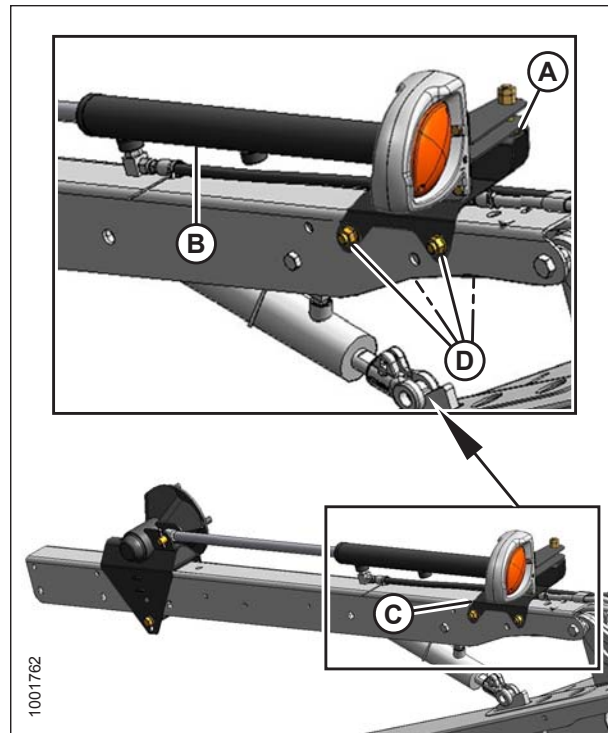


Figure 3.93: Left Arm – Rearward Position

OPERATION

Repositioning Fore-Aft Cylinders on European Configured Headers

The reel can be moved approximately 67 mm (2.6 in.) farther aft from factory setting by repositioning the fore-aft cylinders on the reel arms. This may be desirable when straight-combining canola.

For instructions for repositioning the fore-aft cylinders on a non-European configured header, refer to [Repositioning Fore-Aft Cylinders on Non-European Configured Headers, page 85](#).

Reposition center reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustrations for improved clarity.

NOTE:

Reels on European configured headers are at their most forward setting when cylinders are set in position 2 on the fore/aft arm brackets. Reels on these headers are in their most aft position when cylinders are set in position 1 on the fore/aft arm brackets.

1. Remove the securing ring (A) and pin (B) from the center arm fore/aft support bracket (C). Retain pin and ring.

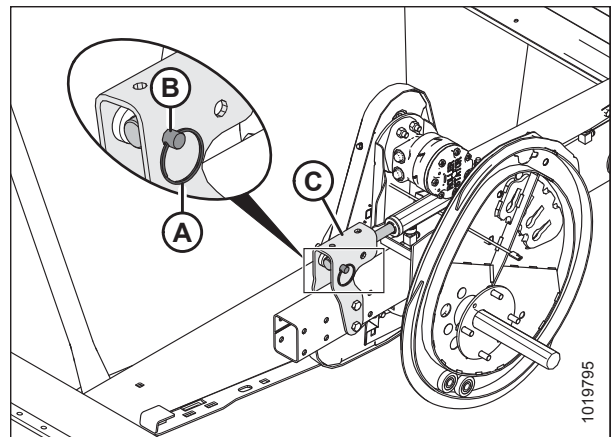


Figure 3.94: Center Reel Arm in Forward Position

2. Push the reel back until the end of the cylinder (A) lines up with the aft setting holes (B) in the fore/aft arm bracket (C). Position washers (D) on both sides of the cylinder end (A) inside the fore/aft arm bracket (C).

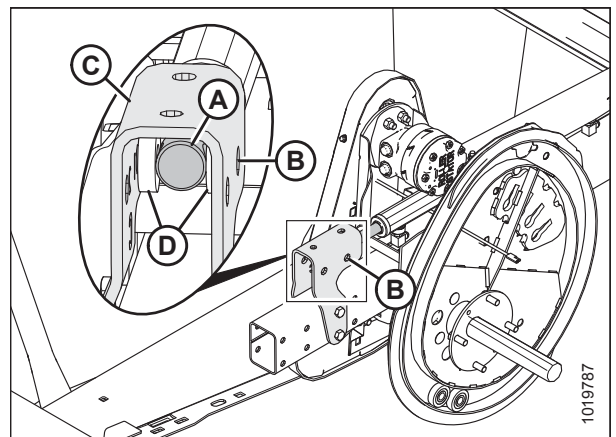


Figure 3.95: Center Reel Arm

OPERATION

- Secure cylinder (A) with pin (B) to the center arm fore/aft support bracket (C). Secure pin with ring (D).

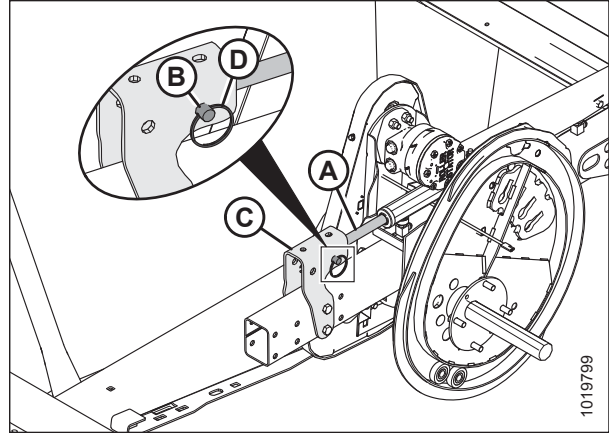


Figure 3.96: Center Reel Arm in Aft Position

Reposition right reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustrations for improved clarity.

NOTE:

Reels on European configured headers are at their most forward setting when cylinders are set in position 2 on the fore/aft arm brackets. Reels on these headers are in their most aft position when cylinders are set in position 1 on the fore/aft arm brackets.

- Remove ring (A) and pin (B) securing the reel arm cylinder (C) and washers (D) to the interior of the right fore/aft arm bracket (E). Retain washers, ring and pin.

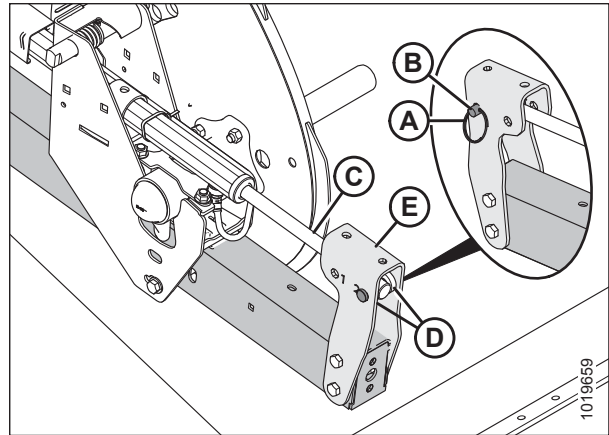


Figure 3.97: Right Reel Arm Cylinder in Forward Position

OPERATION

2. Push the reel back until the end of the cylinder (A) lines up with the aft setting holes (B) in the fore/aft arm bracket (C). Position washers (D) on both sides of the cylinder end (A) inside the fore/aft arm bracket (C).

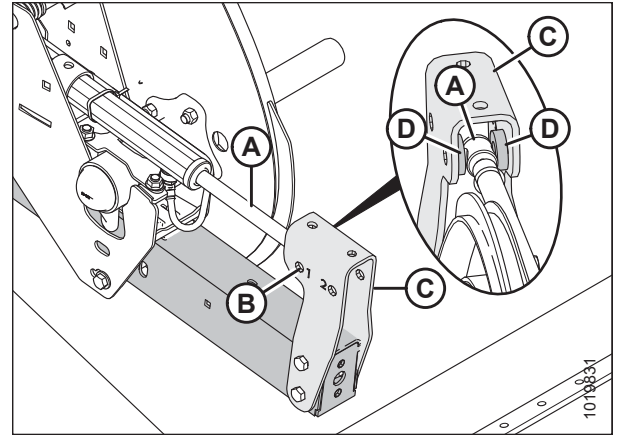


Figure 3.98: Right Reel Arm Cylinder

3. Insert pin (A) into the aft setting holes (B) and through the cylinder end (C) and washers (D). Secure the pin with the ring (E).

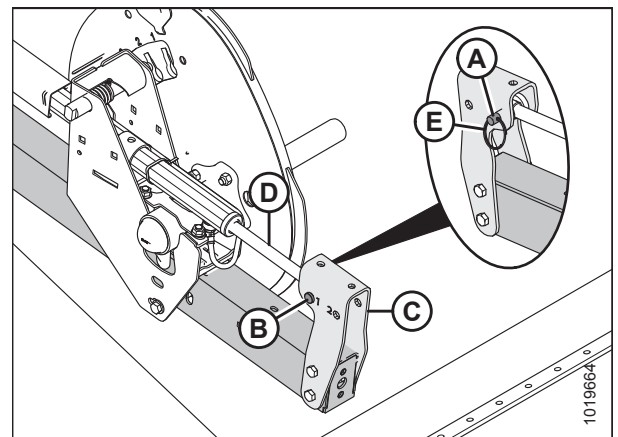


Figure 3.99: Right Reel Arm Cylinder in Aft Position

Reposition left reel arm cylinder as follows:

NOTE:

Some reel components are not shown in illustrations for improved clarity.

NOTE:

Reels on European configured headers are at their most forward setting when cylinders are set in position 2 on the fore/aft arm brackets. Reels on these headers are in their most aft position when cylinders are set in position 1 on the fore/aft arm brackets.

OPERATION

1. Remove ring (A) and pin (B) securing the cylinder (C) to the left fore/aft arm support (D). Retain pin and ring.

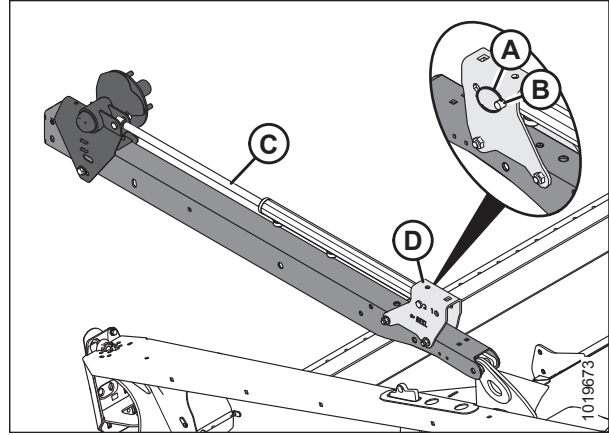


Figure 3.100: Left Reel Arm Cylinder in Forward Position

2. Push reel back toward the header until the end of the cylinder (A) lines up with the aft setting holes (B) in the fore/aft arm bracket (C).

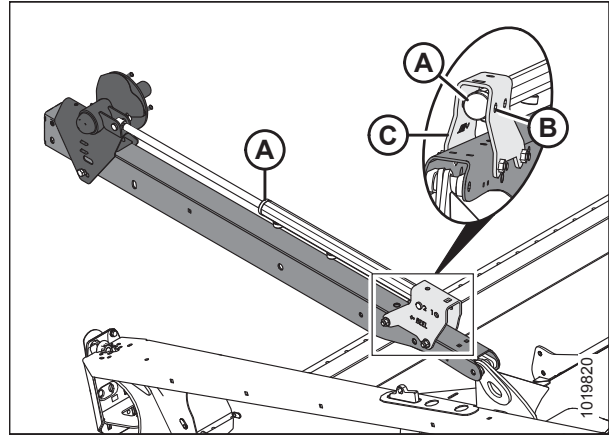


Figure 3.101: Left Reel Arm Cylinder

3. Secure cylinder (A) with pin (B) to the left fore/aft arm support (C). Secure pin with ring (D).
4. Check the reel clearance to the backsheet, upper cross auger (if installed) and reel braces.
5. Adjust the reel tine pitch if necessary. Refer to [3.7.12 Reel Tine Pitch](#), page 96.

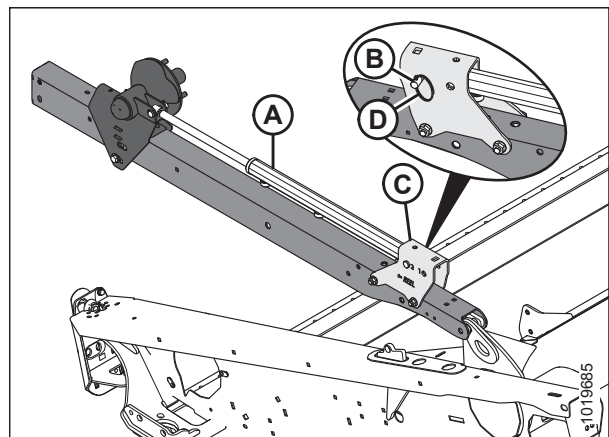


Figure 3.102: Left Reel Arm Cylinder in Aft Position

OPERATION

Repositioning Fore-Aft Cylinders on Non-European Configured Headers with Multi-Crop Rapid Reel Conversion Option

The reel can be moved approximately 227 mm (9 in.) farther aft by repositioning the fore-aft cylinders on the reel arms. The Multi-Crop Conversion option is applicable to double-reel headers only.

NOTE:

B5605 (Short Brace Kit For Center Reel Arm) must be installed before repositioning fore-aft cylinders.

NOTE:

Multi-Crop Rapid Reel Conversion option is not available for European configured FD1 headers.



DANGER

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

Reposition the left reel arm cylinder as follows:

NOTE:

Some reel components not shown in illustrations for improved clarity.

1. Position reel fully aft with support arms horizontal.
2. Stop the engine and remove the key from the ignition.
3. Remove cotter pin (A) and clevis pin (B).
4. Push the reel back until the cylinder barrel (C) lines up with the aft holes in bracket (D).
5. Reinstall clevis pin (B) at the new position and secure with cotter pin (A).

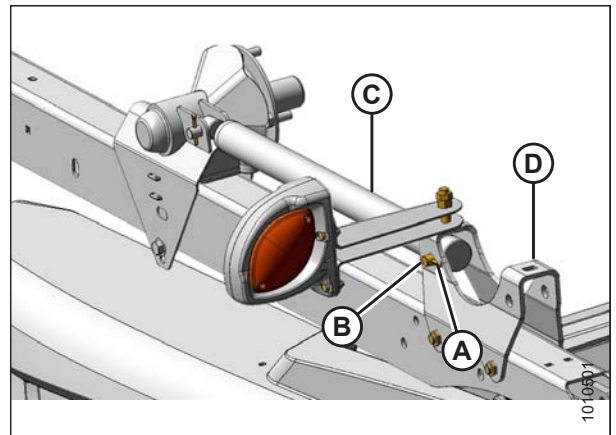


Figure 3.103: Left Reel Arm in Forward Position

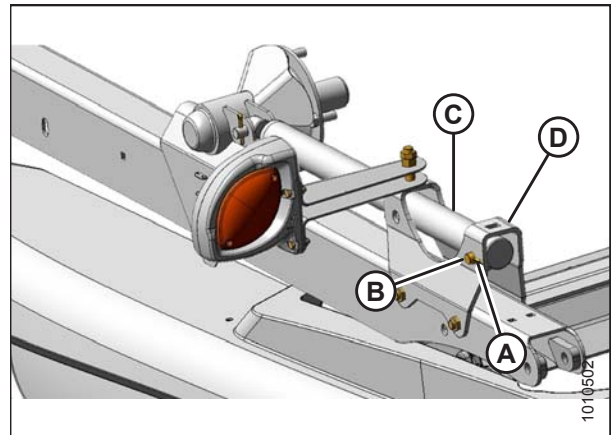


Figure 3.104: Left Reel Arm in Aft Position

Reposition the center reel arm cylinder as follows:

OPERATION

NOTE:

Some reel components not shown in illustrations for improved clarity.

1. Remove cotter pin (A) and clevis pin (B).
2. Push the reel back until the cylinder barrel (C) lines up with the aft holes in bracket (D).
3. Reinstall clevis pin (B) at the new position and secure with cotter pin (A).

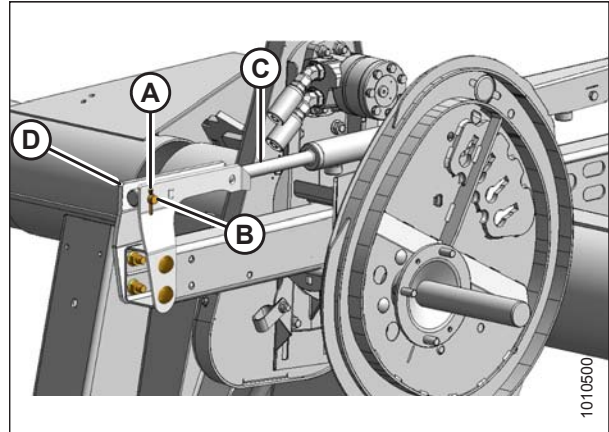


Figure 3.105: Center Reel Arm in Forward Position

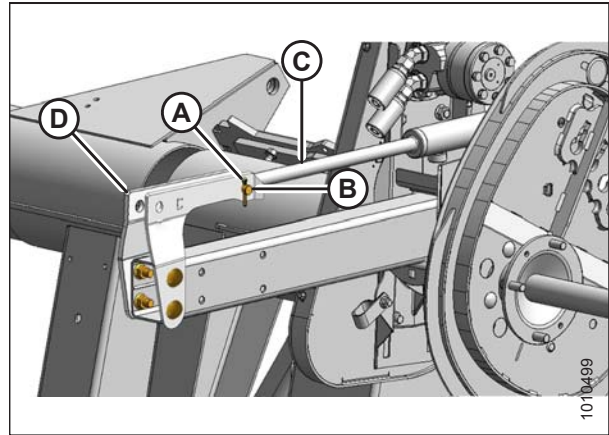


Figure 3.106: Center Reel Arm in Aft Position

Reposition the right reel arm cylinder as follows:

NOTE:

Some reel components not shown in illustrations for improved clarity.

OPERATION

1. Remove cotter pin (A) and clevis pin (B).
2. Push the reel back until cylinder rod (C) lines up with the aft holes in bracket (D).
3. Reinstall clevis pin (B) at the new position and secure with cotter pin (A).

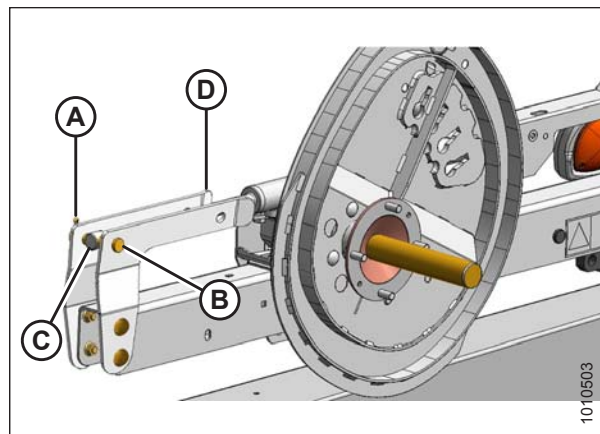


Figure 3.107: Right Reel Arm in Forward Position

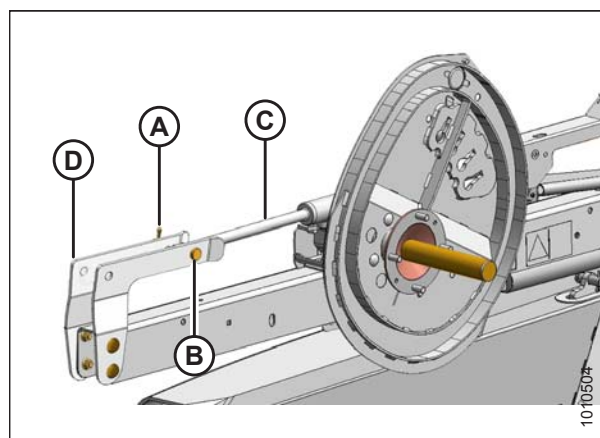


Figure 3.108: Right Reel Arm in Aft Position

3.7.12 Reel Tine Pitch

IMPORTANT:

The following describes the conceptual and operational guidelines of the pick-up reel. Please read carefully before operating the machine.

The pick-up reel is designed to pick up flattened and severely lodged crops. Because the cam setting is mainly used to determine how the crop gets delivered onto the drapers, it is not always necessary to increase the tine pitch (select a higher cam setting) to pick up lodged crops.

The positioning of the fingers relative to the ground (tine pitch) is not significantly affected by the cam setting. 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. Refer to [3.6.2 Header Settings, page 41](#).

Reel Cam Settings

The following outlines the function of each cam setting and provides set-up guidelines for various crop conditions.

The setting numbers are visible above the slots on the cam disc. Refer to [Adjusting Reel Cam, page 98](#).

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 and works best if the cutterbar is on the ground.
- Some crops will not be delivered past the cutterbar when the cutterbar is raised off the ground and the reel is pushed forward; therefore, set the initial reel speed approximately equal to the ground speed.

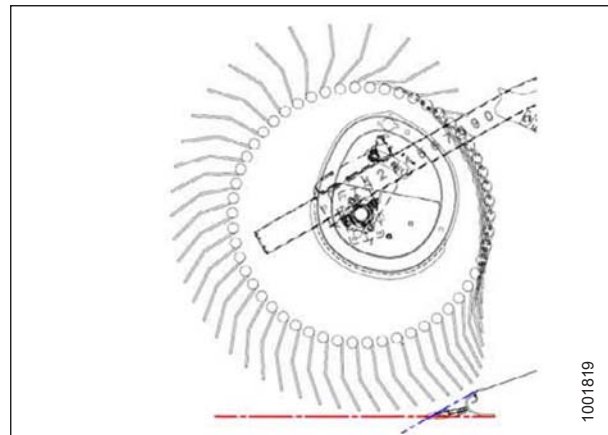


Figure 3.109: Finger Profile – Position 1

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 generates a fingertip speed that is approximately 20% faster than the reel speed.

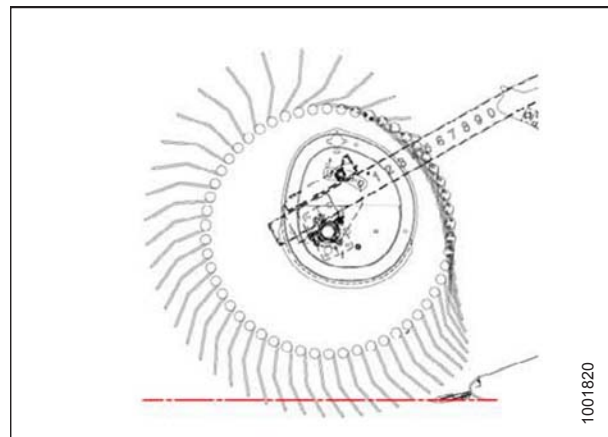


Figure 3.110: Finger Profile – Position 2

OPERATION

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 generates a fingertip speed that is approximately 30% faster than the reel speed.

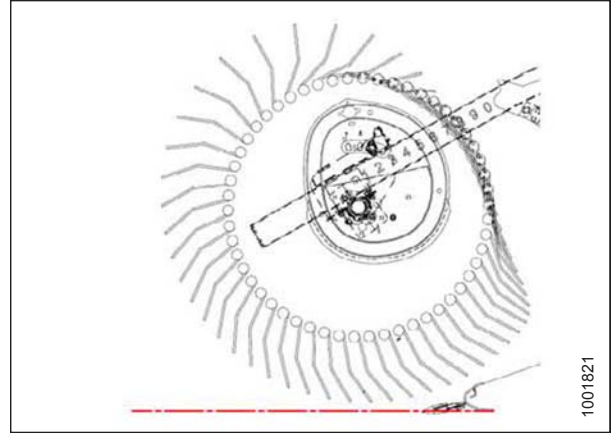


Figure 3.111: Finger Profile – Position 3

Cam Position 4, Reel Position 2 or 3 is used with the reel fully forward to leave the maximum amount of stubble in lodged crops.

- This position allows the reel to reach forward and lift the crop across the knife and onto the drapers.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

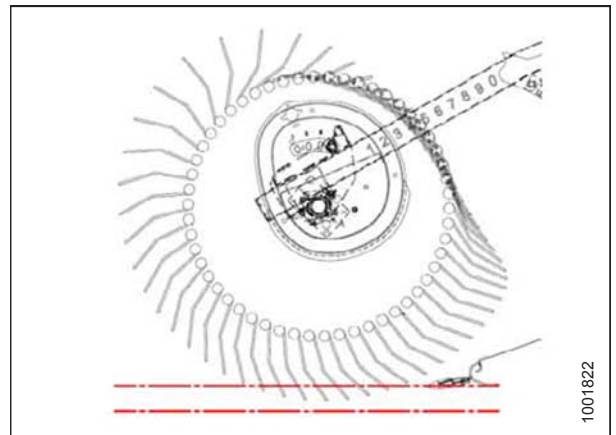


Figure 3.112: Finger Profile – Position 4

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.

- Leaves a significant amount of stubble when cutting height is set to approximately 203 mm (8 in.). In damp materials such as rice, it's possible to double the ground speed because of the reduction of cut material.
- This setting generates a fingertip speed that is approximately 35% faster than the reel speed.

NOTE:

Higher cam settings with the reel fore-aft position set between 4–5 sharply decreases the draper capacity because the reel disrupts the crop flow across the drapers and the fingers engage the crop that is moving on the drapers.

High cam settings are recommended only with the reel at, or close to, full forward settings.

IMPORTANT:

The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft position (refer to [5.15.1 Reel Clearance to Cutterbar, page 442](#)). Refer to [3.6.2 Header Settings, page 41](#) for recommended reel tine pitch in specific crops and crop conditions.

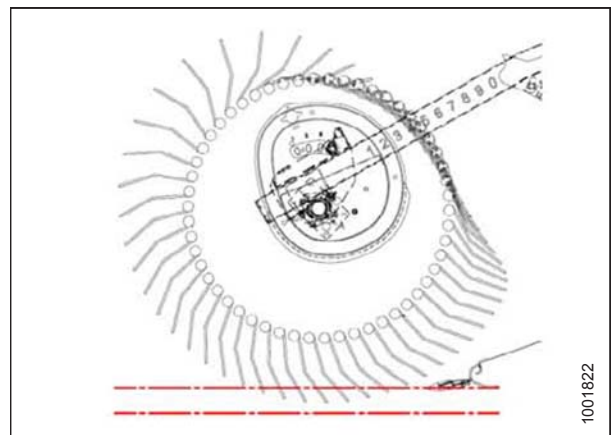


Figure 3.113: Finger Profile – Position 4

Adjusting Reel Cam

DANGER

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

1. Turn the latch pin (A) counterclockwise using a 3/4 in. wrench to release the cam disc.
2. Use the wrench on bolt (B) to rotate the cam disc and align the latch pin (A) with the desired cam disc hole position (C) (1 to 4).

NOTE:

Bolt (B) is positioned through the cam disc (transparent view shown in illustration for improved clarity).

3. Turn the latch pin (A) clockwise to engage and lock the cam disc.
4. Repeat the above procedure for the opposite reel.

IMPORTANT:

Ensure the cam is secured into position before operating the machine.

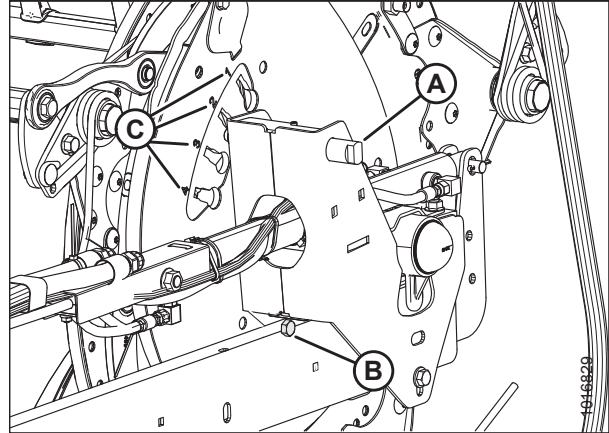


Figure 3.114: Cam Disc Positions

3.7.13 Installing Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to allow installation of vertical knives and to decrease transport width.

Removing Crop Dividers with Latch Option from Header

DANGER

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

1. Lower reel, raise header, stop engine, remove key, and engage header safety props. Refer to your combine operator's manual for instructions.
2. Open or remove endshields. Refer to [3.2.3 Endshields, page 31](#).
3. Lift safety lever (A).
4. Hold onto crop divider (B), push lever (C) to open latch, and lower crop divider.

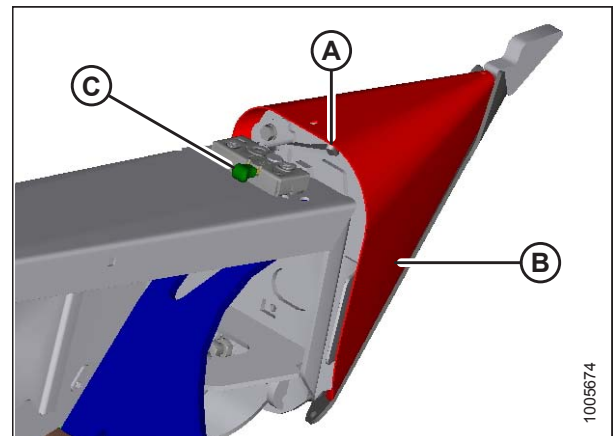


Figure 3.115: Crop Divider

5. Lift crop divider off endsheet and store as follows:
 - a. Insert pin (A) on crop divider into hole in endsheet at location shown.
 - b. Lift crop divider and position lugs (B) on crop divider into bracket on endsheet. Ensure lugs engage bracket.
6. Close or install endshields. Refer to [3.2.3 Endshields, page 31](#).

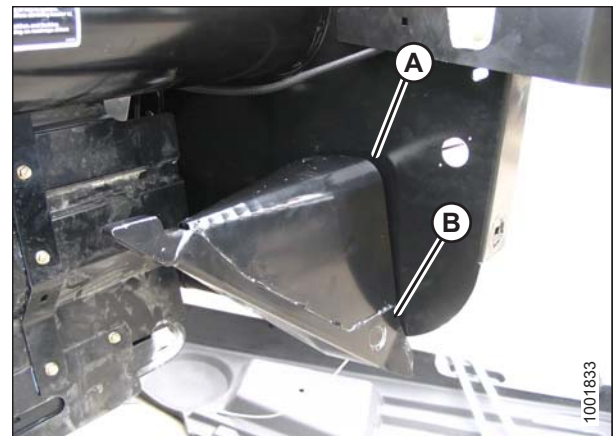


Figure 3.116: Stored Crop Divider

OPERATION

Removing Crop Dividers without Latch Option from Header

DANGER

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

1. Lower reel and raise header. Refer to your combine operator's manual for instructions.
2. Stop engine and remove key.
3. Engage safety props. Refer to your combine operator's manual for instructions.
4. Open or remove endshields. Refer to [3.2.3 Endshields, page 31](#).
5. Remove bolt (A), lock washer, and flat washer.
6. Lower crop divider (B) and then lift to remove from endsheet.
7. Close or install endshields. Refer to [3.2.3 Endshields, page 31](#).

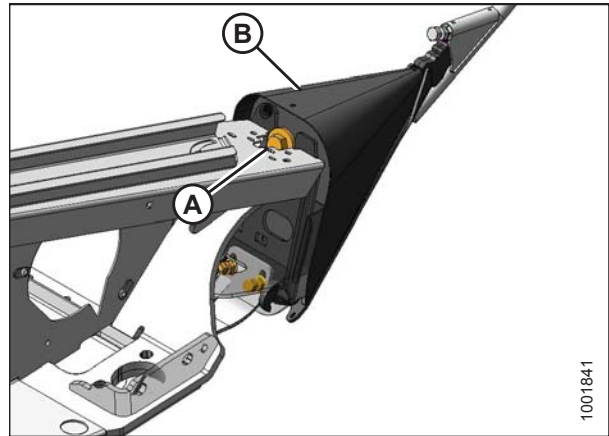


Figure 3.117: Crop Divider

Installing Crop Dividers with Latch Option onto Header

DANGER

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

1. Lower reel and raise header. Refer to your combine operator's manual for instructions.
2. Stop engine and remove key.
3. Engage safety props. Refer to your combine operator's manual for instructions.
4. Open or remove endshields. Refer to [3.2.3 Endshields, page 31](#).

OPERATION

5. Remove crop divider from storage location by lifting crop divider to disengage lugs (A) at lower end and then lowering it slightly to disengage pin (B) from endsheet.

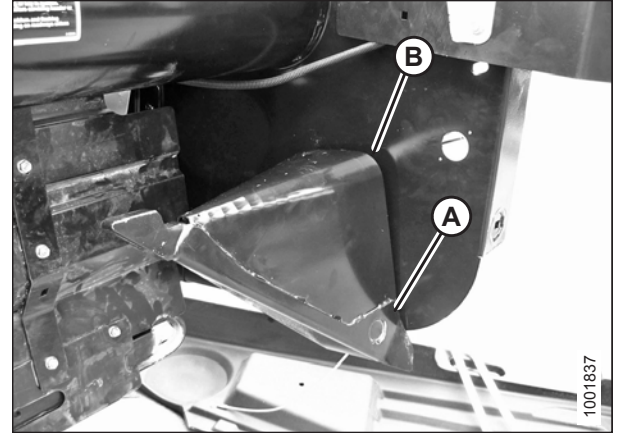


Figure 3.118: Stored Crop Divider

6. Position crop divider as shown by inserting lugs (A) into holes in endsheet.
7. Lift forward end of crop divider until pin (B) at top of crop divider engages and closes latch (C).
8. Push safety lever (D) downwards to lock pin into latch (C).

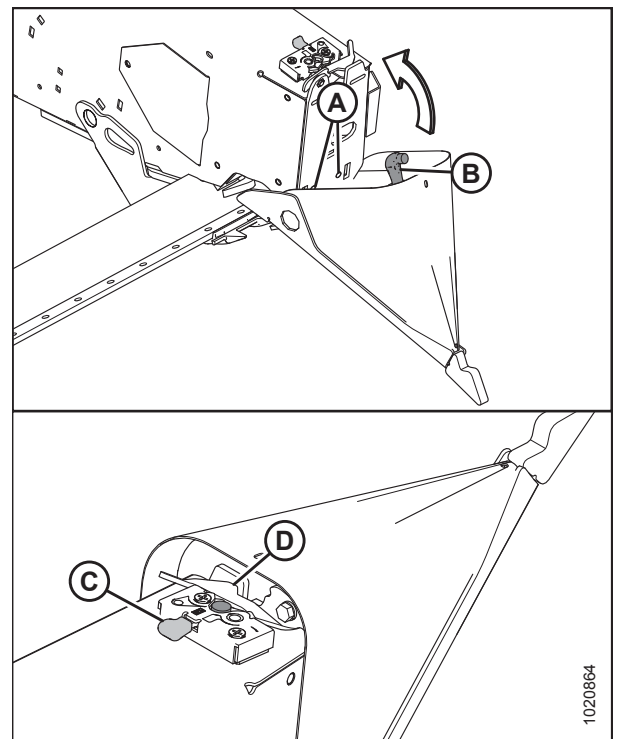


Figure 3.119: Crop Divider

OPERATION

9. Pull the tip of the crop divider to ensure there is no lateral movement. If necessary, adjust bolts (A) to tighten crop divider and eliminate lateral movement.
10. Close or install endshields. Refer to [3.2.3 Endshields, page 31](#).

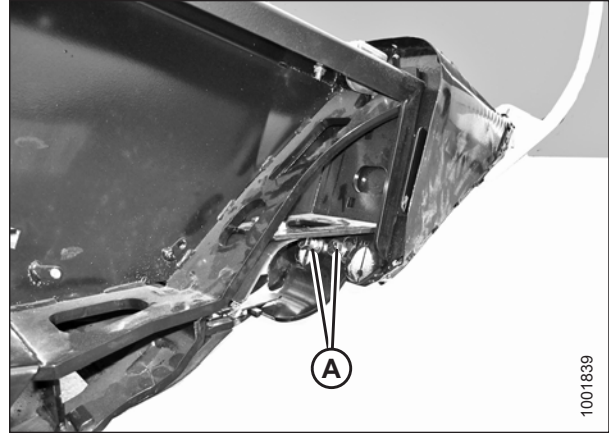


Figure 3.120: Crop Divider

Installing Crop Dividers without Latch Option onto Header

DANGER

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

1. Lower reel and raise header. Refer to your combine operator's manual for instructions.
2. Stop engine and remove key.
3. Engage safety props. Refer to your combine operator's manual for instructions.
4. Open or remove endshields. Refer to [3.2.3 Endshields, page 31](#).
5. Remove crop divider from storage location by lifting crop divider to disengage lugs (A) at lower end and then lowering it slightly to disengage pin (B) from endsheet.

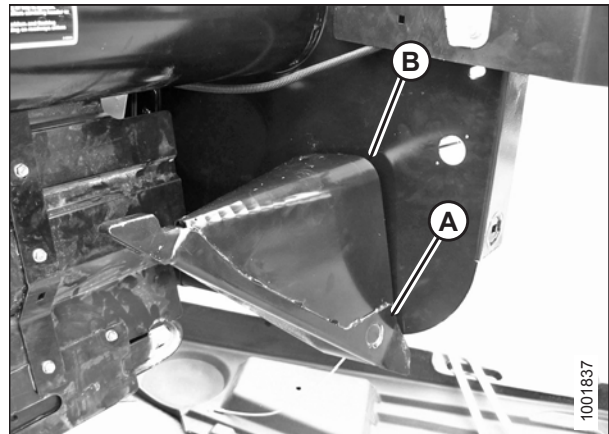


Figure 3.121: Stored Crop Divider

OPERATION

6. Position crop divider as shown by inserting lugs (A) into holes in endsheet.

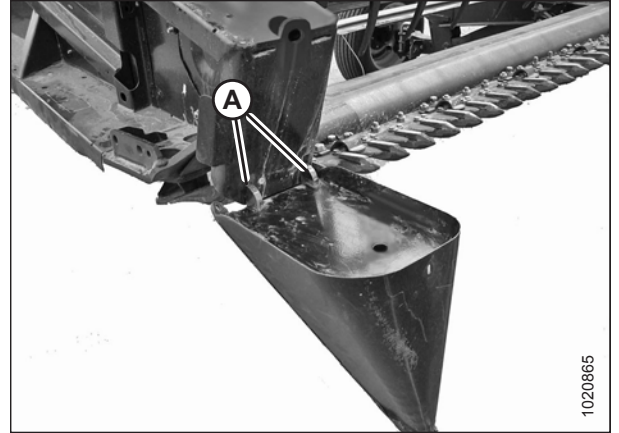


Figure 3.122: Crop Divider

7. Lift forward end of crop divider and install bolt (A) and special stepped washer (B) (step towards divider). Tighten bolt.
8. Pull the tip of the crop divider to ensure there is no lateral movement. If necessary, adjust bolts (C) to tighten crop divider and eliminate lateral movement.
9. Close or install endshields. Refer to [3.2.3 Endshields](#), [page 31](#).

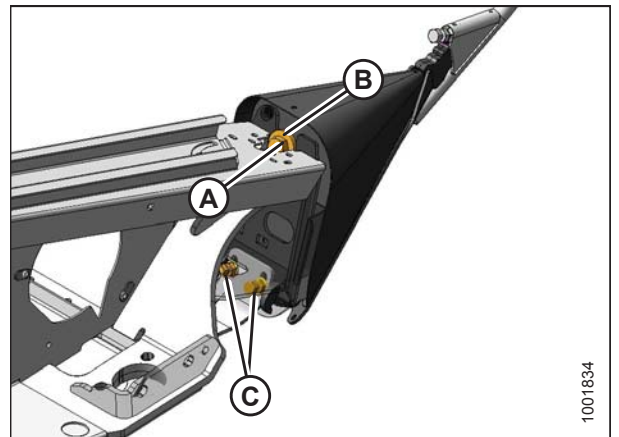


Figure 3.123: Crop Divider

OPERATION

3.7.14 Crop Divider Rods

Crop divider rods are used in conjunction with crop dividers. The removable crop divider rods are most useful when crop is down. In standing crops, using only crop dividers is recommended.

Table 3.11 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

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

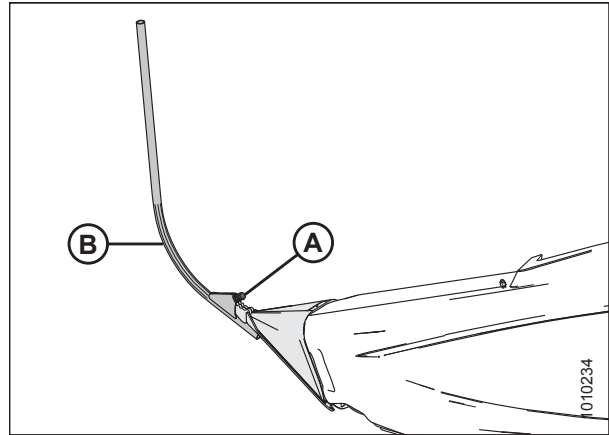


Figure 3.124: Crop Divider Rod

2. Store both crop divider rods (A) inboard on the right side endsheet.

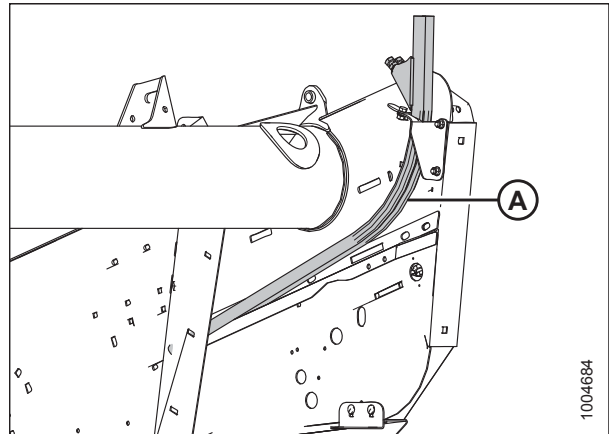


Figure 3.125: Right Side Endsheets

OPERATION

Installing Crop Divider Rods

1. Remove crop divider rods (A) from storage location on inboard of right side endsheet.

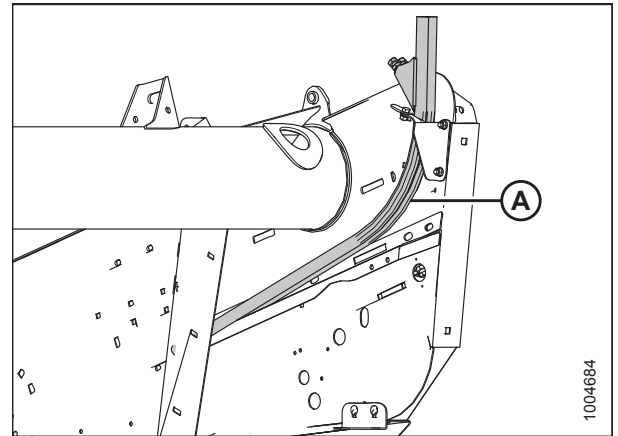


Figure 3.126: Right Side Endsheet

2. Position crop divider rod (B) on tip of crop divider as shown and tighten bolt (A).
3. Repeat procedure at opposite end of header.

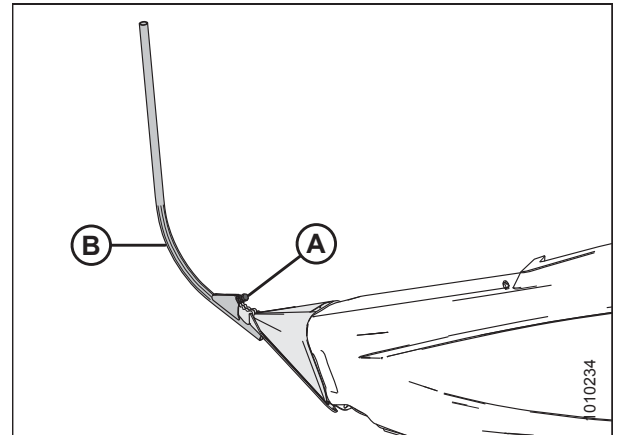


Figure 3.127: Divider Rod on Crop Divider

Rice Divider Rods

Optional rice divider rods provide improved performance in tall and tangled rice crops. The installation and removal procedures for these rods are the same as the installation and removal procedures for standard crop divider rods. Refer to [6.5.9 Rice Divider Rods, page 499](#).

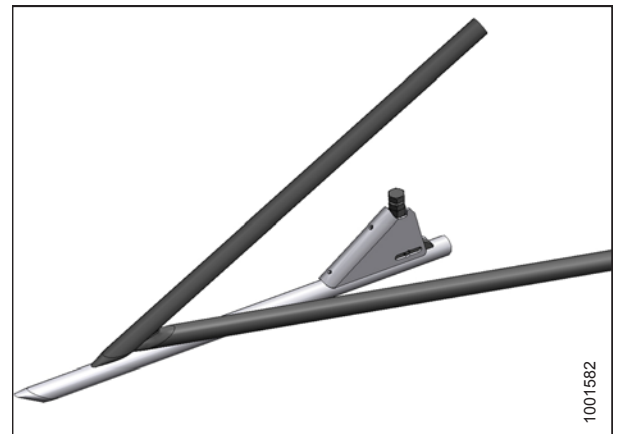


Figure 3.128: Divider Rod for Rice

3.7.15 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.

⚠ DANGER

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

The auger float adjustment arms (A) are located at the bottom left and bottom right of the float module.

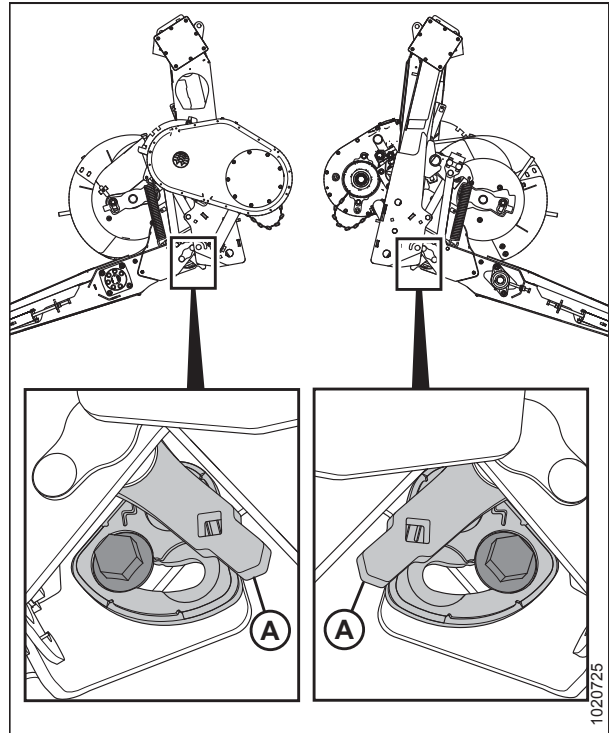


Figure 3.129: Auger Float Adjustment Arms

If bolt (A) is next to the floating symbol (B), the auger is in the floating position. If bolt (A) is next to the fixed symbol (C), the auger is in the fixed position.

⚠ CAUTION

Make sure left and right sides are set to the same position; the two bolts (A) must be in the same location to prevent damage to the machine during operation.

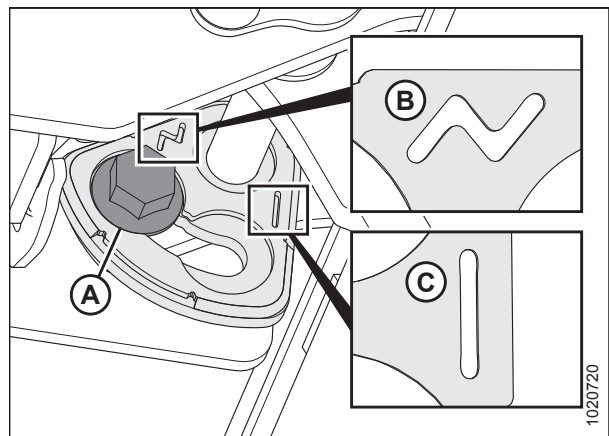


Figure 3.130: Auger Float Positions

To set the auger position, follow these steps:

OPERATION

1. Extend center-link to the steepest header angle.
2. Raise header to full height, and engage safety props.
3. Shut down combine, and remove key from ignition.
4. Using a 21 mm (13/16 in.) wrench, loosen bolt (A) until the bolt head is clear of bracket (B).

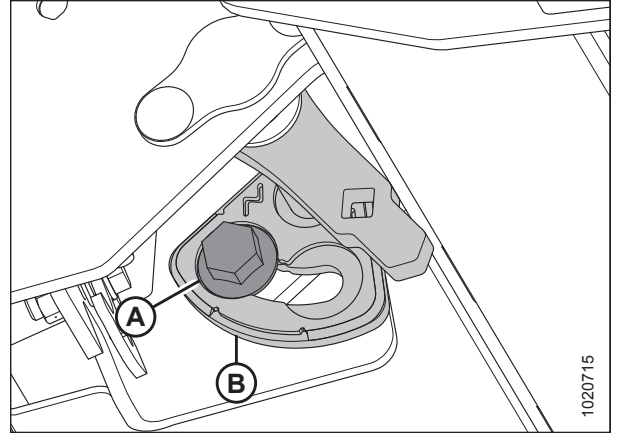


Figure 3.131: Auger Float Adjustment Arm – Left Side

5. Using the same wrench, move arm (B) forward until bolt (A) is in the slot on bracket next to the fixed symbol (C). The arm can also be moved using a breaker bar in the square hole (D).

NOTE:

If changing the auger position from fixed to floating, move arm in opposite direction.

6. Tighten bolt (A) to 122 Nm (90 lbf·ft).

IMPORTANT:

Bolt (A) must be properly seated in recess on bracket before tightening bolt. If arm (B) can be moved after tightening bolt, then bolt (A) is not seated properly.

7. Repeat on opposite side.

IMPORTANT:

Both bolts (A) must be in the same position to prevent damage to the machine during operation.

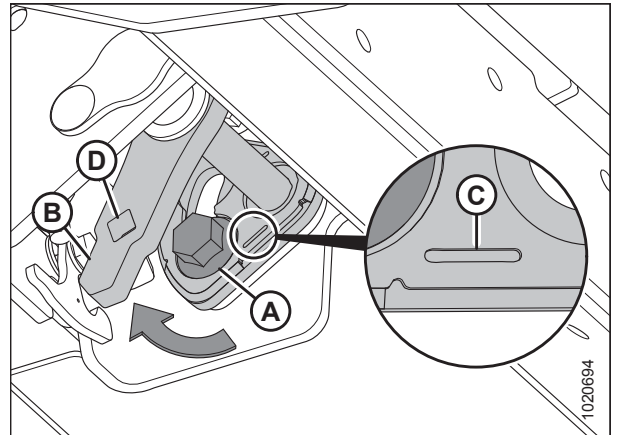


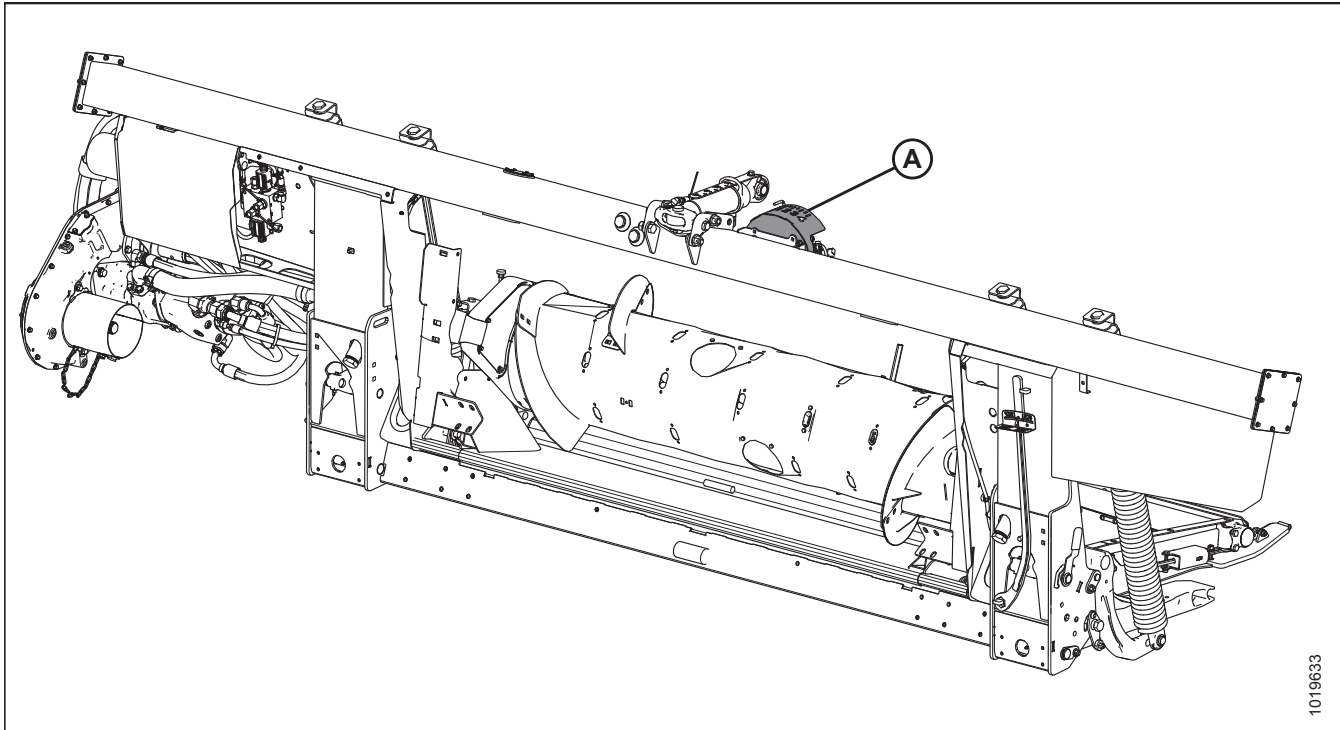
Figure 3.132: Auger Float Adjustment Arm – Left Side

3.8 Auto Header Height Control (AHHC)

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

A sensor is installed in the float indicator box (A) on the FM100 Float Module. This sensor sends a signal to the combine allowing it to maintain a consistent cutting height and an optimum float as the header follows ground contours. A two-sensor system is also available as an optional kit.

Figure 3.133: FM100 Float Module



FM100 Float Modules are factory-equipped for AHHC; however, before using the AHHC feature, you must do the following:

1. Ensure that the AHHC sensor's output voltage range is appropriate for the combine.
For more information, refer to [3.8.1 Sensor Output Voltage Range – Combine Requirements, page 110](#).
2. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the instructions for your combine).
3. Calibrate the AHHC system so that the combine can correctly interpret data from the height sensor on the combine float module (refer to the instructions for your combine).

NOTE:

Once calibration is complete, you are ready to use the AHHC feature in the field. Individual combine settings can improve AHHC performance (refer to your combine instruction manual).

Refer to the following instructions for your specific combine model:

- [3.8.2 Case IH 5088/6088/7088 Combines, page 119](#)
- [3.8.3 Case IH 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230 and 7240/8240/9240 Combines, page 121](#)

OPERATION

- *3.8.4 Challenger and Massey Ferguson 6 and 7 Series Combines, page 133*
- *3.8.5 Gleaner R65/R66/R75/R76 and S Series Combines, page 141*
- *3.8.6 Gleaner S9 Series Combines, page 150*
- *3.8.7 John Deere 60 Series Combines, page 164*
- *3.8.8 John Deere 70 Series Combines, page 171*
- *3.8.9 John Deere S and T Series Combines, page 178*
- *3.8.10 CLAAS 500 Series Combines, page 191*
- *3.8.11 CLAAS 600 and 700 Series Combines, page 201*
- *3.8.12 New Holland Combines (CR/CX Series—Pre-2015 Model Year), page 207*
- *3.8.13 New Holland Combines (CR Series—Model Year 2015 and Later), page 216*

3.8.1 Sensor Output Voltage Range – Combine Requirements

The auto header height control (AHHC) sensor output must be within a specific voltage range for each combine, or the AHHC feature will not work properly.

Table 3.12 Combine Voltage Limits

Combine	Low Voltage Limit	High Voltage Limit	Range (Difference between High and Low Limits)
Challenger, Gleaner A, Massey Ferguson	0.5 V	4.5 V	2.5 V
Case IH 5088/6088/7088, 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230, and 7240/8240/9240	0.5 V	4.5 V	2.5 V
Case IH 2588/2577	2.8 V	7.2 V	4.0 V
Gleaner R and S Series	0.5 V	4.5 V	2.5 V
John Deere 60, 70, S, and T Series	0.5 V	4.5 V	2.5 V
CLAAS 500/600/700 Series	0.5 V	4.5 V	2.5 V
New Holland CR/CX - 5 V system	0.7 V	4.3 V	2.5 V
New Holland CR/CX - 10 V system	2.8 V	7.2 V	4.1–4.4 V

NOTE:

Some combine models do not support checking sensor output voltage from the cab (early 23/2588 series, CLAAS 500/600/700 Series). For these models, check output voltage manually. Refer to [Manually Checking Voltage Range: One-Sensor System, page 111](#) or [Manually Checking Voltage Range: Two-Sensor System, page 113](#).

10-Volt Adapter (MD #B6421) – New Holland Combines Only

New Holland combines with a 10-V system require the 10-V adapter (A) (MD #B6421) for proper calibration of the auto header height control (AHHC) feature.

If a 10-V New Holland combine does not have the adapter installed, the AHHC output will always read 0 V, regardless of sensor position.

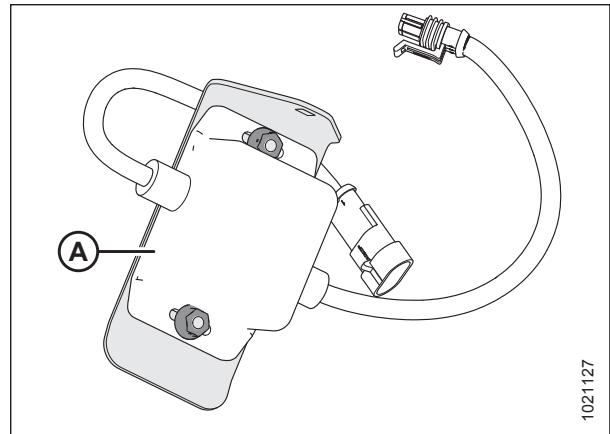


Figure 3.134: 10 V Adapter (MD #B6421)

OPERATION

Use a voltmeter to measure the voltage between the Pin 1 (power) and Pin 2 (ground) wires at the AHHC sensor (A). This will determine whether the combine has a 5-V system or a 10-V system.

NOTE:

Combine key must be in ON position, but engine does not need to be running.

The three possible voltage readings are listed below.

- 0 V – combine key is in OFF position, or there is a faulty harness / bad connection
- 5 V – standard combine reading
- 10 V – 10-V combine reading; adapter (MD #276759) is required

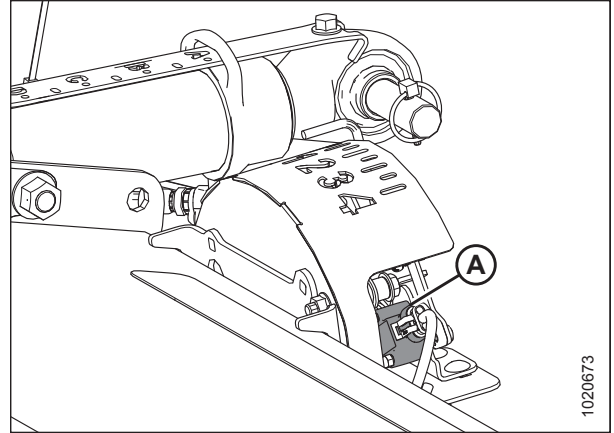


Figure 3.135: Float Indicator Box

Manually Checking Voltage Range: One-Sensor System

The one-sensor system is standard for the FM100 Float Module. If equipped with the optional two-sensor system, refer to [Manually Checking Voltage Range: Two-Sensor System, page 113](#).

The output voltage range of the auto header height control (AHHC) sensors in some combines can be checked from the cab. For instructions, refer to your combine operator's manual or the AHHC instructions later in this document.

To manually check the sensor's output voltage range, follow these steps:

1. Extend guard angle fully; the header angle indicator should be at D.
2. Position the header 150 mm (6 in.) above the ground, and unlock the float module's float.

OPERATION

3. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

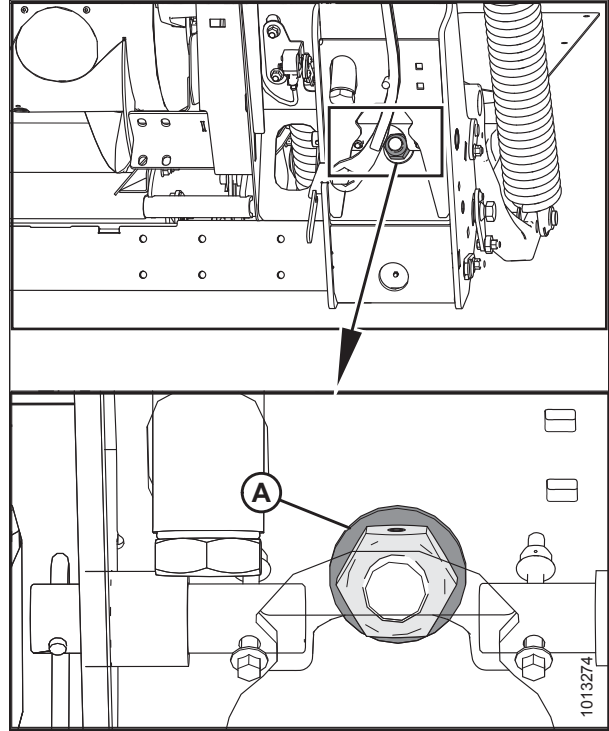


Figure 3.136: Down Stop Washer

4. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

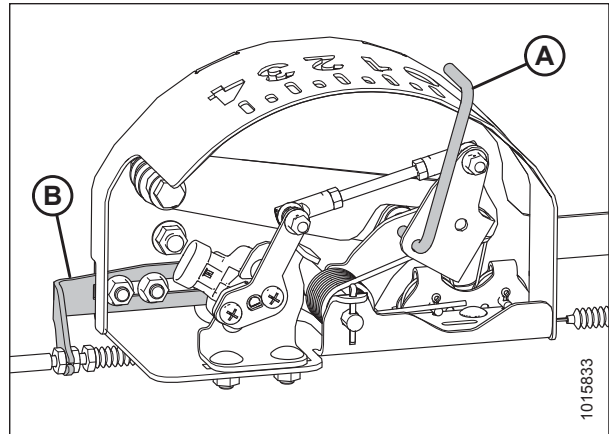


Figure 3.137: Float Indicator Box

OPERATION

5. Use a voltmeter (A) to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires at the AHHC sensor in the float indicator box. Ensure it is at the high voltage limit for the combine. Refer to Table 3.12, page 110.

NOTE:

The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

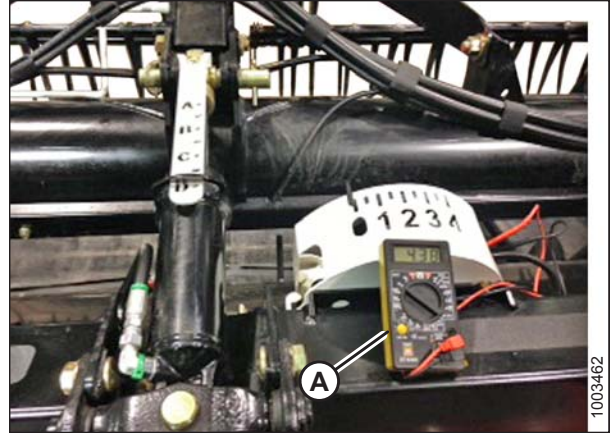


Figure 3.138: Measuring Voltage at Float Indicator Box

6. Fully lower the combine feeder house, and float the header up off the down stops (float indicator should be at 4, and the float module should be fully separated from the header).

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

7. Use a voltmeter (A) to measure the voltage between the ground and signal wires at the AHHC sensor in the float indicator box. It should be at the low voltage limit for the combine. Refer to Table 3.12, page 110.

NOTE:

The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

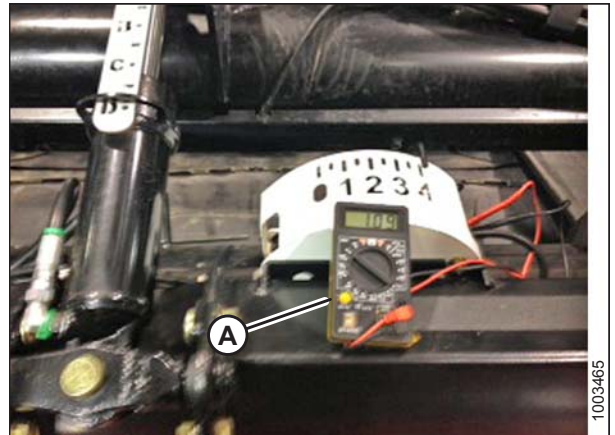


Figure 3.139: Measuring Voltage at Float Indicator Box

8. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

Manually Checking Voltage Range: Two-Sensor System

FM100 Float Modules equipped with the optional two-sensor system have a left and right sensor located on the back frame of the float module.

To manually check the sensor's output voltage range, follow these steps:

1. Extend guard angle fully; the header angle indicator should be at D.
2. Position the header 150 mm (6 in.) above the ground, and unlock the float module's float.

OPERATION

3. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHC system.

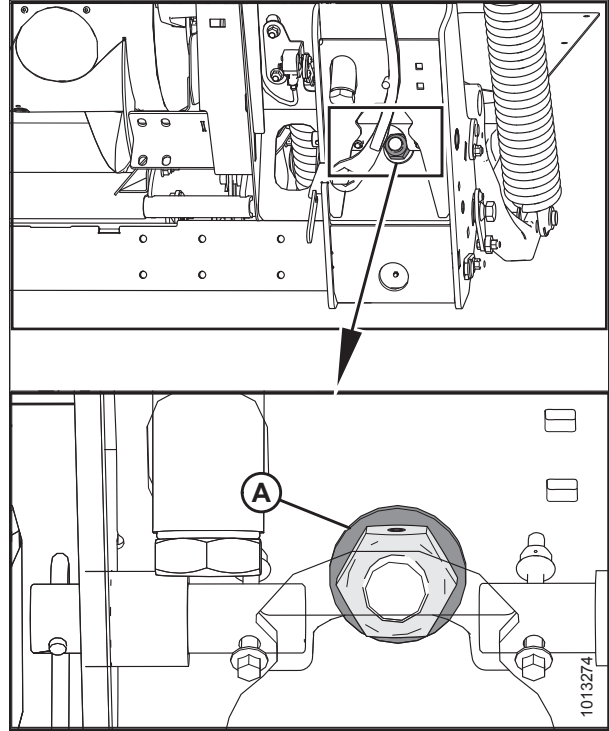


Figure 3.140: Down Stop Washer

4. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

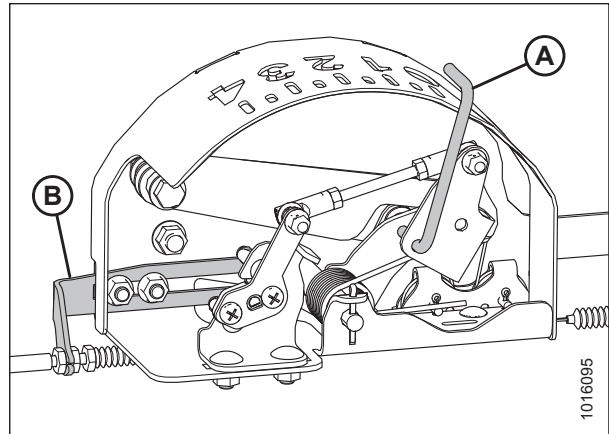


Figure 3.141: Float Indicator Box

OPERATION

5. Use a voltmeter to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of the AHHC sensor (A) at the back of the float module side frame. Ensure it is at the high voltage limit for the combine. Refer to Table 3.12, page 110.

NOTE:

The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

6. Repeat at the opposite side.

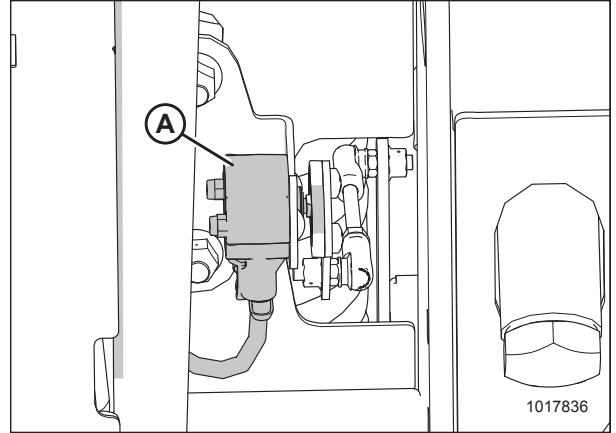


Figure 3.142: Optional Two-Sensor Kit – Right Sensor

7. Fully lower the combine feeder house, and float the header up off the down stops (float indicator [A] should be at 4, and the float module should be fully separated from the header).

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

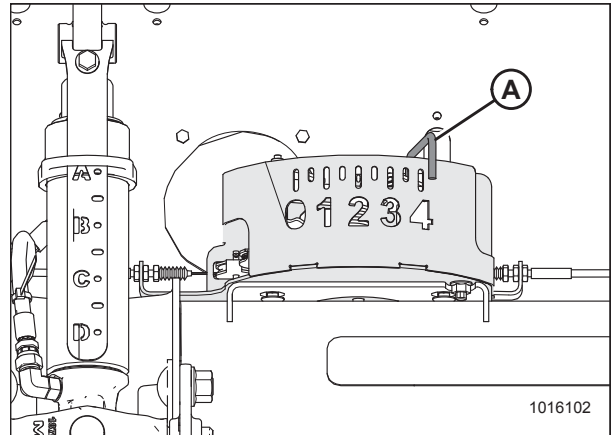


Figure 3.143: Float Indicator Box

8. Using a voltmeter, measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of the AHHC sensor (A) at the back of the side frame. Ensure it is at the high voltage limit for the combine. Refer to Table 3.12, page 110.

NOTE:

The wiring harness connector must be attached to the sensor. Do NOT disconnect it.

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: Two-Sensor System, page 117](#).
10. Repeat at the opposite side.

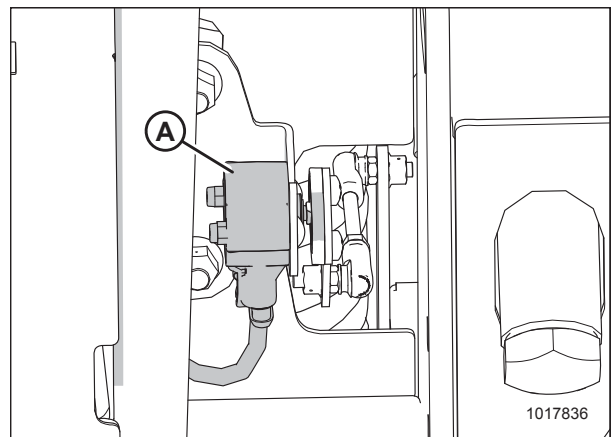


Figure 3.144: Optional Two-Sensor Kit – Right Sensor

OPERATION

Adjusting Voltage Limits: One-Sensor System

Follow this procedure if you have checked the voltage range (either manually or from the cab) and found that the sensor voltage is not within the low and high limits or that the range between the low and high limits is insufficient.

DANGER

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

1. Follow these steps to adjust the **upper** voltage limit:
 - a. Extend guard angle fully; the header angle indicator should be at D.
 - b. Position header 152–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
 - c. Check the upper voltage limit using the combine display or voltmeter. Refer to Table 3.12, page 110.
 - d. Loosen sensor mounting nuts (A).
 - e. Rotate sensor (B) counterclockwise to increase high voltage limit and clockwise to decrease it.
 - f. Tighten sensor mounting nuts (A).

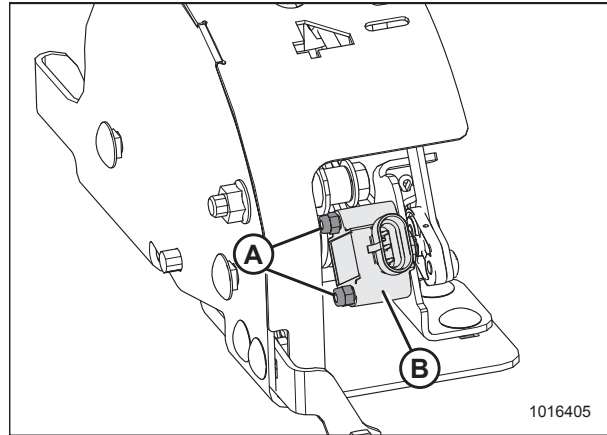


Figure 3.145: AHHC Sensor Assembly

2. Follow these steps to adjust the **lower** voltage limit:
 - a. Extend guard angle fully; the header angle indicator should be at D.
 - b. Fully lower header on the ground; the float indicator should be at 4.
 - c. Check the lower voltage limit using the combine display or voltmeter. Refer to Table 3.12, page 110.
 - d. Loosen sensor mounting nuts (A).
 - e. Rotate sensor (B) counterclockwise to increase low voltage limit and clockwise to decrease it.
 - f. Tighten sensor mounting nuts (A).

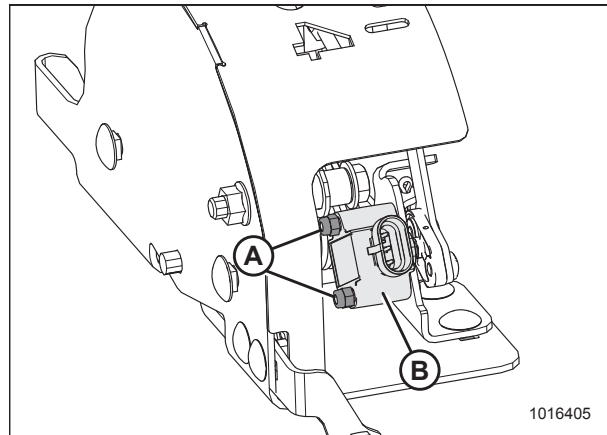


Figure 3.146: AHHC Sensor Assembly

3. After making adjustments, recheck both the upper and lower voltage limits to make sure they are within the required range according to Table 3.12, page 110.

OPERATION

4. If unable to get the voltage within the required range, loosen mounting bolts (A) and shift sensor assembly (B) inboard as shown.

NOTE:

If sensor assembly is shifted right or left, it may be necessary to repeat Steps 1, page 116 and 2, page 116 to achieve the proper voltage limits.

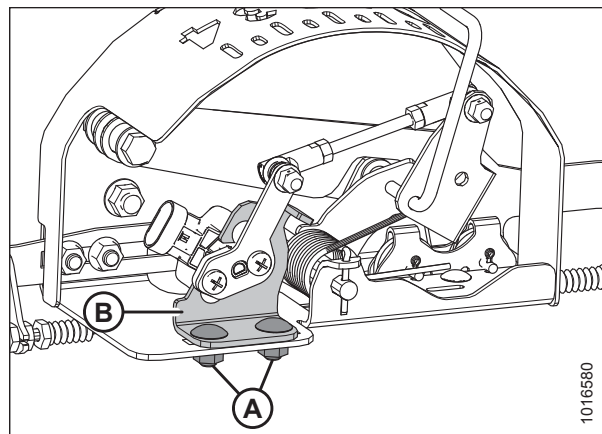


Figure 3.147: AHC Sensor Assembly

Adjusting Voltage Limits: Two-Sensor System

DANGER

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

1. Extend guard angle fully; the header angle indicator should be at D.
2. Position header 150–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
3. Follow these steps to adjust left sensor voltage:
 - a. Loosen sensor mounting nuts (A).
 - b. Rotate sensor (B) counterclockwise to lower the voltage. Rotate sensor clockwise to raise the voltage.
 - c. Check that the left sensor is at the correct upper voltage limit according to Table 3.12, page 110.
 - d. Tighten sensor mounting nuts (A).

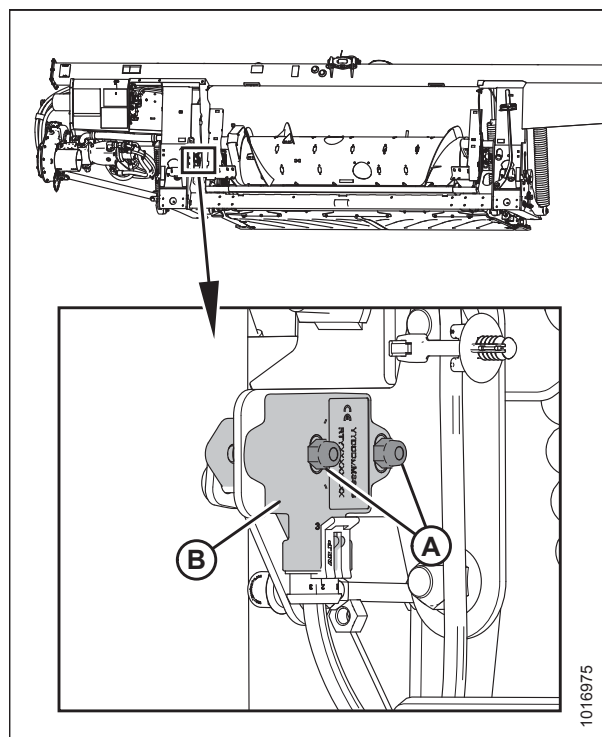


Figure 3.148: Optional Two-Sensor Kit – Left Sensor

OPERATION

4. Follow these steps to adjust right sensor voltage:
 - a. Loosen sensor mounting nuts (A).
 - b. Rotate sensor (B) clockwise to lower the voltage. Rotate sensor counterclockwise to raise the voltage.
 - c. Check that the right sensor is at the correct upper voltage limit according to Table 3.12, page 110.
 - d. Tighten sensor mounting nuts (A).

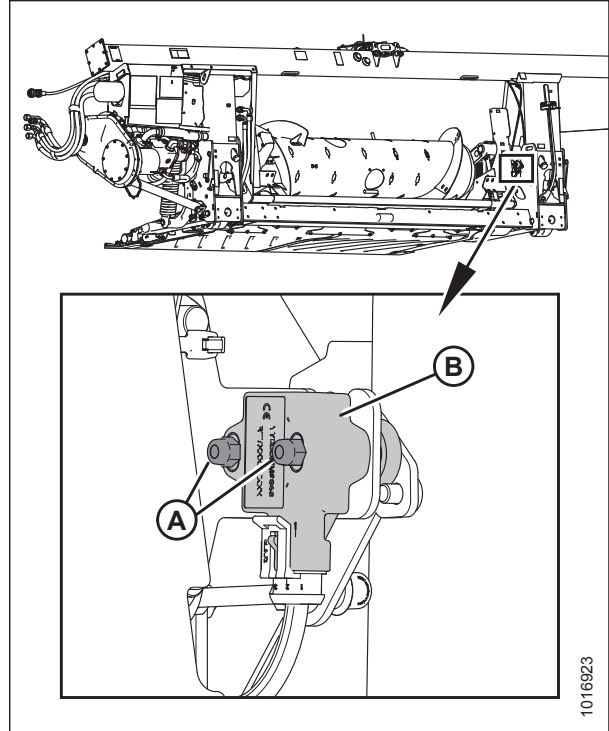


Figure 3.149: Optional Two-Sensor Kit – Right Sensor

5. Fully lower the header; the float indicator should be at 4.
6. Check that both sensors are at the correct lower voltage limit according to Table 3.12, page 110.

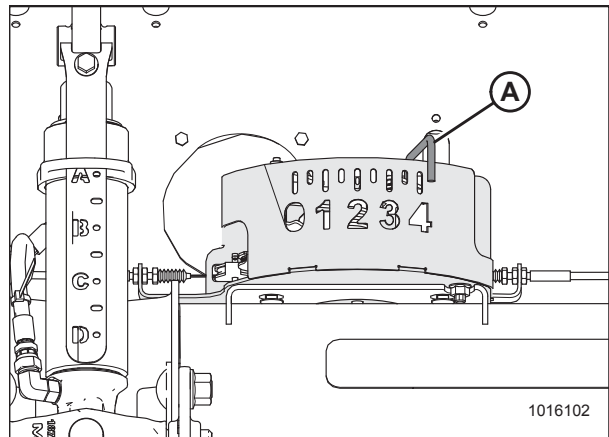


Figure 3.150: Float Indicator Box

3.8.2 Case IH 5088/6088/7088 Combines

Calibrating the Auto Header Height Control (AHHC) (Case IH 5088/6088/7088)

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to D. When calibration is complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Set the flotation on the header. Refer to [3.7.3 Header Float, page 55](#). Position fore-aft in mid span.
3. Start the combine engine, but do NOT have separator or feeder house engaged.
4. Locate header control switch (A) on the right console, and set to HT (this is AHHC mode).

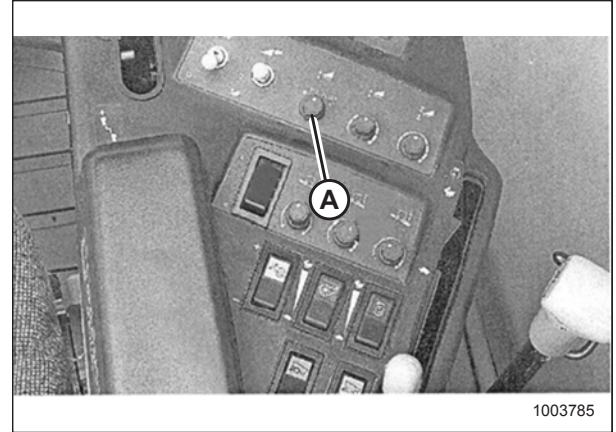


Figure 3.151: Right Console

5. Press the header lower switch (A) on the joystick lever until the float module and header are fully lowered. You may need to hold the switch for several seconds.
6. Press the header raise switch (A) on the joystick lever. The header should stop at about the halfway point. Continue holding the header raise switch, and the header will rise until the feeder house reaches its upper limit. The AHHC system is now calibrated.

NOTE:

If float was set heavier to complete the ground calibration procedure, adjust to recommended operating float after the calibration is complete.

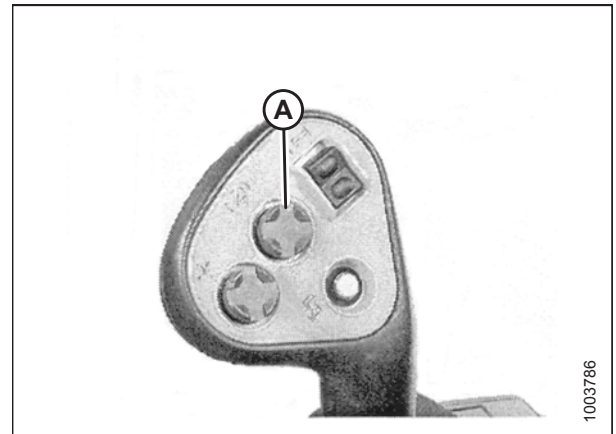


Figure 3.152: Joystick (Case IH 2300/2500)

OPERATION

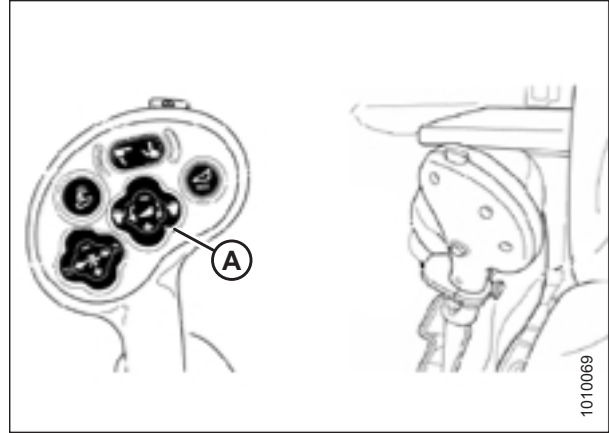


Figure 3.153: Joystick (Case IH 5088/6088/7088)

Setting the Sensitivity of the Auto Header Height (Case IH 5088/6088/7088)

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 display since this document was published. Refer to the combine operator's manual for updates.

1. Use the HEADER SETTINGS key (M) to display the HEADER SENSITIVITY CHANGE screen.
2. Use the UP or DOWN keys (E) and (H) to adjust the highlighted item. The height sensitivity setting range is 0 (least sensitive) to 250 (most sensitive) in increments of 10.

NOTE:

Adjustments take effect immediately. Use the CANCEL key to return to the original settings.

3. Use the HEADER SETTINGS key (M) to highlight the next changeable item.
4. Use the ENTER key (D) to save changes and return to the monitor screen. If there are no changes, the screen will return to the monitor screen after 5 seconds.

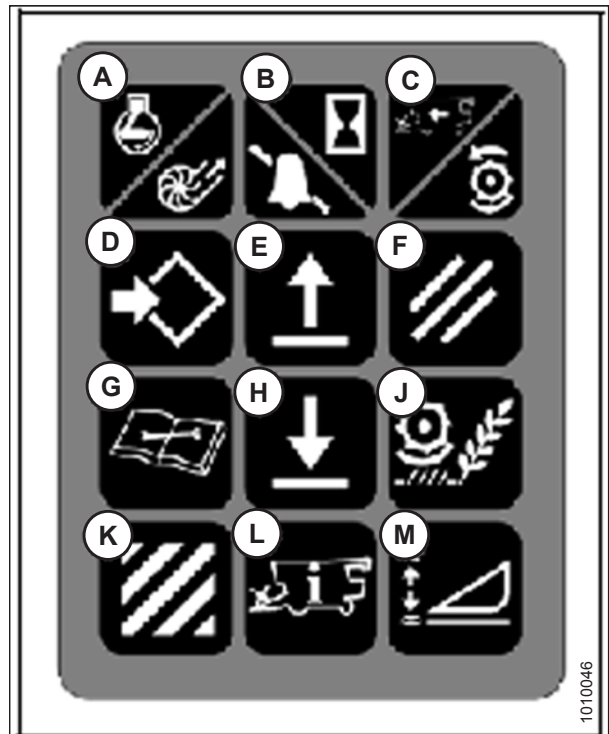


Figure 3.154: Combine Controls

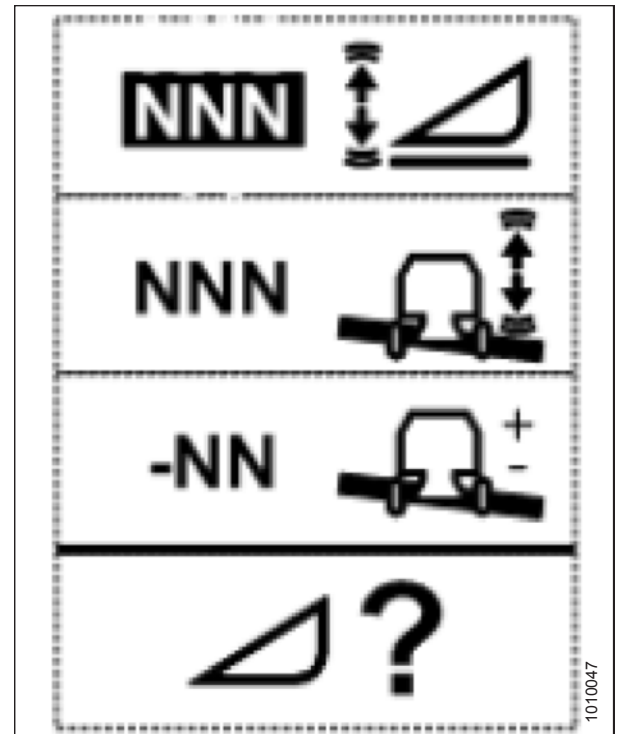


Figure 3.155: Height Sensitivity Change Page

3.8.3 Case IH 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230 and 7240/8240/9240 Combines

Checking Voltage Range from the Combine Cab (Case 8010)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.

OPERATION

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

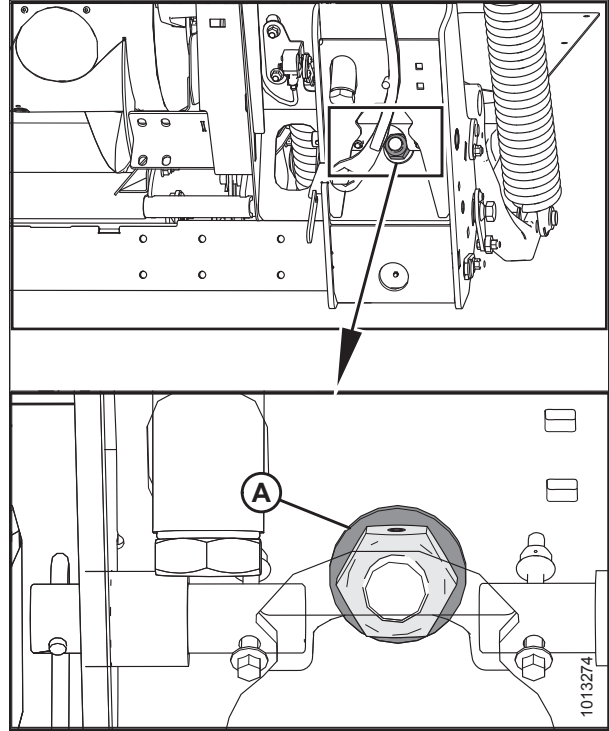


Figure 3.156: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

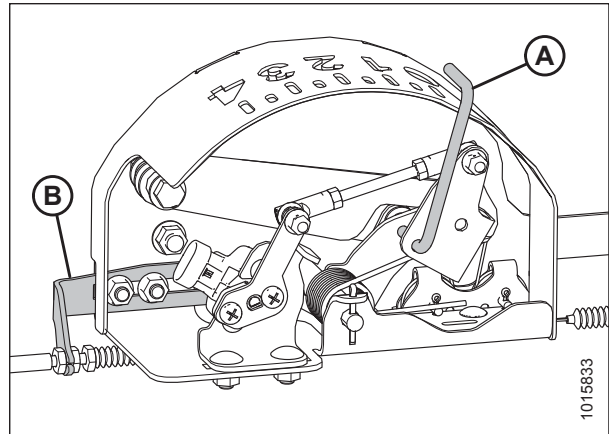


Figure 3.157: Float Indicator Box

OPERATION

4. Ensure header float is unlocked.
5. Select DIAG (A) on the Universal display MAIN screen. The DIAG screen displays.

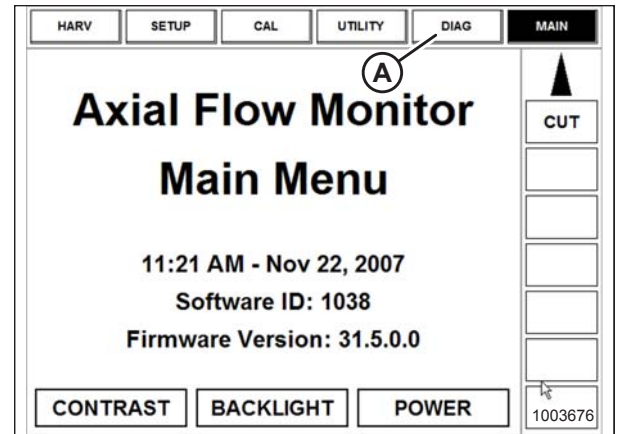


Figure 3.158: Case 8010 Combine Display

6. Select SUB SYSTEM (A). The SUB SYSTEM screen displays.

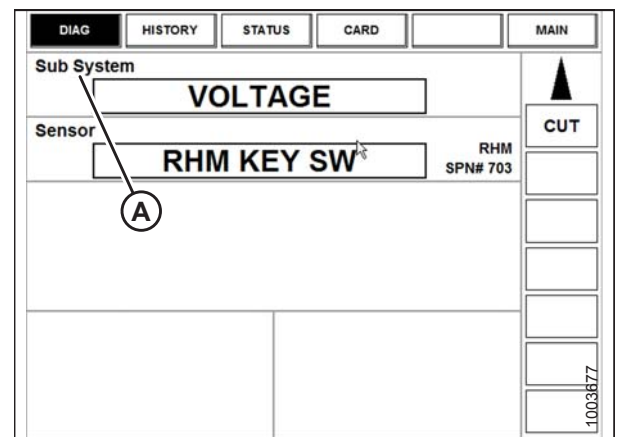


Figure 3.159: Case 8010 Combine Display

7. Select HDR HEIGHT/TILT (A). The SENSOR screen displays.

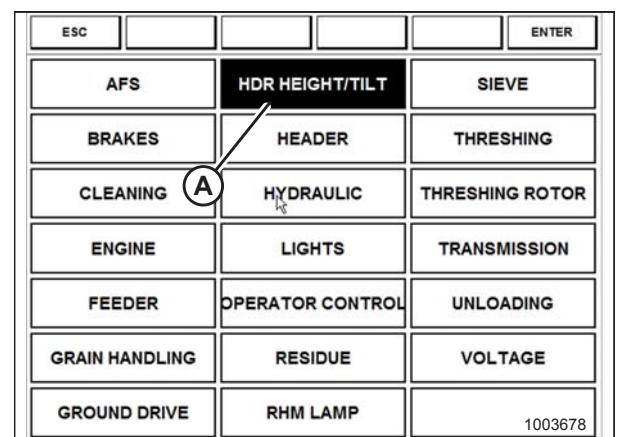


Figure 3.160: Case 8010 Combine Display

OPERATION

8. Select LEFT SEN (A). The exact voltage is displayed. Raise and lower the header to see the full range of voltage readings.

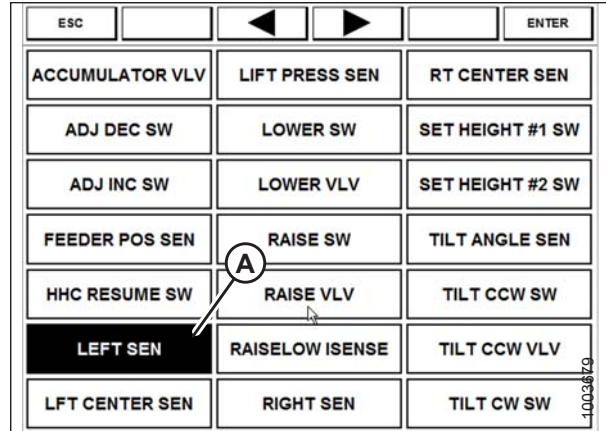


Figure 3.161: Case 8010 Combine Display

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

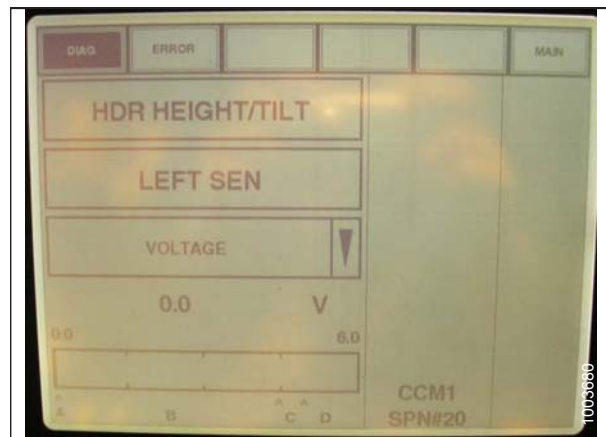


Figure 3.162: Case 8010 Combine Display

Checking Voltage Range from the Combine Cab (Case IH 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.

OPERATION

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

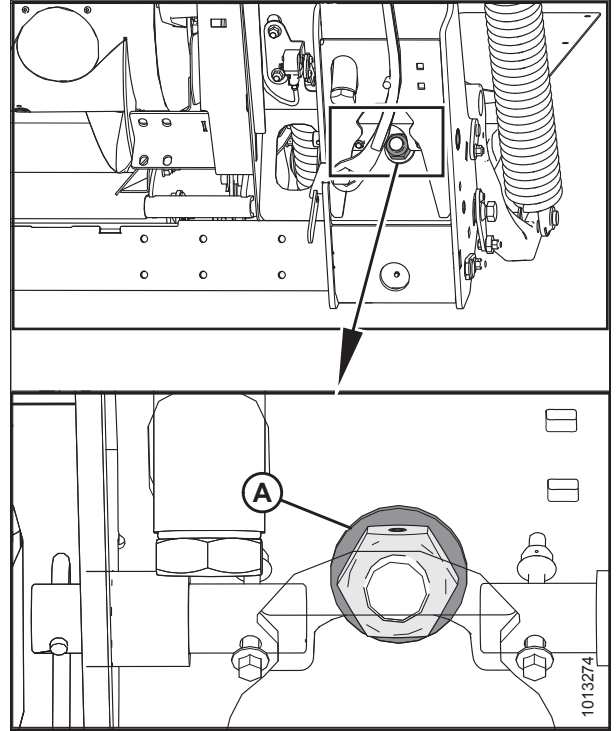


Figure 3.163: Float Lock

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

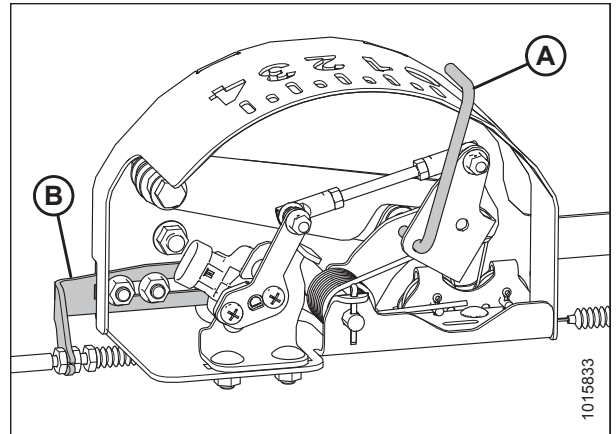


Figure 3.164: Float Indicator Box

OPERATION

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the MAIN screen. The DIAGNOSTICS screen opens.
6. Select SETTINGS. The SETTINGS screen opens.

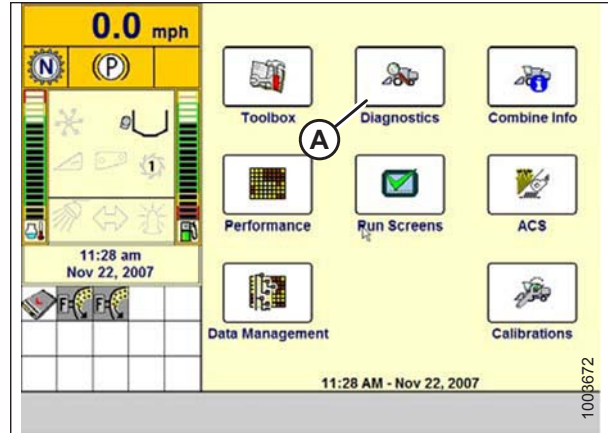


Figure 3.165: Case IH Combine Display

7. Select the GROUP arrow (A). The GROUP dialog box opens.

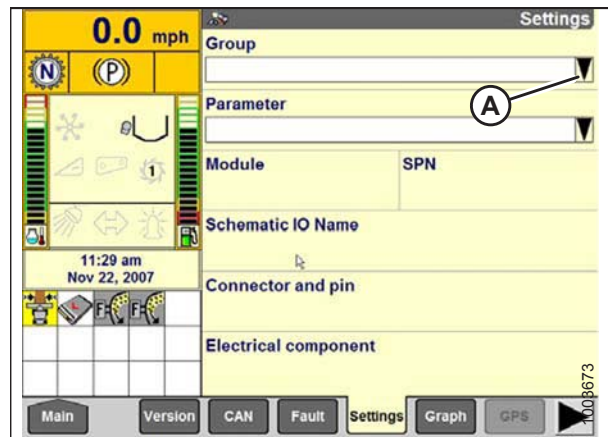


Figure 3.166: Case IH Combine Display

8. Select HEADER HEIGHT/TILT (A). The PARAMETER screen opens.

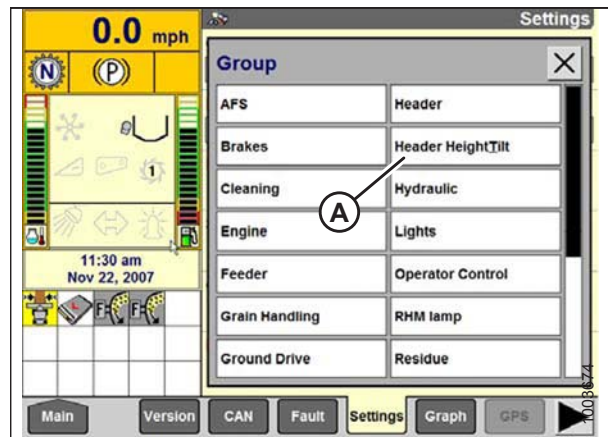


Figure 3.167: Case IH Combine Display

OPERATION

9. Select LEFT HEADER HEIGHT SEN (A), and then select the GRAPH button (B). The exact voltage is displayed at top of screen. Raise and lower the header to see the full range of voltage readings.
10. If the sensor voltage is not within the low and high limits or, if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System](#), page 116.

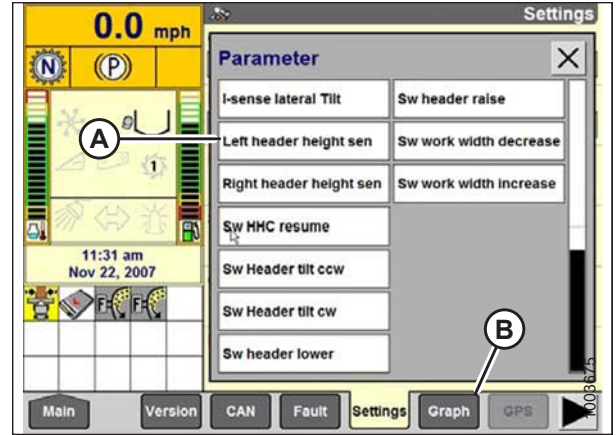


Figure 3.168: Case IH Combine Display

Calibrating the Auto Header Height Control (Case IH5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230)

For best performance from the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle](#), page 72.

NOTE:

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to [Calibrating the Auto Header Height Control \(Case Combines with Version 28.00 or Higher Software\)](#), page 129.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Ensure all header and float module electrical and hydraulic connections are made.
3. Select TOOLBOX on the MAIN screen, and then select HEADER.
4. Set appropriate HEADER STYLE.



Figure 3.169: Case IH Combine Display

OPERATION

5. Set AUTO REEL SPEED SLOPE.
6. Set HEADER PRESSURE FLOAT to NO if equipped, and ensure REEL DRIVE is HYDRAULIC.

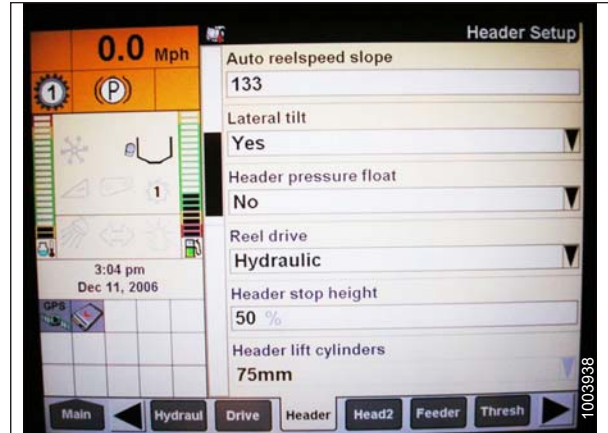


Figure 3.170: Case IH Combine Display

7. Install REEL FORE-BACK (if applicable).
8. Set HEIGHT SENSITIVITY to desired value. The recommended starting point is 180.

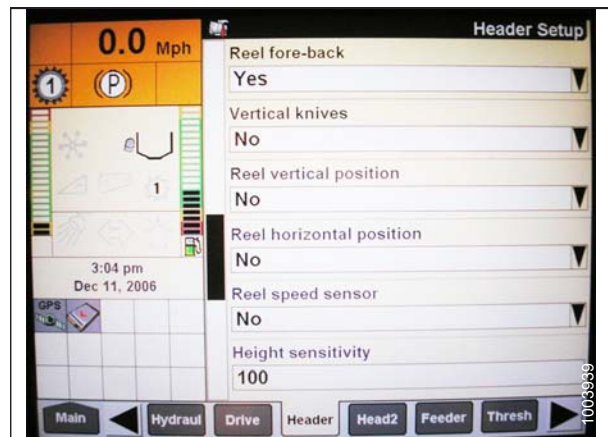


Figure 3.171: Case IH Combine Display

9. Install FORE-AFT CONTROL and HDR FORE-AFT TILT (if applicable).

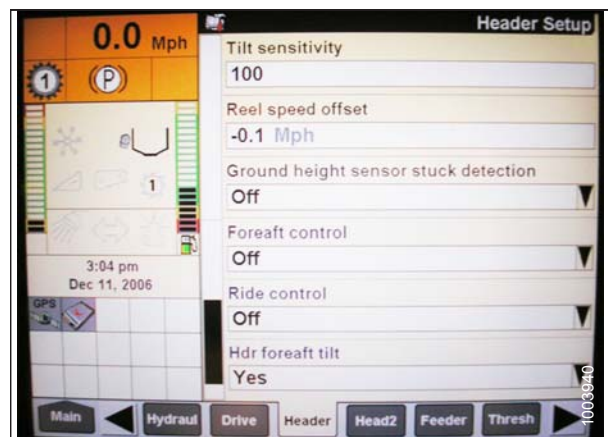


Figure 3.172: Case IH Combine Display

OPERATION

10. Press HEAD2 at bottom of screen.
11. Ensure HEADER TYPE is DRAPER.

NOTE:

If recognition resistor is plugged in to header harness, you will not be able to change this.

12. Set cutting type to PLATFORM.
13. Set appropriate HEADER WIDTH and HEADER USAGE.

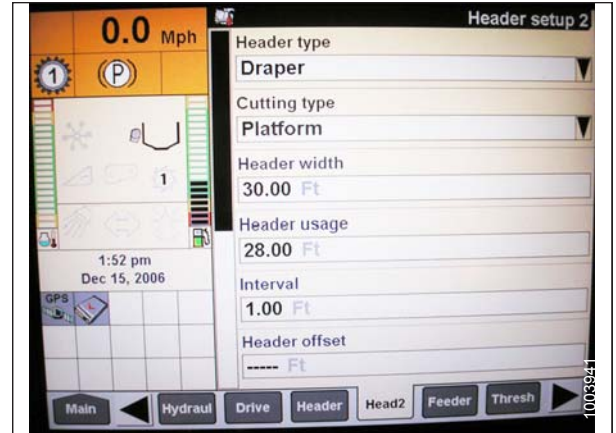


Figure 3.173: Case IH Combine Display

Calibrating the Auto Header Height Control (Case Combines with Version 28.00 or Higher Software)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Select TOOLBOX on the MAIN screen, and then select HEADER SETUP.
3. Locate the HEADER SUB TYPE field. It will be located on either the HEAD 1 or the HEAD 2 tab.
4. Select 2000 (A).

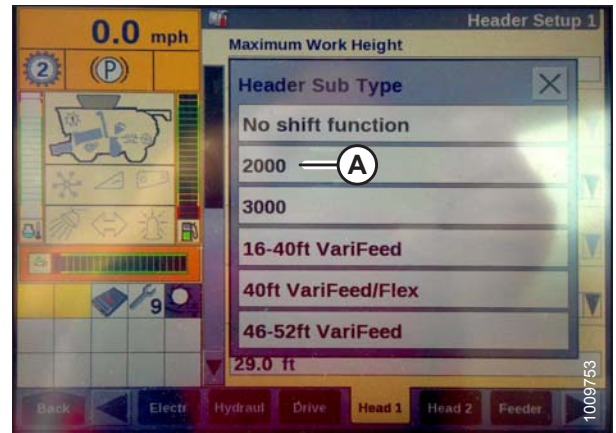


Figure 3.174: Case IH Combine Display

OPERATION

5. Locate the HEADER SENSORS and HEADER PRESSURE FLOAT fields. They will be located on either the HEAD 1 or the HEAD 2 tab.
6. Select ENABLE (A) in the HEADER SENSORS field.
7. Select NO (B) in the HEADER PRESSURE FLOAT field.

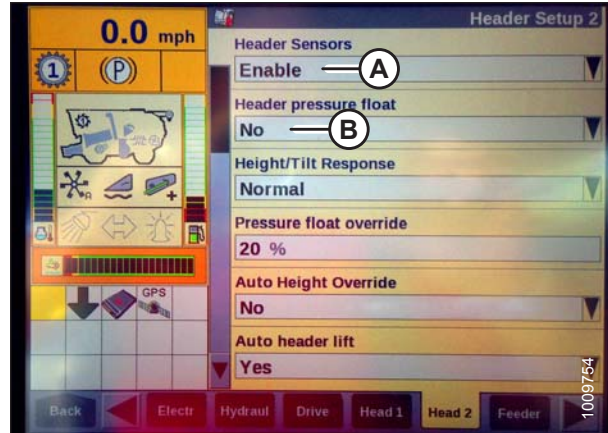


Figure 3.175: Case IH Combine Display

8. Ensure AUTO HEIGHT icon (A) appears on the monitor and is displayed as shown at location (B). When the header is set for cutting on the ground, this verifies that the combine is correctly using the potentiometer on the header to sense ground pressure.

NOTE:

AUTO HEIGHT field (B) may appear on any of the RUN tabs and not necessarily on the RUN 1 tab.

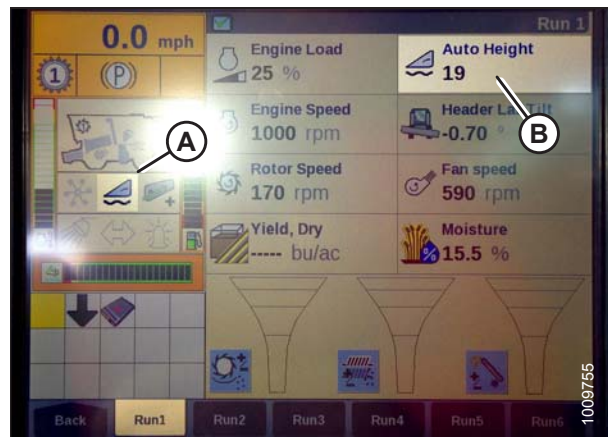


Figure 3.176: Case IH Combine Display

9. Select CALIBRATION on the combine display, and press the right arrow navigation key to enter the information box.
10. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

NOTE:

You can use the up and down navigation keys to move between options.

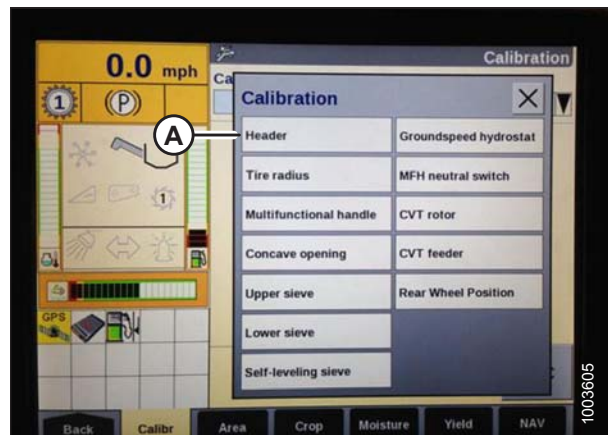


Figure 3.177: Case IH Combine Display

OPERATION

11. 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 3.178: Case IH Combine Display

12. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

NOTE:

If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.

13. If the unit does not function properly, conduct the maximum stubble height calibration.

Setting Preset Cutting Height (Case 7010/8010, 7120/8120/9120, 7230/8230/9230)

To set the preset cutting height, follow these steps:

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Engage separator and header.
2. Manually raise or lower the header to the desired cutting height.
3. Press the SET #1 switch (A). The HEADER HEIGHT MODE lamp (C), next to the SET #1 switch, turns on.
4. Manually raise or lower the header to a second desired cutting height.
5. Press the SET #2 switch (B). The HEADER HEIGHT MODE lamp (D), next to the SET #2 switch, turns on.

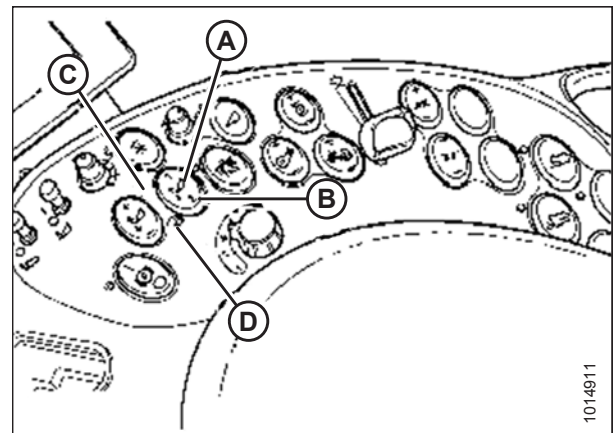


Figure 3.179: Case Combine Controls

OPERATION

6. To swap between set points, press HEADER RESUME (A).
7. To pick up header at headlands, press HEADER RESUME (A) twice. To lower, press HEADER RESUME (A).

NOTE:

You can fine adjust these set points by using the FINE ADJUST switch (A).

NOTE:

Pressing the HEADER RAISE/LOWER switch will disengage AUTO HEIGHT mode. Press HEADER RESUME to reengage.

NOTE:

The indicator reading with the header off the ground 152 mm (6 in.) should be at 0 (B). If not, refer to [Step 4, page 112](#). Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.



Figure 3.180: Case Combine Controls

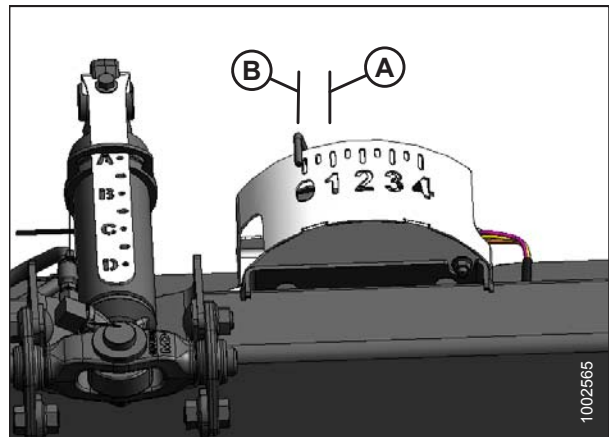


Figure 3.181: Float Indicator Box

3.8.4 Challenger and Massey Ferguson 6 and 7 Series Combines

Checking Voltage Range from the Combine Cab (Challenger and Massey Ferguson)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on 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.

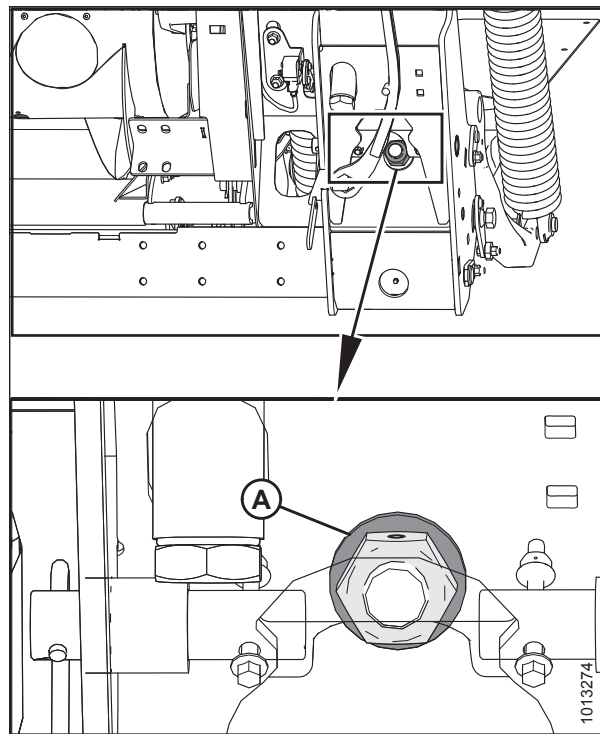


Figure 3.182: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

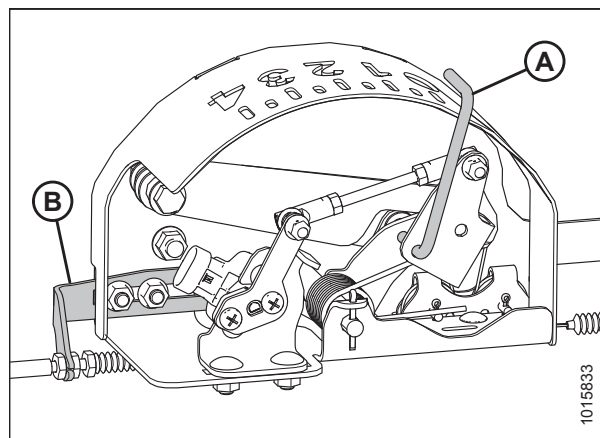


Figure 3.183: Float Indicator Box

OPERATION

4. Go to the FIELD screen on the combine monitor, and then press the diagnostics icon. The MISCELLANEOUS screen displays.
5. Press the VMM DIAGNOSTIC button (A). The VMM DIAGNOSTIC screen displays.

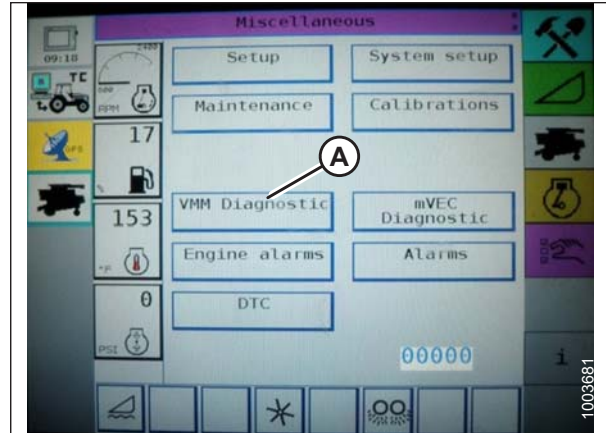


Figure 3.184: Challenger Combine Display

6. Go to the ANALOG IN tab (A), and then select VMM MODULE 3 by pressing the text box below the four tabs. The voltage from the AHHC sensor is now displayed on screen as HEADER HEIGHT RIGHT POT and HEADER HEIGHT LEFT POT. The readings may be slightly different.

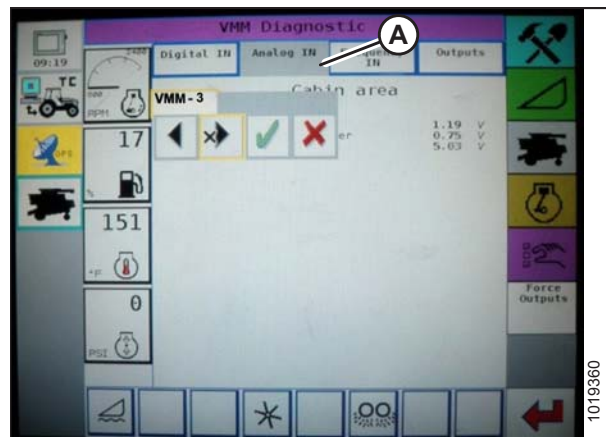


Figure 3.185: Challenger Combine Display

7. Fully lower the combine feeder house (float module should be fully separated from the header).

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

8. Read voltage.
9. Raise header so cutterbar is 150 mm (6 in.) off the ground.
10. Read voltage.

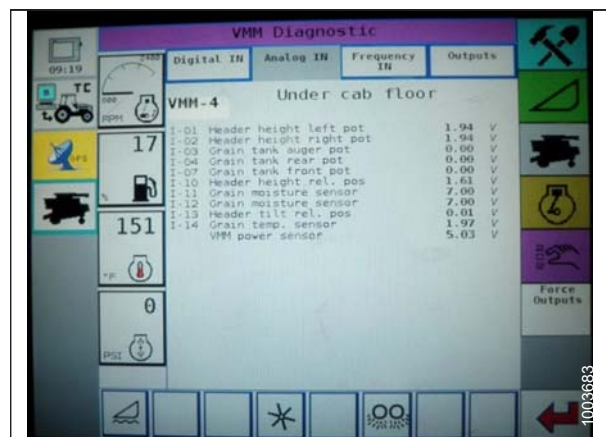


Figure 3.186: Challenger Combine Display

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#) or [Adjusting Voltage Limits: Two-Sensor System, page 117](#).

OPERATION

Engaging the Auto Header Height Control (Challenger and Massey Ferguson)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse panel module (FP)
- Multi-function control handle operator inputs
- Operator inputs mounted in the control console module (CC) panel

NOTE:

In addition to the above components, the electrohydraulic header lift control valve is an integral part of the system.

Engage the AHHC as follows:

1. Scroll through the header control options on the combine display using the header control switch until the AHHC icon (A) is displayed in the first message box. The AHHC will adjust the header height in relation to the ground according to the height setting and sensitivity setting.

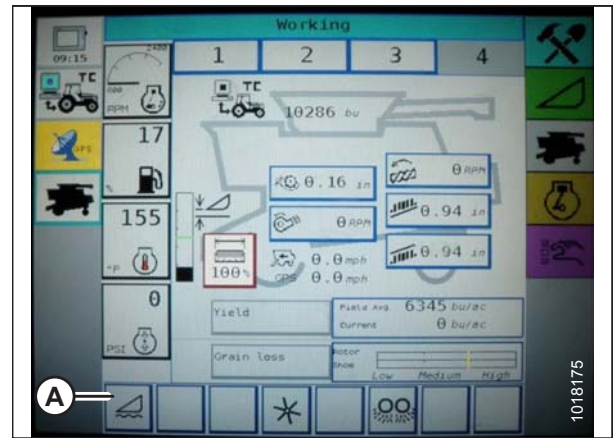


Figure 3.187: Challenger Combine Display

Calibrating the Auto Header Height Control (Challenger and Massey Ferguson)

NOTE:

For best performance of the auto header height control (AHHC) system, perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.

OPERATION

2. On the FIELD screen, press the DIAGNOSTICS icon (A). The MISCELLANEOUS screen appears.



Figure 3.188: Challenger Combine Display

3. Press the CALIBRATIONS button (A). The CALIBRATIONS screen appears.

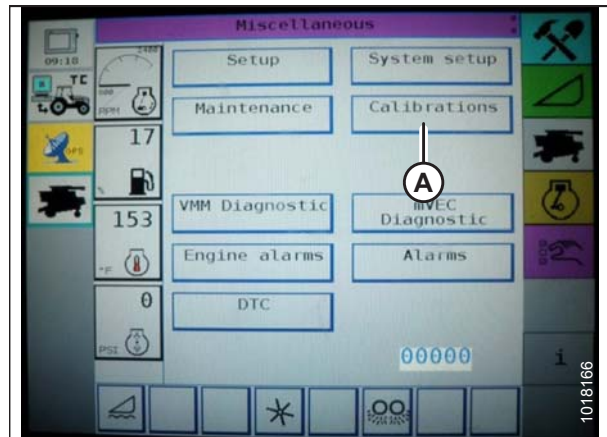


Figure 3.189: Challenger Combine Display

4. Press the HEADER button (A). The HEADER CALIBRATION screen displays a warning.

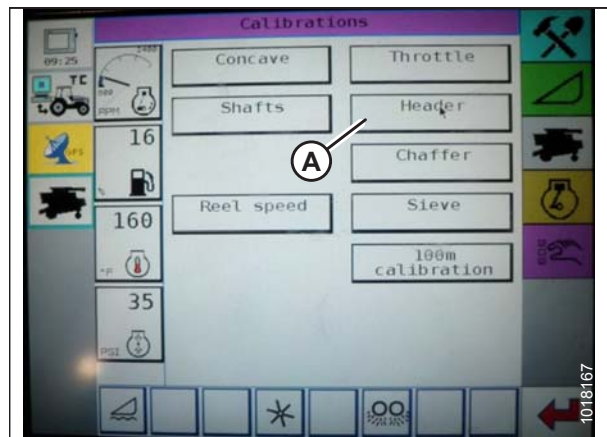


Figure 3.190: Challenger Combine Display

OPERATION

5. Read the warning message, and then press the green check mark button.

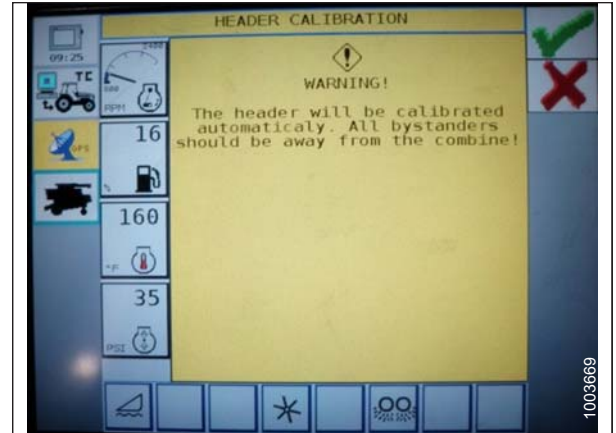


Figure 3.191: Challenger Combine Display

6. Follow the on-screen prompts to complete calibration.

NOTE:

The calibration procedure can be cancelled at anytime by pressing the cancel button in the bottom right corner of the screen. While the header calibration is running, the calibration can also be canceled by using the up, down, tilt right, or tilt left buttons on the control handle.

NOTE:

If the combine does not have header tilt installed or if it is inoperable, you may receive warnings during calibration. Press the green check mark if these warnings appear. This will not affect the AHHC calibration.

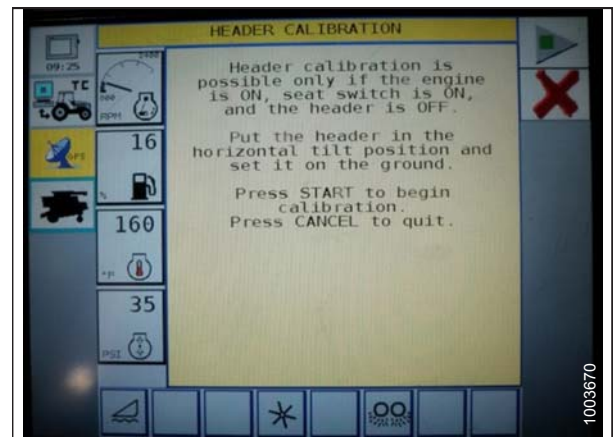


Figure 3.192: Challenger Combine Display

Adjusting the Header Height (Challenger and Massey Ferguson)

Once the auto header height control (AHHC) is activated, press and release the HEADER LOWER button on the control handle. The AHHC will automatically lower the header to the selected height setting.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

You can adjust the selected AHHC height using the HEIGHT ADJUSTMENT knob (A) on the control console. Turning the knob clockwise increases the selected height, and turning the knob counterclockwise decreases the selected height.



Figure 3.193: Height Adjustment Knob on the Combine Control Console

Adjusting the Header Raise/Lower Rate (Challenger and Massey Ferguson)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the Header icon (A) on the FIELD screen. The HEADER screen displays.

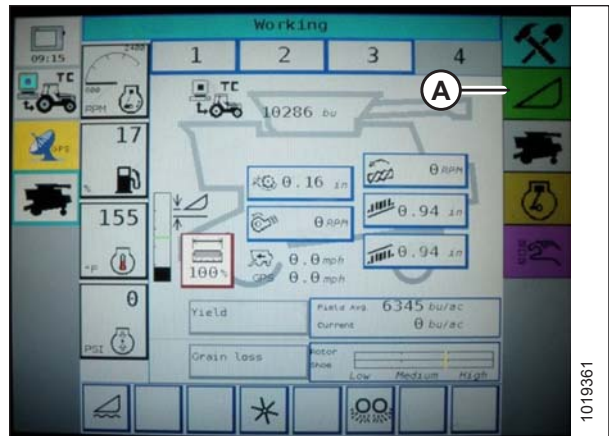


Figure 3.194: Challenger Combine Display

OPERATION

2. Press HEADER CONTROL (A). The HEADER CONTROL screen displays.

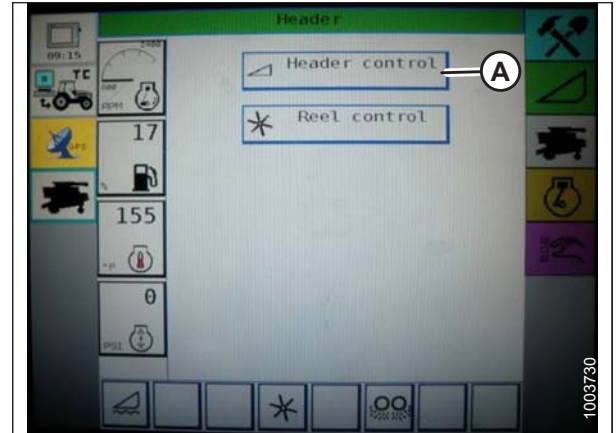


Figure 3.195: Challenger Combine Display

3. Go to the TABLE SETTINGS tab.
4. Press up arrow on MAX UP PWM to increase percentage number and increase raise speed; Press down arrow on MAX UP PWM to decrease percentage number and decrease raise speed.
5. Press up arrow on MAX DOWN PWM to increase percentage number and increase lower speed. Press down arrow on MAX DOWN PWM to decrease percentage number and decrease lower speed.

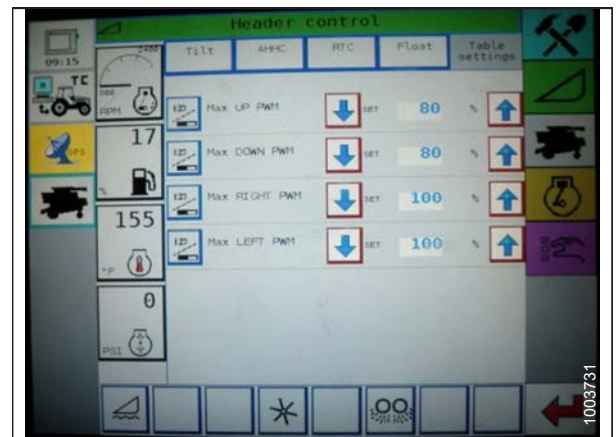


Figure 3.196: Challenger Combine Display

Setting the Sensitivity of the Auto Header Height Control (Challenger and Massey Ferguson)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the 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 display since this document was published. Refer to the combine operator's manual for updates.

1. Press the HEADER icon on the FIELD screen. The HEADER screen appears.

OPERATION

2. Press the HEADER CONTROL button (A). The HEADER CONTROL screen appears. You can adjust sensitivity on this screen using the up and down arrows.

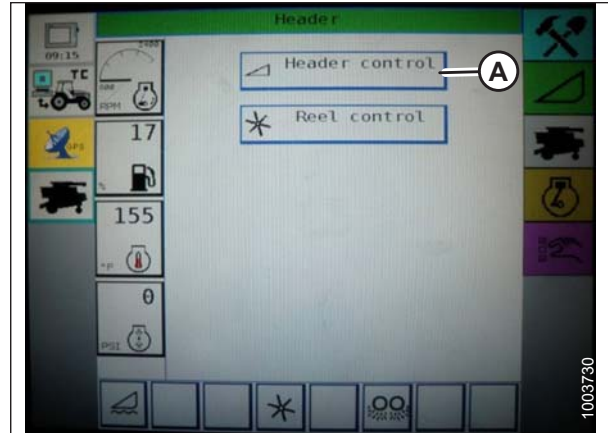


Figure 3.197: Challenger Combine Display

3. Adjust the sensitivity to the maximum setting.
4. Activate the AHHC, and press the HEADER LOWER button on the control handle.
5. Decrease the sensitivity until the feeder house remains steady and does not bounce up and down.

NOTE:

This is the maximum sensitivity and is only an initial setting. The final setting must be made in the field as the system reaction will vary with changing surfaces and operating conditions.

NOTE:

If maximum sensitivity is not needed, a less sensitive setting will reduce the frequency of header height corrections and component wear. Partially opening the accumulator valve will cushion the action of the header lift cylinders and reduce header hunting.

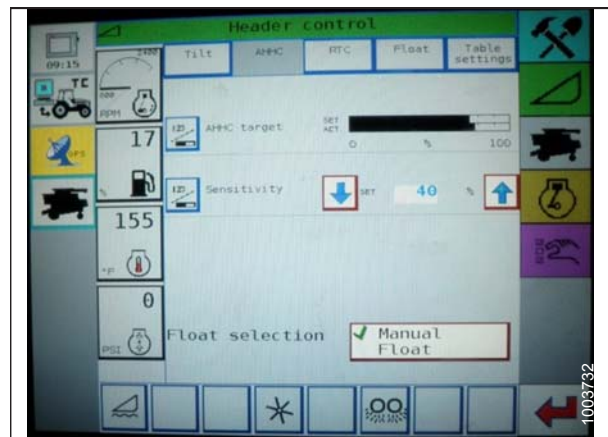


Figure 3.198: Challenger Combine Display

3.8.5 Gleaner R65/R66/R75/R76 and S Series Combines

Checking Voltage Range from the Combine Cab (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

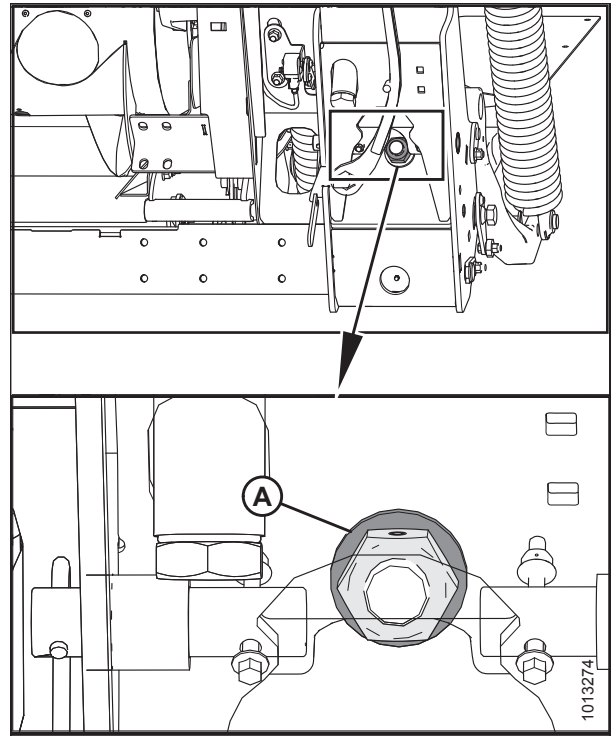


Figure 3.199: Float Lock

3. Ensure pointer (A) on the float indicator box is on 0. If necessary, adjust the cable take-up bracket (B) until pointer is on 0.

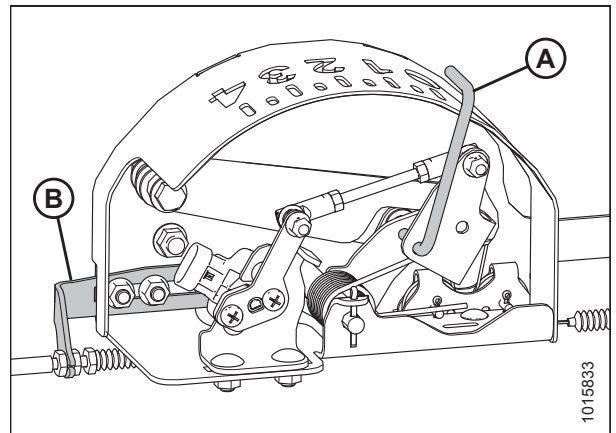
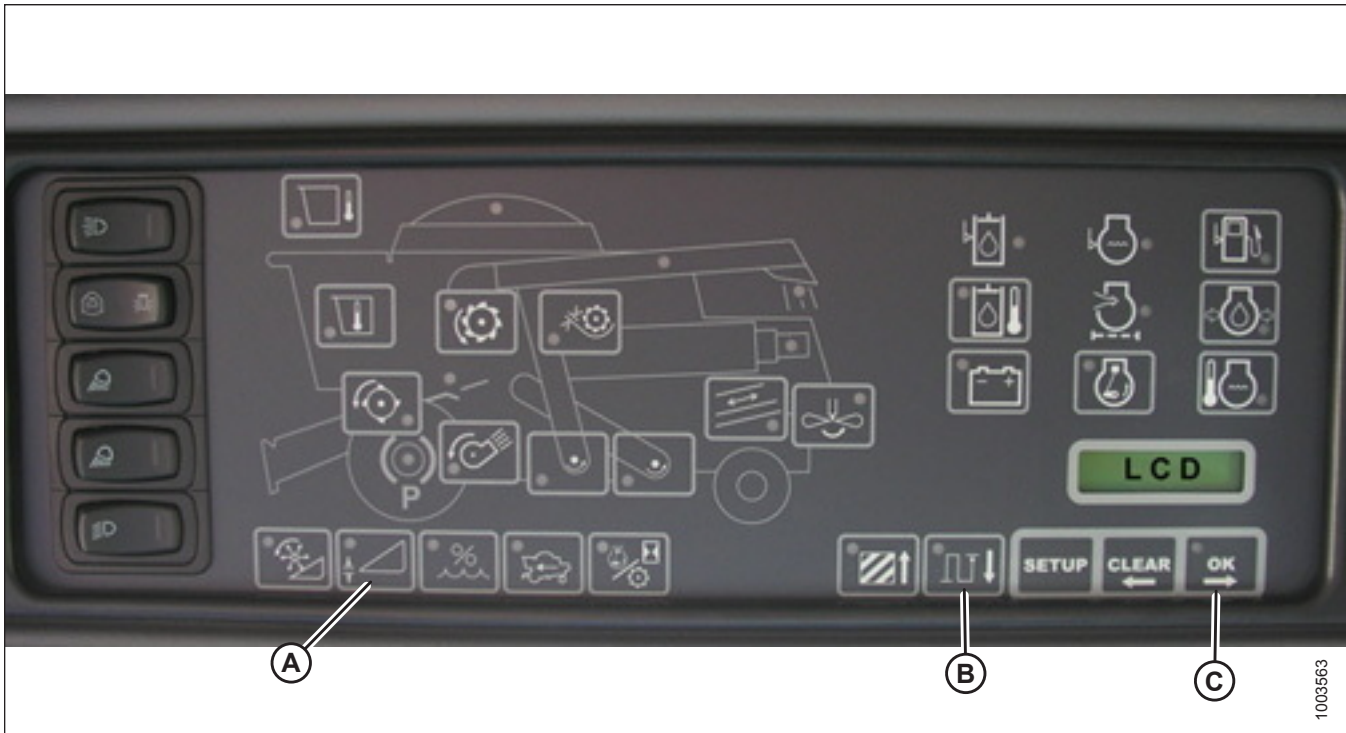


Figure 3.200: Float Indicator Box

OPERATION

Figure 3.201: Combine Heads-Up Display



4. Ensure header float is unlocked.
5. Press and hold button (A) on the heads-up display for 3 seconds to enter diagnostic mode.
6. Scroll down using button (B) until LEFT is displayed on the LCD screen.
7. Press the OK button (C). The number indicated on the LCD screen is the voltage reading from the sensor of the AHHC. Raise and lower the header to see the full range of voltage readings.

Engaging the Auto Header Height Control (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

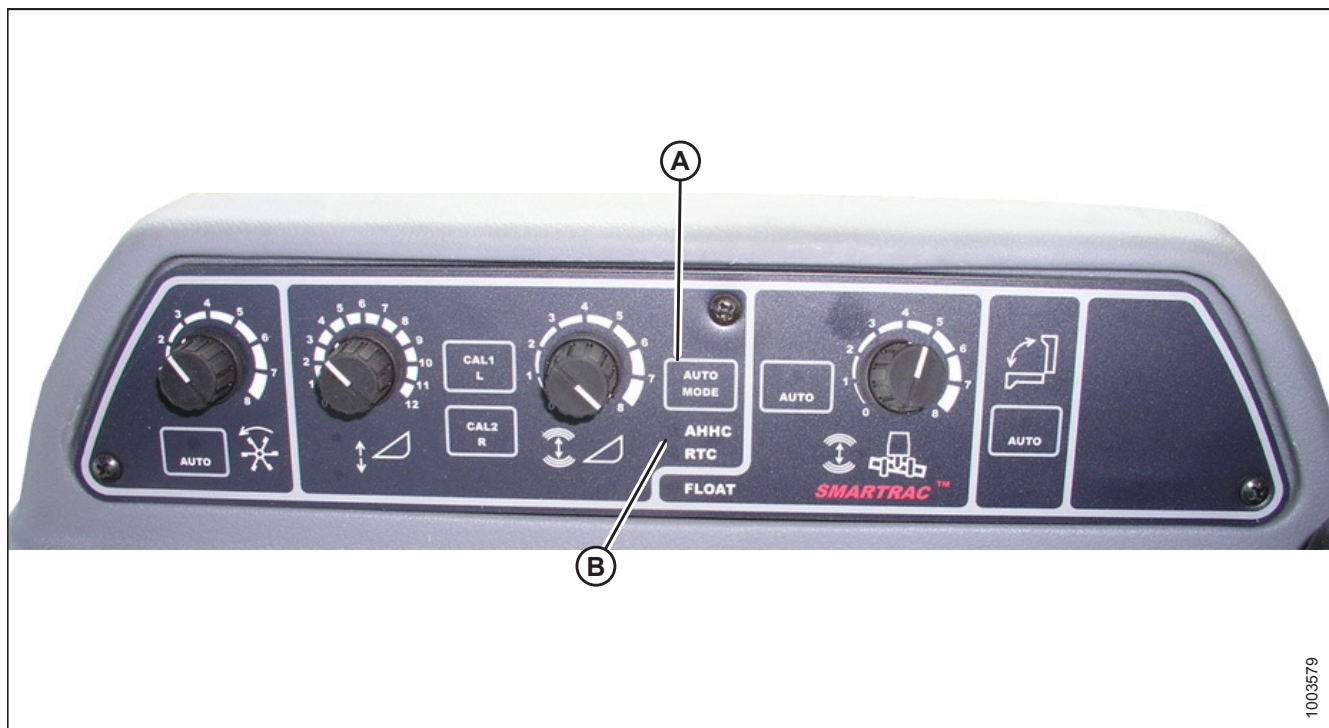
- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse pane module (FP).
- Multi-Function Control Handle operator inputs.
- Operator inputs mounted in the control console module (CC) panel.

NOTE:

In addition to the above components, the electrohydraulic header lift control valve also is an integral part of the system.

OPERATION

Figure 3.202: Combine Auto Header Height Controls



1. Press the AUTO MODE (A) button until the AHHC LED light (B) begins flashing. If the RTC light is flashing, press the AUTO MODE (A) button again until it switches to AHHC.
2. Briefly press button (A) on the control handle. The AHHC light should change from flashing to solid. The header also should drop toward the ground. The AHHC is now engaged and can be adjusted for height and sensitivity.
3. Use controls to adjust height and sensitivity to changing ground conditions such as shallow gullies and field drainage trenches.



Figure 3.203: Control Handle

Calibrating the Auto Header Height Control (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

Calibration should be done on flat, level ground without the header clutches engaged. Header height and header tilt must not be in auto or standby modes. The engine rpm must be above 2000 rpm. The header tilt option on 2004

OPERATION

and earlier model combines does not work with MacDon headers. This system will have to be removed and disabled in order to calibrate the auto header height control (AHHC). Refer to combine manual for instructions.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

Figure 3.204: Combine Auto Header Height Controls



A - AUTO MODE Button
D - Raise Header
G - CAL2 Button

B - AHHC Light
E - Lower Header

C - CAL1 Button
F - AUTO Mode

NOTE:

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

1. Ensure center-link is set to D.
2. Press AUTO MODE button (A) until the AHHC light (B) is illuminated.
3. Press and hold CAL1 button (C) until you see the following lights flash: raise header (D), lower header (E), tilt auto mode (F), and AHHC (B).
4. Fully lower the header, and continue to hold the HEADER LOWER button for 5–8 seconds to ensure float module has separated from header.
5. Press CAL2 button (G) until lower header light (E) stops flashing, and release it when the raise header light (D) begins flashing.
6. Raise header to its maximum height (ensure the header is resting on the down-stop pads).
7. Press CAL2 button (G) until the raise header light (D) turns off.

OPERATION

NOTE:

The following steps are applicable only to 2005 and newer combines with the Smartrac feeder house.

8. Wait for the HEADER TILT LEFT light (not shown) to start flashing, and then tilt header to the maximum left position.
9. Press CAL2 button (G) until the HEADER TILT LEFT light (not shown) stops flashing, and release button when the HEADER TILT RIGHT light (not shown) begins flashing.
10. Tilt the header to the maximum right position.
11. Press CAL2 button (G) until all of the following lights flash: raise header (D), lower header (E), height auto mode (A), right header and left header (not shown), and tilt auto mode (F).
12. Center the header.
13. Press CAL1 button (C) to exit calibration and save all values to the memory. All lights should stop flashing.

Turning off the Accumulator (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

The accumulator will affect the combine's reaction time and greatly inhibit the auto header height control's performance.

Refer to the combine operator's manual for proper procedure when turning accumulator off and on. For best performance, turn the feeder house accumulator off.

NOTE:

The accumulator is located in front of the front left axle beam.



Figure 3.205: Combine Accumulator On/Off Switch

A - Accumulator Lever (Off Position)

Adjusting the Header Raise/Lower Rate (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

The auto header height control (AHHC) system's stability is affected by hydraulic flow rates. Ensure that the header raise (A) and header lower (B) adjustable restrictors in the hydraulic manifold are adjusted so that it takes approximately 6 seconds to raise the header from ground level to maximum height (hydraulic cylinders fully extended), and approximately 6 seconds to lower the header from maximum height to ground level.

If there is too much header movement (for example, hunting) when the header is on the ground, adjust the lower rate to a slower rate of drop: 7 or 8 seconds.

NOTE:

Make this adjustment with the hydraulic system at normal operating temperature (54.4°C [130°F]) and the engine running at full throttle.



Figure 3.206: Header Raise and Lower Adjustable Restrictors

Adjusting Ground Pressure (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

To adjust header height, ensure the header is in auto header height control (AHHC) mode. This is indicated by the AUTO MODE LED light (A) displaying a continuous, solid light. The header will lower to the height (ground pressure) corresponding to the position selected with the height control knob (B).

Turn the knob counterclockwise for minimum ground pressure, and clockwise for maximum ground pressure.

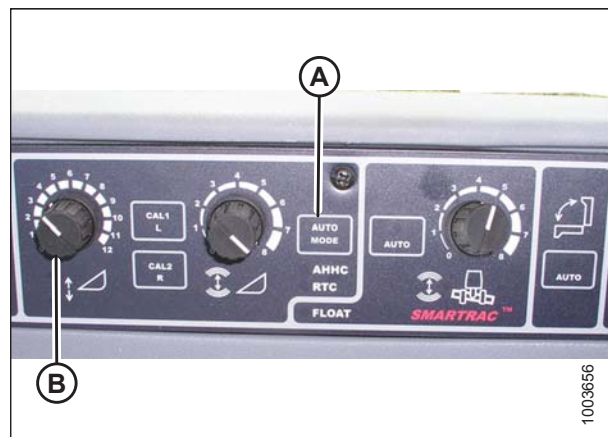


Figure 3.207: AHHC Console

OPERATION

NOTE:

The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to Step 4, [page 112](#). Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

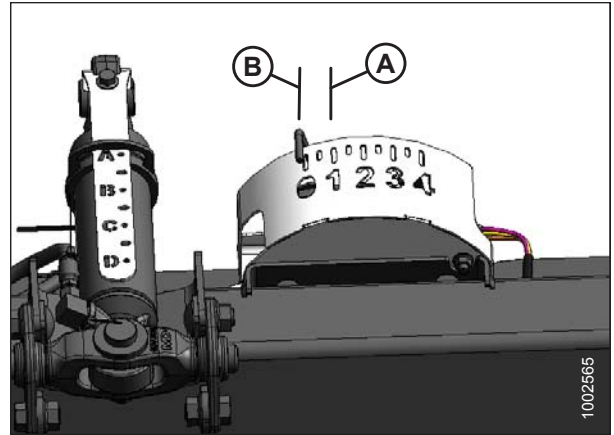


Figure 3.208: Float Indicator Box

Adjusting the Sensitivity of the Auto Header Height Control (AHHC) (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

Figure 3.209: Auto Header Height Control Console



The SENSITIVITY ADJUSTMENT dial (A) controls the distance the cutterbar must travel up or down before the AHHC reacts and raises or lowers the feeder house.

When the SENSITIVITY ADJUSTMENT dial (A) is set to maximum (turned completely clockwise), only small changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar

OPERATION

moves up and down approximately 19 mm (3/4 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

When the SENSITIVITY ADJUSTMENT dial (A) is set to minimum (turned completely counterclockwise), large changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 51 mm (2 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

The HEADER SENSE LINE input also changes the range of the sensitivity. When connected to a draper, the counterclockwise position (least sensitive) allows for approximately 102 mm (4 in.) of vertical travel before correction is made.

Troubleshooting Alarms and Diagnostic Faults (Gleaner R65/R66/R75/R76 and Pre-2016 S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

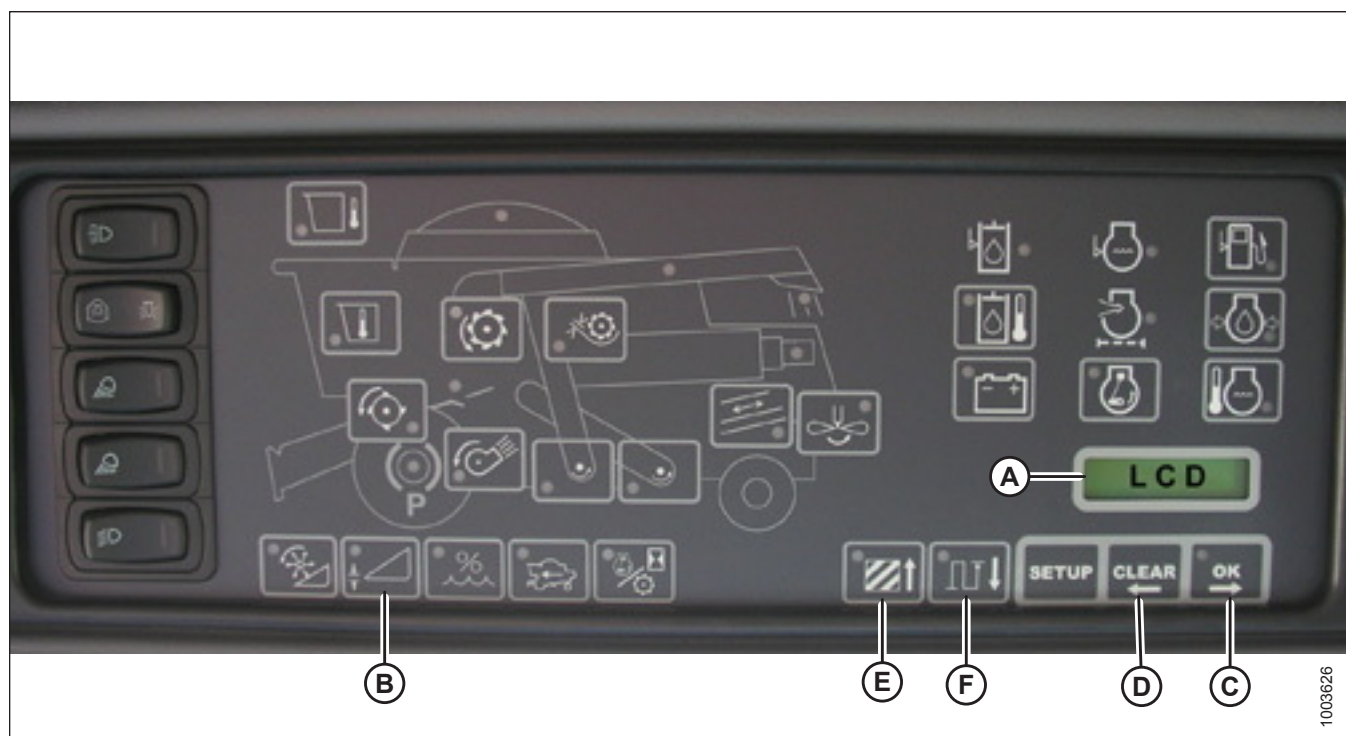
Display type:

Displayed on tachometer (A) as XX or XXX.



Figure 3.210: Tachometer

Figure 3.211: Combine Heads-Up Display



NOTE:

Displayed on LCD (A) as XX in. or XXX cm.

Alarm conditions:

If an error message is received from the fuse panel, an audible alarm sounds. The LCD on the electronic instrument panel (EIP) indicates the header system in error as HDR CTRL followed by HGT ERR for height, and HDR CTRL followed by TILT ERR for tilt. The header height LED flashes yellow two times every second.

The alarm also is noted by the buzzer sounding five times every 10 seconds.

When an alarm condition occurs, a green LED flashes on and off (green, yellow, or red depending on the input). In addition, a message is displayed on the LCD to identify the nature of the alarm. For example, HYD TEMP, OPEN, SHRT will be flashed alternately.

Diagnostic fault failures: Refer to Figure 3.211, page 149.

Pressing the header height switch (B) for a minimum of 5 seconds will put the EIP in header diagnostic mode. The LCD (shown on previous screen) will display the message HDR DIAG when the EIP has entered header diagnostic mode.

In this mode, after 3 seconds, header fault parameter labels are displayed on the EIP LCD. All the information displayed is read-only.

The OK (C) and CLEAR (D) buttons allow you to scroll through the list of parameters. If there are no active fault codes, the EIP LCD will display NO CODE.

When a parameter is displayed, its label is displayed for 3 seconds, after which its value is automatically displayed.

Pressing the OK button (C) while the value is displayed will advance to the next parameter and display its label.

When a parameter label is displayed and the OK button (C) is pressed before 3 seconds, the parameter's value will be displayed.

OPERATION

Pressing AREA (E) will cycle through the options. When LEFT is displayed on the LCD, press the OK button (C), and the auto header height control (AHHC) voltage will be shown on the display.

Press the DIST button (F) to cycle back through the table.

Press the CLEAR button (D) to exit header diagnostics and return to normal mode.

Refer to [3.8.14 Sensor Operation, page 228](#).

3.8.6 Gleaner S9 Series Combines

Setting up the Header (Gleaner S9 Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The AGCO Tyton terminal (A) is used to set up and manage a MacDon draper header on a Gleaner S9 combine. Use the touch screen display to select the desired item on the screen.



Figure 3.212: Gleaner S9

A - Tyton Terminal B - Hydro Handle / Ground Speed Lever
C - Throttle Lever D - Header Control Cluster

1. On the top right quadrant of the home screen, touch the COMBINE icon (A). The COMBINE MAIN MENU opens.



Figure 3.213: Combine Icon on Home Page

OPERATION

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS screen opens.

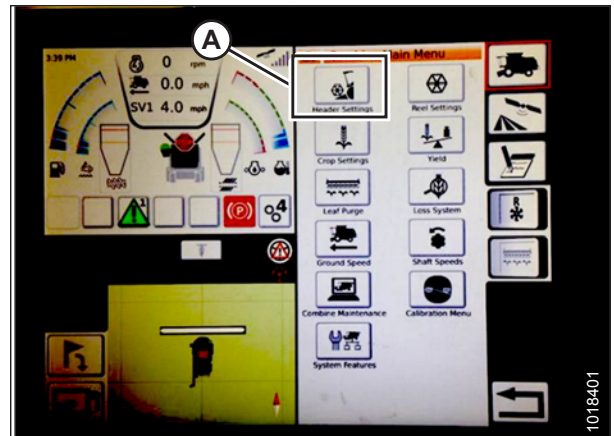


Figure 3.214: Header Settings in Combine Main Menu

OPERATION

3. Touch the HEADER CONFIGURATION field (A).
A screen showing predefined headers opens.

- If your MacDon header is already set up, it appears on the header list. Touch the MacDon header title (B) to highlight the selection in blue, and then touch the green check mark (E) to continue.
- If only the default header (D) is shown, touch the ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS screen:
 - The green check mark (E) saves the settings
 - The garbage can icon (F) deletes the highlighted header from the list
 - The red X (G) cancels the change(s)

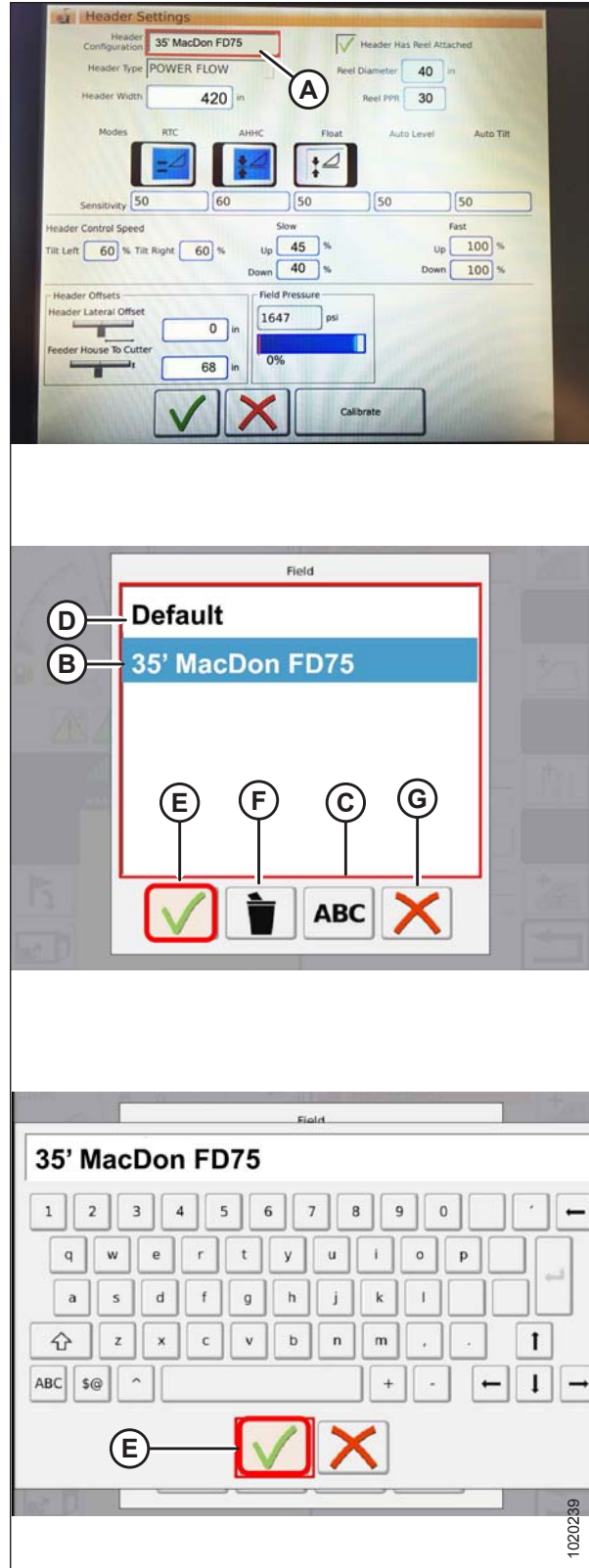


Figure 3.215: Header Configuration Menu on Header Settings Page

OPERATION

4. To specify the type of header installed on the machine, touch the HEADER TYPE field (A).

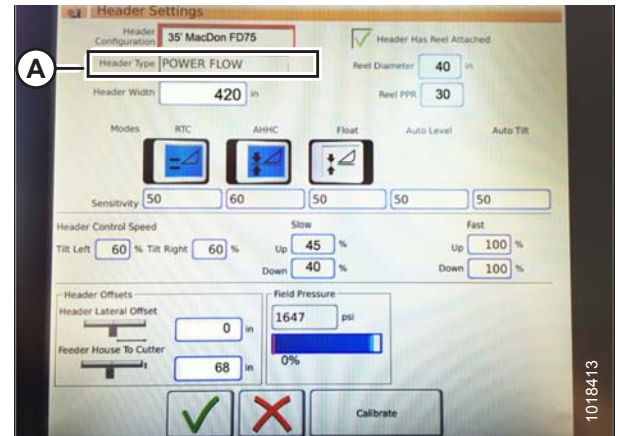


Figure 3.216: Header Settings

5. A list of predefined header types appears.
 - For MacDon D1 Series Draper and FD1 Series FlexDraper headers, touch POWER FLOW (A)
 - Touch the green check mark (B) to save the selection and continue

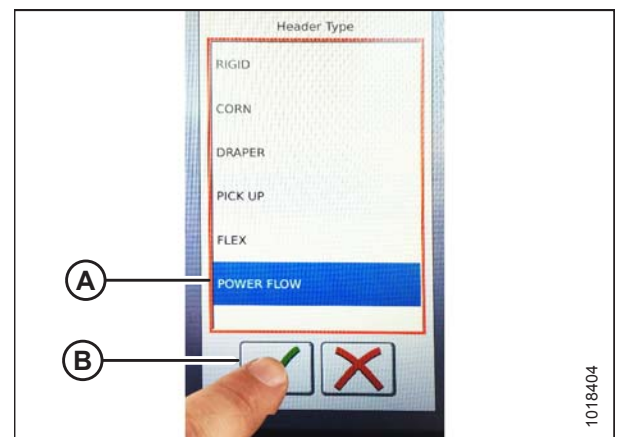


Figure 3.217: Header Type

6. Make sure that the HEADER HAS REEL ATTACHED check box (A) is checked.

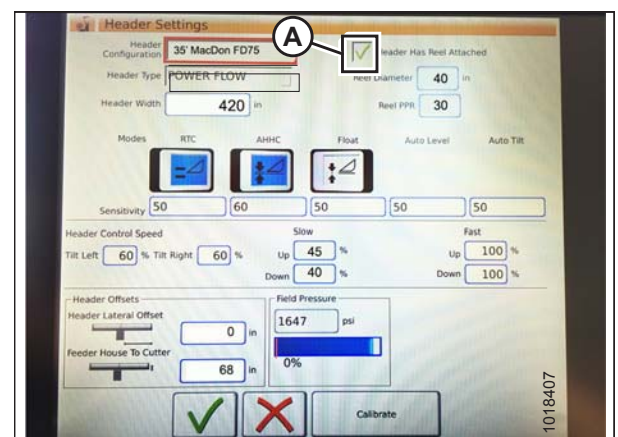


Figure 3.218: Header Settings

OPERATION

7. Touch the REEL DIAMETER field (A) and a numeric keypad displays. Enter **40** for a MacDon reel.
8. Touch the REEL PPR (Pulses Per Revolution) field (B) and enter **30** as the value for your MacDon header. (PPR is determined by the number of teeth on the reel speed sprocket).

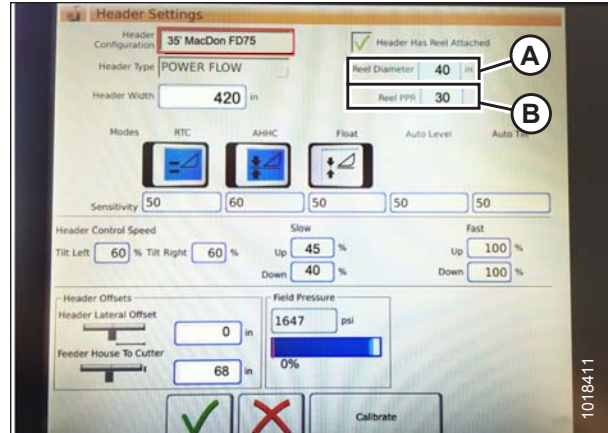


Figure 3.219: Header Settings

9. Touch the green check mark (B) at the bottom of the numeric keypad (A) when complete, or the red X to cancel.

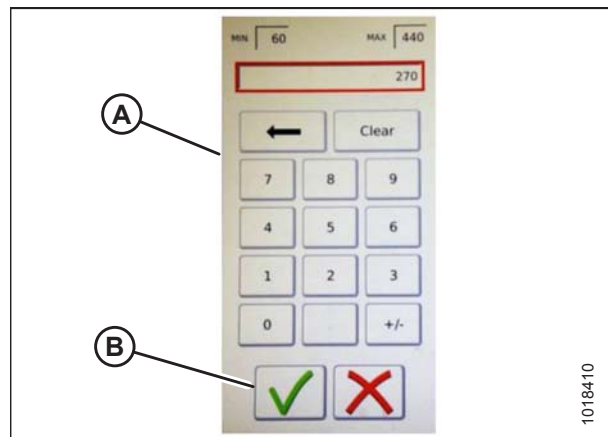


Figure 3.220: Numeric Keypad

10. When complete, touch the green check mark (A) at the bottom of the HEADER SETTINGS screen.

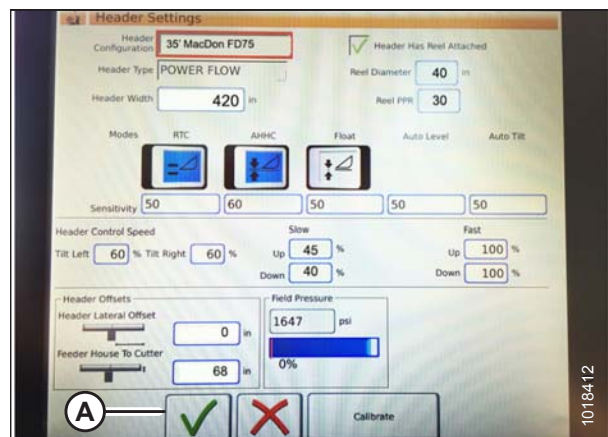


Figure 3.221: Header Settings Page

Setting up Reel Settings (Gleaner S9 Series)

CAUTION

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

OPERATION

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS screen.



Figure 3.222: Reel Settings on Combine Main Menu

2. To set minimum reel speed, touch the SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed (in mph) and rpm are shown.

NOTE:

At the bottom of the REEL SETTINGS screen, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS screen.

3. Reel speed is calibrated in the REEL SETTINGS screen by touching the CALIBRATE button (A) in the top right of the screen.
4. The CALIBRATION WIZARD opens and displays a hazard message warning screen.
5. Make sure to meet all the conditions listed on the CALIBRATION WIZARD warning screen. Press the green check mark to accept and start reel calibration. Pressing the red X will cancel the calibration procedure.

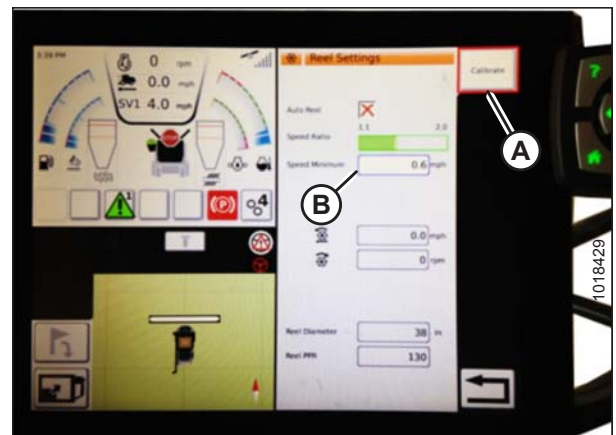


Figure 3.223: Reel Settings Calibration



Figure 3.224: Calibration Wizard

OPERATION

- An informational message appears in the CALIBRATION WIZARD that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.



Figure 3.225: Calibration Progress

Setting up Automatic Header Controls (Gleaner S9 Series)

Automatic header functions are configured on the HEADER SETTINGS screen.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

- Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS screen for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:

- RTC (return to cut) (A)
- AHHC (automatic header height control) (B)

All other switches are disabled (not highlighted).

- The **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.

- Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
- Decrease sensitivity if the combine hunts for a position in Auto Mode.

NOTE:

Recommended sensitivity starting points for MacDon headers are:

- 50** for RTC (A)
- 60** for AHHC (B)

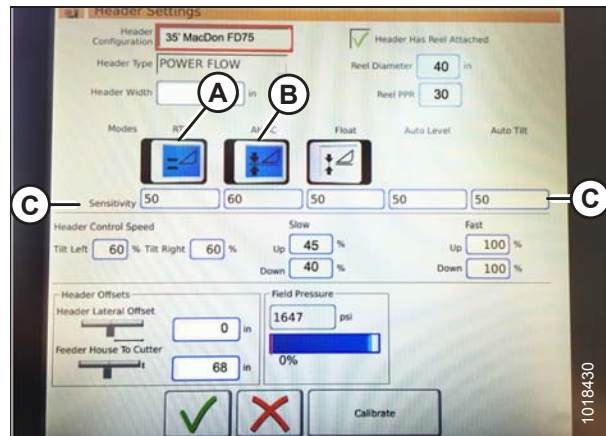


Figure 3.226: Automatic Controls and Sensitivity Settings

OPERATION

3. **Header Speed:** The HEADER CONTROL SPEED area (A) on the HEADER SETTINGS screen is used to adjust the following speeds:

- Tilt left and right is the lateral tilt of the combine faceplate
- Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

NOTE:

Recommended header control speed starting points

- Slow: 45 up / 40 down
- Fast: 100 up / 100 down

4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS screen:

- Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. This should be set at **0** for a MacDon header.
- Feeder House to Cutter: the distance from the machine interface to the cutterbar. This should be set at **68** for a MacDon header.

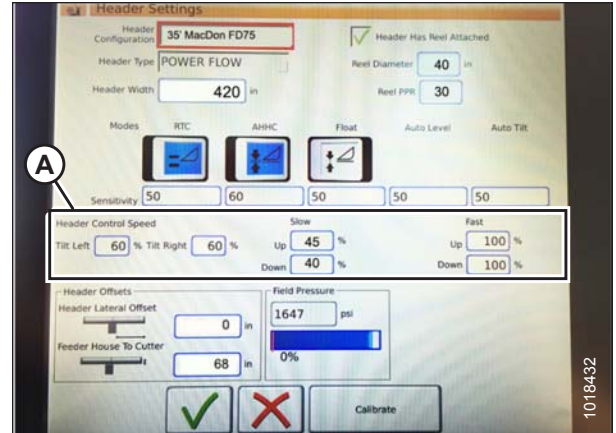


Figure 3.227: Header Speed Control Settings

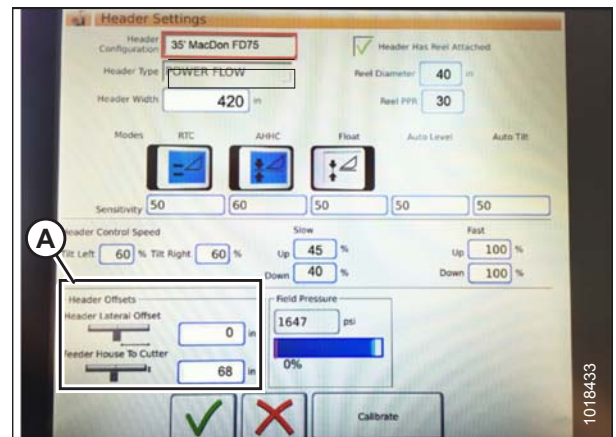
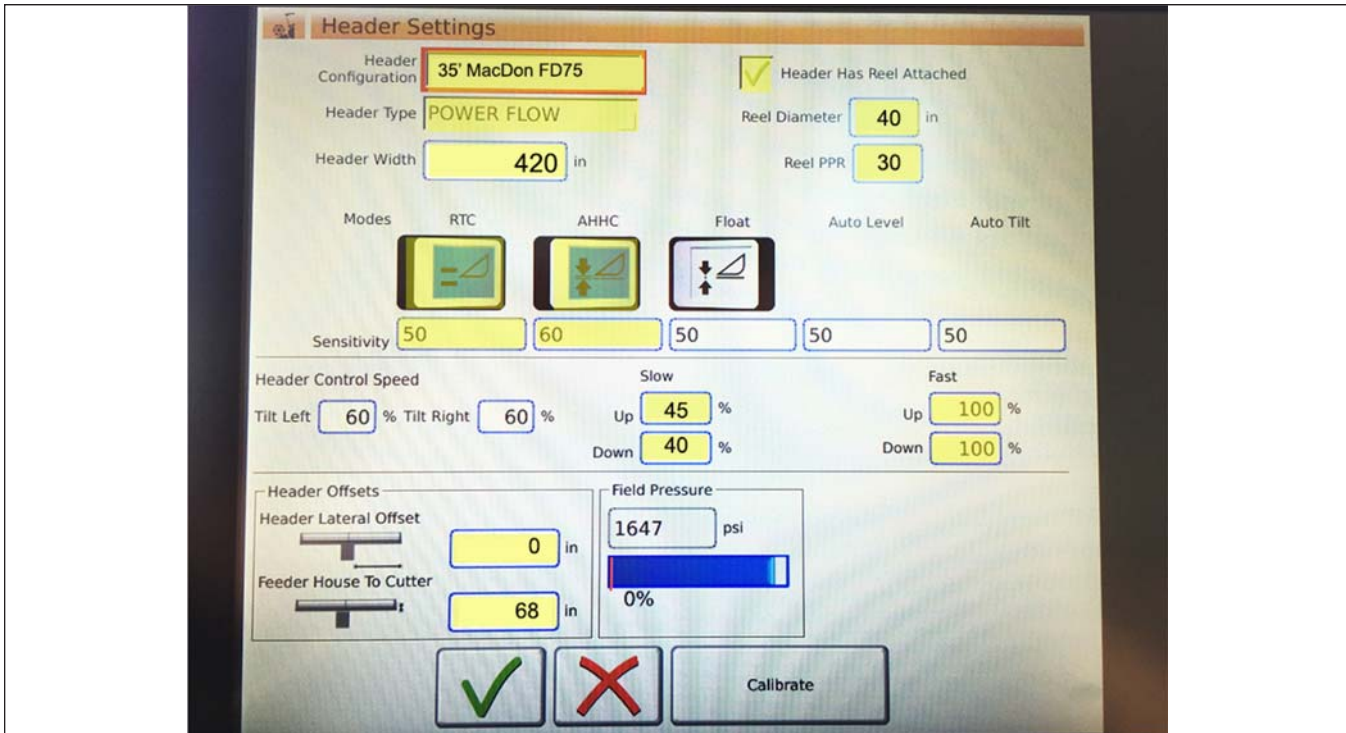


Figure 3.228: Header Offset Settings

OPERATION

Figure 3.229: MacDon Header Settings Inputs



Calibrating the Header (Gleaner S9 Series)

The auto header control functions are configured on the HEADER SETTINGS screen.

CAUTION

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

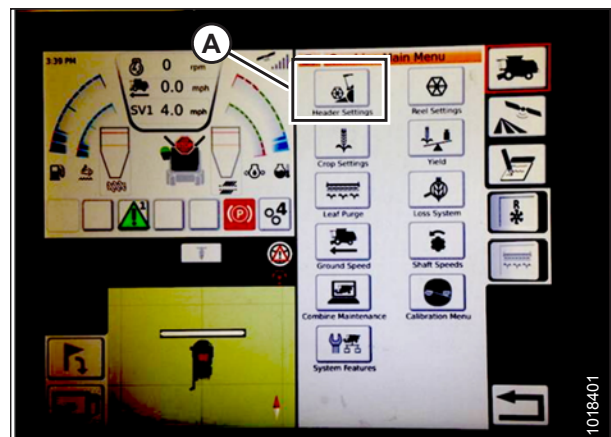


Figure 3.230: Combine Main Menu

OPERATION

2. Touch CALIBRATE (A) at the bottom right of the screen. The HEADER CALIBRATION screen displays.

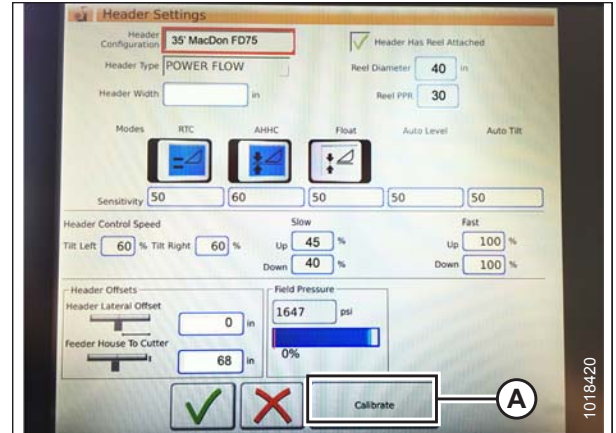


Figure 3.231: Calibration

The right side of the screen shows the Header Calibration information (A). Results are shown for a variety of sensors (B)

- Left and right header sensor (voltage) (values will be the same with MacDon headers)
- Header height sensor (mA)
- Tilt position sensor (mA)

The following valid modes are shown with check marks (C) below the sensor values (B):

- Return to cut
- Automatic header height control

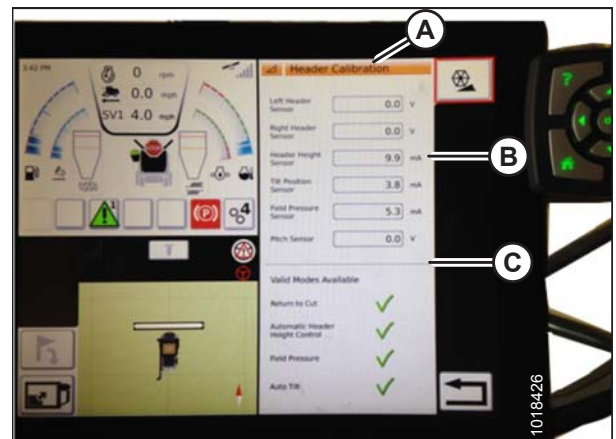


Figure 3.232: Header Calibration Page

CAUTION

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

3. On the ground speed lever (GSL), touch the HEADER DOWN button (A). Sensor values start changing on the HEADER CALIBRATION screen as the header lowers.

NOTE:

The header needs to be lowered all the way, and then raised off the ground. The range should be between **0.5 and 4.5 V**. If the value is not in that range, the sensor needs to be adjusted. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#) or [Adjusting Voltage Limits: Two-Sensor System, page 117](#).



Figure 3.233: Header Down Switch

OPERATION

4. When the sensor values are stable, touch the CALIBRATE icon (A).

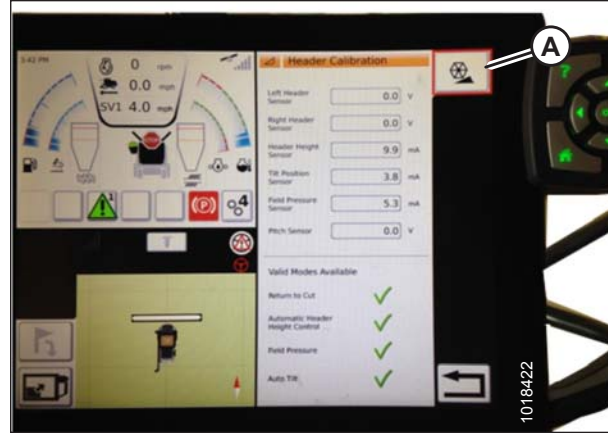


Figure 3.234: Header Calibration

5. The hazard message warning screen for HEADER CALIBRATION appears. Make sure that all conditions are met.
6. Touch the green check mark at the bottom of the screen to start the CALIBRATION WIZARD.

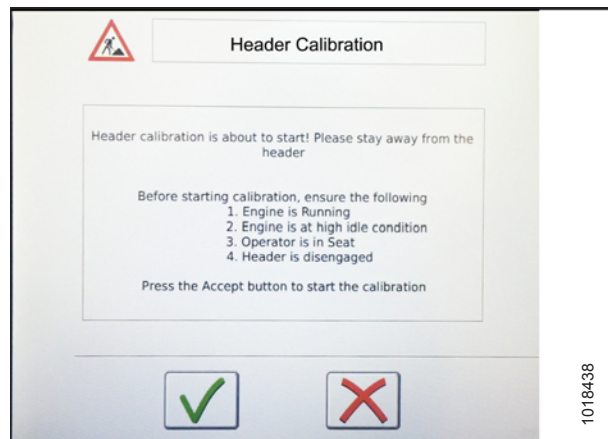


Figure 3.235: Header Calibration Warning

A progress bar is provided and the wizard can be stopped at any time by touching the red X. The header moves automatically and erratically during this process.

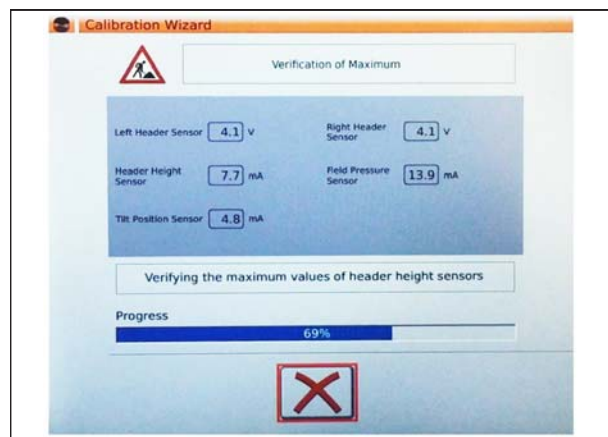


Figure 3.236: Calibration In Progress

OPERATION

7. When the calibration is complete, a message displays, and summary information (A) is shown. Green check marks confirm the functions have been calibrated (B). Touch the bottom green check mark (C) to save.



Figure 3.237: Completed Calibration Page

Tip

Touch the CALIBRATION icon (A) on the COMBINE MAIN MENU screen to open the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.



Figure 3.238: Direct Calibration Menu

Operating with a Gleaner S9 Series Combine

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton Terminal (A)
- Hydro Handle / Ground Speed Lever (B)
- Throttle Lever (C)
- Header Control Cluster (D)

Use the combine operator's manual to familiarize yourself with the controls.



Figure 3.239: Gleaner S9

OPERATION

1. With the header running, set lateral tilt switch (A) to MANUAL.
2. Engage the AHHC by pressing the switch (B) upward to the I position.

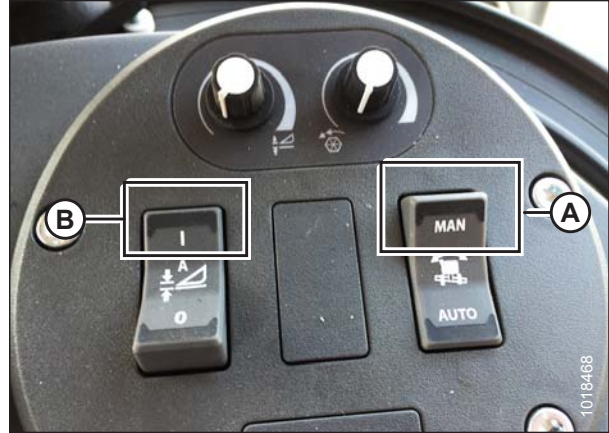


Figure 3.240: Header Control Cluster

3. Press the AHHC control switch (A) on the ground speed lever (GSL) to engage the AHHC. The header moves to the current setpoint position.



Figure 3.241: AHHC on GSL

4. Use the HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.



Figure 3.242: Header Control Cluster

Header In-Field Settings

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. To view header group settings, touch the HEADER icon (A) on the right side of the home screen.
2. The following information is displayed:
 - Current position of the header (B).
 - Setpoint cut-off position (C) (indicated by red line)
 - HEADER symbol (D) – touch to adjust the setpoint cut-off position using the scroll wheel on the right side of the Tyton terminal.
 - Cut height for the AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
 - Header working width (F)
 - Header pitch (G)
3. Touching a field opens the on-screen keyboard so that values can be adjusted. Enter the new value and touch the green check mark when complete.

NOTE:

The scroll wheel (A) is located on the right side of the Tyton terminal.

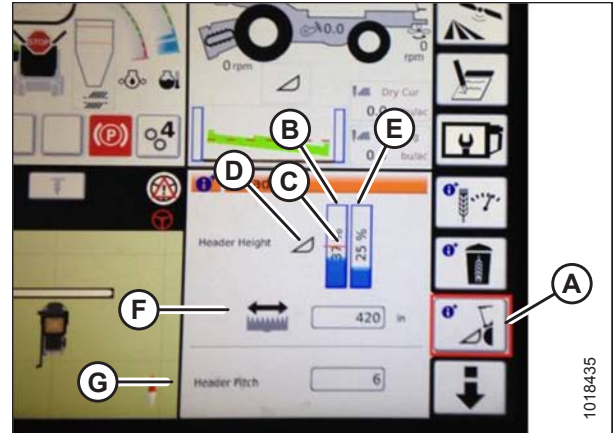


Figure 3.243: Header Groups



Figure 3.244: Scroll Wheel for Adjustments

NOTE:

Header height setpoint control dial (A) is on the header control cluster.



Figure 3.245: Header Control Cluster

3.8.7 John Deere 60 Series Combines

Checking Voltage Range from the Combine Cab (John Deere 60 Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

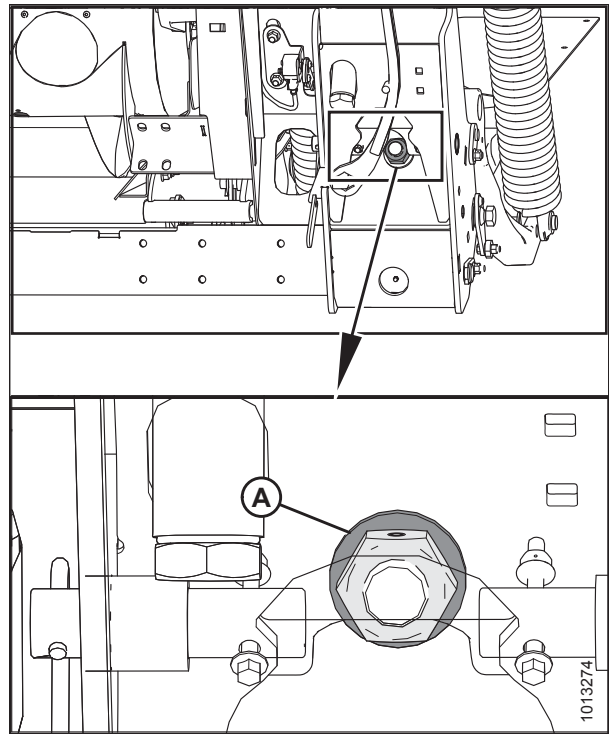


Figure 3.246: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

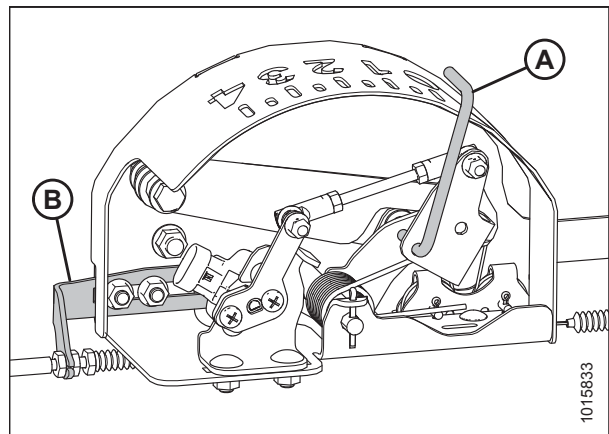
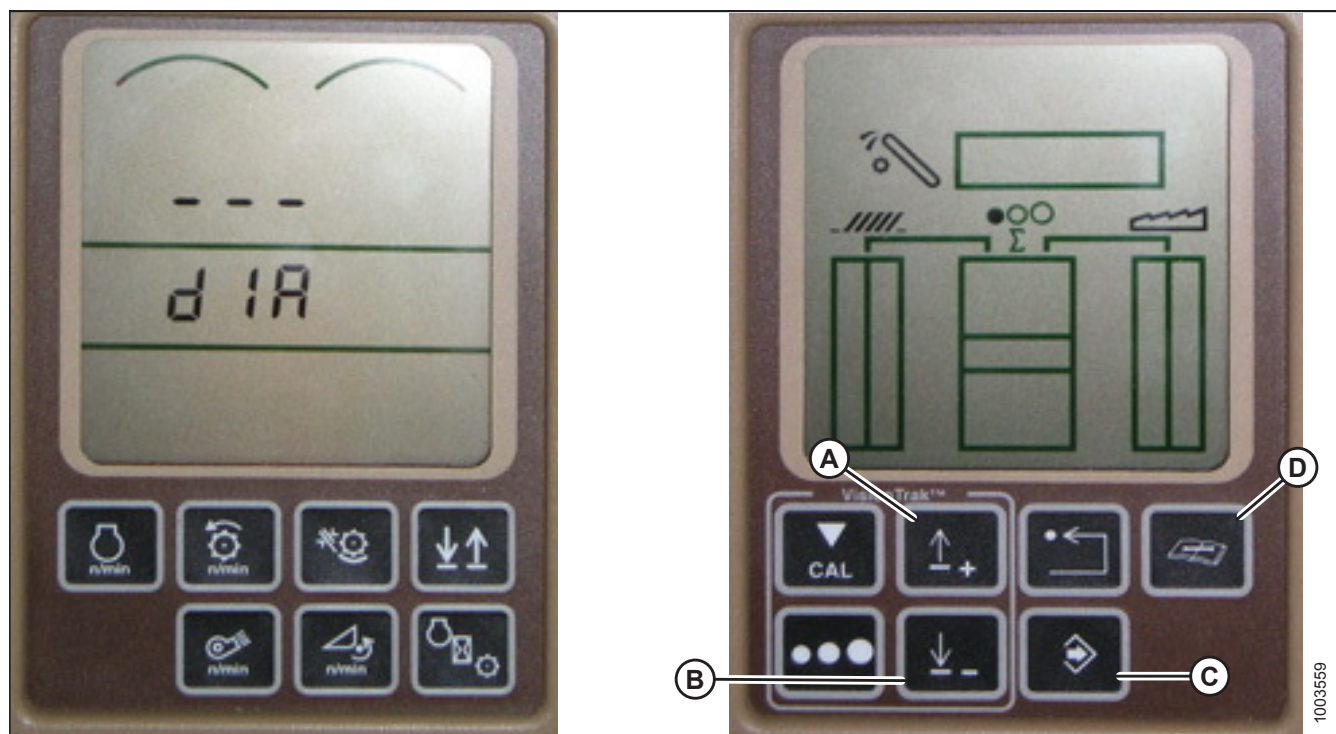


Figure 3.247: Float Indicator Box

Figure 3.248: John Deere Combine Display



4. Press the DIAGNOSTIC button (D) on the monitor—DIA appears on the monitor.
5. Press the UP button (A) until EO1 appears on the monitor—this is the header adjustments.
6. Press the ENTER button (C).
7. Press the UP (A) or DOWN button (B) until 24 is displayed on the top portion of the monitor—this is the voltage reading for the sensor.
8. Ensure header float is unlocked.
9. Start the combine, and fully lower feeder house to the ground.

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

10. Check the sensor reading on the monitor. The reading should be above 0.5 volts.
11. Raise the header so it is just off the ground. The reading on the monitor should read below 4.5 volts.
12. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

OPERATION

Calibrating the Auto Header Height Control (John Deere 60 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Ensure center-link is set to D.
2. Rest header on down stops, and unlock float module float.
3. Put wings in locked position.
4. Start the combine.
5. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
6. Press the CAL button (B). DIA-CAL appears on the monitor.

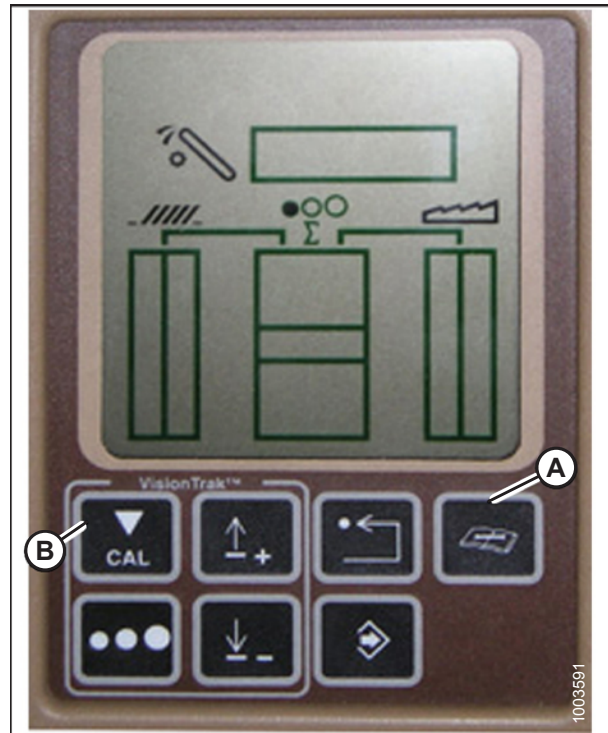


Figure 3.249: John Deere Combine Display

OPERATION

7. Press the UP or DOWN buttons until HDR appears on the monitor.
8. Press the ENTER button. HDR H-DN appears on the monitor.

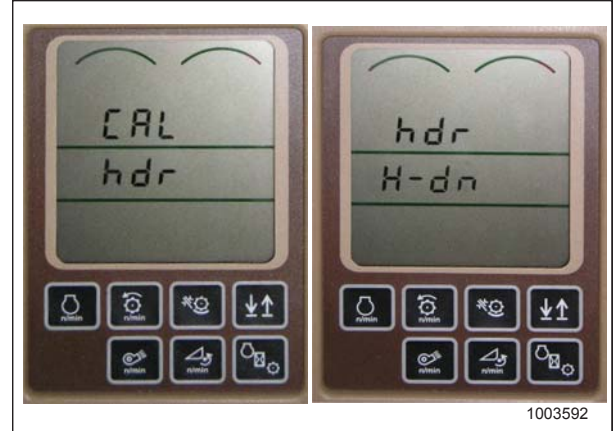


Figure 3.250: John Deere Combine Display

9. Fully lower feeder house to the ground.

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

10. Press the CAL button (A) to save the calibration of the header. HDR H-UP appears on the monitor.
11. Raise the header 3 feet off the ground and press the CAL button (A). EOC appears on the monitor.
12. Press the ENTER button (B) to save the calibration of the header. Your AHHC is now calibrated.

NOTE:

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to [Checking Voltage Range from the Combine Cab \(John Deere 60 Series\)](#), page 164.

NOTE:

After the calibration is complete, adjust combine operation settings to ensure proper field operation.

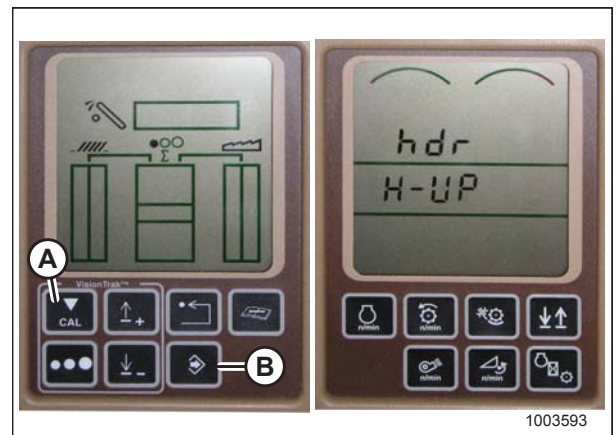


Figure 3.251: John Deere Combine Display

Turning the Accumulator Off (John Deere 60 Series)

The accumulator is a hydraulic device that cushions the shock of hydraulic fluid when installing a heavy header onto the combine.

NOTE:

The accumulator should not be used when operating the combine with a FD1 and FM100 attached.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 132 is displayed on the top portion of the monitor. This is the reading for the accumulator.
4. Press ENTER (D) to select 132 as the accumulator reading (this will allow you to change the display to a three-digit number so it has a 0 in it, for example, x0x).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL button (E).
6. Press ENTER (D) to save the changes. The accumulator is now deactivated.

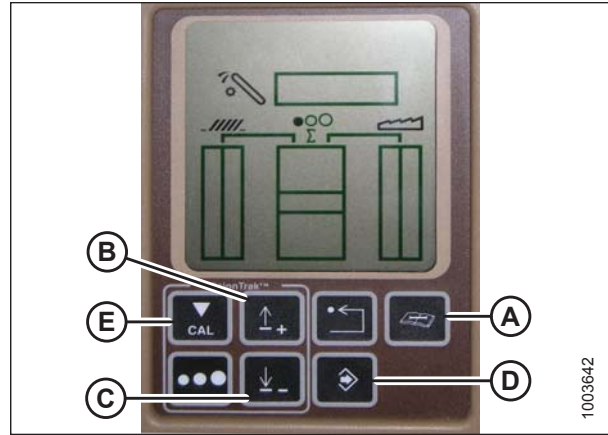


Figure 3.252: John Deere Combine Display

Setting the Sensing Grain Header Height to 50 (John Deere 60 Series)

In order for a John Deere 60 Series combine to accurately read the height sensors on a MacDon FD1 header, the combine's sensitivity needs to be set to 50.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

To set the sensing grain header height, follow these steps:

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 128 is displayed on the top portion of the monitor. This is the reading for the sensor.
4. Press ENTER (D) to select 128 as the sensor reading (this will allow you to change the display to a three-digit number so it has a 50 in it).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL button (E).
6. Press ENTER (D) to save the changes. The height is now set.

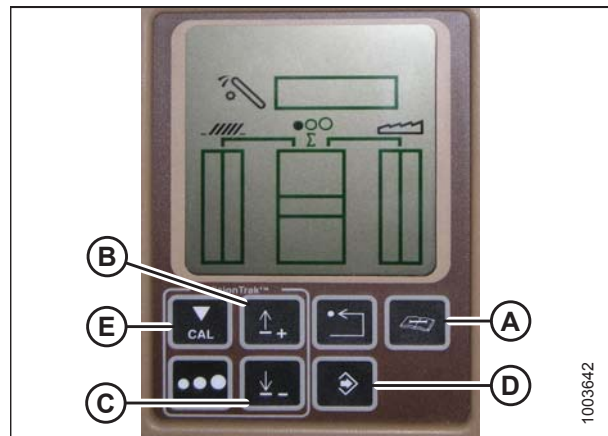


Figure 3.253: John Deere Combine Display

OPERATION

NOTE:

Do **NOT** use the active header float function (A) in combination with the MacDon auto header height control (AHHC)—the two systems will counteract one another. The header symbol (B) on the display should NOT have a wavy line under it and should appear exactly as shown on the Active Header Control Display in Figure 3.253, page 168.

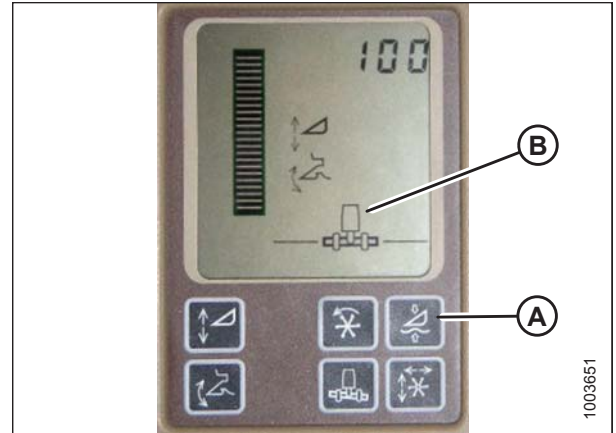


Figure 3.254: John Deere Combine Display

Setting the Sensitivity of the Auto Header Height Control (John Deere 60 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 display since this document was published. Refer to the combine operator's manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 112 is displayed on the monitor. This is your sensitivity setting.

NOTE:

The lower the reading, the higher the sensitivity. Ideal operating range is typically between 50 and 80.

4. Press ENTER (D) to select 112 as the sensitivity setting (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (C) until the desired number is displayed, then press the CAL button (E). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

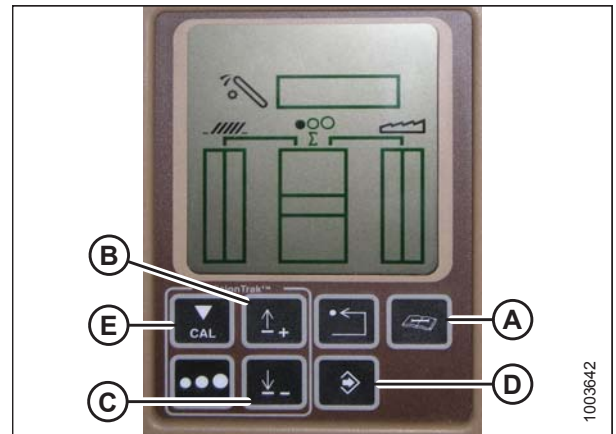


Figure 3.255: John Deere Combine Display

OPERATION

Adjusting the Threshold for the Drop Rate Valve (John Deere 60 Series)

This procedure explains how to adjust the point at which the restrictor valve opens allowing full flow to the lift cylinders.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor and press ENTER (C). This is the header adjustment.
3. Press the UP (B) or DOWN button until 114 is displayed on the top portion of the monitor. This is the setting that adjusts when the fast drop rate starts with respect to the dead band.

NOTE:

The default setting is 100. Ideal operating range is typically between 60 and 85.

4. Press ENTER (C) to select 114 as the fast drop rate (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (E) until the desired number is displayed, then press the CAL button (D). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (C) to save changes.

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

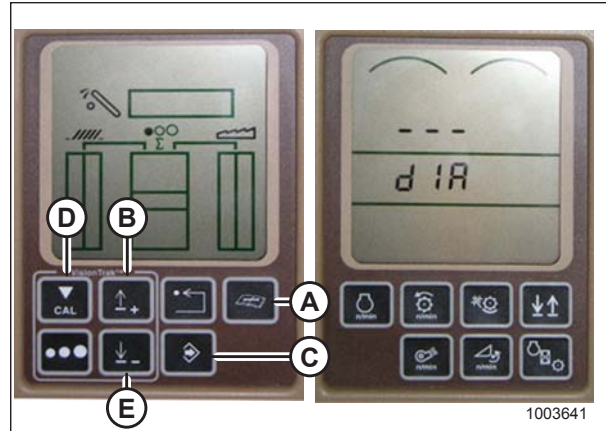


Figure 3.256: John Deere Combine Display

3.8.8 John Deere 70 Series Combines

Checking Voltage Range from the Combine Cab (John Deere 70 Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHC system.

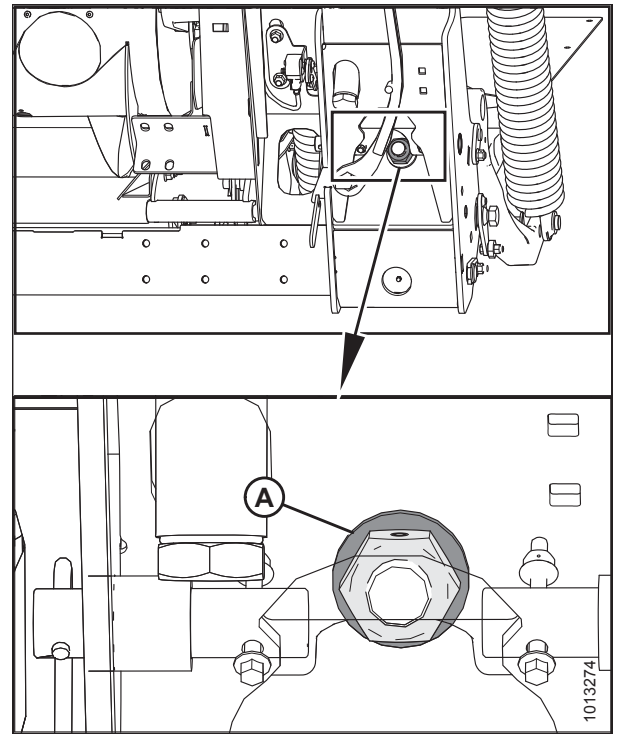


Figure 3.257: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

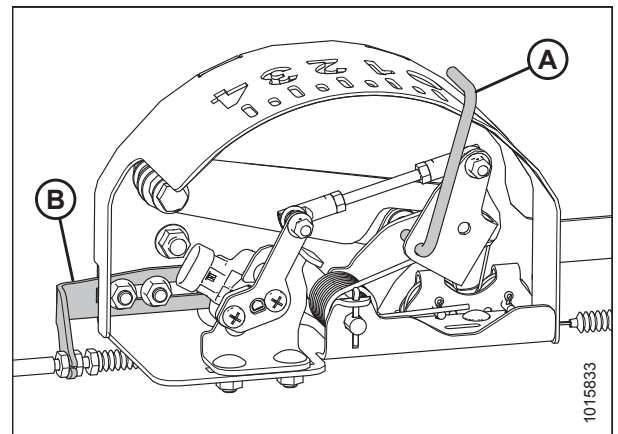


Figure 3.258: Float Indicator Box

OPERATION

4. Press the HOME PAGE button (A) on the main screen of the monitor.



Figure 3.259: John Deere Combine Display

5. Ensure the three icons (A) depicted in the illustration at right appear on the monitor.



Figure 3.260: John Deere Combine Display

6. Use scroll knob (A) to highlight the middle icon (the green i) and press the check mark button (B) to select it. This will bring up the Message Center.

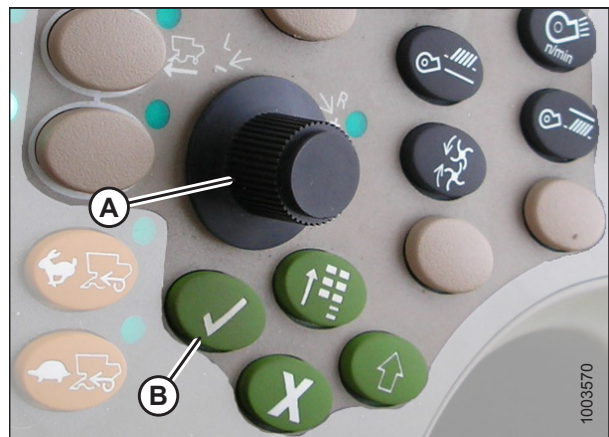


Figure 3.261: John Deere Combine Control Console

OPERATION

7. Use the scroll knob to highlight DIAGNOSTIC ADDRESSES (A) from the right column and select it by pressing the check mark button.
8. Use the scroll knob to highlight the drop-down box (B) and press the check mark button to select it.



Figure 3.262: John Deere Combine Display

9. Use the scroll knob to highlight LC 1.001 VEHICLE (A) and press the check mark button to select it.



Figure 3.263: John Deere Combine Display

10. Use the scroll knob to highlight the down arrow (A) and press the check mark button to scroll through the list until 029 DATA (B) is displayed and voltage reading (C) appears on the monitor.

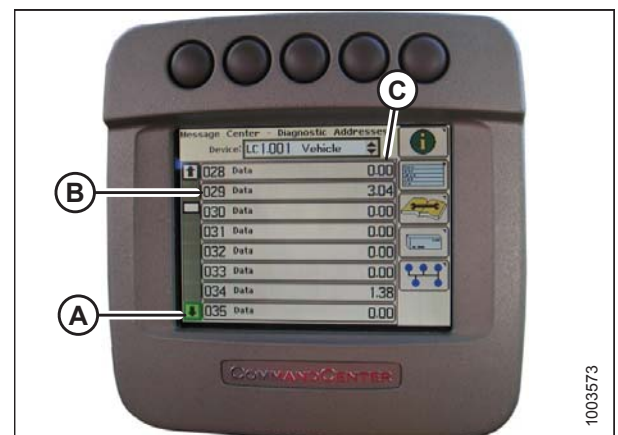


Figure 3.264: John Deere Combine Display

11. Ensure header float is unlocked.
12. Start the combine and fully lower feeder house to the ground.

OPERATION

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

13. Check the sensor reading on the monitor.
14. Raise the header so it is just off the ground and recheck the sensor reading.
15. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

Calibrating Feeder House Speed (John Deere 70 Series)

The feeder house speed must be calibrated before you calibrate the auto header height control (AHHC) system. Refer to the combine operator's manual for instructions.

Calibrating the Auto Header Height Control (John Deere 70 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Start the combine.
5. Press the button located fourth from the left along the top of the monitor (A) to select the icon that resembles an open book with a wrench on it (B).
6. Press the top button (A) a second time to enter diagnostics and calibration mode.



Figure 3.265: John Deere Combine Display

OPERATION

7. Select HEADER in box (A) by scrolling down to the box using the scroll knob, and then pressing the check mark button (knob and button are shown in Figure 3.267, page 175).
8. Scroll down to the lower right icon that resembles an arrow in a diamond (B) and press the check mark button to select it.



Figure 3.266: John Deere Combine Display

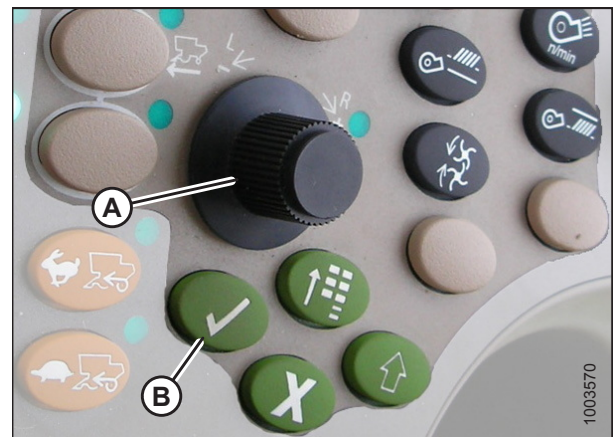


Figure 3.267: John Deere Combine Control Console

A - Scroll Knob

B - Check Mark Button

9. Follow the steps listed on the monitor to perform the calibration.

NOTE:

If an error code appears on screen, the sensor is not in the correct working range. Refer to [Checking Voltage Range from the Combine Cab \(John Deere S and T Series\)](#), page 178 to check and adjust the range.

Setting the Sensitivity of the Auto Header Height Control (John Deere 70 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press button (A) twice and the current sensitivity setting will appear on the monitor (the lower the reading, the lower the sensitivity).
2. Use scroll knob (B) to adjust the sensitivity setting. The adjustment will be saved automatically.

NOTE:

If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing the check mark button (C) also will return the monitor to the previous screen.

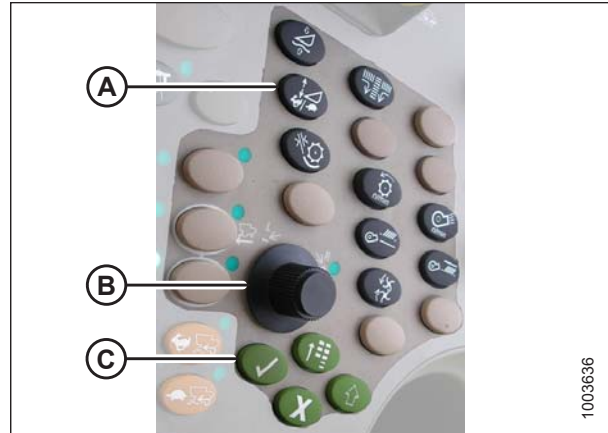


Figure 3.268: John Deere Combine Control Console

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.



Figure 3.269: John Deere Combine Display

Adjusting the Manual Header Raise/Lower Rate (John Deere 70 Series)

The weight of the header will dictate the rate at which the header can be raised or lowered during operation.

To manually adjust the header raise/lower rate, do the following steps:

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press button (A) and the current raise/lower rate setting will appear on the monitor (the lower the reading, the slower the rate).
2. Use scroll knob (B) to adjust the rate. The adjustment will be saved automatically.

NOTE:

If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing the check mark button (C) will also return the monitor to the previous screen.

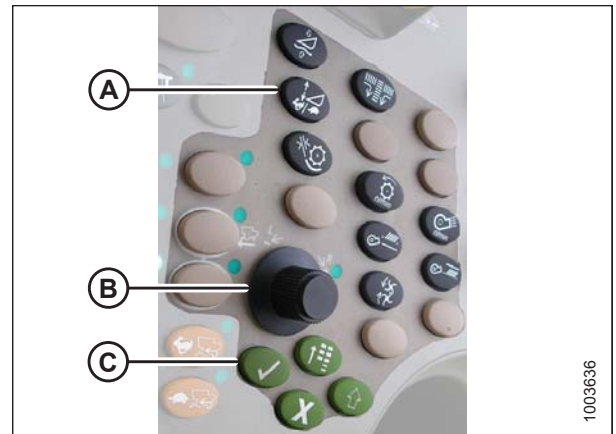


Figure 3.270: John Deere Combine Control Console

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.



Figure 3.271: John Deere Combine Display

3.8.9 John Deere S and T Series Combines

Checking Voltage Range from the Combine Cab (John Deere S and T Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

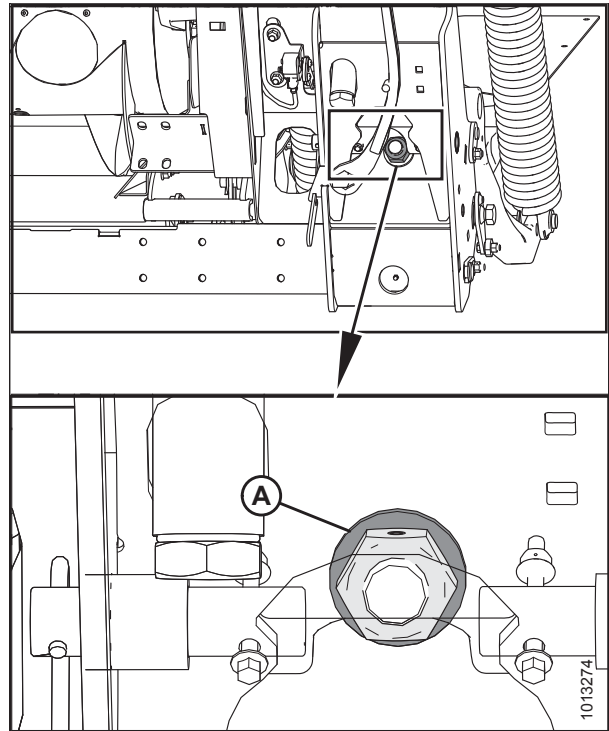


Figure 3.272: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

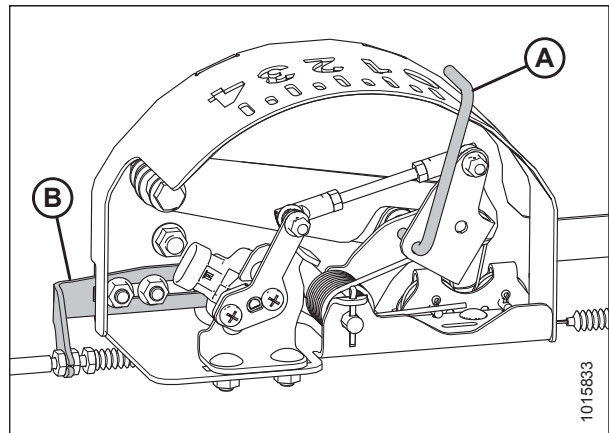


Figure 3.273: Float Indicator Box

OPERATION

4. Press the CALIBRATION icon (A) on the main screen of the monitor. The CALIBRATION screen appears.



Figure 3.274: John Deere Combine Display

5. Press the DIAGNOSTIC READINGS icon (A) on the CALIBRATION screen. The DIAGNOSTIC READINGS screen appears. This screen provides access to calibrations, header options, and diagnostic information.

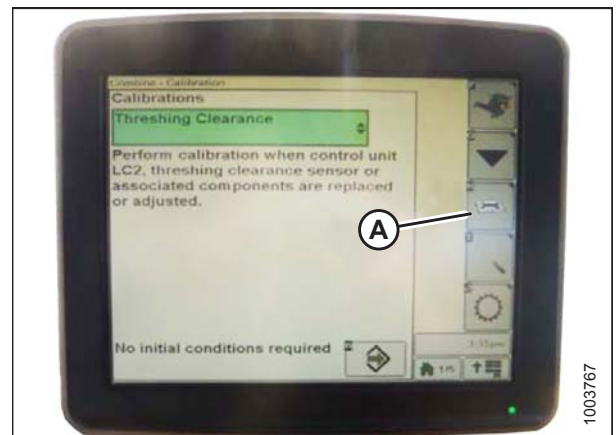


Figure 3.275: John Deere Combine Display

6. Select AHHC RESUME (A) and a list of calibration options appears.



Figure 3.276: John Deere Combine Display

OPERATION

7. Select the AHC SENSING option.
8. Press the icon that resembles an arrow in a box (A). The AHC SENSING menu appears and five screens of information are displayed.



Figure 3.277: John Deere Combine Display

9. Press icon (A) until it reads Page 5 near the top of the screen and the following sensor readings appear:
 - LEFT HEADER HEIGHT
 - CENTER HEADER HEIGHT
 - RIGHT HEADER HEIGHT

A reading is displayed for both left and right sensors. On the MacDon header, there may be one sensor located in the float indicator box (standard) or two sensors located at the back of the float module side frame (optional).



Figure 3.278: John Deere Combine Display

10. Ensure header float is unlocked.
11. Start the combine and fully lower feeder house to the ground.

NOTE:

You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

12. Check the sensor reading on the monitor.
13. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

Calibrating the Auto Header Height Control (John Deere S and T Series)

For best performance of the auto header height control (AHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Press the DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

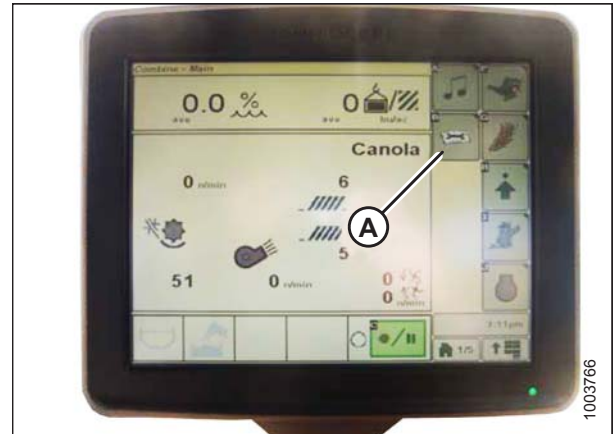


Figure 3.279: John Deere Combine Display

5. Select THRESHING CLEARANCE (A) and a list of calibration options appears.

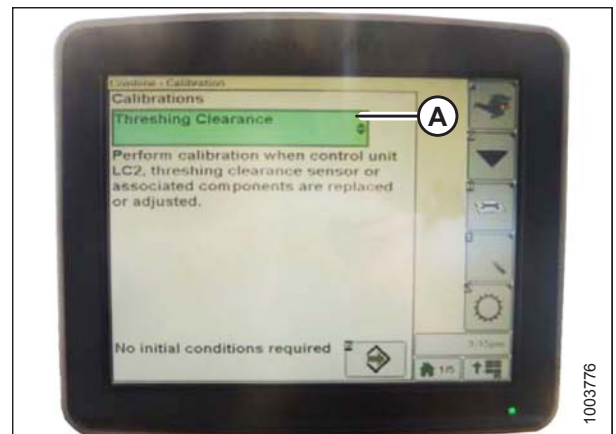


Figure 3.280: John Deere Combine Display

6. Select FEEDER HOUSE SPEED (A) and calibrate.
7. Select HEADER (B) and calibrate.

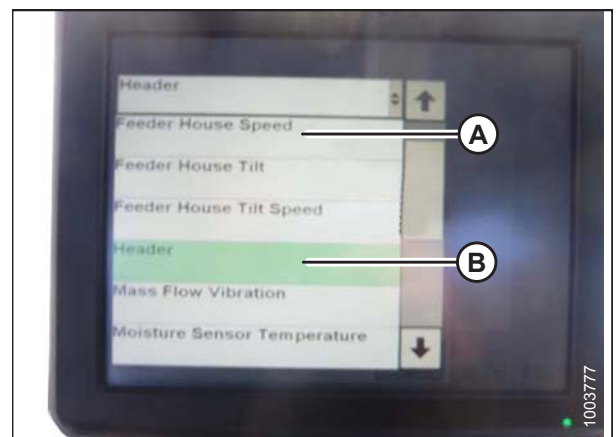


Figure 3.281: John Deere Combine Display

OPERATION

8. Press icon (A) with either FEEDER HOUSE SPEED or HEADER selected and the icon will turn green.

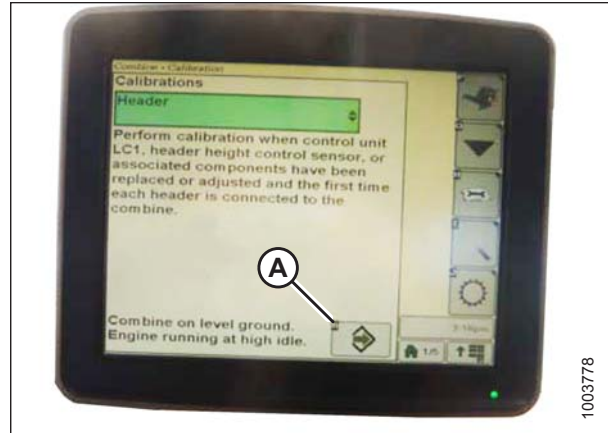


Figure 3.282: John Deere Combine Display

9. Click button (A) and instructions will appear on screen to guide you through the remaining calibration steps.

NOTE:

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to [Checking Voltage Range from the Combine Cab \(John Deere S and T Series\)](#), page 178.

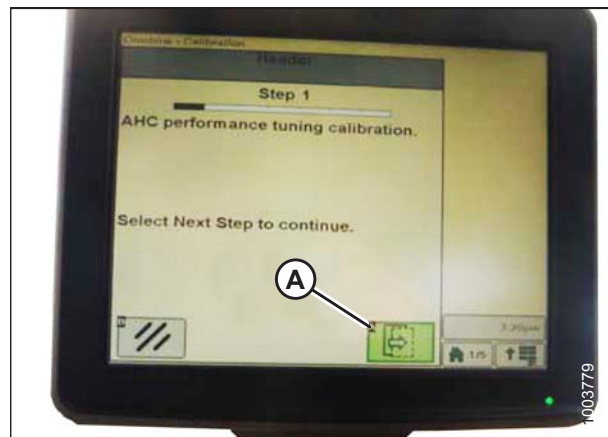


Figure 3.283: John Deere Combine Display

Setting the Sensitivity of the Auto Header Height Control (John Deere S and T Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHC) 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 display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press button (A) twice and the current sensitivity setting will appear on the monitor.



Figure 3.284: John Deere Combine Command Center

2. Press the – or + icon (A) to adjust rates.

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

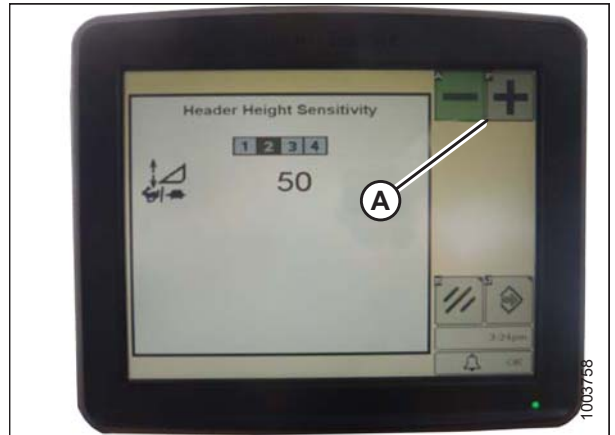


Figure 3.285: John Deere Combine Display

Adjusting the Manual Header Raise/Lower Rate (John Deere S and T Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press button (A) and the current sensitivity setting will appear on the monitor.



Figure 3.286: John Deere Combine Command Center

2. Press the – or + icon (A) to adjust rates.

NOTE:

The numbers depicted on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

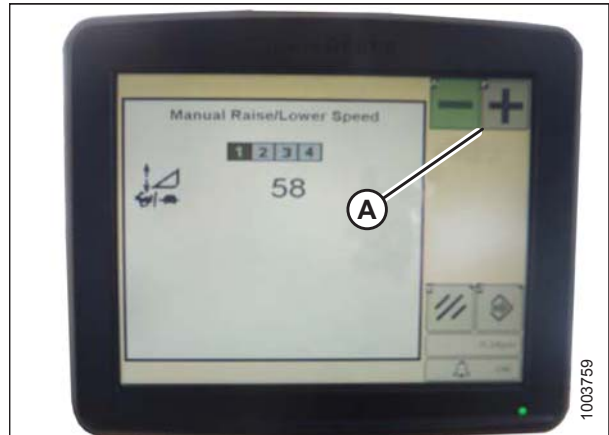


Figure 3.287: John Deere Combine Display

NOTE:

The indicator reading with the header off the ground [152 mm (6 in.)] should be at 0 (B). If not, refer to Step 4, page 112. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

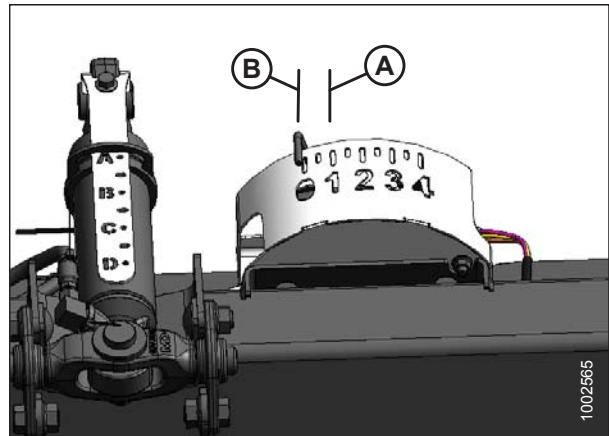


Figure 3.288: Float Indicator Box

Setting Preset Cutting Height (John Deere S Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Press the COMBINE – HEADER SETUP icon (A) on the main screen. The COMBINE – HEADER SETUP screen appears. This screen is used to set various header settings such as reel speed, header width, and height of feeder house for acre counter engagement.



Figure 3.289: Combine Display

2. Select the COMBINE – HEADER SETUP AHC icon (A). The COMBINE – HEADER SETUP AHC screen appears.



Figure 3.290: Combine Display

3. Select the top-left and top-center icons for auto height sensing and return to cut.

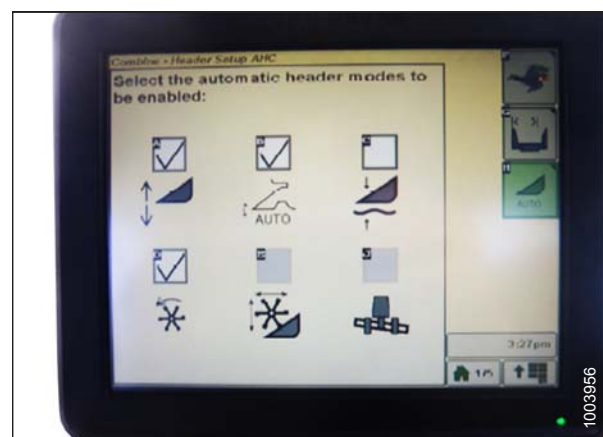


Figure 3.291: Combine Display

OPERATION

4. Select an appropriate ground pressure setting. Preset button 2 (B) on the joystick for a light ground pressure setting in muddy or soft soil conditions, or preset button 3 (C) for a heavy ground pressure setting in harder soil conditions and a faster ground speed.

NOTE:

Preset button 1 (A) is reserved for header lift on the headland and is not used for ground cutting.



Figure 3.292: Joystick Buttons

NOTE:

The indicator reading with the header off the ground (152 mm[6 in.]) should be at 0 (A). If not, refer to Step 4, [page 112](#). Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

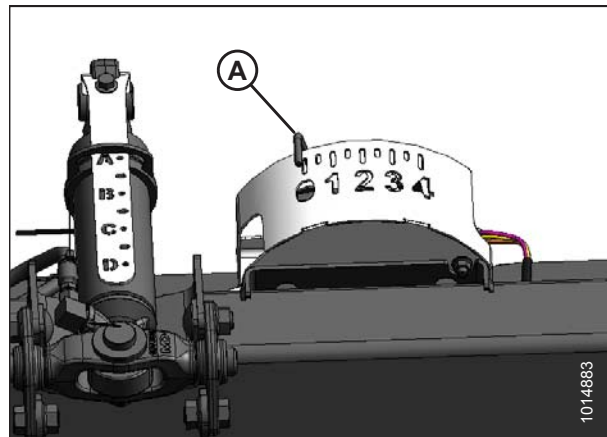


Figure 3.293: Float Indicator Box

5. Use control knob (A) to scroll through the different button options.



Figure 3.294: Combine Control Console

OPERATION

NOTE:

When the AHHC is engaged, the AHHC icon (A) appears on the monitor and the number indicating which button was pressed (B) is displayed on the screen.

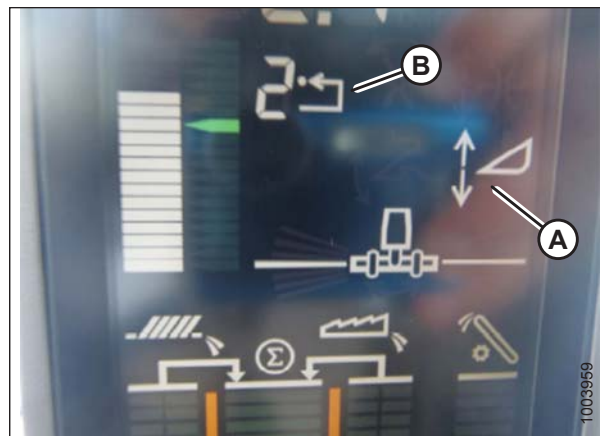


Figure 3.295: Combine Display

Calibrating Feeder House Fore-Aft Tilt Range (John Deere S and T Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

The feeder house fore/aft tilt is controlled by buttons (C) and (D) at the back of the hydro handle.



Figure 3.296: John Deere Hydro Handle

OPERATION

NOTE:

The feeder house fore/aft tilt controls can be changed to work with buttons E and F by pressing the hydro handle icon (A) and then selecting FEEDER HOUSE FORE/AFT TILT from the drop-down menu (B).

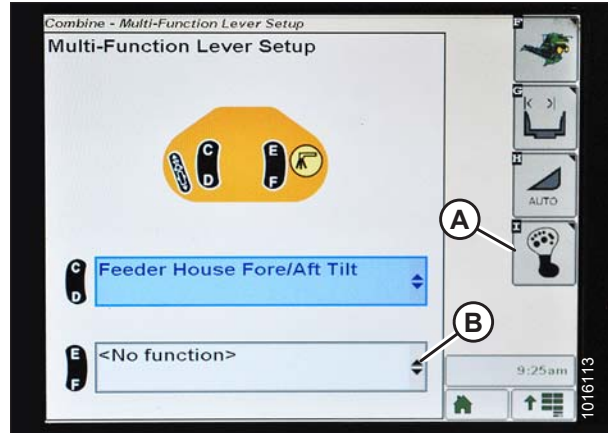


Figure 3.297: John Deere Combine Display

To calibrate the feeder house fore/aft tilt range, follow these steps:

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float module float.
3. Place wings in locked position.
4. Press the DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen displays.

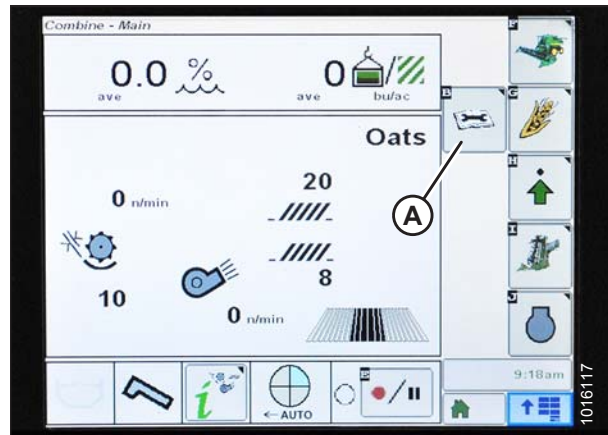


Figure 3.298: John Deere Combine Display

OPERATION

5. Select the CALIBRATIONS drop-down menu (A) to view the list of calibration options.

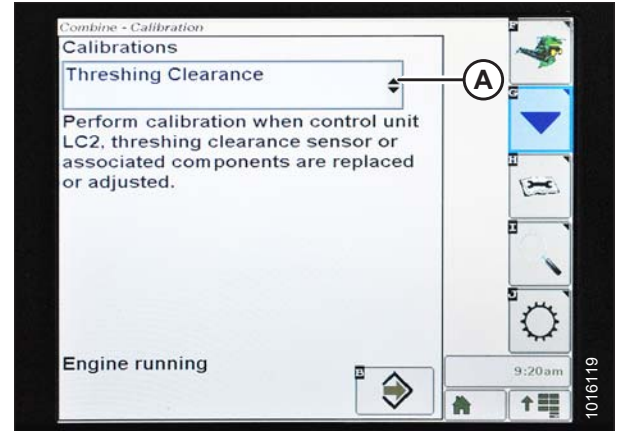


Figure 3.299: John Deere Combine Display

6. Press the arrow (A) to cycle up through the calibration options and select FEEDER HOUSE FORE/AFT TILT RANGE.

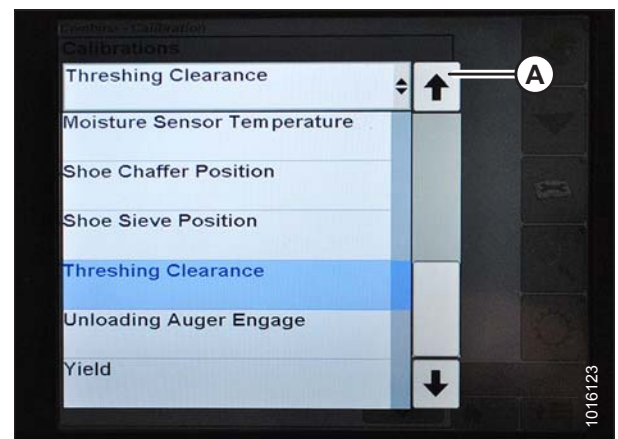


Figure 3.300: John Deere Combine Display

7. Press the ENTER icon (A).

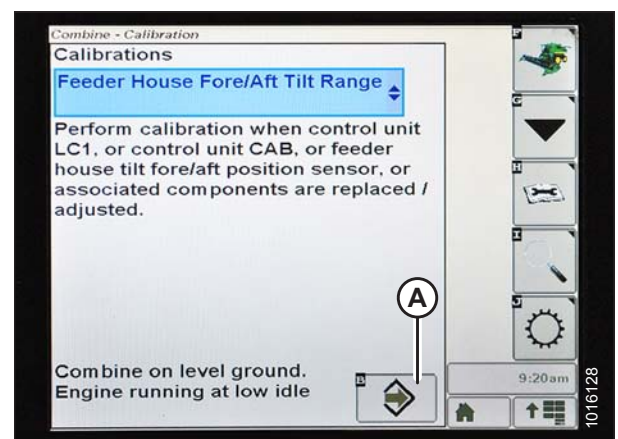


Figure 3.301: John Deere Combine Display

OPERATION

8. Follow the instructions that appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step.

NOTE:

If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. Refer to [Checking Voltage Range from the Combine Cab \(John Deere S and T Series\)](#), page 178.

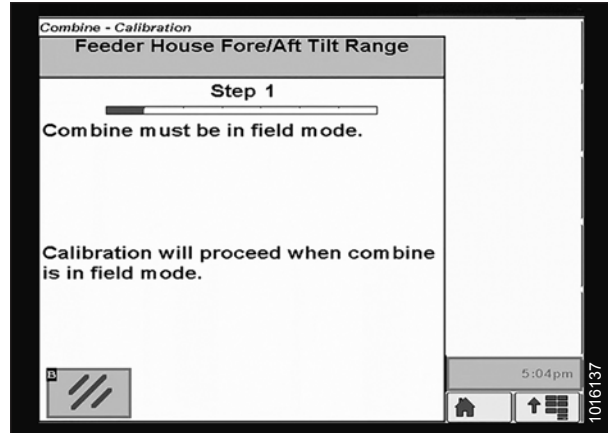


Figure 3.302: John Deere Combine Display

3.8.10 CLAAS 500 Series Combines

Calibrating the Auto Header Height Control (CLAAS 500 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Use the < key (A) or > key (B) to select AUTO HEADER, and press the OK key (C). The E5 screen displays whether the automatic header height is on or off.

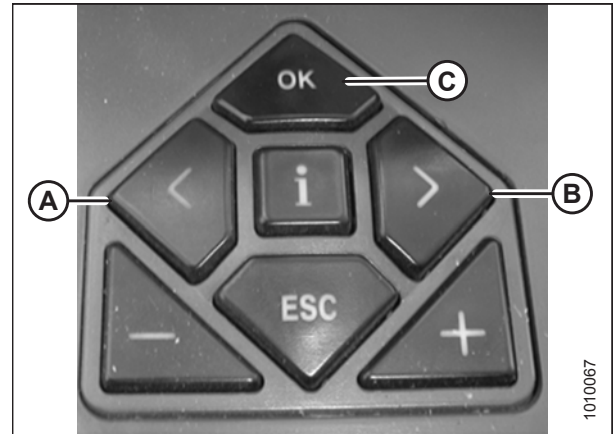


Figure 3.303: CLAAS Combine Controls

3. Use the – key (A) or the + key (B) to turn the AHHC on, and press the OK key (C).
4. Engage the threshing mechanism and the header.

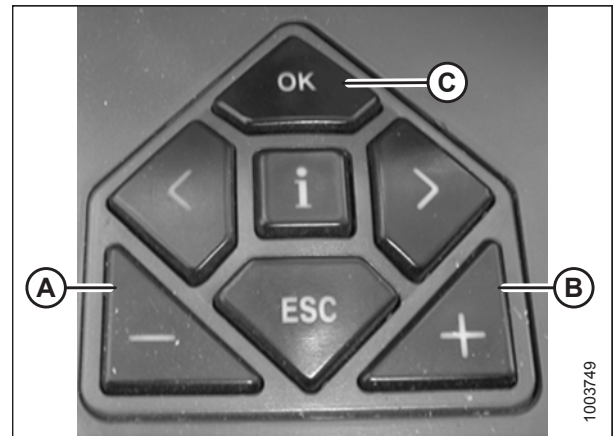


Figure 3.304: CLAAS Combine Controls

OPERATION

5. Use the < or > key to select CUTT.HEIGHT LIMITS, and press the combine controls OK key.
6. Follow the procedure displayed on the screen to program the upper and lower limits of the header into the CEBIS.

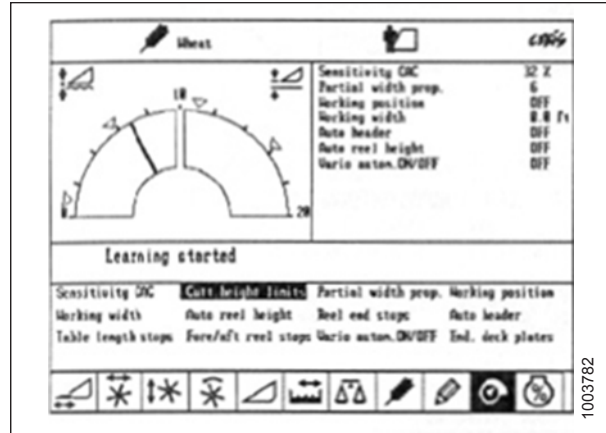


Figure 3.305: CLAAS Combine Display

7. Use the < or > key to select SENSITIVITY CAC, and press the combine controls OK key.

NOTE:

Setting the sensitivity of the AHHC system impacts the reaction speed of the AHHC on the header.

8. Use the – key or the + key to change the setting of the reaction speed, and press the combine controls OK key.

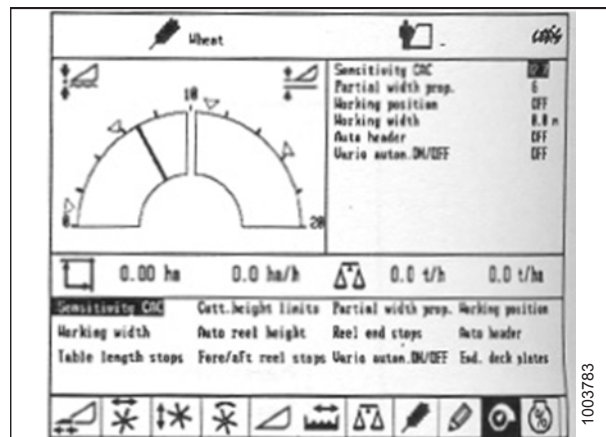


Figure 3.306: CLAAS Combine Display

9. Use line (A) or value (B) to determine the sensitivity setting.

NOTE:

The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

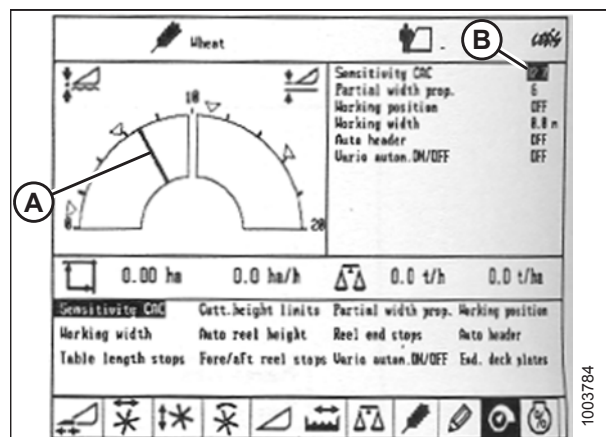


Figure 3.307: CLAAS Combine Display

OPERATION

Setting Cutting Height (CLAAS 500 Series)

Cutting heights can be programmed into the preset cutting height and auto contour systems. Use the preset cutting height system for cutting heights above 150 mm (6 in.), and use the auto contour system for cutting heights below 150 mm (6 in.).

Setting Preset Cutting Height (CLAAS 500 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Start the engine.
2. Activate the machine enable switch.
3. Engage the threshing mechanism.
4. Engage the header.
5. Briefly press button (A) in order to activate the auto contour system, or briefly press button (B) in order to activate the preset cutting height system.

NOTE:

Button (A) is used only with auto header height control (AHHC) function. Button (B) is used only with the return to cut function.



Figure 3.308: Joystick Buttons

6. Use the < key (C) or > key (D) to select the CUTTING HEIGHT screen, and press the OK key (E).
7. Use the – key (A) or the + key (B) to set the desired cutting height. An arrow indicates the selected cutting height on the scale.

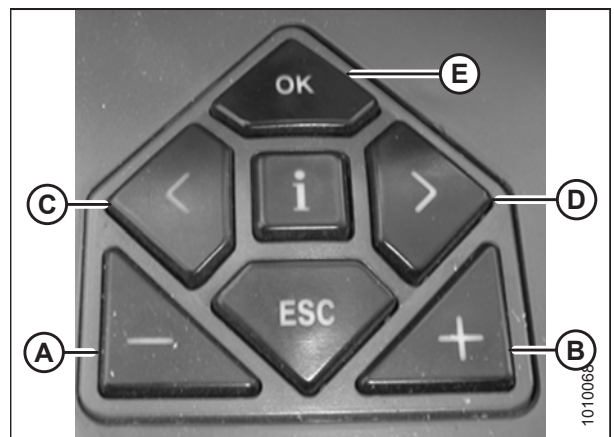


Figure 3.309: CLAAS Combine Controls

OPERATION

- Briefly press button (A) or button (B) in order to select the set point.
- Repeat Step 7, page 193 for the set point.



Figure 3.310: Joystick Buttons

Setting Cutting Height Manually (CLAAS 500 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

- Use button (A) to raise the header or button (B) to lower the header to the desired cutting height.
- Press and hold button (C) for 3 seconds to store the cutting height into the CEBIS (an alarm will sound when the new setting has been stored).
- Program a second set point, if desired, by using button (A) to raise the header or button (B) to lower the header to the desired cutting height, and briefly press button (C) to store the second set point into the CEBIS (an alarm will sound when the new setting has been stored).

NOTE:

For above the ground cutting, repeat Step 1, page 194, and use button (D) instead of button (C) while repeating Step 2, page 194.



Figure 3.311: Joystick Buttons

Setting the Sensitivity of the Auto Header Height Control (CLAAS 500 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small

OPERATION

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:

The upper and lower limits of the header must be programmed into the CEBIS before adjusting the sensitivity of the AHHC system. The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use the < key (C) or the > key (D) to select SENSITIVITY CAC, and press the OK key (E).
2. Use the – key (A) or the + key (B) to change the reaction speed setting, and press the OK key (E).

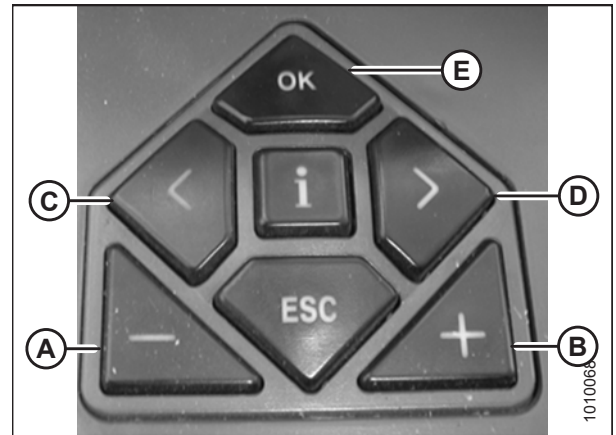


Figure 3.312: CLAAS Combine Controls

3. Use line (A) or value (B) to determine the sensitivity setting.

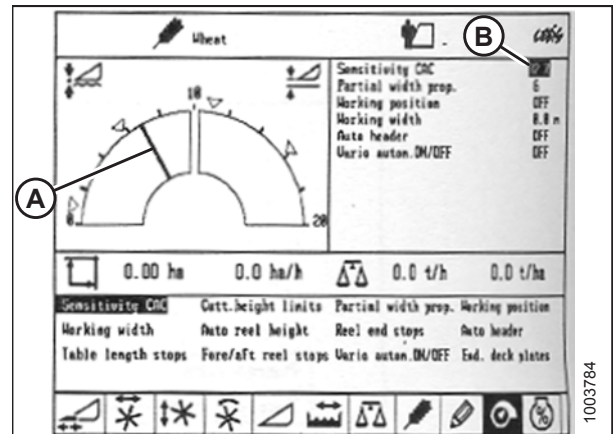
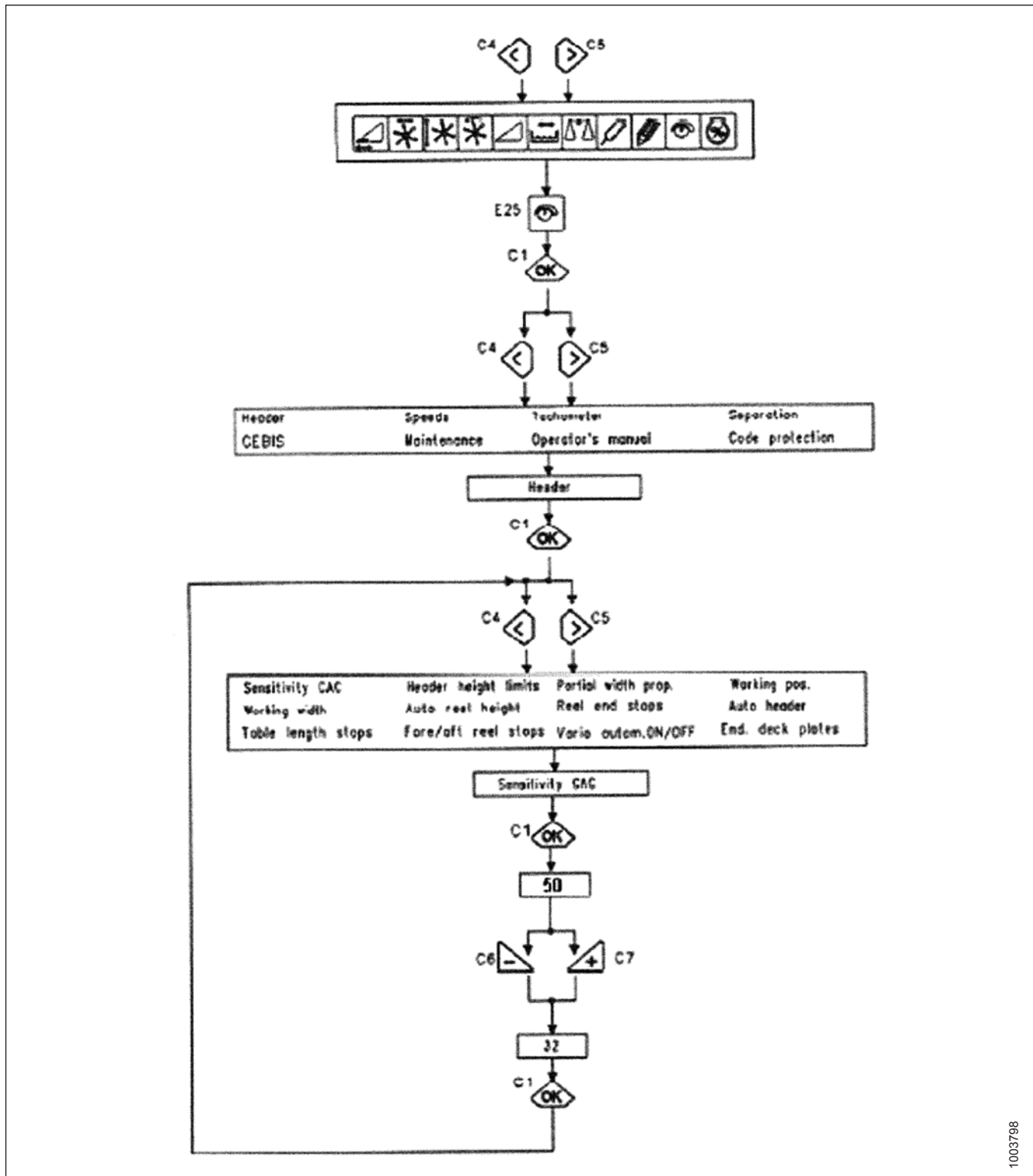


Figure 3.313: CLAAS Combine Display

OPERATION

Figure 3.314: Flow Chart for Setting the Sensitivity of the Float Optimizer



OPERATION

Adjusting Auto Reel Speed (CLAAS 500 Series)

The preset reel speed can be set when the automatic header functions are activated.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use the < or > key to select REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.

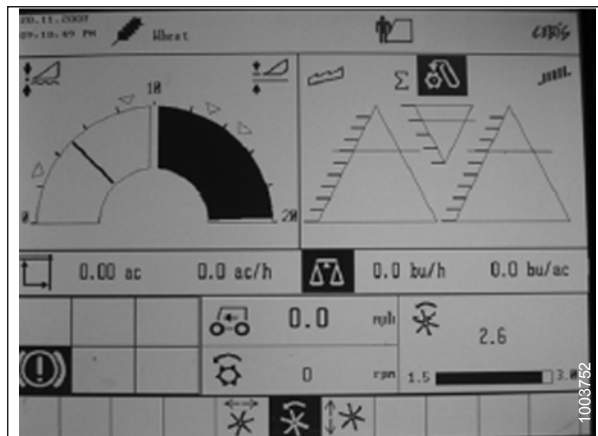


Figure 3.315: CLAAS Combine Display

2. Press the OK key (C) to open the REEL SPEED window.
3. Use the – key (A) or the + key (B) to set the reel speed in relation to the current ground speed. Window E15 will display the selected reel speed.

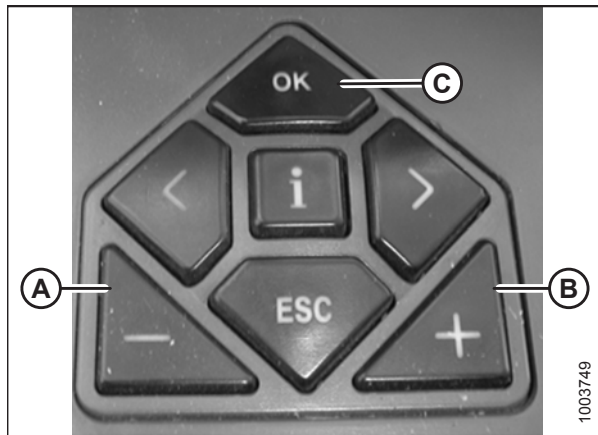


Figure 3.316: CLAAS Combine Controls

OPERATION

4. Manually adjust the reel speed by rotating the rotary switch to the reel position (A), and then use the – or + key to set the reel speed.



Figure 3.317: CLAAS Combine Rotary Switch

5. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

NOTE:

Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.



Figure 3.318: CLAAS Joystick Buttons

OPERATION

6. Use the < or > key to select the REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.



Figure 3.319: CLAAS Combine Display

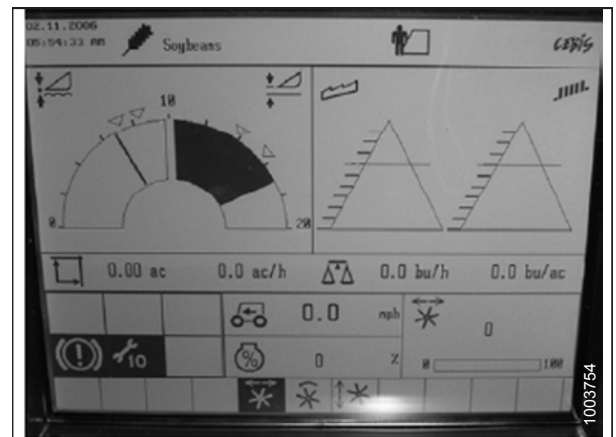


Figure 3.320: CLAAS Combine Display

7. Press the OK key (E), and use the < key (C) or the > key (D) to select the REEL FORE AND AFT window.
8. Use the – key (A) or the + key (B) to set the reel fore-aft position.

NOTE:

Joystick button (A) or button (B) also can be used to set the reel fore-aft position.

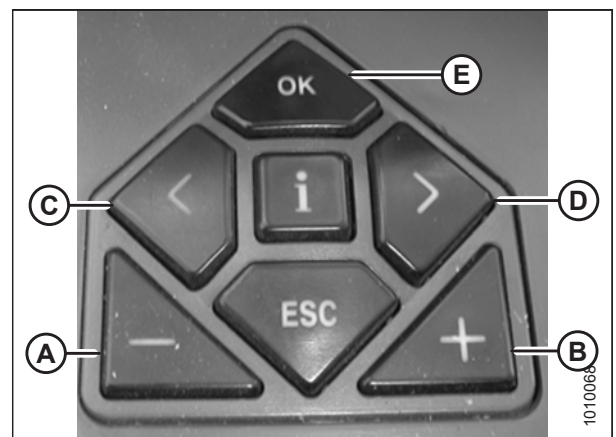


Figure 3.321: CLAAS Combine Controls

OPERATION

9. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

NOTE:

Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.



Figure 3.322: CLAAS Joystick Buttons

3.8.11 CLAAS 600 and 700 Series Combines

Calibrating the Auto Header Height Control (CLAAS 600 and 700 Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Ensure center-link is set to D.
2. Ensure that the header float is unlocked (A).
3. Use control knob (A) to highlight the AUTO CONTOUR icon (B) and press control knob (A) to select it.

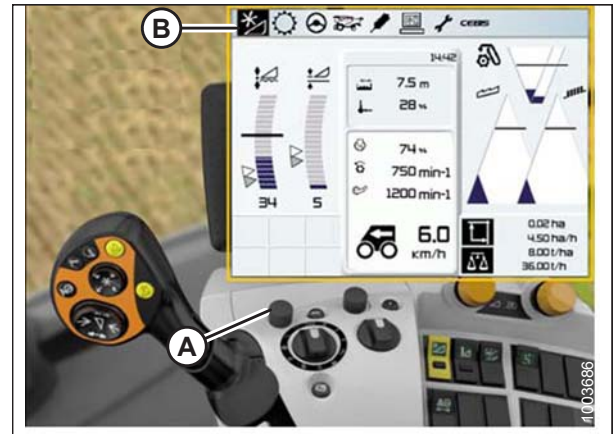


Figure 3.323: CLAAS Combine Display, Console, and Joystick Lever

4. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (not shown), and press control knob (A) to select it. The highlighted header icon (B) will be displayed on the screen.



Figure 3.324: CLAAS Combine Display, Console, and Joystick Lever

OPERATION

5. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (C), and press control knob (A) to select it.

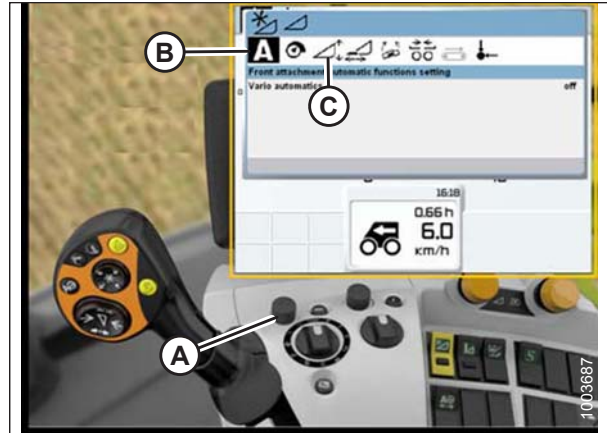


Figure 3.325: CLAAS Combine Display, Console, and Joystick Lever

6. Use control knob (A) to highlight the icon that resembles a screwdriver (B).
7. Engage the combine separator and feeder house.
8. Press control knob (A) and a progress bar chart will appear.



Figure 3.326: CLAAS Combine Display, Console, and Joystick Lever

9. Fully raise the feeder house. The progress bar chart will advance to 25% (A).
10. Fully lower the feeder house. The progress bar chart will advance to 50%.
11. Fully raise the feeder house. The progress bar chart will advance to 75%.
12. Fully lower the feeder house. The progress bar chart will advance to 100%.



Figure 3.327: CLAAS Combine Display, Console, and Joystick Lever

OPERATION

13. Ensure the progress bar chart displays 100% (A). The calibration procedure is now complete.

NOTE:

If the voltage is not within the range of 0.5–4.5 volts at any time throughout the calibration process, the monitor will indicate learning procedure not concluded.

NOTE:

If header float is set too light, an error message will appear. Back float off three full-turns of the adjuster bolts to adjust float to approximately 45–57 kg (100–125 lb.).



Figure 3.328: CLAAS Combine Display, Console, and Joystick Lever

Setting Cutting Height (CLAAS 600 and 700 Series)

CAUTION

Check to be sure all bystanders have cleared the area.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Lower the header to desired cutting height or ground pressure setting. The float indicator box should be set to 1.5.
2. Hold the left side of the header raise and lower switch (A) until you hear a ping.

NOTE:

You can set two different cutting heights.



Figure 3.329: CLAAS Combine Display, Console, and Joystick Lever

Setting the Sensitivity of the Auto Header Height Control (CLAAS 600 and 700 Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

OPERATION

1. Use control knob (A) to highlight the HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.
2. Select HEADER icon.

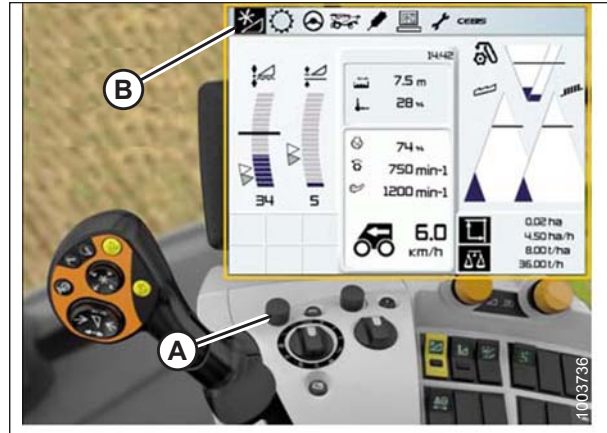


Figure 3.330: CLAAS Combine Display, Console, and Joystick Lever

3. Select the FRONT ATTACHMENT PARAMETER SETTINGS icon (A). A list of settings appears.
4. Select SENSITIVITY CAC (B) from the list.



Figure 3.331: CLAAS Combine Display, Console, and Joystick Lever

5. Select the SENSITIVITY CAC icon (A).

NOTE:

To set the sensitivity, you will have to change the CUTTING HEIGHT ADJUSTMENT (B) from the 0 default. The settings from 1–50 provide a faster response, whereas the settings from -1 to -50 provide a slower response. For best results, make adjustments in increments of five.

6. Increase the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too slow while cutting on the ground, and decrease the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too fast.
7. Increase the sensitivity if the header is lowered too slowly, and decrease the sensitivity if the header hits the ground too hard or is lowered too quickly.



Figure 3.332: CLAAS Combine Display

OPERATION

Adjusting Auto Reel Speed (CLAAS 600 and 700 Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

1. Use control knob (A) to highlight the HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.

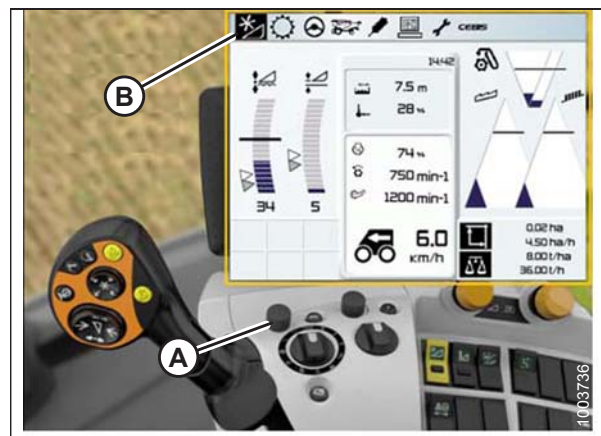


Figure 3.333: CLAAS Combine Display, Console, and Joystick Lever

2. Use control knob (A) to select REEL SPEED (B), and adjust the reel speed (if you are NOT using Auto Reel Speed). A graph displays in the dialog box.



Figure 3.334: CLAAS Combine Display, Console, and Joystick Lever

OPERATION

3. Select ACTUAL VALUE (A) from the AUTO REEL SPEED dialog box (if you are using Auto Reel Speed). The ACTUAL VALUE dialog box indicates the auto reel speed.



Figure 3.335: CLAAS Combine Display, Console, and Joystick Lever

4. Use control knob (A) to raise or lower the reel speed.

NOTE:

This option is only available at full throttle.



Figure 3.336: CLAAS Combine Display, Console, and Joystick Lever

NOTE:

The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to Step 4, page 112. Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

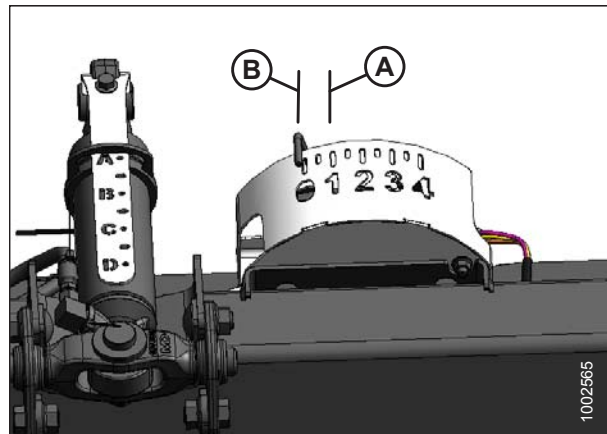


Figure 3.337: Float Indicator Box

3.8.12 New Holland Combines (CR/CX Series—Pre-2015 Model Year)

This section applies only to pre-2015 CR/CX models. For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

Checking Voltage Range from the Combine Cab (New Holland)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

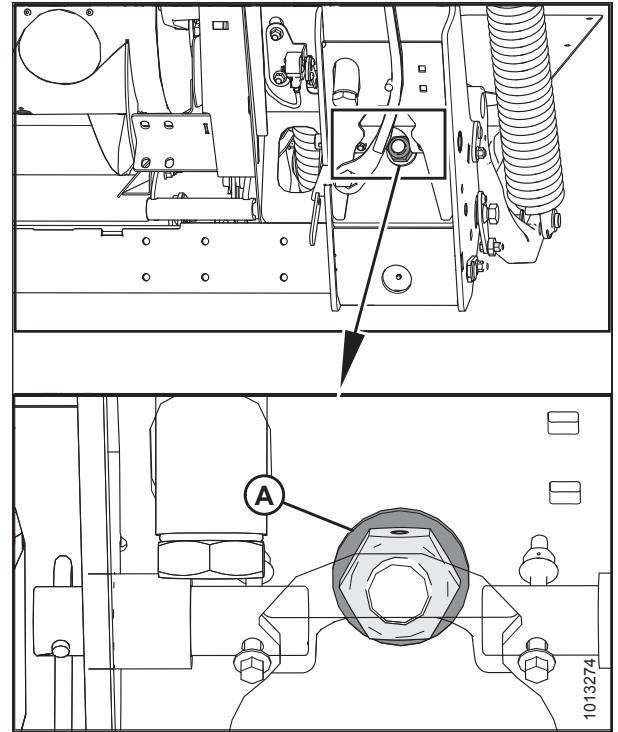


Figure 3.338: Float Lock

OPERATION

- Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

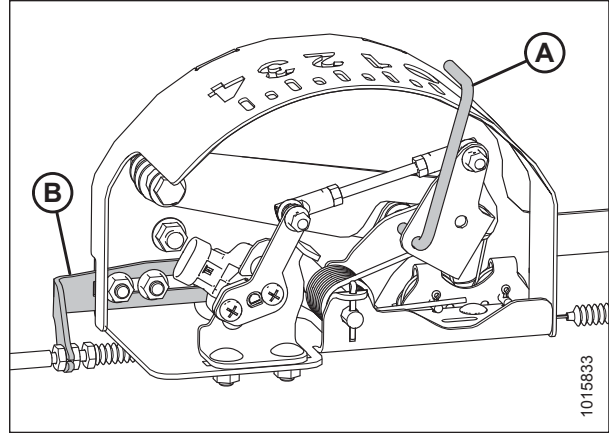


Figure 3.339: Float Indicator Box

- Ensure header float is unlocked.
- Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.
- Select SETTINGS. The SETTINGS screen displays.

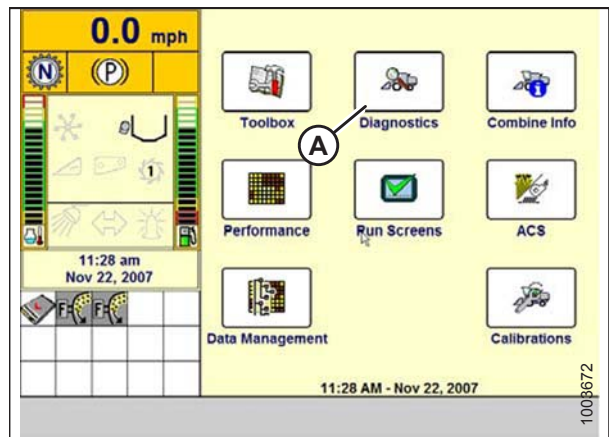


Figure 3.340: New Holland Combine Display

- Select the GROUP drop-down arrow (A). The GROUP dialog box displays.

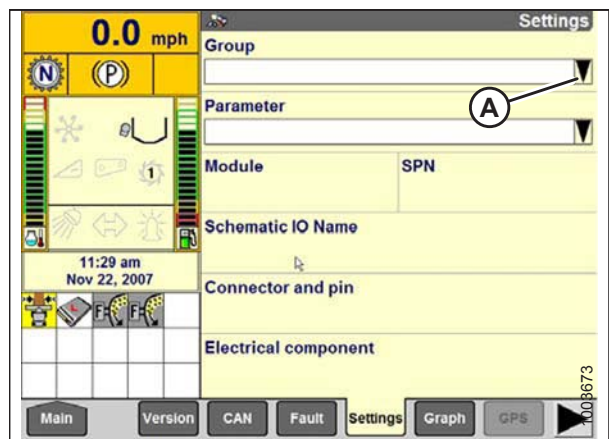


Figure 3.341: New Holland Combine Display

OPERATION

8. Select HEADER HEIGHT/TILT (A). The PARAMETER screen displays.

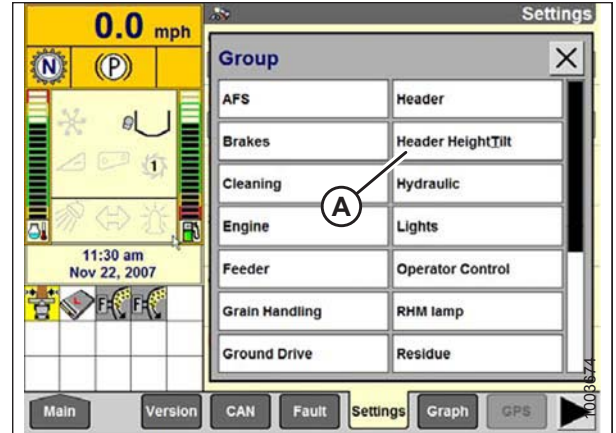


Figure 3.342: New Holland Combine Display

9. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at the top of the screen.
10. Raise and lower the header to see the full range of voltage readings.

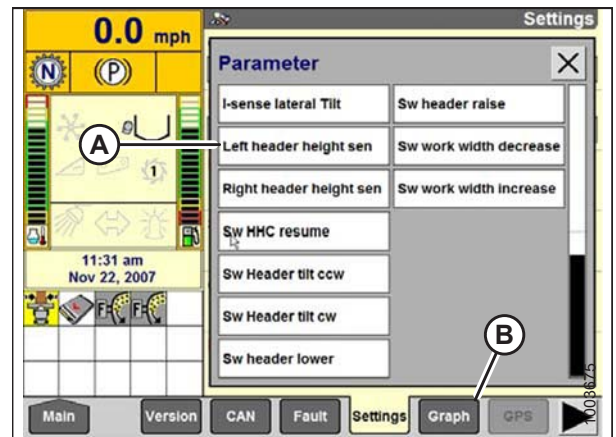


Figure 3.343: New Holland Combine Display

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

Engaging the Auto Header Height Control (New Holland CR/CX Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\), page 216](#).

OPERATION

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.

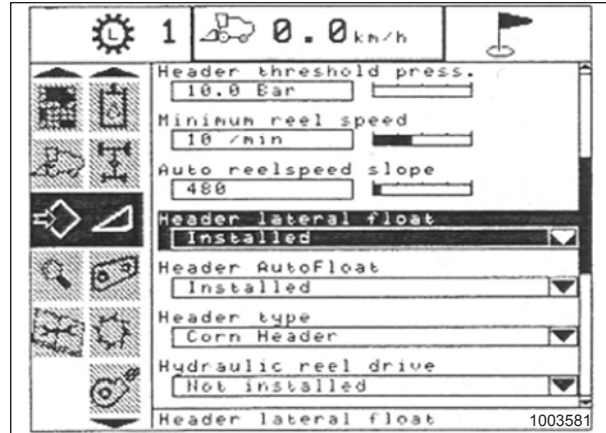


Figure 3.344: New Holland Combine Display

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



Figure 3.345: New Holland Combine Display

Calibrating the Auto Header Height Control (New Holland CR/CX Series)

For best performance of the auto header height control (AHH), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\), page 216](#).

CAUTION

Check to be sure all bystanders have cleared the area.

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.

OPERATION

- 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.
- Header/feeder is disengaged.
- Lateral flotation buttons are NOT pressed.
- 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 options.

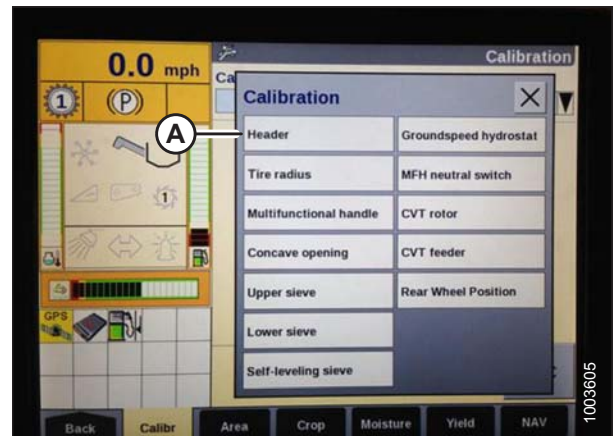


Figure 3.346: New Holland Combine Display

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.

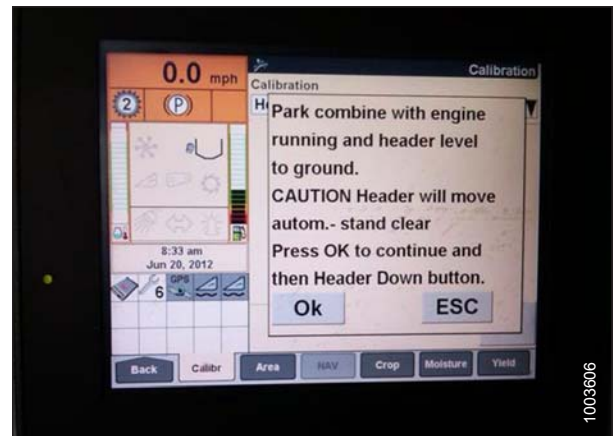


Figure 3.347: New Holland Combine Display

4. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

NOTE:

If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.

5. If the unit does not function properly, conduct the maximum stubble height calibration.

OPERATION

Calibrating Maximum Stubble Height

This procedure describes how to calibrate the area counter to stop or start counting at the correct height. Program the header to a height that will never be reached while cutting. The area counter will stop counting when the header is above the programmed height, and will begin counting when the header is below the programmed height.

Select the height of the header that corresponds to the description above.

IMPORTANT:

- If the value is set too low, area may NOT be counted 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.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Select the MAXIMUM STUBBLE HEIGHT calibration dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

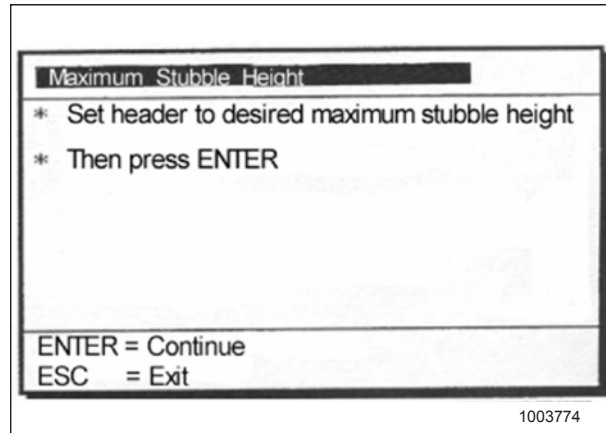


Figure 3.348: New Holland Calibration Dialog Box

2. Move header to the correct position using the header up or down control switch on the multifunction handle.
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.

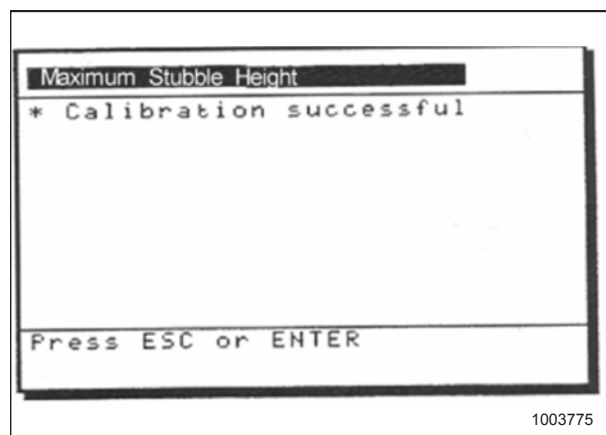


Figure 3.349: New Holland Calibration Dialog Box

OPERATION

Adjusting Header Raise Rate (New Holland CR/CX Series)

If necessary, the header raise rate (the first speed on the HEADER HEIGHT rocker switch of the multifunctional handle) can be adjusted.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

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 steps of 34. The factory setting is 100.

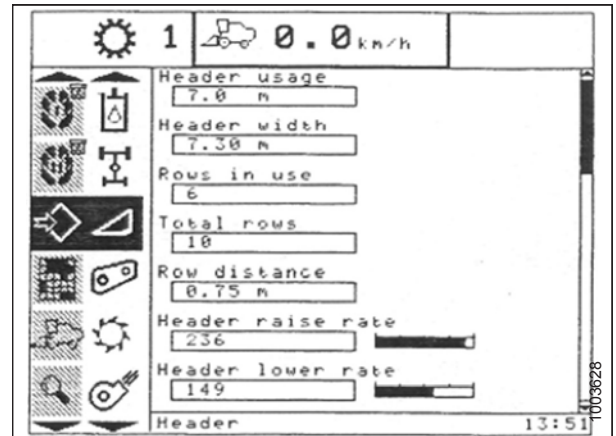


Figure 3.350: New Holland Combine Display

Setting the Header Lower Rate (New Holland CR/CX Series)

If necessary, the header lower rate (the automatic header height control button or second speed on the header height rocker switch of the multi-function handle) can be adjusted.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

OPERATION

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 lower rate can be changed from 2–247 in steps of 7. It is factory-set to 100.

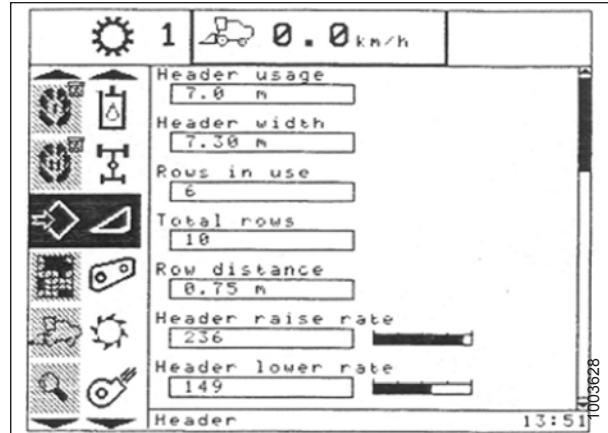


Figure 3.351: New Holland Combine Display

Setting the Sensitivity of the Auto Header Height Control (New Holland CR/CX Series)

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Engage threshing and feeder house.
2. Select HEIGHT SENSITIVITY on the combine display screen.
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 steps of 10. It is factory-set to 100.



Figure 3.352: New Holland Combine Display

OPERATION

Setting Preset Cutting Height (New Holland CR/CX Series)

To set the preset cutting height, follow these steps:

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

NOTE:

For New Holland CR models 6.80, 6.90, 7.90, 8.90, 9.90, and 10.90, refer to [3.8.13 New Holland Combines \(CR Series—Model Year 2015 and Later\)](#), page 216.

1. Engage the threshing mechanism and the feeder with switches (A) and (B).
2. Set HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT MODE position (A) or (B).
3. Lower the header to the desired cutting height using the HEADER HEIGHT AND HEADER LATERAL FLOTATION rocker switch (C).
4. Press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.

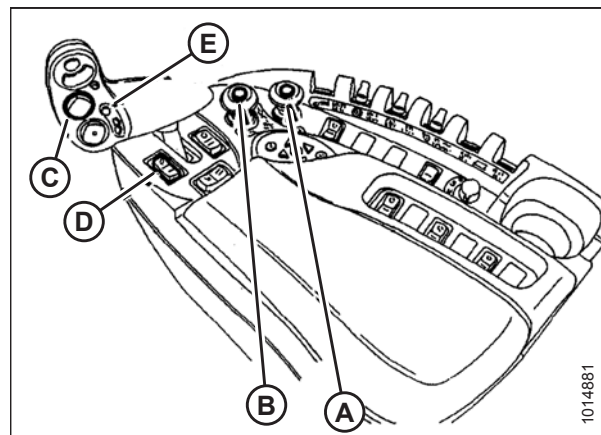


Figure 3.353: New Holland Combine Controls

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. To change one of the memorized header height set points while the combine is in use, use the HEADER HEIGHT AND HEADER LATERAL FLOTATION rocker switch (C) (slow up/down) to raise or lower header to the desired value. Press the AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the new height position. A beep will confirm setting.

NOTE:

Do not press too hard on AUTOMATIC HEADER HEIGHT CONTROL button (E), or float mode will be disengaged.

NOTE:

It is not necessary to press rocker switch (D) again after adjusting.

OPERATION

NOTE:

The indicator reading with the header off the ground (152 mm [6 in.]) should be at 0 (B). If not, refer to [Step 4, page 112](#). Ground and crop conditions will dictate what number you will need to be set at. A reading at 1 (A) is set to light and 4 is set to heavy. The ideal setting is as light as possible without bouncing or missing crop. Operating with heavier pressures can wear the cutterbar wearplate prematurely.

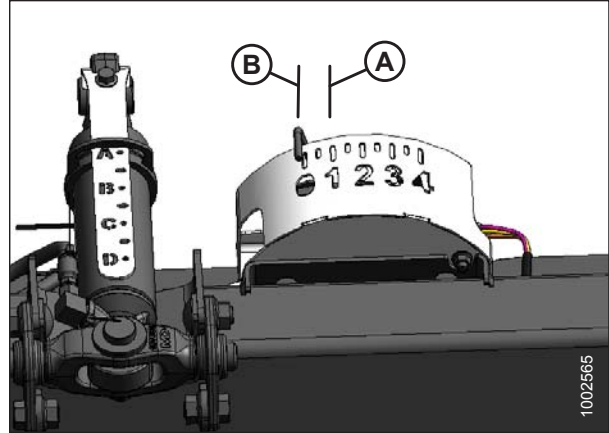


Figure 3.354: Float Indicator Box

3.8.13 New Holland Combines (CR Series—Model Year 2015 and Later)

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\)](#), [page 207](#).

Checking Voltage Range from the Combine Cab (New Holland CR Series)

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\)](#), [page 207](#).



CAUTION

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float module float.

OPERATION

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:

If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHC system.

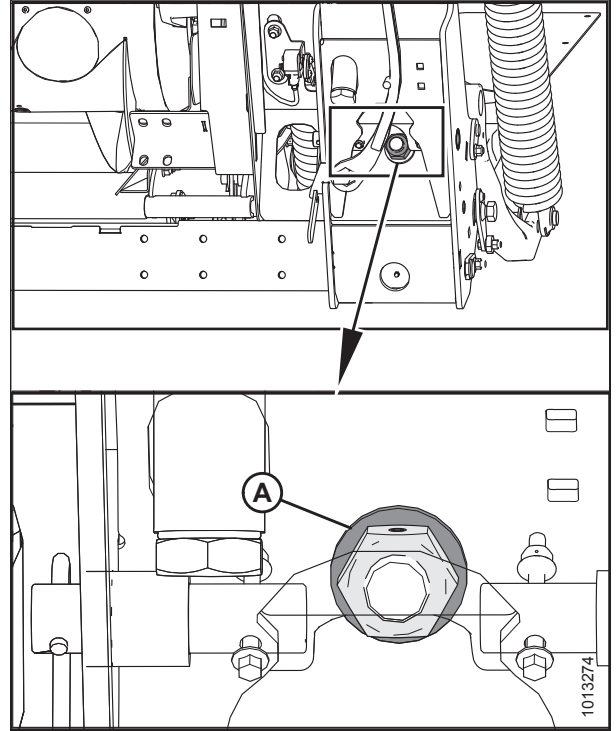


Figure 3.355: Float Lock

3. Adjust the cable take-up bracket (B) (if necessary) until the pointer (A) on the float indicator is on 0.

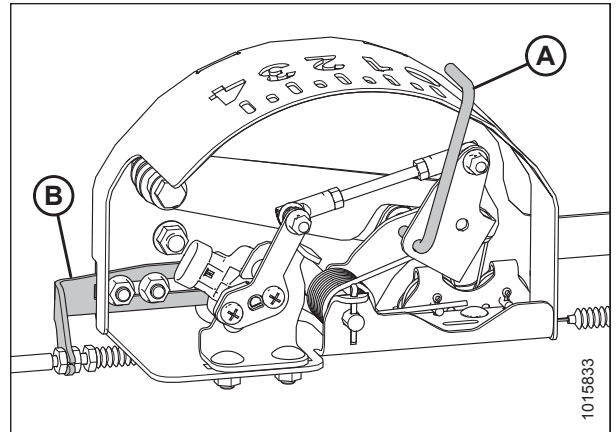


Figure 3.356: Float Indicator Box

OPERATION

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.

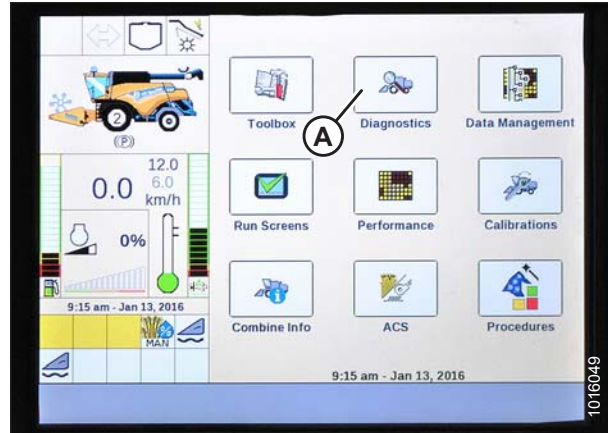


Figure 3.357: New Holland Combine Display

6. Select SETTINGS (A). The SETTINGS screen displays.

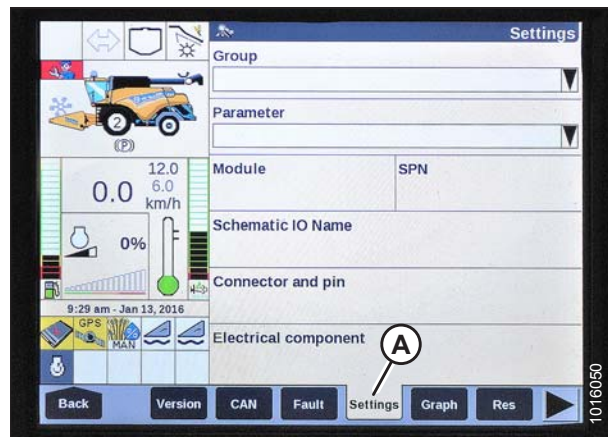


Figure 3.358: New Holland Combine Display

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



Figure 3.359: New Holland Combine Display

OPERATION

9. Select GRAPH (A). The exact voltage (B) is displayed at the top of the screen.
10. Raise and lower the header to see the full range of voltage readings.
11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to [Adjusting Voltage Limits: One-Sensor System, page 116](#).

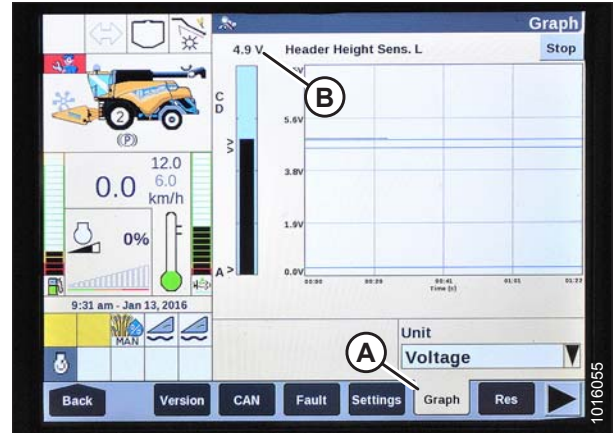


Figure 3.360: New Holland Combine Display

Engaging the Auto Header Height Control (New Holland CR Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\), page 207](#).

1. Ensure center-link is set to D.
2. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.

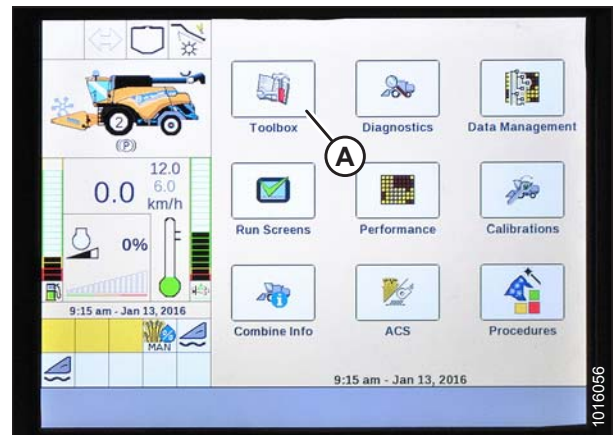


Figure 3.361: New Holland Combine Display

OPERATION

3. Simultaneously press both the UNLOAD (A) and RESUME (B) buttons on the hydro handle.



Figure 3.362: New Holland Combine Controls

4. Select HEAD 1 (A). The HEADER SETUP 1 screen displays.
5. Select the CUTTING TYPE drop-down arrow (B) and change the CUTTING TYPE to PLATFORM (C).



Figure 3.363: New Holland Combine Display

6. Select the HEADER SUB TYPE drop-down arrow (A). The HEADER SUB TYPE dialog box displays.



Figure 3.364: New Holland Combine Display

OPERATION

7. Select HEAD 2 (A). The HEADER SETUP 2 screen displays.



Figure 3.365: New Holland Combine Display

8. Select the AUTOFLOAT drop-down arrow and set AUTOFLOAT to INSTALLED (A).
9. Select the AUTO HEADER LIFT drop-down arrow 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 ground speed lever (GSL).

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



Figure 3.366: New Holland Combine Display

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



Figure 3.367: New Holland Combine Display

OPERATION

Calibrating the Auto Header Height Control (New Holland CR Series)

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. Refer to [3.7.5 Header Angle, page 72](#).

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator's manual for updates.

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\), page 207](#).

CAUTION

Check to be sure all bystanders have cleared the area.

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.
- Header/feeder is disengaged.
- Lateral flotation buttons are NOT pressed.
- ESC key is NOT pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATIONS (A) on the main screen. The CALIBRATION screen displays.

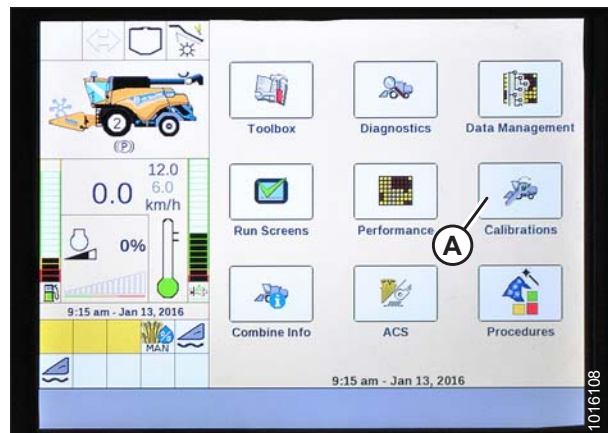


Figure 3.368: New Holland Combine Display

OPERATION

2. Select the CALIBRATION drop-down arrow (A).



Figure 3.369: New Holland Combine Display

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

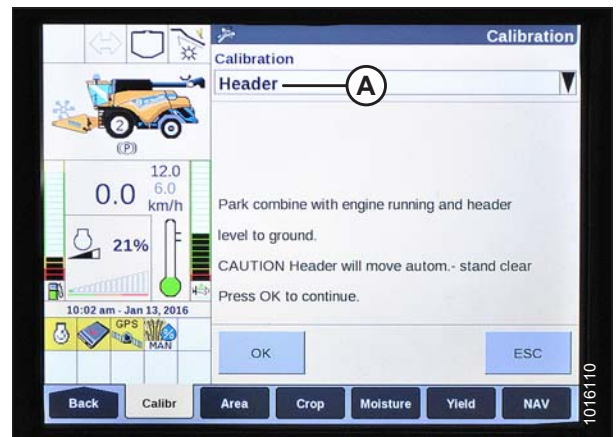


Figure 3.370: New Holland Combine Display

4. Follow the calibration steps in the order in which they appear on the screen. 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 3.371: New Holland Combine Display

OPERATION

- When all steps have been completed, CALIBRATION COMPLETED message is displayed on the screen.

NOTE:

If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.



Figure 3.372: New Holland Combine Display

Setting Auto Height (New Holland CR Series)

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\)](#), [page 207](#).

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 the first two buttons (A) and (B). The third button (C) is not configured.

CAUTION

Check to be sure all bystanders have cleared the area.

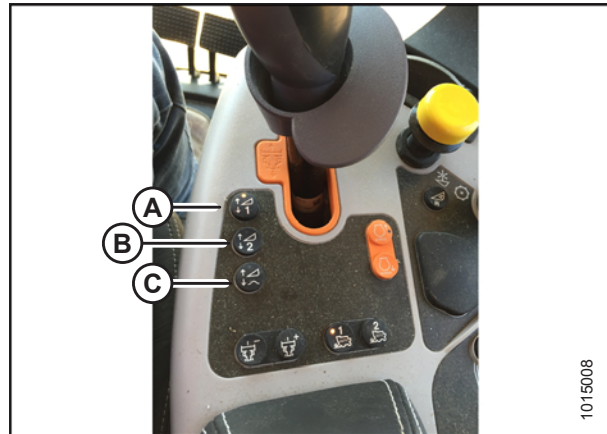


Figure 3.373: New Holland Combine Controls

To set the auto height, follow these steps:

- Engage separator and header.

OPERATION

2. Select RUN SCREENS (A) on the main screen.

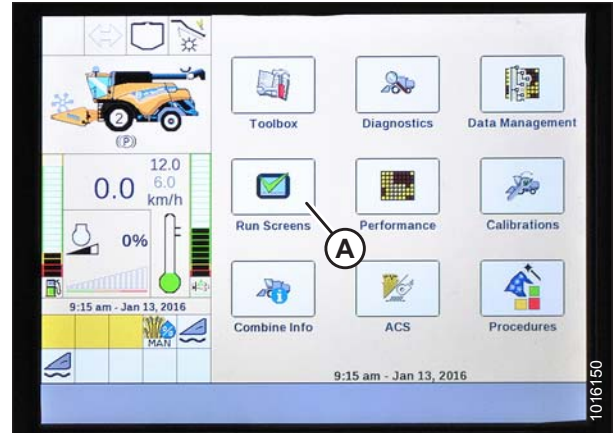


Figure 3.374: New Holland Combine Display

3. 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 set point button is pressed, the display will change to AUTO HEIGHT (A).

4. Lower the header to the ground.
5. Select one of the auto height set point buttons shown in Figure 3.373, page 224.
 - Press the SET 1 button for a light ground setting (1 on the float indicator box).
 - Press the SET 2 button for a heavier ground setting (2 on the float indicator box).



Figure 3.375: New Holland Combine Display

Setting Maximum Work Height (New Holland CR Series)

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 [3.8.12 New Holland Combines \(CR/CX Series—Pre-2015 Model Year\)](#), page 207.

OPERATION

1. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.

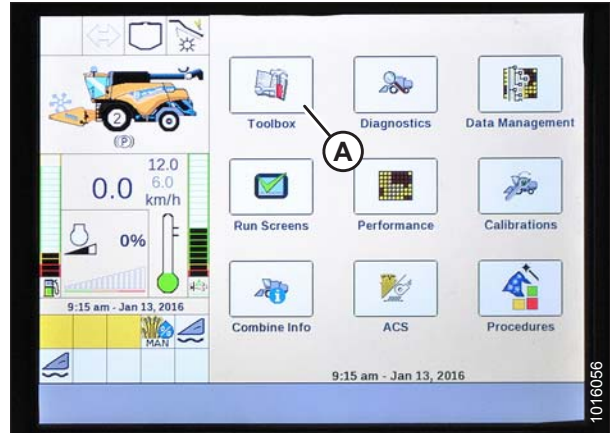


Figure 3.376: New Holland Combine Display

2. Select FEEDER (A). The FEEDER SETUP screen displays.
3. Select the MAXIMUM WORK HEIGHT field (B).

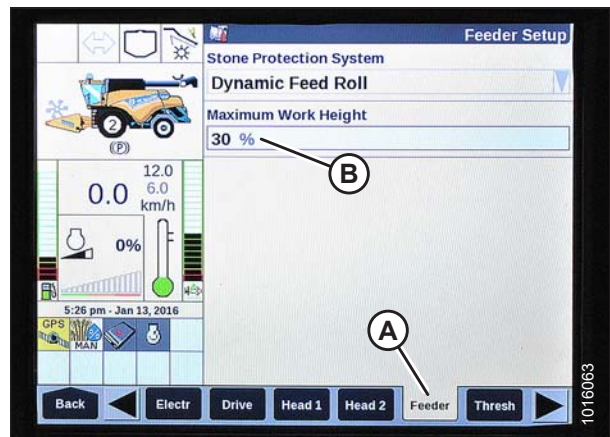


Figure 3.377: New Holland Combine Display

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



Figure 3.378: New Holland Combine Display

OPERATION

Configuring Reel Fore-Aft, Header Tilt, and Header Type (New Holland CR Series)

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 display since this document was published. Refer to the combine operator's manual for updates.

1. Simultaneously press both the UNLOAD (A) and RESUME (B) buttons on the hydro handle.



Figure 3.379: New Holland Combine Controls

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



Figure 3.380: New Holland Combine Display

OPERATION

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



Figure 3.381: New Holland Combine Display

There are now two different buttons for ON GROUND presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require the first two buttons (A) and (B). The third button down (C) is not configured.

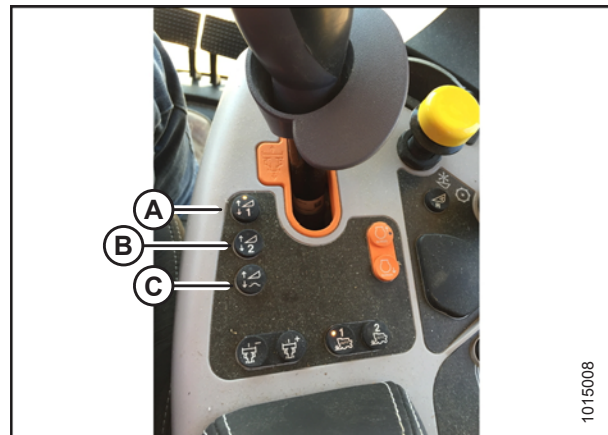


Figure 3.382: New Holland Combine Controls

3.8.14 Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system are hall-effect sensors containing sealed connectors. Normal operating signal voltages for the sensors fall between 10% (0.5VDC) and 90% (4.5VDC). An increase in sensor voltage correlates to an increase in header height.

Any sensor error results in a 0 V signal, indicating either a faulty sensor or lack of proper supply voltage.

3.8.15 Replacing the Auto Header Height Control (AHHC) Sensor (One-Sensor System)

1. Disconnect the wiring harness (A) from the existing sensor (B).
2. Remove the two screws (C) that secure the sensor (B) to the sensor arm (D).

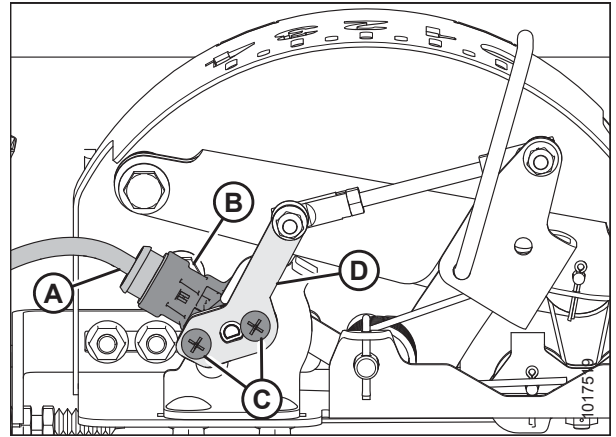


Figure 3.383: AHHC Sensor

3. Swing the sensor arm (A) upwards to gain access to the two bolts (B) securing the sensor (C) to the bracket (D).
4. Remove the two bolts and nuts (B) that secure the sensor (B) to the bracket (D).
5. Pull sensor (B) away from the bracket (D).

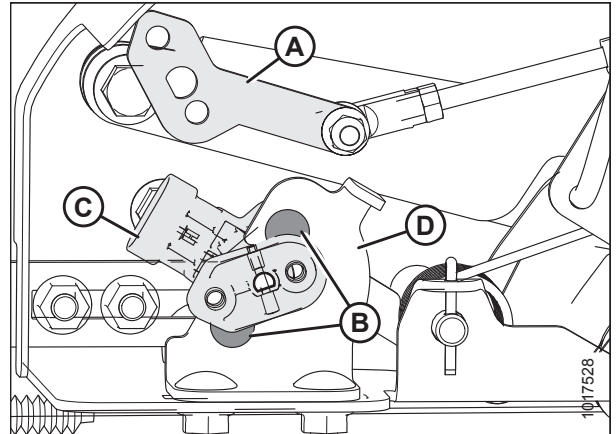


Figure 3.384: AHHC Sensor

IMPORTANT:

To avoid damaging the new sensor, install sensor as follows:

6. Position the new sensor (A) on the bracket (B).
7. Secure with two bolts (C) and nuts (D).

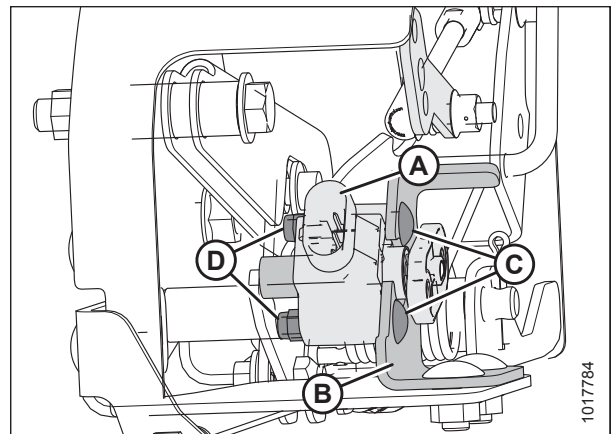


Figure 3.385: AHHC Sensor

OPERATION

8. Attach sensor arm (A) to the sensor (B) and secure with two screws (C).
9. Reconnect the wiring harness to the plug (B) on the sensor.
10. Check the voltage range of the new sensor, and adjust if necessary. Refer to:
 - *Manually Checking Voltage Range: One-Sensor System, page 111*
 - *Adjusting Voltage Limits: One-Sensor System, page 116*

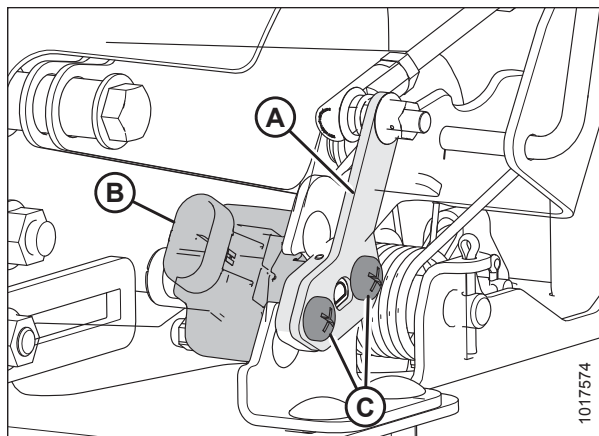


Figure 3.386: AHC Sensor

3.9 Levelling the Header

The float module is factory-set to provide the proper level for the header and should not normally require adjustment.

If the header is **NOT** level, perform the following checks prior to adjusting the levelling linkages:

- Check the combine tire pressures.
- Check that the combine feeder house is level. Refer to your combine operator's manual for instructions.
- Check that the top of the float module is level and parallel with the feeder house.

NOTE:

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

1. Park the combine on level ground.
2. Set the header approximately 150 mm (6 in.) off the ground, and check that the float linkage is against the down stops. Note the high and low end of the header.
3. Set wing float lock (A) to engaged. Refer to *Operating in Rigid Mode, page 63*.
4. Check, and if necessary adjust the float. Refer to *Checking and Adjusting Header Float, page 56*.

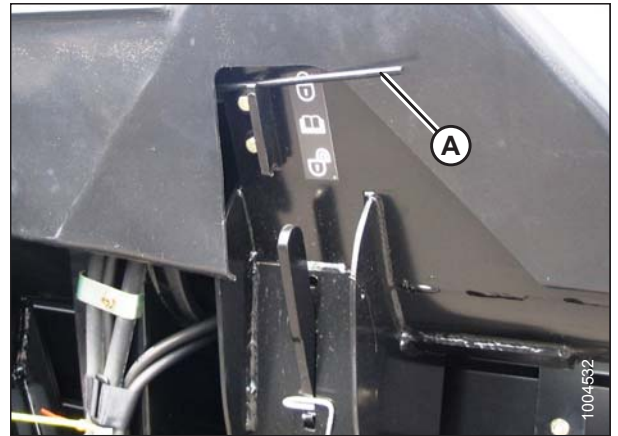


Figure 3.387: Wing Lock

OPERATION

5. Adjust the header level by making small adjustments (1/4–1/2 turn) to nut (A) on each float lock. Adjust each side equally but in opposite directions as follows:

NOTE:

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

- a. Turn low-side nut **clockwise** to raise header.
- b. Turn high-side nut **counterclockwise** to lower header.

NOTE:

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

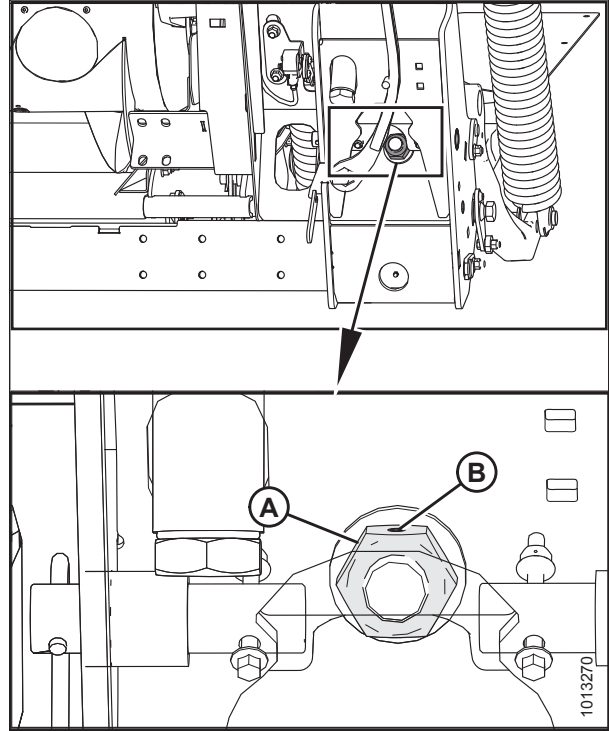


Figure 3.388: Float Lock

NOTE:

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

NOTE:

Check the float after levelling header. Refer to [Checking and Adjusting Header Float, page 56](#).

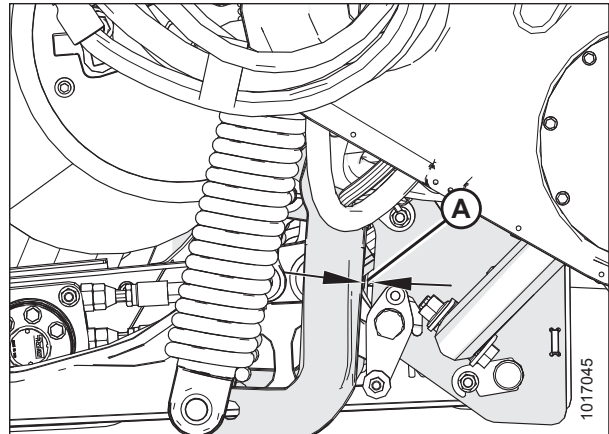


Figure 3.389: Bell Crank

3.10 Unplugging the Cutterbar



DANGER

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



CAUTION

Wear heavy gloves when working around or handling knives.



CAUTION

Lowering rotating reel on a plugged cutterbar will damage the reel components.

To unplug cutterbar, reverse the combine feeder house. If still plugged, do the following:

1. Stop the forward movement of the machine and disengage the header drives.
2. Raise the header to prevent it from filling with dirt, and engage the header drive clutch.
3. Disengage the header drive clutch and fully raise the header if plug does **NOT** clear.
4. Shut off the engine, remove the key from the ignition, and engage the park brake.
5. Engage the header safety props.
6. Clean off the cutterbar by hand.

NOTE:

If cutterbar plugging persists, refer to [7 Troubleshooting, page 501](#).

3.11 Unplugging the Float Module

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 manufacturers specifications (reverse feed varies among different combine models).
4. Engage the header drive.

3.12 Transporting the Header

WARNING

Do NOT drive combine with 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.

3.12.1 Transporting Header on Combine

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 header drive clutch when travelling to and from the field.
- Before driving combine 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 header at a minimum height to provide maximum stability if forward momentum is stopped for any reason. Raise header completely at bottom of grade to avoid contacting the ground.
- Travel at safe speeds to ensure complete machine control and stability at all times.

3.12.2 Towing

Headers with the Slow Speed Transport / Stabilizer Wheel option can be towed behind a properly configured MacDon windrower or an agricultural tractor. Refer to the combine operator's manual for instructions.

Attaching Header to Towing Vehicle

CAUTION

Adhere to the following slow speed transport instructions to prevent loss of control leading to bodily injury and/or machine damage:

- Weight of towing vehicle must exceed header weight to ensure adequate control and braking performance.
- Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or a properly configured MacDon windrower.
- Ensure reel is fully lowered and back on support arms to increase header stability during transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other or the circuit will be complete and the reel could creep forward during transport.
- Check that all pins are properly secured in transport position at wheel supports, cutterbar support, and hitch.
- Check tire condition and pressure prior to transporting.
- Connect hitch to towing vehicle using a proper hitch pin with a spring locking pin or other suitable fastener.
- Attach hitch safety chain to towing vehicle. Adjust safety chain length to provide only enough slack to permit turning.
- Connect header seven-pole plug wiring harness to mating receptacle on towing vehicle. (The seven-pole receptacle is available from your MacDon Dealer parts department.)
- Ensure lights are functioning properly and clean the slow moving vehicle sign and other reflectors. Use flashing warning lights unless prohibited by law.

Towing the Header

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 corners and slippery or rough conditions.
- Turn corners at only very low speeds (8 km/h [5 mph] or less). Header stability is reduced while cornering because front wheel moves to the left.
- 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.

3.12.3 Converting from Transport to Field Position

Removing Tow-Bar

1. Block the tires to prevent the header from rolling, and unhook the header from the towing vehicle.
2. Disconnect the electrical connector (A) on the tow-bar.
3. Remove pin (B) from the tow-bar, and disassemble the outer section (C) from the inner section (D).

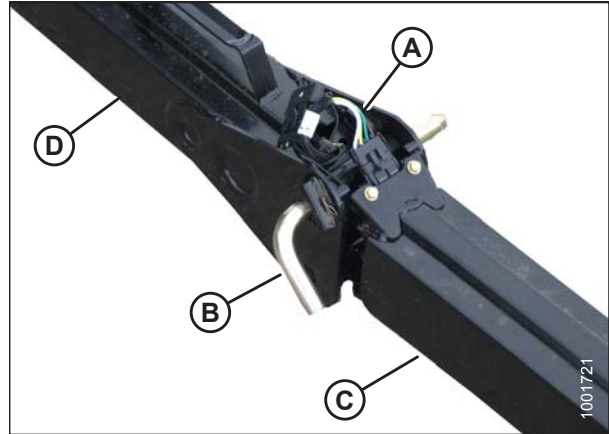


Figure 3.390: Tow-Bar Assembly

4. Disconnect the electrical connector (A) at the front wheel.

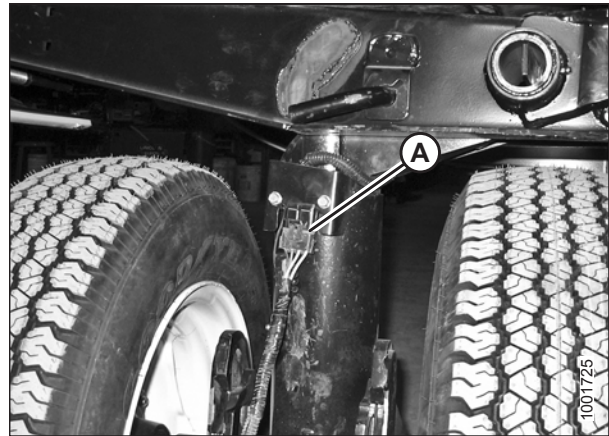


Figure 3.391: Wiring Connector

5. Remove clevis pin (A) and set aside for reinstallation.
6. Push latch (B) and lift the tow-bar (C) from the hook. Release latch.
7. Install clevis pin (A).

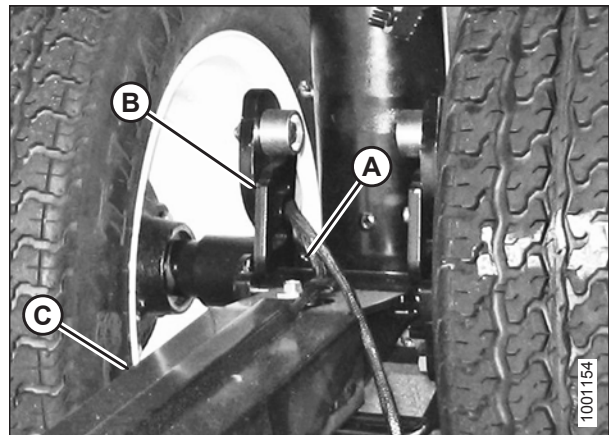


Figure 3.392: Tow-Bar Latch

OPERATION

Storing the Tow-Bar

1. Place the inner end of the outer half of the tow-bar into the cradle (A) on the left side of the header backtube.
2. Secure clevis/pintle end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure with lynch pin.
3. Install the rubber strap (D) on the cradle (A).

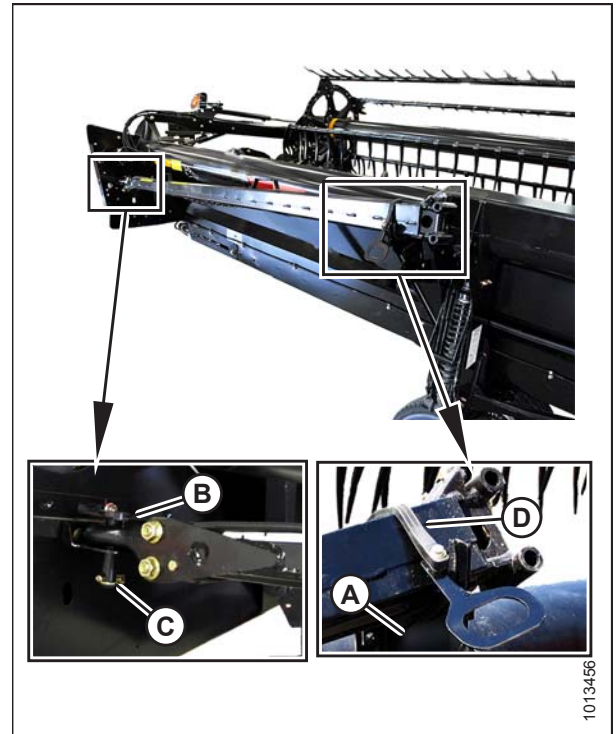


Figure 3.393: Tow-Bar Storage – Left Side

4. Place the inner end of the outer half of the tow-bar into the cradle (A) on the right side of the header backtube.
5. Secure the tube end of the tow-bar in support (B) on the endsheet using hitch pin (C). Secure with hairpin.
6. Install the rubber strap (D) on the cradle (A).

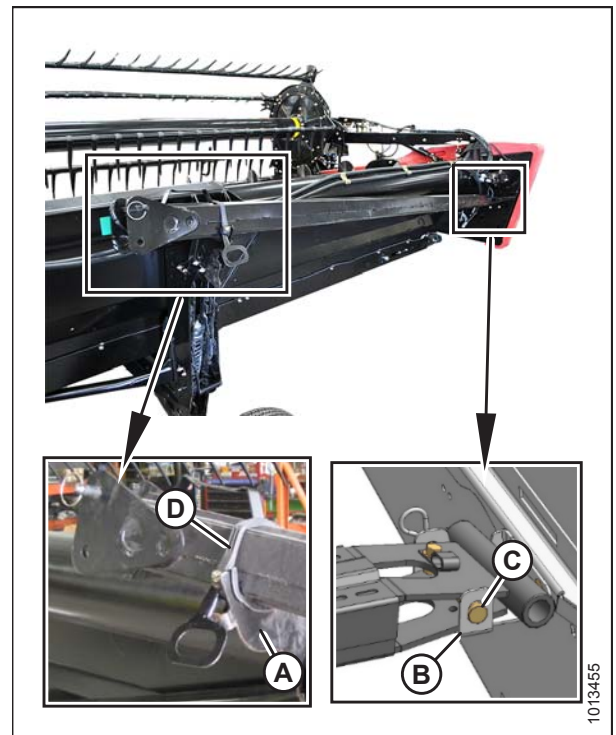


Figure 3.394: Tow-Bar Storage – Right Side

OPERATION

7. Place the inner end of the inner half of the tow-bar into the cradle (A) on the right side of the header backtube.
8. Secure the tube end of the tow-bar in support (B) on the endsheet using clevis pin (C). Secure with hairpin.
9. Install the rubber strap (D) on the cradle (A).

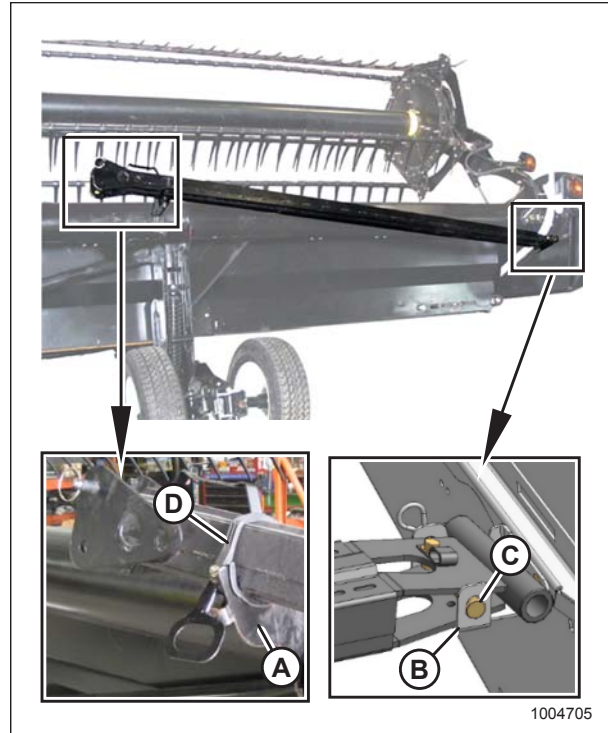


Figure 3.395: Tow-Bar Storage

10. Attach the header to the combine. Refer to the combine operator's manual for instructions.

IMPORTANT:

Carrying the tow-bar on the header will affect the main header float. Refer to your combine operator's manual for adjustment procedures.

11. Place the transport wheels into field position. Refer to the following:
 - [*Moving Front \(Left\) Wheels into Field Position, page 239*](#)
 - [*Moving Rear \(Right\) Wheels into Field Position, page 240*](#)

OPERATION

Moving Front (Left) Wheels into Field Position

DANGER

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

1. Raise the header fully and engage the header safety props.
2. Swivel the front wheel assembly (A) so the wheels are aligned with the lower frame.
3. Remove pin (B) and pull the wheel assembly towards the rear of header. Store the pin in hole (C) at the top of the leg.
4. Pull handle (D) upwards to release and lower the linkage into the vertical support.

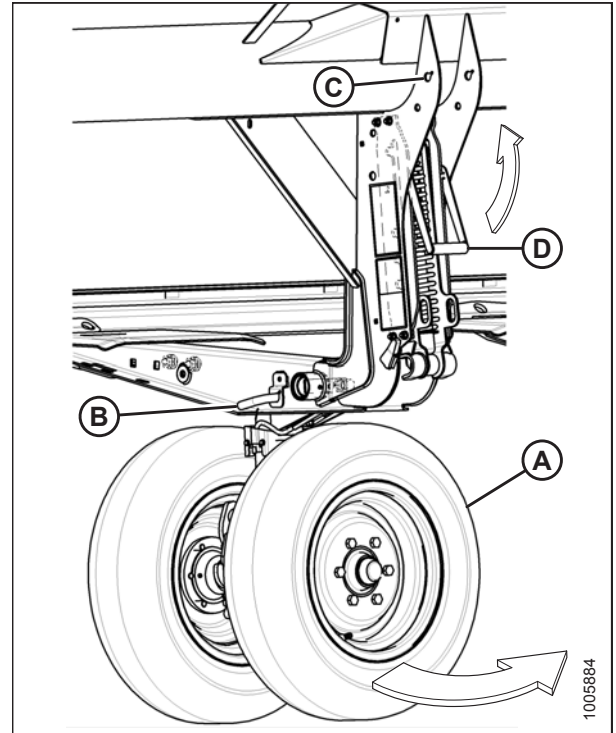


Figure 3.396: Front (Left) Wheels

5. Align lift hook (A) with lug (B) and lift the wheel assembly to engage the pin in the lift hook. Ensure latch (C) is engaged.
6. Install clevis pin (D) and secure to the center of the axle with hairpin.

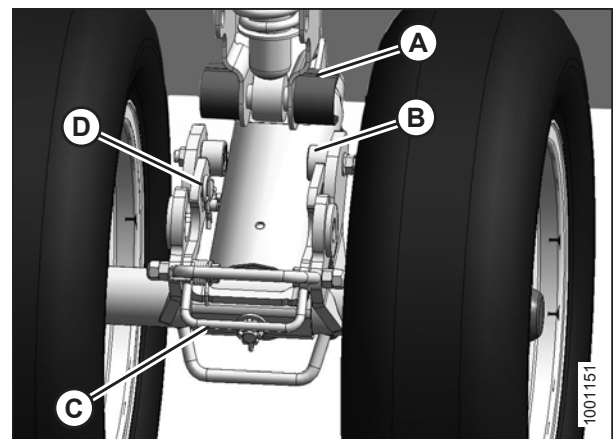


Figure 3.397: Front (Left) Wheels

OPERATION

7. Lift the wheel assembly to the desired height and slide the linkage (A) into the appropriate slot in the vertical support.
8. Push down on the handle (B) to lock.

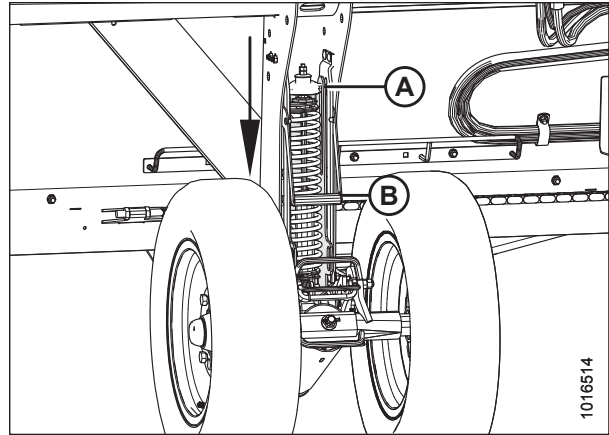


Figure 3.398: Front (Left) Wheels

Moving Rear (Right) Wheels into Field Position

1. Pull pin (A) on the left side rear wheel. Swivel the wheel clockwise and lock with pin.

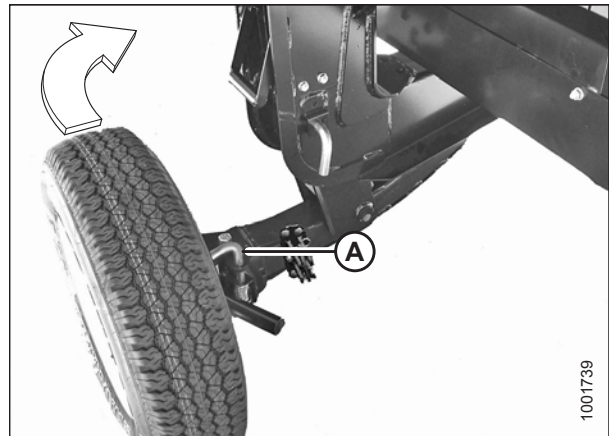


Figure 3.399: Rear Wheel – Left Side

2. Remove pin (A) and store at location (B).
3. Pull handle (C) upwards to release.
4. Lift the wheel to the desired height, and engage the support channel into slot (D) in the vertical support.
5. Push down on handle (C) to lock.

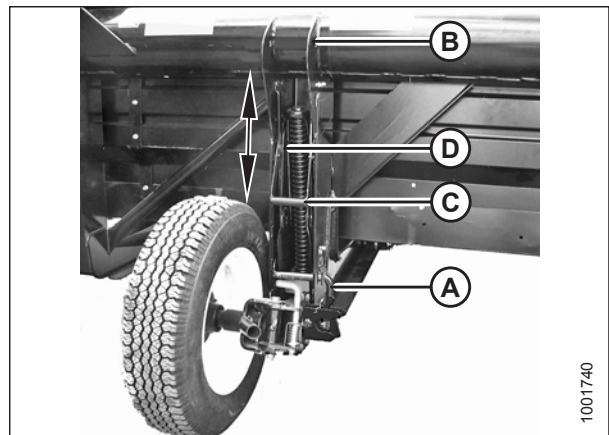


Figure 3.400: Rear Wheel – Left Side

OPERATION

6. Pull the pin (A) on brace (B) on the left wheel in front of the cutterbar. Disengage the brace from the cutterbar, and lower the brace against the axle (C).
7. Remove pin (D), lower support (E) onto axle, and reinsert pin into support.
8. Swing the axle (C) clockwise towards the rear of the header.

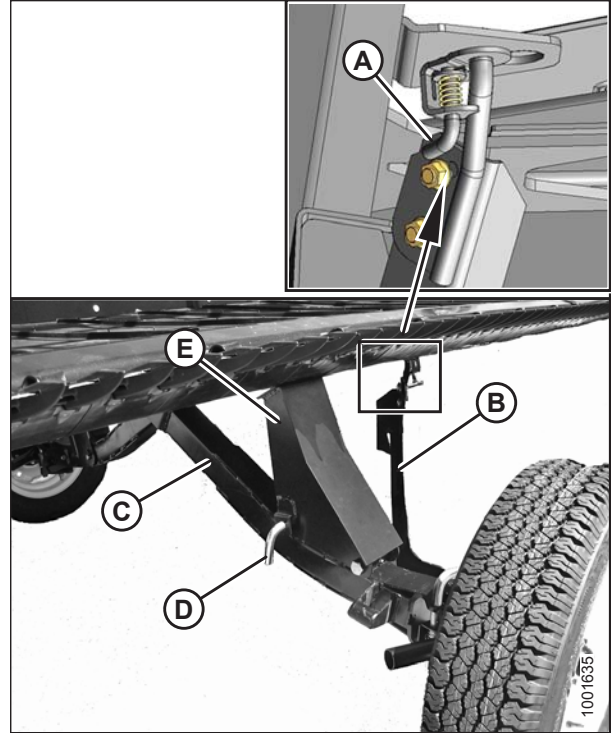


Figure 3.401: Right Rear Axle

9. Pull pin (A) on right wheel, swivel the wheel counterclockwise to position shown, and lock with pin (A).
10. Remove the hairpin (B) from the latch (C).
11. Lift the wheel, lift latch (C), and engage lug (D) onto the left axle. Ensure the latch closes.
12. Secure the latch with hairpin (B), ensuring the open end of the pin faces the rear of the combine.

NOTE:

The hairpin can become dislodged by crop if installed with the open end facing the cutterbar.

IMPORTANT:

Check that wheels are locked and that handle is in locked position.

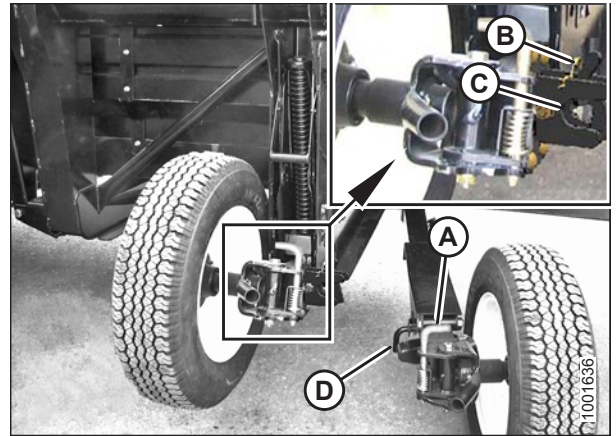


Figure 3.402: Rear Axles

OPERATION

13. Complete the conversion by ensuring the left side (A) and right side (B) wheels are in the position shown.

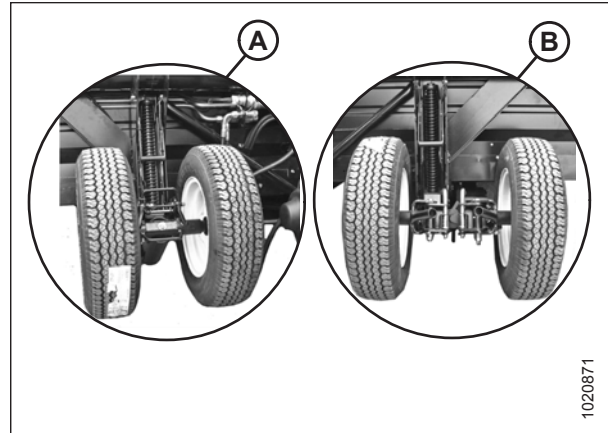


Figure 3.403: Field Position

3.12.4 Converting from Field to Transport Position

Moving Front (Left) Wheels into Transport Position

DANGER

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

CAUTION

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

1. Pull the handle (B) upwards to release and raise the linkage (A) fully upwards into the vertical support.
2. Raise the header fully, stop the engine, and remove the key from ignition. Engage the header safety props.

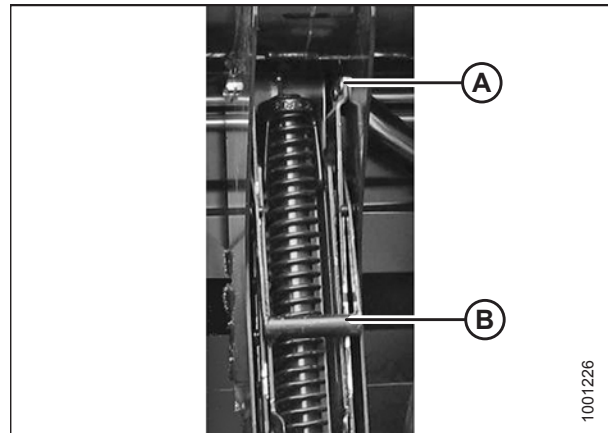


Figure 3.404: Suspension Linkage

OPERATION

3. Remove the hair pin and clevis pin (A).
4. Pull the latch handle (B) to release the suspension linkage (C), and pull the suspension linkage away from the spindle (D).
5. Lower the wheels slowly.

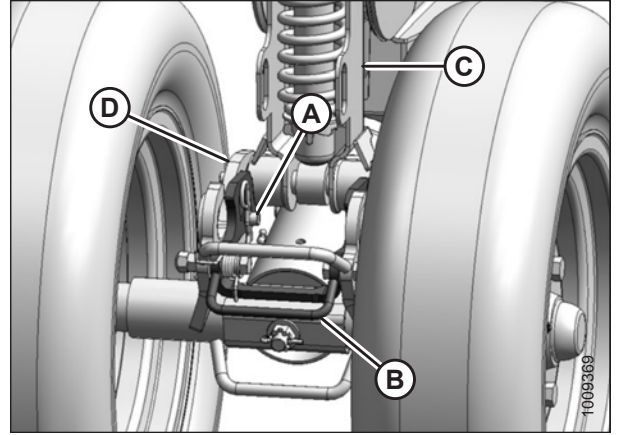


Figure 3.405: Left Front Wheels

6. Lower the handle (B) to lock.

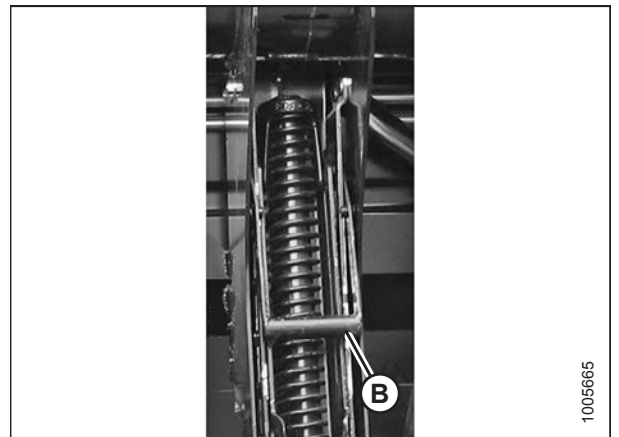


Figure 3.406: Suspension Linkage

OPERATION

7. Remove the pin (A) from storage at the top of the leg (B).
8. Move and swivel the wheels clockwise until the connector (C) is turned towards the front end of the header.
9. Insert pin (A) and turn to lock.
10. Lower the header until the left wheels are just touching the ground.

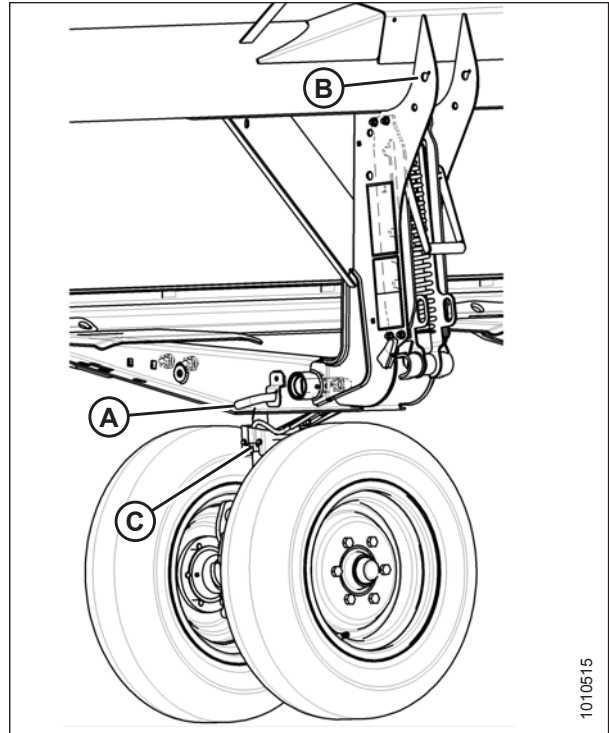


Figure 3.407: Left Front Wheels

Moving Rear (Right) Wheels into Transport Position

1. Remove the hairpin (A) from the latch (B).
2. Lift the latch (B), disengage the right axle (C), and lower to the ground.



CAUTION

Stand clear of wheels and release linkage carefully as wheels will drop once the mechanism is released.

3. Pull handle (D) carefully to release the spring and lower the wheel to the ground.
4. Lift the wheel and linkage with handle (E) and position the linkage in the bottom slot.
5. Lower the handle (C) to lock.

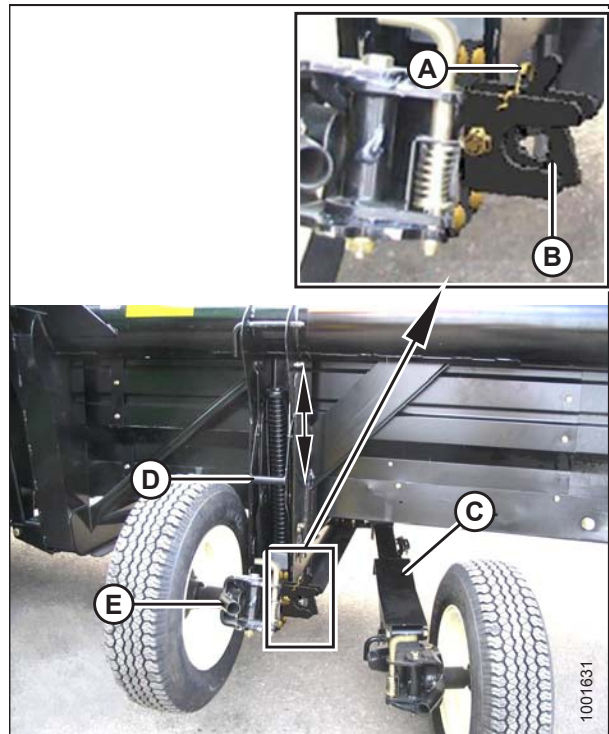


Figure 3.408: Separating Axles

OPERATION

6. Remove the pin (A) and install at location (B) to secure the linkage. Turn the pin to lock.
7. Pull the pin (D), swivel the wheel (C) counterclockwise 90°, and release the pin to lock.



Figure 3.409: Wheel Position

8. Ensure the left wheel is in the transport position as shown.



Figure 3.410: Left Wheel in Transport Position

9. Pull the pin (A) and swivel the right rear wheel (B) clockwise 90°.

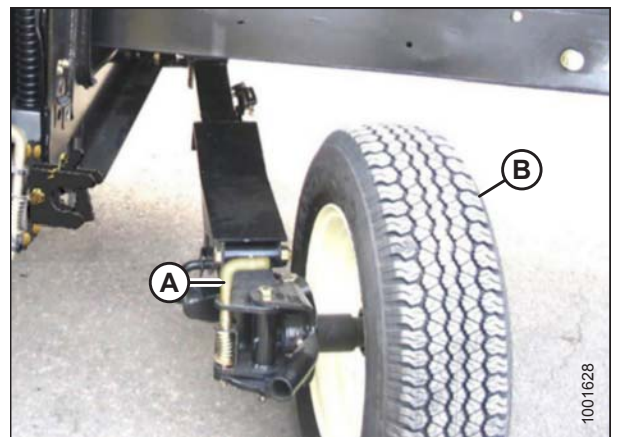


Figure 3.411: Right Rear Wheel

OPERATION

10. Lock the wheel (A) with pin (B). Move the right axle (C) to the front of the header.

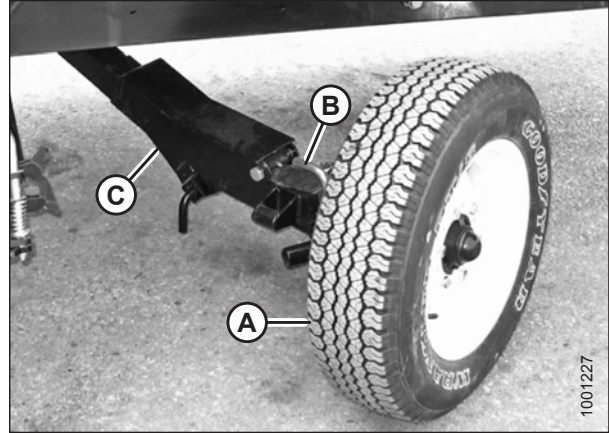


Figure 3.412: Right Rear Wheel

11. Remove the pin (A), raise support (B) to the position shown, and reinsert pin.

IMPORTANT:

Ensure the pin (A) engages the tube on the axle.

12. Swing the brace (C) into the position shown and insert the brace into the slot (D) behind the cutterbar. Position the brace so that pin (E) engages the hole in the bracket (F). The right hand wheel is now in transport position.
13. Disengage the header cylinder lift stops.
14. Detach the header's hydraulic and electrical connections from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
15. Start the combine and lower the header to the ground.

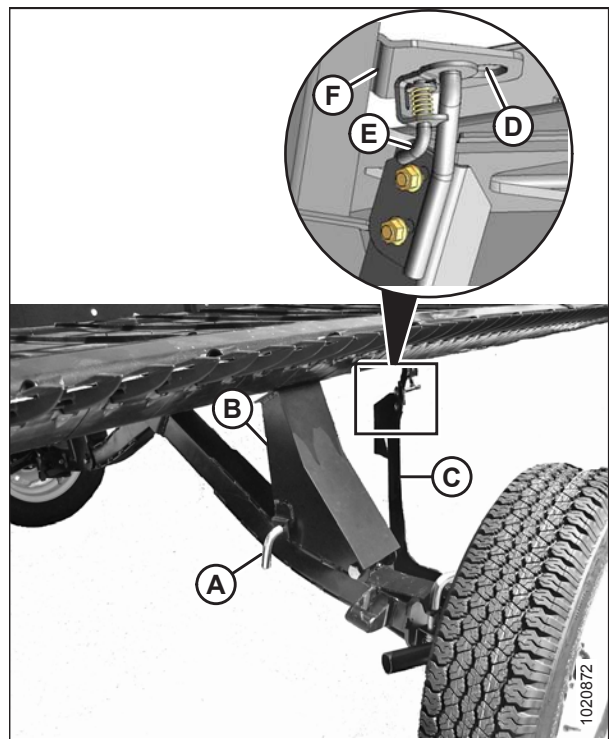


Figure 3.413: Right Rear Wheel Position

OPERATION

Attaching Tow-Bar

The tow-bar consists of two sections which make storage and handling easier.

1. Unhook the rubber strap (D) from the cradle (A) on the right side of the header.
2. Remove the clevis pin (C) and detach the tube end from the support (B).
3. Replace the clevis pin (C).
4. Lift the inner half of the tow-bar off the header and place it near the left side of the header.

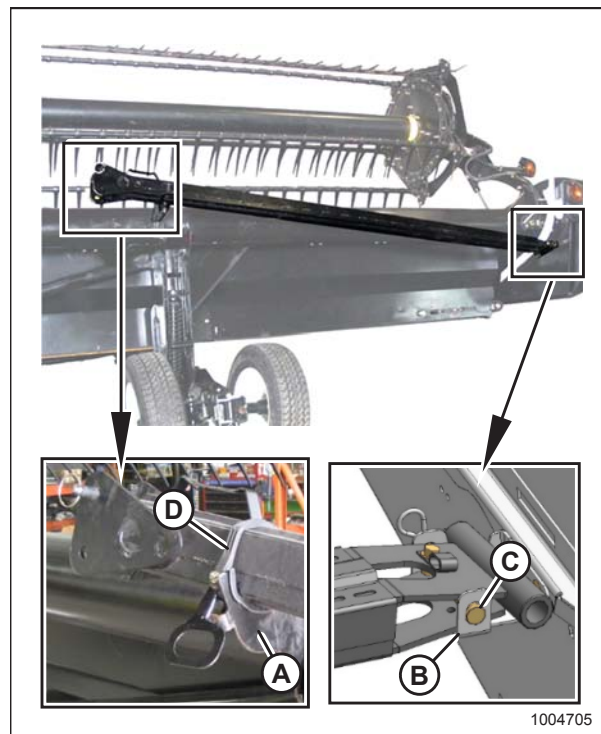


Figure 3.414: Tow-Bar Removal – Right Side

5. Unhook the rubber strap (D) from the cradle (A) on the left side of the header.
6. Remove the hitch pin (C) from the support (B), and remove the tow-bar.
7. Install the rubber strap (D) on the cradle (A).

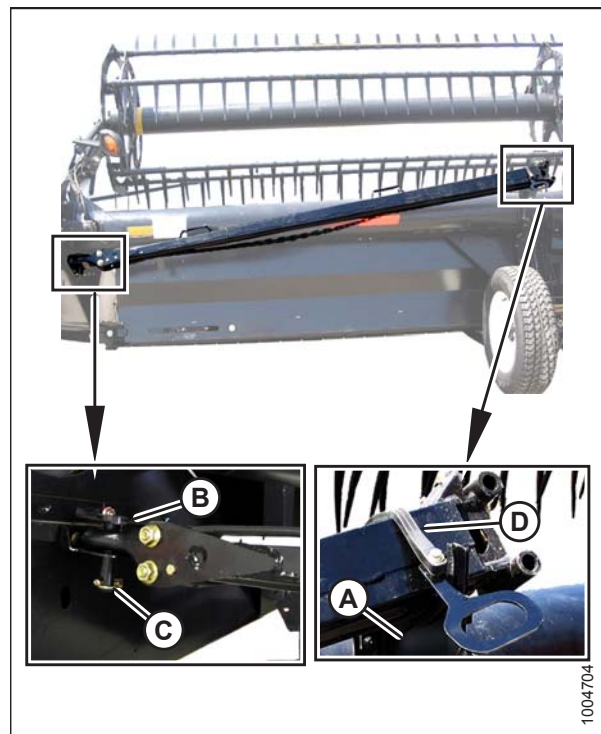


Figure 3.415: Tow-Bar Removal – Left Side

OPERATION

8. Connect the outer half (B) of the tow-bar to the inner half (A).

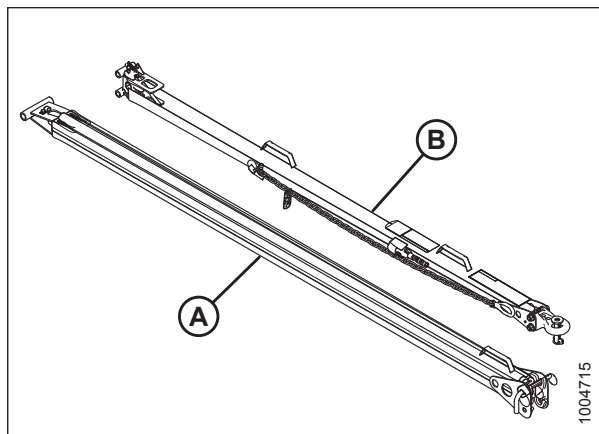


Figure 3.416: Tow-Bar Assembly

9. Lift the outer half (B) and insert it into the inner half (A).

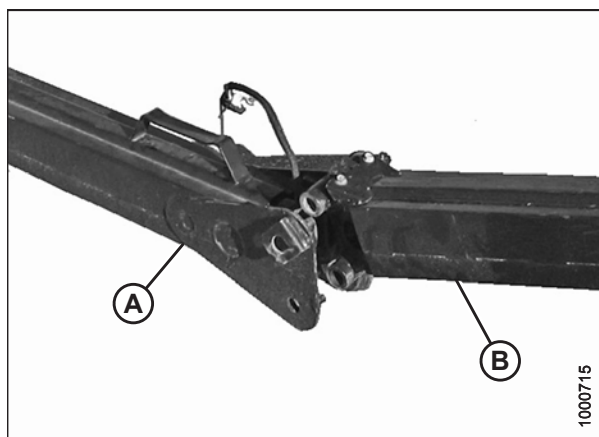


Figure 3.417: Tow-Bar Assembly

10. Secure the two halves together with the L-pin (A) and then turn to lock. Secure the L-pin with ring (B).
11. Connect the electrical harness to connector (C).

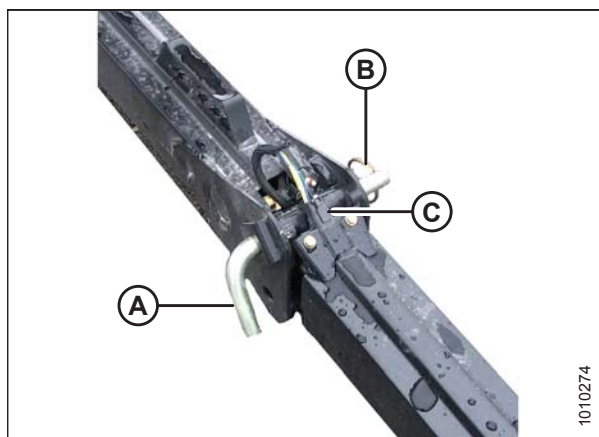


Figure 3.418: Tow-Bar Assembly

OPERATION

12. Position the tow-bar (A) onto the axle, and push against the latch (B) until the tow-bar pins drop into the hooks (C).
13. Check that latch (B) has engaged the tow-bar.
14. Install the clevis pin (D) and secure with hairpin.

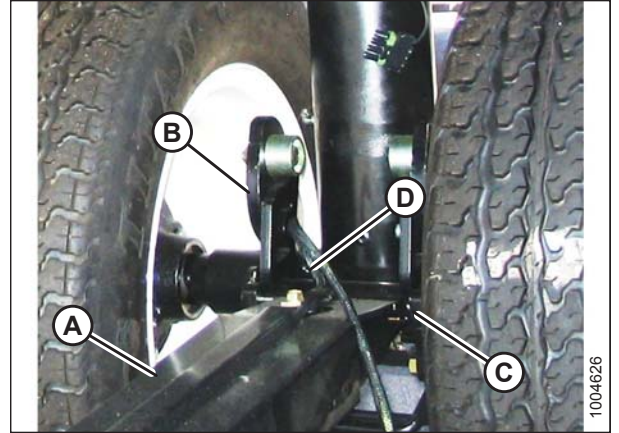


Figure 3.419: Attaching Tow-Bar

15. Connect the electrical harness (A) at the front wheel.

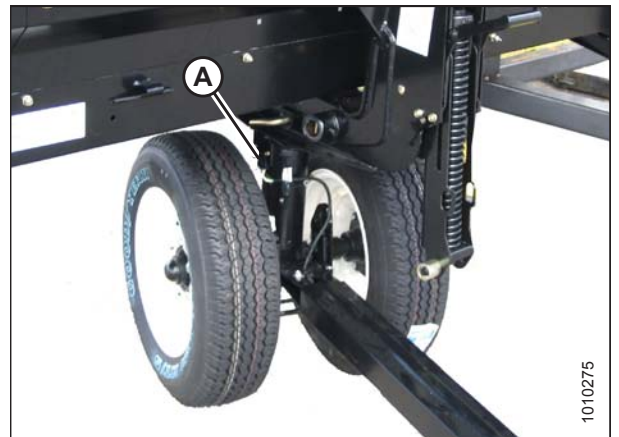


Figure 3.420: Harness Connection

3.13 Storing the Header

Perform the following procedures 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 cutterbar and knife guards to prevent injury from accidental contact.

1. Clean the header thoroughly.
2. Store the machine in a dry, protected place if possible. If storing outside, always cover with a waterproof canvas or other protective material.

NOTE:

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, 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 to keep moisture out of the bearings.
8. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair as necessary.
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. Replace or tighten any missing or loose hardware. Refer to [8.1 Torque Specifications, page 517](#).

4 Header Attachment/Detachment

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

Combine	Refer to
Case IH 7010, 8010, 7120, 8120, 9120, 5130, 6130, 7130, 7230, 8230, 9230	4.3 Case IH Combines, page 275
John Deere 60, 70, S, and T Series	4.5 John Deere Combines, page 290
CLAAS Lexion 500, 700 (R Series)	4.6 CLAAS Combines, page 297
New Holland CR, CX	4.7 New Holland Combines, page 304
Gleaner R and S Series, Challenger 660, 670, 680B, 540C, 560C, Massey Ferguson 9690, 9790, 9895, 9520, 9540, 9560	4.4 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines, page 282

NOTE:

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

4.1 Float Module Feed Auger Configurations

The FM100 feed auger can be configured to suit various needs; there are four configurations available. Check the conversion instructions to determine if additional auger flighting kits are required.

Narrow Configuration is a standard configuration for the following combines:

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

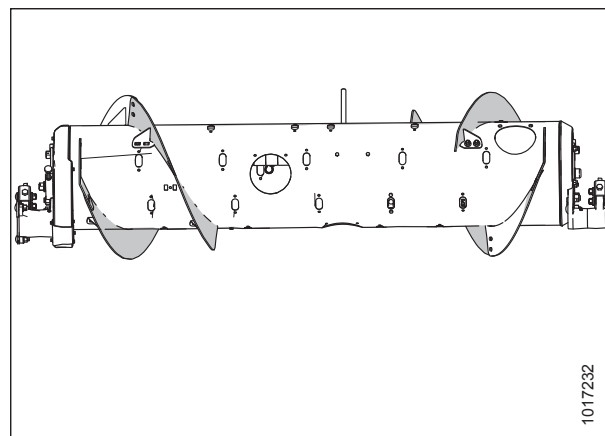


Figure 4.1: Narrow Configuration (Rear View)

To convert to Narrow configuration from Medium or Wide configuration, refer to [4.1.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration, page 259](#).

To convert to Narrow configuration from Ultra-Narrow configuration, refer to [4.1.4 Converting from Ultra-Narrow Configuration to Narrow Configuration, page 261](#).

HEADER ATTACHMENT/DETACHMENT

Medium Configuration is a standard configuration for the following combines:

- Case (5/6/7088, 7/8010, 7/8/9120, 5/6/7130, 7/8/9230, 5/6/7140, 7/8/9240)
- Challenger (66/67/680B, 54/560C, 54/560E)
- CLAAS (56/57/58/590R, 57/58/595R, 62/63/64/65/66/670, 73/74/75/76/77/780)
- John Deere (95/96/97/9860, 95/96/97/9870, S65/66/67/68/690, T670)
- Massey Ferguson (96/97/9895, 9520/40/60, 9545/65, 9380)
- New Holland CR (970/980, 9070/9080, 8090/9090, X.90, X.80)
- New Holland CX (8X0, 80X0, 8.X0, 8080/8090 Elevation)
- Versatile (RT490)

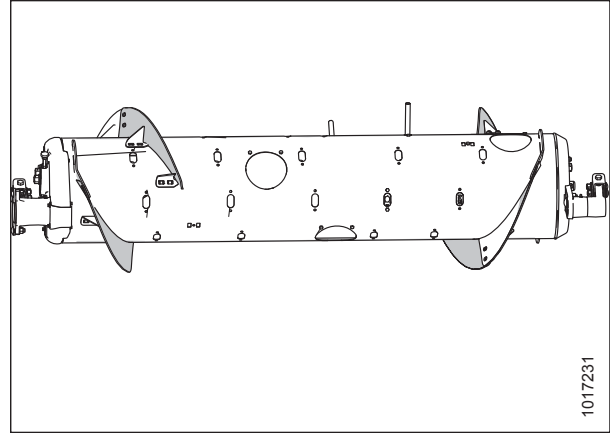


Figure 4.2: Medium Configuration (Rear View)

To convert to Medium configuration from Narrow or Ultra-Narrow configuration, refer to [4.1.1 Converting from Ultra-Narrow Configuration or Narrow Configuration to Medium Configuration, page 254](#).

To convert to Medium configuration from Wide configuration, refer to [4.1.2 Converting from Wide Configuration to Medium Configuration, page 257](#).

Wide Configuration is an optional configuration for the following combines:

- Challenger (670B/680B, 540C/560C, 540E/560E)
- CLAAS (590R/595R, 660/670, 760/770/780)
- John Deere (T670)
- Massey Ferguson (9895, 9540, 9560, 9545, 9565, 9380)
- New Holland CX (8X0, 80X0, 8.X0)

NOTE:

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

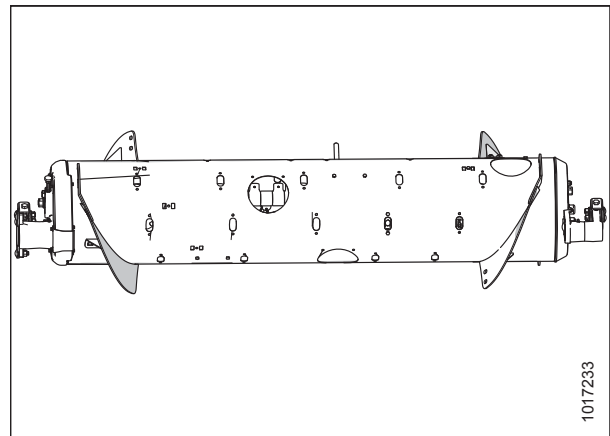


Figure 4.3: Wide Configuration (Rear View)

To convert to Wide configuration from Medium configuration, refer to [4.1.5 Converting from Medium Configuration to Wide Configuration, page 262](#).

To convert to Wide configuration from Narrow or Ultra-Narrow configuration, refer to [4.1.6 Converting from Ultra Narrow or Narrow Configuration to Wide Configuration, page 264](#).

NOTE:

In some conditions, feeding may be further improved by removing all bolt-on flighting. Refer to [4.1.7 Optional Modification to Wide Configuration, page 266](#).

HEADER ATTACHMENT/DETACHMENT

Ultra-Narrow Configuration is an optional configuration that may improve feeding performance on combines with narrow feeder houses. It may also be helpful when harvesting rice.

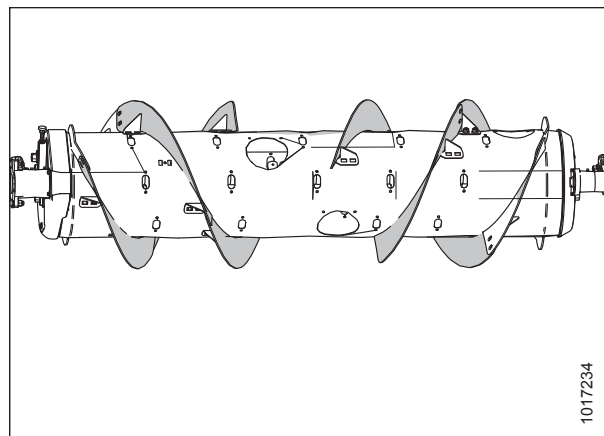


Figure 4.4: Ultra-Narrow Configuration (Rear View)

To convert to Ultra-Narrow configuration from Medium or Wide configuration, refer to [4.1.8 Converting from Medium Configuration or Wide Configuration to Ultra-Narrow Configuration, page 267](#).

To convert to Ultra-Narrow configuration from Narrow configuration, refer to [4.1.9 Converting from Narrow Configuration to Ultra-Narrow Configuration, page 271](#).

4.1.1 Converting from Ultra-Narrow Configuration or Narrow Configuration to Medium Configuration

Two kits of either MD #287031 or B6215²⁰ are required to convert to this configuration.

Ultra Narrow, Narrow, and Medium auger configurations are shown at right. When converting from the Ultra-Narrow configuration or Narrow configuration to Medium configuration, you will need to replace the existing flightings (A) with flightings (B).

NOTE:

Additional auger fingers are not included in this kit. Order these parts separately if necessary.

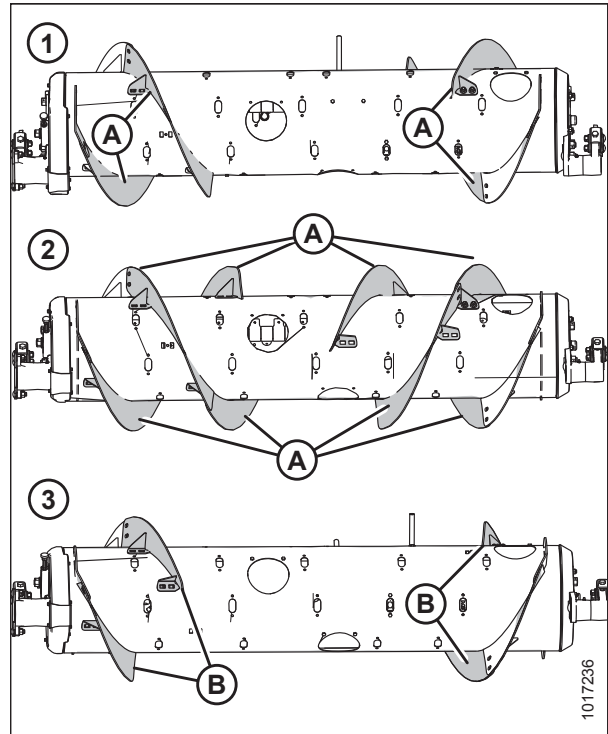


Figure 4.5: Auger Configurations (Rear View)

1 - Narrow Configuration
3 - Medium Configuration

2 - Ultra-Narrow Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts have been removed from the illustrations for clarity.

20. MD #287031 is available for ordering only through MacDon Parts. B6215 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

2. Remove bolts (A) and access cover (B) from right end of auger. Retain for reassembly later.

NOTE:

It may be necessary to remove multiple access covers for ease of access.

3. Remove hardware (C) and bolt-on flighting (D) from the right end of the auger. Repeat for all the remaining hardware and bolt-on flighting. Discard flighting, but retain hardware to attach new flighting.
4. Repeat Steps 2, [page 255](#) and 3, [page 255](#) at the left side of the feed auger.

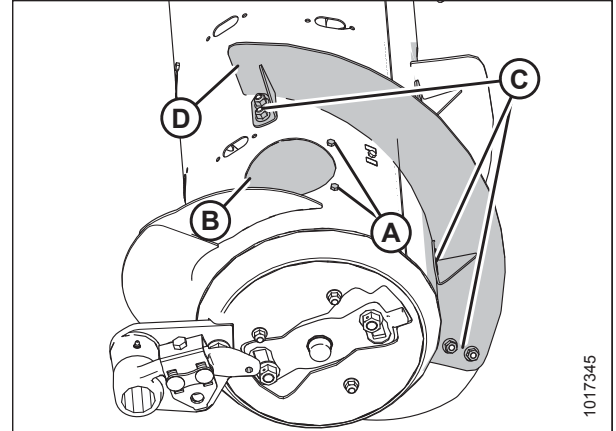


Figure 4.6: Narrow Configuration (Right Side)

5. Remove flighting slot plug (B), M6 bolt (A), and tee nut from inside the feed auger. Repeat at the left side of the feed auger.

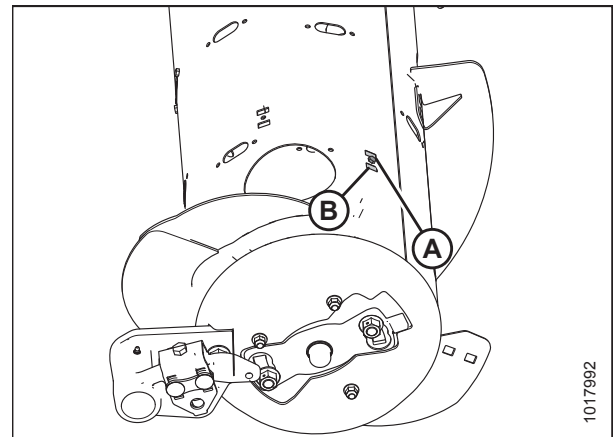


Figure 4.7: Narrow Configuration (Right Side)

6. Install two bolt-on flightings (A) on the right side as shown, and secure each flighting with six carriage head bolts and nuts at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

7. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).

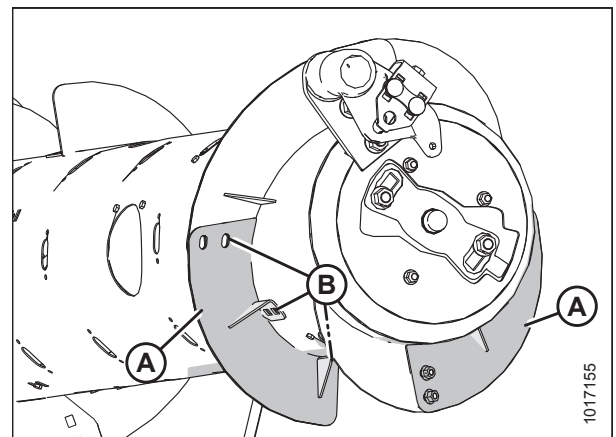


Figure 4.8: Medium Configuration (Right Side)

HEADER ATTACHMENT/DETACHMENT

8. Install two bolt-on flightings (A) on the left side as shown, and secure each flighting with six carriage head bolts and nuts at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

9. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).

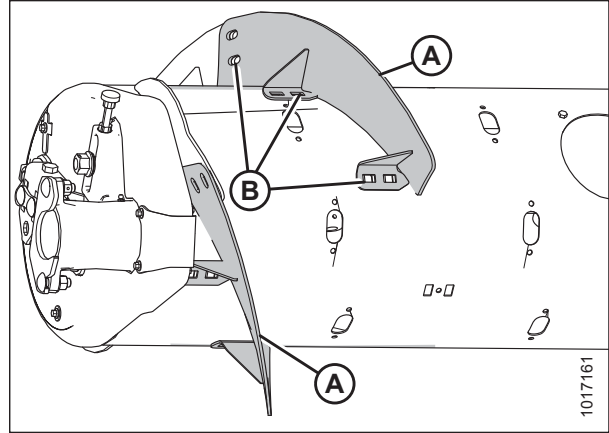


Figure 4.9: Medium Configuration (Left Side)

10. Use the access hole (A) to position the flighting slot plug (B) from inside the feed auger (as shown) and secure with a 20 mm long M6 hex head bolt and tee nut (C). Repeat for the remaining locations previously used to mount the flighting in Step 3, page 255 and Step 4, page 255.
11. Install additional fingers. A total of 22 fingers is recommended for this configuration. Refer to *Installing Feed Auger Fingers*, page 373.

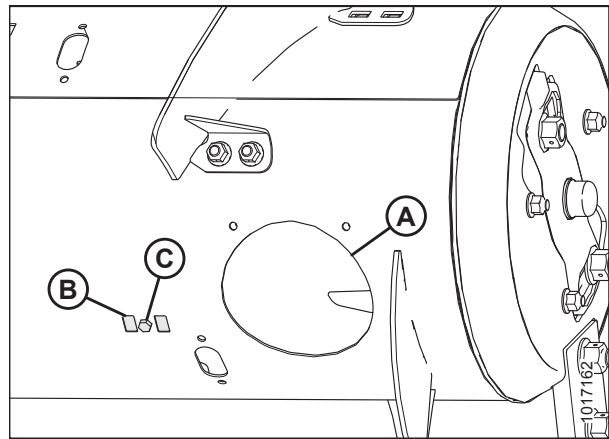


Figure 4.10: Medium Configuration Flighting Plug (Right Side)

4.1.2 Converting from Wide Configuration to Medium Configuration

One kit (either MD #287031 or B6215²¹) is required to convert to this configuration.

Wide and Medium auger configurations are shown at right. When converting from Wide configuration to Medium configuration, you will need to install new flightings (A).

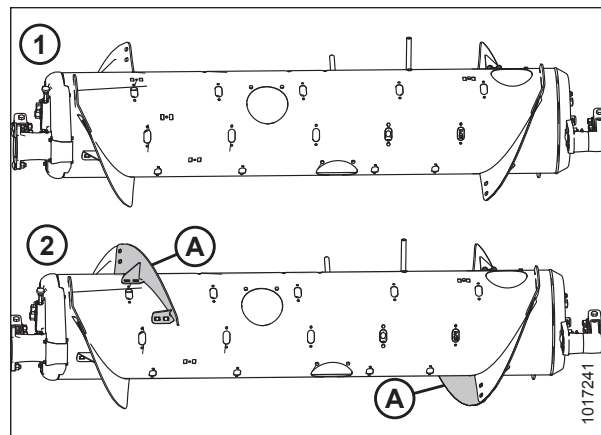


Figure 4.11: Auger Configurations (Rear View)

1 - Wide Configuration

2 - Medium Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts are removed from illustrations for clarity.

2. Remove bolts (A) and remove the access cover (B) on the right side of the auger. Retain for reassembly later.

NOTE:

It may be necessary to remove multiple access covers for ease of access.

3. Remove and discard the two flighting slot plugs (C) on the right side of the auger.

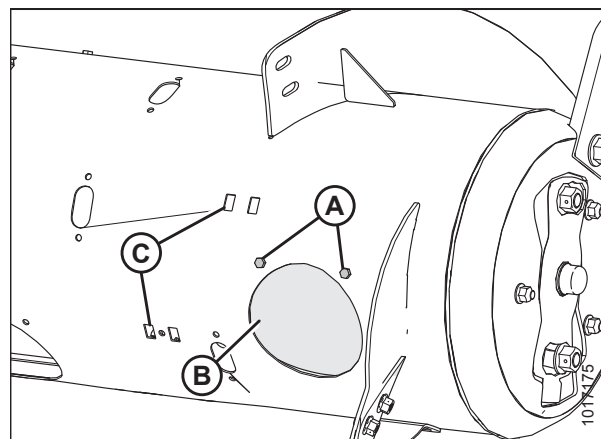


Figure 4.12: Wide Configuration (Right Side)

21. MD #287031 is available for ordering only through MacDon Parts. B6215 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

4. Install bolt-on fighting (A) on the right side of the auger as shown, and secure with six carriage head bolts and six nuts at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

5. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on fighting, then retorque them to 58–64 Nm (43–47 lbf·ft).

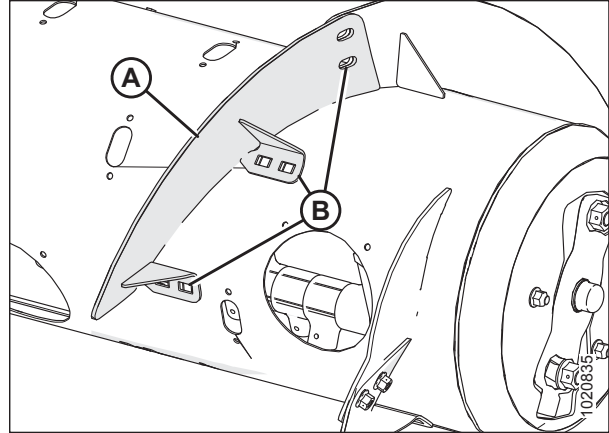


Figure 4.13: Medium Configuration (Right Side)

6. Repeat Steps 2, page 257 and 3, page 257 at the left side of auger.
7. Install bolt-on fighting (A) on the left side as shown, and secure with six carriage head bolts and six nuts at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

8. Torque all nuts and bolts (B) to 47 Nm (35 lbf·ft) to eliminate deflection on fighting, then retorque them to 58–64 Nm (43–47 lbf·ft).
9. Remove extra auger fingers. A total of 22 fingers are recommended for this configuration. Refer to [Removing Feed Auger Fingers, page 371](#).

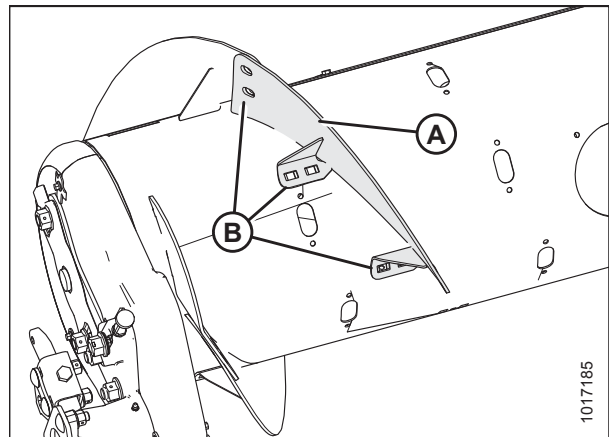


Figure 4.14: Medium Configuration (Left Side)

4.1.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration

Two of either MD #287032 or B6216²² are required to convert to this configuration. 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.

Medium, Wide, and Narrow auger configurations are shown at right. When converting from a Medium or Wide configuration to a Narrow configuration, you will need to replace the existing flightings (A) with flightings (B). All parts are included in this kit.

NOTE:

Ideally, the flighting should fit tight against the auger tube; however, gaps are not uncommon. Crop material may collect in this gap, but generally this will not affect performance. If desired, silicone sealant may be used to fill these gaps.

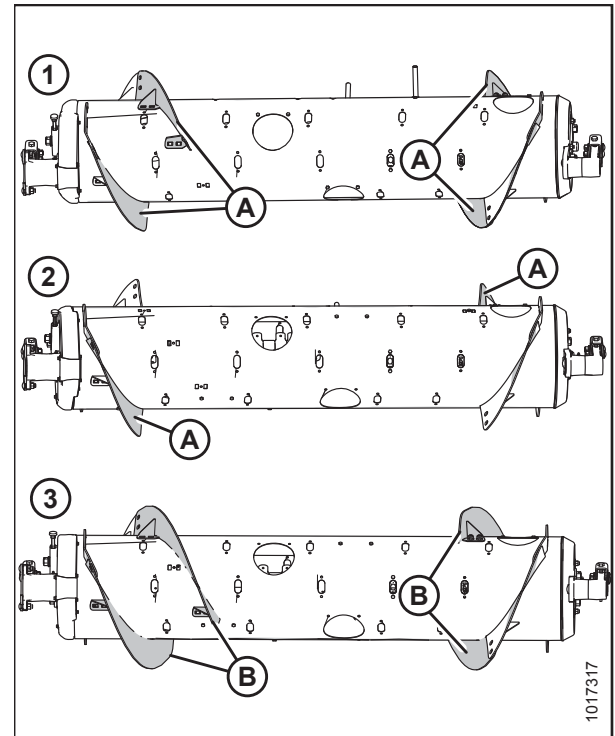


Figure 4.15: Auger Configurations (Rear View)

1 - Medium Configuration
3 - Narrow Configuration

2 - Wide Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts have been removed from the illustrations for clarity.

22. MD #287032 is available for ordering only through MacDon Parts. B6216 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly.
3. Remove hardware (C) and bolt-on flighting (D) from the auger.
4. Remove and discard the flighting slot plug (E) located close to the end of the flighting (D).
5. **Converting from Medium Configuration:** Repeat above steps for the other flighting on the right side.

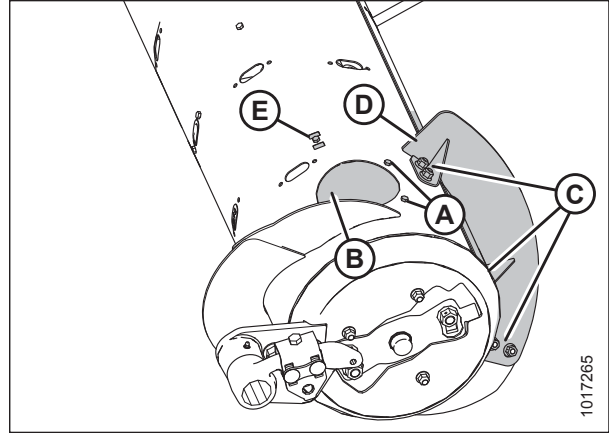


Figure 4.16: Wide Configuration (Right Side)

6. **Converting from Wide Configuration:** Remove bolts (A), access cover (B), and two flighting slot plugs (C) from the right side of the auger.
7. Repeat Steps 2, page 260 to 6, page 260 at the left side of the feed auger.

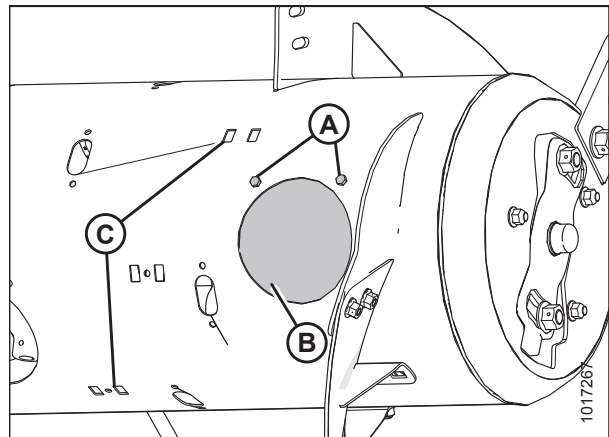


Figure 4.17: Wide Configuration (Right Side)

8. Install two bolt-on flightings (A) on the right side as shown, and secure each flighting with six carriage head bolts (MD #184657) and nuts (MD #135799) at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

9. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).
10. Install flighting slot plug (MD #213084) at location (C) from inside the auger and secure with an M6 hex head bolt (MD #252703) and tee nut (MD #197263). Repeat for the other flighting mounting locations.

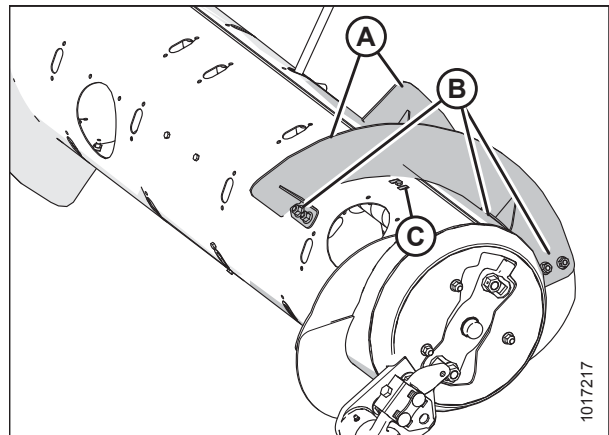


Figure 4.18: Narrow Configuration (Right Side)

HEADER ATTACHMENT/DETACHMENT

11. Install two bolt-on flightings (A) on the left side as shown, and secure each flighting with six carriage head bolts (MD #184657) and nuts (MD #135799) at location (B).

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

12. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).
13. Install flighting slot plug (C) (MD #213084) from inside the auger and secure with an M6 hex head bolt (MD #252703) and tee nut (MD #197263). Repeat for the other flighting mounting location used to mount the previous flighting in Step 3, page 260.
14. Remove extra fingers. A total of 18 fingers is recommended for this configuration. Refer to [Removing Feed Auger Fingers, page 371](#).

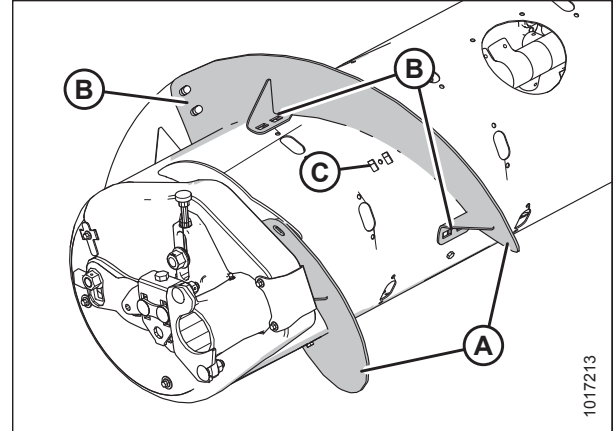


Figure 4.19: Narrow Configuration (Left Side)

4.1.4 Converting from Ultra-Narrow Configuration to Narrow Configuration

Ultra-Narrow and Narrow auger configurations are shown at right. Existing flightings (A) are removed when converting to Narrow configuration.

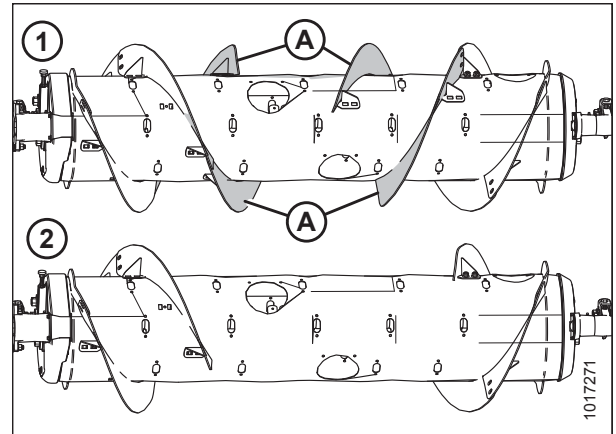


Figure 4.20: Auger Configurations (Rear View)

1 - Ultra-Narrow Configuration 2 - Narrow Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

HEADER ATTACHMENT/DETACHMENT

2. Remove bolts (A) and access cover (B). Retain for reassembly.

NOTE:

Some parts are removed from the illustration for clarity.

3. Remove hardware from location (C), and remove bolt-on flighting (D) from feed auger.
4. Repeat procedure for the remaining three inboard flightings.
5. Install additional fingers. A total of 18 fingers are recommended for this configuration. Refer to *Installing Feed Auger Fingers, page 373* for instructions.

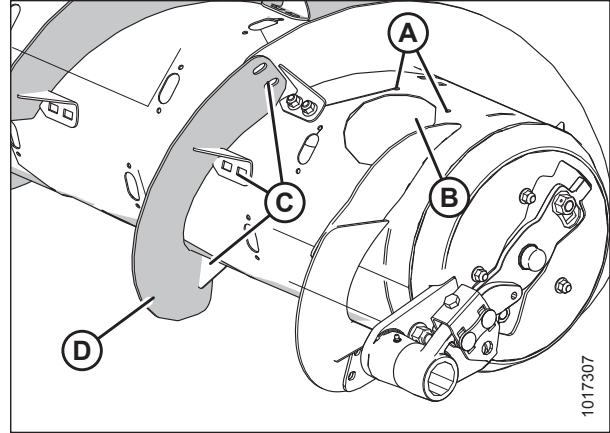


Figure 4.21: Ultra-Narrow Configuration (Right Side)

4.1.5 Converting from Medium Configuration to Wide Configuration

Four flighting plugs (MD #213084), M6 hex head bolts (MD #252703), and M6 tee nuts (MD #197263) are recommended to cover the flighting mounting holes after the flightings are removed. These parts can be ordered from a MacDon Dealer.

Medium and Wide auger configurations are shown at right. When converting from a Medium configuration to a Wide configuration, you will need to remove existing flightings (A).

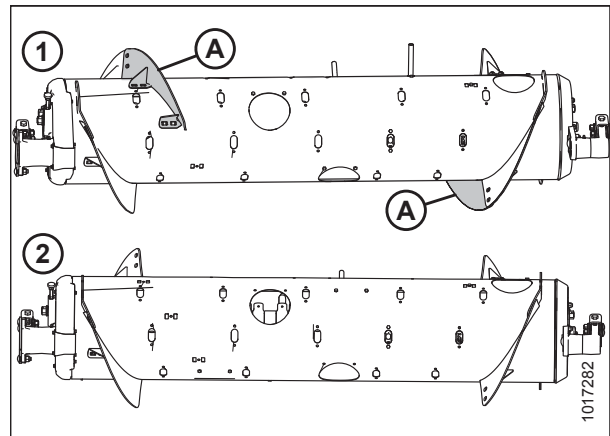


Figure 4.22: Auger Configurations (Rear View)

1 - Medium Configuration 2 - Wide Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to *4 Header Attachment/Detachment, page 251*.

NOTE:

Some parts have been removed from the illustrations for clarity.

HEADER ATTACHMENT/DETACHMENT

2. Remove bolts (A) and access cover (B). Retain for reassembly.
3. Remove hardware from location (C), and remove bolt-on fighting (D) from the feed auger.

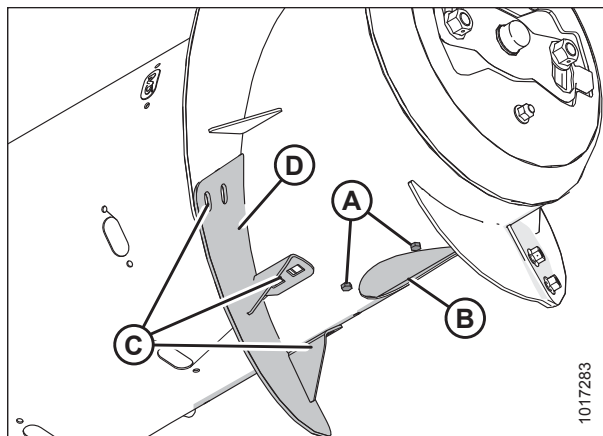


Figure 4.23: Right Side of Medium Configuration

4. Install fighting slot plug (A) (MD #213084) in the fighting slot from inside the auger and secure with M6 hex head bolts (B) (MD #252703) and tee nuts (MD #197263).
5. Repeat above steps at the left side of the auger.
6. Install additional fingers. A total of 30 fingers are recommended for this configuration. Refer to [Installing Feed Auger Fingers, page 373](#).

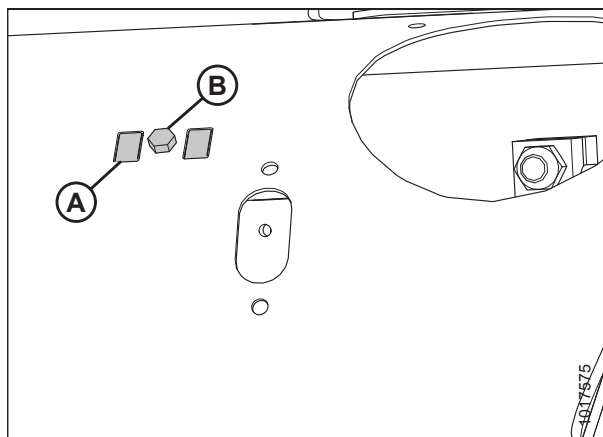


Figure 4.24: Right Side of Wide Configuration

4.1.6 Converting from Ultra Narrow or Narrow Configuration to Wide Configuration

One kit (either MD #287031 or B6215²³) is required to convert to this configuration. Two flighting plugs (MD #213084), two M6 hex head bolts (MD #252703), and two M6 tee nuts (MD #197263) are recommended to close the flighting mounting locations. These parts can be ordered from a MacDon Dealer.

The Narrow, Ultra-Narrow, and Wide auger configurations are shown at right. When converting from the Narrow or Ultra-Narrow configuration to the Wide configuration, you will need to replace the existing flightings (A).

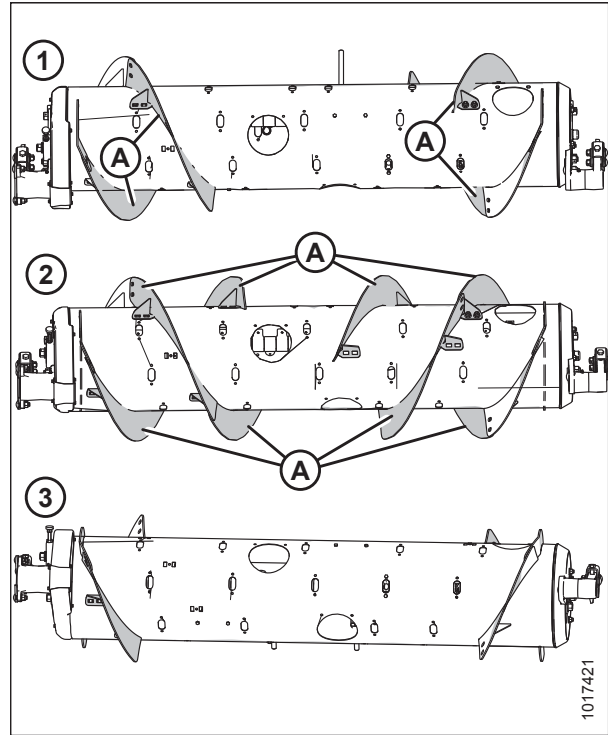


Figure 4.25: Auger Configurations (Rear View)

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

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

23. MD #287031 is available for ordering only through MacDon Parts. B6215 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

NOTE:

Some parts have been removed from the illustrations for clarity.

2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly later.
3. Remove hardware (C) and bolt-on fighting (D) from the right side of the auger. Discard fighting, but retain hardware to attach the new fighting.
4. Remove fighting slot plug, bolt, and tee nut (E). Retain for reinstallation later.

NOTE:

Only two fighting slot plugs (E) should be removed. One from each outboard side of the auger.

5. Repeat Steps 2, page 265 and 3, page 265 for the remaining bolt-on fighting(s).
6. Install the new bolt-on fighting (A) using six carriage head bolts (MD #184657) and nuts (B) (MD #135799) on the right side of the auger.

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

7. Reinstall fighting slot plug (C) removed in Step 4, page 265.

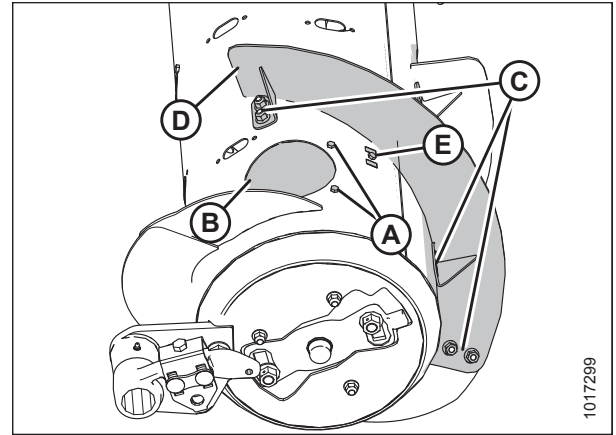


Figure 4.26: Narrow Configuration (Right Side)

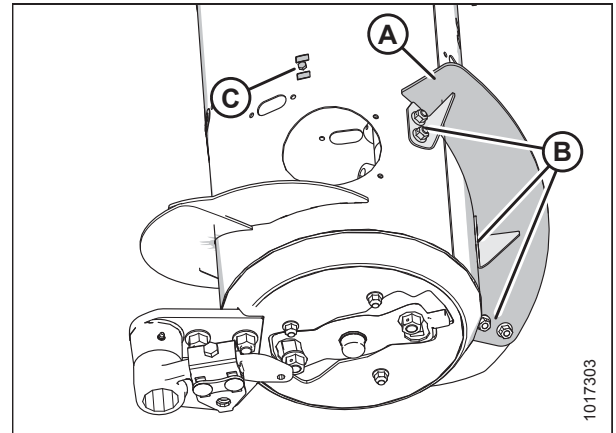


Figure 4.27: Wide Configuration (Right Side)

8. Install the new bolt-on fighting (A) using six carriage head bolts (MD #184657) and nuts (B) (MD #135799) on the left side of the auger.

IMPORTANT:

Bolt heads must be installed on inside of auger to prevent damage to internal components.

9. Reinstall fighting slot plug (C) removed in Step 4, page 265.

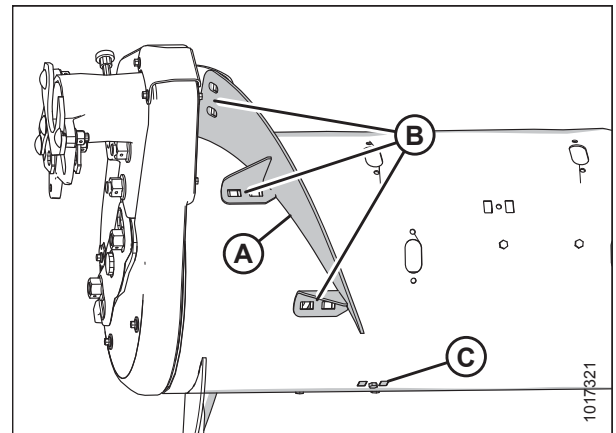


Figure 4.28: Wide Configuration (Left Side)

HEADER ATTACHMENT/DETACHMENT

10. Install the remaining flighting slot plugs (MD #213084) using the M6 hex head bolts (MD #252703) and tee nuts (MD #197263) in the locations previously used to mount the flighting in Step 3, page 265 and Step 5, page 265.
11. Install additional fingers. There should be a total of 30 fingers in this configuration. Fingers and all required parts are included in kit. Refer to [Installing Feed Auger Fingers, page 373](#).

4.1.7 Optional Modification to Wide Configuration

In some conditions, feeding may be further improved by removing all bolt-on flightings (A). Four flighting plugs (MD #213084), M6 bolts (MD #252703), and M6 tee nuts (MD #197263) are recommended to cover the flighting mounting holes. These parts can be ordered from a MacDon Dealer.

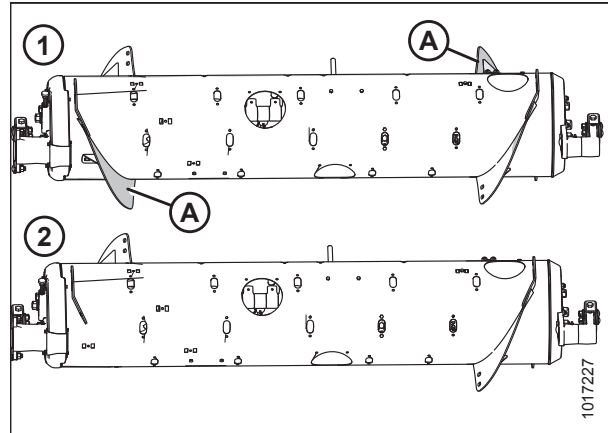


Figure 4.29: Auger Configurations (Rear View)
1 - Wide Configuration 2 - Modified Wide Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts have been removed from illustration for clarity.

2. Remove two bolts and access cover (A).
3. Remove hardware (B), and bolt-on flighting (C).
4. Install flighting slot plugs (MD #213084) in the flighting mounting locations (D) and secure with M6 bolts (MD #252703) and tee nuts (MD #197263).
5. Repeat at the left side of the auger.
6. Install additional fingers. A total of 30 fingers are recommended for this configuration. Refer to [Installing Feed Auger Fingers, page 373](#).

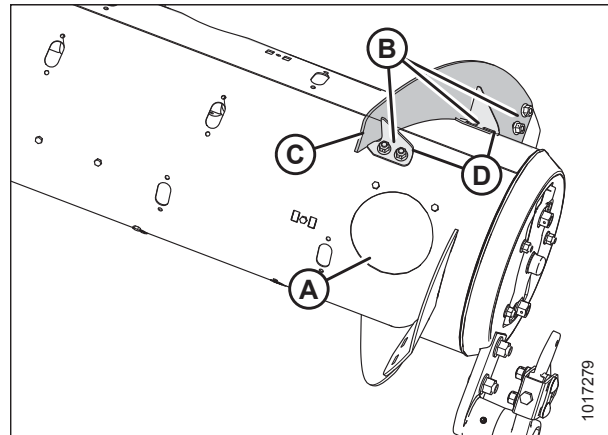


Figure 4.30: Wide Configuration (Right Side)

4.1.8 Converting from Medium Configuration or Wide Configuration to Ultra-Narrow Configuration

Four kits of either MD #287032 or B6216²⁴ and some hole-drilling are required to convert to the Ultra-Narrow configuration. 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.

NOTE:

A wear-resistant long flighting kit is available for this configuration conversion. This kit includes long tungsten carbide coated flightings that have increased durability for harvesting abrasive crops like rice. If this is required, order four kits of either MD #287804 or B6400²⁵ instead of four kits of MD #287032 or B6216.

Medium, Wide, and Ultra-Narrow auger configurations are shown at right. When converting to an Ultra-Narrow configuration, existing flightings (A) are removed and new flightings (B) are installed.

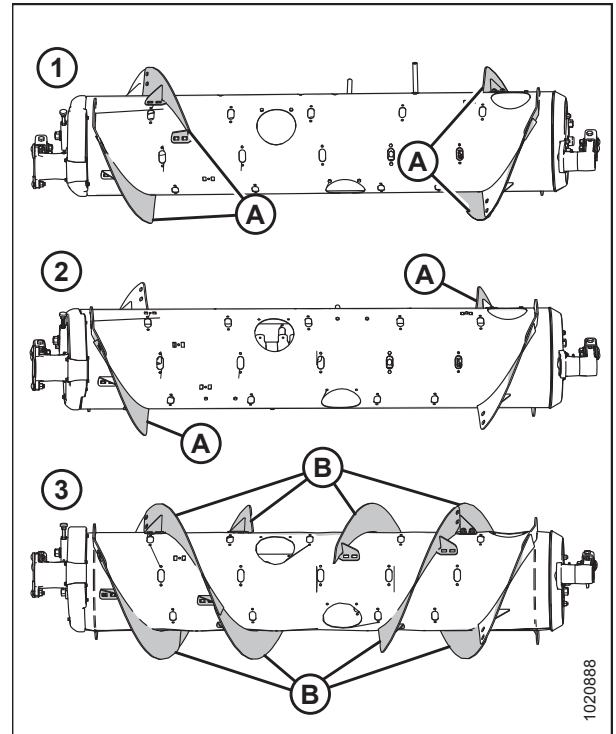


Figure 4.31: Auger Configurations (Rear View)

1 - Medium Configuration

2 - Wide Configuration

3 - Ultra-Narrow Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts are removed from the illustrations for clarity.

24. MD #287032 is available for ordering only through MacDon Parts. B6216 is available for ordering only through Whole Goods. They contain the same parts.

25. MD #287804 is available for ordering only through MacDon Parts. B6400 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly.
3. Remove hardware (C) and bolt-on flighting (D) from the auger.
4. Remove the flighting slot plug (E) located close to the end of the flighting (D).
5. **Converting from Medium Configuration:** Repeat above steps for the other bolt-on flighting on the same side.

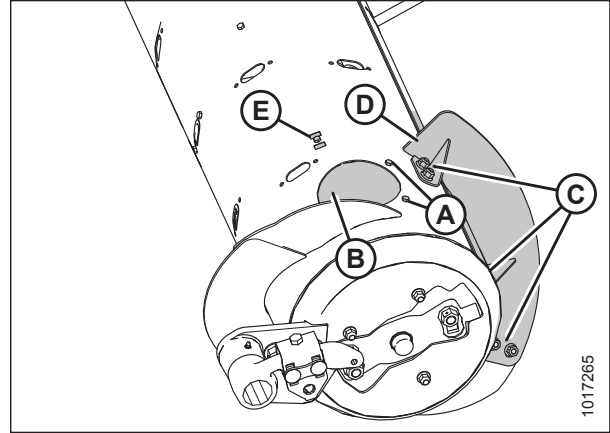


Figure 4.32: Wide Configuration (Right Side)

6. **Converting from Wide Configuration:** Remove bolts (A), access cover (B), and two flighting slot plugs (C) from the right side of the auger.
7. Repeat Steps [2, page 268](#) to [6, page 268](#) at the left side of the auger.

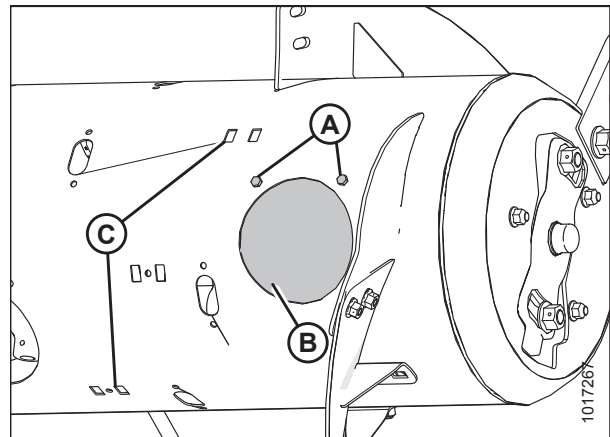


Figure 4.33: Wide Configuration (Right Side)

8. Position two bolt-on flightings (A) on the right side, as shown. Temporarily secure flightings with two carriage head bolts (MD #184657) and nuts (MD #135799) at each location (B).

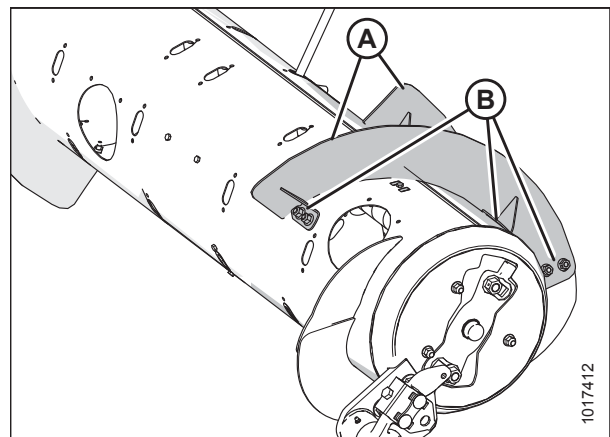


Figure 4.34: Right Side of Auger

HEADER ATTACHMENT/DETACHMENT

9. Position another bolt-on flighting (A) outboard of the temporarily installed flighting (B). Mark hole locations (C) of the bolt-on flighting onto the temporarily installed bolt-on flighting (B).
10. Remove temporarily installed bolt-on flighting (B) from the auger and drill two 11 mm (7/16 in.) holes at the marked locations.
11. Install the bolt-on flighting (B) with newly drilled holes using six carriage head bolts (MD #184657) and nuts (MD #135799).

IMPORTANT:

Carriage bolt heads must be installed on inside of auger to prevent damage to internal components.

12. Repeat Steps 9, page 269 to 11, page 269 to the remaining bolt-on flighting on the right side of the auger.
13. Position two bolt-on flightings (A) on the left side, as shown. Temporarily secure flightings with two carriage head bolts (MD #184657) and nuts (MD #135799) at each location (B).

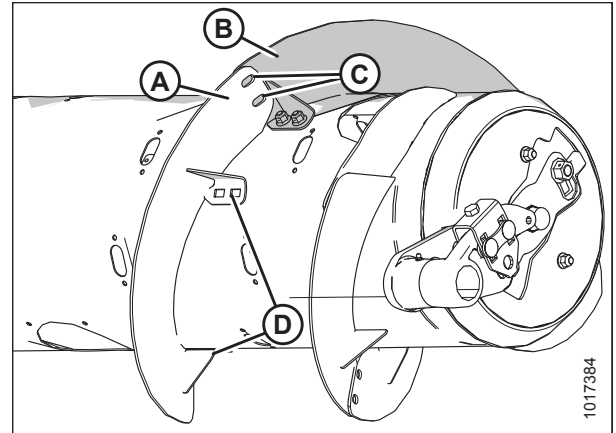


Figure 4.35: Right Side of Auger

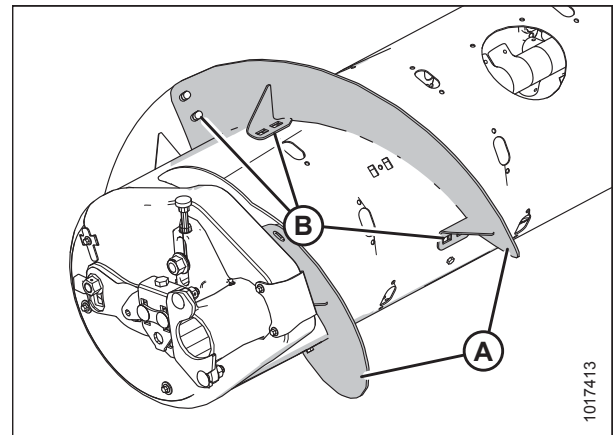


Figure 4.36: Left Side of Auger

14. Position another bolt-on flighting (A) outboard of the temporarily installed flighting (B). Mark hole locations (C) of the bolt-on flighting onto the temporarily installed bolt-on flighting.
15. Remove temporarily installed bolt-on flighting (B) from the auger and drill two 11 mm (7/16 in.) holes at the marked locations.
16. Install the bolt-on flighting (B) with newly drilled holes using six carriage head bolts (MD #184657) and nuts (MD #135799).

IMPORTANT:

Carriage bolt heads must be installed on inside of auger to prevent damage to internal components.

17. Repeat Steps 14, page 269 to 16, page 269 to the remaining bolt-on flighting on the left side of the auger.

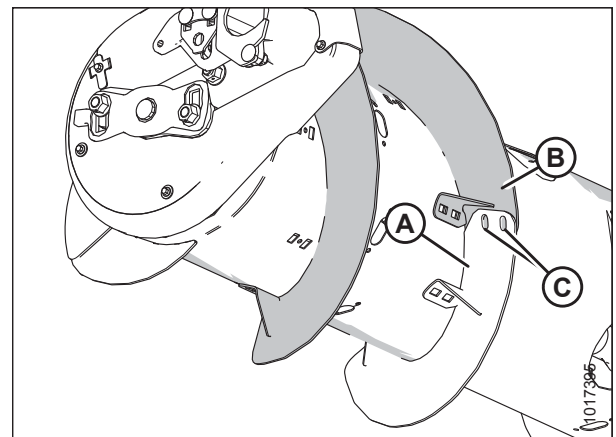


Figure 4.37: Left Side of Auger

HEADER ATTACHMENT/DETACHMENT

18. Place bolt-on flighting (A) outboard of the other flighting (B) on the left side of the auger, as shown.
19. Temporarily secure bolt-on flighting (A) with two button head bolts (MD #135723) and nuts (MD #135799) at location (C).

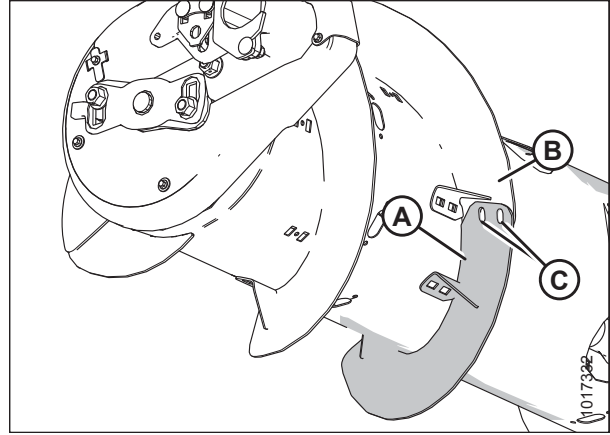


Figure 4.38: Left Side of Auger

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

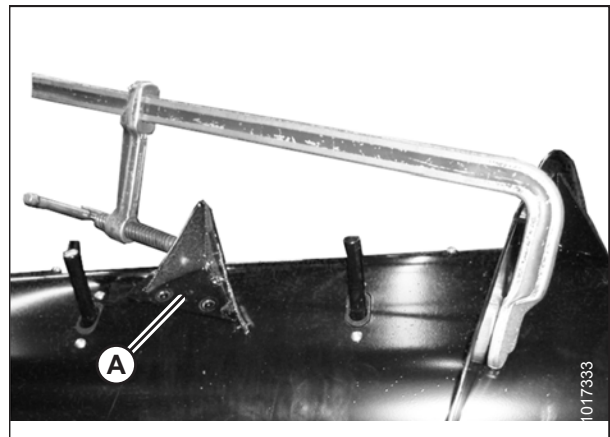


Figure 4.39: Flighting Stretched Axially

21. With flighting in the desired position, mark hole locations (A) on auger tube.
22. Remove the flighting (B) from auger, and drill 11 mm (7/16 in.) holes at the marked location on auger tube.
23. Remove nearest access cover(s). Retain for reinstallation.
24. Install the bolt-on flighting (B) using two button head bolts (MD #135723) and nuts (MD #135799) at location (C), and four flange head bolts (MD #152655) and nuts (MD #135799) at location (A).

IMPORTANT:

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

25. Repeat Steps [18, page 270](#) to [24, page 270](#) for the remaining flighting on the left side of the auger.

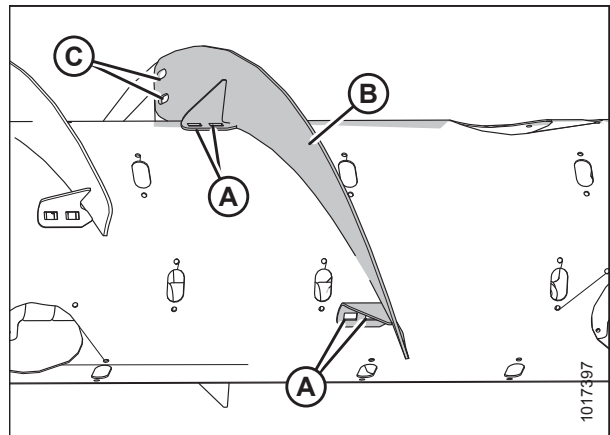


Figure 4.40: Left Side of Auger

HEADER ATTACHMENT/DETACHMENT

26. Place bolt-on flighting (A) outboard of the other flighting (B) on the right side of the auger as shown.
27. Temporarily secure bolt-on flighting (A) with two button head bolts (MD #135723) and nuts (MD #135799) at location (C).
28. Repeat Steps 20, page 270 to for both pieces of flighting on the right side of the auger.
29. Install flighting slot plugs (MD #213084) in the flighting mounting locations and secure with M6 bolts (MD #252703) and tee nuts (MD #197263).
30. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).

NOTE:

Ideally, the flighting should fit tightly against the auger tube; however, gaps are not uncommon. Crop material may collect in these gaps, but generally, this will not affect performance. If desired, you can use silicone sealant to fill these gaps.

31. Add or remove fingers to optimize feeding for your combine and crop conditions. Refer to [Installing Feed Auger Fingers, page 373](#) or [Removing Feed Auger Fingers, page 371](#).
32. If not adding or removing fingers, reinstall all access covers and secure with bolts. Coat bolts with Loctite® #243 (or equivalent) and torque to 8.5 Nm (75 lbf·in).

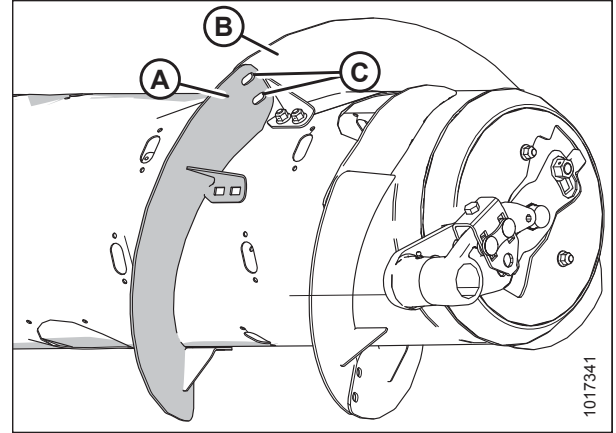


Figure 4.41: Right Side of Auger

4.1.9 Converting from Narrow Configuration to Ultra-Narrow Configuration

Two kits (of either MD #287032 or B6216²⁶) and some hole-drilling are required to convert to this configuration. 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.

NOTE:

A wear-resistant long flighting kit is available for this configuration conversion. This kit includes long tungsten carbide coated flightings that have increased durability for harvesting abrasive crops like rice. If this is required, order two kits of either MD #287804 or B6400²⁷ instead of two kits of MD #287032 or B6216.

-
26. MD #287032 is available for ordering only through MacDon Parts. B6216 is available for ordering only through Whole Goods. They contain the same parts.
 27. MD #287804 is available for ordering only through MacDon Parts. B6400 is available for ordering only through Whole Goods. They contain the same parts.

HEADER ATTACHMENT/DETACHMENT

NOTE:

Additional holes on the auger are needed before these flightings (A) can be installed.

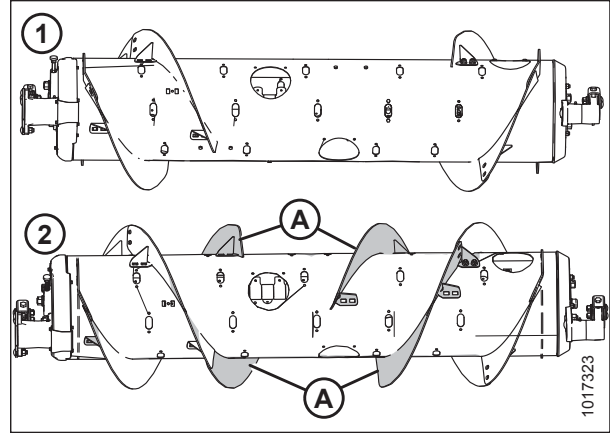


Figure 4.42: Auger Configurations (Rear View)

1 - Narrow Configuration

2 - Ultra-Narrow Configuration

1. To improve access and ease installation, remove float module from combine. For instructions, refer to [4 Header Attachment/Detachment, page 251](#).

NOTE:

Some parts have been removed from the illustrations for clarity.

2. Place new bolt-on flighting (A) outboard of the existing flighting (B) on the left side of the auger, as shown.
3. Mark hole locations (C) of the new bolt-on flighting (A) onto existing bolt-on flighting (B).
4. Remove nearest access cover to existing bolt-on flighting (B). Retain hardware for reassembly.
5. Remove existing bolt-on flighting (B) from the auger. Retain hardware for reassembly.
6. Drill two 11 mm (7/16 in.) holes at the marked locations of existing bolt-on flighting (B).
7. Reinstall existing bolt-on flighting (B) on the auger.

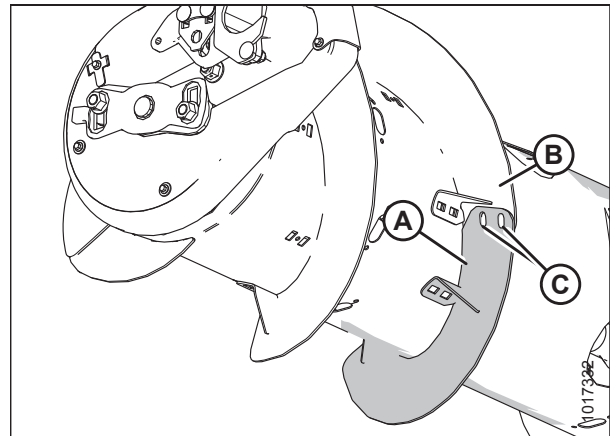


Figure 4.43: Left Side of Auger

NOTE:

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

HEADER ATTACHMENT/DETACHMENT

8. Place new bolt-on fighting (A) outboard of the existing fighting (B) of the left side of the auger, as shown.
9. Secure with two button head bolts (MD #135723) and nuts (MD #135799) at location (C).

IMPORTANT:

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

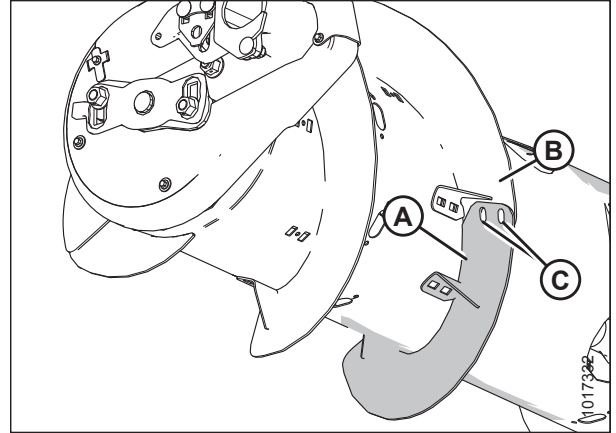


Figure 4.44: Left Side of Auger

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

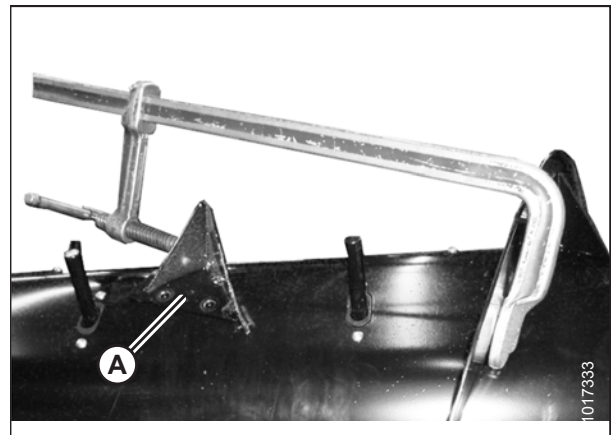


Figure 4.45: Fighting Stretched Axially

11. With fighting in desired position, mark holes (A) and drill 11 mm (7/16 in.) holes in auger tube.
12. Remove nearest access cover(s). Retain for reinstallation.
13. Secure bolt-on fighting on the newly drilled holes (A) using four flange head bolts (MD #152655) and nuts (MD #135799).
14. Repeat Steps 2, page 272 to 13, page 273 for the other fighting on the left side of the auger.

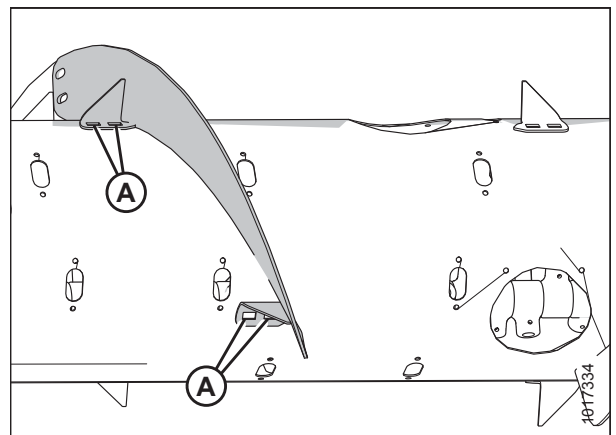


Figure 4.46: Fighting on Left Side of Auger

HEADER ATTACHMENT/DETACHMENT

15. Place flighting (A) outboard of the existing flighting (B) on the right side of the auger, as shown.
16. Repeat Steps [3, page 272](#) to [13, page 273](#) for both flightings on the right side of the auger.
17. Install flighting slot plugs (MD #213084) in the flighting mounting locations and secure with M6 bolts (MD #252703) and tee nuts (MD #197263).
18. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf·ft).

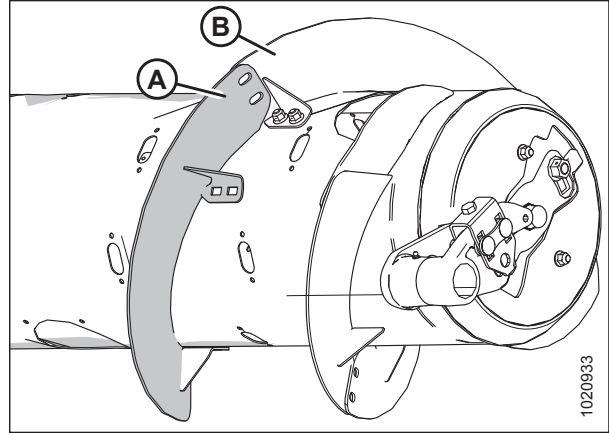


Figure 4.47: Flighting on Right Side of Auger

NOTE:

Ideally, the flighting should fit tightly against the auger tube; however, gaps are not uncommon. Crop material may collect in these gaps, but generally, this will not affect performance. If desired, you can use silicone sealant to fill these gaps.

19. Add or remove fingers as necessary to optimize feeding for your combine and crop conditions. Refer to [Installing Feed Auger Fingers, page 373](#) or [Removing Feed Auger Fingers, page 371](#).
20. If not adding or removing fingers, reinstall all access covers and secure with bolts. Coat bolts with Loctite® #243 (or equivalent) and torque to 8.5 Nm (75 lbf·in).

4.2 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 [7 Troubleshooting, page 501](#).

4.2.1 Using Auger Flighting

The auger flighting on the FM100 can be configured for specific combines and crop conditions. Refer to [4.1 Float Module Feed Auger Configurations, page 251](#) for combine/crop specific configurations.

4.2.2 Using Stripper Bars

Stripper bar kits may have been supplied with your header to improve feeding in certain crops such as rice. They are **NOT** recommended in cereal crops.

For servicing information, refer to [5.13 Float Module Stripper Bars and Feed Deflectors, page 422](#).

4.3 Case IH Combines

4.3.1 Attaching Header to Case IH Combine

DANGER

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

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

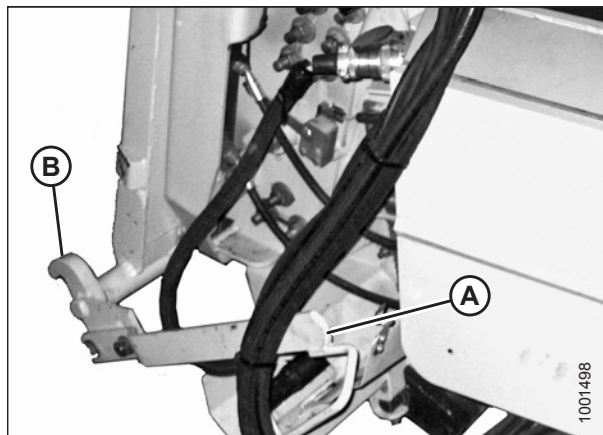


Figure 4.48: Feeder House Locks

CAUTION

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

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

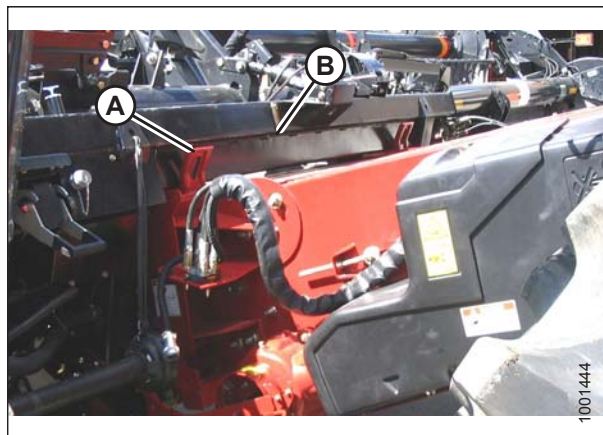


Figure 4.49: Combine and Float Module

HEADER ATTACHMENT/DETACHMENT

5. On the left side of the feeder house, lift lever (A) on the float module and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.
6. Push down on the lever (A) so the slot in the lever engages the handle and locks the handle in place.
7. If lock (C) does not fully engage the pin on the float module, loosen bolts (D) and adjust lock. Retighten bolts.

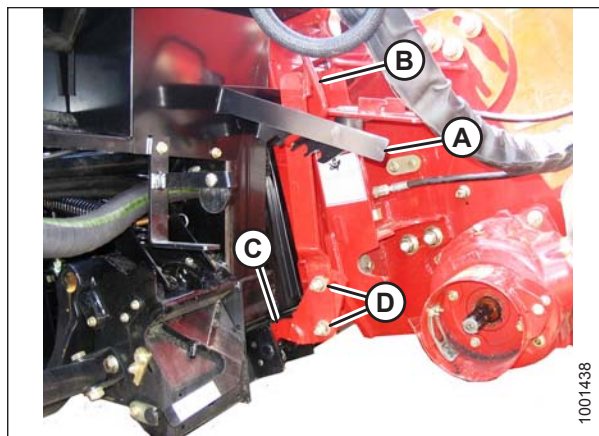


Figure 4.50: Combine and Float Module

8. Open the cover on the receptacle (A) located on the left side of the float module.
9. Press the lock button (B) and pull the handle (C) to the fully-open position.
10. Clean the receptacle mating surfaces.

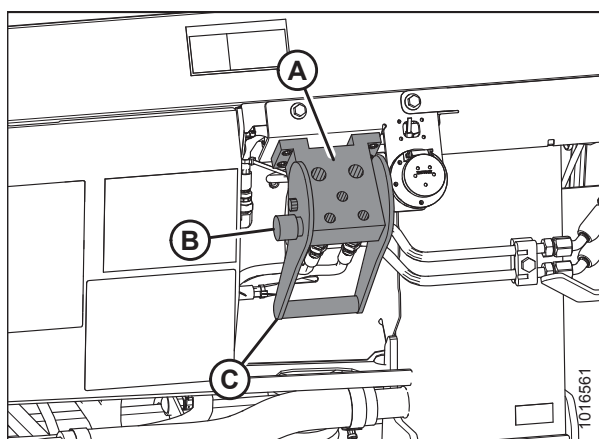


Figure 4.51: Float Module Receptacle

11. Remove the hydraulic quick coupler (A) from the combine, and clean the mating surfaces.



Figure 4.52: Combine Connectors

HEADER ATTACHMENT/DETACHMENT

12. Position the coupler onto the coupler receptacle (A) and push the handle (B) (not shown) to engage the multicoupler pins into the receptacle.
13. Push the handle (B) to the closed position until the lock button (C) snaps out.

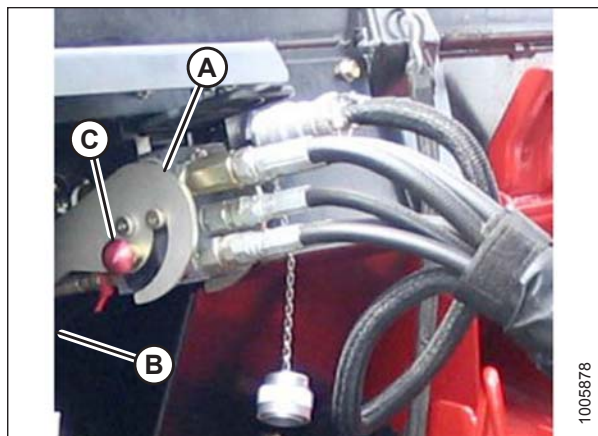


Figure 4.53: Hydraulic Connection

14. Remove the cover from the electrical receptacle (A). Ensure the receptacle is clean and has no signs of damage.

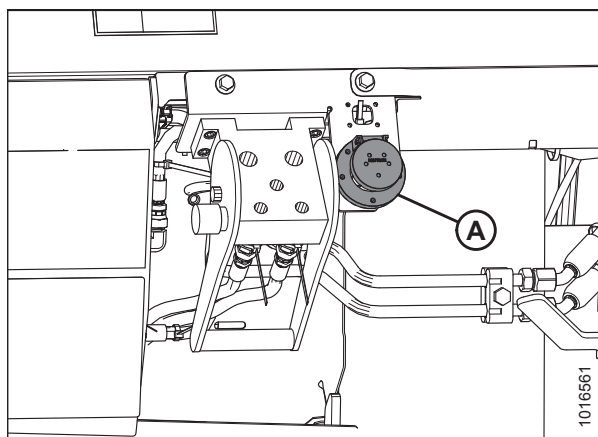


Figure 4.54: Electrical Receptacle

15. Remove the electrical connector (A) from the storage cup on the combine and route it to the float module receptacle.



Figure 4.55: Combine Connectors

HEADER ATTACHMENT/DETACHMENT

16. Align the lugs on the connector (A) with the slots in the receptacle (B), push the connector onto the receptacle, and turn the collar on the connector to lock it in place.

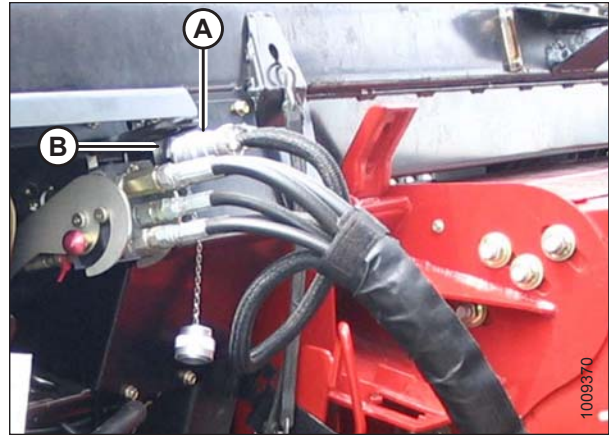


Figure 4.56: Electrical Connection

17. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from support bracket.

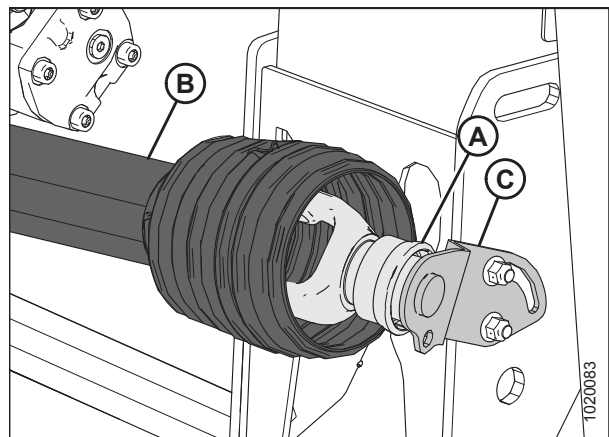


Figure 4.57: Driveline

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

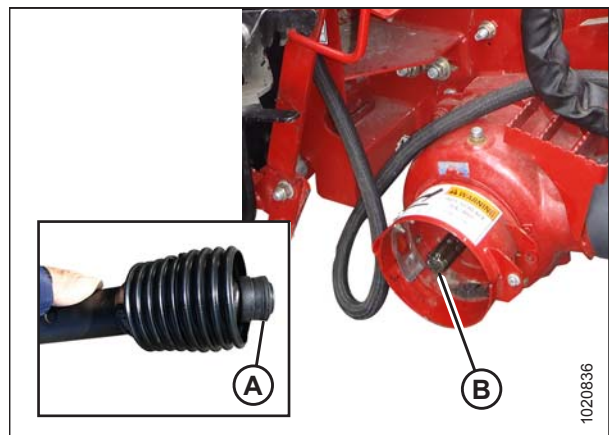


Figure 4.58: Combine Output Shaft

HEADER ATTACHMENT/DETACHMENT

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

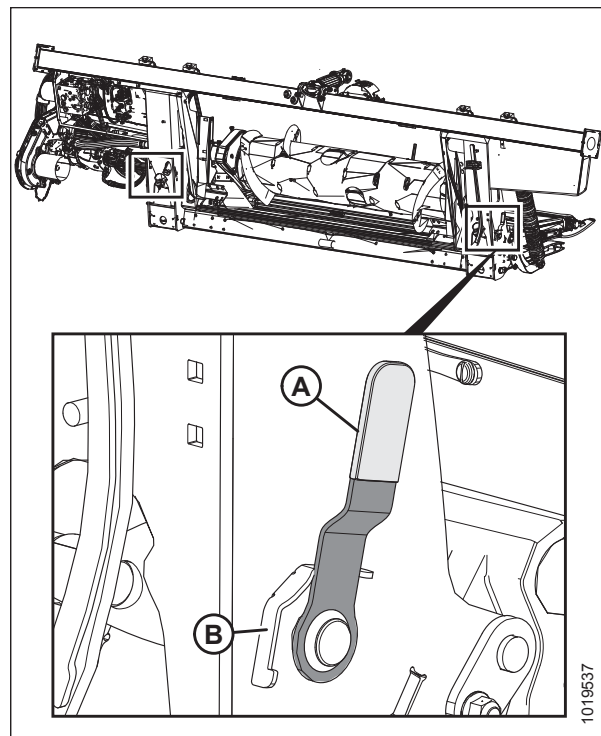


Figure 4.59: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4.3.2 Detaching Header from Case IH Combine



DANGER

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

HEADER ATTACHMENT/DETACHMENT

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 slow speed 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. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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. Refer to [Adjusting Stabilizer Wheels](#), page 52.

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

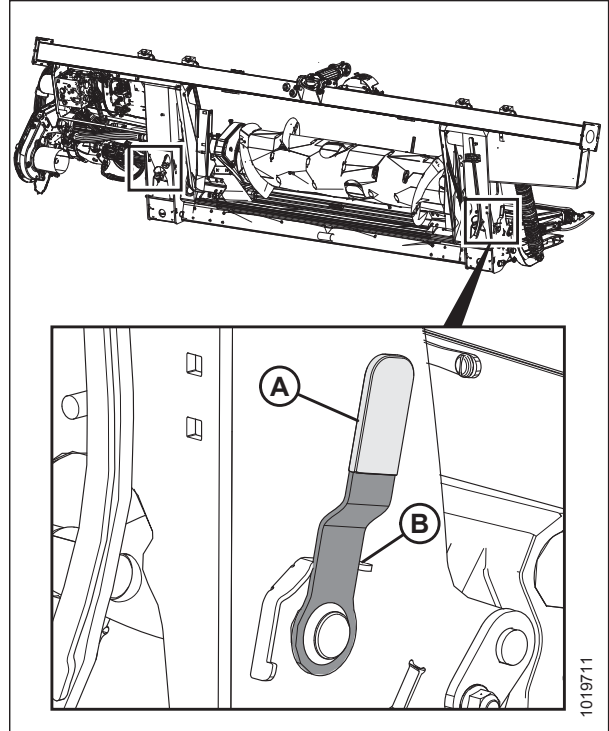


Figure 4.60: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

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

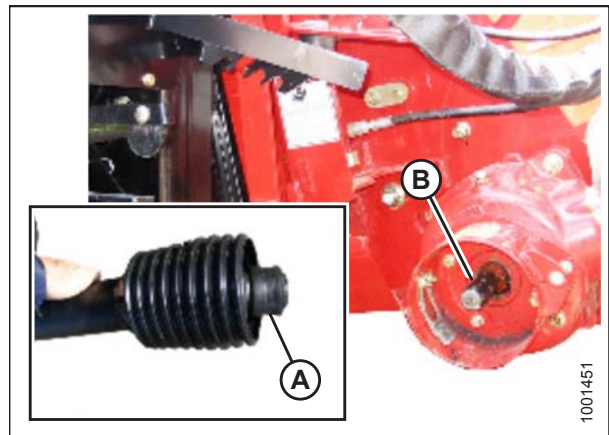


Figure 4.61: Driveline

HEADER ATTACHMENT/DETACHMENT

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

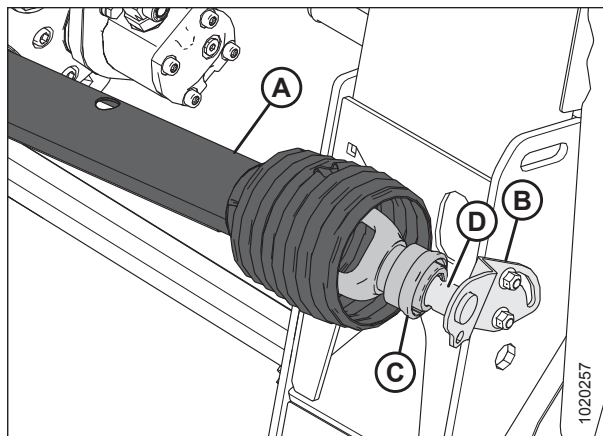


Figure 4.62: Driveline

6. Remove the electrical connector (A) and replace the cover (B).
7. Push in the lock button (C) and pull the handle (D) to release the multicoupler (E).

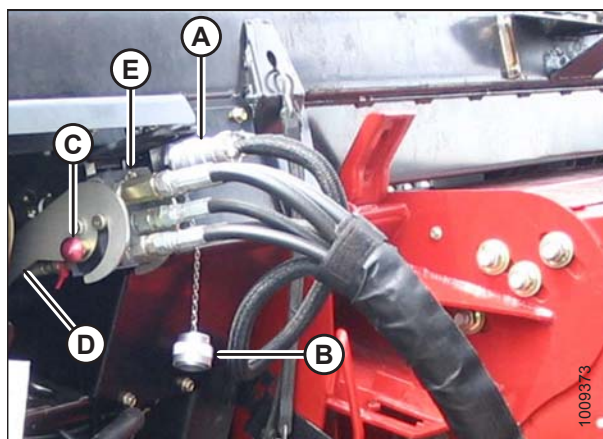


Figure 4.63: Multicoupler

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

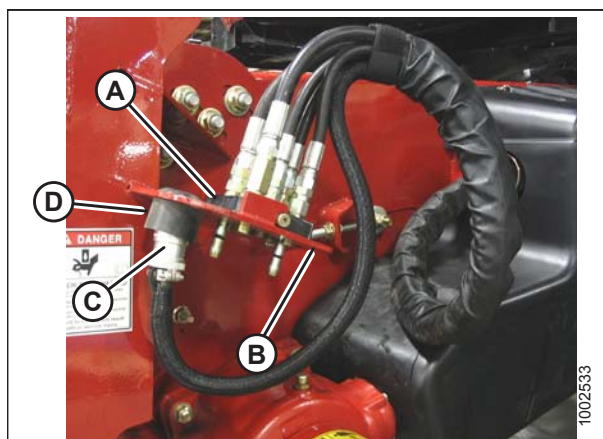


Figure 4.64: Multicoupler Storage

HEADER ATTACHMENT/DETACHMENT

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

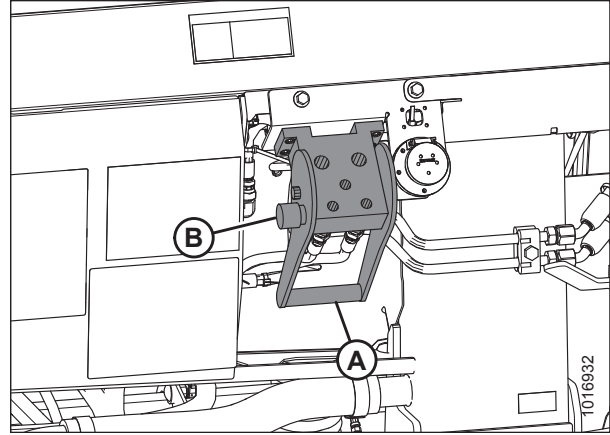


Figure 4.65: Float Module Receptacle

11. Lift the lever (A) and pull and lower the handle (B) to disengage the feeder house/float module lock (C).
12. Lower the feeder house until it disengages the float module support.
13. Back the combine away slowly from the float module.

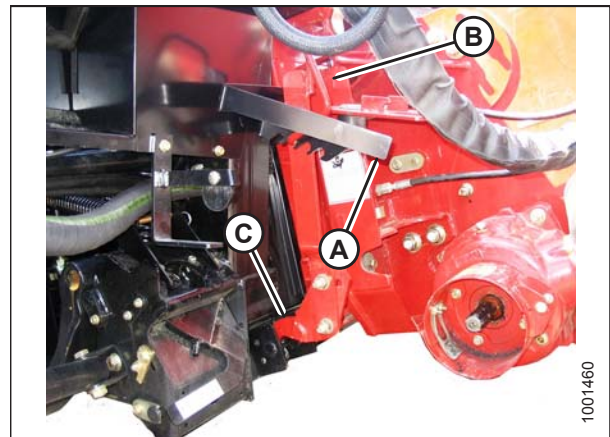


Figure 4.66: Feeder House Locks

4.4 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines

4.4.1 Attaching Header to a Challenger, Gleaner, or Massey Ferguson Combine

DANGER

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

HEADER ATTACHMENT/DETACHMENT

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

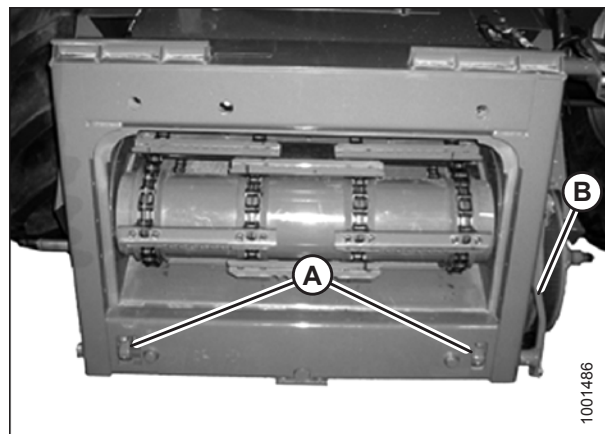


Figure 4.67: AGCO Group Feeder House

CAUTION

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

2. Start the engine and slowly approach the header until the feeder house is directly under the float module top cross member (A) and the alignment pins (C) (refer to Figure 4.69, page 283) on the feeder house are aligned with the holes (B) in the float module frame.

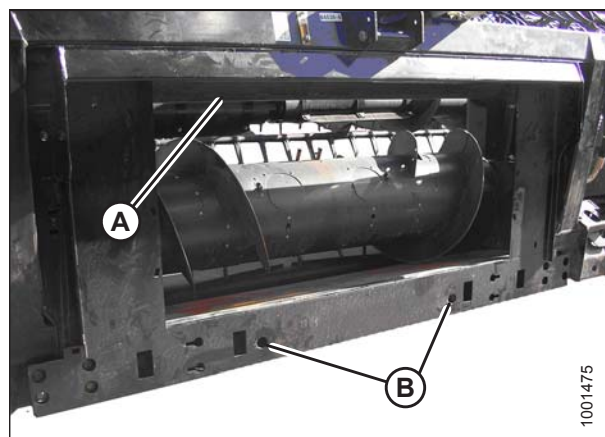


Figure 4.68: Float Module

NOTE:

Your combine feeder house may not be exactly as shown.

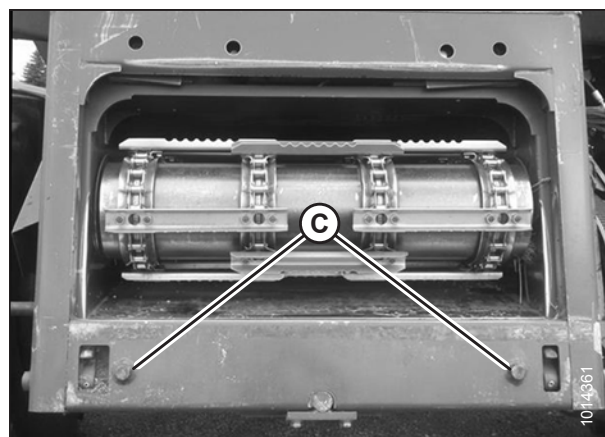


Figure 4.69: AGCO Group Alignment Pins

HEADER ATTACHMENT/DETACHMENT

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



Figure 4.70: Feeder House and Float Module

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

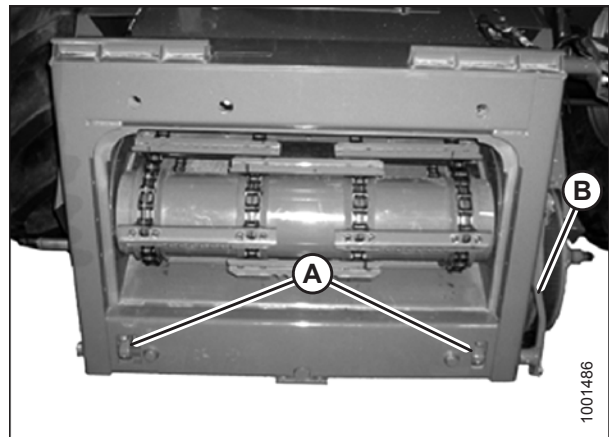


Figure 4.71: AGCO Group Feeder House

CAUTION

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

6. Start the engine and lower the header.
7. Stop the engine and remove the key from the ignition.

NOTE:

The FM100 Float Module is equipped with a multicoupler that connects to the combine. If your combine is equipped with individual connectors, a multicoupler kit (single-point connector) must be installed. Refer to Table 4.1, page 284 for a list of kits and installation instructions that are available through your combine Dealer.

Table 4.1 Multicoupler Kits

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

HEADER ATTACHMENT/DETACHMENT

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

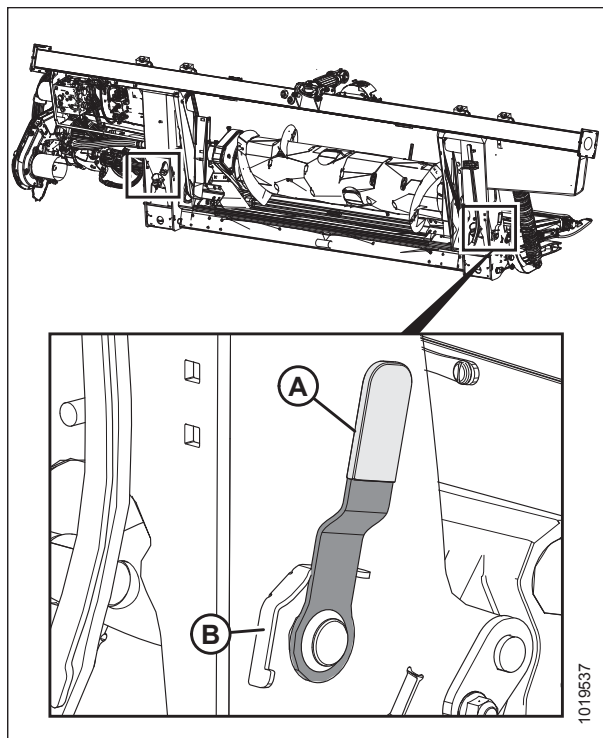


Figure 4.72: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

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

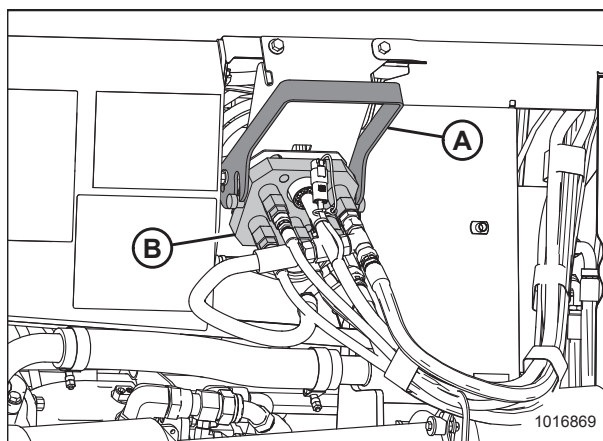


Figure 4.73: Float Module Multicoupler

HEADER ATTACHMENT/DETACHMENT

10. Push the handle (A) on the combine to the fully-open position.
11. Clean the mating surfaces of the multicoupler (B) and receptacle if necessary.

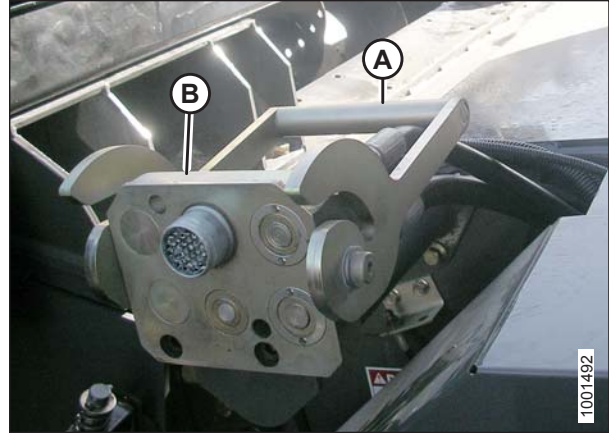


Figure 4.74: Combine Receptacle

12. Position the multicoupler (A) onto the combine receptacle, and pull the handle (B) to fully engage the multicoupler into the receptacle.
13. Connect the reel fore-aft/header tilt selector harness (C) to the combine harness (D).

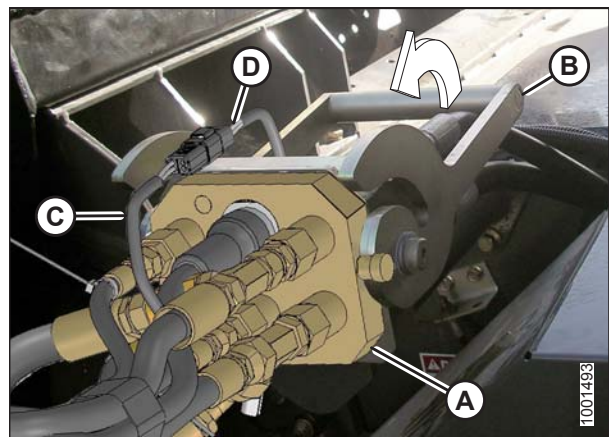


Figure 4.75: Multicoupler

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

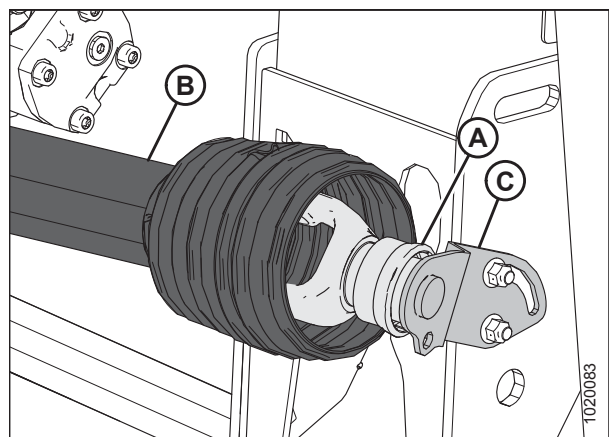


Figure 4.76: Driveline

HEADER ATTACHMENT/DETACHMENT

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

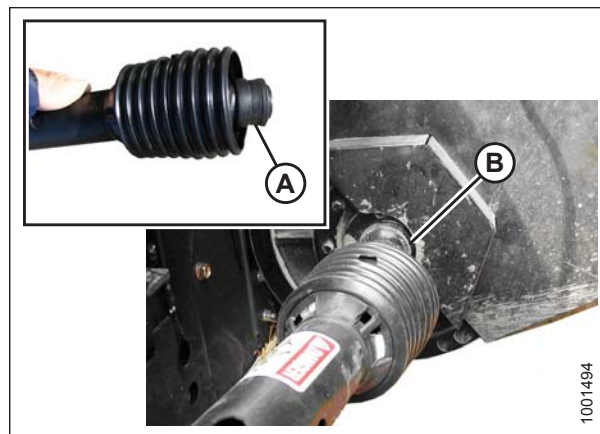


Figure 4.77: Driveline

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

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header 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 slow speed 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. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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. Refer to [Adjusting Stabilizer Wheels](#), page 52.

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

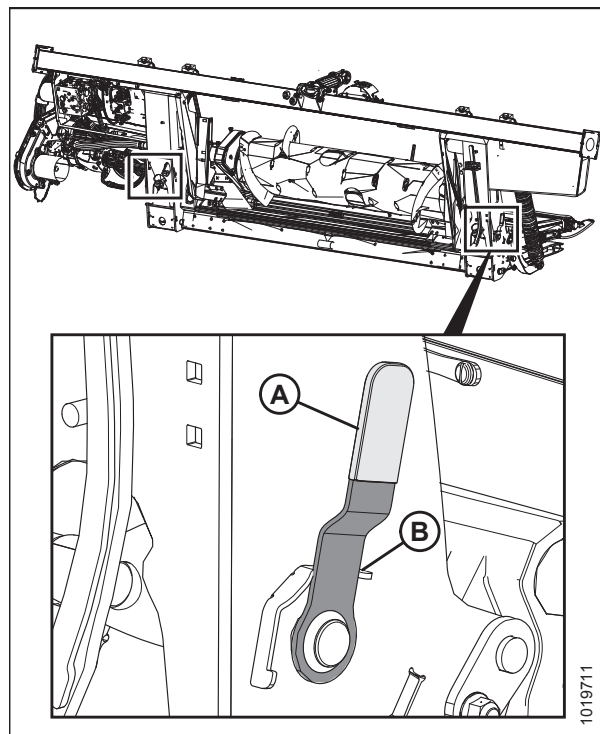


Figure 4.78: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

HEADER ATTACHMENT/DETACHMENT

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

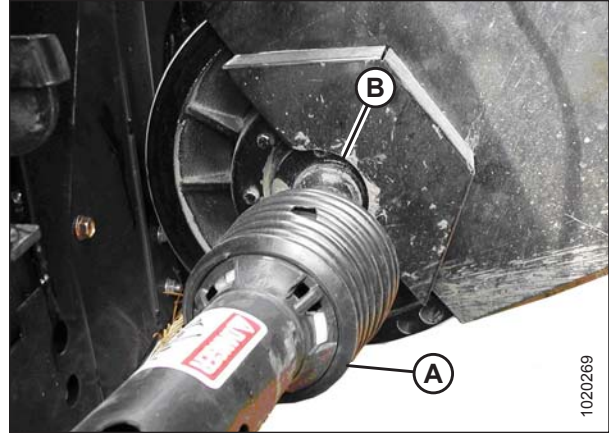


Figure 4.79: Disconnect Driveline

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

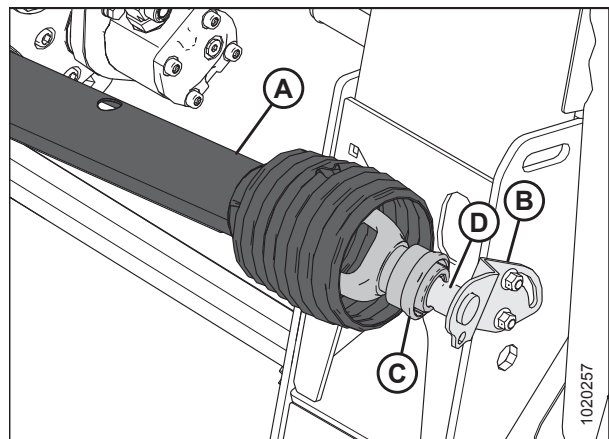


Figure 4.80: Driveline

6. Disconnect the harness at the connector (A).
7. Move the handle (B) on the combine multicoupler to the full open position to release the multicoupler (C) from the combine.

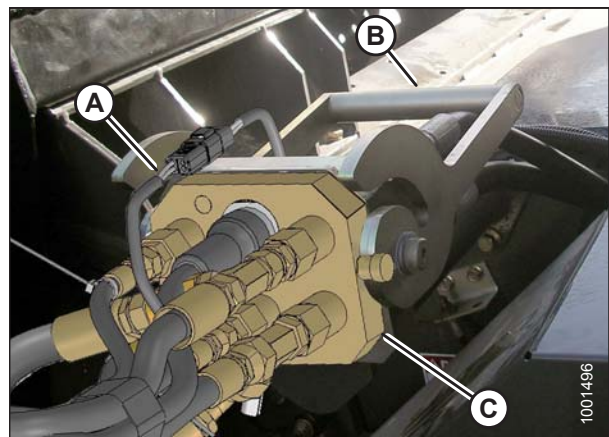


Figure 4.81: Multicoupler

HEADER ATTACHMENT/DETACHMENT

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

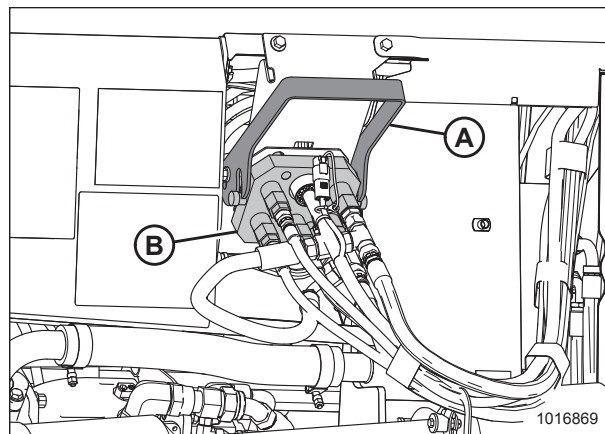


Figure 4.82: Float Module Multicoupler

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

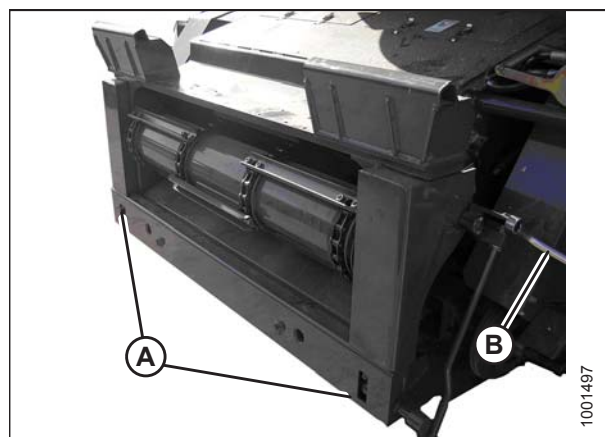


Figure 4.83: Challenger and Massey Ferguson

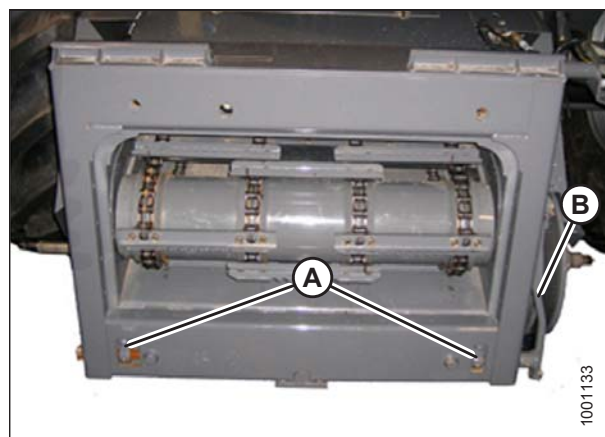


Figure 4.84: Gleaner R and S Series

HEADER ATTACHMENT/DETACHMENT

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

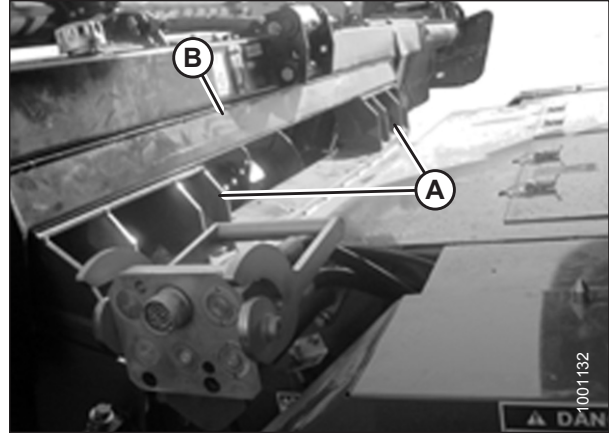


Figure 4.85: Float Module on Combine

4.5 John Deere Combines

The FD1 Series FlexDraper® Header is compatible with John Deere 60, 70, S, and T Series combines.

4.5.1 Attaching Header to John Deere Combine

DANGER

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

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

CAUTION

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

2. Start the engine and slowly drive the combine up to the header until the feeder house saddle (C) is directly under the float module top cross member (D).
3. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.
4. Stop the engine and remove the key from the ignition.

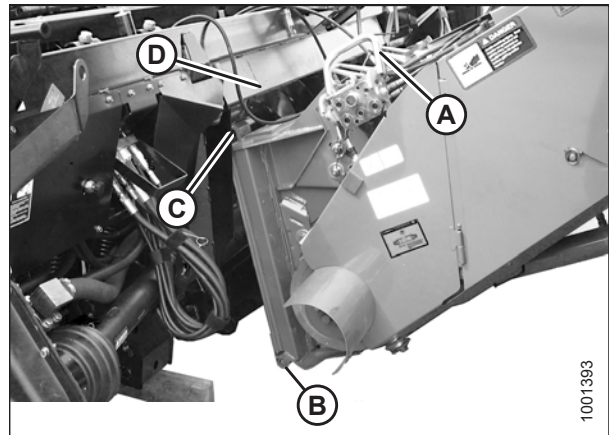


Figure 4.86: Combine and Float Module

HEADER ATTACHMENT/DETACHMENT

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

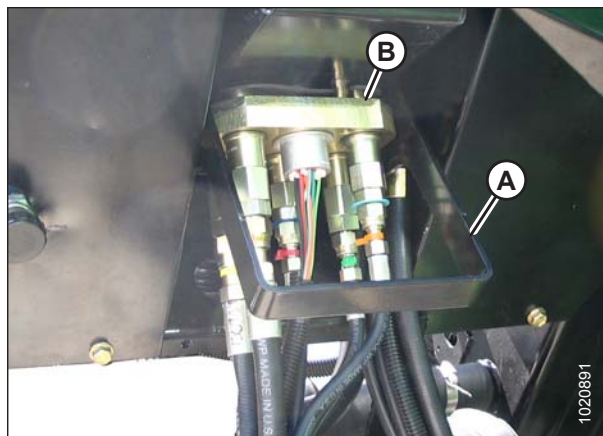


Figure 4.87: Multicoupler Storage

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

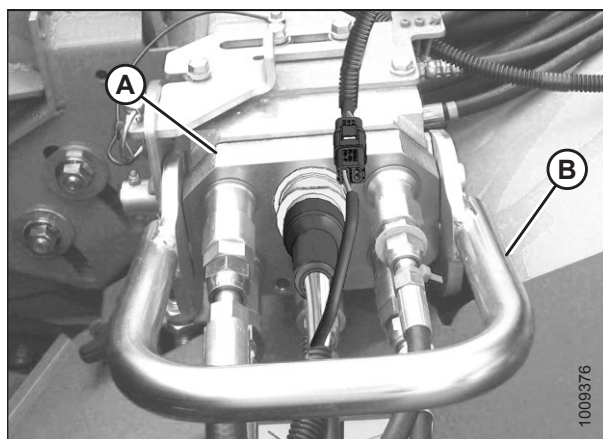


Figure 4.88: Multicoupler

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

NOTE:

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

9. Tighten bolts (B).

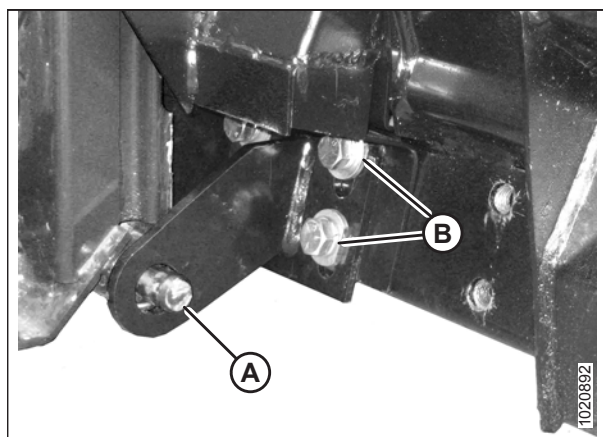


Figure 4.89: Feeder House Pin

HEADER ATTACHMENT/DETACHMENT

10. Slide the latch (A) to lock the handle (B) in position and secure with the lynch pin (C).
11. If the float module is equipped with the reel fore-aft/header tilt selector, connect the harness (D) to the combine connector (E).

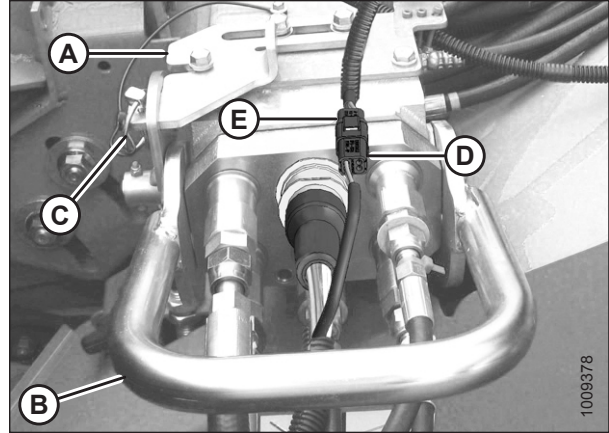


Figure 4.90: Multicoupler

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

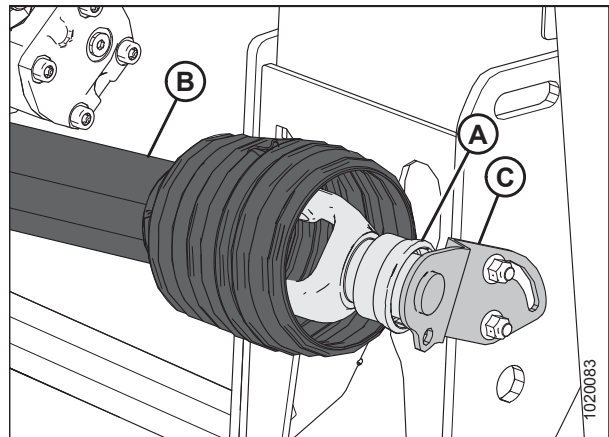


Figure 4.91: Driveline

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

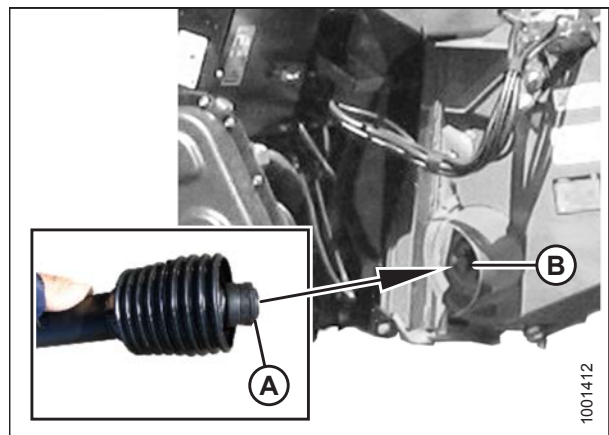


Figure 4.92: Driveline

HEADER ATTACHMENT/DETACHMENT

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

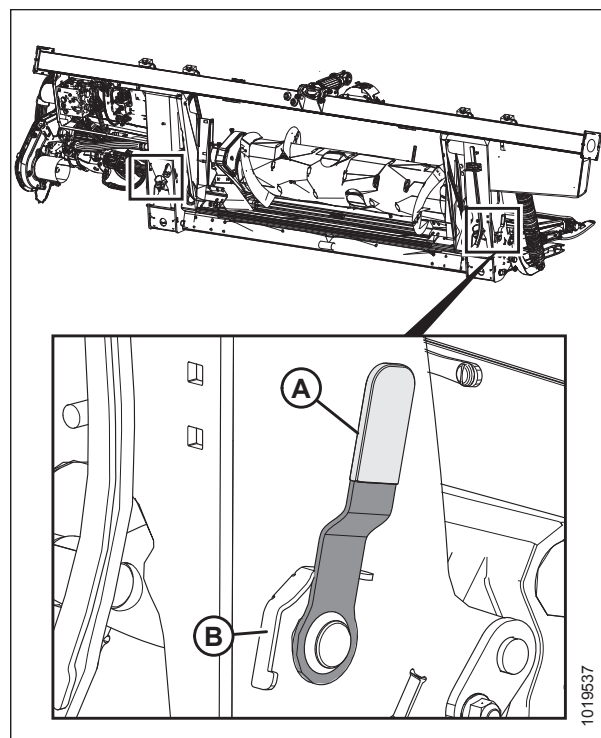


Figure 4.93: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4.5.2 Detaching Header from John Deere Combine



DANGER

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

HEADER ATTACHMENT/DETACHMENT

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 slow speed 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. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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. Refer to [Adjusting Stabilizer Wheels](#), page 52.

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

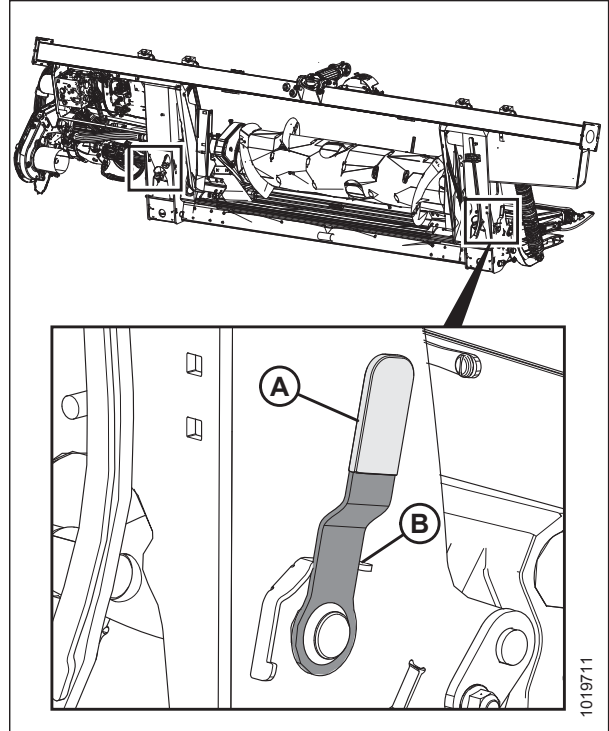


Figure 4.94: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4. Open the shield (A) on the combine, pull back the collar on the driveline (B), and pull the driveline off the combine output shaft.

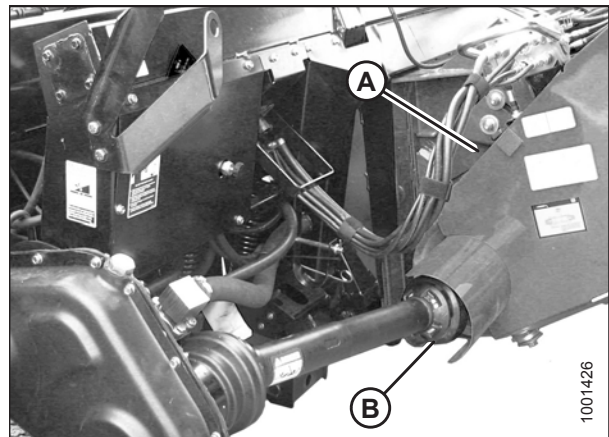


Figure 4.95: Driveline

HEADER ATTACHMENT/DETACHMENT

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

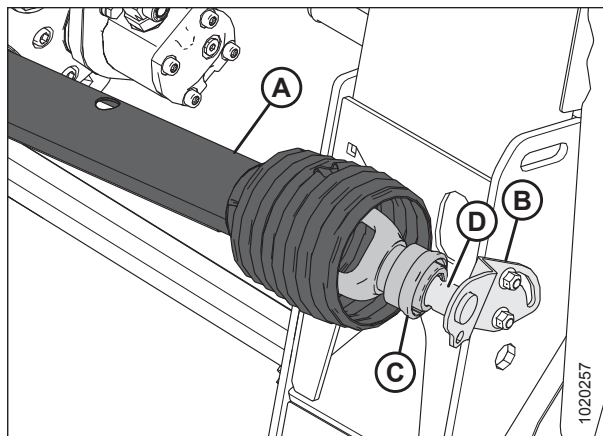


Figure 4.96: Driveline

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

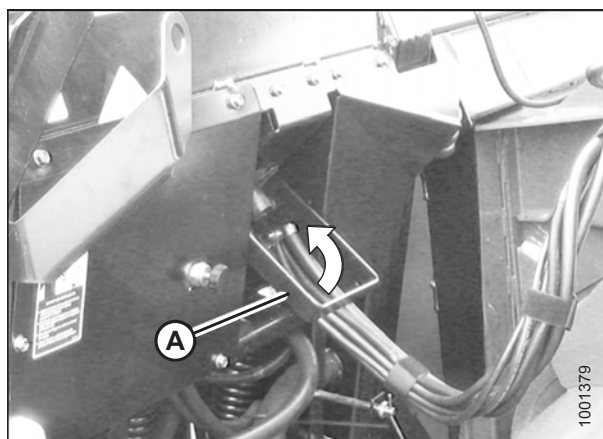


Figure 4.97: Multicoupler Storage

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

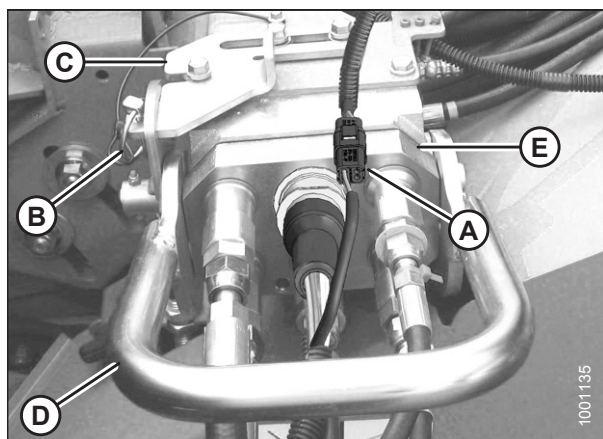


Figure 4.98: Multicoupler

HEADER ATTACHMENT/DETACHMENT

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

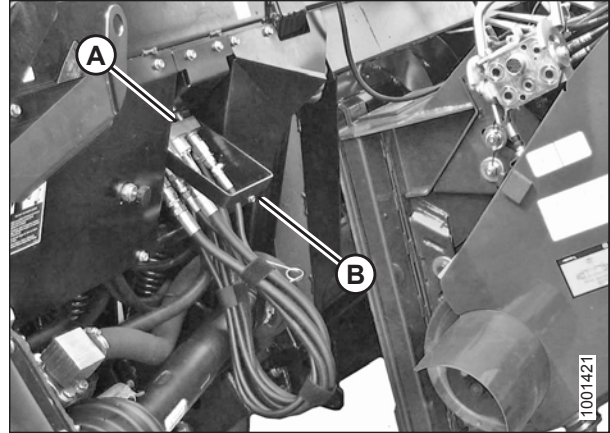


Figure 4.99: Multicoupler Storage

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

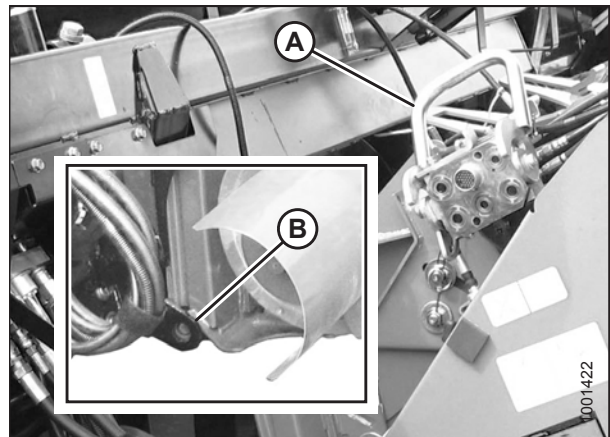


Figure 4.100: Feeder House Locks

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

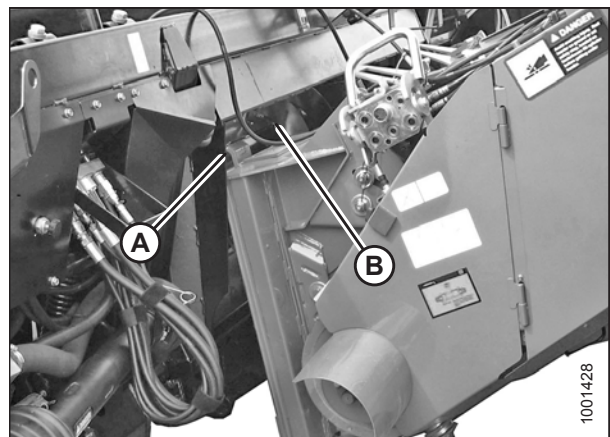


Figure 4.101: Header/Feeder House

4.6 CLAAS Combines

The FD1 Series FlexDraper® Header is compatible with CLAAS 500, 600, and 700 Series combines.

4.6.1 Attaching Header to CLAAS Combine

DANGER

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

1. Move the handle (A) on the FM100 Float Module into the raised position, and ensure the pins (B) at the bottom corners of the float module are retracted.

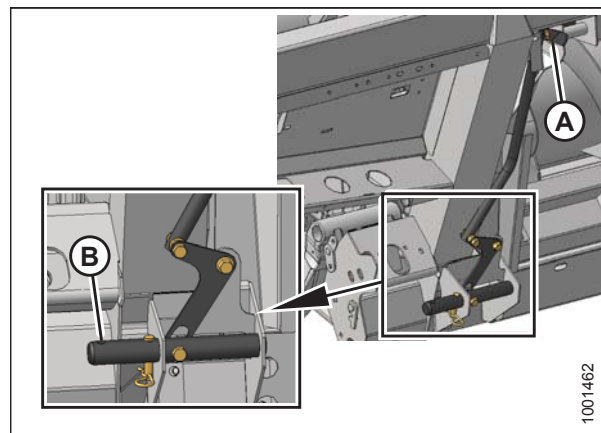


Figure 4.102: Pins Retracted

CAUTION

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

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

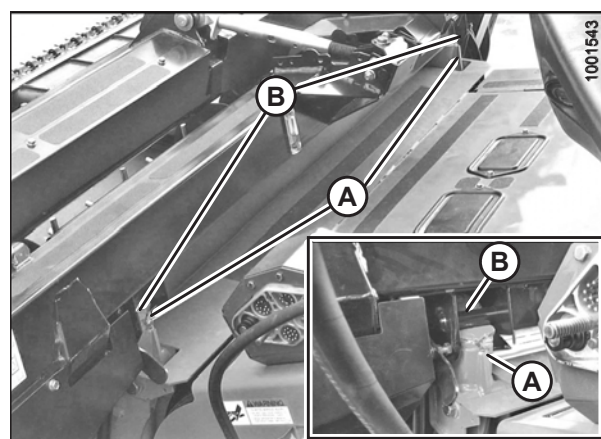


Figure 4.103: Header on Combine

HEADER ATTACHMENT/DETACHMENT

5. Remove the locking pin (B) from the float module pin (A).

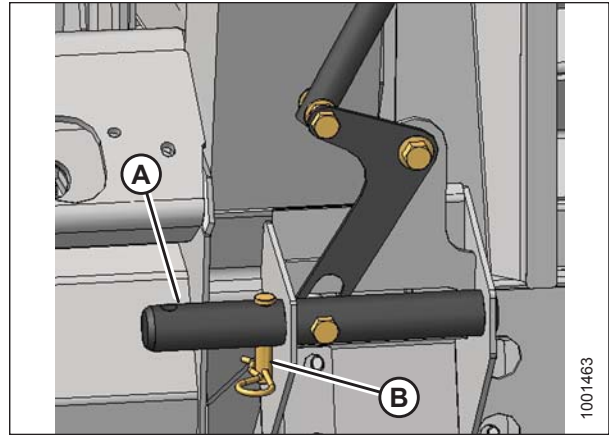


Figure 4.104: Locking Pins

6. Lower the handle (A) to engage the float module pins (B) into the feeder house. Reinsert the locking pin (C) and secure with the hairpin.
7. Stop the engine and remove the key from the ignition.

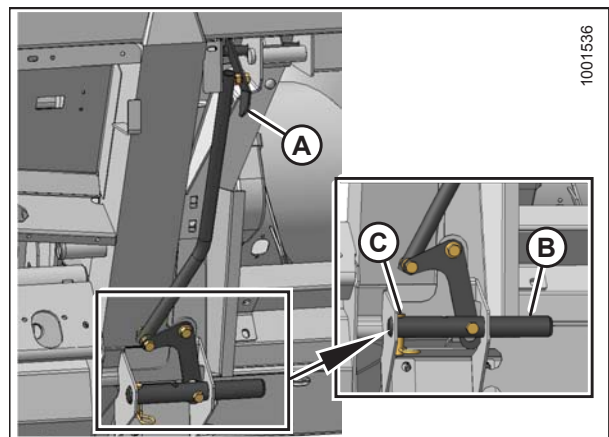


Figure 4.105: Engaging Pins

8. Unscrew the knob (A) on the combine coupler (B) to release the coupler from the combine receptacle and clean the coupler.

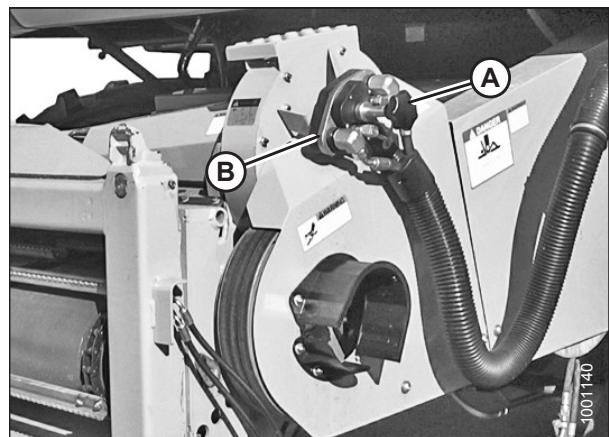


Figure 4.106: Combine Coupler

HEADER ATTACHMENT/DETACHMENT

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

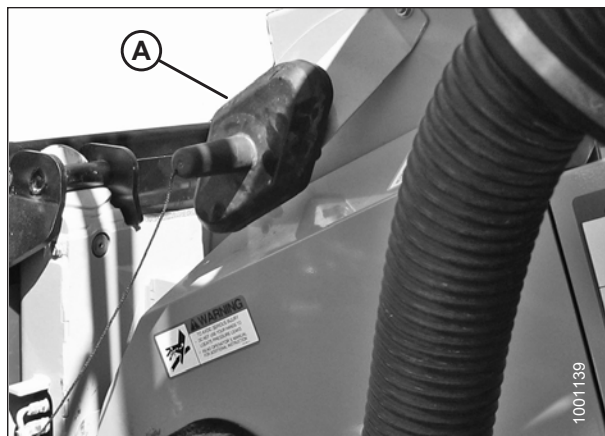


Figure 4.107: Receptacle Cover

10. Clean the mating surface of the coupler (A) and position onto the float module receptacle (B).
11. Turn the knob (C) to secure the coupler to the receptacle.

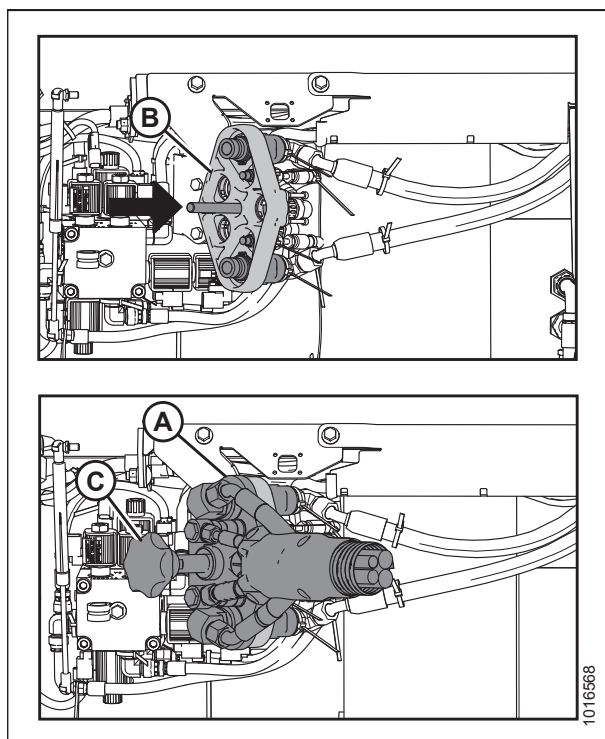


Figure 4.108: Coupler

HEADER ATTACHMENT/DETACHMENT

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

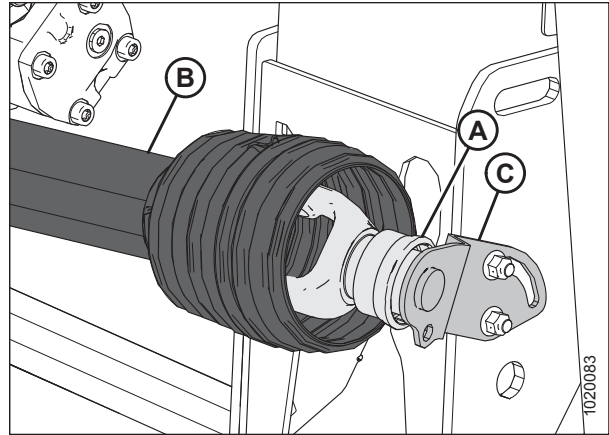


Figure 4.109: Driveline

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

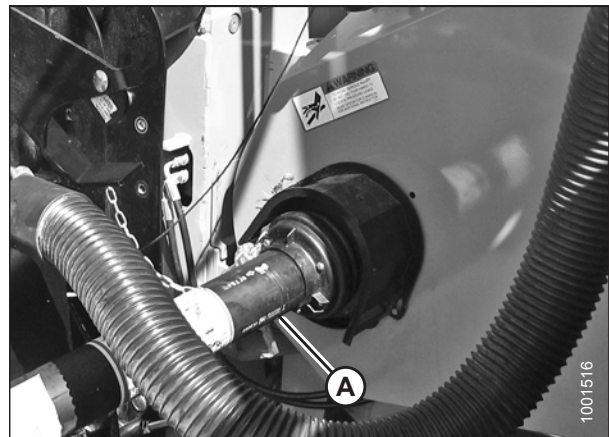


Figure 4.110: Driveline and Output Shaft

HEADER ATTACHMENT/DETACHMENT

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

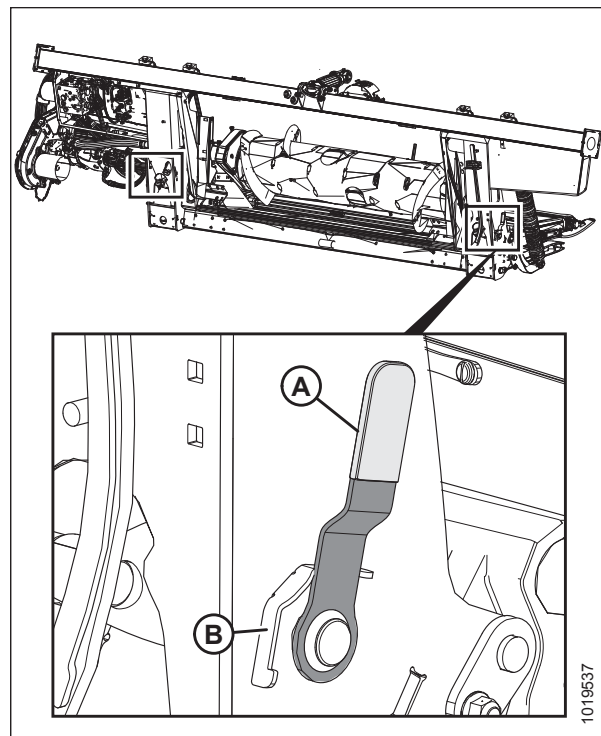


Figure 4.111: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4.6.2 Detaching Header from CLAAS Combine



DANGER

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

HEADER ATTACHMENT/DETACHMENT

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 slow speed 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. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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. Refer to [Adjusting Stabilizer Wheels](#), page 52.

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

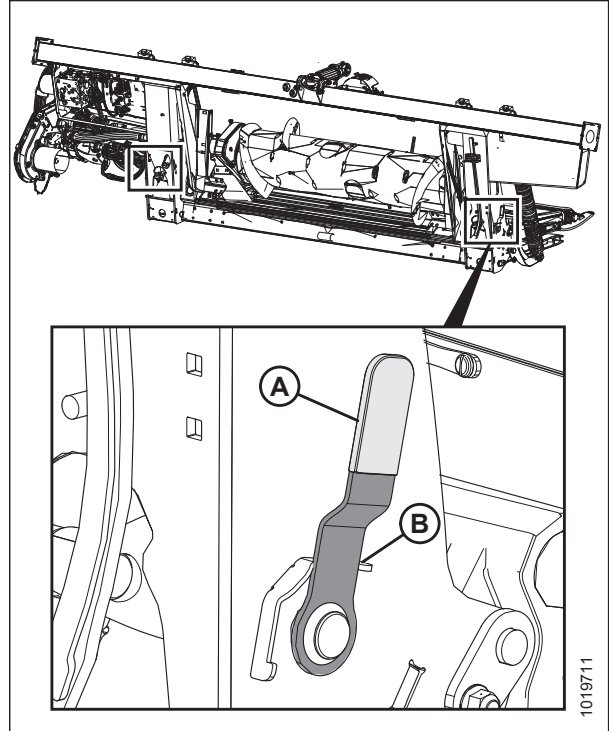


Figure 4.112: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4. Disconnect the driveline (A) from the combine.

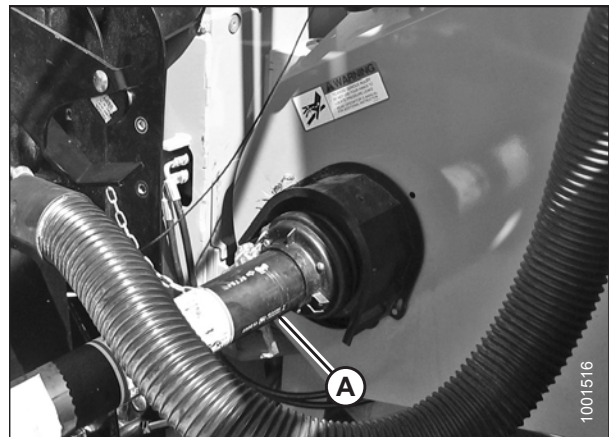


Figure 4.113: Driveline

HEADER ATTACHMENT/DETACHMENT

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

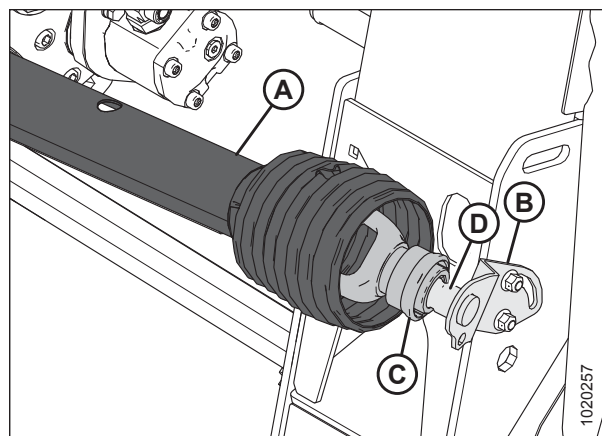


Figure 4.114: Driveline

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

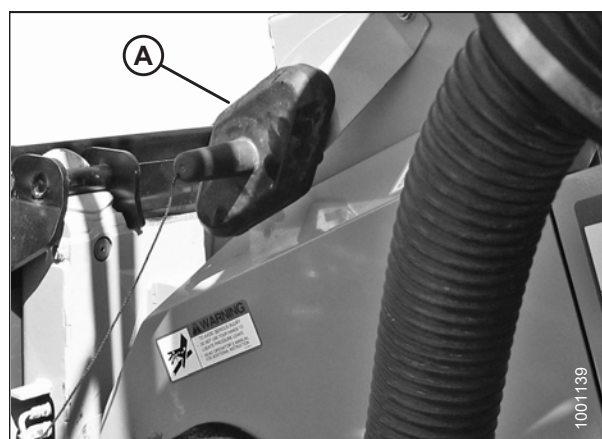


Figure 4.115: Cover

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

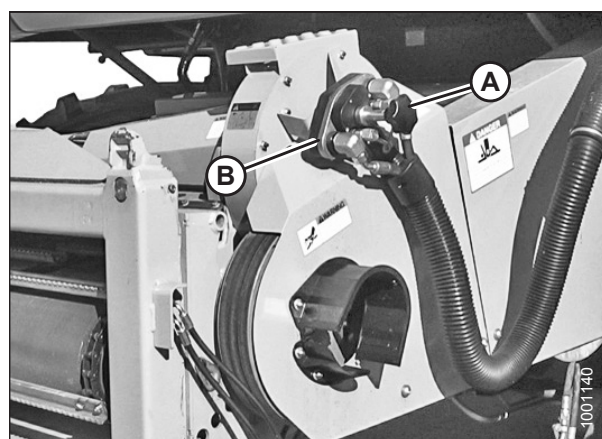


Figure 4.116: Combine Coupler

HEADER ATTACHMENT/DETACHMENT

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

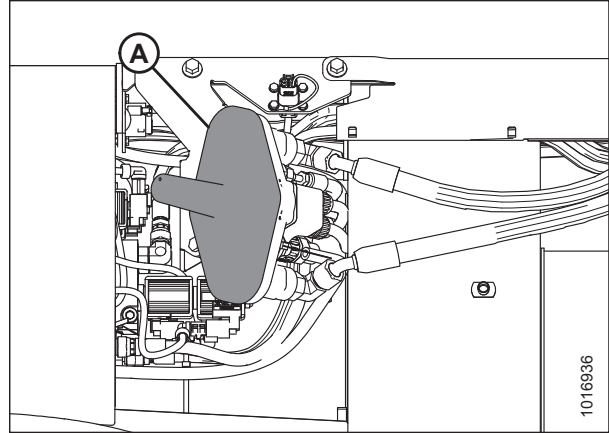


Figure 4.117: Float Module

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

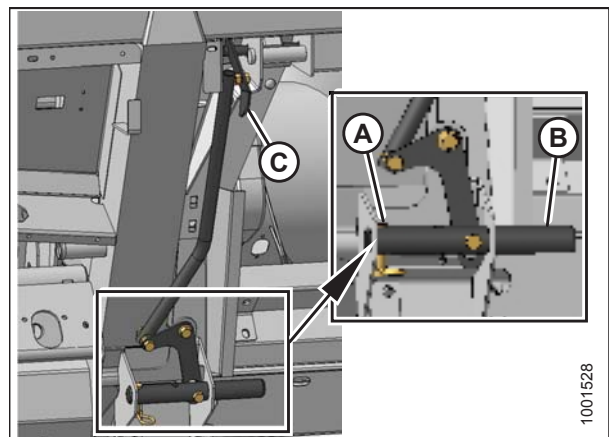


Figure 4.118: Feeder House Locks

12. Lower the feeder house until the feeder house posts (A) disengage the float module (B).
13. Back the combine away slowly from the float module.

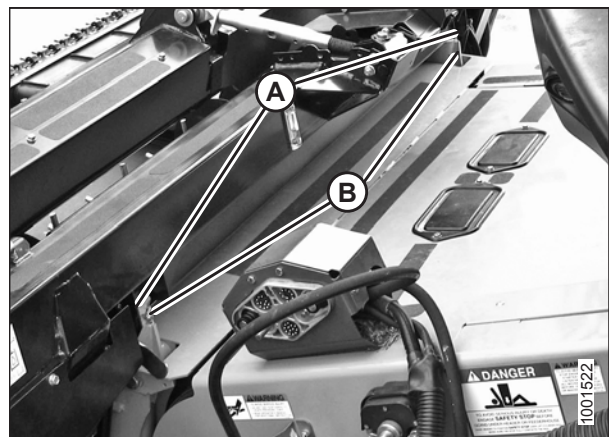


Figure 4.119: Header on Combine

4.7 New Holland Combines

The FD1 Series FlexDraper® is compatible with the following New Holland combines:

HEADER ATTACHMENT/DETACHMENT

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

4.7.1 Attaching Header to New Holland CR/CX Combine

DANGER

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

1. Ensure the handle (A) is positioned so the hooks (B) can engage the float module.

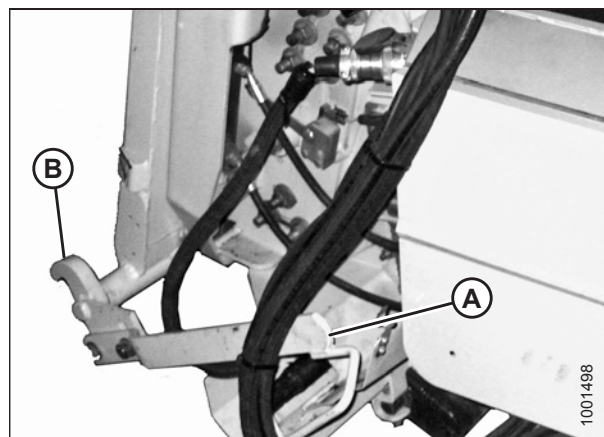


Figure 4.120: Feeder House Locks

CAUTION

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

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

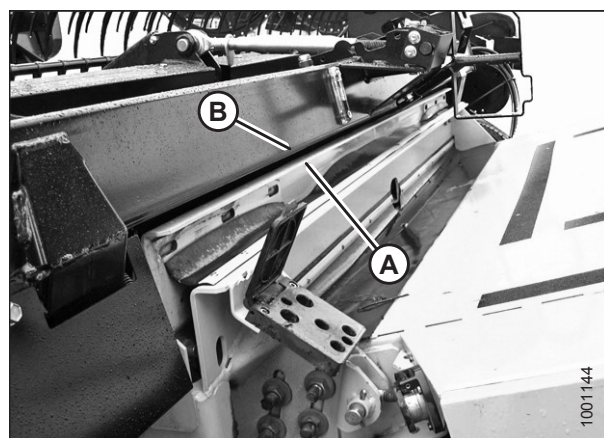


Figure 4.121: Header on Combine

HEADER ATTACHMENT/DETACHMENT

5. Lift lever (A) on the float module on the left side of the feeder house, and push the handle (B) on the combine to engage the locks (C) on both sides of the feeder house.
6. Push down on the lever (A) so the slot in the lever engages the handle and locks the handle in place.
7. If the lock does not fully engage the pin (D) on the float module when the lever (A) and handle (B) are engaged, loosen bolts (E) and adjust the lock (C). Retighten bolts.

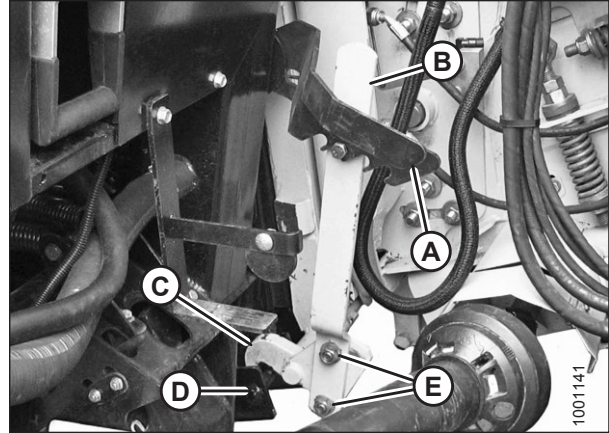


Figure 4.122: Feeder House Locks

8. Open the cover on the receptacle (A) located on the left side of the float module.
9. Push in the lock button (B) and pull the handle (C) to the full open position.
10. Clean the receptacle mating surfaces.

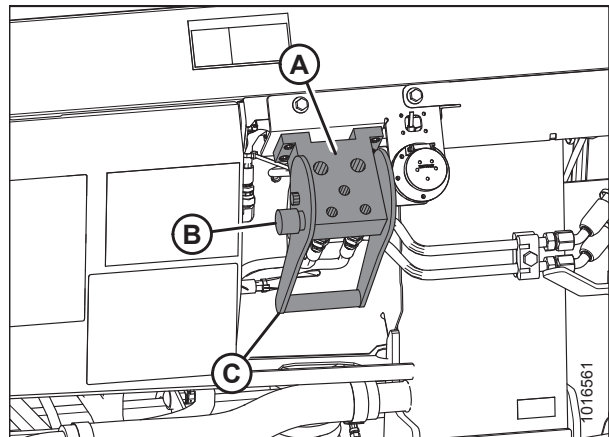


Figure 4.123: Float Module Receptacle

11. Remove the hydraulic quick coupler (A) from the storage plate on the combine, and clean the mating surface of the coupler.

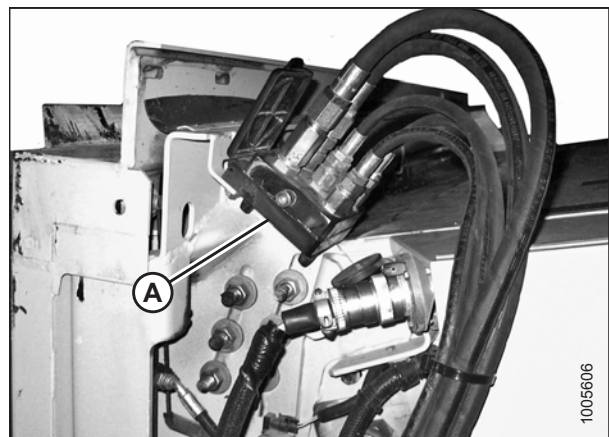


Figure 4.124: Combine Coupler

HEADER ATTACHMENT/DETACHMENT

12. Position the coupler (A) onto the float module receptacle, and push the handle (B) to engage the pins into the receptacle.
13. Push the handle (B) to closed position until the lock button (C) snaps out.
14. Remove the cover on the float module electrical receptacle.
15. Remove the connector (D) from the combine.
16. Align the lugs on the connector (D) with the slots in the float module receptacle, and push the connector onto the receptacle. Turn the collar on the connector to lock it in place.
17. Pull collar (A) back to release driveline (B) from support bracket (C). Remove the driveline from the support bracket.

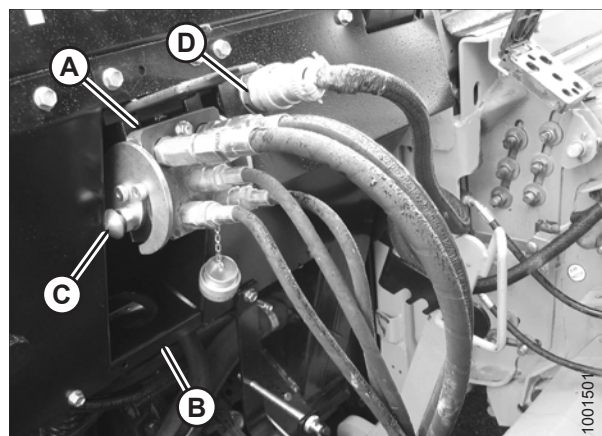


Figure 4.125: Connections

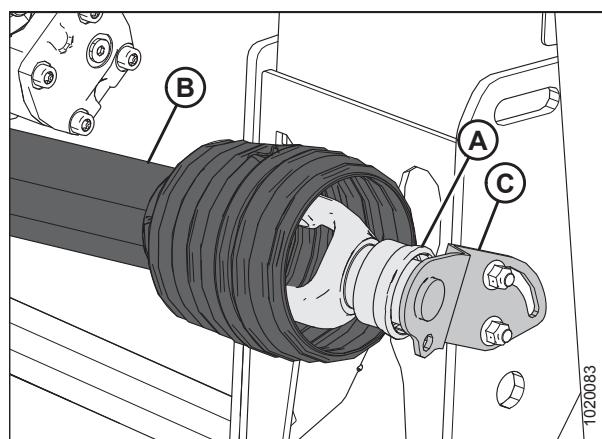


Figure 4.126: Driveline

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

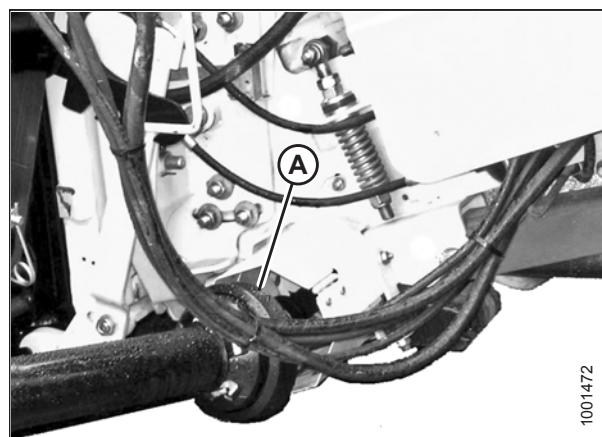


Figure 4.127: Driveline and Output Shaft

HEADER ATTACHMENT/DETACHMENT

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

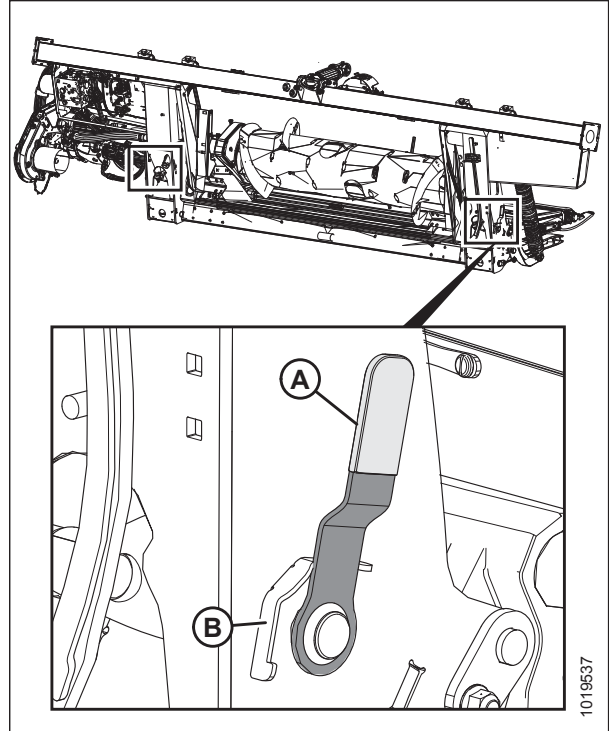


Figure 4.128: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4.7.2 Detaching Header from New Holland CR/CX Combine

DANGER

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

HEADER ATTACHMENT/DETACHMENT

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 slow speed 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. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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. Refer to [Adjusting Stabilizer Wheels](#), page 52.

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

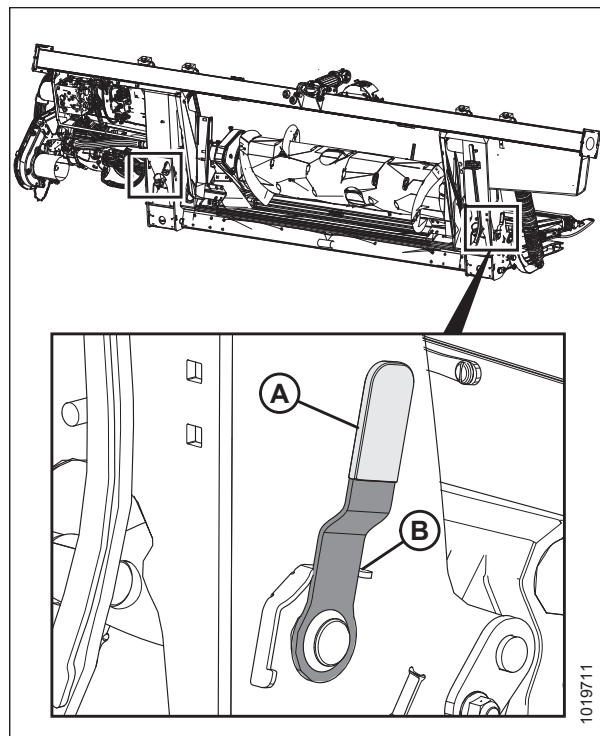


Figure 4.129: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

4. Disconnect the driveline (A) from the combine.

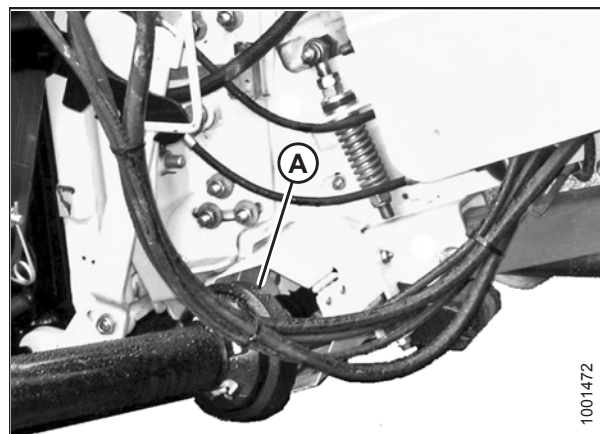


Figure 4.130: Driveline

HEADER ATTACHMENT/DETACHMENT

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

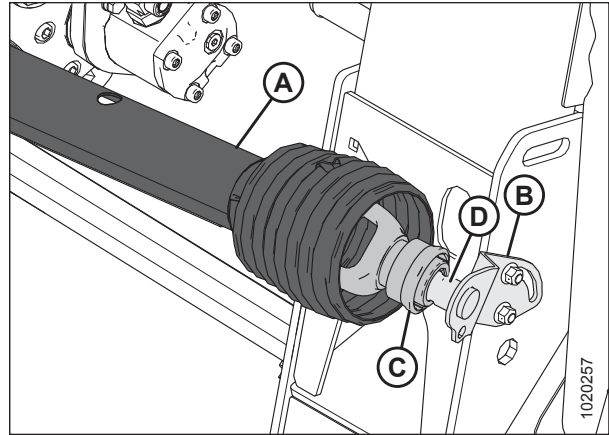


Figure 4.131: Driveline

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

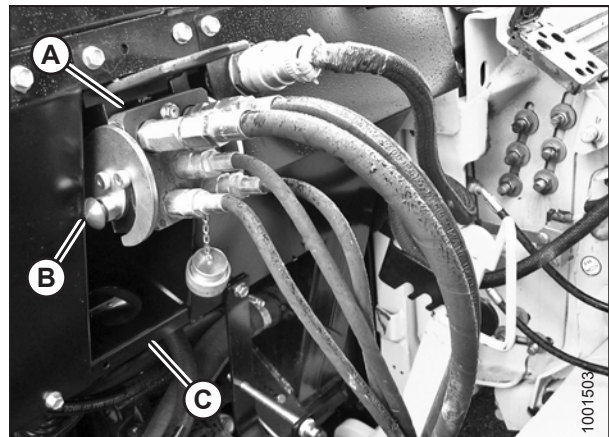


Figure 4.132: Float Module Connections

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

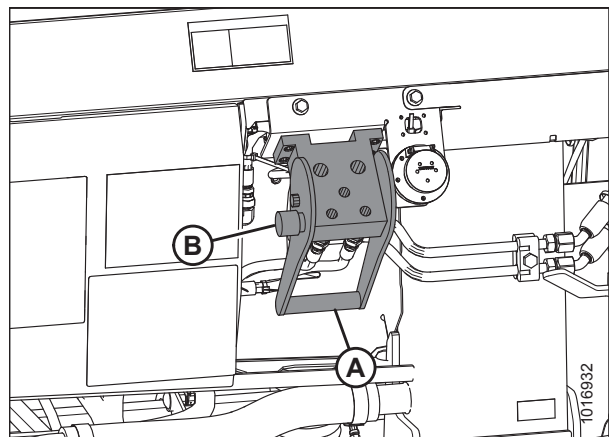


Figure 4.133: Float Module Receptacles

HEADER ATTACHMENT/DETACHMENT

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

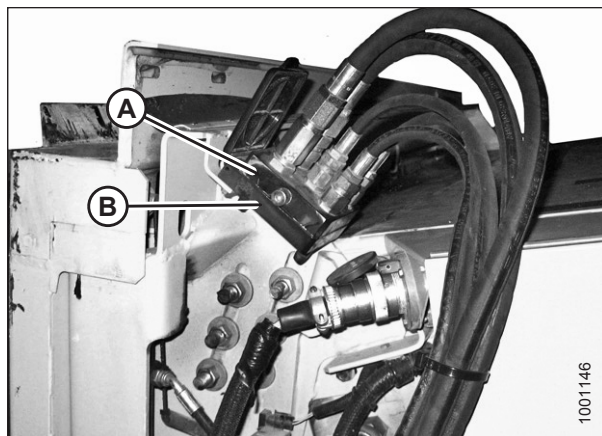


Figure 4.134: Combine Coupler

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

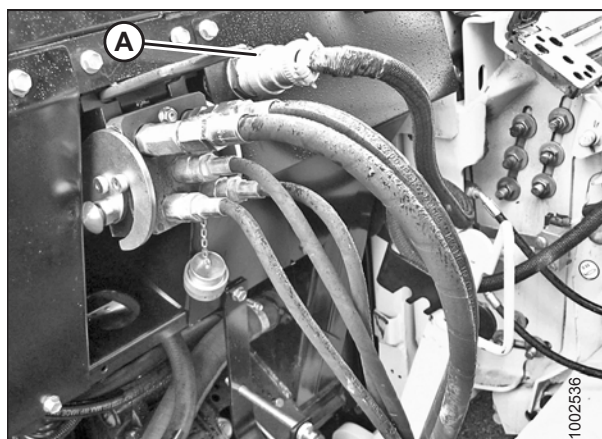


Figure 4.135: Float Module Connections

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

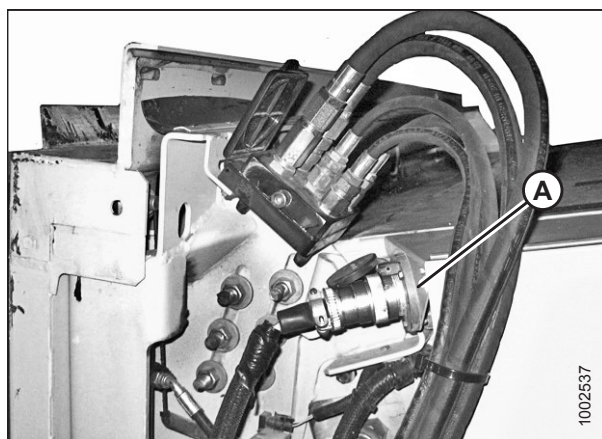


Figure 4.136: Combine Couplers

HEADER ATTACHMENT/DETACHMENT

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

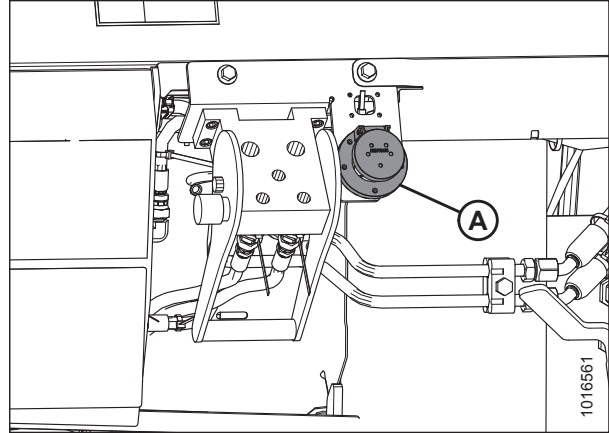


Figure 4.137: Float Module Receptacles

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

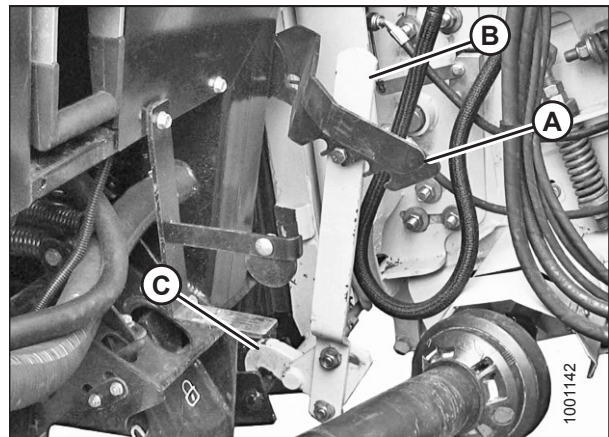


Figure 4.138: Feeder House Locks

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

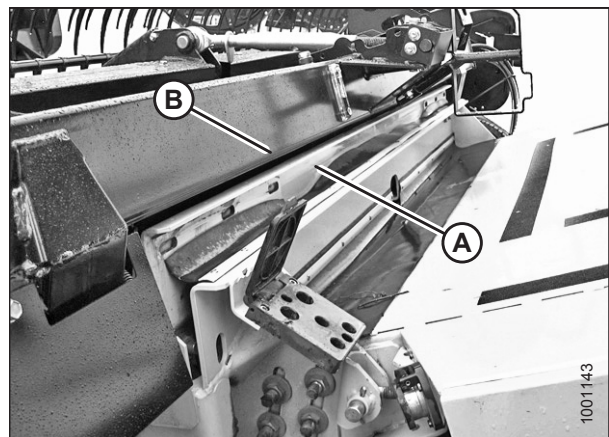


Figure 4.139: Header on Combine

4.7.3 CR Feeder Deflectors

For New Holland combines only: Short feeder deflectors have been factory-installed on the float module to improve feeding into the feeder house. Remove the feeder deflectors if necessary. Refer to [5.13.3 Replacing Feed Deflectors on New Holland CR Combines, page 423](#).

HEADER ATTACHMENT/DETACHMENT

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

Feeder House Size	Feeder Kit Size	MacDon Part Number
1250–1350 mm (49–65 in.)	Short: 200 mm (7-7/8 in.)	MD #213613, 213614
1100 mm (43-1/2 in.) and below	Long: 325 mm (12-13/16 in.)	MD #213592, 213593

4.8 Attaching and Detaching Header from Float Module

Attaching/detaching procedures are the same for all makes and models of combines. Headers can be attached to the float module from either field or transport configurations.

The procedures in this manual require that the float module remains attached to the combine. Attach/detach the float module only if performing the following tasks:

- Detaching the header for use on a windrower
- Changing headers
- Performing certain maintenance tasks

4.8.1 Attaching Header to Float Module

The FD1 Series header can be attached to the float module from either field or transport configuration.

DANGER

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

NOTE:

Stabilizer / slow speed transport wheels can be used to support the header. Refer to [Adjusting Stabilizer / Slow Speed Transport Wheels](#), page 50.

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

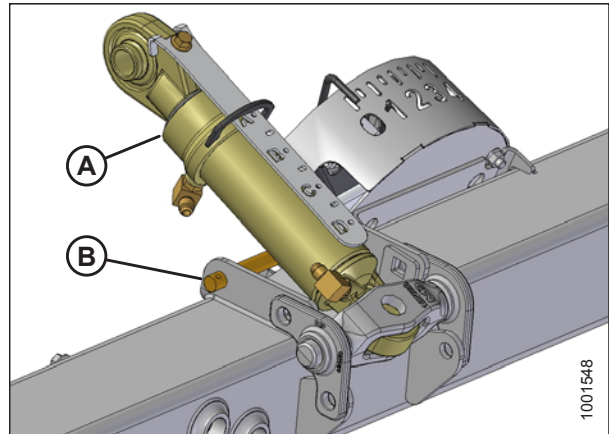


Figure 4.140: Center-Link

HEADER ATTACHMENT/DETACHMENT

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

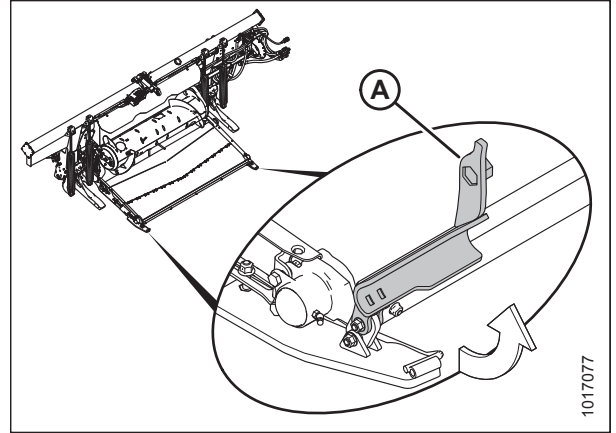


Figure 4.141: Latch

CAUTION

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

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

IMPORTANT:

Keep hydraulic hoses clear to prevent damage when driving into header.

6. Continue forward until float module arms (A) contact stops in balance channels (B) in Figure 4.142, page 315.
7. Adjust the length of the center-link (A) using the header angle hydraulics to approximately align the center-link eye (B) with the hole in the header bracket.
8. Shut down the engine and remove the key from the ignition.

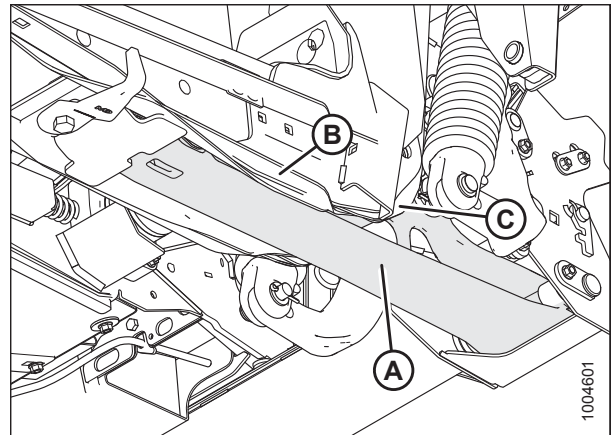


Figure 4.142: Float Module Underside

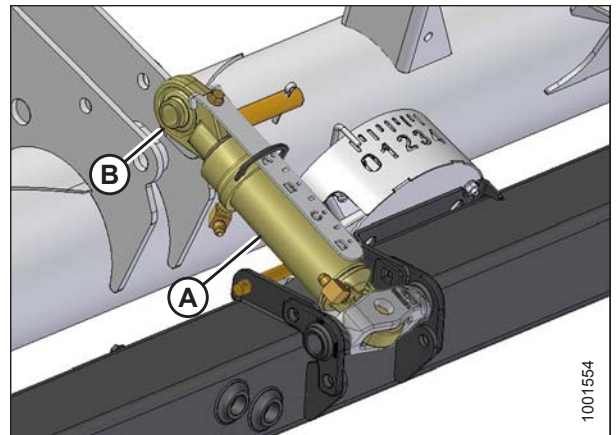


Figure 4.143: Center-Link

HEADER ATTACHMENT/DETACHMENT

9. Connect the center-link as follows:
 - a. Pull pin (B) part way out of the bracket (C), and remove the prop from under the center-link (A).
 - b. Install the pin (B) through the center-link bracket (C), and secure with lynch pin.

CAUTION

Always connect center-link before fully raising header.

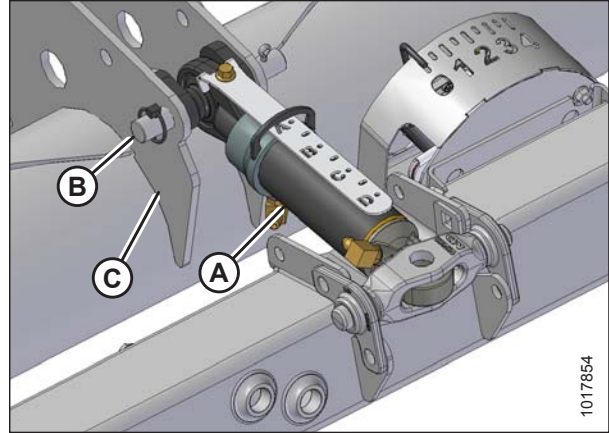


Figure 4.144: Center-Link

10. Match the colored cable ties and connect the reel hydraulics (A) at the right end of the float module.

CAUTION

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

11. Start the engine and slowly raise the float module while making sure the float module legs engage the header legs.
12. Raise the header to its full height, stop the engine, and remove the key from the ignition.
13. Engage the safety props on the combine.

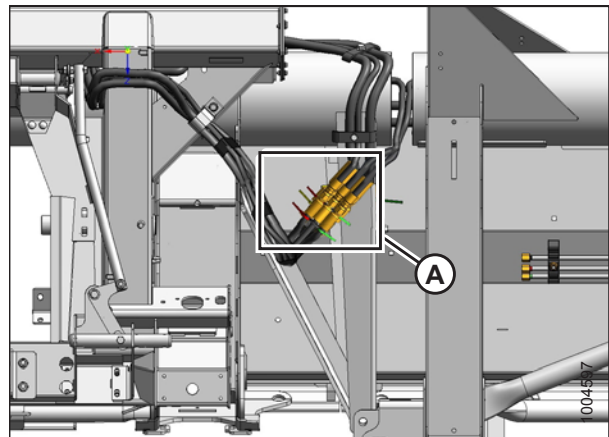


Figure 4.145: Reel Hydraulics

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

CAUTION

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

15. Remove the lift cylinder locks, start the engine, and lower the header to the ground. Adjust the header angle to the shallowest setting (shortest center-link).
16. Raise the reel to its full height.
17. Shut down the engine and remove the key from the ignition.
18. Engage the reel safety props.

HEADER ATTACHMENT/DETACHMENT

WARNING

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

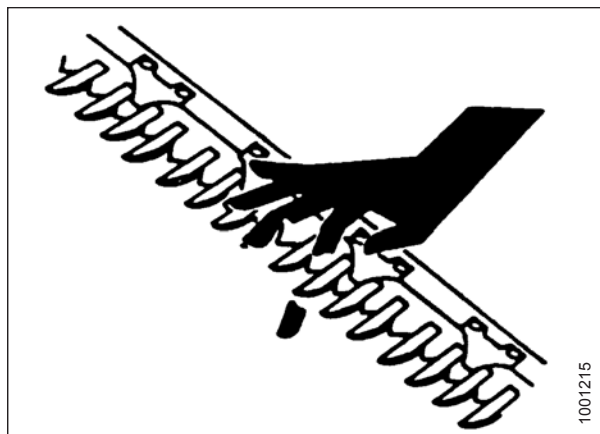


Figure 4.146: Cutterbar Hazard

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

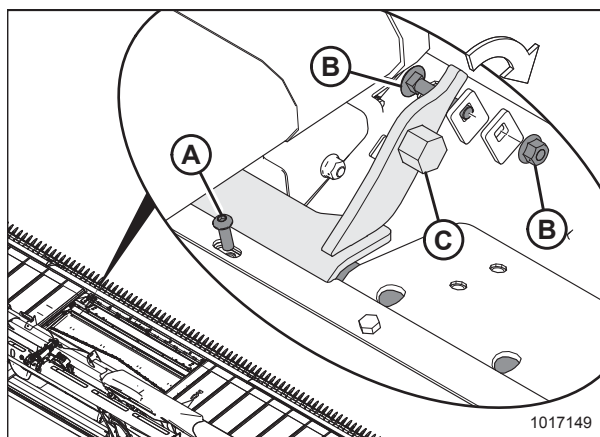


Figure 4.147: Float Module Latch

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

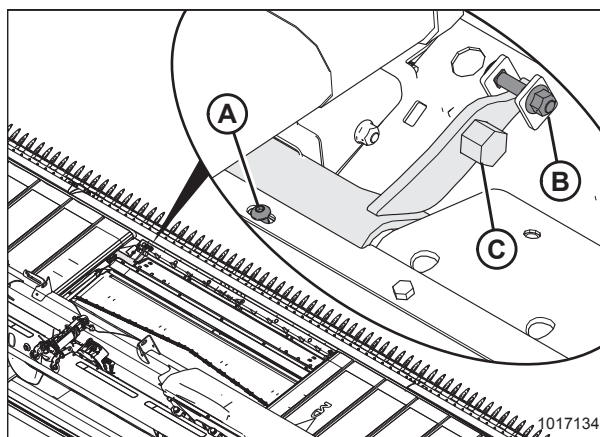


Figure 4.148: Float Module Latch

HEADER ATTACHMENT/DETACHMENT

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

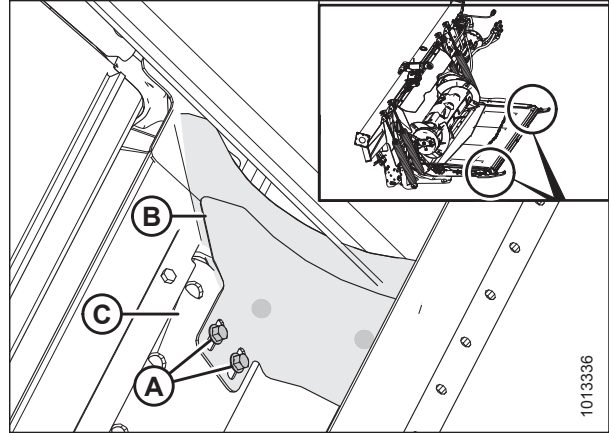


Figure 4.149: Fillers

25. Use a clean cloth to remove debris from couplers and receptacles.

26. Connect the following hydraulic hoses at the coupler bracket (A):

- Knife pressure (orange cable tie)
- Knife return (blue cable tie)
- Draper pressure (no cable tie)
- Draper return (red cable tie)
- Case drain (no cable tie)

NOTE:

Match the hydraulic hose cable ties to the cable ties on the coupler bracket fittings.

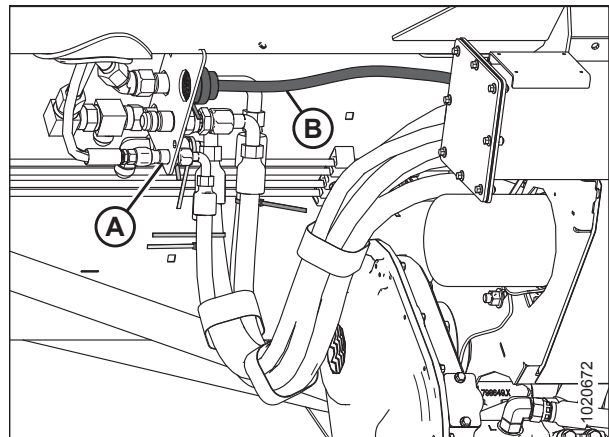


Figure 4.150: Header Connections

27. Attach electrical connector (B).

28. Connect the quick disconnects (if installed) as follows:

- Remove the covers (if installed) from the receptacles and hose ends.
- Check the connectors and clean if necessary.
- Push the hose connector (A) onto the mating receptacle (B) until the collar on the mating receptacle snaps into the lock position.

NOTE:

Ensure the hoses are clear of the driveline and adjacent structure.

NOTE:

It is not necessary to bleed the system by loosening fittings.

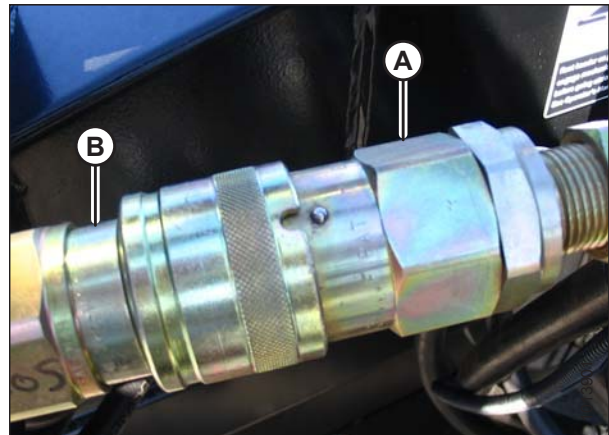


Figure 4.151: Quick Disconnect Coupling

29. Check the float and confirm the header is level. Refer to the following:

- [Checking and Adjusting Header Float, page 56](#)
- [3.9 Levelling the Header, page 231](#)

CAUTION

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

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

4.8.2 Detaching Header from Float Module

DANGER

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

WARNING

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

CAUTION

Wear heavy gloves when working around or handling knives.

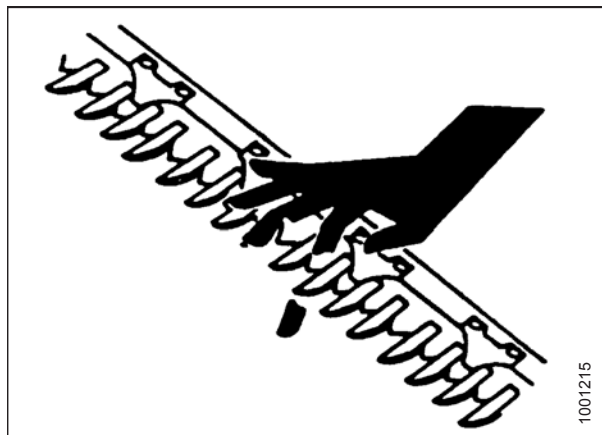


Figure 4.152: Cutterbar Hazard

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

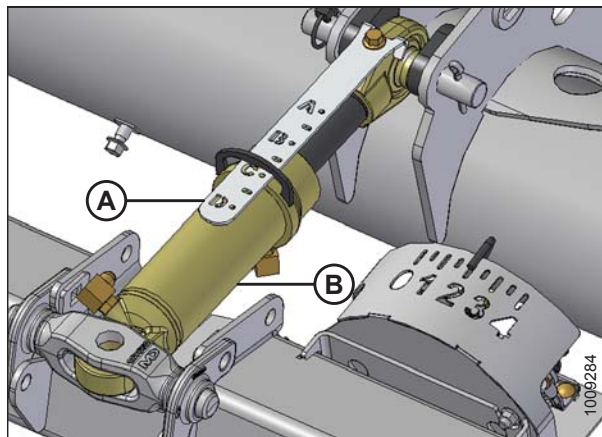


Figure 4.153: Center-Link

HEADER ATTACHMENT/DETACHMENT

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

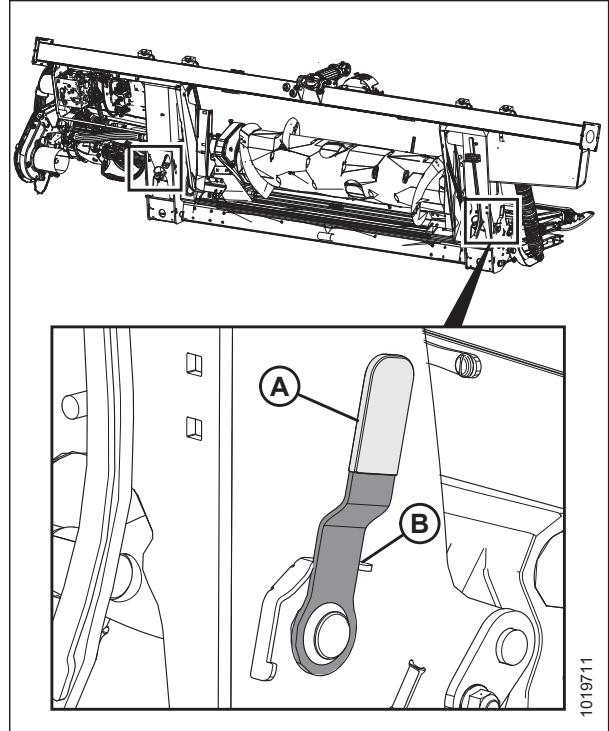


Figure 4.154: Float Lock Handle (Right Side Shown in Detail, Left Side Opposite)

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

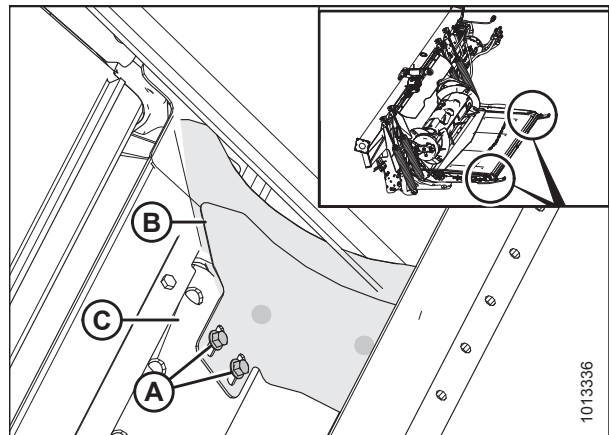


Figure 4.155: Fillers

HEADER ATTACHMENT/DETACHMENT

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



CAUTION

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

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

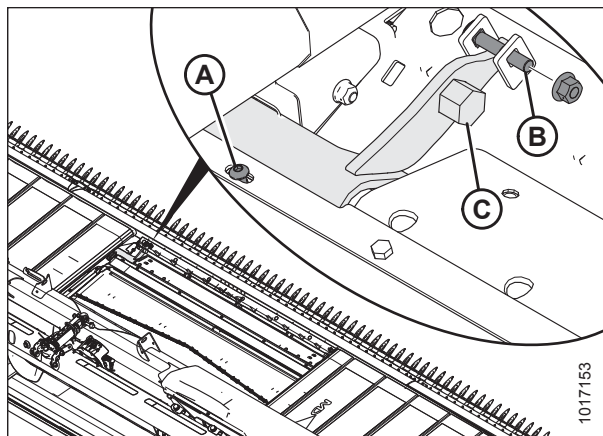


Figure 4.156: Float Module Latch

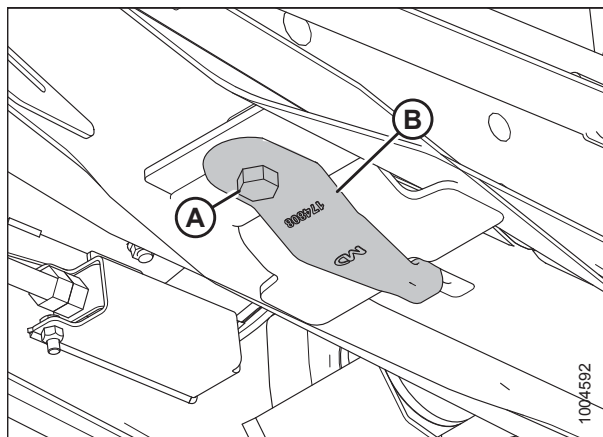


Figure 4.157: Float Module Underside

HEADER ATTACHMENT/DETACHMENT

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

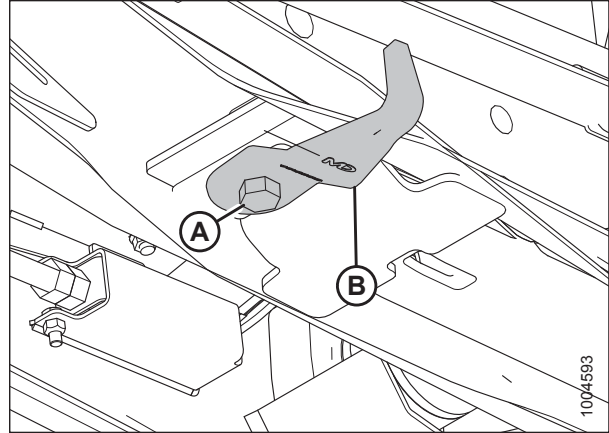


Figure 4.158: Float Module Underside

18. Place a 150 mm (6 in.) block (A) under the header leg. This will assist with disconnecting the center-link.
19. Disengage combine lift cylinder locks, start engine, and lower header until the header leg rests on the block or stabilizer wheels are the ground.

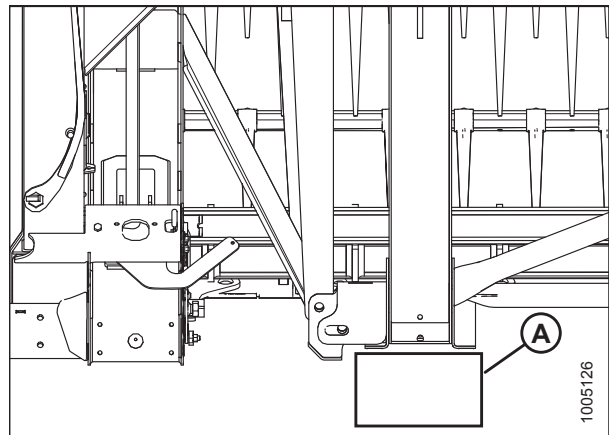


Figure 4.159: Header Leg on Block

20. Disconnect the hydraulic center-link as follows:
 - a. Remove the lynch pin and clevis pin (A), and lift the center-link (B) clear of the bracket.
 - b. Replace the clevis pin (A) and secure with lynch pin.

NOTE:

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

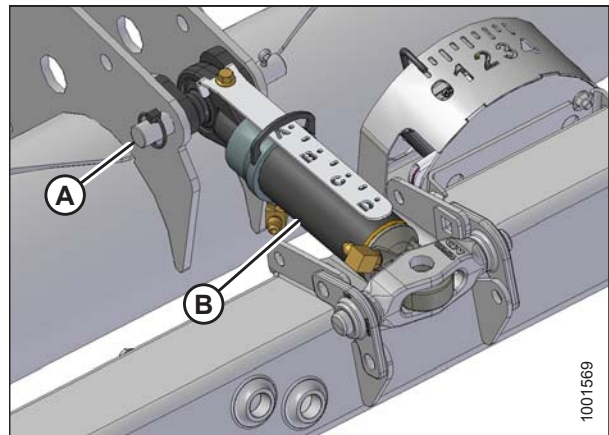


Figure 4.160: Hydraulic Center-Link

NOTE:

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

HEADER ATTACHMENT/DETACHMENT

21. Disconnect electrical connector (A).
22. Disconnect the case drain, knife, and draper drive hydraulic hoses at the coupler bracket (B). Cap off ends immediately to avoid loss of oil.
23. Store and secure hoses on float module frame.

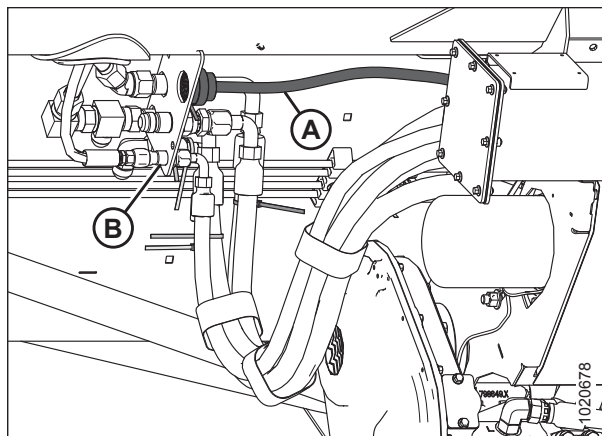


Figure 4.161: Header Connections

24. Disconnect the quick disconnects (if installed) as follows:
 - a. Line up the slot (A) in the collar with the pin (B) on the connector.
 - b. Push the collar towards the pin, and pull the connector to disengage.
 - c. Install plugs or caps on the hose ends (if equipped).

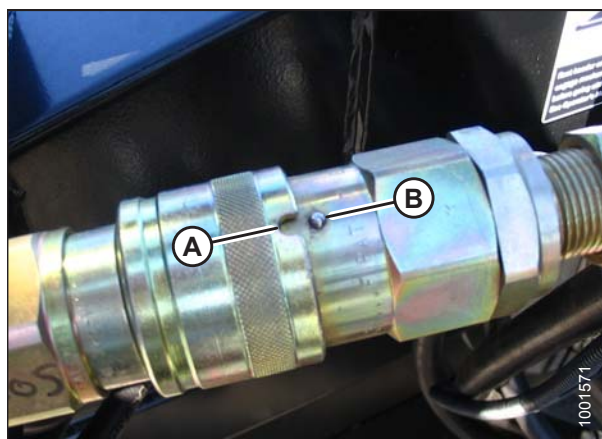


Figure 4.162: Quick Disconnect Coupling

25. Disconnect the reel hydraulics (A). Immediately cap hoses to prevent oil loss.

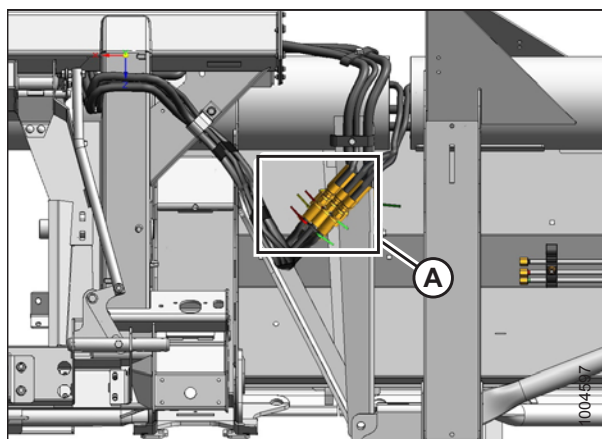


Figure 4.163: Reel Hydraulics

HEADER ATTACHMENT/DETACHMENT

26. Store and secure the hoses and electrical connector on the float module at position (A) as shown.
27. Ensure the header is on the ground or is supported by the wheels in transport mode.

CAUTION

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

28. Start the engine and slowly back the float module away from header.
29. Stop the engine and remove the key from the ignition.

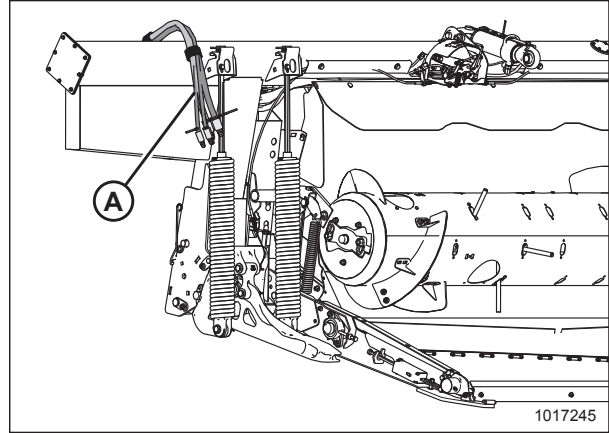


Figure 4.164: Hose Storage

5 Maintenance and Servicing

The following instructions provide information about routine header service. Detailed maintenance and service information is available in the technical service manual that is available from your Dealer. A parts catalog is provided in the plastic manual case inside the left endshield of the header.

Log hours of operation and use the maintenance record provided (refer to [5.3.1 Maintenance Schedule/Record](#), [page 326](#)) to keep track of your scheduled maintenance.

5.1 Preparing Machine for Servicing

DANGER

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

CAUTION

To avoid personal injury, follow all the safety precautions listed before servicing header or opening drive covers.

1. Lower the header fully. If it is necessary to service the header in the raised position, always engage the safety props.
2. Stop the engine and remove the key from the ignition.
3. Engage the park brake.
4. Wait for all moving parts to stop.

5.2 Maintenance Specifications

5.2.1 Installing a Sealed Bearing

1. Clean the shaft and apply a rust preventive coating.
2. Install the flange (A), bearing (B), second flange (C), and lock the collar (D).

NOTE:

The locking cam is on only one side of the bearing.

3. Install the flange bolts (E). Do not tighten.
4. Position the shaft correctly, and lock the lock collar with a punch. Lock the collar in the same direction the shaft rotates, and tighten the setscrew in the collar.
5. Tighten the flange bolts (E).
6. Loosen the flange bolts on the mating bearing (one turn) and then retighten. This will allow the bearing to properly line up.

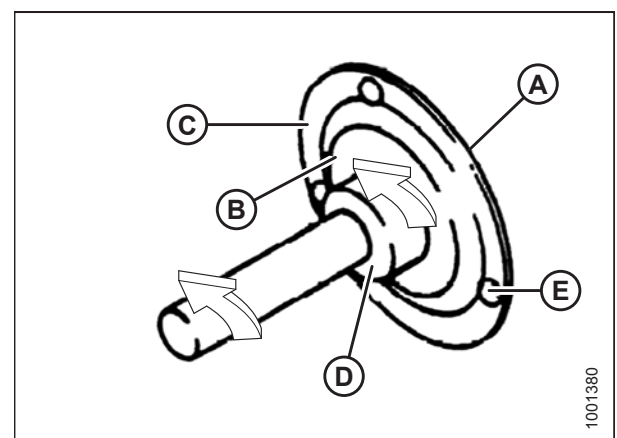


Figure 5.1: Sealed Bearing

5.3 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 [5.3.1 Maintenance Schedule/Record, page 326](#)).

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. Refer to [5.1 Preparing Machine for Servicing, page 325](#) and [1 Safety, page 1](#).

5.3.1 Maintenance Schedule/Record

Action:		✓ – Check					⬇ – Lubricate					▲ – Change				
	Hour meter reading															
	Service date															
	Serviced by															
First Use		Refer to 5.3.2 Break-In Inspection, page 329 .														
End of Season		Refer to 5.3.4 End-of-Season Service, page 330 .														
10 Hours or Daily (Whichever Occurs First)																
✓	Hydraulic hoses and lines; refer to 5.3.5 Checking Hydraulic Hoses and Lines, page 331	NOTE: MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine; however, daily maintenance records are not required to meet normal warranty conditions.														
✓	Knife sections, guards, and hold-downs; refer to 5.8 Knives, page 379															
✓	Tire pressure; refer to 5.17.3 Checking Tire Pressure, page 485															
⬇	Knife (except in sandy conditions); refer to Every 10 Hours, page 332															
25 Hours																
✓	Hydraulic oil level at reservoir; refer to 5.4.1 Checking Oil Level in Hydraulic Reservoir, page 349	NOTE: MacDon recommends keeping a record of daily maintenance as evidence of a properly maintained machine; however, daily maintenance records are not required to meet normal warranty conditions.														
⬇	Knifeheads; refer to Every 25 Hours, page 332															
50 Hours or Annually																

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◆	Draper roller bearings; refer to 5.14.6 Header Draper Roller Maintenance, page 434																		
◆	Driveline and driveline universals; refer to Every 50 Hours, page 333																		
◆	Upper cross auger center support and U-joint; refer to Every 50 Hours, page 333																		
▲	Knife drive box lubricant (first 50 hours only); refer to Changing Oil in Knife Drive Box, page 401																		
100 Hours or Annually (Whichever Occurs First)																			
✓	Auger to pan and feed draper clearance; refer to 5.7.1 Adjusting Auger to Pan Clearance, page 361																		
✓	Draper seal; refer to 5.14.5 Adjusting Deck Height, page 432																		
✓	Gearbox lubricant level; refer to Checking Oil Level in Header Drive Gearbox, page 347																		
✓	Reel drive chain tension; refer to 5.16.2 Reel Drive Chain Tension, page 469																		
✓	Reel finger/cutterbar clearance; refer to Adjusting Reel Clearance, page 445																		
✓	Knife drive belt tension; refer to 5.9.2 Knife Drive Belts, page 402																		
✓	Wheel bolt torque; refer to 5.17.1 Checking Wheel Bolt Torque, page 483																		
✓	Knife drive box lubricant level; refer to Checking Knife Drive Box, page 393																		
✓	Knife drive box mounting bolts; refer to Checking Mounting Bolts, page 394																		
◆	Auger drive chain; refer to Every 100 Hours, page 335																		
◆	Float pivots; refer to Every 100 Hours, page 335																		
◆	Float module auger pivots; refer to Every 100 Hours, page 335																		
◆	Float spring tensioners; refer to Every 100 Hours, page 335																		
◆	Reel drive chain; refer to Every 100 Hours, page 335																		
◆	Upper cross auger right bearing; refer to Every 100 Hours, page 335																		

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250 Hours or Annually (Whichever Occurs First)																		
✓	Draper seal; refer to 5.14.5 Adjusting Deck Height, page 432																	
●	Reel drive U-joint; refer to Every 250 Hours, page 338																	
●	Bell crank linkage; refer to 3.9 Levelling the Header, page 231																	
●	Transport axle pivot bushings; refer to Every 250 Hours, page 338																	
▲	Hydraulic oil filter; refer to 5.4.4 Changing Oil Filter, page 352																	
500 Hours or Annually (Whichever Occurs First)																		
✓	Draper seal; refer to 5.14.5 Adjusting Deck Height, page 432																	
●	Reel shaft bearings; refer to Every 500 Hours, page 340																	
●	Stabilizer/slow speed transport wheel bearings; refer to Every 500 Hours, page 340																	
✓	Header drive gearbox chain tension; refer to 5.7.3 Adjusting Auger Drive Chain Tension, page 365																	
1000 Hours or 3 Years (Whichever Occurs First)																		
▲	Knife drive box lubricant; refer to Changing Oil in Knife Drive Box, page 401																	
▲	Header drive gearbox lubricant; refer to Changing Oil in Header Drive Gearbox, page 348																	
▲	Hydraulic oil; refer to 5.4.3 Changing Oil in Hydraulic Reservoir, page 351																	

5.3.2 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 Instance	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).	5.4.1 Checking Oil Level in Hydraulic Reservoir, page 349
5 Hours	Check for loose hardware and tighten to required torque.	8.1 Torque Specifications, page 517
	Check knife drive belts tension (check periodically for first 50 hours).	Tensioning Knife Drive Belts, page 404
10 Hours	Check auger drive chain tension.	5.7.3 Adjusting Auger Drive Chain Tension, page 365
	Check knife drive box mounting bolts.	Checking Mounting Bolts, page 394
50 Hours	Change float module gearbox oil.	Changing Oil in Header Drive Gearbox, page 348
	Change float module hydraulic oil filter.	5.4.4 Changing Oil Filter, page 352
	Change knife drive box lubricant.	Changing Oil in Knife Drive Box, page 401
	Check gearbox chain tension.	5.6.5 Adjusting Gearbox Drive Chain Tension, page 360
	Check deck height adjustment.	5.14.5 Adjusting Deck Height, page 432

5.3.3 Preseason Servicing

Perform the following procedures 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. Refer to [5.3.6 Lubrication and Servicing, page 332](#).
 2. Adjust the tension on the drive belts. Refer to [Tensioning Knife Drive Belts, page 404](#).
 3. Perform all annual maintenance tasks. Refer to [5.3.1 Maintenance Schedule/Record, page 326](#).

5.3.4 End-of-Season Service

Perform the following procedures 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 cutterbar and knife guards to prevent injury from accidental contact.

1. Clean the header thoroughly.
2. Bring the machine for storage in a dry and protected place if possible. If storing outside, always cover the machine with a waterproof canvas or other protective material.

NOTE:

If storing the machine outside, remove the drapers and store them in a dark, dry place. If not removing the drapers, store the header with the cutterbar lowered so water and snow will not accumulate on the drapers. The weight of water and snow accumulation puts excessive stress on the drapers and header.

3. Lower the header onto blocks to keep the cutterbar off the ground.
4. Lower the reel completely. If stored outside, 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 to keep moisture out of the bearings.
8. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
9. Check for worn components and repair as necessary.
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. Replace or tighten any missing or loose hardware. Refer to [8.1 Torque Specifications, page 517](#).

5.3.5 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.

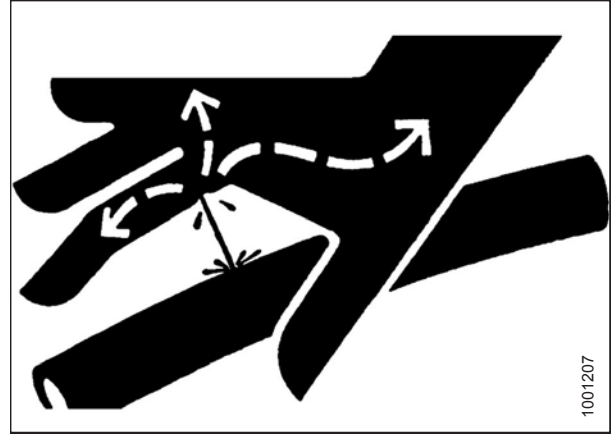


Figure 5.2: Hydraulic Pressure Hazard

- 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.

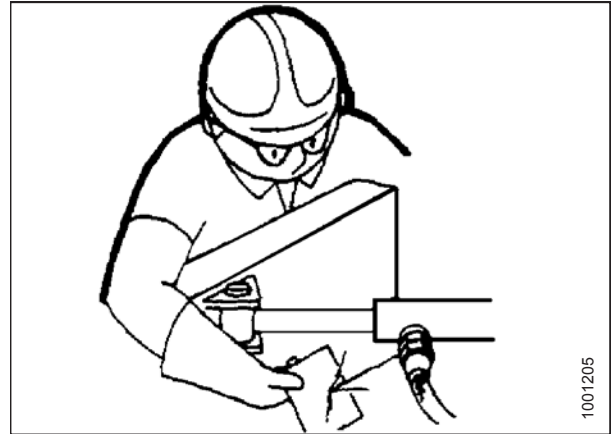


Figure 5.3: Testing for Hydraulic Leaks

5.3.6 Lubrication and Servicing

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in [5.1 Preparing Machine for Servicing, page 325](#).

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 [5.3.1 Maintenance Schedule/Record, page 326](#).

Service Intervals

Every 10 Hours

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

Knife: Lubricate the knife every 10 hours or daily, except in sandy conditions.

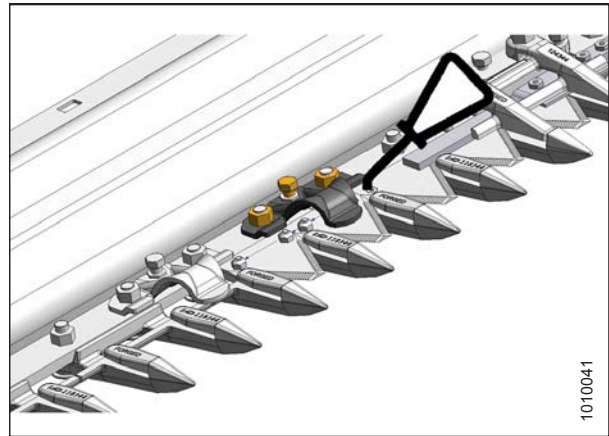


Figure 5.4: Lubricating Knife

Every 25 Hours

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

Knifehead: Lubricate the 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. Refer to [5.8.3 Removing Knifehead Bearing, page 381](#).



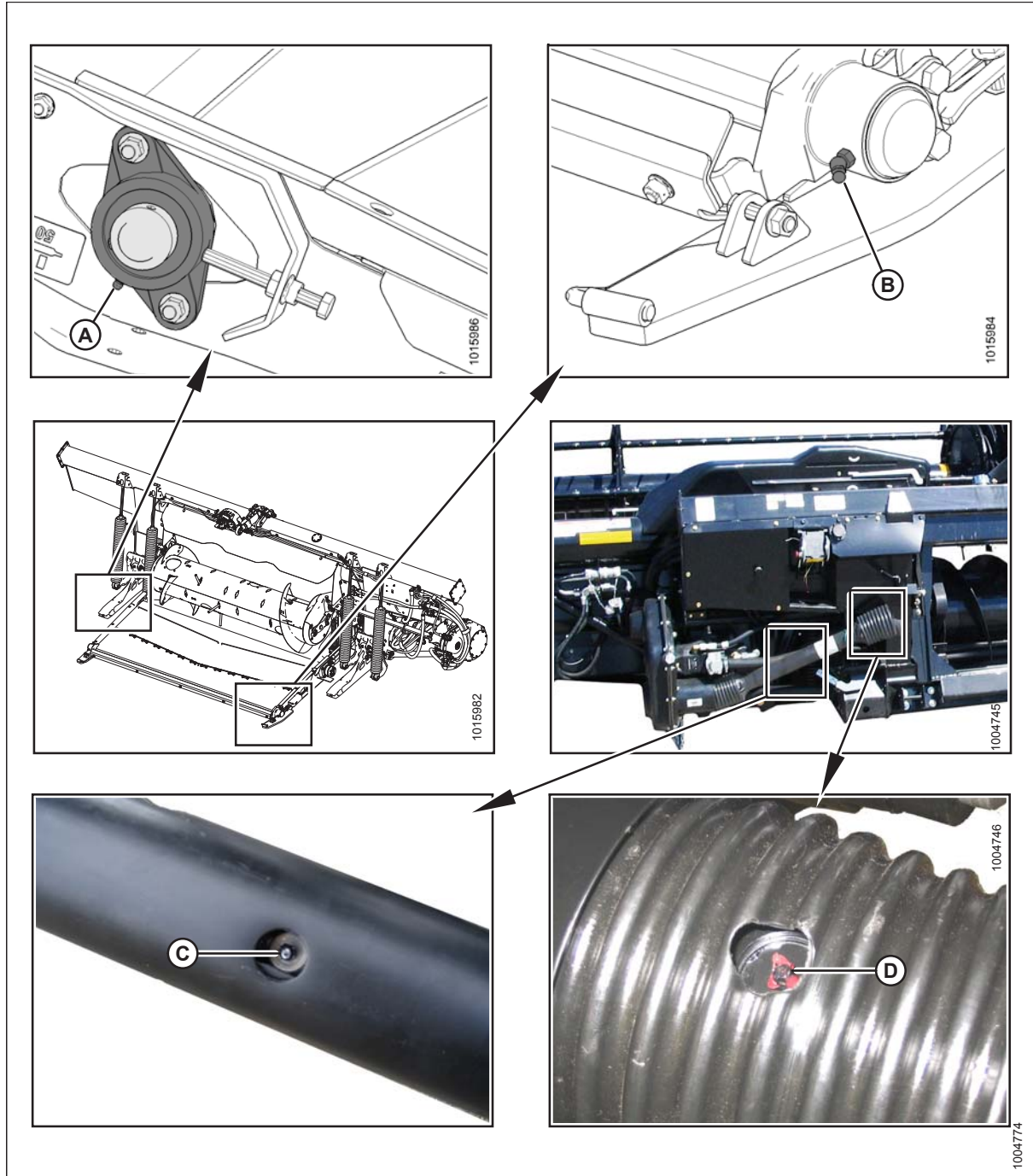
Figure 5.5: Every 25 Hours

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Every 50 Hours

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

Figure 5.6: Every 50 Hours



A - Drive Roller Bearing

B - Idler Roller Bearing (Both Sides)

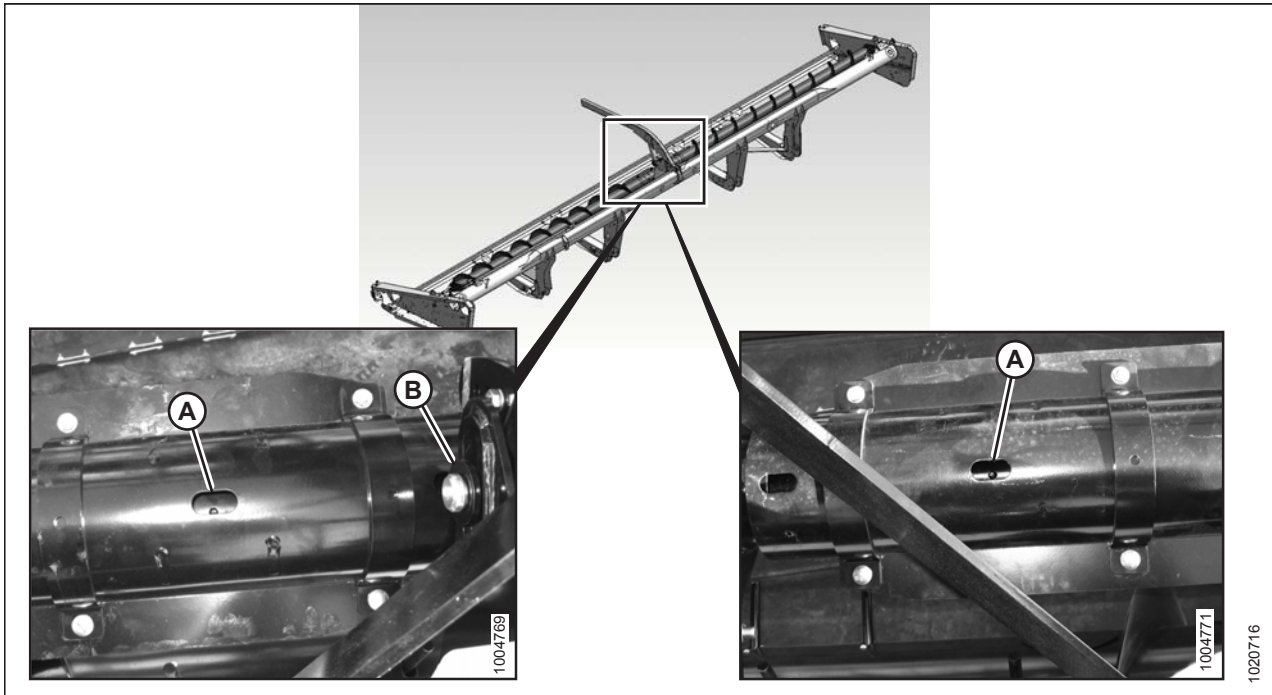
C - Driveline Slip Joint²⁸

D - Driveline Universal (Two Places)

28. Use high temperature extreme pressure (EP2) performance with 10% max molybdenum disulphide (NLGI Grade 2) lithium base.

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Figure 5.7: Every 50 Hours



A - Upper Cross Auger U-joint and Bearing²⁹

B - Upper Cross Auger Bearing (Two Places)

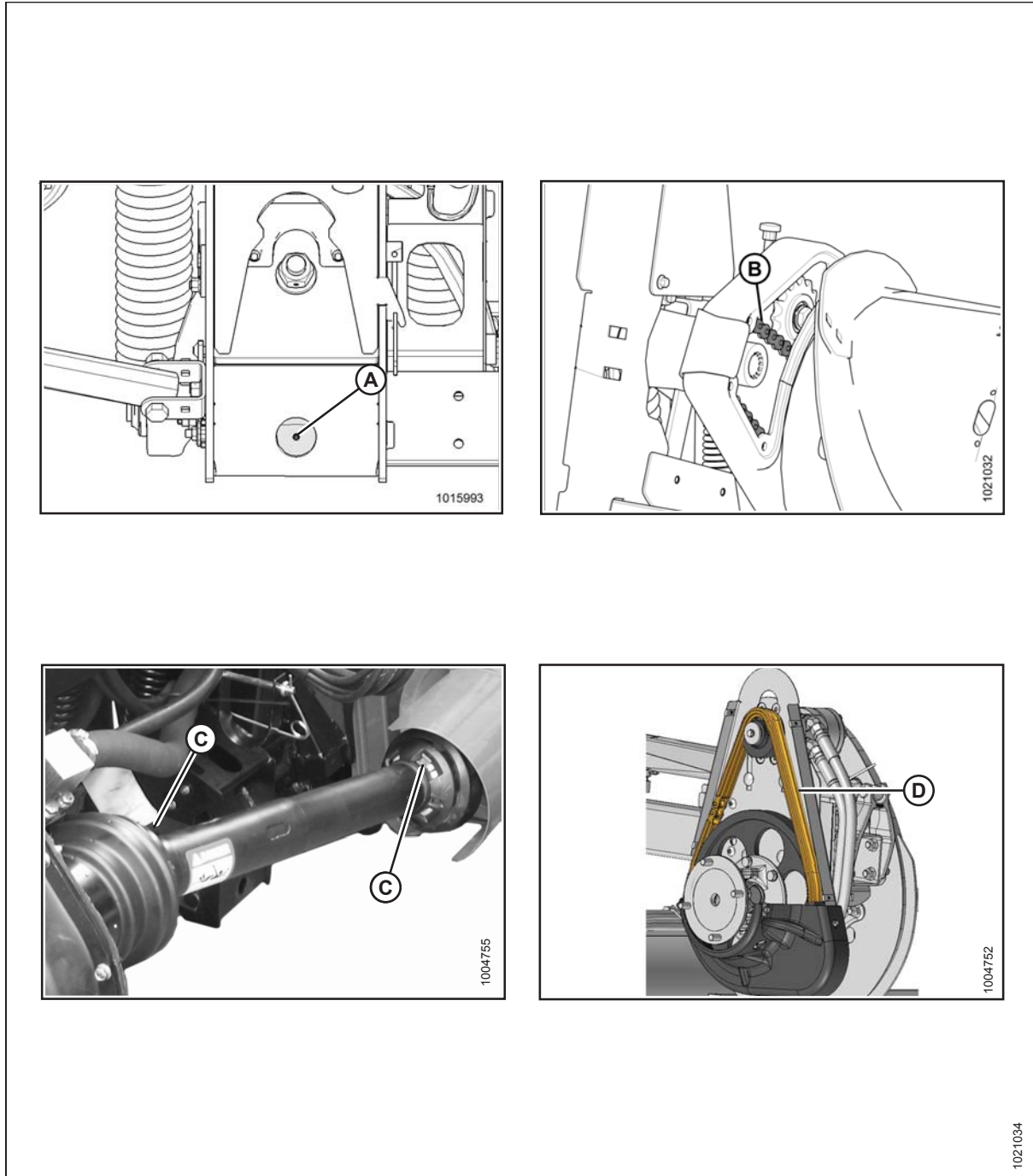
29. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. Six to eight pumps are sufficient at first grease (factory). Decrease grease interval as U-joint wears and requires more than six pumps.

MAINTENANCE AND SERVICING

Every 100 Hours

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

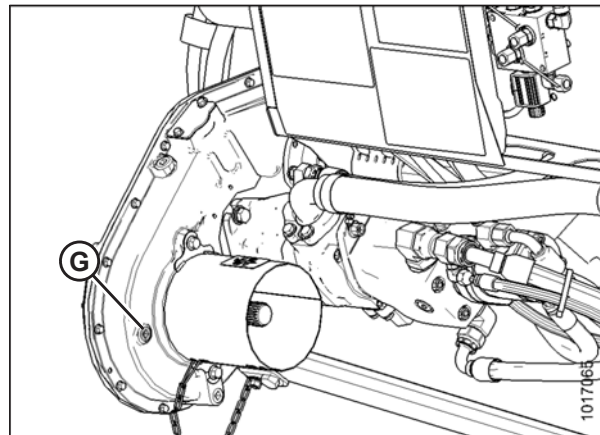
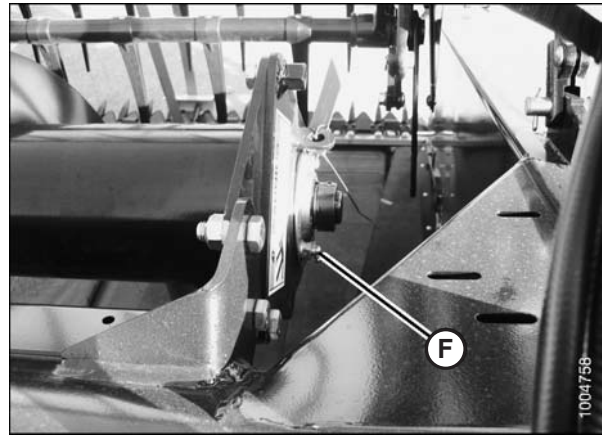
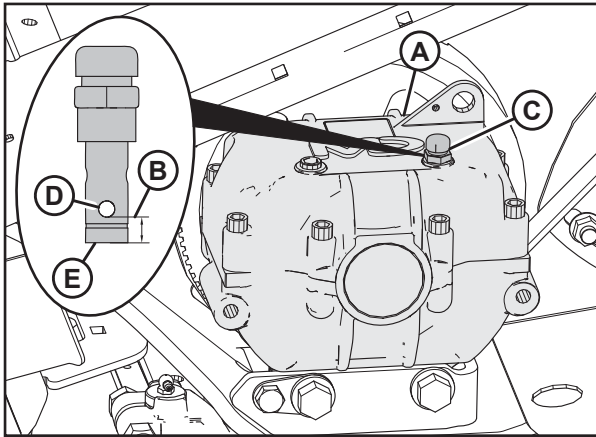
Figure 5.8: Every 100 Hours



- A - Float Pivot – Right and Left
- B - Auger Drive Chain. Refer to [Lubricating Auger Drive Chain, page 345](#)
- C - Driveline Guard – Two Places
- D - Reel Drive Chain – One Place. Refer to [Lubricating Reel Drive Chain, page 343](#)

MAINTENANCE AND SERVICING

Figure 5.9: Every 100 Hours



A - Knife Drive Box (Check Oil Level [B] on Dipstick [C]: Between Edge of Lower Hole [D] on Dipstick and Dipstick Bottom Edge [E])

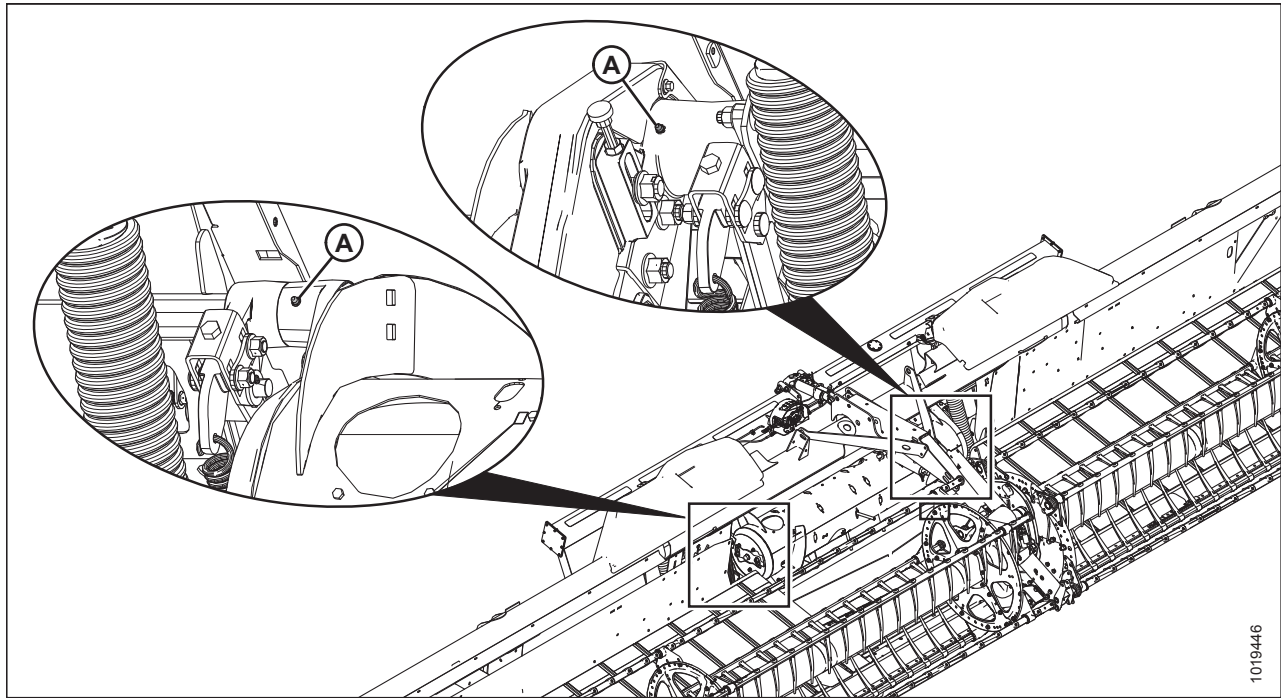
F - Upper Cross Auger Bearing (One Place)

G - Main Drive Gearbox Oil Level. Refer to [Lubricating Header Drive Gearbox, page 347](#)

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MAINTENANCE AND SERVICING

Figure 5.10: Every 100 Hours



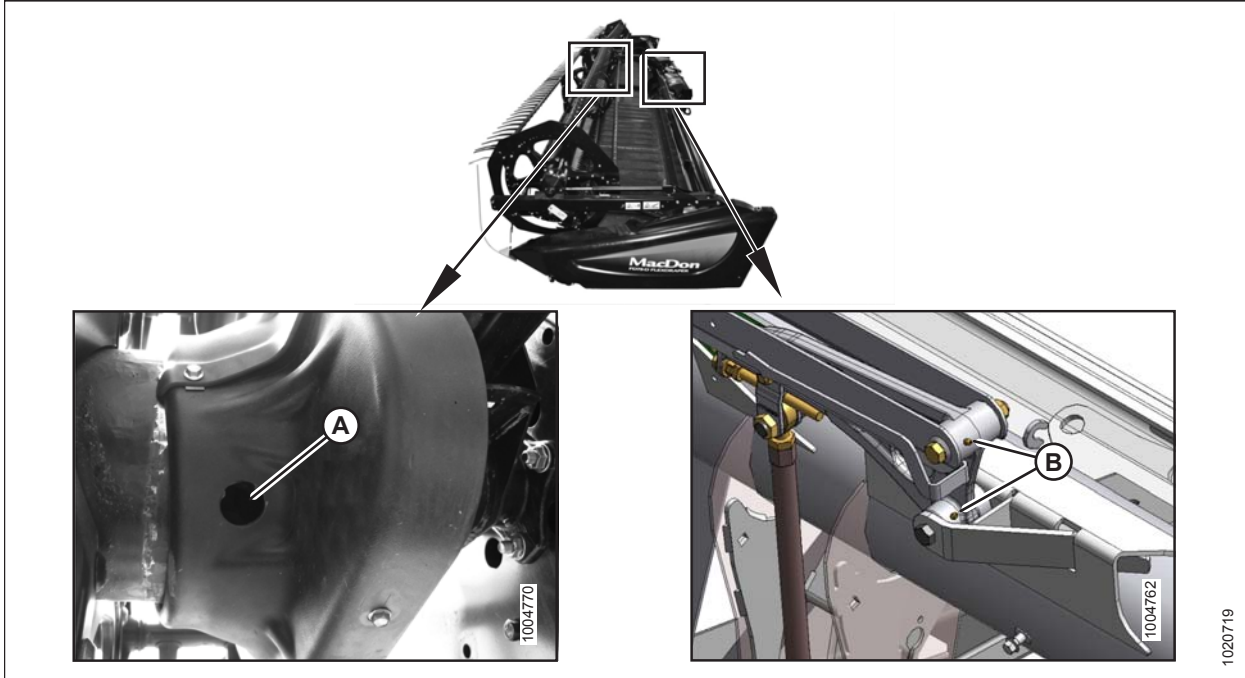
A - Auger Pivots

MAINTENANCE AND SERVICING

Every 250 Hours

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

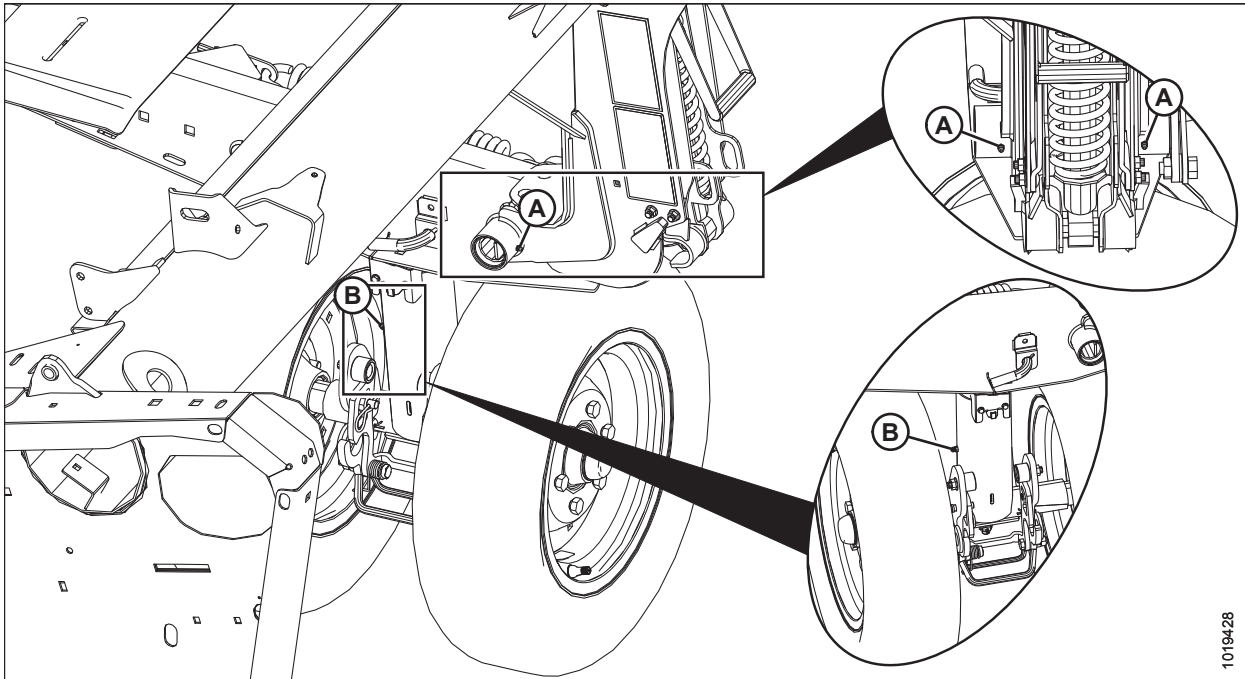
Figure 5.11: Every 250 Hours



A - Reel U-joint (One Place)

B - Flex Linkage (Two Places) – Both Sides

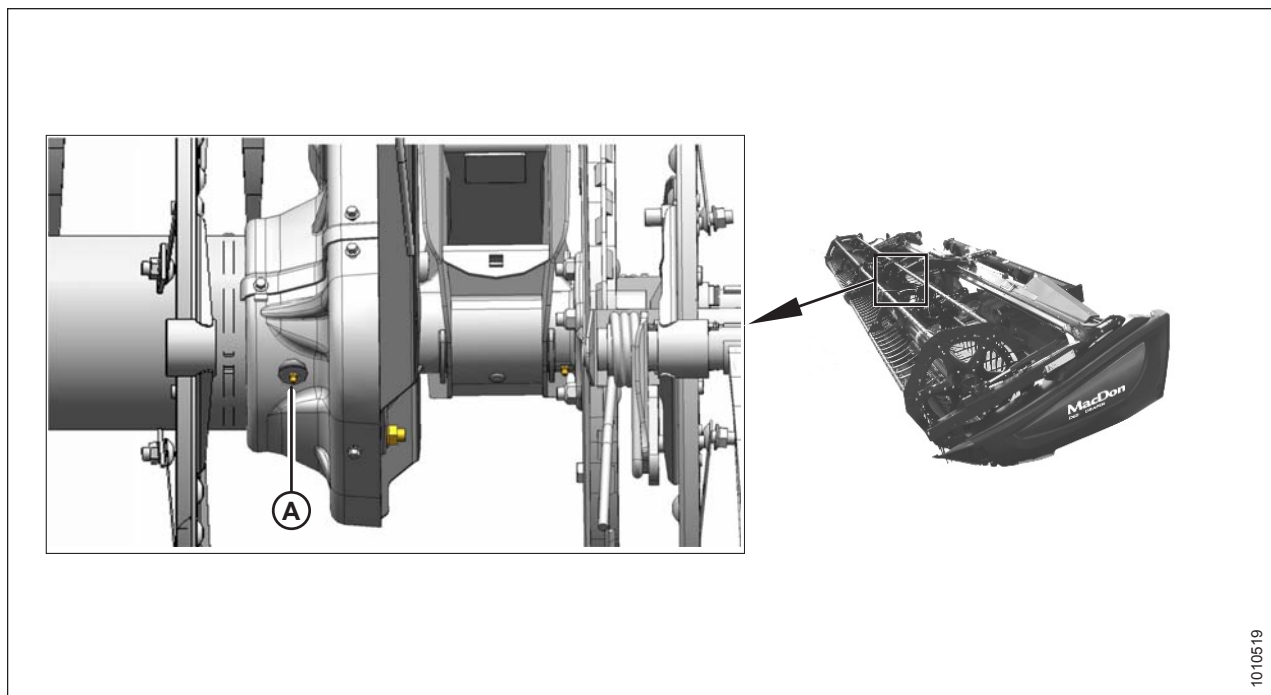
Figure 5.12: Every 250 Hours



A - Frame/Wheel Pivot (Front and Rear) – Both Sides

B - Front Wheel Pivot (One Place)

Figure 5.13: Every 250 Hours



A - Double Reel U-joint³⁰

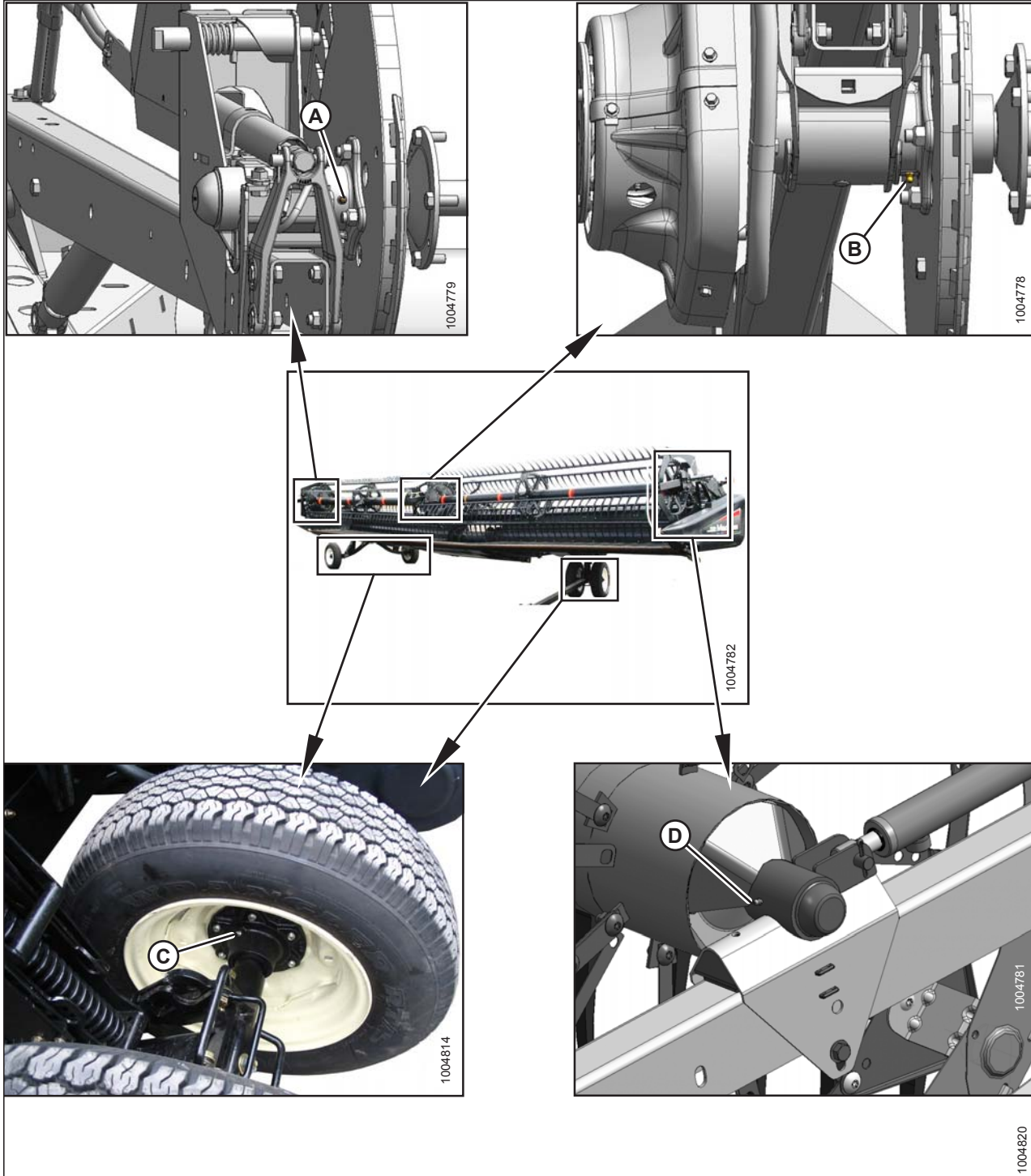
30. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. Six to eight pumps are sufficient at first grease (factory). Increase grease interval as U-joint wears and requires more than six pumps.

MAINTENANCE AND SERVICING

Every 500 Hours

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

Figure 5.14: Every 500 Hours



A - Reel Right Bearing (One Place)
C - Wheel Bearings (Four Places)

B - Reel Center Bearing (One Place)
D - Reel Left Bearing (One Place)

MAINTENANCE AND SERVICING

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 avoid bodily injury or death from unexpected start-up of machine, always stop engine and remove key from ignition before leaving 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 [5.3.1 Maintenance Schedule/Record, page 326](#).

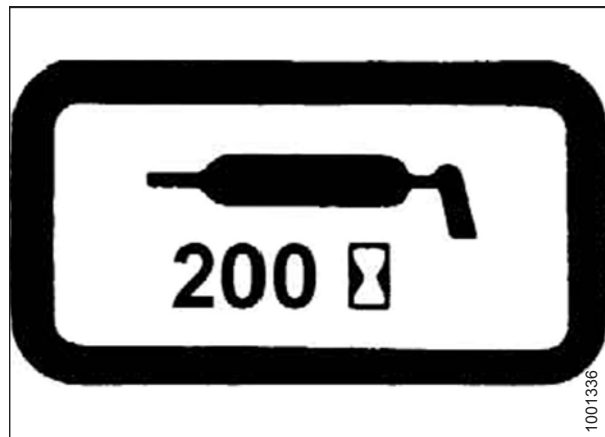


Figure 5.15: Greasing Interval Decal

MAINTENANCE AND SERVICING

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

IMPORTANT:

Use clean, high-temperature, extreme-pressure grease only.

2. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.
6. Use clean, high-temperature, extreme-pressure grease only.

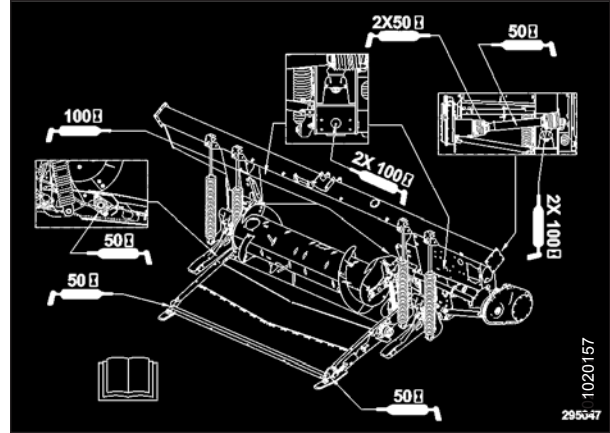


Figure 5.16: FM100 Grease Point Layout Decal

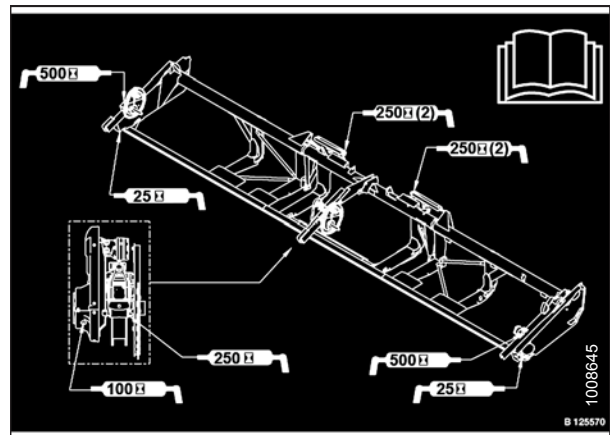


Figure 5.17: FD1 Series Grease Point Layout Decal

Lubricating Reel Drive Chain

⚠ DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove six bolts (A) securing the upper cover (B) to the reel drive and lower cover (C).

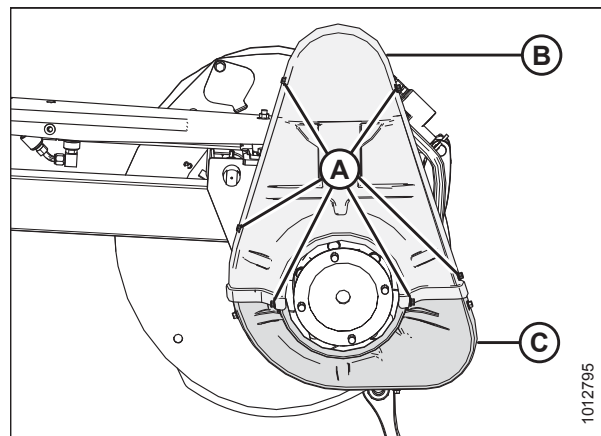


Figure 5.18: Drive Cover

3. Remove three bolts (A) and remove the lower cover (B) if necessary.

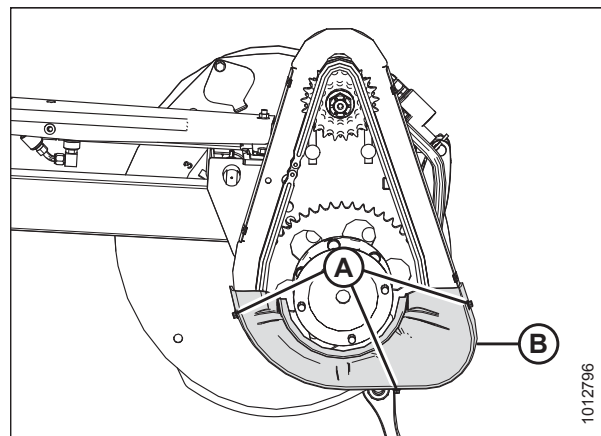


Figure 5.19: Lower Drive Cover (Upper Cover Removed)

MAINTENANCE AND SERVICING

4. Apply a liberal amount of grease to the chain (A).

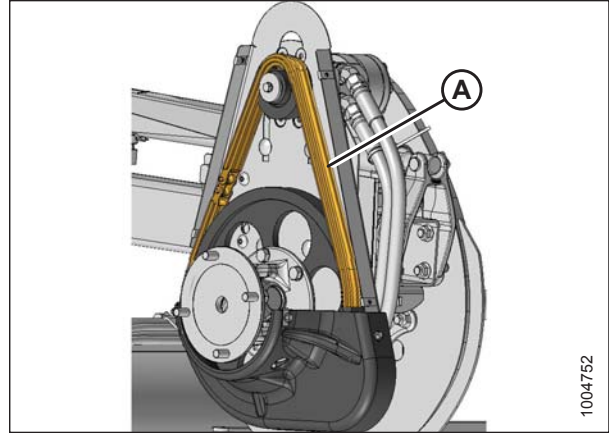


Figure 5.20: Drive Chain

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

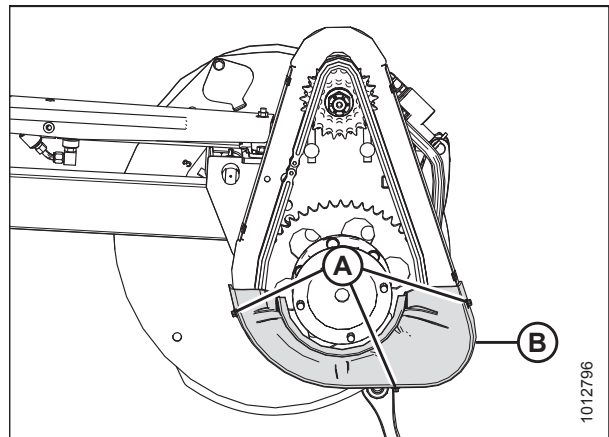


Figure 5.21: Lower Drive Cover

6. Position the upper drive cover (B) onto the reel drive and lower cover (C), and secure with six bolts (A).

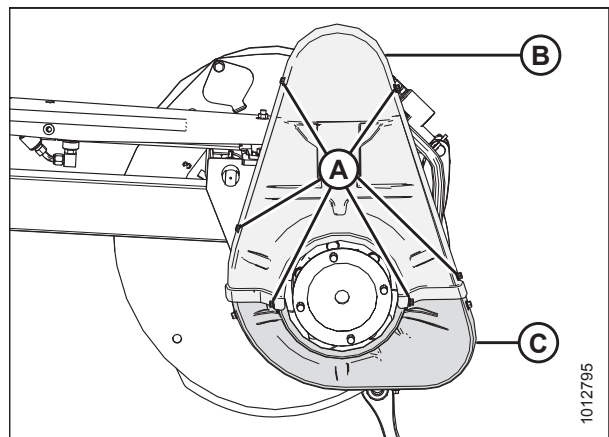


Figure 5.22: Drive Cover

Lubricating Auger Drive Chain



DANGER

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

Lubricate the auger drive chain every 100 hours. The auger drive chain can be lubricated with the float module attached to the combine, but it is easier with the float module detached

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 grease the chain.

1. Remove four bolts (A) and the metal inspection panel (B).

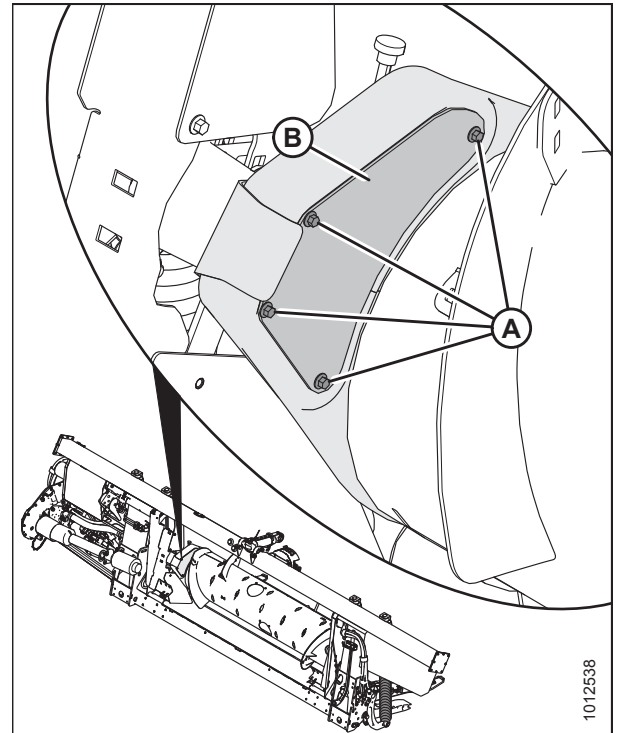


Figure 5.23: Auger Drive Inspection Panel

2. Apply a liberal amount of grease to the chain (A), drive sprocket (B), and idler sprocket (C).
3. Rotate the auger and apply grease to more areas of the chain, if necessary.

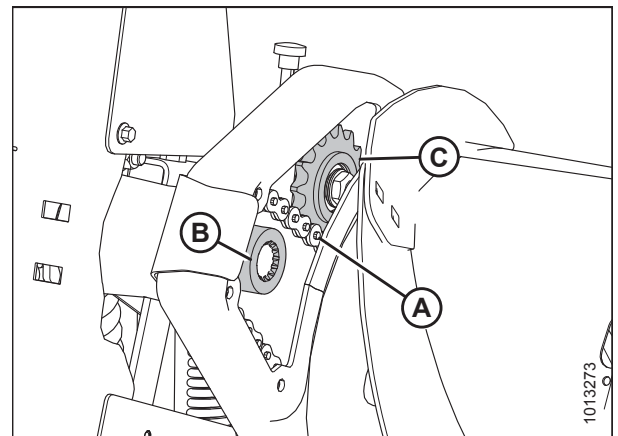


Figure 5.24: Auger Drive Chain

MAINTENANCE AND SERVICING

4. Reinstall metal inspection panel (B) and secure with four bolts (A).

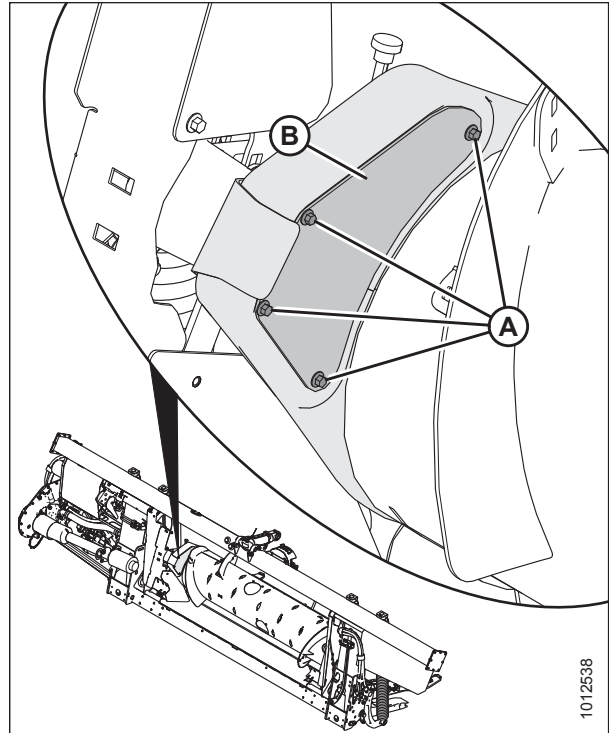


Figure 5.25: Auger Drive Inspection Panel

Lubricating Header Drive Gearbox

Checking Oil Level in Header Drive Gearbox

Check the header drive gearbox oil level every 100 hours.

DANGER

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

1. Lower the header to the ground and ensure the gearbox is in working position.
2. Shut down the combine, and remove the key from the ignition.
3. Remove the oil level plug (A) and check that the oil level is up to the bottom of the hole.
4. Replace the oil level plug (A).
5. Add oil if required. Refer to [Adding Oil to Header Drive Gearbox, page 347](#).

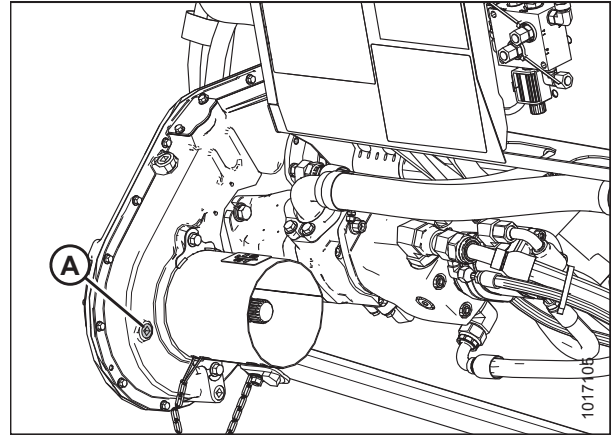


Figure 5.26: Header Drive Gearbox

Adding Oil to Header Drive Gearbox

DANGER

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

1. Lower the cutterbar to the ground, and ensure the gearbox is in working position.
2. Shut down the combine, and remove the key from the ignition.
3. Remove filler plug (B) and the oil level plug (A).
4. Add SAE 85W-140 (API service class GL-5) oil into the filler plug (B) until it runs out of the oil level plug hole (A).
5. Replace the oil level plug (A) and the filler plug (B).

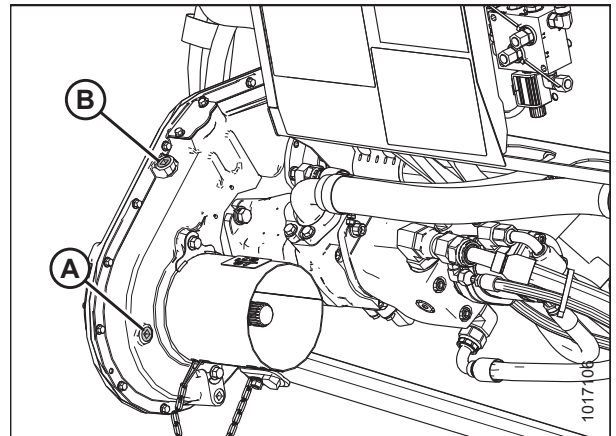


Figure 5.27: Header Drive Gearbox

Changing Oil in Header Drive Gearbox

Change the header drive gearbox oil after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

DANGER

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

1. Start engine.
2. Engage the header to warm up the oil.
3. Raise or lower the header to position the oil drain plug (A) at its lowest point.
4. Shut down the combine, 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 the oil drain plug (A) and the filler plug (C), and allow the oil to drain.
7. Replace the oil drain plug (A) and remove the oil level plug (B).
8. Add SAE 85W-140 (API service class GL-5) oil into the filler plug (C) until it runs out of the oil level hole (B).

NOTE:

The header drive gearbox holds approximately 2.5 liters (2.6 quarts) of oil.

9. Replace the oil level plug (B) and the filler plug (C).

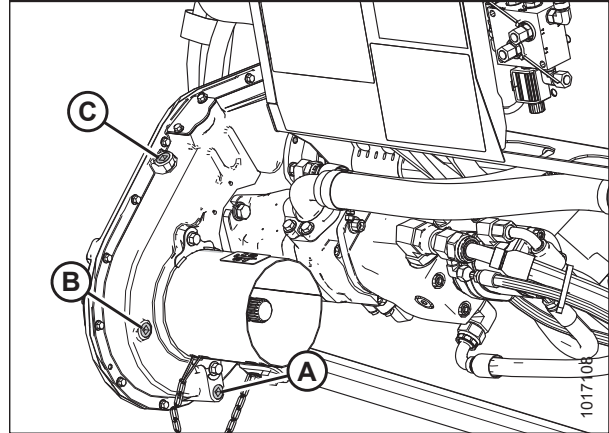


Figure 5.28: Header Drive Gearbox

5.4 Hydraulics

The FM100 Float Module's hydraulic system drives the float module feed draper, header drapers, and knife drives. The combine's hydraulic system drives the reel hydraulics.

The float module frame acts as an oil reservoir. Refer to inside back cover for oil requirements.

5.4.1 Checking Oil Level in Hydraulic Reservoir

Check the hydraulic oil level in the reservoir every 25 hours.

1. Check the oil level using the lower sight (A) and the upper sight (B) with the cutterbar just touching the ground and with center-link retracted.

NOTE:

Check the level when the oil is cold.

NOTE:

For extremely hilly terrain a hillside extension kit can be installed. Refer to [6.1.1 Hillside Extension Kit, page 487](#).

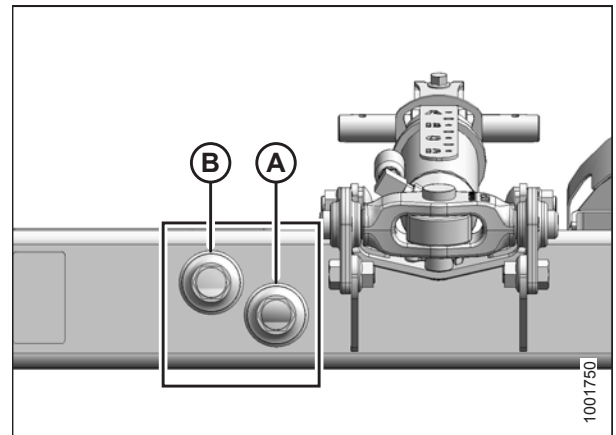


Figure 5.29: Oil Level Sight Glass

2. Ensure the oil is at the appropriate level for the terrain as follows:
 - **Hilly terrain (A):** Maintain level so lower sight (A) is full, and upper sight (B) is up to one-half filled.
 - **Normal terrain (B):** Maintain level so lower sight (A) is full, and upper sight (B) is empty.
 - **Level ground (C):** For slopes of 6° or less, oil level may be kept slightly lower if desired. Maintain level so lower sight (A) is one-half filled or slightly higher.

NOTE:

It may be necessary to slightly reduce the oil level when ambient temperatures are above 35°C (95°F) to prevent overflow at the breather when normal operating temperatures are reached.

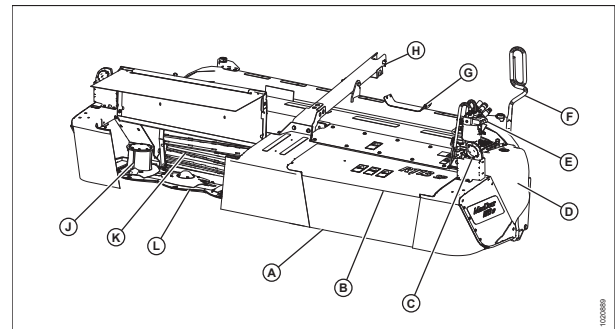


Figure 5.30: Oil Levels

5.4.2 Adding Oil to Hydraulic Reservoir

Follow this procedure to top up the oil in the hydraulic reservoir. To change the hydraulic oil, refer to [5.4.3 Changing Oil in Hydraulic Reservoir, page 351](#).

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Clean any dirt or debris from the filler cap (A).
3. Loosen and remove the filler cap (A) by turning it counterclockwise.
4. Add warm oil (approximately 21°C [70°F]) and fill to the required level. Refer to inside back cover for specifications.

IMPORTANT:

Warm oil will flow through the screen better than cold oil. Do **NOT** remove the screen.

5. Reinstall the filler cap (A).
6. Recheck oil level. Refer to [5.4.1 Checking Oil Level in Hydraulic Reservoir, page 349](#).

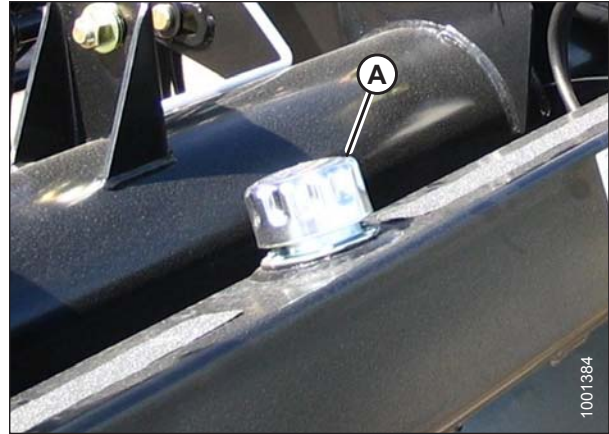


Figure 5.31: Oil Reservoir Filler Cap

5.4.3 Changing Oil in Hydraulic Reservoir

Change the hydraulic oil in the reservoir every 1000 hours or 3 years (whichever comes first).

DANGER

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

1. Start engine.
2. Engage the header to warm up the oil.
3. Shut down the combine, and remove the key from the ignition.
4. Place a suitably sized container (at least 40 liters [10 gallons]) under each of the two oil drain plugs (A) located at the back on each side of the frame.
5. Remove the oil drain plugs (A) with a 1-1/2 in. hex socket and allow the oil to drain.
6. Replace the oil drain plugs (A) when reservoir is empty.
7. Change the oil filter if required. Refer to [5.4.4 Changing Oil Filter, page 352](#).
8. Add approximately 75 liters (20 gallons) of oil to the reservoir. Refer to [5.4.2 Adding Oil to Hydraulic Reservoir, page 350](#).

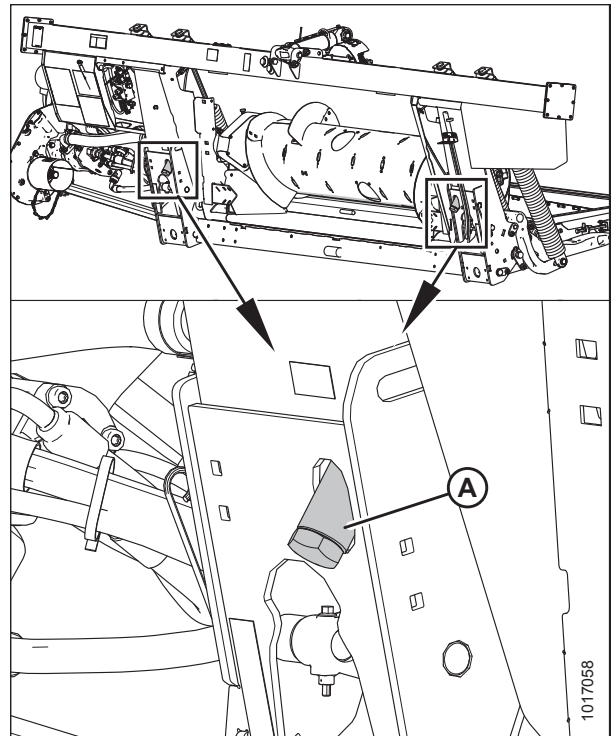


Figure 5.32: Reservoir Drain

5.4.4 Changing Oil Filter

Change the oil filter after the first 50 hours of operation and every 250 hours thereafter.

Obtain filter part MD #202986 from your MacDon Dealer.

DANGER

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

1. Clean around the mating surfaces of the filter (B) and manifold (A).
2. Place a suitably sized container (approximately 1 liter [0.26 gallons]) under the oil drain spout (C) to collect oil runoff.
3. Remove the spin-off filter (B) and clean the exposed filter port in the manifold (A).
4. Apply a thin film of clean oil to the O-ring provided with the new filter.
5. Turn the new filter into the manifold (A) 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.

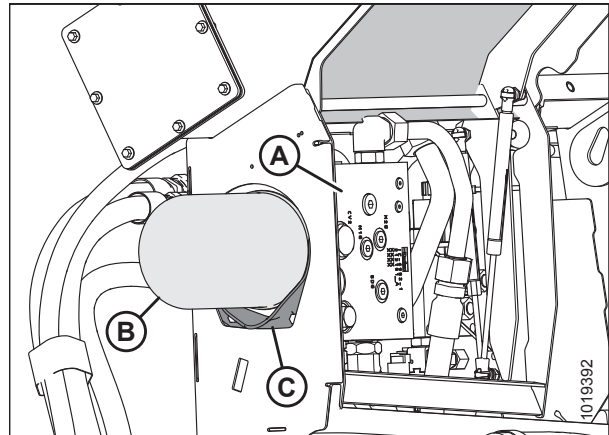


Figure 5.33: FM100 Hydraulics (Cover Opened to Show Manifold)

5.5 Electrical System

5.5.1 Replacing Light Bulbs

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Use a Phillips screwdriver to remove the screws (A) from the fixture, and remove the plastic lens.
2. Replace the bulb, and reinstall the plastic lens and screws.

NOTE:

Use bulb trade #1156 for amber transport lights and #1157 for red tail light (Slow Speed Transport option).

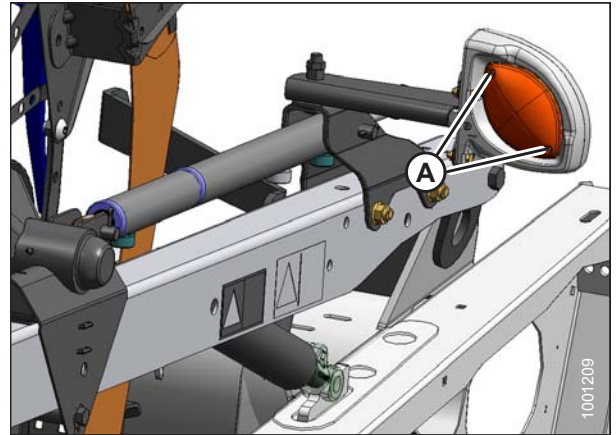


Figure 5.34: Transport Light

5.6 Header Drive

The header drive consists of a driveline from the combine to the FM100 Float Module gearbox that drives the feed auger and hydraulic pumps. The pumps provides hydraulic power to the drapers, knives, and optional equipment.

5.6.1 Removing Driveline

DANGER

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

NOTE:

The driveline normally remains attached to the float module and is stored on the support bracket provided when not in use.

1. If the float module is attached to the combine, remove the driveline from the combine by pulling the quick disconnect collar to release the driveline yoke at the combine shaft.

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2. Remove the two nuts (A) securing the shield (B) to the gearbox.
3. Slide the shield (B) over the driveline shield to expose the quick disconnect on the gearbox. Do **NOT** disconnect the tether (C).
4. Pull the quick disconnect collar to release the driveline yoke, and pull the driveline off the gearbox shaft.
5. Slide the shield (B) off the driveline.

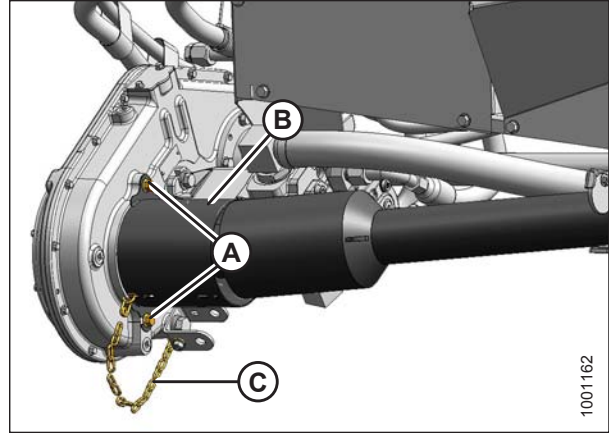


Figure 5.35: Float Module End of Driveline

6. Pull the driveline collar (A) away from the power take-off (PTO) support (B). Slide the yoke (C) off the support bracket (B), and release collar (A).

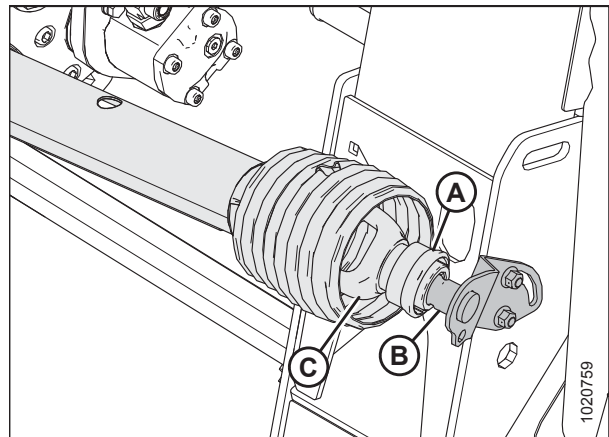


Figure 5.36: Combine End of Driveline

5.6.2 Installing Driveline

DANGER

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

IMPORTANT:

If the combine output shaft splines match the float module input shaft splines, ensure the driveline is installed with the longer guard at the float module gearbox end.

IMPORTANT:

Ensure the driveline length corresponds with the length specifications for your specific equipment. Refer to Table 2.2, page 22.

1. Position the combine end of the driveline (A) on the power take-off (PTO) storage support (B). Pull back the collar (C) on the driveline and slide driveline onto the support until the driveline yoke (D) locks onto support. Release collar (C).

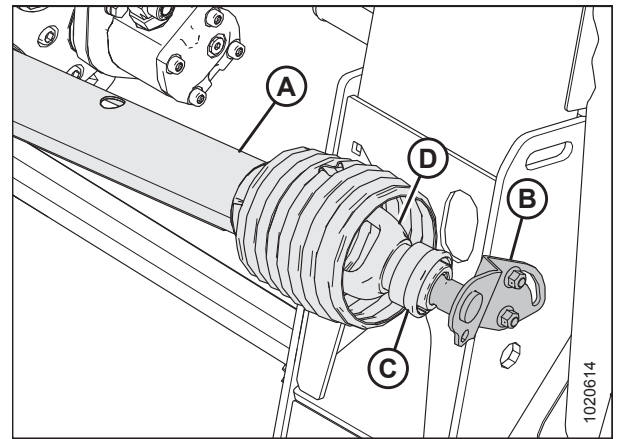


Figure 5.37: Combine End of Driveline

2. Slide the shield (B) over the driveline.
3. Position the driveline quick disconnect onto the float module gearbox shaft, pull back the collar, and slide onto the shaft until the yoke locks onto the shaft. Release the collar.
4. Position the shield (B) on the gearbox and secure with bolts (A).

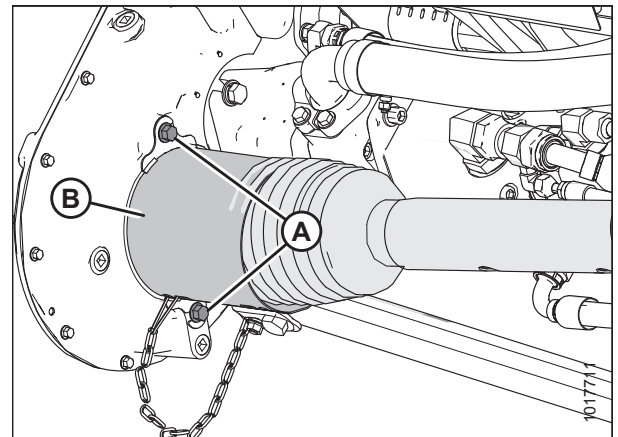


Figure 5.38: Float Module End of Driveline

5.6.3 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 avoid bodily injury or death from unexpected start-up of machine, always stop engine and remove key from ignition before leaving 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 the driveline collar (A) away from the power take-off (PTO) support (B). Slide the yoke (C) off the support bracket (B), and release collar (A).

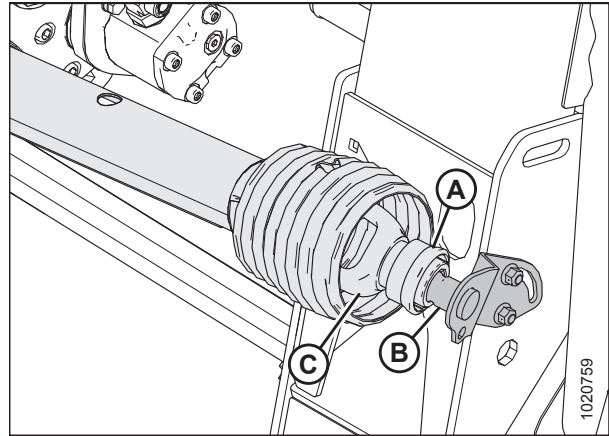


Figure 5.39: Combine End of Driveline

3. Lift the combine end of the driveline (A) from the hook, and extend the driveline until it separates. Hold the float module end of the driveline (B) to prevent it from dropping and hitting the ground.



Figure 5.40: Separated Driveline

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



Figure 5.41: Driveline Guard

5. Rotate the driveline guard locking ring (A) counterclockwise using a screwdriver until the lugs (B) line up with the slots in the guard.
6. Pull the guard off the driveline.

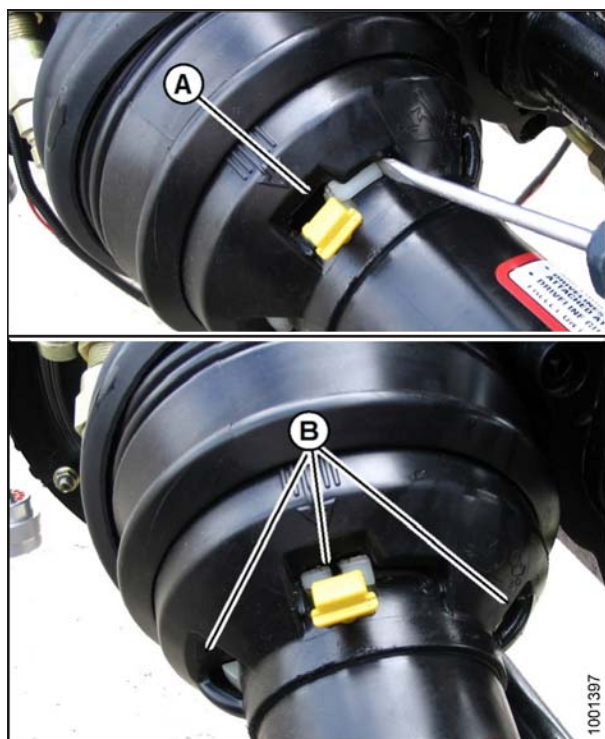


Figure 5.42: Driveline Guard

5.6.4 Installing Driveline Guard

1. Slide the guard onto the driveline, and line up the slotted lug on the locking ring (A) with the arrow (B) on the guard.



Figure 5.43: Driveline Guard

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

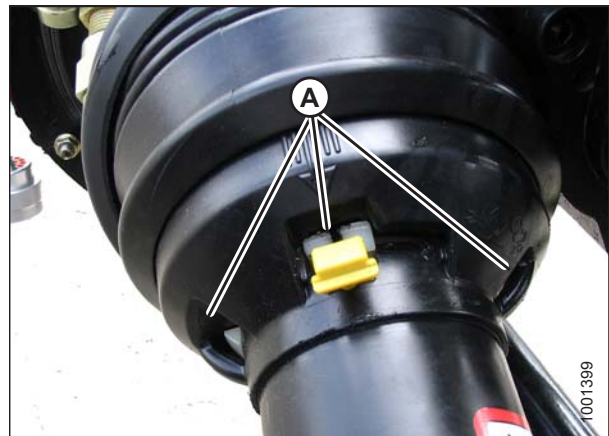


Figure 5.44: Driveline Guard

3. Use a slotted screwdriver to rotate ring (A) clockwise and lock ring in guard.



Figure 5.45: Driveline Guard

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



Figure 5.46: Driveline Guard

5. Assemble the driveline.

NOTE:

The splines are keyed to align the universals. Align weld (A) with the missing spline (B) when assembling.

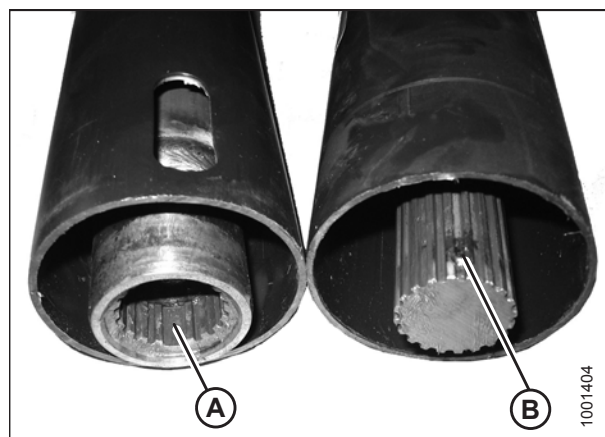


Figure 5.47: Driveline

6. Position the combine end of the driveline (A) on the power take-off (PTO) storage support (B). Pull back the collar (C) on the driveline and slide driveline onto the support until the driveline yoke (D) locks onto support. Release collar (C).

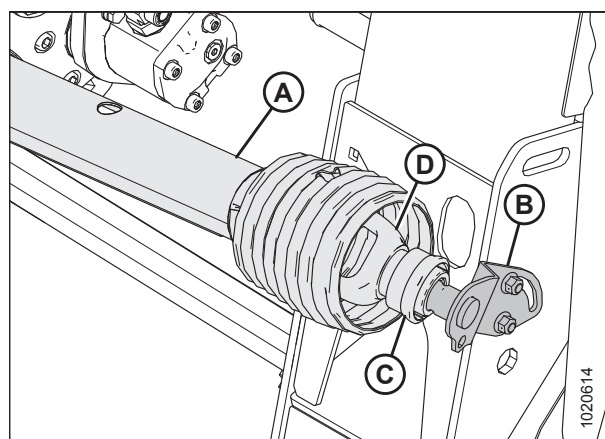


Figure 5.48: Combine End of Driveline

5.6.5 Adjusting Gearbox Drive Chain Tension

The gearbox drive chain tension is factory-set, but tension adjustments are required every 500 hours or annually (whichever comes first). The gearbox drive chain, located inside the gearbox, requires no other regular maintenance.

DANGER

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

1. Lower the header.
2. Shut down the combine, and remove the key from the ignition.
3. Remove two bolts and the chain adjusting cover (A). Ensure there is no gasket (B) damage.
4. Remove the retainer plate (C).
5. Tighten bolt (D) to 6.8 Nm (60 lbf-in).
6. Refer to Table 5.1, page 360 and back off (loosen) bolt (D) based on your gearbox configuration.

NOTE:

For proper tensioning, the chain should have 10–14 mm (3/8–9/16 in.) of deflection at its midpoint.

7. Reinstall the retainer plate (C).
8. Reinstall the chain adjusting cover (A) and gasket (B). Torque hardware to 9.5 Nm (84 lbf-in).

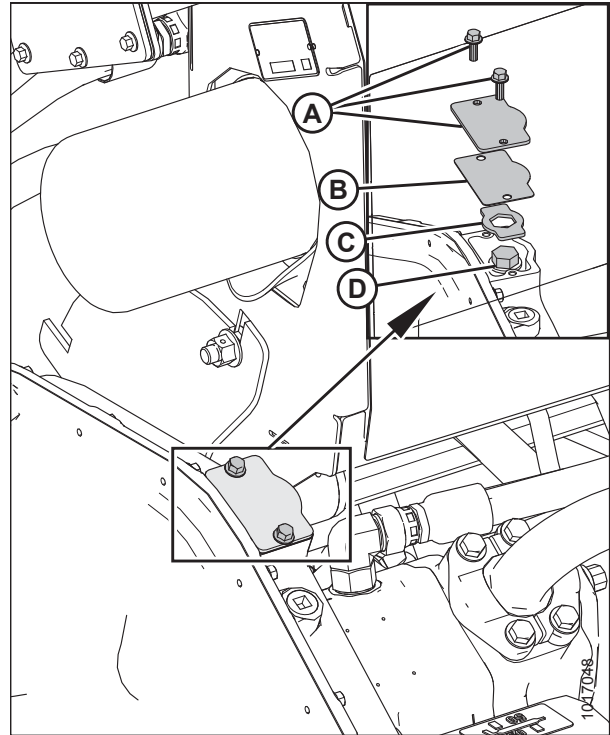


Figure 5.49: Chain Tensioner

Table 5.1 Adjusting Bolt Tightness on Configured Gearboxes

Gearbox Configuration	Gear Ratios	Back Off Amounts
CLAAS	22/38 sprocket ratio, 74 pitch chain	1 turn
Case, New Holland, and AGCO (Challenger, Gleaner, Massey Ferguson)	29/38 sprocket ratio, 78 pitch chain	
John Deere	37/38 sprocket ratio, 80 pitch chain	2-1/2 turn

5.7 Auger

The FM100 Float Module auger feeds the cut crop from the draper decks into the combine feeder house.

5.7.1 Adjusting Auger to Pan Clearance

DANGER

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

IMPORTANT:

Maintain an appropriate distance between the auger and the 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, and position the header 150–254 mm (6–10 in.) off the ground.
2. Lock header wings. Refer to [Locking/Unlocking Header Wings, page 62](#).
3. Shut down the combine, and remove the key from the ignition.
4. Ensure the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

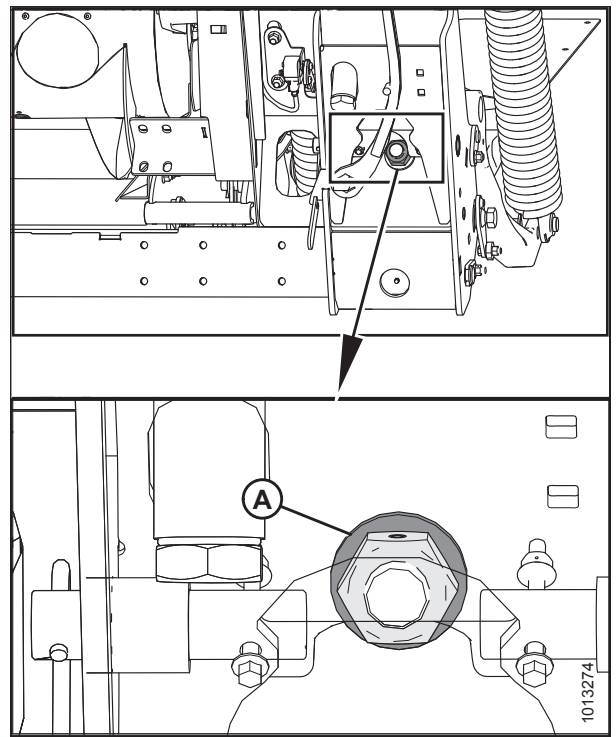


Figure 5.50: Float Lock

MAINTENANCE AND SERVICING

5. Before adjusting the auger to pan clearance, check the auger float position to determine how much clearance is required:
 - If the bolt head (A) is closest to the floating symbol (B), the auger is in the floating position.

CAUTION

Make sure the two bolts (A) are in the same location to prevent damage to the machine during operation.

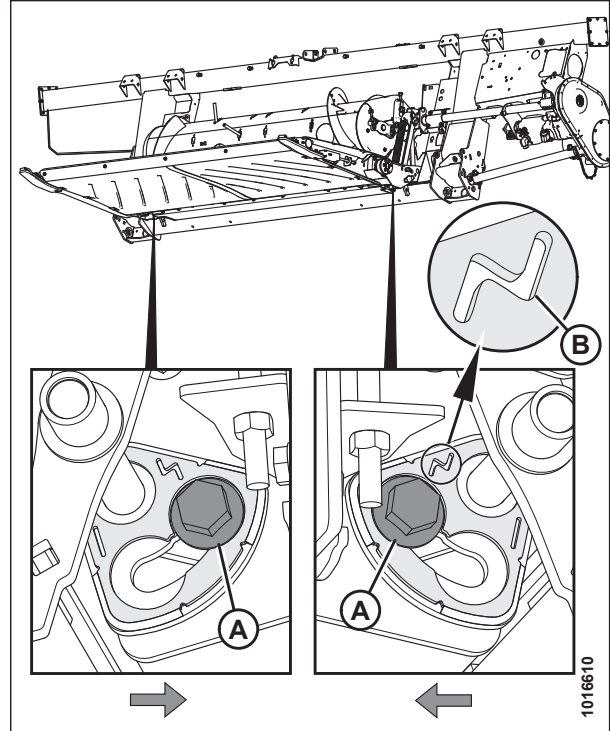


Figure 5.51: Floating Position

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

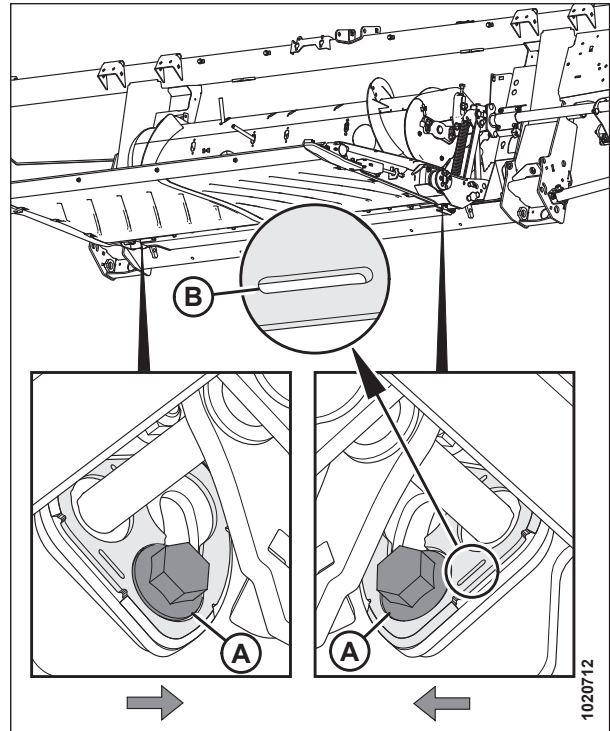


Figure 5.52: Fixed Position

MAINTENANCE AND SERVICING

6. Loosen two nuts (B).
7. Using the adjuster bolt (A), set clearance (C) to 22–26 mm (7/8–1.0 in.) if feed auger is in rigid position, and 11–15 mm (7/16–5/8 in.) if feed auger is in floating position. Turn bolt clockwise to increase clearance and counterclockwise to decrease clearance.

NOTE:

The clearance increases between 25–40 mm (1–1-1/2 in.) when the center-link is fully retracted.

8. Repeat Step 6, [page 363](#) and Step 7, [page 363](#) for the opposite end of the auger.

IMPORTANT:

Adjusting one side of the auger can affect the other side so recheck both sides after final adjustment is made.

9. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 93–99 Nm (68–73 lbf·ft).

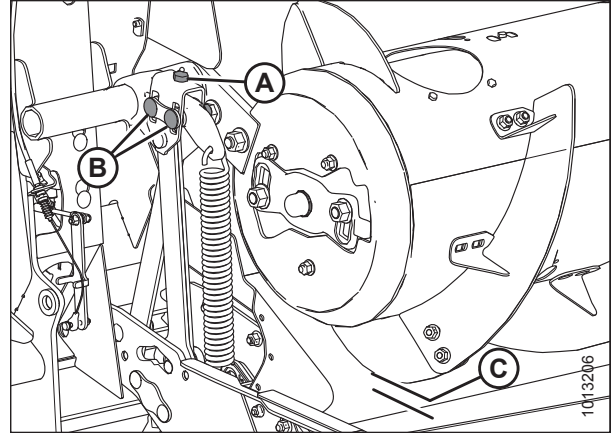


Figure 5.53: Auger Clearance

5.7.2 Checking Auger Drive Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

DANGER

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

1. Lower the header to the ground.
2. Raise the reel and engage the reel safety props. Refer to [Engaging Reel Safety Props, page 29](#).
3. Shut down the combine, and remove the key from the ignition.
4. Rotate the auger (A) by hand in reverse direction, until it cannot turn anymore.
5. Mark a line (B) across the drum and cover.

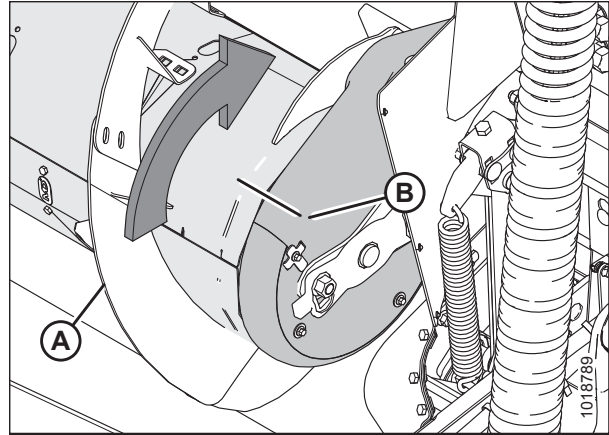


Figure 5.54: Auger Drive

6. Rotate the auger (A) by hand, in forward direction, until it cannot turn anymore.
7. Measure the distance between the two lines (B).

For a new chain:

- If the difference (B) is 1–4 mm (0.04–0.16 in.), no adjustment is required.
- If the difference (B) is greater than 4 mm (0.16 in.), the auger drive chain tension needs adjusting. Refer to [5.7.3 Adjusting Auger Drive Chain Tension, page 365](#).

For a used chain:

- If the difference (B) is 3–8 mm (0.12–0.31 in.), no adjustment is required.
- If the difference (B) is greater than 8 mm (0.31 in.), the auger drive chain tension needs adjusting. Refer to [5.7.3 Adjusting Auger Drive Chain Tension, page 365](#).
- If the difference (B) is less than 3 mm (0.12 in.), the auger drive chain needs adjusting. Refer to [5.7.3 Adjusting Auger Drive Chain Tension, page 365](#).

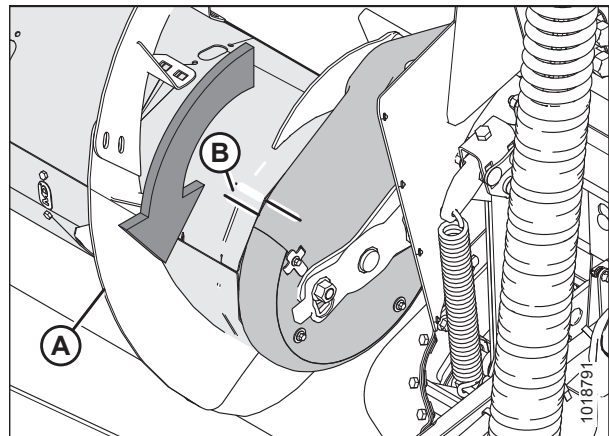


Figure 5.55: Auger Drive

5.7.3 Adjusting Auger Drive Chain Tension

The auger is chain-driven by the float module drive system sprocket attached to the side of the auger.

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Detach the header from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
3. Loosen the idler nut (A) and jam nut (B).
4. Rotate the auger in reverse to take up the slack in the lower strand of the chain.
5. Turn adjuster thumbscrew (C) clockwise to move the idler sprocket until it is finger tight only.

NOTE:

Do **NOT** overtighten.

6. Tighten the idler nut (A) and torque to 258–271 Nm (190–200 lbf-ft).
7. Tighten the jam nut (B).
8. Check chain tension. Refer to [5.7.2 Checking Auger Drive Chain Tension, page 364](#).

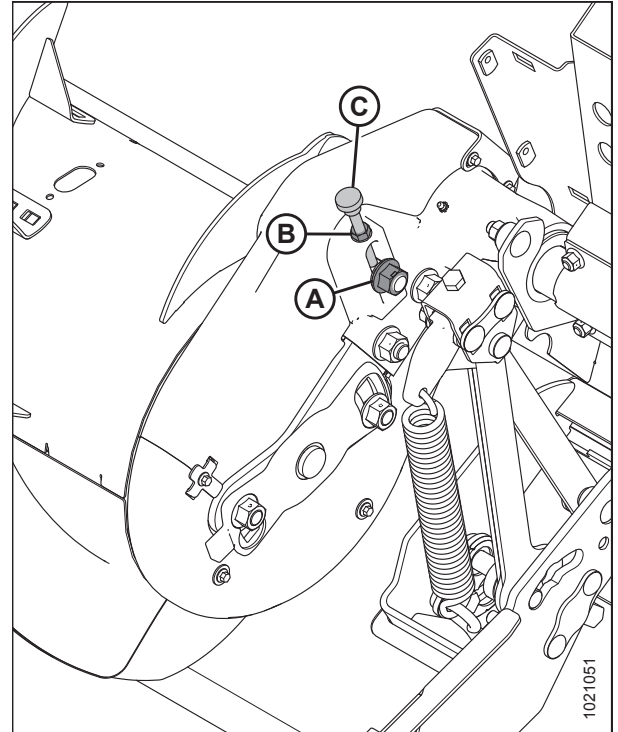


Figure 5.56: Auger Drive (Left and Right View)

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

NOTE:

Factory-installed chain does not have a connector. Replace chain with endless chain, MD #220317.

NOTE:

To help with the removal of plastic drive covers, tilt the header all the way back (position 0) to maximize the space between the auger and the feed pan.

MAINTENANCE AND SERVICING

1. Detach the header from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
2. Shut down the combine, and remove the key from the ignition.
3. Remove the four bolts (A) and the inspection panel (B).
4. Remove the bolt and clamp (C) that holds the two covers (G) and (H) together.
5. Remove the two bolts (D) that secure the bottom cover.
6. Remove the two bolts (E) and remove cover retainer (F).
7. Rotate top (G) and bottom (H) cover forward to remove.

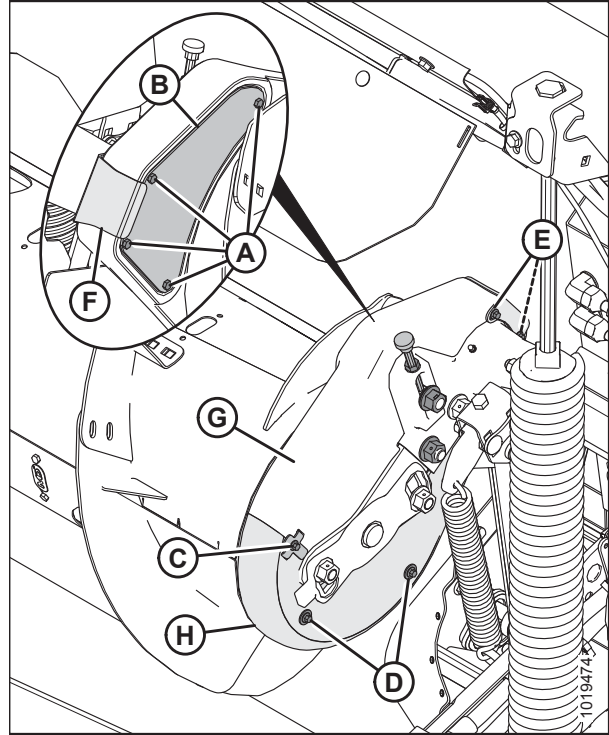


Figure 5.57: Auger Drive

8. Loosen jam nut (C) and turn thumbscrew (D) counterclockwise to release the bolt holding the sprocket (B) and to allow the sprocket to be raised up to release chain tension.

IMPORTANT:

Do **NOT** loosen the thin nut (E) on the inboard side of the idler sprocket spindle.

9. Loosen the idler sprocket nut (A), and raise the sprocket (B) to the uppermost position to release the tension on the chain. Tighten nut (A) to hold sprocket.
10. Remove screw (F) and washer (G).

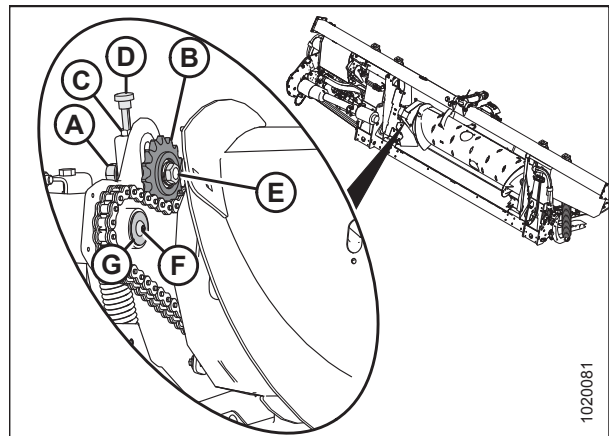


Figure 5.58: Auger Drive

MAINTENANCE AND SERVICING

11. Remove the two bolts and nuts (A), and separate the drum support arm from the casting.

NOTE:

You may need a second person to lift or support the drum to remove the bolts.

NOTE:

The bolts on the left side of the drum are longer than the bolts on the right side.

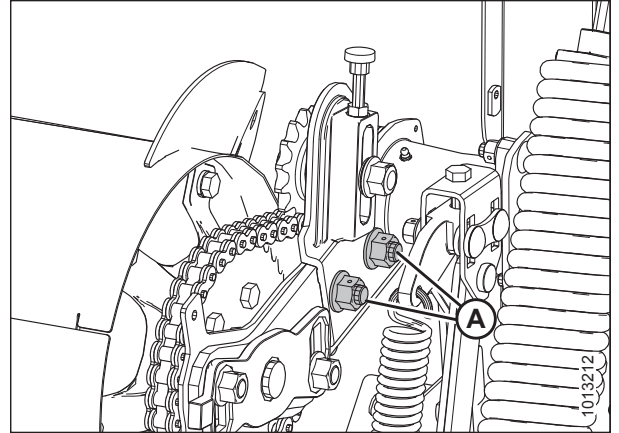


Figure 5.59: Auger Support Arm

12. Place a wooden block under the drive end of the auger (B) to prevent the auger from dropping and damaging the feed draper.
13. Use a pry bar (A) to slide the drum assembly to the right.

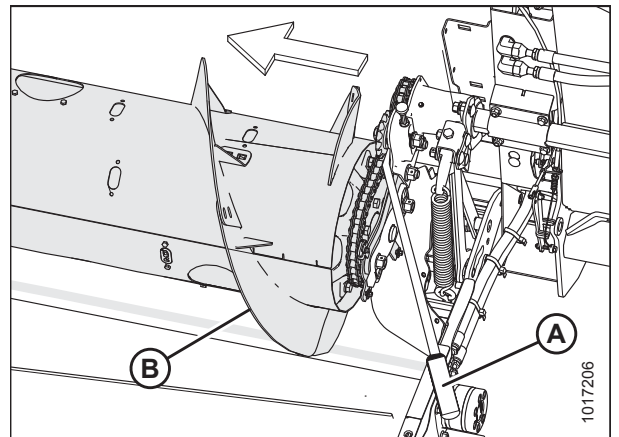


Figure 5.60: Auger Drive

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

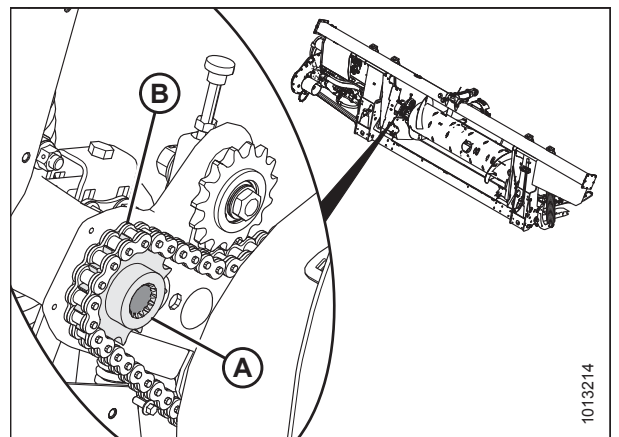


Figure 5.61: Auger Drive

MAINTENANCE AND SERVICING

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

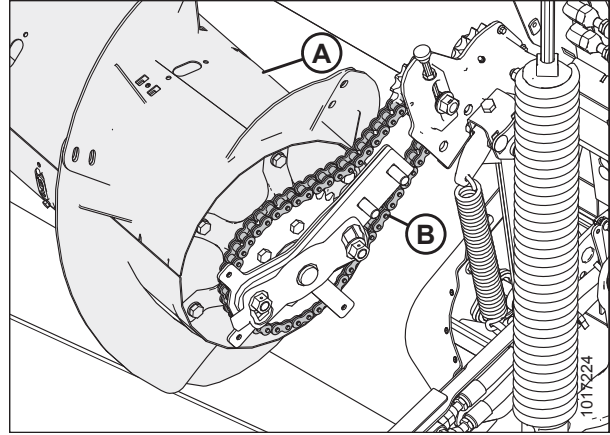


Figure 5.62: Auger Drive

5.7.5 Installing Auger Drive Chain

1. Place the drive chain (B) over the sprocket on the left side of the drum assembly (A).

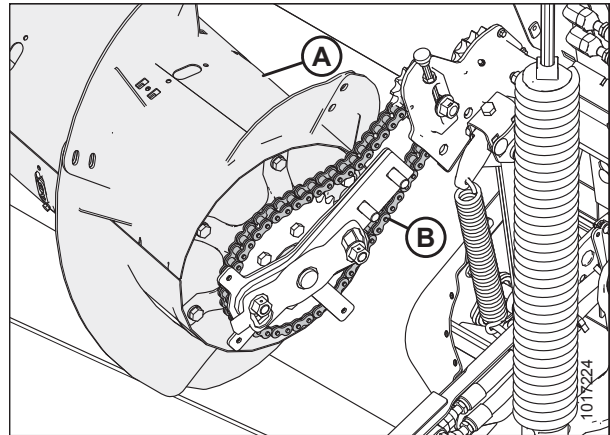


Figure 5.63: Auger Drive

2. Place the drive sprocket (A) into the chain (B) and align the sprocket onto the shaft.

NOTE:

The shoulder of the drive sprocket (A) faces the auger.

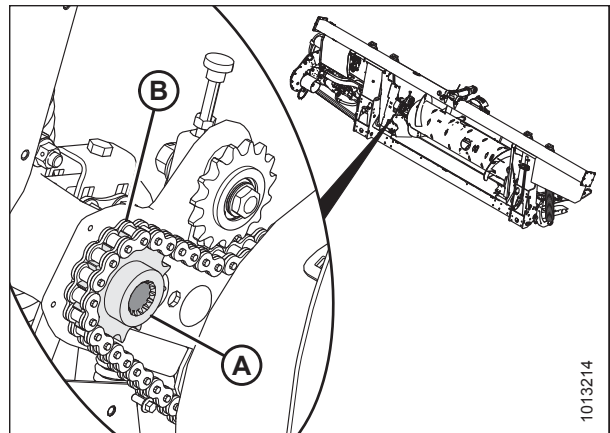


Figure 5.64: Auger Drive

MAINTENANCE AND SERVICING

3. Slide the drum assembly toward the casting and reinstall the two bolts and nuts (A).

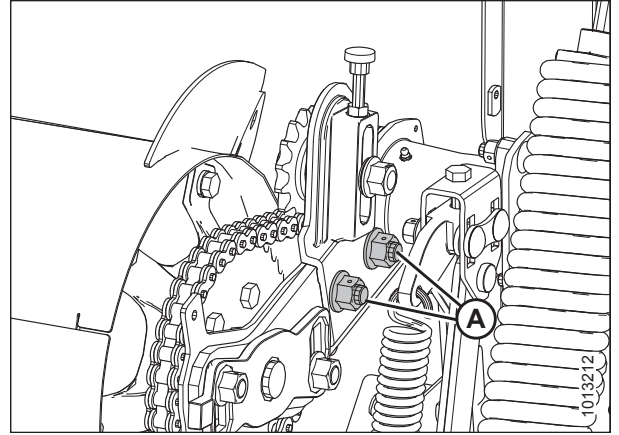


Figure 5.65: Auger Drive

4. Remove the block from under the auger.
5. Rotate the auger in reverse to take up the slack in the lower strand of the chain.

IMPORTANT:

Do **NOT** loosen the thin nut (E) on the inboard side of the idler sprocket spindle.

6. Turn the adjuster thumbscrew (D) clockwise to move the idler sprocket (B) until it is FINGER TIGHT ONLY.

NOTE:

Do **NOT** overtighten.

7. Tighten the idler nut (A) and torque to 258–271 Nm (190–200 lbf·ft).
8. Tighten the jam nut (C).
9. Apply medium strength thread locker to threads of screw (F).
10. Install washer (G) and secure it with screw (F).

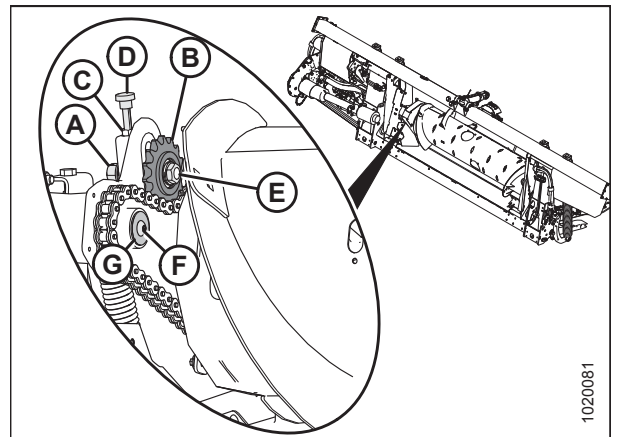


Figure 5.66: Auger Drive

MAINTENANCE AND SERVICING

11. Position bottom cover (H) and secure with two bolts (D).
12. Position top cover (G). Secure top and bottom cover with clamp and bolt (C).
13. Install inspection panel (B) and secure with four bolts (A). Tighten bolts (A) and torque to 2.7–4.1 Nm (24–36 lbf·in).
14. Install cover retainer (F) and secure with two bolts (E).

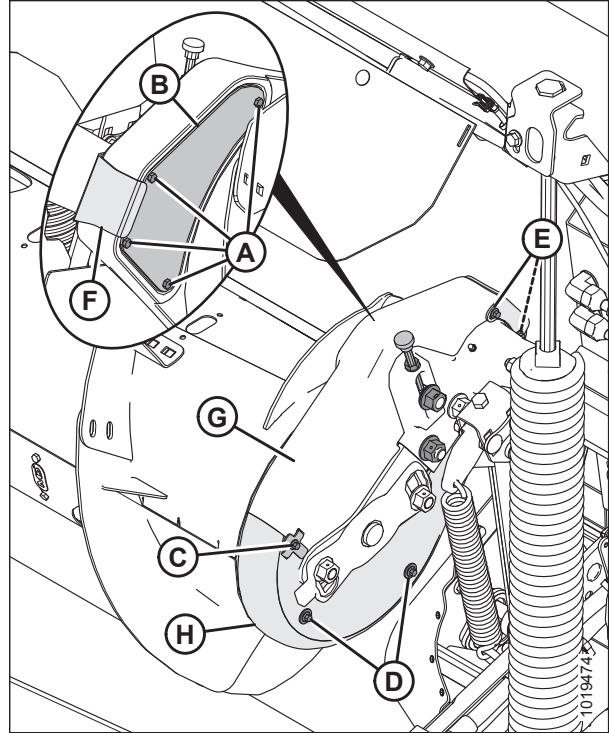


Figure 5.67: Auger Drive

5.7.6 Using Auger Flighting

The auger flighting on the FM100 can be configured for specific combines and crop conditions. Refer to [4.1 Float Module Feed Auger Configurations, page 251](#) for combine/crop specific configurations.

5.7.7 Auger Fingers

The FM100 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.

IMPORTANT:

Only install hollow fingers in a FM100. The use of solid fingers will cause severe damage to the machine.

Removing Feed Auger Fingers



DANGER

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

1. Raise the reel.
2. Shut down the combine, and remove the key from the ignition.
3. Engage the reel safety props.
4. Remove bolts (A) and remove the access cover (B) closest to the finger you are removing.

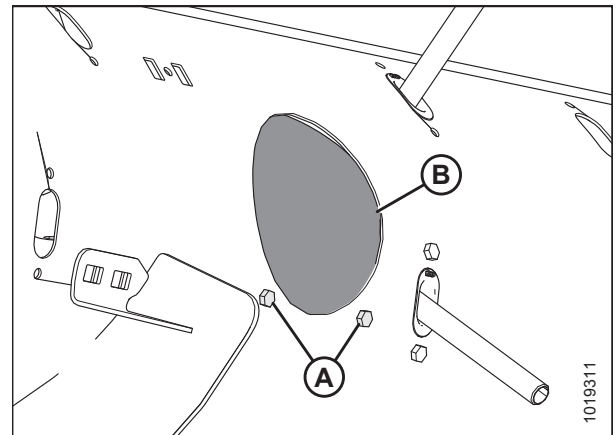


Figure 5.68: Auger Access Hole Cover

MAINTENANCE AND SERVICING

5. Remove the hairpin (A), pull the finger (B) out of the bushing (C) from inside the auger, and remove the finger from the auger by pulling it out through the plastic guide (D).

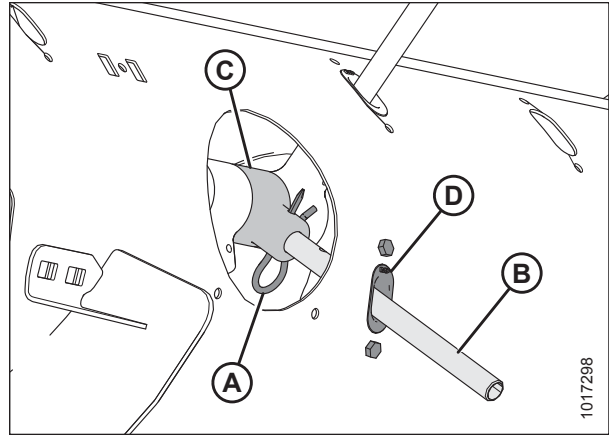


Figure 5.69: Auger Finger

6. Remove the bolts (A) and tee nuts securing the plastic guide (B) to the auger, and remove the guide from inside the auger.

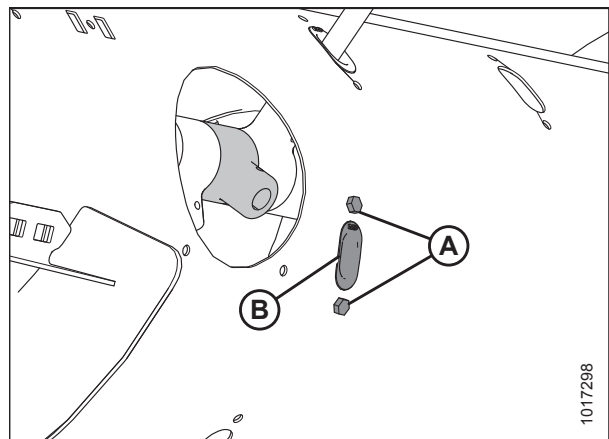


Figure 5.70: Auger Finger Hole

7. Position plug (A) into the hole from inside the auger, and secure with two bolts (B) and tee nuts. Coat the bolts with Loctite® #243 (or equivalent), and torque to 8.5 Nm (75 lbf-in).

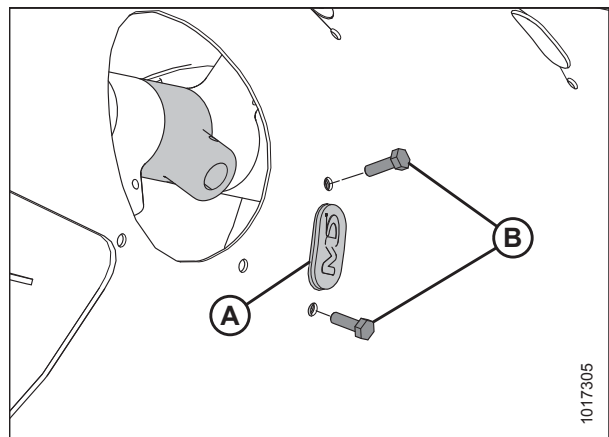


Figure 5.71: Plug

MAINTENANCE AND SERVICING

- Coat bolts (A) with Loctite® #243 (or equivalent) and replace the access cover (B) using the bolts to secure the access cover in place. Torque bolts to 8.5 Nm (75 lbf-in).

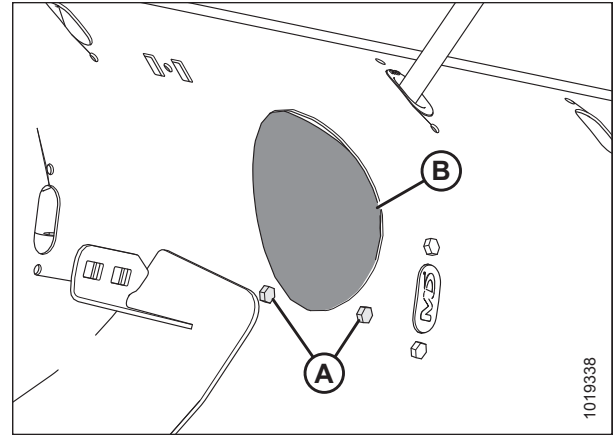


Figure 5.72: Auger Access Cover

Installing Feed Auger Fingers

DANGER

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

NOTE:

Not all parts needed for this procedure are included in this kit, and depending on the original configuration of the feed auger, additional parts may need to be ordered. Refer to [4.1 Float Module Feed Auger Configurations, page 251](#) to see which parts are available.

- Raise the reel.
- Shut down the combine, and remove the ignition key.
- Engage the reel safety props.
- Remove bolts (A) and access cover (B) from the access cutout closest to the finger that needs to be installed or replaced.

If you are replacing an existing auger finger, refer to [Step 5, page 374](#), otherwise proceed to [Step 7, page 374](#) for installation instructions for new auger fingers.

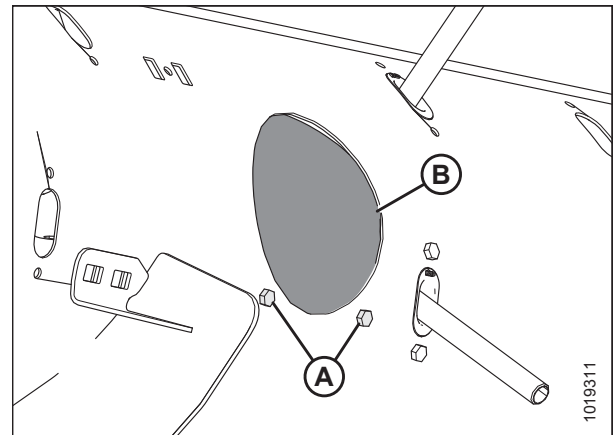


Figure 5.73: Auger Access Cover

Replacing an existing auger finger:

MAINTENANCE AND SERVICING

5. Remove the hairpin (A), pull the finger (B) out of the bushing (C) from inside the auger, and remove the finger from the auger by pulling it through the plastic guide (D).

NOTE:

Note the orientation of the hairpin (A). The round part should face the direction of auger rotation; the formed side (that is, the S-shaped side) must face the chain drive side of the auger.

If you are replacing the plastic finger guide before installing the auger finger, refer to Step 6, [page 374](#), otherwise refer to Step 9, [page 375](#).

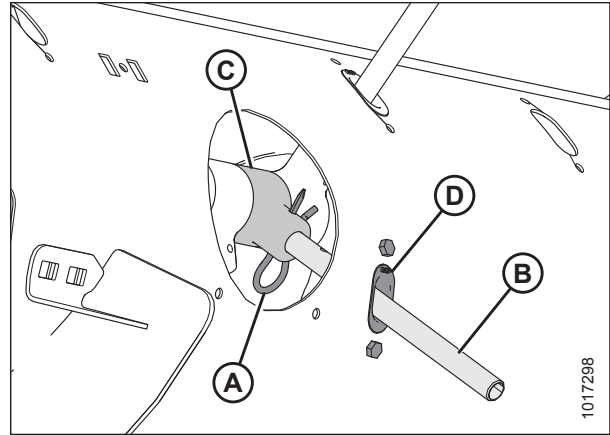


Figure 5.74: Auger Finger

6. Remove the bolts (A) securing the plastic finger guide (B) to the auger. Remove the guide (B) from inside the auger. Proceed to Step 8, [page 375](#).

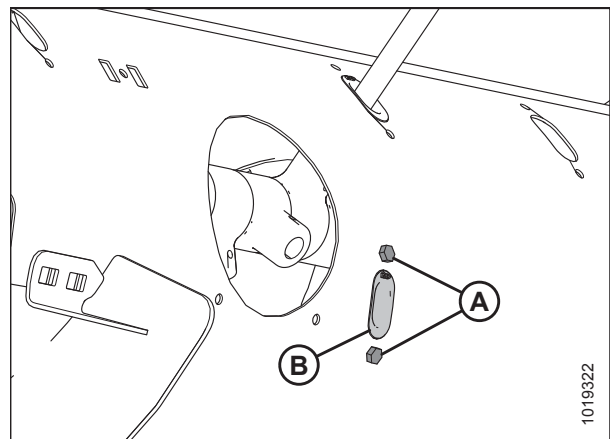


Figure 5.75: Auger Finger Hole

Installing a new auger finger:

7. Remove the two bolts (B), tee nuts, and plug (A).

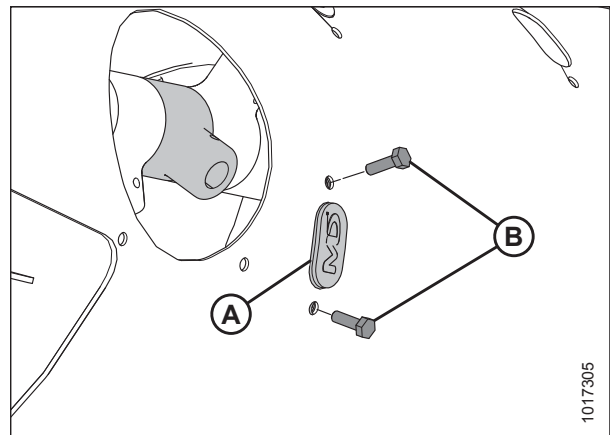


Figure 5.76: Auger Finger Hole

MAINTENANCE AND SERVICING

8. Insert the plastic finger guide (B) from inside the auger and secure it with bolts (A) and tee nuts. Coat bolts with Loctite® #243 (or equivalent) and torque bolts to 8.5 Nm (75 lbf-in).

NOTE:

When installing additional fingers, ensure you install an equal number on each side of the auger.

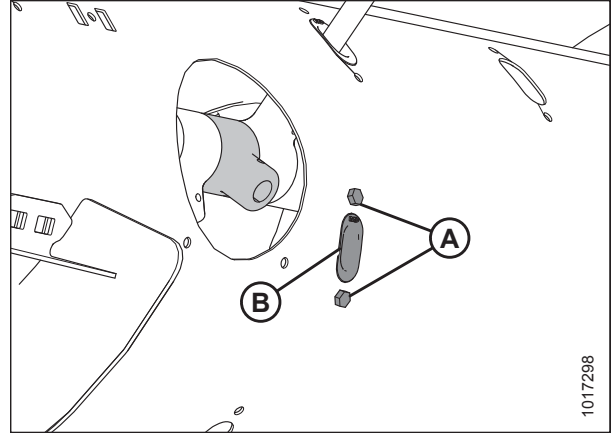


Figure 5.77: Auger Finger Hole

9. From inside the auger, insert the new auger finger (B) through the plastic guide (D).
10. Insert the finger (B) into bushing (C) and secure with hairpin (A).

NOTE:

Note the orientation of the hairpin (A). The round part should face the direction of auger rotation; the formed side (that is, the S-shaped side) must face the chain drive side of the auger.

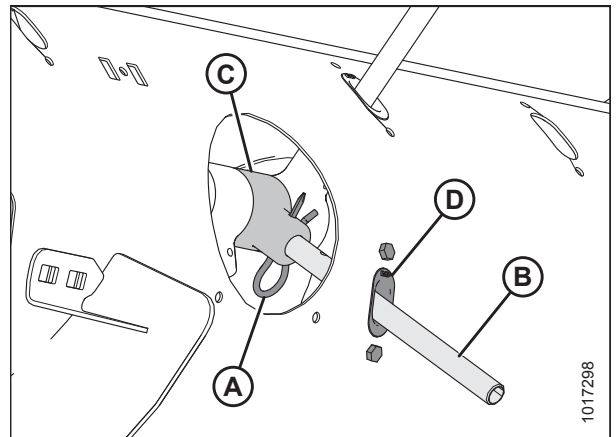


Figure 5.78: Auger Finger

11. Replace the access cover (B) and secure with bolts (A). Coat bolts with Loctite® #243 (or equivalent) and torque to 8.5 Nm (75 lbf-in).

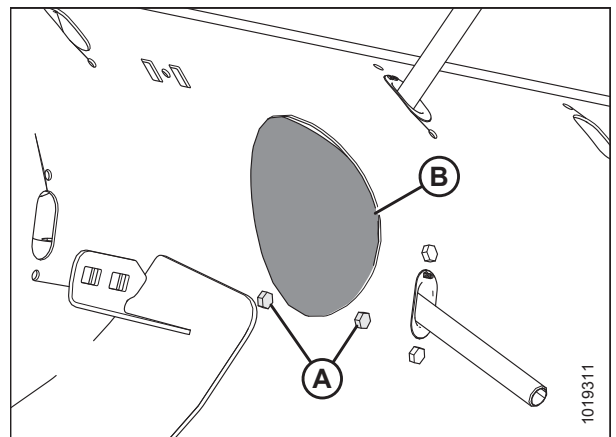


Figure 5.79: Auger Access Cover

Checking Auger Finger Timing

This procedure is for checking the setting that determines when the fingers are fully extended from the auger.

NOTE:

Left side shown.

1. Raise the reel to maximum height. Engage reel safety props. Refer to [Engaging Reel Safety Props, page 29](#).
2. Shut down the combine and remove the key from the ignition.
3. Check that indicator (B) is set to the same position (A) at each end of the auger. Factory setting is **B**. There are two different auger tine extension positions: A and B. Setting A would be used for canola and setting B would be used for grains.

CAUTION

To avoid damaging the auger beyond repair, it is extremely important that both sides are at the same setting.

4. If necessary, loosen nuts (C) and adjust position of indicator (B). Tighten nuts.
5. Disengage reel safety props. Refer to [Disengaging Reel Safety Props, page 30](#)

Adjusting Auger Finger Timing

NOTE:

Left side shown.

1. Raise the reel to maximum height. Engage reel safety props. Refer to [Engaging Reel Safety Props, page 29](#).
2. Shut down the combine and remove the key from the ignition.
3. Locate indicator (A) that specifies when the fingers in the drum extend. There are two settings for the indicator: **A** and **B**.

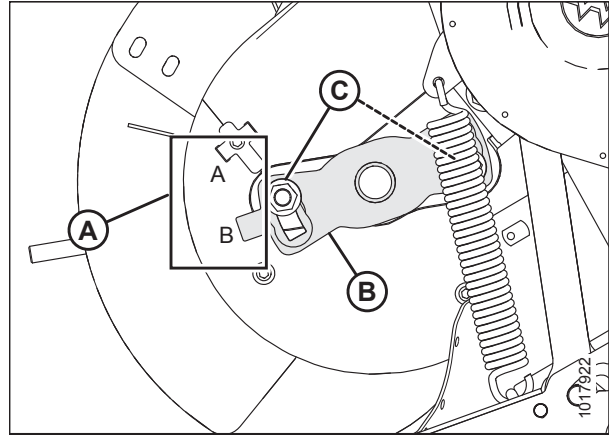


Figure 5.80: Auger Tine Timing (Left Side Shown)

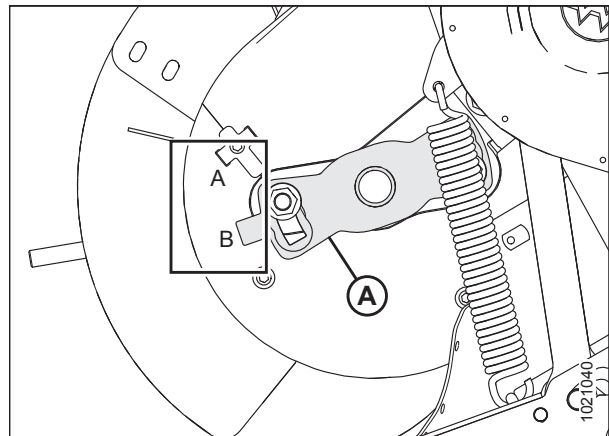


Figure 5.81: Auger Tine Timing Indicator

MAINTENANCE AND SERVICING

4. Loosen nuts (A) and adjust tine timing indicator (B) to desired position.

IMPORTANT:

It is extremely important that both sides are set at the same position; if not, the drum will be damaged beyond repair.

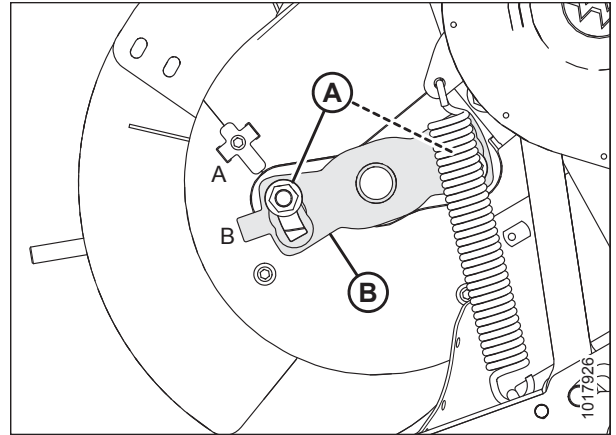


Figure 5.82: Auger Tine Timing Indicator

NOTE:

If the tine timing indicator is pointing at setting **A**, it indicates that at that point the auger finger 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 rape seed.

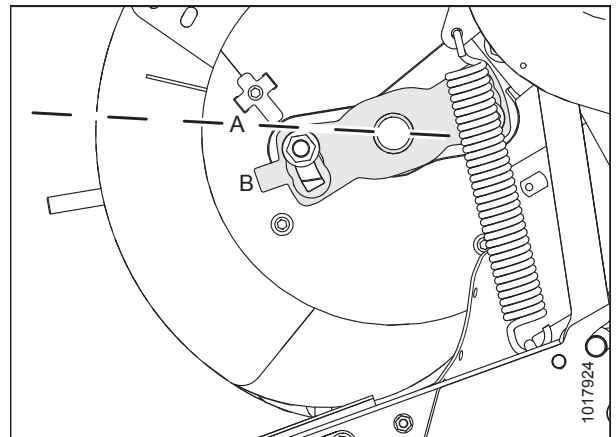


Figure 5.83: Auger Setting A

NOTE:

If the indicator is pointing at setting **B**, it indicates that at that point the auger finger 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.

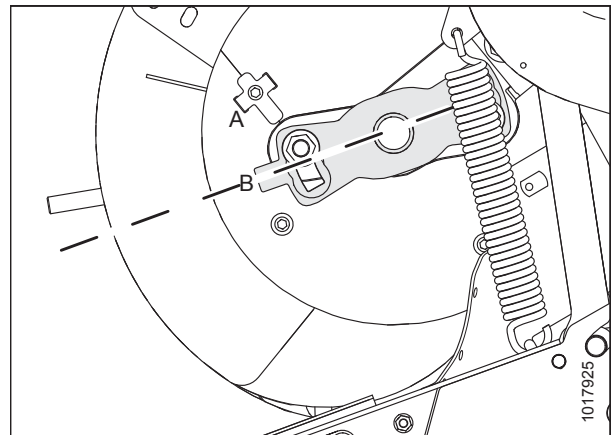


Figure 5.84: Auger Setting B

MAINTENANCE AND SERVICING

7. Tighten nuts (A) once adjustment is complete.
8. Disengage reel safety props. Refer to [Disengaging Reel Safety Props](#), page 30.

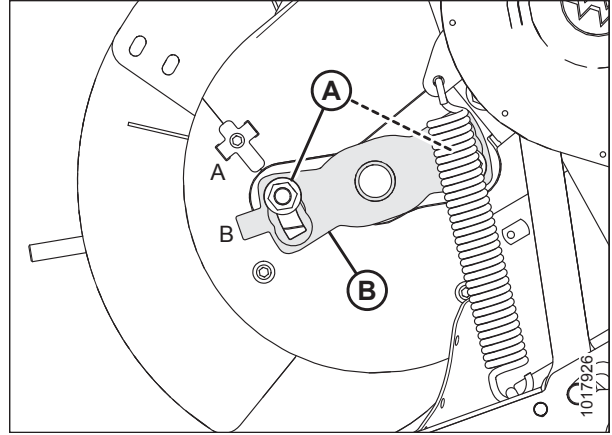


Figure 5.85: Auger Tine Timing Indicator

5.8 Knives

WARNING

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

CAUTION

Wear heavy gloves when working around or handling knives.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 325](#).

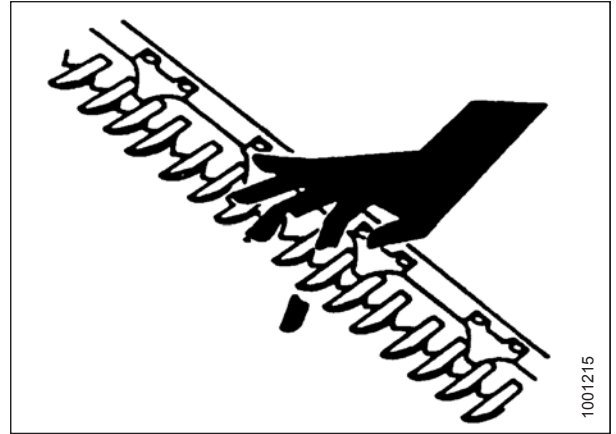


Figure 5.86: Cutterbar Hazard

5.8.1 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.

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

NOTE:

For dirty, sandy conditions, coarse serrated sections last longer than fine serrated sections. Fine serrated sections perform best in thin stemmed grasses and plants with more fibrous stems.

MAINTENANCE AND SERVICING

1. Shut down the combine, and remove the key from the ignition.
2. Stroke the knife as required to center the knife section (A) between the guards (E).
3. Remove nuts (B).
4. Remove bars (C) and lift the knife section (A) off the knife bar.
5. Remove the splice bar (D) if knife section is under the bar.
6. Clean dirt off the knife back, and position the new knife section onto the knife back.

IMPORTANT:

Do **NOT** mix fine and coarse sections on the same knife.

7. Reposition bars (C) and/or splice bars (D) and install nuts (B).

NOTE:

If replacing screws, ensure they are fully inserted. Do not use nuts to draw screws into the knife bar.

8. Torque nuts to 9.5 Nm (7 lbf-ft).

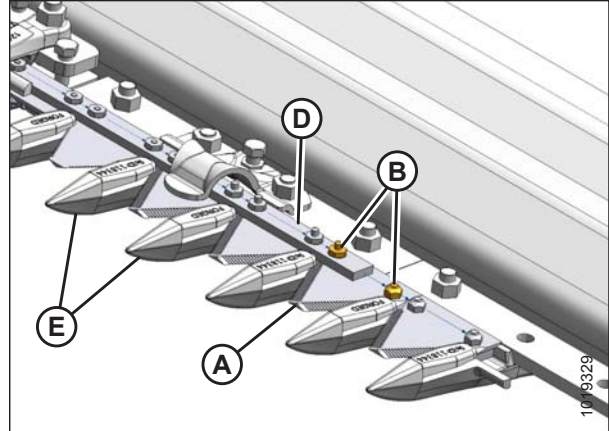


Figure 5.87: Cutterbar with Guards

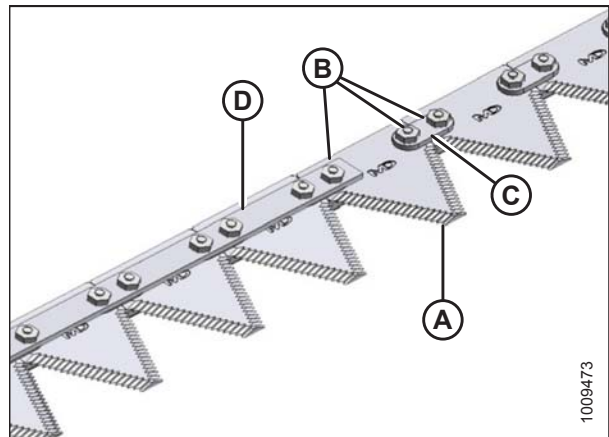


Figure 5.88: Cutterbar

5.8.2 Removing Knife

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

WARNING

Stand to rear of knife during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

1. Shut down the combine, and remove the key from the ignition.
2. Stroke the knife manually to its outer limit.
3. Clean the area around the knifehead.
4. Remove the grease zerk (B) from the pin.
5. Remove bolt (A).
6. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
7. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
8. Push the knife assembly inboard until it is clear of the output arm.
9. Seal the knifehead bearing with plastic or tape unless it is being replaced.
10. Wrap a chain around the knifehead and pull out the knife.

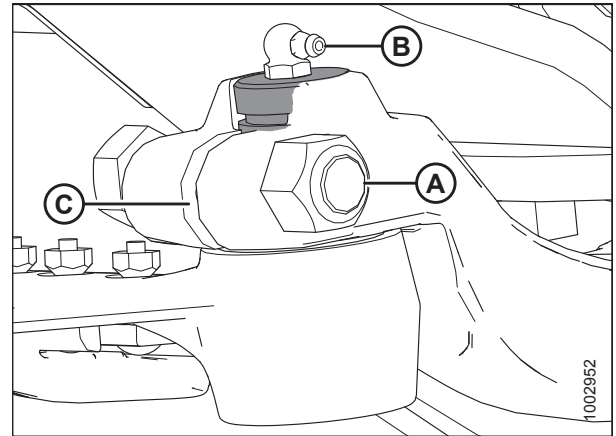


Figure 5.89: Knifehead

5.8.3 Removing Knifehead Bearing

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

WARNING

Stand to rear of knife during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

IMPORTANT:

Repeat this procedure for each knife.

1. Shut down the combine, and remove the key from the ignition.
2. Remove the knife. Refer to [5.8.2 Removing Knife, page 381](#).

NOTE:

Because the bearing is being replaced, it is not necessary to wrap the knifehead to protect the bearing.

MAINTENANCE AND SERVICING

3. Use a flat-ended tool with the same approximate diameter as the pin (A). Tap the 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.

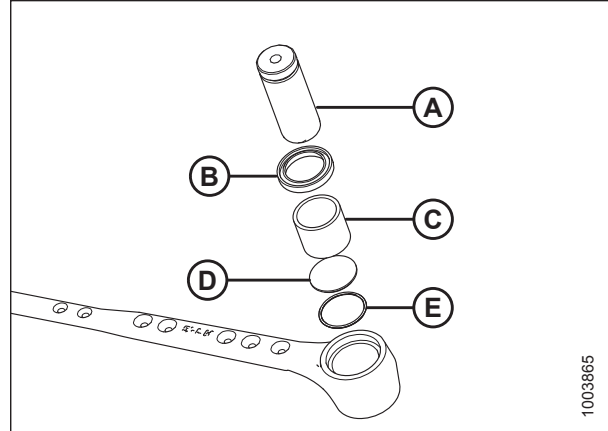


Figure 5.90: Knifehead Bearing Assembly

5.8.4 Installing Knifehead Bearing

1. Place O-ring (E) and plug (D) into knifehead.

IMPORTANT:

Install the bearing with the stamped end (the end with the identification markings) facing up.

2. Use a flat-ended tool (A) with the same approximate diameter as the bearing (C), and push the bearing into the knifehead until the top of the bearing is flush with the step in the knifehead.
3. Install seal (B) into knifehead with the lip facing outwards.

IMPORTANT:

To prevent premature knifehead or knife drive box failure, ensure there's a tight fit between the knifehead pin and the needle bearing, and also between the knifehead pin and the output arm.

4. Install the knife. Refer to [5.8.5 Installing Knife, page 383](#).

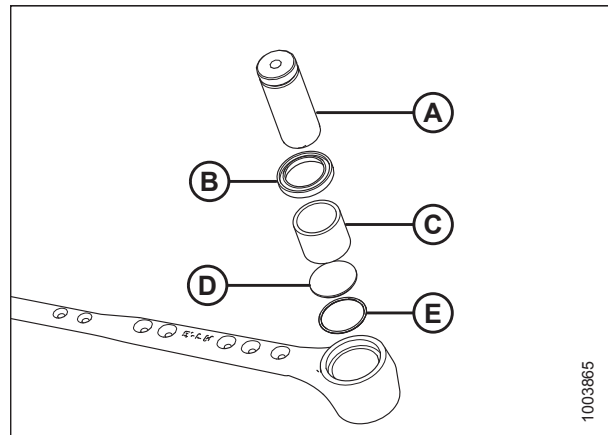


Figure 5.91: Knifehead Bearing Assembly

5.8.5 Installing Knife

WARNING

Stand to rear of knife during installation to reduce risk of injury from cutting edges. Wear heavy gloves when handling knife.

1. Slide the knife into place and align the knifehead with the output arm.

NOTE:

Remove the grease zerk from the knifehead pin for easier installation of knifehead pin.

2. Install the knifehead pin (A) through the output arm (C) and into the knifehead.
3. Set the groove (B) in the knifehead pin 1.5 mm (1/16 in.) above the output arm (C). Secure with 5/8 x 3 in. hex head bolt and nut (D), and torque to 217 Nm (160 lbf·ft).

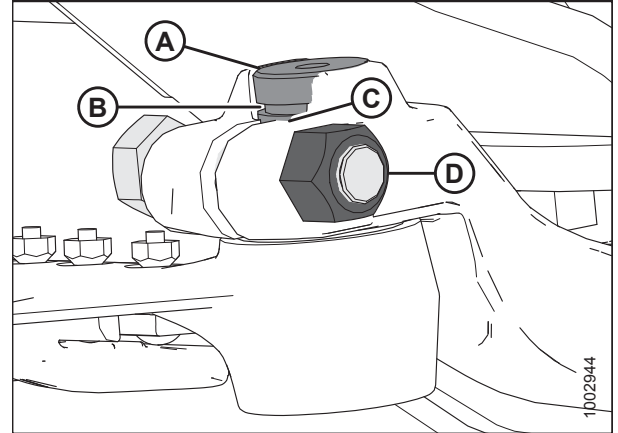


Figure 5.92: Knifehead

4. Install the grease zerk (A) into the knifehead pin, and turn the grease zerk for easy access.

IMPORTANT:

Slowly apply grease to the knifehead until slight downward movement of the knifehead is observed. Do **NOT** overgrease the knifehead. Overgreasing leads to knife misalignment causing excessive heating of guards and overloading of drive systems. If overgreasing occurs, remove the grease zerk to release pressure.

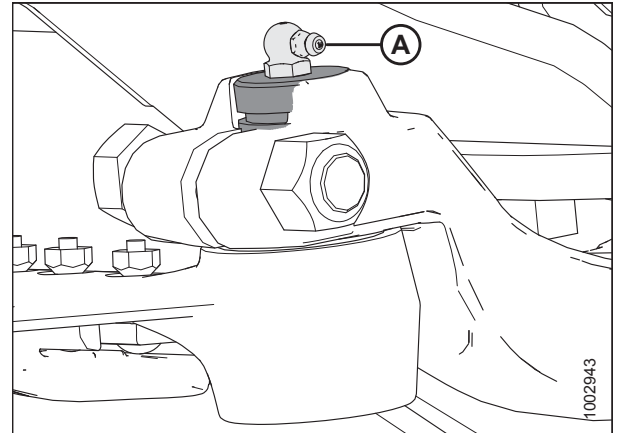


Figure 5.93: Knifehead

5.8.6 Spare Knife

A spare knife can be stored in the header frame tube (A) at the left end. Ensure the spare knife is secured in place.

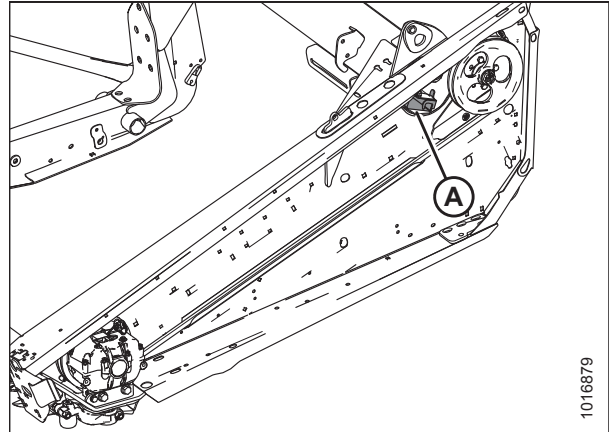


Figure 5.94: Spare Knife

5.8.7 Knife Guards

Perform **DAILY** inspections to ensure the knife guards are aligned, and the knife sections are contacting the shear surfaces of the knife guards.

Adjusting Knife Guards

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

NOTE:

Use guard straightening tool (MD #140135) available from your MacDon Dealer.

1. Position the tool (A) as shown, and pull up to adjust the guard tips upwards.



Figure 5.95: Upward Adjustment

MAINTENANCE AND SERVICING

2. Position the tool (A) as shown, and push down to adjust the guard tips downwards.

Tip

If material is tough to cut, install stub guards with top guard and adjuster plate. A kit is available from your MacDon Dealer. Refer to [6.3.3 Stub Guard Conversion Kit](#), page 492.

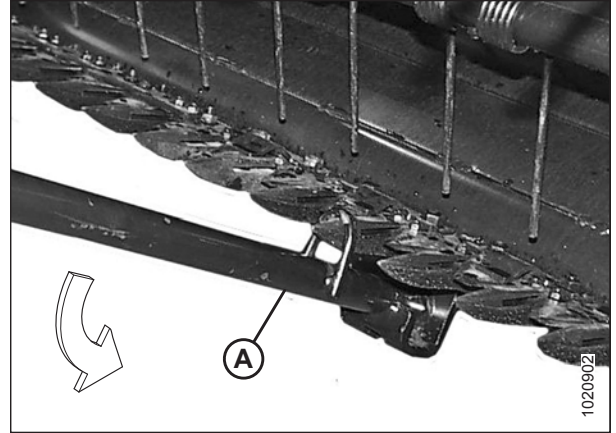


Figure 5.96: Downward Adjustment

Replacing Pointed Guards

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

Replacing normal and drive side guard

1. Shut down the combine, and remove the key from the ignition.
2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove two nuts (B) and bolts attaching the guard (A) and hold-down (C) (if applicable) to the cutterbar.
4. Remove the guard (A), hold-down (C), and plastic wearplate (if installed).

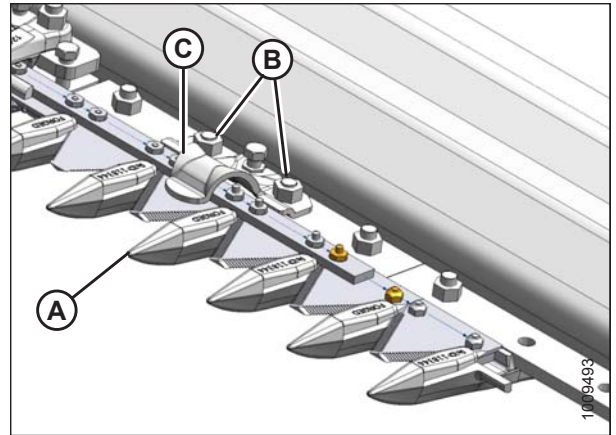


Figure 5.97: Pointed Guards

MAINTENANCE AND SERVICING

IMPORTANT:

The first four outboard guards (B) on the drive sides of the header do not have ledger plates. Ensure proper replacement guards are installed at these locations.

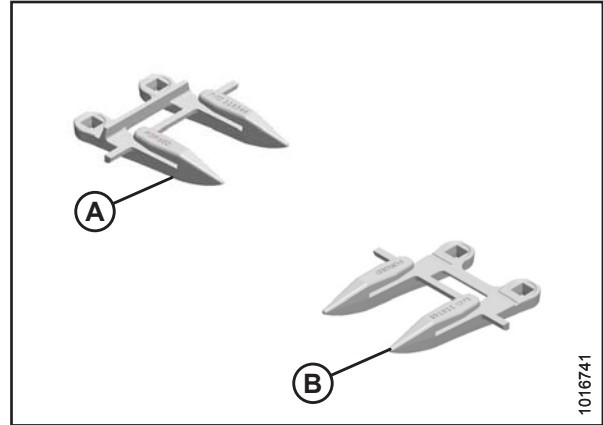


Figure 5.98: Pointed Guards

A - Normal

B - Drive Side

5. Position the new guard (A), hold-down (C), and plastic wearplate (if applicable) onto the cutterbar. Secure with two nuts (B) and bolts, but do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. Refer to [Checking Knife Hold-Downs](#), page 389.

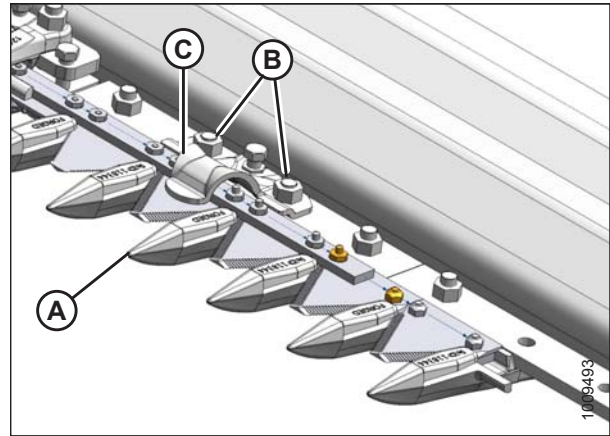


Figure 5.99: Pointed Guards

Replacing center guard

NOTE:

The guard at the center of a double-knife header (where the two knives overlap) requires a slightly different replacement procedure.

1. Shut down the combine, and remove the key from the ignition.
2. Remove the two nuts (B) and bolts attaching the guard (A) and top guide (C) to the cutterbar.
3. Remove the guard (A), plastic wearplate (if installed), top guide (C), and adjuster bar (D).

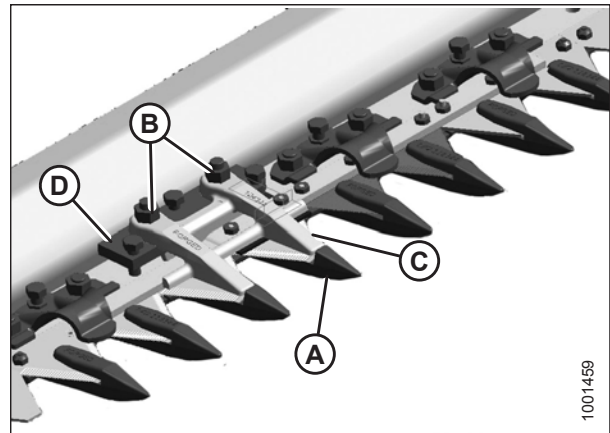


Figure 5.100: Center Guards

MAINTENANCE AND SERVICING

4. Position the plastic wearplate (if applicable), replacement center guard (A), adjuster bar, and top guide (B) onto the cutterbar. Install bolts, but do **NOT** tighten.

IMPORTANT:

Ensure the center guard (A) (right of the cutterbar split) has offset cutting surfaces.

NOTE:

The top guide (B) must accommodate the two overlapping knives at the center guard location. Ensure the proper replacement guard is installed at this location.

5. Check and adjust the clearance between the hold-down and knife. Refer to [Checking Knife Hold-Downs, page 389](#).

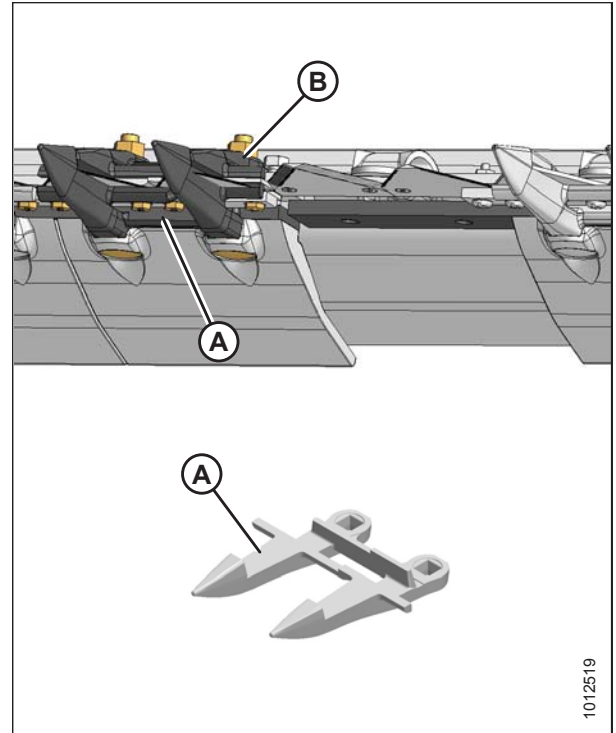


Figure 5.101: Center Guards

Replacing Stub Guards

Stub guards, complete with top guides and adjuster plates, are designed to cut tough crops and are factory-installed at the outer ends of specific headers.

⚠ WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

Replacing normal, drive side, and end guard

1. Shut down the combine, and remove the key from the ignition.
2. Stroke the knife manually until the knife sections are spaced midway between the guards.
3. Remove the two nuts (A) and bolts attaching the guard (B) and top guide (C) to the cutterbar.
4. Remove the guard (B), plastic wear plate (if installed), top guide (C), and adjuster bar (D).

IMPORTANT:

Note the position of the mitre on the adjuster bar (D), and reinstall the adjuster bar in the same position. Mitres should not be adjacent to each other.

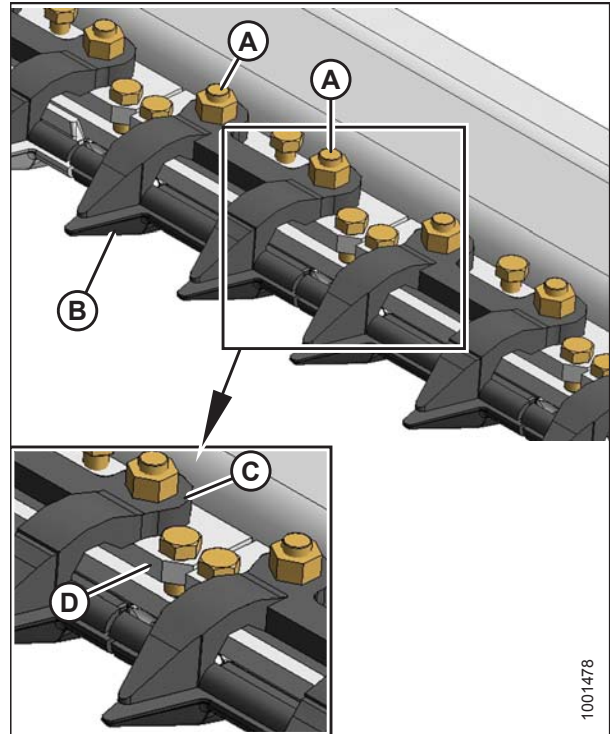


Figure 5.102: Stub Guards

IMPORTANT:

The first four outboard guards (B) on the drive sides of the header do not have ledger plates. Ensure the proper replacement guards are installed at these locations.

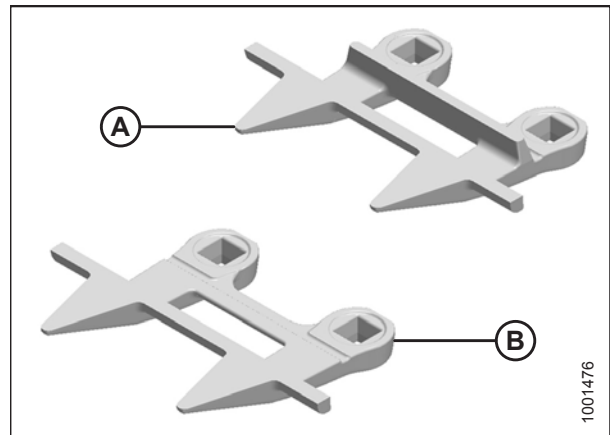


Figure 5.103: Stub Guards

A - Normal Guard

B - Drive Side Guard

MAINTENANCE AND SERVICING

5. Position the plastic wearplate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do **NOT** tighten.
6. Check and adjust the clearance between the hold-downs and the knife. Refer to [Checking Knife Hold-Downs, page 389](#).

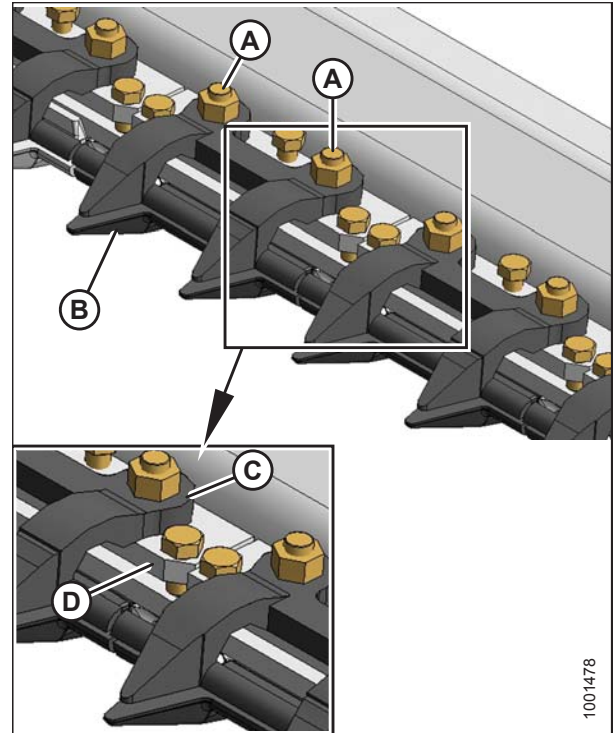


Figure 5.104: Stub Guards

Checking Knife Hold-Downs

Perform daily inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding. Use a feeler gauge to measure the clearance between the hold-downs and knife sections and refer to the following for adjustment procedures:

- [Adjusting Hold-Downs with Pointed Guards, page 389](#)
- [Adjusting Hold-Downs with Stub Guards, page 390](#)

NOTE:

Align guards prior to adjusting the hold-downs. Refer to [Adjusting Knife Guards, page 384](#).

Adjusting Hold-Downs with Pointed Guards

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

MAINTENANCE AND SERVICING

1. Shut down the combine, and remove the key from the ignition.
2. Use a feeler gauge to measure the clearance between the normal guard hold-down (A) and the knife section. Ensure the clearance is 0.1–0.6 mm (0.004–0.024 in.).
3. To lower the front of the hold-down and decrease clearance, turn bolt (B) clockwise; to raise the front of the hold-down and increase clearance, turn bolt (B) counterclockwise.

NOTE:

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten nuts.

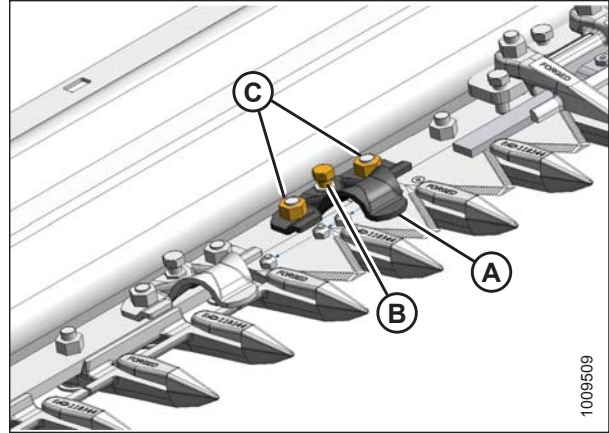


Figure 5.105: Normal Guard Hold-Down

4. Use a feeler gauge to measure the clearance between the center guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
 - **At guide tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
 - **At rear of guide (C):** 0.1–1.0 mm (0.004–0.040 in.)
5. Adjust the clearance as follows:
 - a. Tighten nuts (D) until they are finger tight.
 - b. Turn the three adjuster bolts (E) clockwise to raise the front of the hold-down and increase clearance, or counterclockwise to lower the front of the hold-down and decrease clearance.
 - c. Torque the nuts (D) to 72 Nm (53 lbf-ft) after all the adjustments are complete and the specified clearances are achieved.

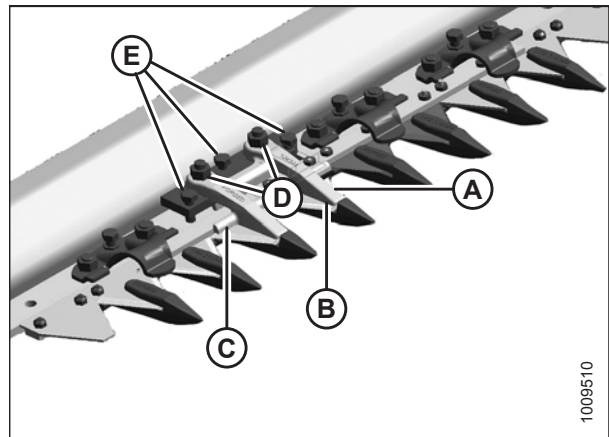


Figure 5.106: Center Guard Hold-Down



WARNING

Check to be sure all bystanders have cleared the area.

6. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

NOTE:

Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

Adjusting Hold-Downs with Stub Guards



WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

MAINTENANCE AND SERVICING

1. Shut down the combine, and remove the key from the ignition.
2. Use a feeler gauge to measure the clearance between the stub guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
 - **At guide tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
 - **At rear of guide (C):** 0.1–1.0 mm (0.004–0.040 in.)
3. Adjust the clearance as follows:
 - a. Tighten nuts (D) until they are finger tight.
 - b. To lower the front of the hold-down and decrease clearance, turn the three adjuster bolts (E) clockwise; to raise the front of the hold-down and increase clearance, turn the adjuster bolts (E) counterclockwise.
 - c. Torque the nuts (D) to 72 Nm (53 lbf-ft) after all the adjustments are complete and the specified clearances are achieved.



WARNING

Check to be sure all bystanders have cleared the area.

4. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

NOTE:

Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

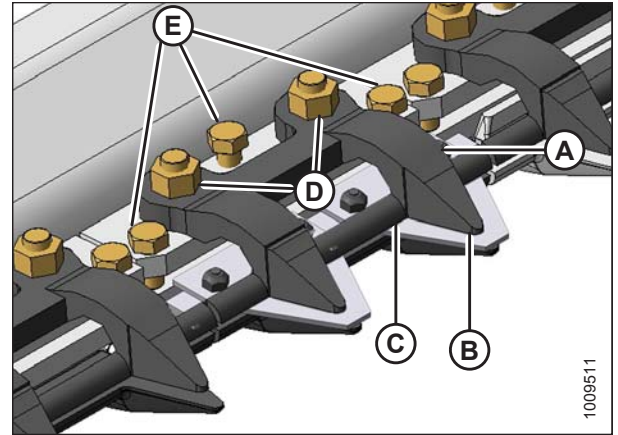


Figure 5.107: Stub Guards

5.8.8 Knifehead Shield

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

The shields and mounting hardware are available from your MacDon Dealer.

IMPORTANT:

Remove the shields when cutting with 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 supplied in flattened form, but it can be bent to suit installation on pointed or stub guard cutterbars. Knifehead shields differ slightly depending on header size and guard configuration, so ensure you are using the proper knifehead shield for your header. Refer to your parts catalog for proper replacement parts.

DANGER

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

CAUTION

Wear heavy gloves when working around or handling knives.

1. Raise the reel to its full height, lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the reel arm locks.
4. Place the knifehead shield (A) against the endsheet as shown. Align the shield so the cutout matches the profile of the knifehead and/or hold-downs.
5. Bend the knifehead shield (A) along the slit to conform to the endsheet.
6. Align the mounting holes and secure with two 3/8 x 1/2 in. Torx® head bolts (B).
7. Tighten the bolts (B) just enough to hold the knifehead shield (A) in place while allowing it to be adjusted as close to the knifehead as possible.
8. Rotate the knife drive box pulley manually 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.
9. Tighten the bolts (B).

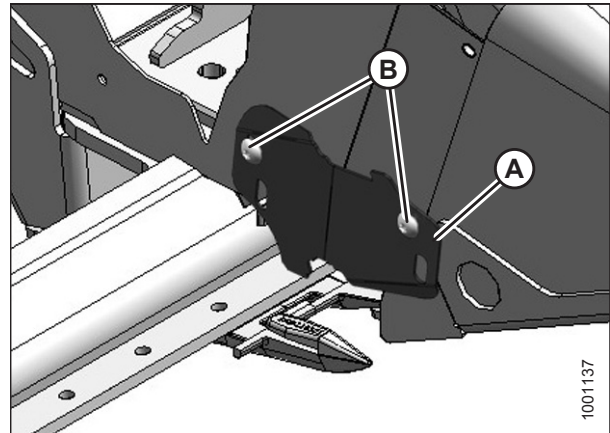


Figure 5.108: Knifehead Shield

5.9 Knife Drive System

5.9.1 Knife Drive Box

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 325](#).

Double-knife headers have a knife drive box at each end. Knife drive boxes are belt driven by a hydraulic motor, and convert rotational motion into the reciprocating motion of the knife.

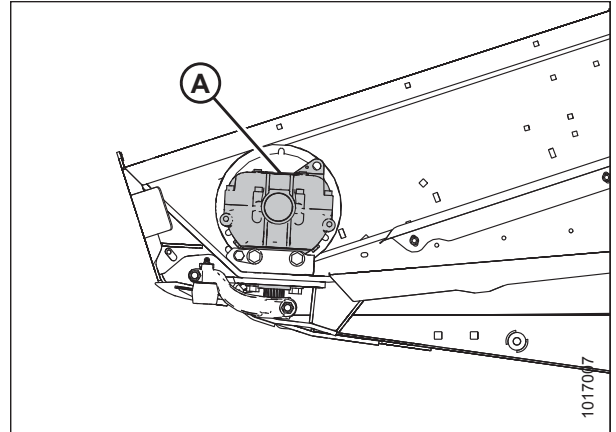


Figure 5.109: Left Side Knife Drive Box Shown – Right Side Similar

Checking Knife Drive Box

To access the knife drive box(es), endshield(s) must be fully opened. Single-knife headers have one knife-drive box and double-knife headers have two knife-drive boxes.

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Press down on the latch in the opening (A) on the inboard side of the endsheet.
2. Pull endshield open using handle depression (B).

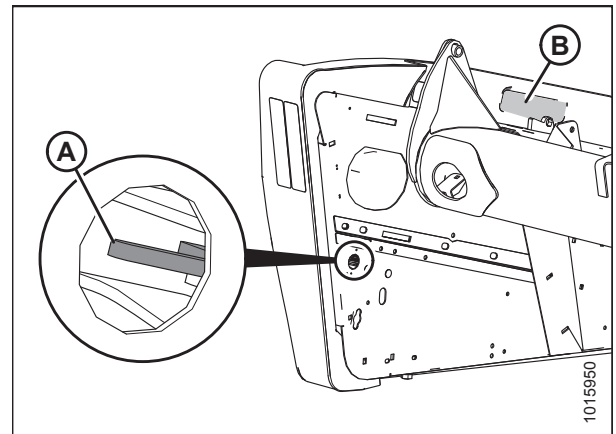


Figure 5.110: Endshield Latch Access

MAINTENANCE AND SERVICING

- Swivel the endshield toward the back of the header and use the safety latch (B) to secure the endshield support tube (A) to the endsheet.

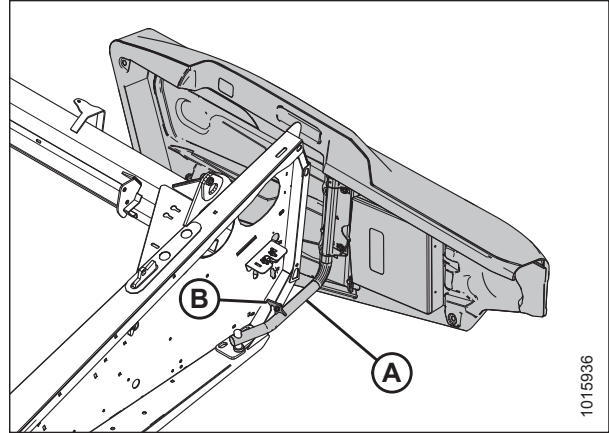


Figure 5.111: Left Endshield Support Tube

IMPORTANT:

The knife drive box breather is shipped in position (A) (forward) to prevent oil loss during transport. The breather **MUST** be repositioned to location (B) to prevent oil loss during normal operation. Failure to do so can result in damage to the knife drive box.

- Check position of plug (A) and breather (B) at knife drive box. Position **MUST** be as shown.
- Remove breather (B) and check oil level. The oil level should be between the bottom edge (C) of the lower hole (D) and the bottom (E) of the breather.

NOTE:

Check oil level with top of knife drive box horizontal and with the breather (B) screwed in.

- Reinstall breather and tighten.

Checking Mounting Bolts

Check the torque on the four knife drive box mounting bolts (A) and (B) after the first 10 hours operation and every 100 hours thereafter.

- Torque the side bolts (A) first, then torque the bottom bolts (B). Torque all bolts to 271 Nm (200 lbf·ft).

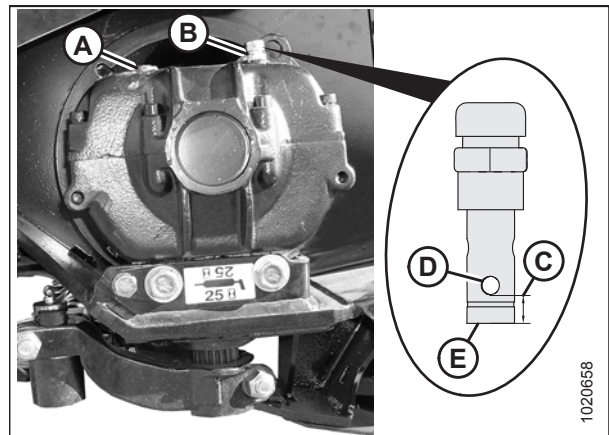


Figure 5.112: Knife Drive Box

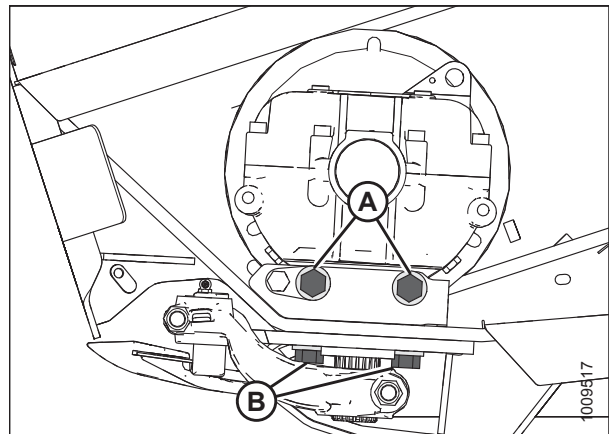


Figure 5.113: Knife Drive Box

Removing Knife Drive Box

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Shut down the combine, and remove the key from the ignition.
2. Open the endshield. Refer to [Opening Endshields](#), page 31.
3. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
4. Loosen the belt tension by turning the tensioning bolt (B) counterclockwise.

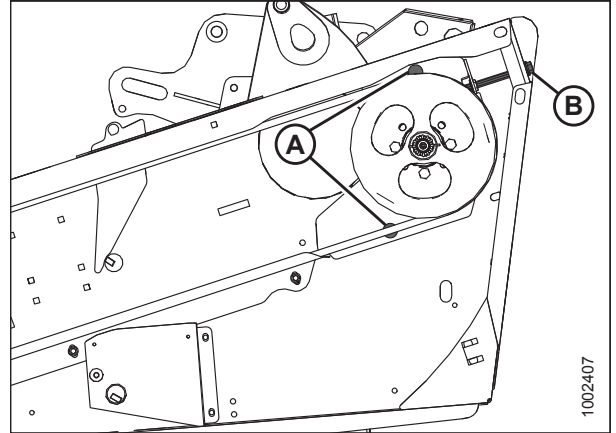


Figure 5.114: Knife Drive

5. To provide clearance between the knife drive box pulley and the endsheet, open the access cover (A) on the endsheet behind the cutterbar.

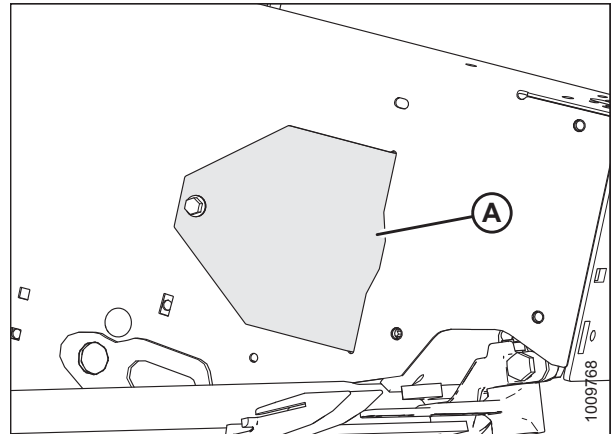


Figure 5.115: Access Cover

6. Remove the belt (A) from the drive pulley (B).
7. Slip the belt (A) over and behind the knife drive box pulley (C). Use the notch in the pulley to assist with belt removal.

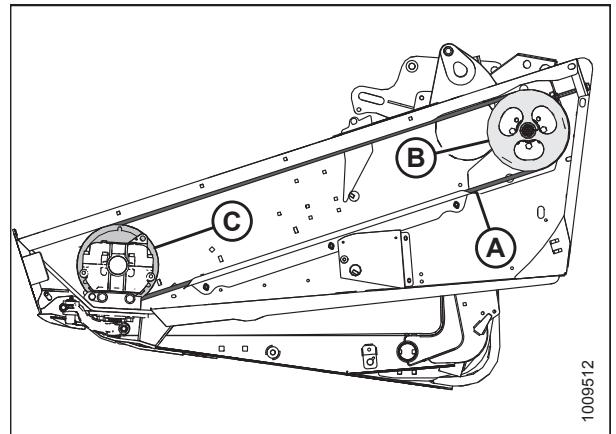


Figure 5.116: Knife Drive

MAINTENANCE AND SERVICING

8. Stroke the knife manually to its outer limit.
9. Clean the area around the knifehead.
10. Remove the grease zerk (B) from the pin.
11. Remove bolt (A).
12. Use a screwdriver or chisel in slot (C) to release the load on the knifehead pin.
13. Use a screwdriver or chisel to pry the pin upwards in the pin groove until the pin is clear of the knifehead.
14. Push the knife assembly inboard until it is clear of the output arm.
15. Seal the knifehead bearing with plastic or tape unless it is being replaced.
16. Remove the bolt (A) that clamps the knife drive arm to the knife drive box output shaft.
17. Remove the knife drive arm (B) from the knife drive box output shaft.
18. Remove the four knife drive box mounting bolts (C) and (D).

NOTE:

Do **NOT** remove bolt (E); it is factory-set to properly position the knife drive box in the correct fore-aft position.

CAUTION

Knife drive box with pulley weighs over 35 kg (65 lb) Use care when removing or installing. Lug (L) can be used for lifting.

19. Remove the knife drive box from the header and set aside.
20. Repeat procedure for the opposite end of the header.

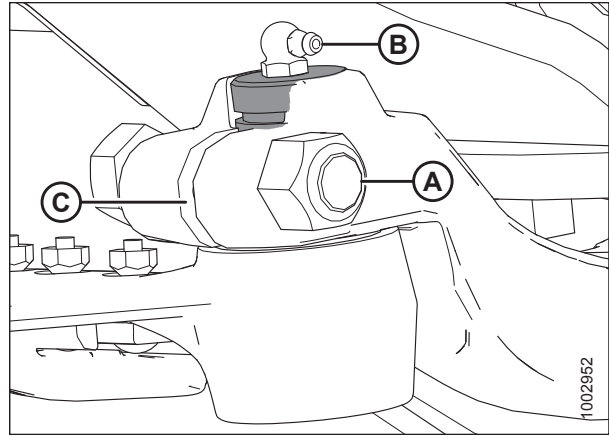


Figure 5.117: Knifehead

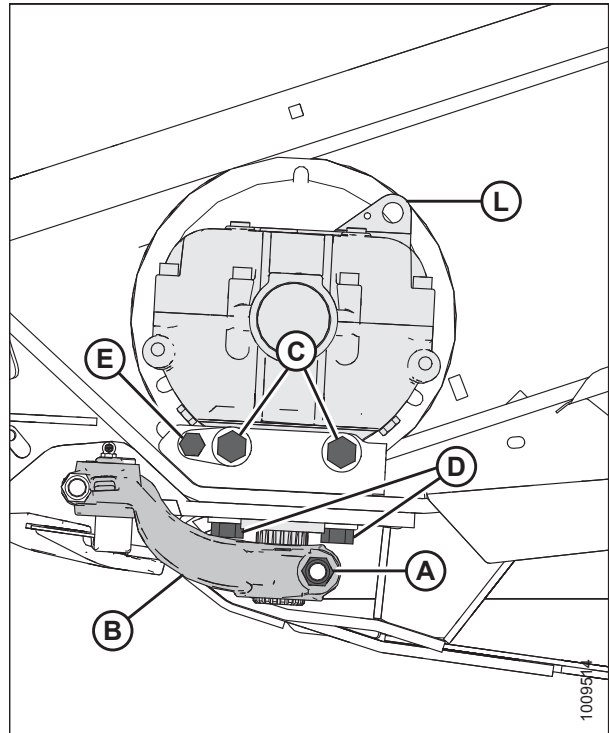


Figure 5.118: Knife Drive Box

Removing Knife Drive Box Pulley

Before removing the knife drive box pulley, remove the knife drive box from the header. Refer to [Removing Knife Drive Box, page 395](#).

1. Loosen and remove the knife drive box pulley clamping bolt (A) and nut (B).
2. Remove the knife drive box pulley (C) using a three-jaw puller.

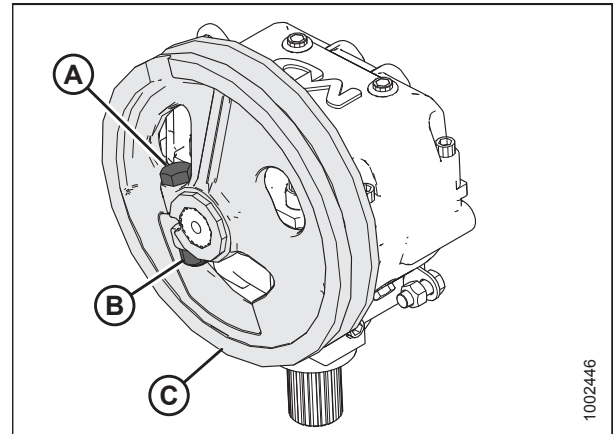


Figure 5.119: Knife Drive Box and Pulley

Installing Knife Drive Box Pulley

Before removing the knife drive box pulley, remove the knife drive box from the header. Refer to [Removing Knife Drive Box, page 395](#).

1. Ensure the splines and bores in the pulley and drive arm are free of paint, oil, and solvents.
2. Apply two bands (A) of Loctite® #243 adhesive (or equivalent) around the shaft as shown. Apply one band at the end of the spline and the second band in the middle.
3. Install the pulley (B) until flush with the end of the shaft.
4. Secure the pulley with 5/8 x 3 in. hex head bolt with distorted thread NC lock nut and torque to 217 Nm (160 lbf·ft).

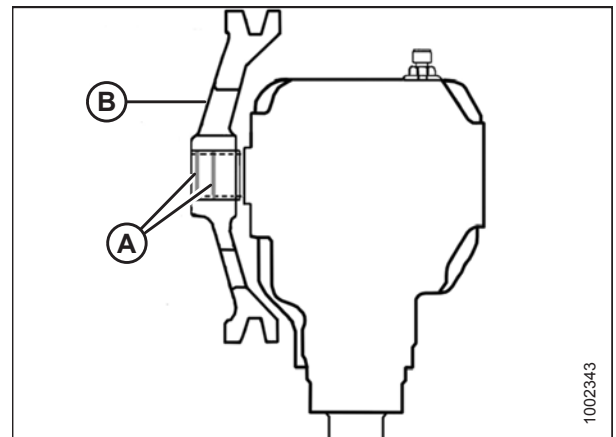


Figure 5.120: Knife Drive Box

Installing Knife Drive Box

NOTE:

If the pulley was removed from the knife drive box, refer to [Installing Knife Drive Box Pulley, page 397](#). If the pulley was **NOT** removed, proceed to Step 1, [page 398](#).

CAUTION

Knife drive box with pulley weighs over 35 kg (65 lb) Use care when removing or installing. Lug (L) can be used for lifting.

1. Position the knife drive box onto the header mount and install the belt onto the pulley.
2. Secure the knife drive box to the frame using two 5/8 x 1-3/4 in. grade 8 hex head bolts (A) on the side and two 5/8 x 2-1/4 in. grade 8 hex head bolts (B) on the bottom.
3. Tighten the knife drive box side bolts (A) slightly, then tighten the bottom bolts (B) to ensure proper contact with the vertical and horizontal mounting surfaces. Do **NOT** torque the bolts at this time.

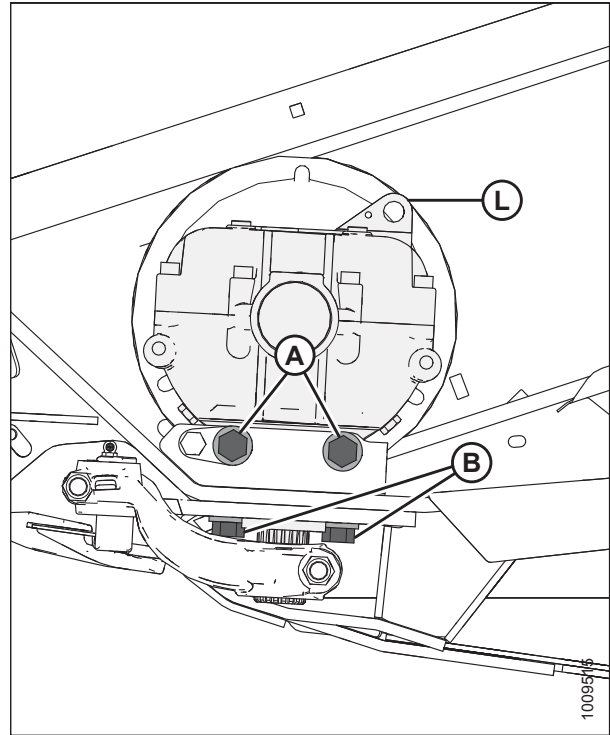


Figure 5.121: Knife Drive Box

4. Apply two bands (A) of Loctite® #243 (or equivalent) to the output shaft as shown. Apply one band at the end of the output shaft and the second band in the middle.
5. Slide the output arm (B) onto the output shaft. Rotate the pulley to ensure the splines are properly aligned and the drive arm clears the frame on the inboard stroke.

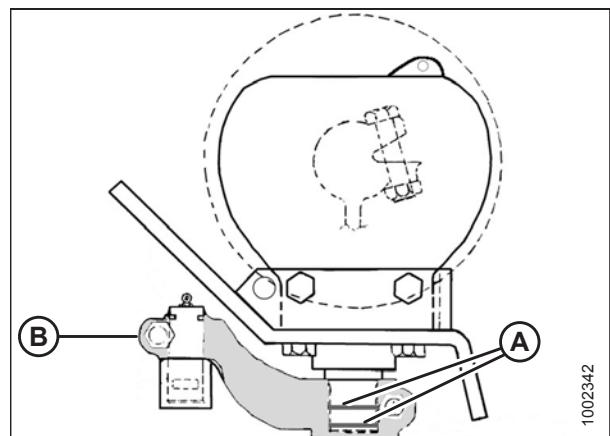


Figure 5.122: Knife Drive Box

MAINTENANCE AND SERVICING

6. Position the output arm (A) to the farthest outboard position. Move the output arm (A) up or down on the splined shaft until it is almost contacting the knifehead (B) (exact clearance [C] is set during the knifehead pin installation).

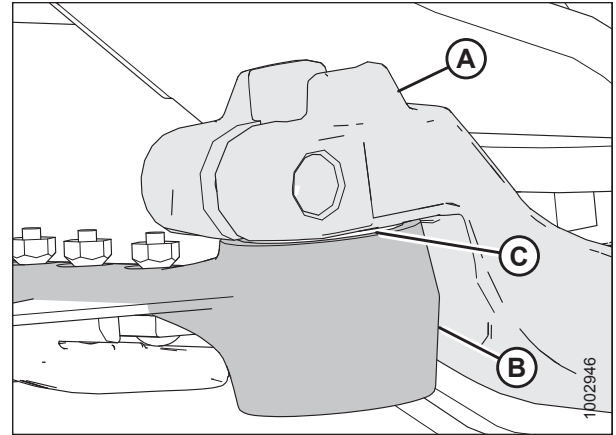


Figure 5.123: Knifehead

7. Torque the output arm bolt (A) to 217 Nm (160 lbf·ft).

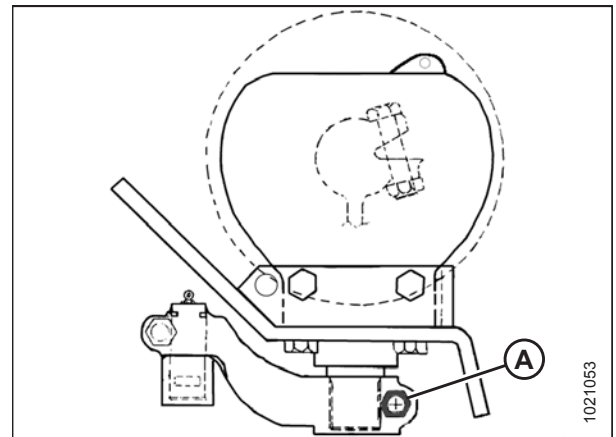


Figure 5.124: Knife Drive Box

8. Slide the knife into place and align the knifehead with the output arm.

NOTE:

Remove the grease zerk from the knifehead pin for easier installation of knifehead pin.

9. Install the knifehead pin (A) through the output arm (C) and into the knifehead.
10. Set the groove (B) in the knifehead pin 1.5 mm (1/16 in.) above the output arm (C). Secure with 5/8 x 3 in. hex head bolt and nut (D), and torque to 217 Nm (160 lbf·ft).

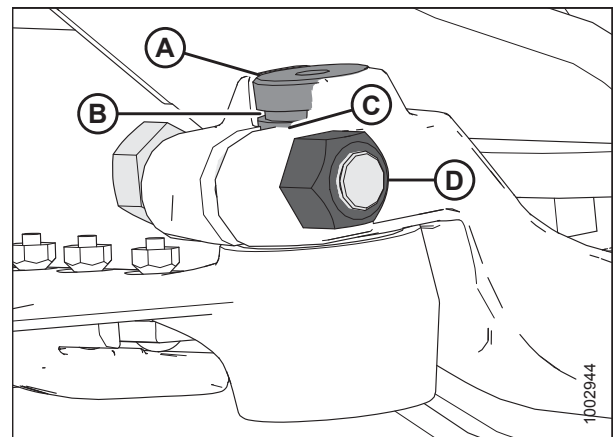


Figure 5.125: Knifehead

MAINTENANCE AND SERVICING

11. Install the grease zerk (A) into the knifehead pin, and turn the grease zerk for easy access.

IMPORTANT:

Slowly apply grease to the knifehead until slight downward movement of the knifehead is observed. Do **NOT** overgrease the knifehead. Overgreasing leads to knife misalignment causing excessive heating of guards and overloading of drive systems. If overgreasing occurs, remove the grease zerk to release pressure.

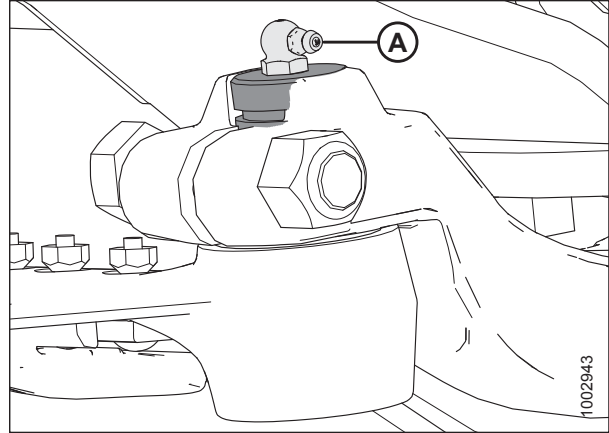


Figure 5.126: Knifehead

13. Tighten the knife drive box side bolts (A) first, then tighten the bottom bolts (B). Torque to 271 Nm (200 lbf·ft).
14. Move the output arm to the mid-stroke position, and ensure the knife bar doesn't contact the front of the first guard. If the knife drive box requires adjustment, contact your MacDon Dealer.
15. Install and tension the knife drive belts. For non-timed belts, refer to [Tensioning Knife Drive Belts, page 404](#).
16. Close the endshield. Refer to [Closing Endshields, page 32](#).

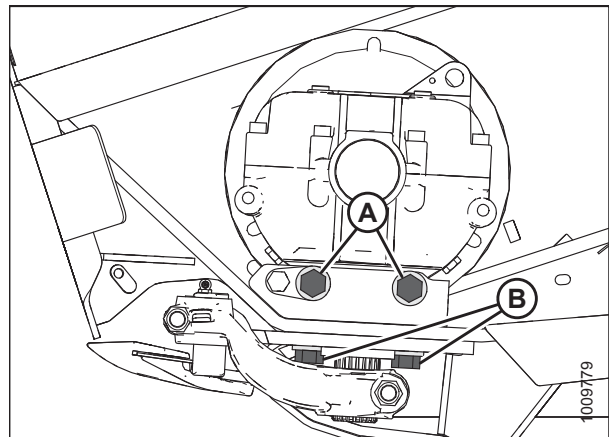


Figure 5.127: Knife Drive Box

Changing Oil in Knife Drive Box

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

Change the knife drive box lubricant after the first 50 hours of operation and every 1000 hours (or 3 years) thereafter.

1. Start engine to warm up oil.
2. Shut down the combine, and remove the key from the ignition.
3. Raise the header and place a container large enough to hold approximately 2.2 liters (2.3 quarts) under the knife drive box to collect the oil.
4. Open the endshield. Refer to [Opening Endshields, page 31](#).
5. Remove the breather/dipstick (A) and the drain plug (B).
6. Allow the oil to drain from the knife drive box and into the container placed below it.
7. Reinstall the drain plug (B).
8. Add 2.2 liters (2.3 quarts) SAE 85W-140 to the knife drive box. Refer to inside back cover for recommended fluids and lubricants.
9. Close the endshield. Refer to [Closing Endshields, page 32](#).

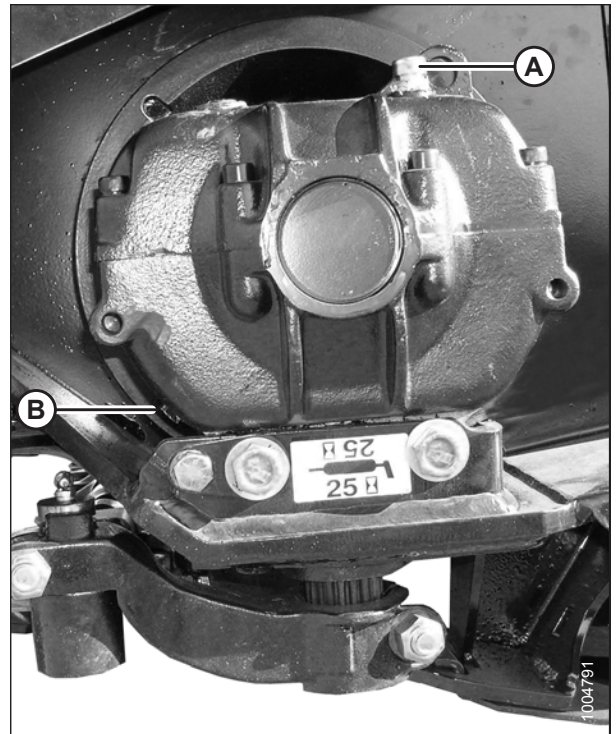


Figure 5.128: Knife Drive Box

5.9.2 Knife Drive Belts

Knife Drive Belts

The knife drive box is driven by a V-belt that is powered by a hydraulic motor on the header left endsheet. There is an identical drive system at the opposite end of 40- and 45-foot double-knife headers.

Removing Knife Drive Belt

The knife drive belt removal procedure is the same for both sides of a double-knife header.

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Shut down the combine, and remove the key from the ignition.
2. Open the endshield. Refer to .
3. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
4. Loosen the belt tension by turning the tensioning bolt (B) counterclockwise.

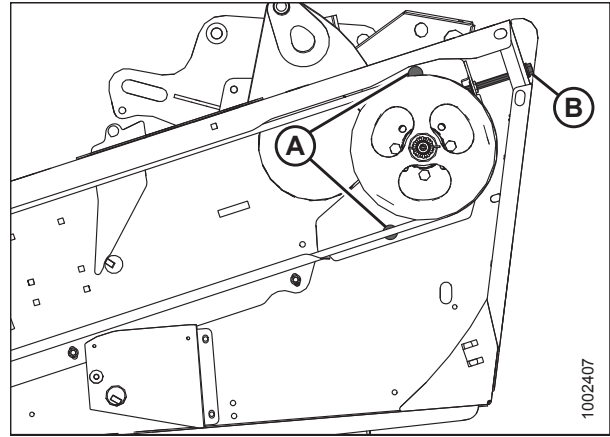


Figure 5.129: Knife Drive

5. To provide clearance between the knife drive box pulley and the endsheet, open the access cover (A) on the endsheet behind the cutterbar.

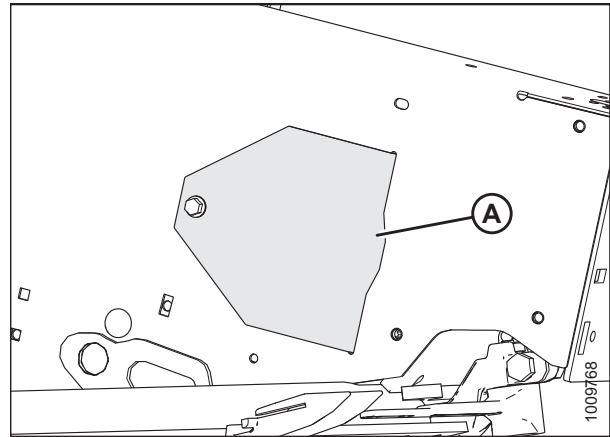


Figure 5.130: Access Cover

MAINTENANCE AND SERVICING

6. Remove the belt (A) from the drive pulley (B).
7. Slip the belt (A) over and behind the knife drive box pulley (C). Use the notch in the pulley to assist with belt removal.

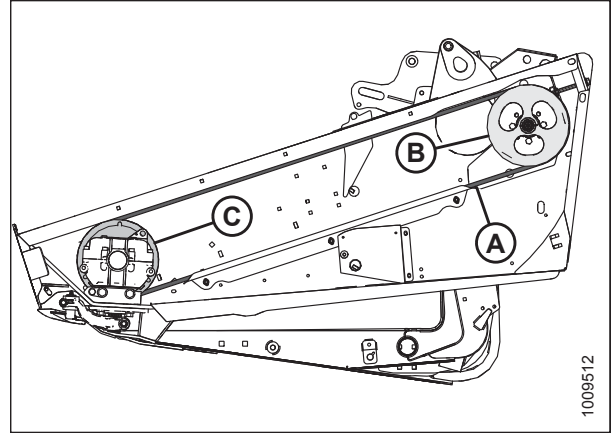


Figure 5.131: Knife Drive

Installing Knife Drive Belts

The procedure for installing non-timed knife drive belts is the same for both sides of the header.

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Shut down the combine, and remove the key from the ignition.
2. Route the knife drive belt (A) around the knife drive box pulley (C) and knife drive pulley (B). Use the notch in the pulley to assist with the belt installation.

NOTE:

Ensure the drive motor is fully forward, do **NOT** pry the belt over the pulley.

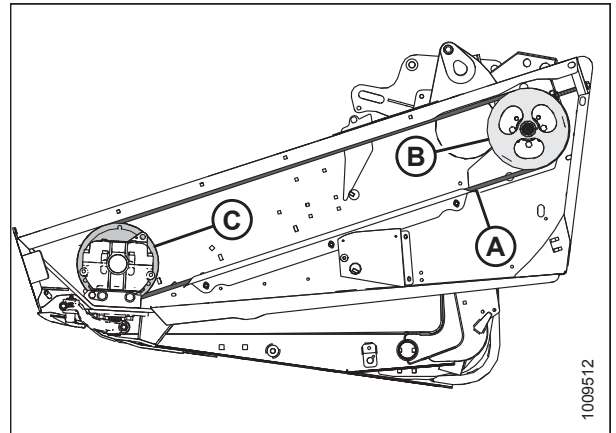


Figure 5.132: Knife Drive

MAINTENANCE AND SERVICING

3. Tension the knife drive belt. Refer to [Tensioning Knife Drive Belts, page 404](#).
4. Install the access cover (A) and secure with bolt.
5. Close the endshield. Refer to [Closing Endshields, page 32](#).

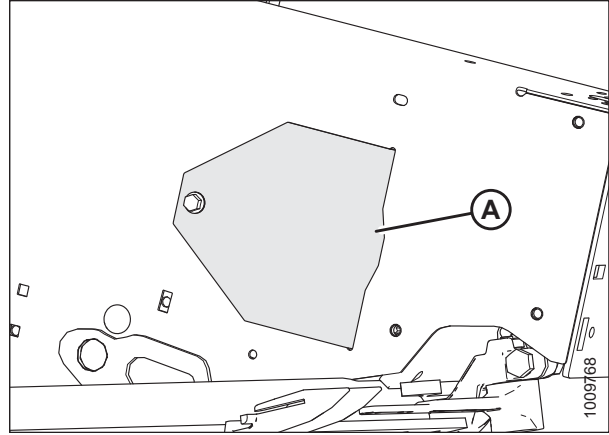


Figure 5.133: Access Cover

Tensioning Knife Drive Belts

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

IMPORTANT:

To prolong the belt and drive life, do **NOT** overtighten the belt.

1. Shut down the combine, and remove the key from the ignition.
2. Open the left endshield. Refer to [Opening Endshields, page 31](#).
3. Loosen the two bolts (A) securing the motor assembly to the header endsheet.
4. Turn the adjuster bolt (B) clockwise to move the drive motor until a force of 133 N (30 lbf) deflects the belt (C) 24–28 mm (15/16–1-1/8 in.) at the midspan.

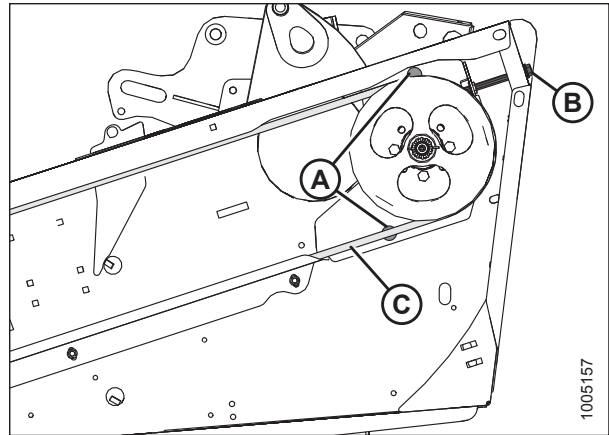


Figure 5.134: Knife Drive

MAINTENANCE AND SERVICING

5. Ensure the clearance between the belt (A) and the belt guide (B) is 1/16 in. (1 mm).
6. Loosen the three bolts (C), and adjust the position of the guide (B) as required.
7. Tighten the three bolts (C).
8. Close the endshield. Refer to [Closing Endshields, page 32](#).

NOTE:

Readjust the tension of a new belt after a short run-in period (about five hours).

9. **Double-knife headers only:** Repeat procedure on the other side of the header.

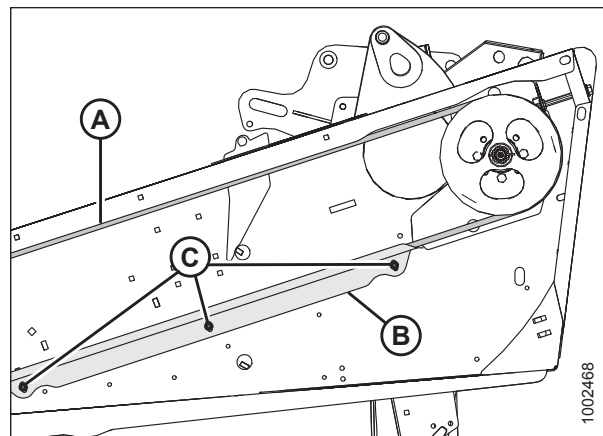


Figure 5.135: Knife Drive

5.10 Feed Draper

The feed draper is located on the FM100 float module and conveys cut crop to the auger.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to .

5.10.1 Replacing Feed Draper

Replace draper if torn, cracked, or missing slats.

DANGER

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

1. Raise header and reel to full height, stop the engine, and remove key from the ignition.
2. Engage reel safety props and header safety props.
3. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side.

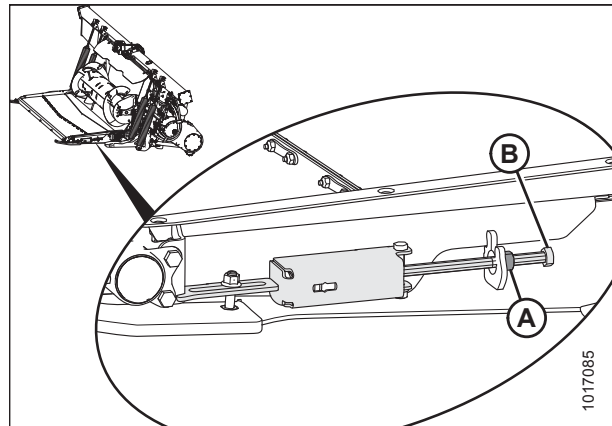


Figure 5.136: Feed Draper Tensioner

4. Unlatch the feed deck pan handle (A) from the pan handle latch supports (B) on either side of the feed deck. This will drop the door down and allow access to feed deck draper and rollers.

NOTE:

Some parts removed from illustration for clarity.

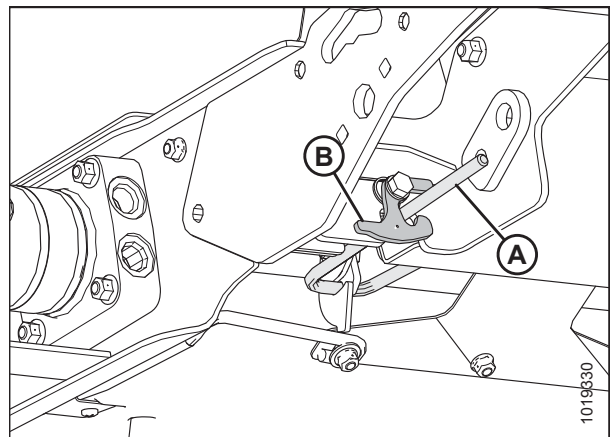


Figure 5.137: Feed Deck Pan Handle and Left Side Pan Handle Latch

MAINTENANCE AND SERVICING

5. Remove screws (A) and nuts, and remove the draper connector straps (B).
6. Pull the draper from the deck.

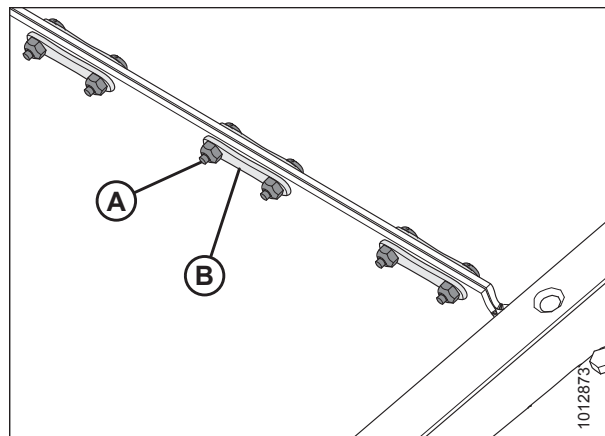


Figure 5.138: Draper Connector

7. Install new draper (A) over the drive roller (B). Make sure the draper guides fit into the drive roller grooves (C).
8. Pull draper along bottom of float module deck and over idler roller (D).

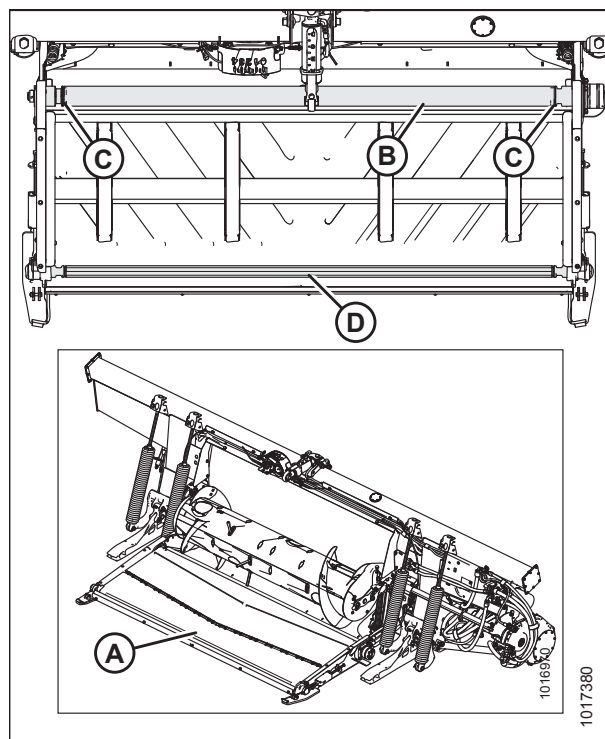


Figure 5.139: Float Module Feed Draper

MAINTENANCE AND SERVICING

9. Connect the draper joint with the connector straps (B) and secure with screws (A) and nuts. Ensure the screw heads face towards the rear of the deck, and tighten only until the end of the screws are flush with the nuts.
10. Adjust the draper tension. Refer to [5.10.2 Adjusting Feed Draper Tension](#), page 408.

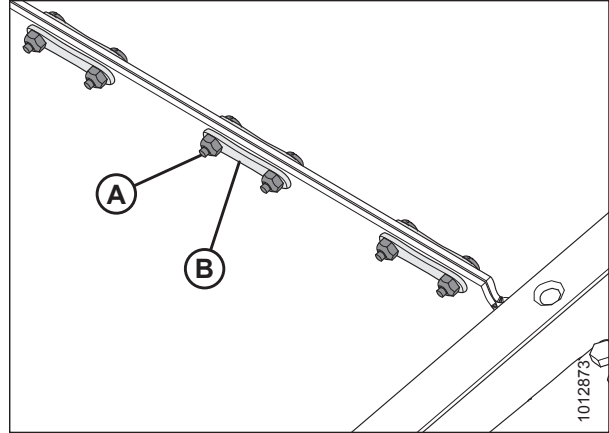


Figure 5.140: Draper Connector Straps

11. Close the feed deck by latching the pan handle latch supports (B) on either side of the feed deck to the feed deck pan handle (A).

NOTE:

Some parts removed from illustration for clarity.

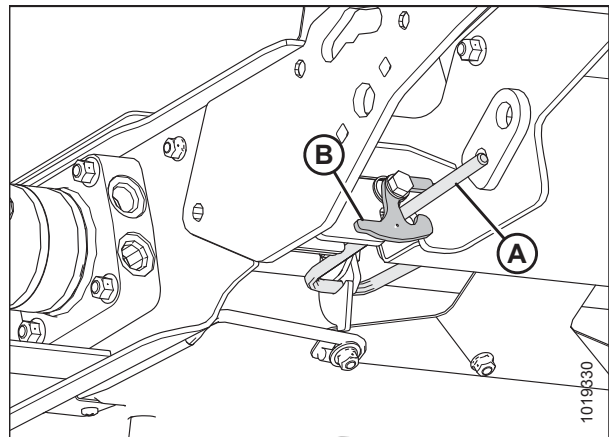


Figure 5.141: Feed Deck Pan Handle and Left Side Pan Handle Latch

5.10.2 Adjusting Feed Draper Tension



DANGER

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

1. Raise the header to its full height, stop the engine, and the remove key from the ignition.
2. Engage the header safety props.
3. Ensure the draper guide (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.

MAINTENANCE AND SERVICING

4. Loosen jam nut (A) and turn bolt (C) clockwise to increase draper tension or counterclockwise to decrease draper tension.
5. Adjust the draper tension until the white indicator (B) is centered within the indicator window on the spring box.

IMPORTANT:

Adjust both sides equally.

6. Tighten jam nut (A).

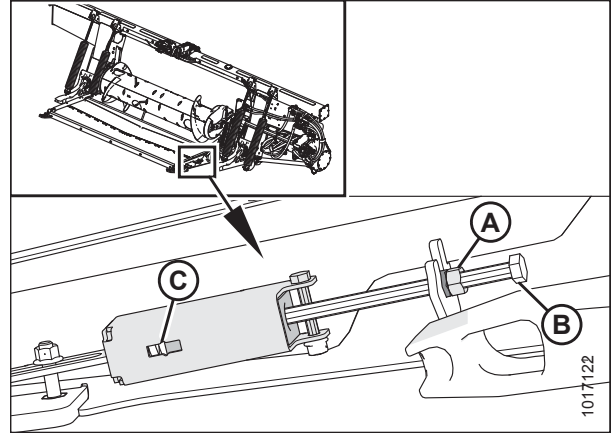


Figure 5.142: Tensioner

5.10.3 Feed Draper Drive Roller

This roller is powered and moves the draper on the float module, conveying crop to the auger.

Removing Feed Draper Drive Roller



DANGER

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

1. Raise header and reel to full height, stop the engine, and remove key from the ignition.
2. Engage reel safety props and header safety props.
3. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side.

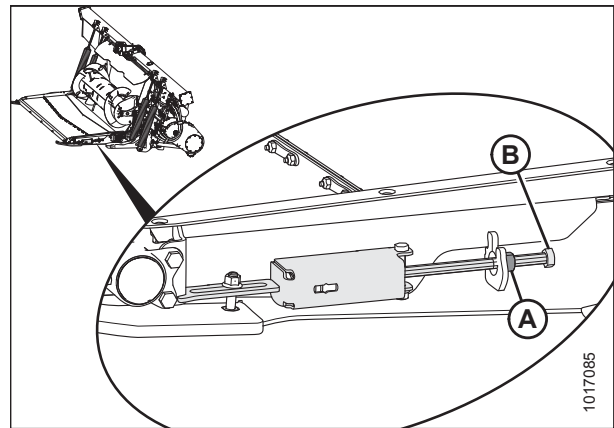


Figure 5.143: Feed Draper Tensioner

MAINTENANCE AND SERVICING

4. Remove the nuts (A) and connector straps (B) and open the feed draper.

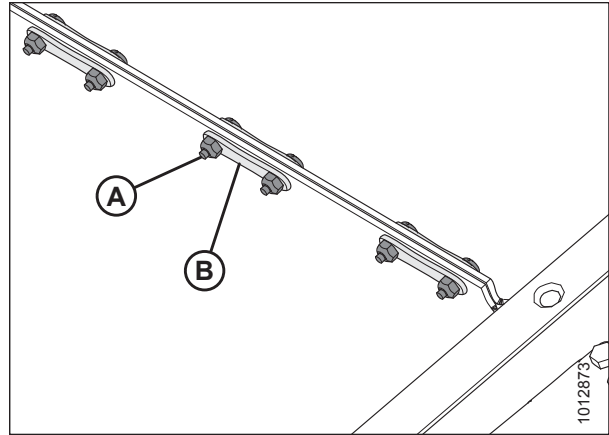


Figure 5.144: Draper Connector

5. Remove two bolts (B) from the drive roller cover (A).

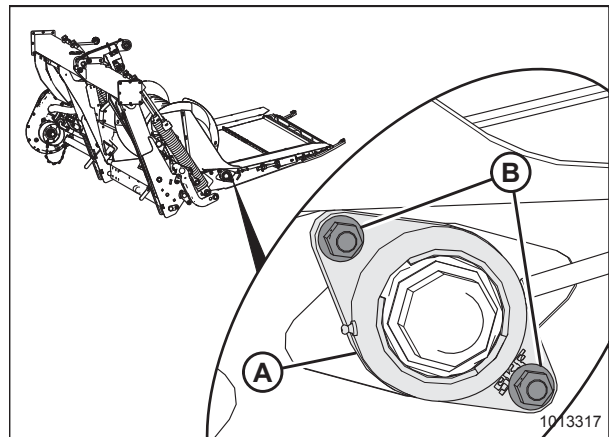


Figure 5.145: Drive Roller Bearing

6. Move the drive roller cover plate (A) to the left.

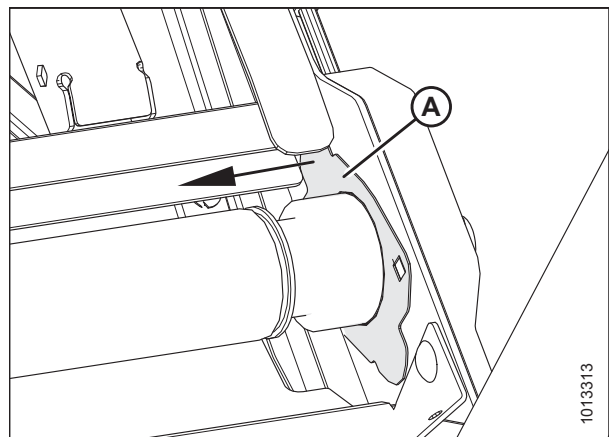


Figure 5.146: Drive Roller

MAINTENANCE AND SERVICING

- Slide drive roller (A) with bearing assembly (B) to the right until left end comes off of spline.

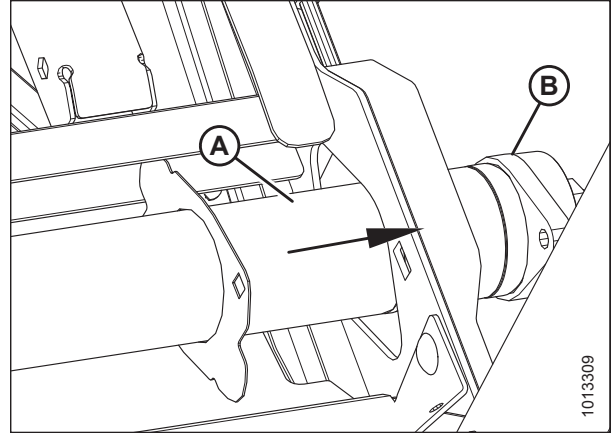


Figure 5.147: Drive Roller

- Lift left end out of the frame.
- Slide assembly (A) to the left, guiding bearing housing (B) through frame opening (C).
- Remove roller (A).

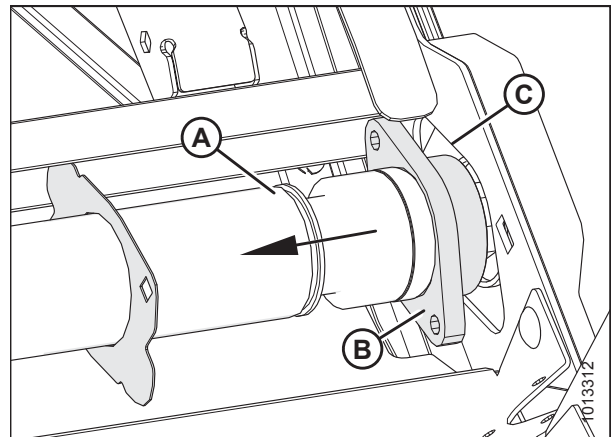


Figure 5.148: Drive Roller

Installing Feed Draper Drive Roller

- Apply grease to the spline.
- Slide drive roller cover plate (A) onto right end of roller (B).
- Guide bearing end (C) of drive roller through frame opening (D).

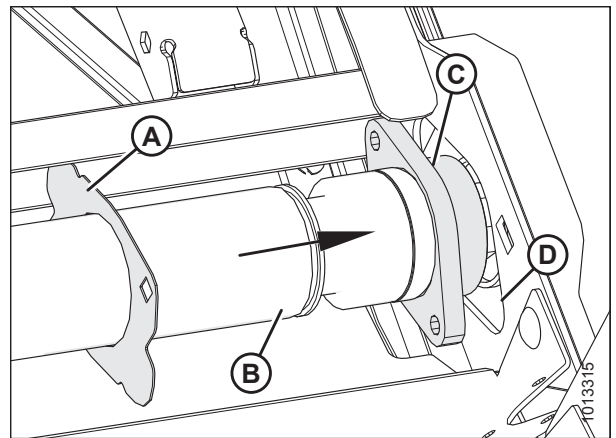


Figure 5.149: Drive Roller (Bearing End)

MAINTENANCE AND SERVICING

- Slide left end of drive roller (A) onto spline of motor (B).

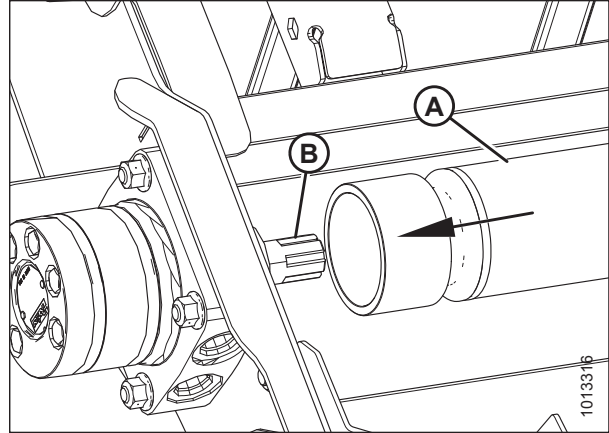


Figure 5.150: Motor

- Secure the bearing and housing (A) with the drive roller cover plate on the frame using two bolts (B).
- Install the feed deck draper. Refer to [5.10.1 Replacing Feed Draper, page 406](#).
- Tension the feed draper. Refer to [5.10.2 Adjusting Feed Draper Tension, page 408](#).

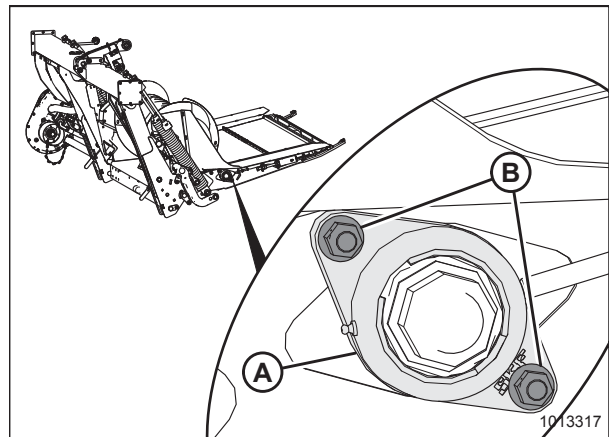


Figure 5.151: Drive Roller Bearing

Replacing Feed Draper Drive Roller Bearing

Removing Feed Draper Drive Roller Bearing



DANGER

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

- Raise header and reel to full height, stop the engine, and remove key from the ignition.
- Engage reel safety props and header safety props.

MAINTENANCE AND SERVICING

3. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side.

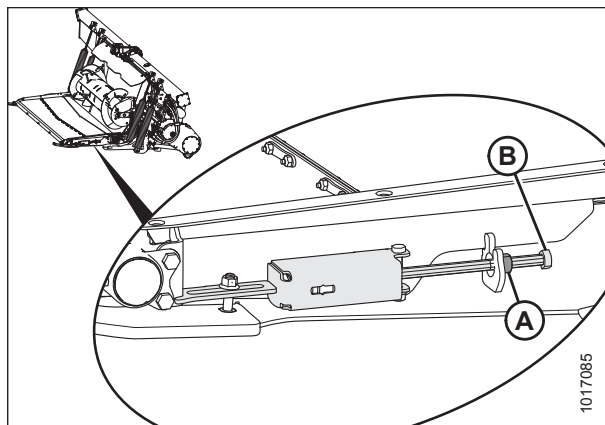


Figure 5.152: Feed Draper Tensioner

4. Loosen the setscrew (B) on the bearing lock (A).
5. Using a hammer and punch, tap the bearing lock (A) in the direction opposite to the auger rotation to release the lock.

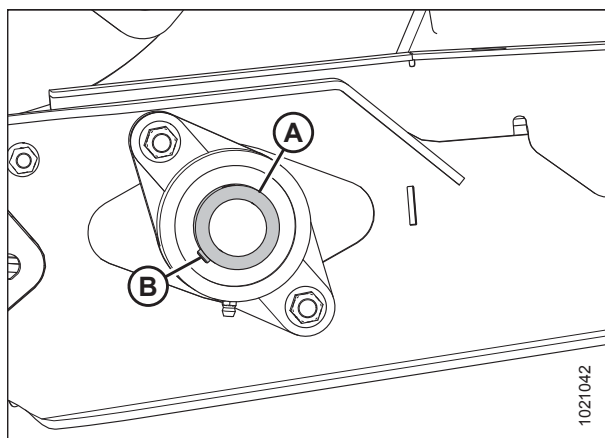


Figure 5.153: Feed Draper Drive Roller Bearing

6. Remove two nuts (A).

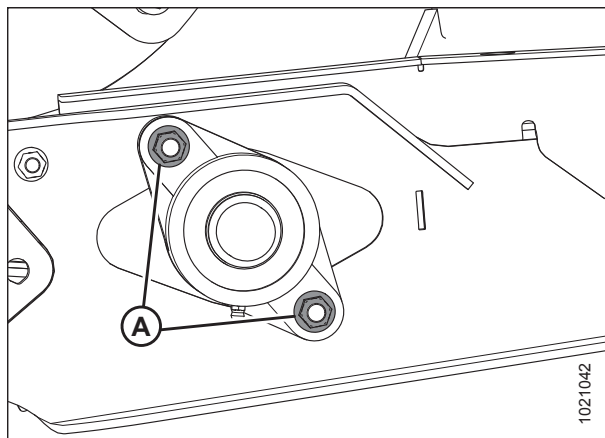


Figure 5.154: Feed Draper Drive Roller Bearing

MAINTENANCE AND SERVICING

7. Remove bearing housing (A).

NOTE:

If bearing is seized on shaft, it may be easier to remove the drive roller assembly. For instructions refer to [Removing Feed Draper Drive Roller, page 409](#).

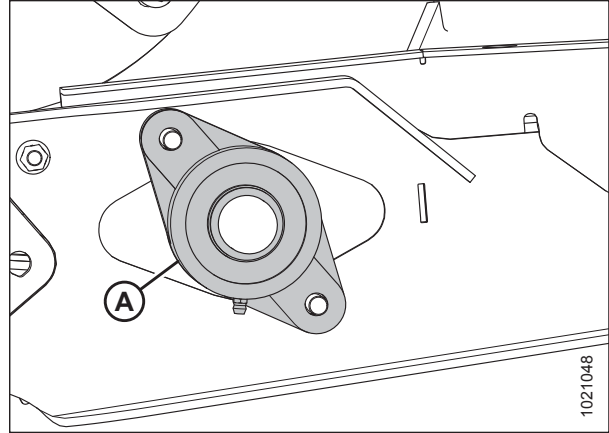


Figure 5.155: Feed Draper Drive Roller Bearing

Installing Feed Draper Drive Roller Bearing

1. Install the drive roller bearing housing (A) onto the shaft (B), and secure with two bolts and nuts (C).

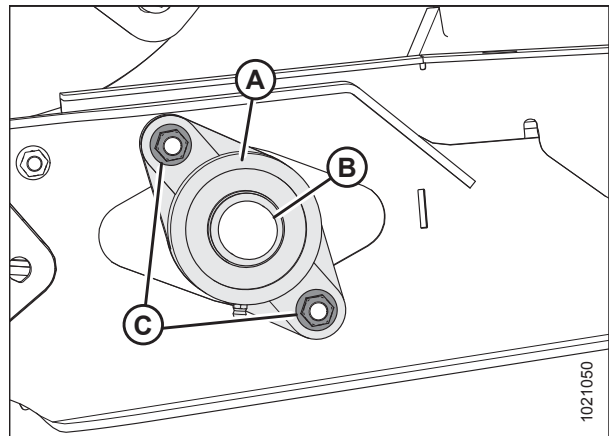


Figure 5.156: Feed Draper Drive Roller Bearing

2. Install bearing lock collar (A) onto the shaft.
3. Using a hammer and punch, tap the bearing lock in the direction of auger rotation to lock.
4. Tighten bearing lock setscrew (B).

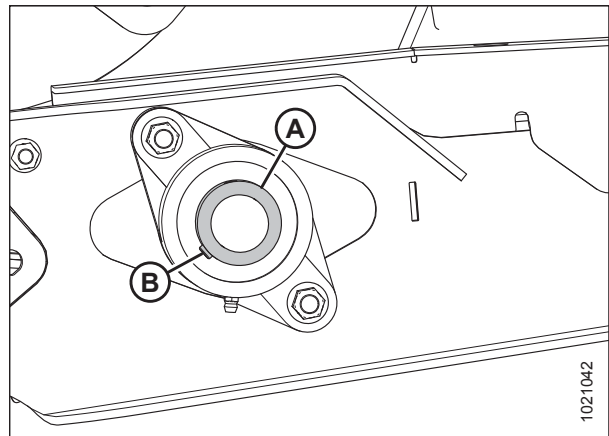


Figure 5.157: Feed Draper Drive Roller Bearing

5. Tension the feed draper. Refer to [5.10.2 Adjusting Feed Draper Tension, page 408](#).

5.10.4 Feed Draper Idler Roller

This roller is non-powered on the feed draper.

Removing Feed Draper Idler Roller

1. Engage the feeder house safety props.
2. Loosen jam nut (A) and turn bolt (B) counterclockwise to release the draper tension. Repeat at the opposite side.

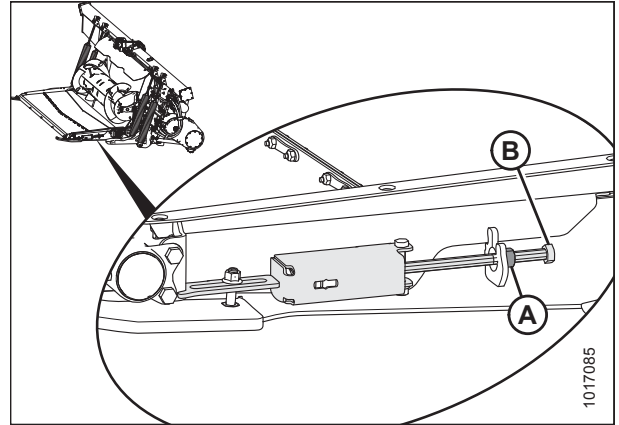


Figure 5.158: Feed Draper Tensioner

3. Remove screws (A) and nuts, and remove the draper connector straps (B).
4. Open feed deck pan.

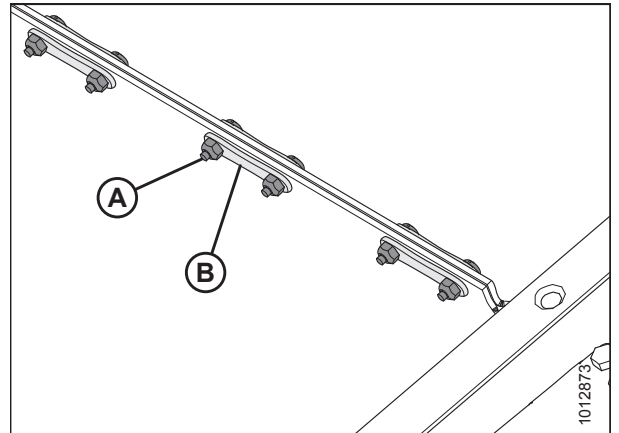


Figure 5.159: Draper Connector

5. Remove nut (D) to have better access to the other two nuts (C).
6. Remove two bolts (A) and nuts (C) from both ends of the idler roller.
7. Remove the idler roller assembly (B).

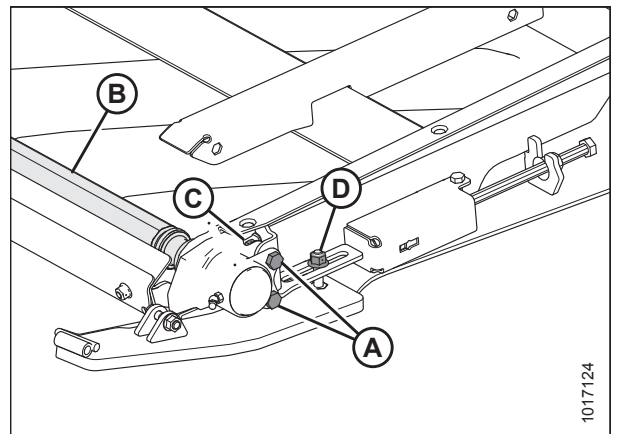


Figure 5.160: Idler Roller

Installing Feed Draper Idler Roller

1. Position the idler roller assembly (B) in the float module deck.
2. Install two bolts (A) and nuts (C) at both ends of the idler roller.

NOTE:

Do **NOT** overtighten the bolts (A).

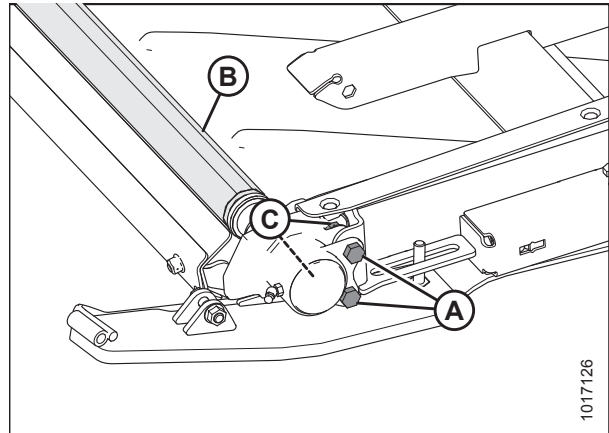


Figure 5.161: Idler Roller

3. Install nut (A).

IMPORTANT:

Maintain a 2–4 mm (1/16–3/16 in.) gap (C) between the plate (B) and nut (A) to allow the idler roller to float and to move when belt is tensioned or adjusted.

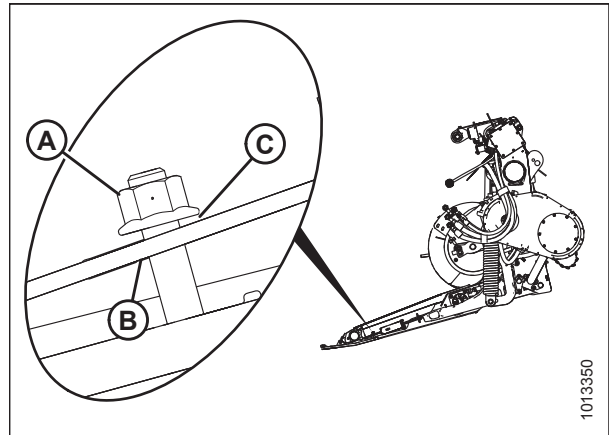


Figure 5.162: Idler Roller

4. Close the feed draper and secure with connector straps (B), screws (A), and nuts.
5. Tension the feed draper. Refer to [5.10.2 Adjusting Feed Draper Tension, page 408](#).

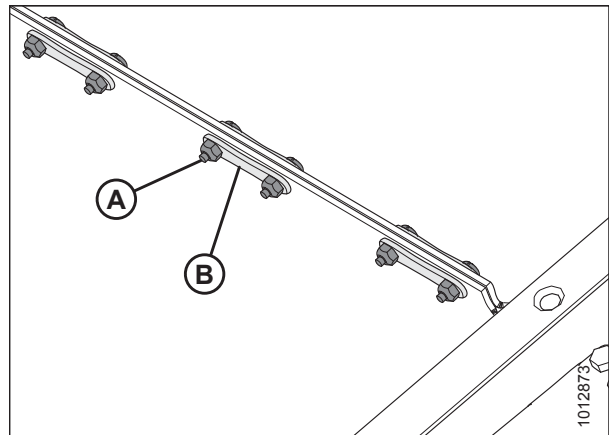


Figure 5.163: Draper Connector

Replacing Feed Draper Idler Roller Bearing

1. Remove the dust cap (A).

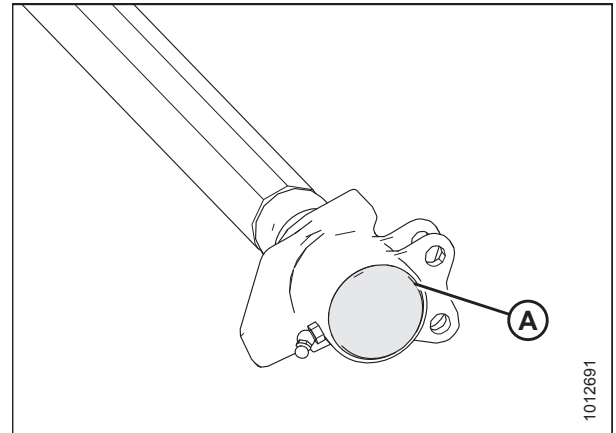


Figure 5.164: Idler Roller

2. Remove nut (A).
3. Use a hammer to tap the bearing assembly (B) until it slides off the shaft.

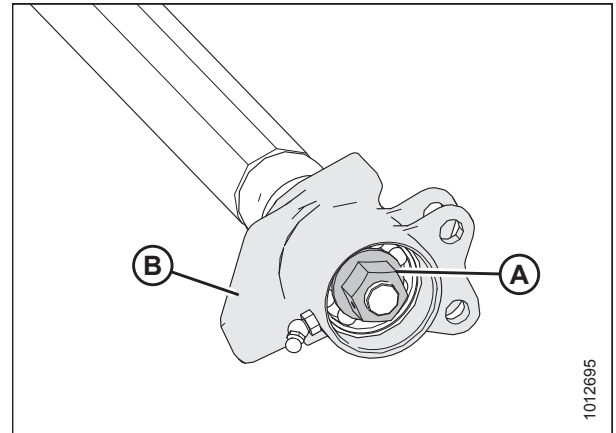


Figure 5.165: Idler Roller

4. Secure the housing (D) and remove the internal retaining ring (A), bearing (B), and two seals (C).
5. Apply oil to bore before assembly.
6. Install the seals (C) into the housing (D).

NOTE:

Ensure the flat side of the seal is facing inboard.

7. Install the bearing (B).
8. Install the retaining ring (A).
9. Brush shaft with oil. Carefully rotate the housing (D) with seals (C), bearing (B), and retaining ring (A) onto the shaft by hand to prevent seal damage.

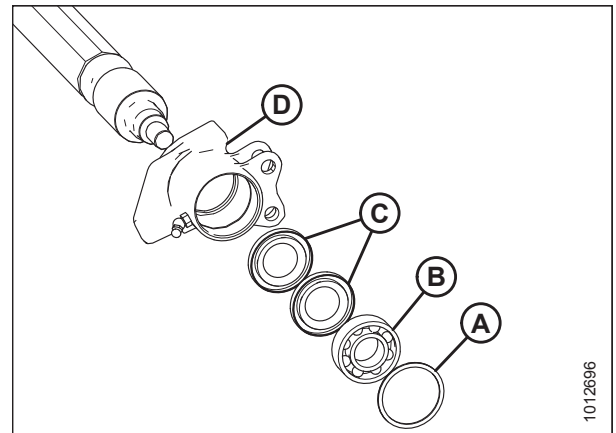


Figure 5.166: Bearing Assembly

MAINTENANCE AND SERVICING

10. Secure the bearing assembly to the shaft with nut (A).
11. Install the dust cap (B).
12. Pump grease into the bearing assembly.

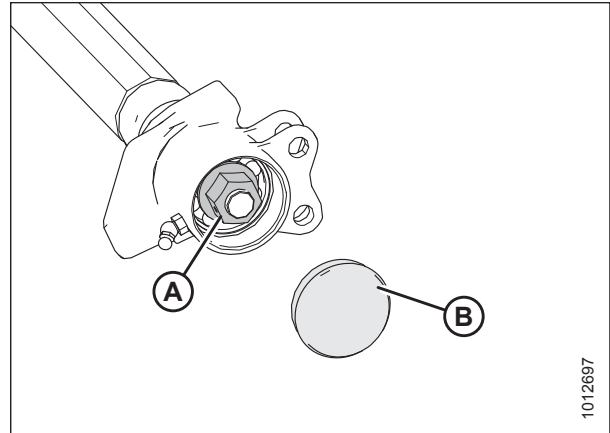


Figure 5.167: Idler Roller

5.11 Lowering Float Module Feed Deck Pan

DANGER

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

1. Start combine, raise header fully, and engage header lift cylinder locks.
2. Stop engine and remove key.
3. Rotate latches (A) to unlock handle (B).

NOTE:

Parts have been removed from illustration at right for clarity.

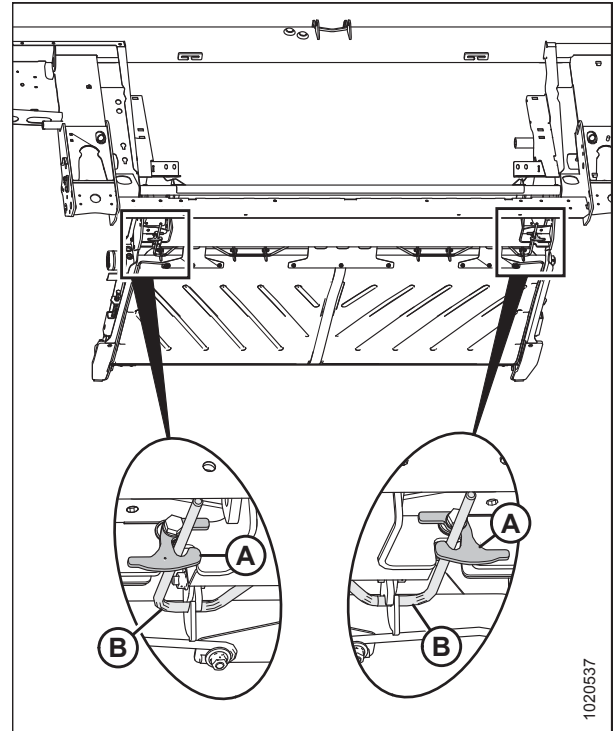


Figure 5.168: Feed Deck Pan (Rear View)

4. Hold pan (A) and rotate handles (B) downward to release pan.

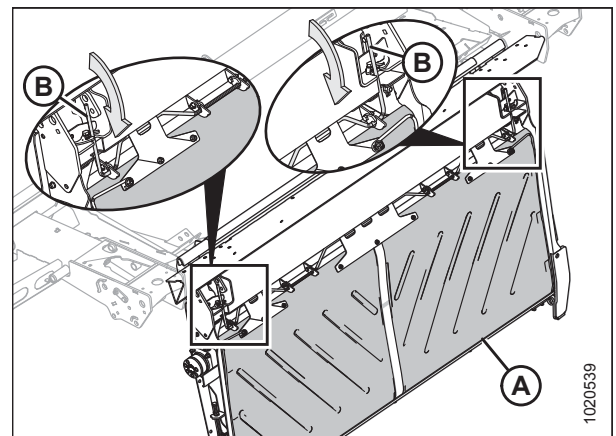


Figure 5.169: Underside of Feed Deck Pan

MAINTENANCE AND SERVICING

5. Lower plastic pan (A) and check for shipping materials/debris that may have fallen under float module draper.

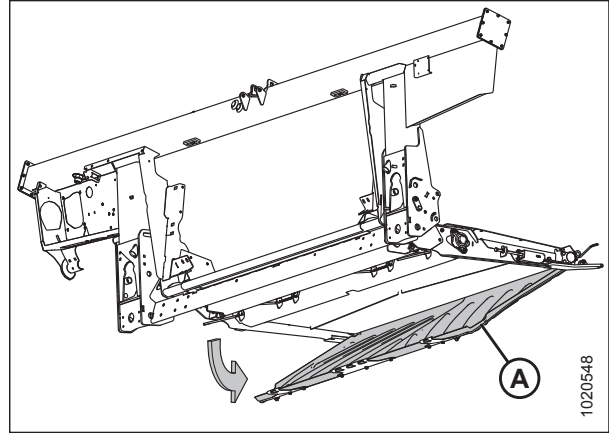


Figure 5.170: Feed Deck Pan (Rear View)

5.12 Raising Float Module Feed Deck Pan

1. Raise feed deck pan (A).
2. Engage lock handle (B) in feed deck pan hooks (C).
3. Rotate handles (B) upwards, bringing the feed deck pan (A) into locking position.

NOTE:

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

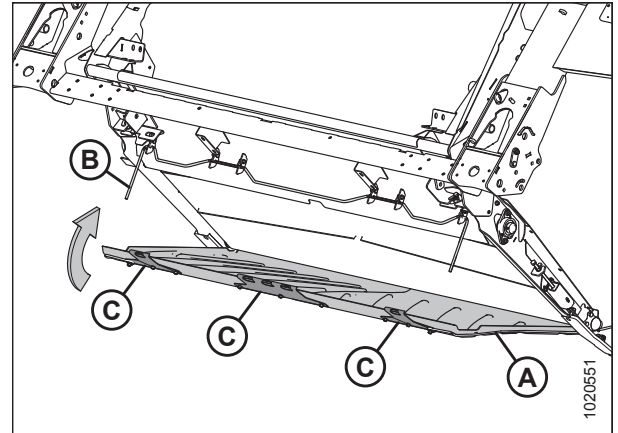


Figure 5.171: Underside of Feed Deck Pan (Rear View)

4. Hold feed deck pan (A) in place, and rotate latches (B) to lock handle (C) securely.

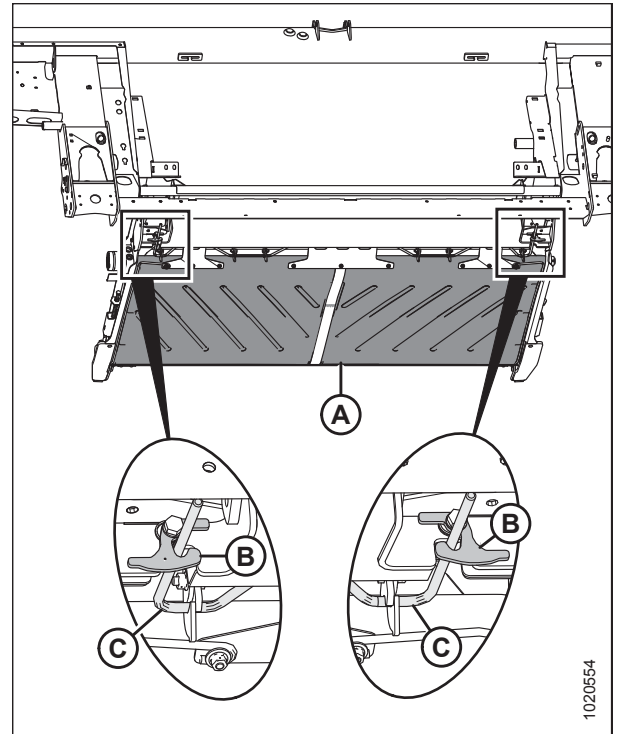


Figure 5.172: Feed Deck Pan (Rear View)

5.13 Float Module Stripper Bars and Feed Deflectors

5.13.1 Removing Stripper Bars

1. Detach the header from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
2. Remove the four bolts and nuts (A) securing the stripper bar (B) to the float module frame, and remove the stripper bar.
3. Repeat at the opposite side.

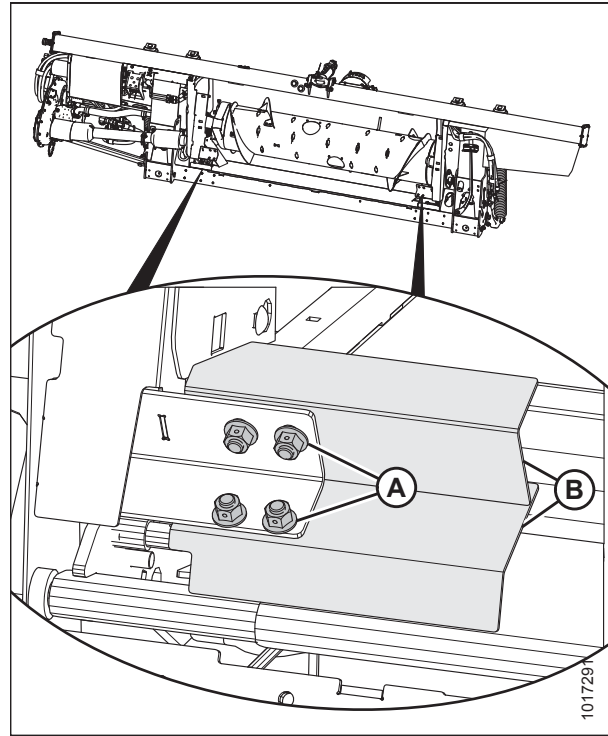


Figure 5.173: Stripper Bar

5.13.2 Installing Stripper Bars

1. Detach the header from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
2. Position the stripper bar (A) so the notch (B) is at the corner of the frame.
3. Secure the stripper bar (A) to the float module with four bolts and nuts (C). Ensure the nuts are facing the combine.
4. Repeat at the opposite side.

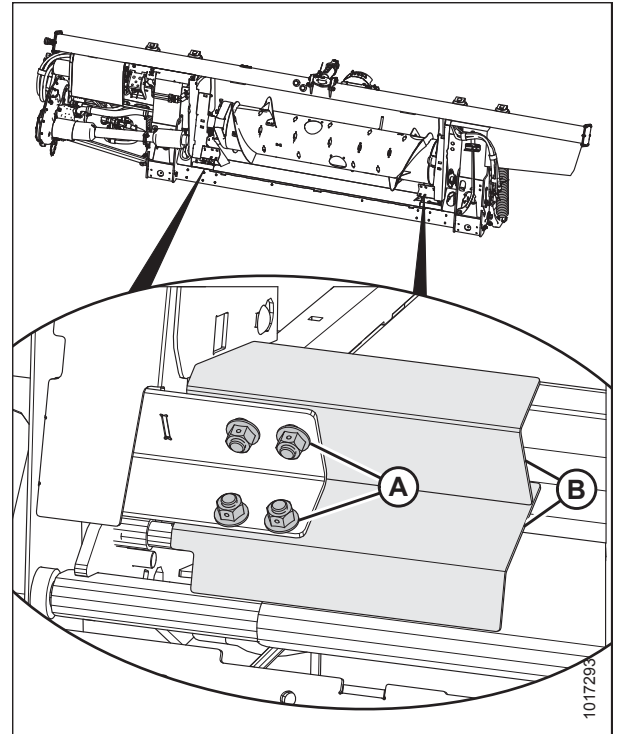


Figure 5.174: Stripper Bar

5.13.3 Replacing Feed Deflectors on New Holland CR Combines

1. Detach the header from the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
2. Remove the two bolts and nuts (B) securing the feed deflector (A) to the float module frame, and remove the feed deflector.
3. Position the replacement feed deflector (A), and secure with bolts and nuts (B) (ensure the nuts are facing the combine). Do **NOT** tighten nuts.

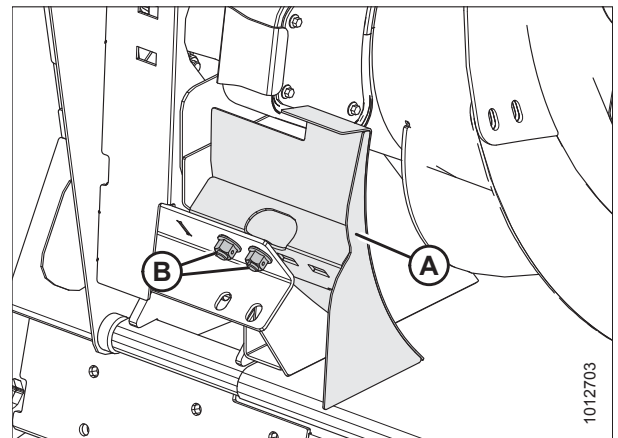


Figure 5.175: Feed Deflector

MAINTENANCE AND SERVICING

4. Adjust deflector (A) so that distance (C) between pan and deflector is 4–6 mm (5/32–1/4 in.).
5. Tighten nuts (B).
6. Repeat for opposite deflector.
7. Attach header onto the combine. Refer to [4 Header Attachment/Detachment, page 251](#).
8. After attaching header to combine, extend center-link fully, and check gap between deflector and pan. Maintain the 4–6 mm (5/32–1/4 in.) gap.

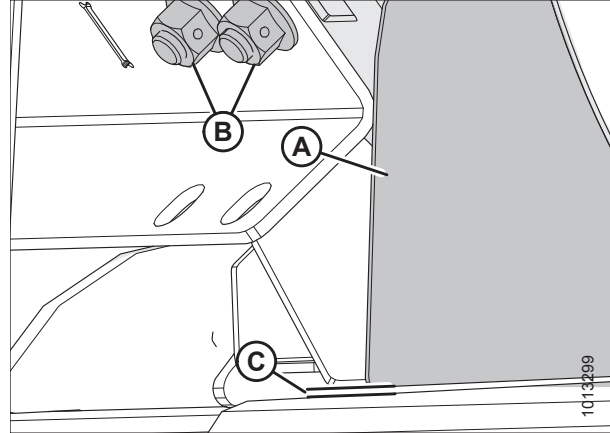


Figure 5.176: Pan and Deflector Distance

5.14 Header Drapers

There are two header drapers. They convey cut crop to the float module feed draper and auger. Replace the drapers if torn, cracked, or missing slats.

5.14.1 Removing Header Drapers

DANGER

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

1. Raise the reel and engage the reel safety props.
2. Raise the header and engage the safety props.
3. Move the draper until the draper joint is in the work area.

NOTE:

The deck also can be shifted towards the center to provide an opening at the endsheet.

4. Shut down the combine, and remove the key from the ignition.
5. Release the tension on the draper. Refer to [5.14.3 Adjusting Draper Tension, page 427](#).

MAINTENANCE AND SERVICING

6. Remove the screws (A) and tube connectors (B) at the draper joint.
7. Pull the draper from deck.

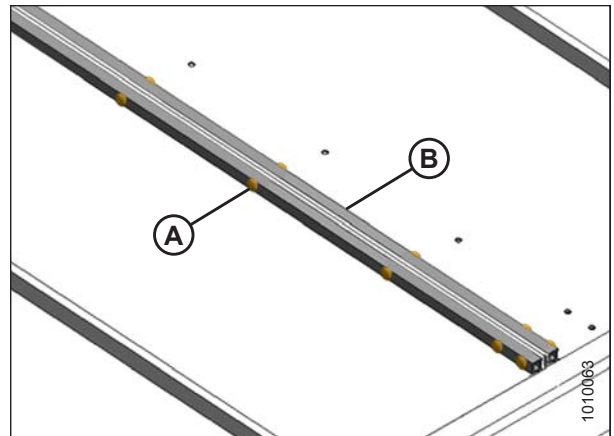


Figure 5.177: Draper Connector

5.14.2 Installing Header Drapers

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

NOTE:

Check the deck height before installing the drapers. Refer to [5.14.5 Adjusting Deck Height, page 432](#).

1. Apply talc, baby powder, or talc/graphite lubricant mix to the draper surface that forms the seal with the cutterbar and to the underside of the draper guides.
2. Insert the draper into the deck at the outboard end under the rollers. Pull the draper into the deck while feeding it at the end.
3. Feed in the draper until it can be wrapped around the drive roller.
4. Insert the opposite end of the draper into the deck over the rollers. Pull the draper fully into the deck.



Figure 5.178: Installing Draper

MAINTENANCE AND SERVICING

5. Loosen the mounting bolts (B) on the rear deck deflector (A) (this may help with draper installation).

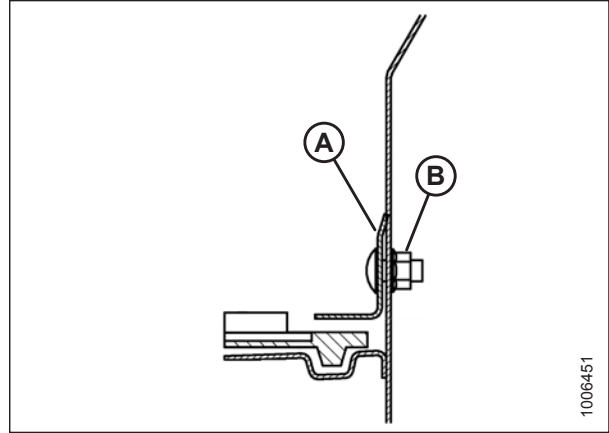


Figure 5.179: Draper Seal

6. Attach the ends of the draper with tube connectors (B), screws (A) (with the heads facing the center opening), and nuts.
7. Adjust the draper tension. Refer to [5.14.3 Adjusting Draper Tension, page 427](#).

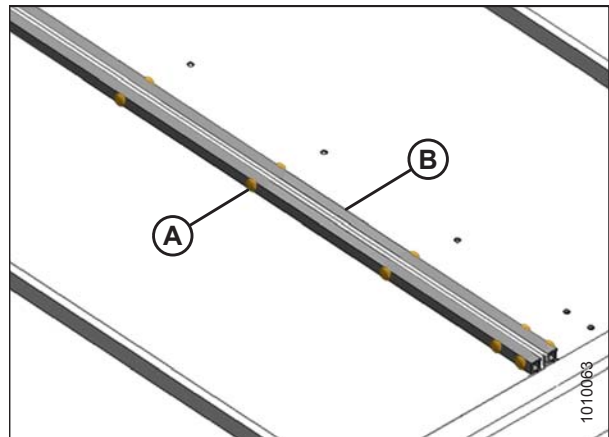


Figure 5.180: Draper Connector

8. Check clearance (A) between drapers (B) and cutterbar (C). It should be 3 mm (0–1/8 in.). Refer to [5.14.5 Adjusting Deck Height, page 432](#) to adjust if necessary.

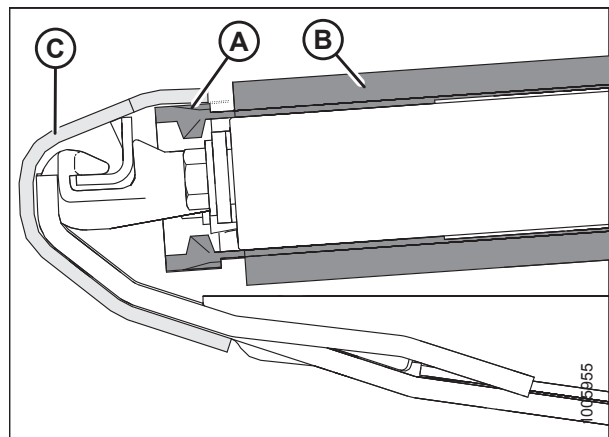


Figure 5.181: Draper Seal

MAINTENANCE AND SERVICING

9. If adjustment of the backsheet deflector (A) is required, loosen nut (D) and move the deflector until there is a 1–7 mm (1/32–5/16 in.) gap (C) between the draper (B) and the deflector.
10. Operate the drapers with the engine at idle so the talc or talc/graphite lubricant makes contact and adheres to the draper seal surfaces.

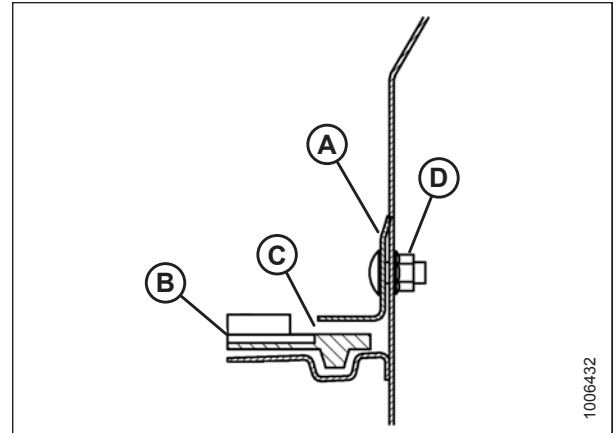


Figure 5.182: Draper Seal

5.14.3 Adjusting Draper Tension

WARNING

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

1. Ensure the white indicator bar (A) is at the halfway point in the window.

WARNING

Check to be sure all bystanders have cleared the area.

2. Start the engine and fully raise the header.
3. Shut down the combine, and remove the key from the ignition.
4. Engage the header safety props.

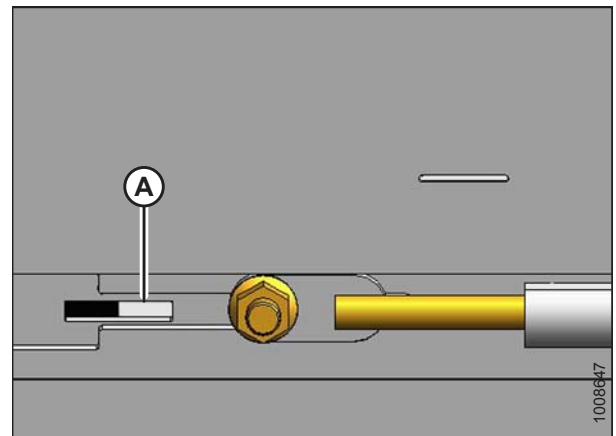


Figure 5.183: Left Tension Adjuster
Shown – Right Opposite

MAINTENANCE AND SERVICING

5. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in the groove (A) on the drive roller.

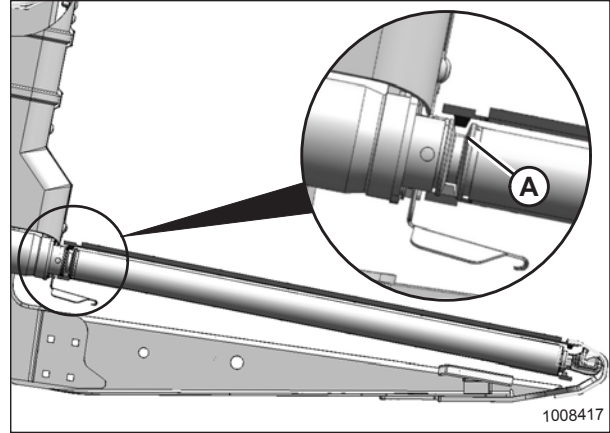


Figure 5.184: Drive Roller

6. Ensure the idler roller (A) is between the draper guides (B).

NOTE:

The drapers are tensioned at the factory and rarely need adjustment. If adjustment is required, tension the drapers just enough to prevent slipping and to keep the draper from sagging below the cutterbar.

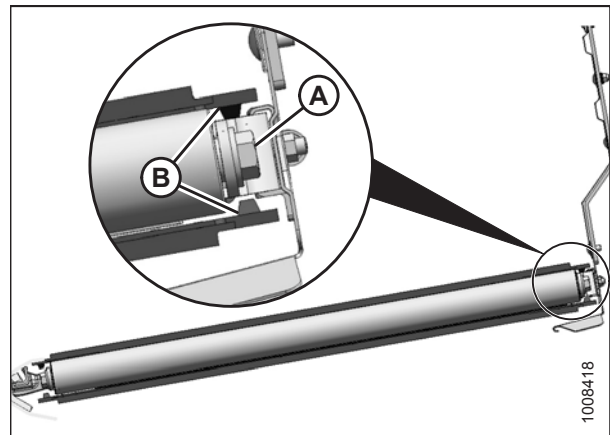


Figure 5.185: Idler Roller

MAINTENANCE AND SERVICING

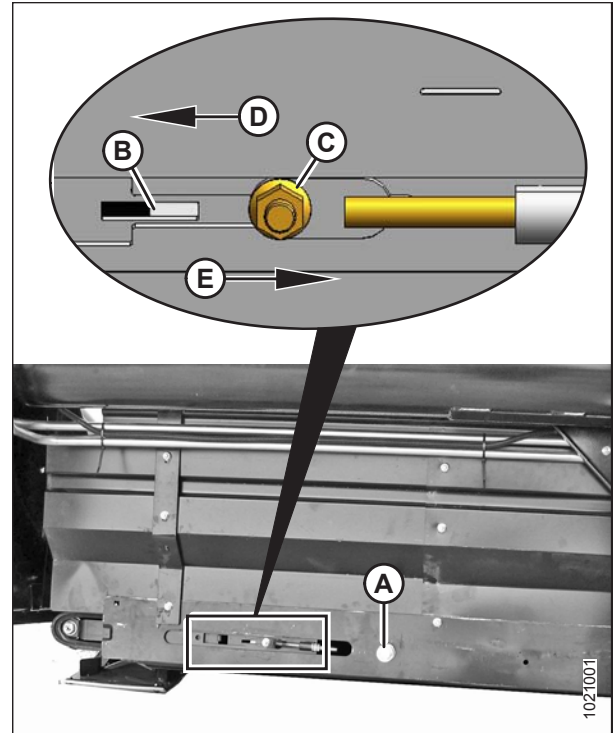
IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

7. To loosen the adjuster bolt (A), turn it counterclockwise. The white indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen until the white indicator bar is at the halfway point in the window.
8. To tighten the adjuster bolt (A), turn it clockwise. The white indicator bar (B) will move inboard in the direction of arrow (E) to indicate that the draper is tightening. Tighten until the white indicator bar is at the halfway point in the window.

IMPORTANT:

- To avoid premature failure of the draper, draper rollers, and/or tightener components, do not operate with the tension set so the white bar is not visible.
- To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.



**Figure 5.186: Left Tension Adjuster
Shown – Right Opposite**

5.14.4 Adjusting Header Draper Tracking

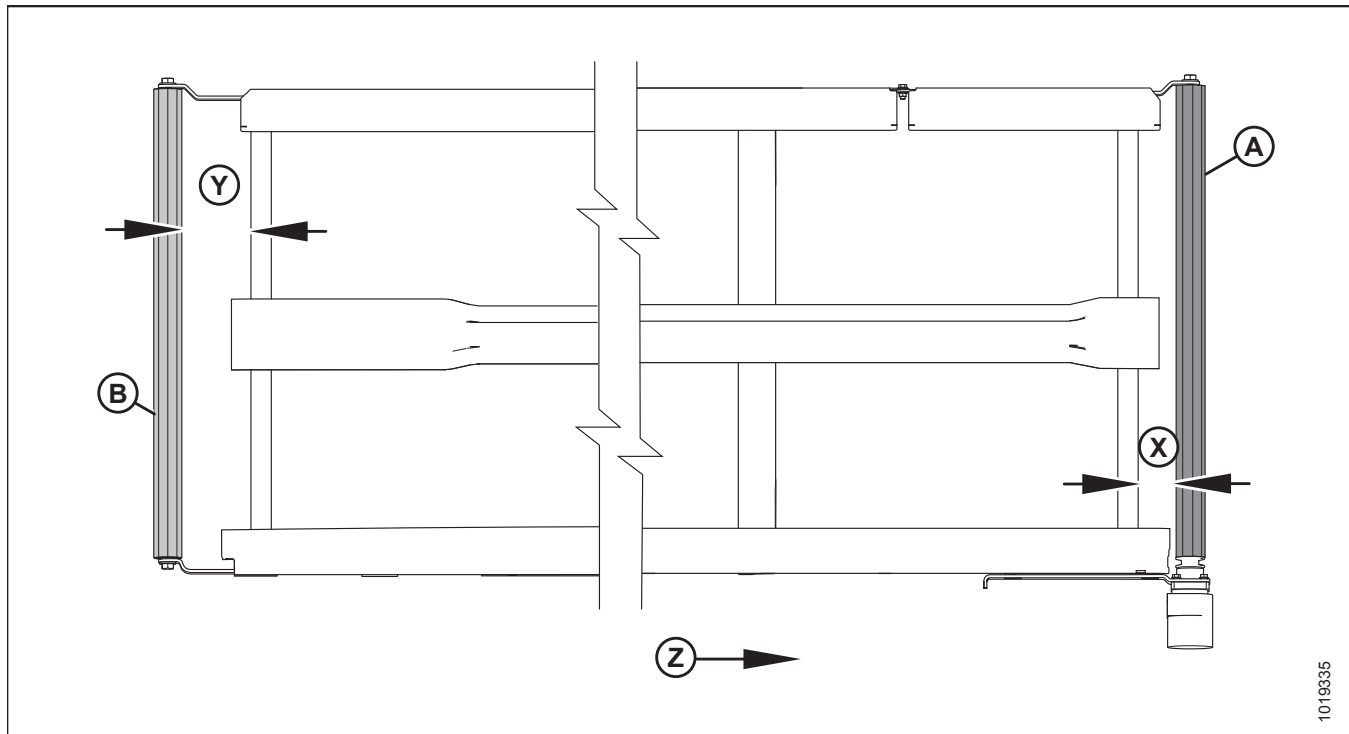
The draper tracking is adjusted by aligning the drive and idler draper rollers.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 325](#).

The images shown in the following procedure are applicable to the left draper deck. Use opposite views for the right draper deck.

Figure 5.187: Draper Tracking Adjustments



A - Drive Roller

X - Drive Roller Adjust

B - Idler Roller

Y - Idler Roller Adjust

Z - Draper Direction

1. Refer to the following table to determine which roller requires adjustment and which adjustments are necessary.

Table 5.2 Header Draper Tracking

Tracking	At Location	Adjustment	Method
Backward	Drive roller	Increase X	Tighten nut (E)
Forward		Decrease X	Loosen nut (E)
Backward	Idler roller	Increase Y	Tighten nut (H)
Forward		Decrease Y	Loosen nut (H)

MAINTENANCE AND SERVICING

2. Adjust drive roller (A) to change **X** as follows:

- a. Loosen nuts (C) and jam nut (D).
- b. Turn the adjuster nut (E).

NOTE:

Some parts removed from illustration for clarity.

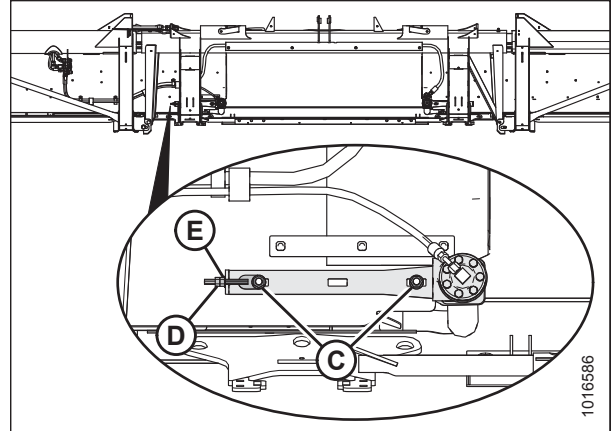


Figure 5.188: Left Deck Drive Roller (Left Shown – Right Opposite)

3. Adjust idler roller (B) to change **Y** as follows:

- a. Loosen nut (F) and jam nut (G).
- b. Turn the adjuster nut (H).

NOTE:

If the draper does not track at the idler roller end after the idler roller adjustment, the drive roller is likely not square to the deck. Adjust the drive roller, and then readjust the idler roller.

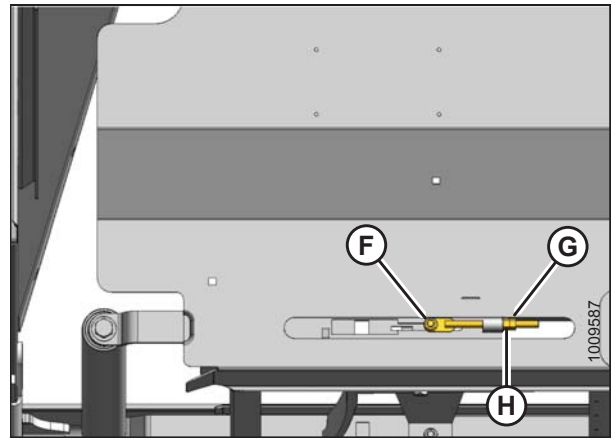


Figure 5.189: Left Deck Idler Roller (Left Shown – Right Opposite)

5.14.5 Adjusting Deck Height

DANGER

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

IMPORTANT:

New factory installed drapers are pressure and heat checked at the factory. The gap between the draper (A) and cutterbar (B) is set to 0–3 mm (0–1/8 in.). This is to prevent material from entering into the side drapers and stalling them. You may need to decrease the deck clearance to 0–1 mm (1/16 in.).

1. Shut down combine, and remove key from ignition.
2. Check that clearance (A) between draper (B) and cutterbar (C) is 0–3 mm (0–1/8 in.).

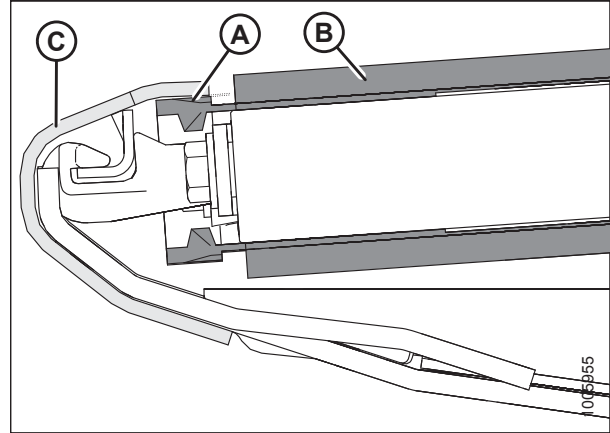


Figure 5.190: Draper Seal

NOTE:

Take measurement at deck supports (A) with the header in working position. There are between two and eight supports per deck depending on header size.

4. Loosen the draper tension. Refer to [5.14.3 Adjusting Draper Tension, page 427](#).
5. Lift the front edge of the draper (A) past the cutterbar (B) to expose the deck support.
6. Measure and note the thickness of the draper belt.

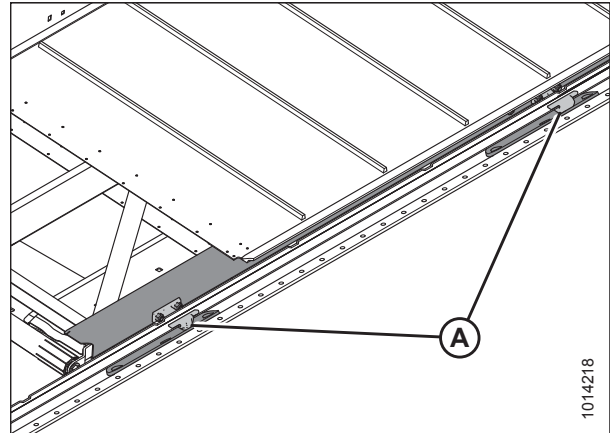


Figure 5.191: Draper Deck Supports

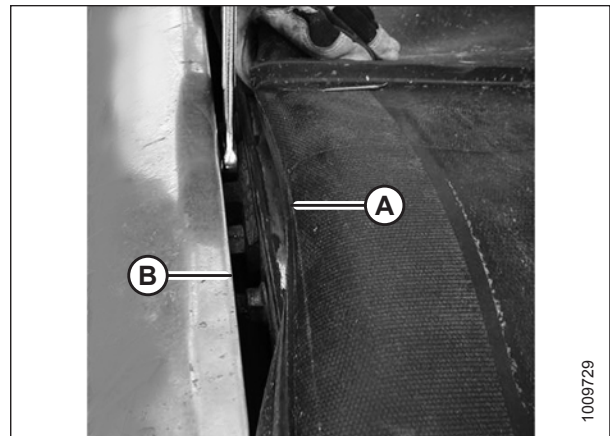


Figure 5.192: Draper Adjustment

MAINTENANCE AND SERVICING

- Loosen the two lock nuts (A) on the deck support (B) **one-half turn only**.

NOTE:

The number of deck supports (B) is determined by the header size: four on single reels, and eight on double reels.

- Tap the deck (C) to lower the deck relative to the deck supports. Tap the deck support (B) using a punch to raise the deck relative to the deck supports.

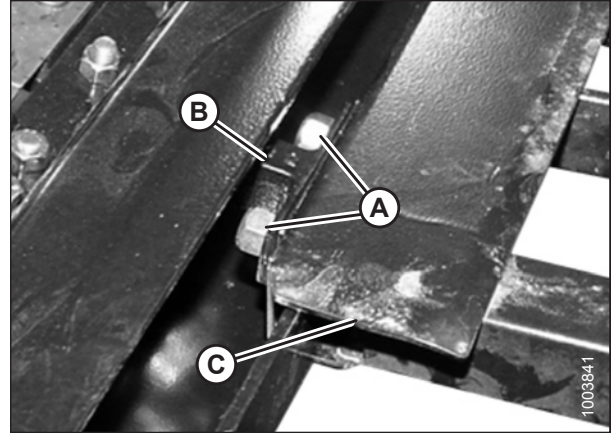


Figure 5.193: Deck Support

- Adjust deck (A) to 1 mm (1/16 in.) then add the draper thickness as measured in Step 6, [page 432](#) below (B) cutterbar (C) to create a seal.
- Tighten deck support hardware (D).
- Recheck gap (B). Refer to Step 9, [page 433](#).
- Tension the draper. Refer to [5.14.3 Adjusting Draper Tension](#), [page 427](#).

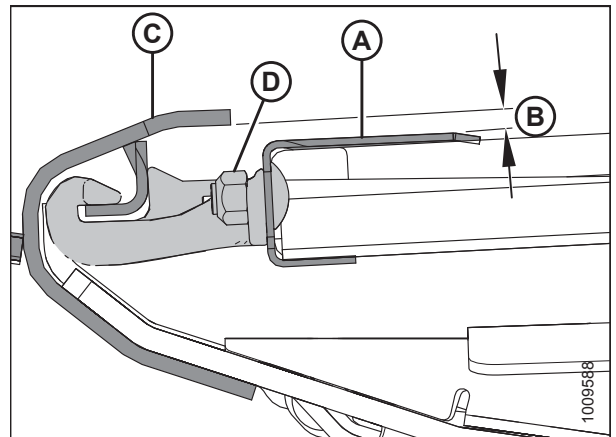


Figure 5.194: Deck Support

- Adjust the backsheet deflector (A) (if required) by loosening nut (D) and moving the deflector until there is a 1–7 mm (1/32–5/16 in.) gap (C) between the draper (B) and the deflector.

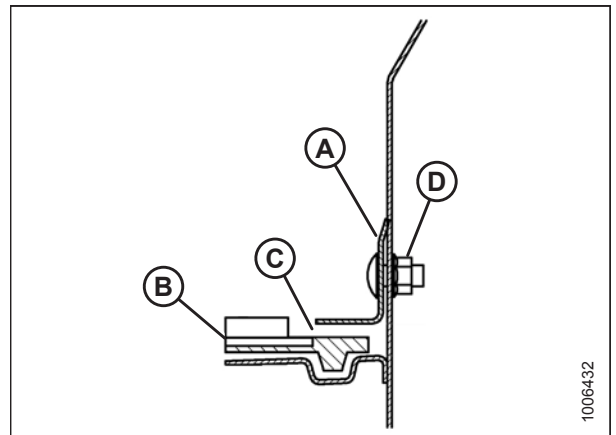


Figure 5.195: Backsheet Deflector

5.14.6 Header Draper Roller Maintenance

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.

Inspecting Draper Roller Bearing

Using an infrared thermometer, check for bad draper roller bearings as follows:

1. Engage the header and run the drapers for approximately three minutes.
2. Check the temperature of the draper roller bearings at each of the 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. Refer to

- [Replacing Header Draper Idler Roller Bearing, page 435](#), and
- [Replacing Header Draper Drive Roller Bearing, page 438](#).

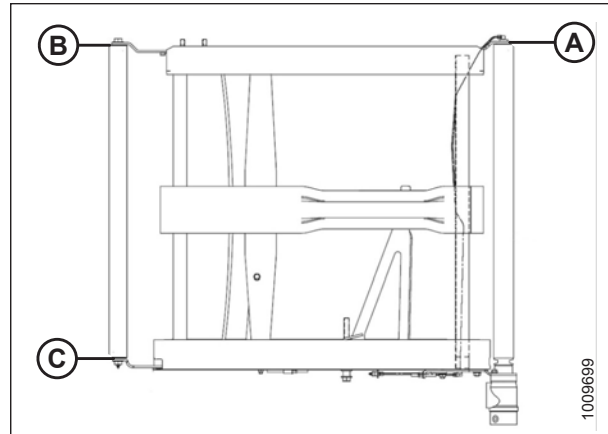


Figure 5.196: Roller Arms

Draper Deck Idler Roller

Removing Draper Deck Idler Roller



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

NOTE:

If the draper connector is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).

1. Start the engine, raise the header, and raise the reel.
2. Shut down the combine, and remove the key from the ignition.
3. Engage the reel safety props, and engage the header safety props.
4. Loosen the draper by turning adjuster bolt (A) counterclockwise.

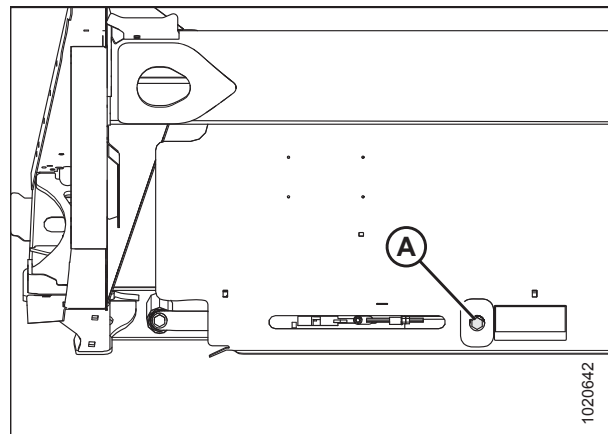


Figure 5.197: Tensioner

MAINTENANCE AND SERVICING

5. Remove the screws (A), tube connectors (B), and nuts from the draper joint to uncouple the draper.
6. Pull the draper off the idler roller.

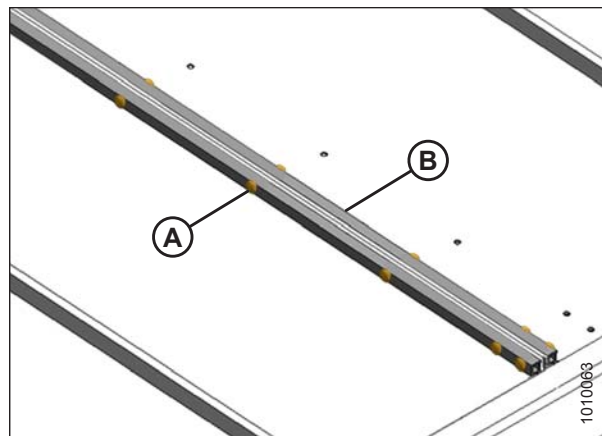


Figure 5.198: Draper Connector

7. Remove the bolts (A) and washer at both ends of the idler roller.
8. Spread the roller arms (B) and (C), and remove the idler roller.

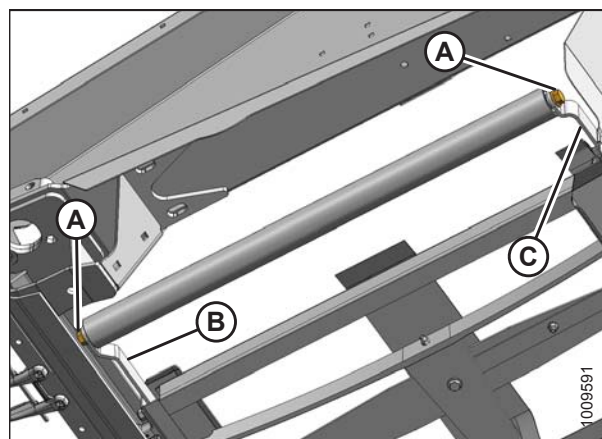


Figure 5.199: Idler Roller

Replacing Header Draper Idler Roller Bearing

1. Remove the draper idler roller assembly. Refer to [Removing Draper Deck Idler Roller, page 434](#).

MAINTENANCE AND SERVICING

2. Remove the bearing assembly (A) and seal (B) from the roller tube (C) as follows:
 - a. Attach a slide hammer (D) to the threaded shaft (E) in the bearing assembly.
 - b. Tap out the bearing assembly (A) and seal (B).
3. Clean the inside of the roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

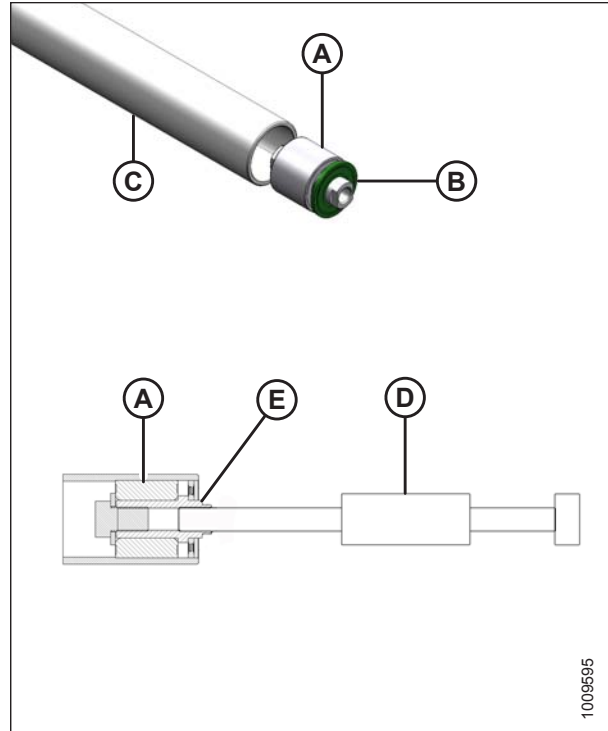


Figure 5.200: Idler Roller Bearing

4. Install the 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 SAE multi-purpose high temperature extreme pressure (EP) performance with 1% max. Molybdenum Disulphide (NLGI Grade 2) lithium base in front of the bearing assembly (A).
6. Install a 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 the seal (C) into the roller opening with a suitably sized socket. Tap the washer and the bearing assembly (A) until the seal is 3–4 mm (1/8–3/16 in.) (D) from the outside edge of the tube.

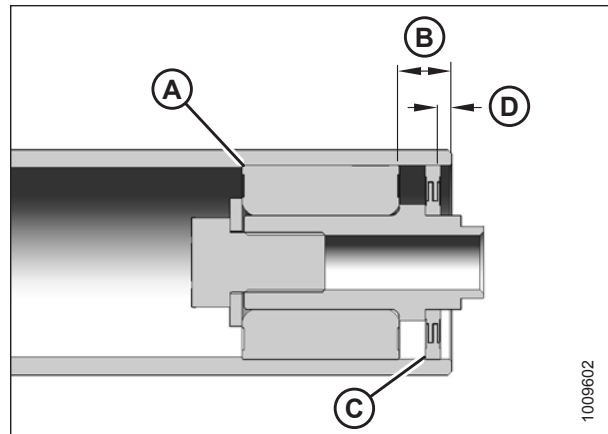


Figure 5.201: Idler Roller Bearing

Installing Header Draper Idler Roller

1. Position the stub shaft into the idler roller in the forward arm (B) on the deck.
2. Push on the roller to slightly deflect the forward arm so the stub shaft at the rear of the roller can be slipped into the rear arm (C).
3. Install bolts (A) with washers, and torque to 93 Nm (70 lbf·ft).
4. Wrap the draper over the idler roller, close the draper, and set the tension. Refer to [5.14.2 Installing Header Drapers](#), page 425.
5. Run the machine and verify the draper tracks correctly. Adjust the draper tracking if required. Refer to [5.14.4 Adjusting Header Draper Tracking](#), page 430.

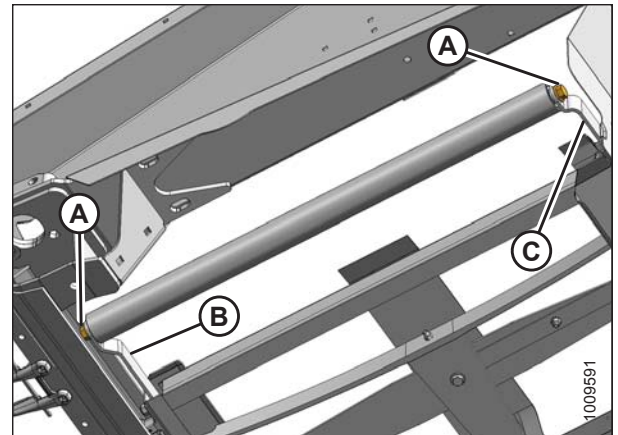


Figure 5.202: Idler Roller

Draper Deck Drive Roller

Removing Header Draper Drive Roller



DANGER

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

NOTE:

If the draper connector is not visible, engage the header until the connector is accessible (preferably close to the outboard end of the deck).

1. Start the engine, raise the header, and raise the reel.
2. Shut down the combine, and remove the key from the ignition.
3. Loosen the draper by turning the adjuster bolt (A) counterclockwise.

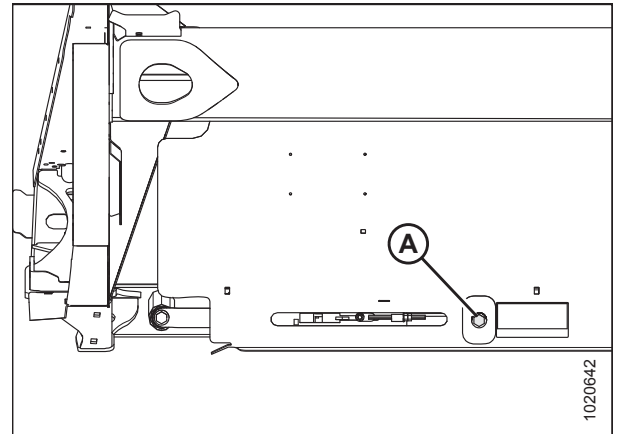


Figure 5.203: Tensioner

MAINTENANCE AND SERVICING

4. Remove the tube connectors (B), screws (A), and nuts from the draper joint to uncouple the draper.
5. Pull the draper off the drive roller.

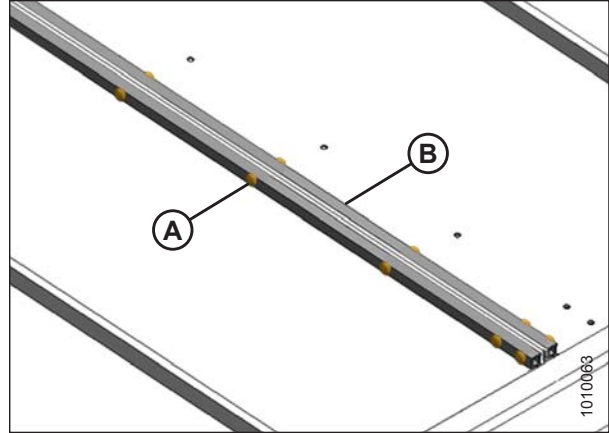


Figure 5.204: Draper Connector

6. Align the setscrews with the hole (A) in the guard. Remove the two setscrews holding the motor onto the drive roller.

NOTE:

The setscrews are 1/4 turn apart.

7. Remove the four bolts (B) securing the motor to the drive roller arm.

NOTE:

It may be necessary to remove the plastic shield (C) to gain access to the top bolt.

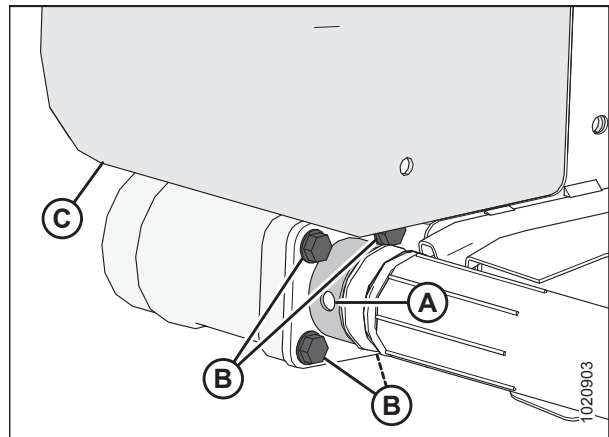


Figure 5.205: Drive Roller

8. Remove the bolt (A) securing the opposite end of the drive roller (B) to the support arm.
9. Remove the drive roller (B).

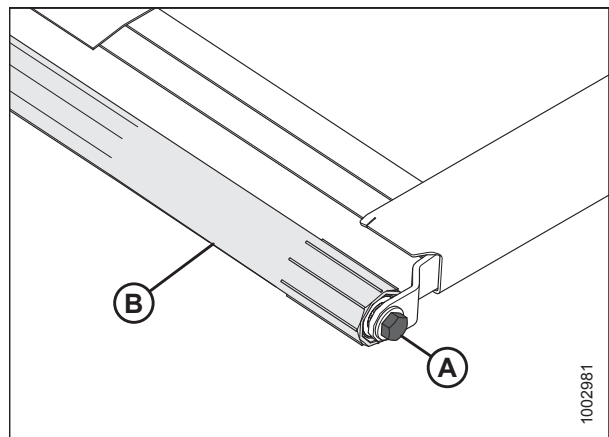


Figure 5.206: Drive Roller

Replacing Header Draper Drive Roller Bearing

1. Remove the draper idler roller assembly. Refer to [Removing Header Draper Drive Roller, page 437](#).

MAINTENANCE AND SERVICING

2. Remove the bearing assembly (A) and seal (B) from the roller tube (C) as follows:
 - a. Attach a slide hammer (D) to the threaded shaft (E) in the bearing assembly.
 - b. Tap out the bearing assembly (A) and seal (B).
3. Clean the inside of the roller tube (C), check the tube for signs of wear or damage, and replace if necessary.

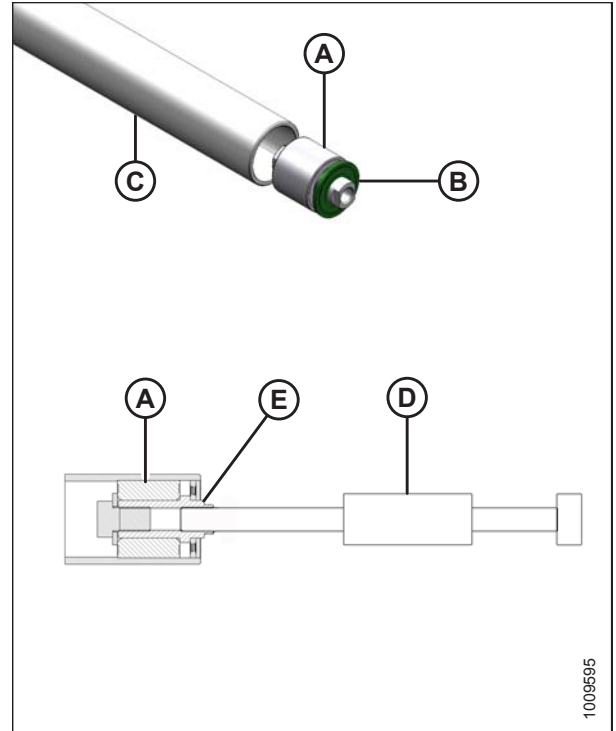


Figure 5.207: Idler Roller Bearing

4. Install the 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 SAE multi-purpose high temperature extreme pressure (EP) performance with 1% max. Molybdenum Disulphide (NLGI Grade 2) lithium base in front of the bearing assembly (A).
6. Install a 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 the seal (C) into the roller opening with a suitably sized socket. Tap the washer and the bearing assembly (A) until the seal is 3–4 mm (1/8–3/16 in.) (D) from the outside edge of the tube.

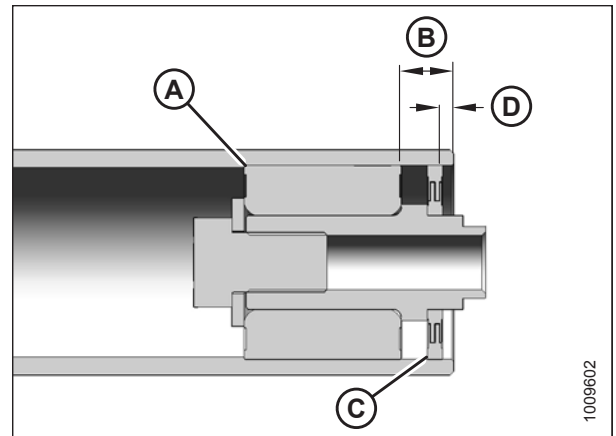


Figure 5.208: Idler Roller Bearing

Installing Draper Drive Roller

1. Position the drive roller (B) between the roller support arms.
2. Install the bolt (A) to secure the drive roller to the arm closest to the cutterbar. Torque bolt to 95 Nm (70 lbf·ft).
3. Grease the motor shaft and insert into the end of the drive roller (B).

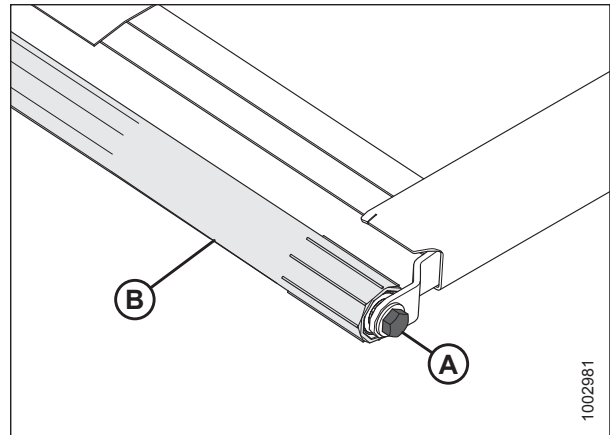


Figure 5.209: Drive Roller

4. Secure the motor to the roller support with four bolts (B). Torque to 27 Nm (20 lbf·ft).

NOTE:

Tighten any loosened bolts and reinstall the plastic shield (C) if previously removed.

5. Ensure the motor is all the way into the roller, and tighten the two setscrews (not shown) through the access hole (A).

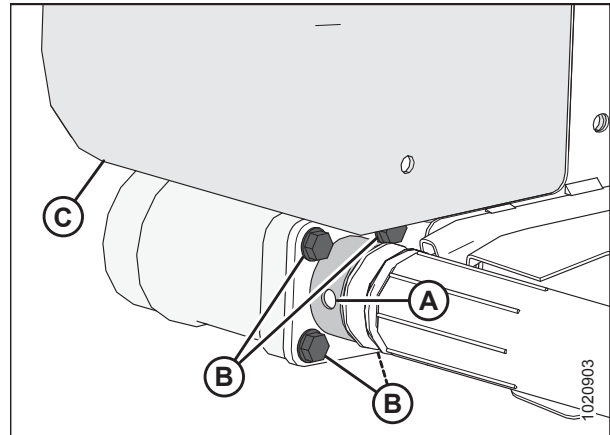


Figure 5.210: Drive Roller

6. Wrap the draper over the drive roller and attach the ends of the draper using the tube connectors (B), screws (A), and nuts.

NOTE:

The heads of the screws must face the center opening.

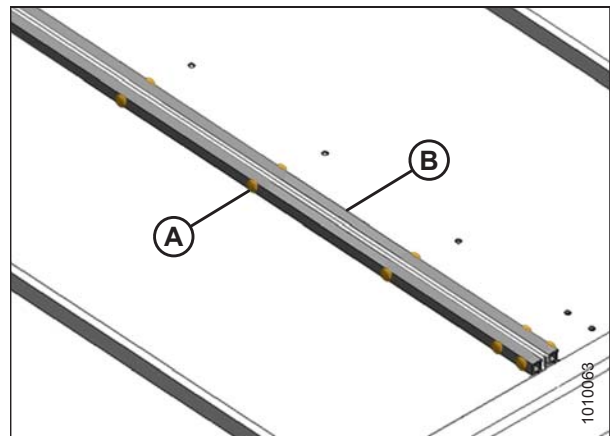


Figure 5.211: Draper Connector

MAINTENANCE AND SERVICING

7. Tension the draper. Locate adjuster bolt (A) and follow the directions on the decal (B) or refer to [5.14.3 Adjusting Draper Tension, page 427](#) for the proper draper tensioning.
8. Disengage the reel and header safety props.
9. Start the engine and lower the header and reel.
10. Run the machine to verify the draper tracks correctly. Refer to [5.14.4 Adjusting Header Draper Tracking, page 430](#) if further adjustment is necessary.

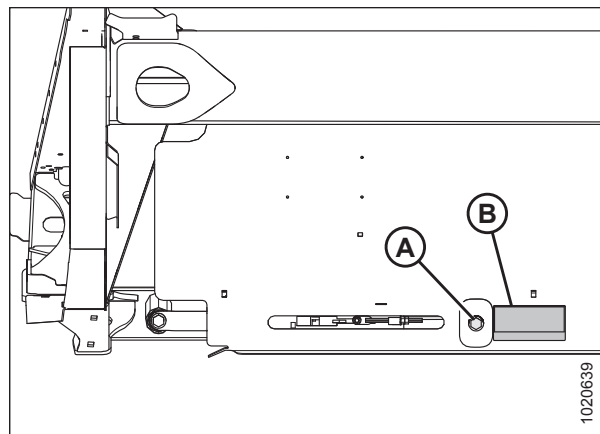


Figure 5.212: Draper Tensioner (Left Side Shown, Right Opposite)

5.15 Reel

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to [5.1 Preparing Machine for Servicing, page 325](#).

5.15.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in Table [5.4, page 443](#).

Table 5.3 Finger to Guard/Cutterbar Clearance

Header Width	(X) 3 mm (+/- 1/8 in.) at Reel Ends and Flex Locations
30 ft.	20 mm (3/4 in.)
35 ft.	
40 ft.	
45 ft.	

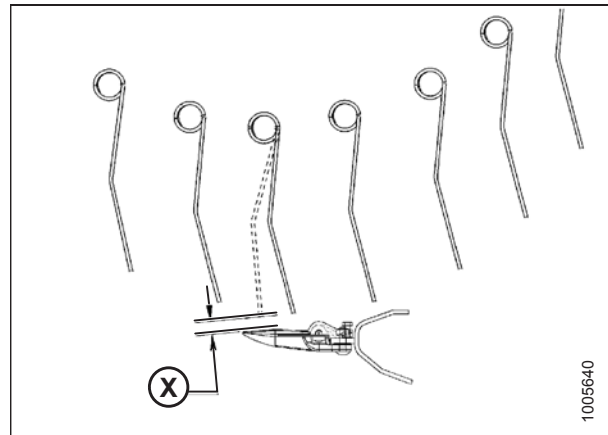


Figure 5.213: Finger Clearance

Measuring Reel Clearance

DANGER

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

IMPORTANT:

Measurements must be taken at **both ends of each reel and at the cutterbar flex locations** with the header in full-frown mode. Refer to Table [5.4, page 443](#).

MAINTENANCE AND SERVICING

Table 5.4 Finger to Guard/Cutterbar Clearance

Header Width	(X) 3 mm (+/- 1/8 in.) at Reel Ends and Flex Locations
30 ft.	20 mm (3/4 in.)
35 ft.	
40 ft.	
45 ft.	

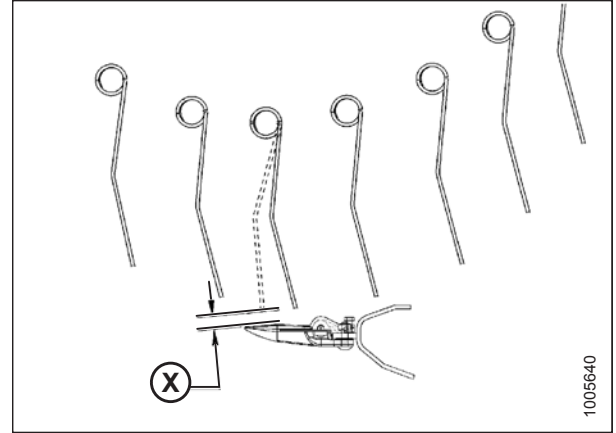


Figure 5.214: Finger Clearance

1. Park the header on level ground.
2. Move spring handles (A) down to (UNLOCK) position.

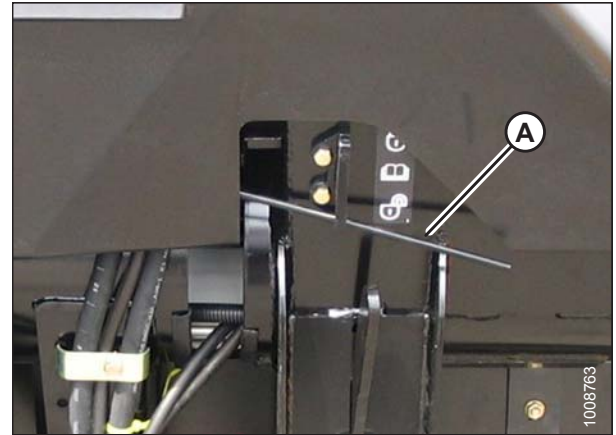


Figure 5.215: Wing Lock in UNLOCK Position

3. Raise header and place two 150 mm (6 in.) blocks (A) under the cutterbar, just inboard of the wing flex points.
4. Lower header fully, allowing it to flex into a full frown mode.

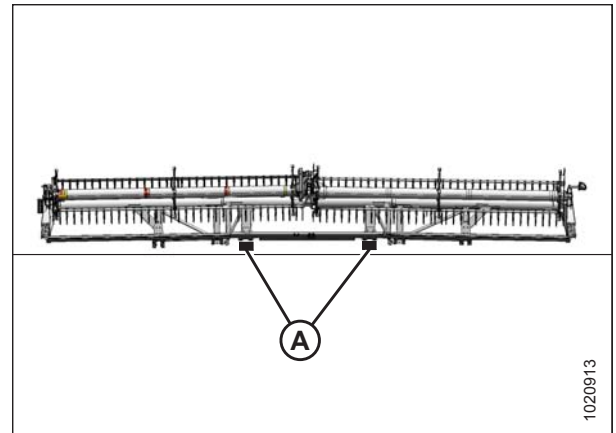


Figure 5.216: FlexDraper® Block Locations

MAINTENANCE AND SERVICING

5. Set the fore-aft position to the middle position (5) on the fore-aft position decal (A).
6. Lower the reel fully.
7. Shut down the engine, and remove the key from the ignition.

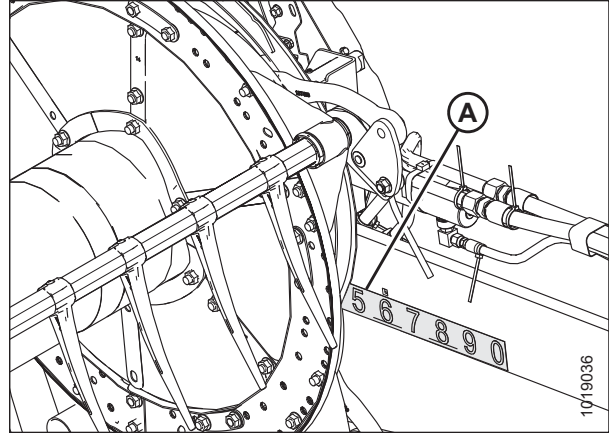


Figure 5.217: Fore-Aft Position

8. Measure the clearance (X) between points (C) and (D) at the ends of each reel (A), and at the flex locations (B). (Refer to Figure 5.219, page 444 for measurement locations.)

NOTE:

The reel is factory-set to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing.

NOTE:

When measuring reel clearance at the center of a double reel header, measure the lowest reel.

9. Check all possible points of contact between points (C) and (D). Depending on the reel fore-aft position, minimum clearance can result at the guard tine, hold-down, or cutterbar.
10. Adjust the reel if necessary. Refer to [Adjusting Reel Clearance, page 445](#).

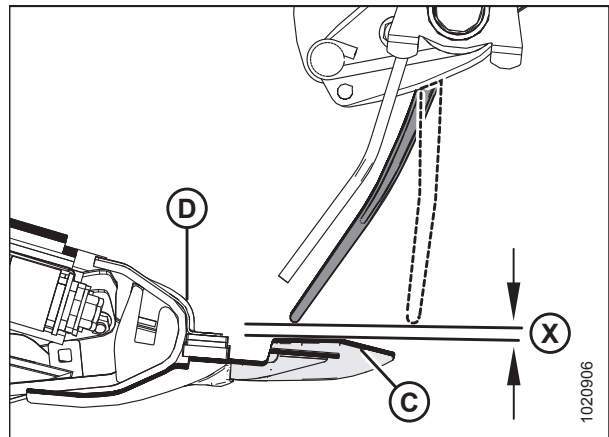


Figure 5.218: Clearance

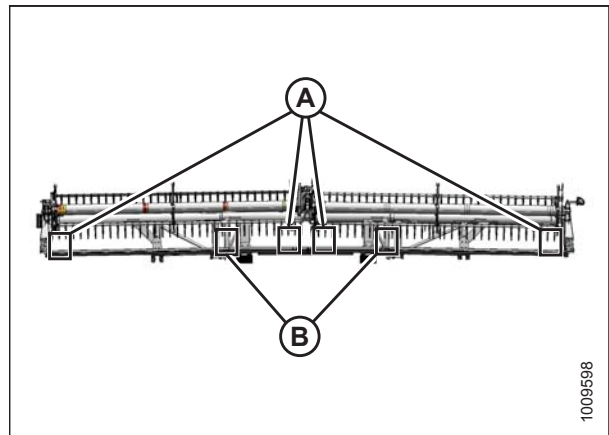


Figure 5.219: Measurement Locations

Adjusting Reel Clearance

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Adjust outboard reel arm lift cylinders to set clearance at outboard ends of reel as follows:
 - a. Loosen bolt (A).
 - b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
 - c. Tighten bolt (A).
 - d. Repeat at opposite side.

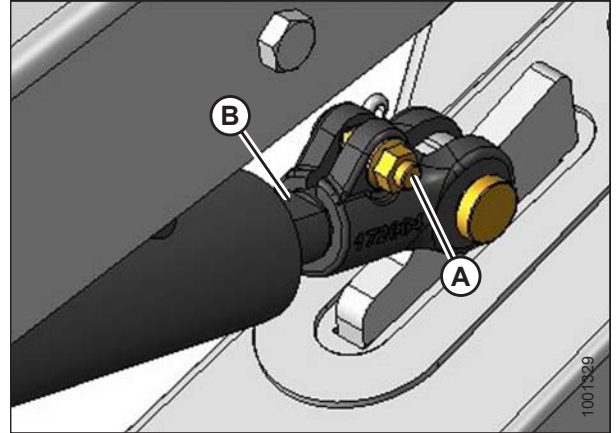


Figure 5.220: Outside Reel Arm

3. Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels and clearance at flex points as follows:
 - a. Loosen nut (B).
 - b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
 - c. Tighten nut (B).
4. Check measurements and if necessary, repeat adjustment procedures.
5. Move reel back to ensure steel end fingers do not contact deflector shields.
6. If contact is evident, adjust reel upward to maintain clearance at all reel fore/aft positions. Alternatively, trim steel end fingers to obtain proper clearance.
7. Periodically check for evidence of contact, and adjust clearance as required.

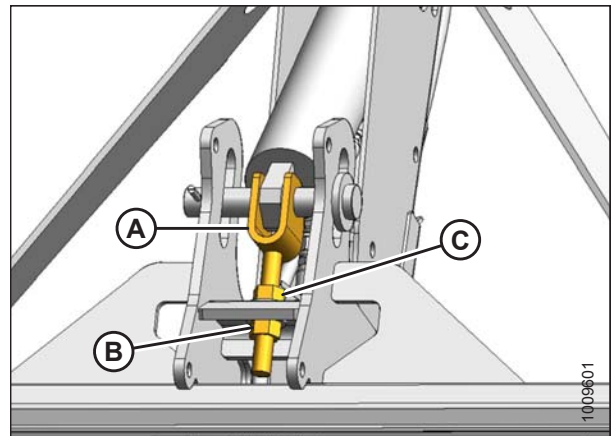


Figure 5.221: Underside of Center Arm

5.15.2 Reel Frown

The reel is factory-set to frown (provide more clearance at the center of the reel than at the ends) to compensate for reel flexing.

Adjusting Reel Frown

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

Adjust the frown by repositioning the hardware connecting the reel tube arms to the reel discs.

NOTE:

Measure the frown profile before disassembling the reel for servicing so the profile can be maintained during reassembly.

1. Position the reel over the cutterbar (between 4 and 5 on the fore-aft position decal [A]) to provide adequate clearance at all reel fore-aft positions.
2. Record the measurement at each reel disc location for each reel tube.
3. Shut down the combine and remove the key from the ignition.

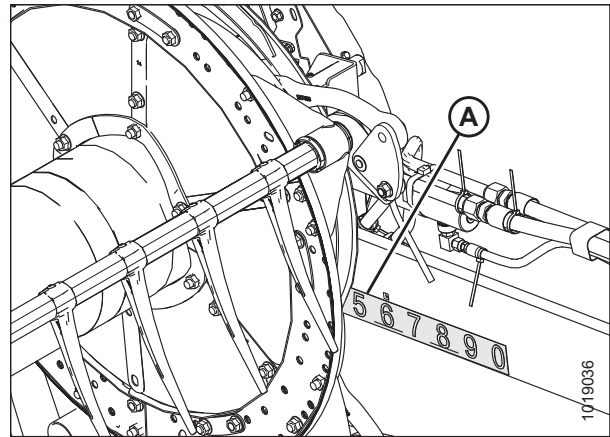


Figure 5.222: Fore-Aft Position Decal

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 the 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 the bolts (A) in the aligned holes and tighten.

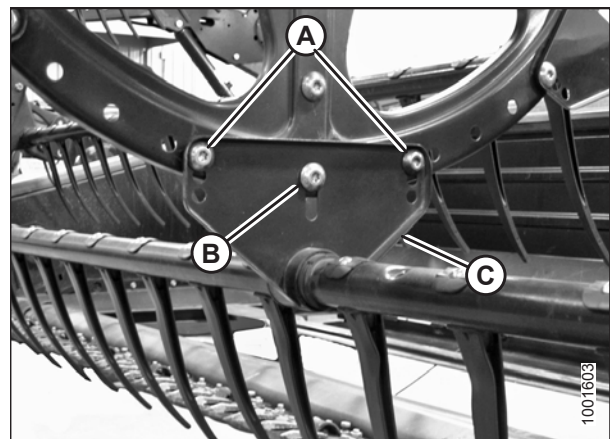


Figure 5.223: Reel Arm

5.15.3 Centering Double Reel

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

To center the reel, follow these steps:

1. Raise the header enough to put 150 mm (6 in.) blocks under the outboard skid shoes. Lower the header slowly to force it into a full smile.
2. Shut down the combine, and remove the key from the ignition.
3. Loosen bolt (A) on each brace (B).
4. Move forward end of reel center support arm (C) laterally as required, to center both reels.
5. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft).

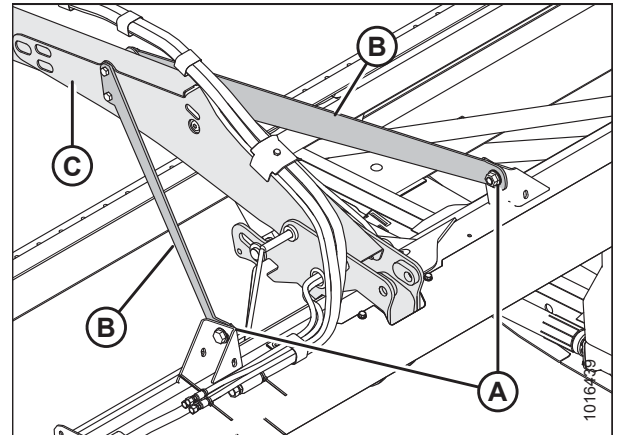


Figure 5.224: Reel Center Support Arm

5.15.4 Reel Fingers

IMPORTANT:

Keep the reel fingers in good condition and straighten or replace them as necessary.

Removing Steel Fingers

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under 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, raise the reel, and engage the reel safety props.
2. Shut down the combine, and remove the key from the ignition.
3. Remove the tine tube bushings from the applicable tine tube at the center and left reel discs. Refer to [Removing Bushings from Five-, Six-, or Nine-Bat Reels, page 451](#).

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4. Attach reel arms (B) (temporarily) to the reel disc at the original attachment locations (A).
5. Cut the damaged finger so it can be removed from the tine tube.
6. Remove bolts from the existing fingers and slide the fingers over to replace the finger that was cut off in Step 4, [page 448](#) (remove the reel arms [B] from the tine tubes as necessary).

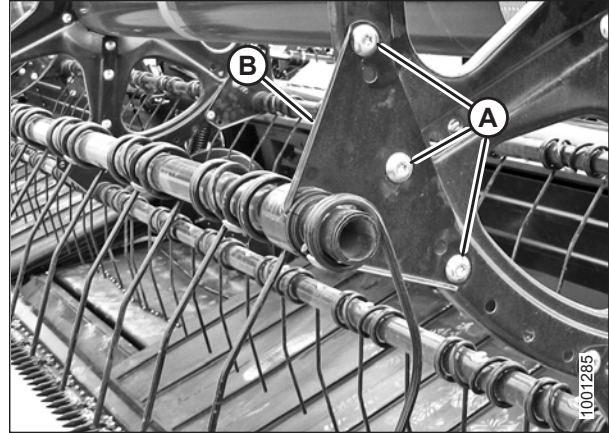


Figure 5.225: Reel Arm

Installing Steel Fingers

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under 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. Remove the applicable finger. Refer to [Removing Steel Fingers, page 447](#).
2. Slide the new fingers and reel arm (A) onto the end of the tube.
3. Install the tine tube bushings. Refer to [Installing Bushings on Five-, Six-, or Nine-Bat Reels, page 457](#).
4. Attach the fingers to the tine bar with bolts and nuts (B).

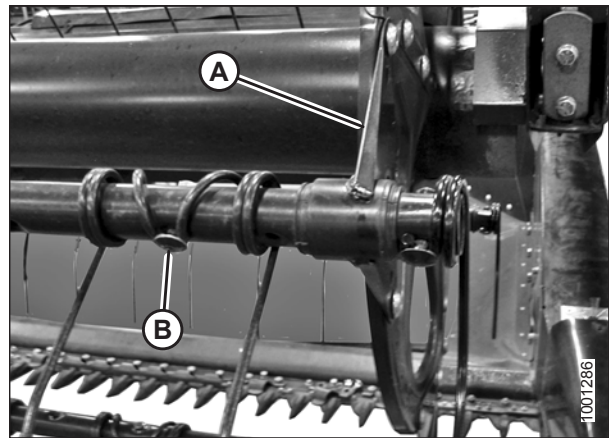


Figure 5.226: Tine Tube

Removing Plastic Fingers

! WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

! WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

2. Shut down the engine and remove key from the ignition.
3. Remove screw (A) using a Torx® Plus 27 IP socket wrench.

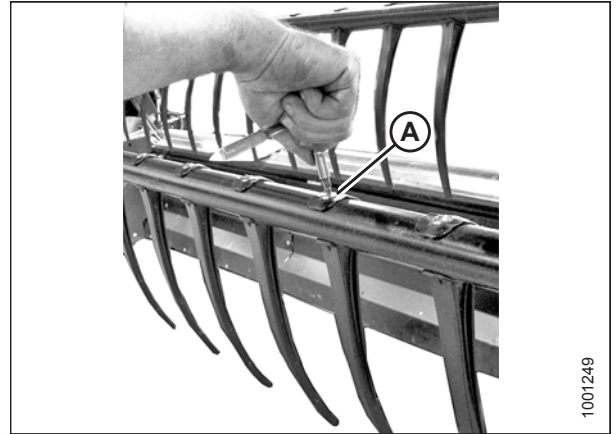


Figure 5.227: Removing Plastic Finger

4. Push the clip at the top of the finger back towards the reel tube and remove the finger from the tube.



Figure 5.228: Removing Plastic Finger

Installing Plastic Fingers

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

1. Position the finger on the rear of the finger tube and engage the lug at the bottom of the finger in the lower hole in the finger tube.
2. Lift the top flange gently and rotate the finger until the lug in the top of the finger engages the upper hole in the finger tube.



Figure 5.229: Installing Plastic Finger

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.

3. Install the screw (A) using a Torx® Plus 27 IP socket wrench and torque to 8.5–9.0 Nm (75–80 lbf in).

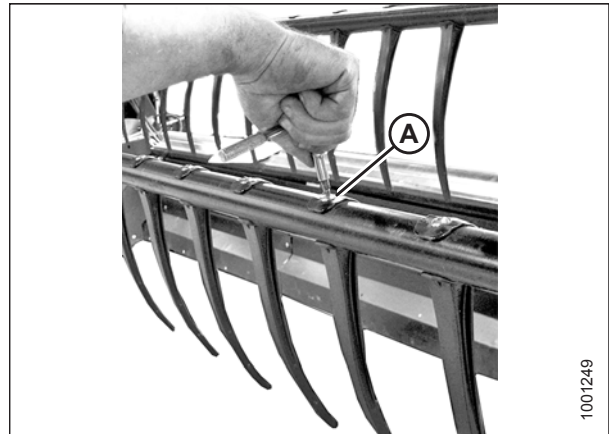


Figure 5.230: Installing Plastic Finger

5.15.5 Tine Tube Bushings

Removing Bushings from Five-, Six-, or Nine-Bat Reels

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under 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, raise the reel, and engage the reel safety props.
2. Shut down the combine, and remove the key from the ignition.

NOTE:

If replacing only the cam end bushing, refer to Step 8, [page 452](#).

Center disc and tail-end bushings

3. 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.

4. Remove bolts (A) securing arm (B) to the disc.

IMPORTANT:

Note the hole locations in the arm and disc and ensure the bolts (A) are reinstalled at the original locations.

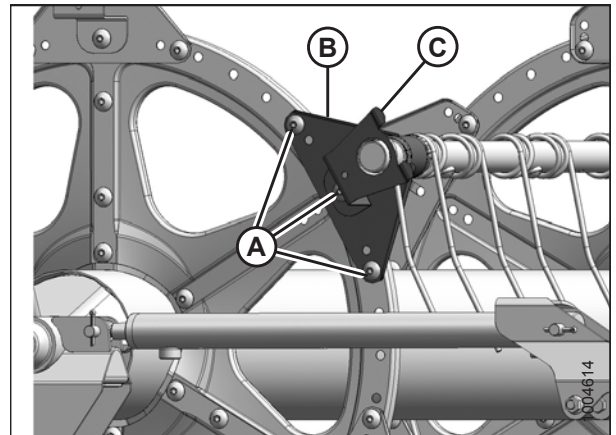


Figure 5.231: Tail End

MAINTENANCE AND SERVICING

5. Release the bushing clamps (A) using a small screwdriver to separate the serrations. Pull the clamp off the tine tube.

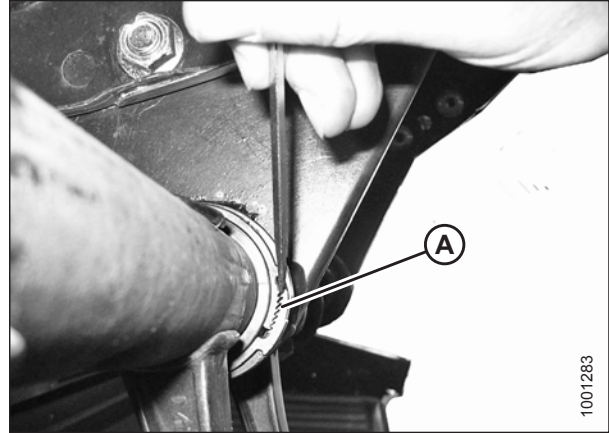


Figure 5.232: Bushing Clamp

6. Rotate the arm (A) until clear of the disc and slide the arm inboard off of bushing (B).
7. Remove the bushing halves (B). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 449](#)
 - [Removing Steel Fingers, page 447](#)

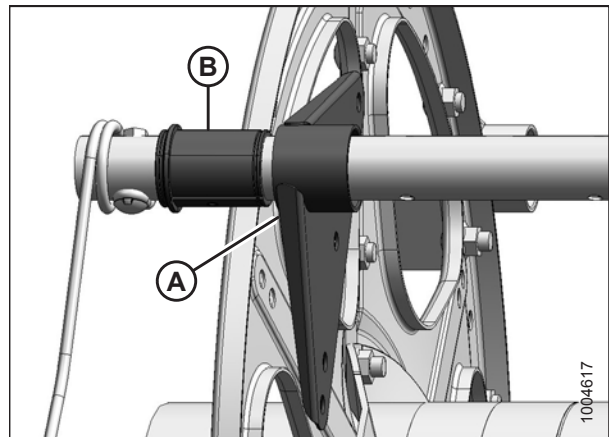


Figure 5.233: Bushing

Cam end bushings

8. Remove the endshields and endshield support (A) at the applicable tine tube location on the cam end.

NOTE:

Removing cam end bushings requires the tine tube be moved through the disc arms to expose the bushing.

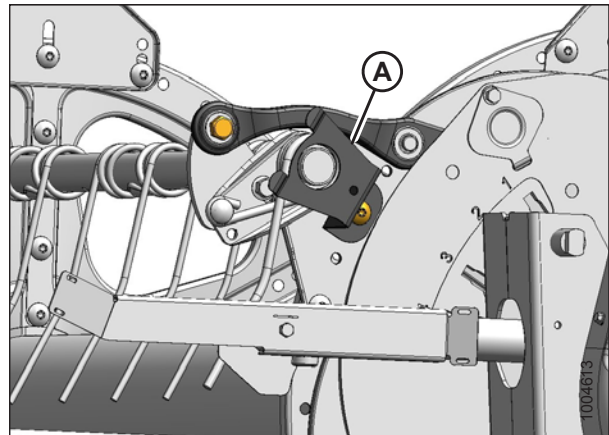


Figure 5.234: Cam End

MAINTENANCE AND SERVICING

9. 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.

10. Remove the bolts (A) securing the arms (B) to the tail and center discs.

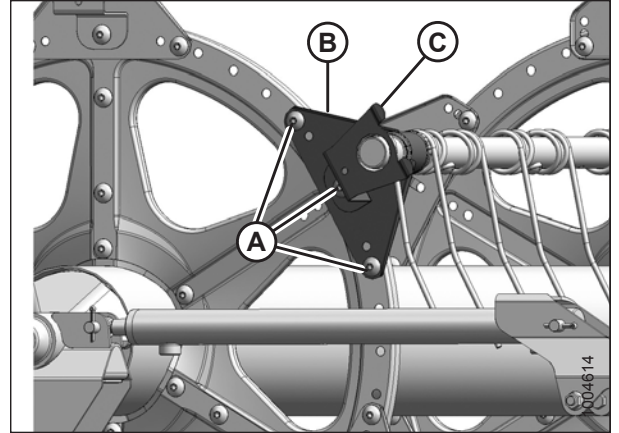


Figure 5.235: Tail End

11. 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.

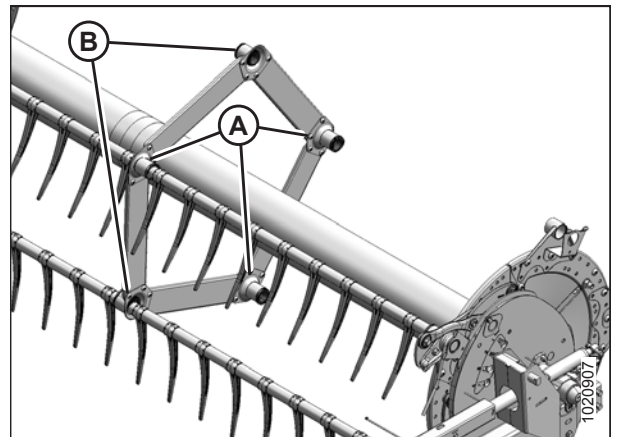


Figure 5.236: Tine Tube Supports

12. Remove bolt (A) from the cam linkage so the tine tube (B) is free to rotate.

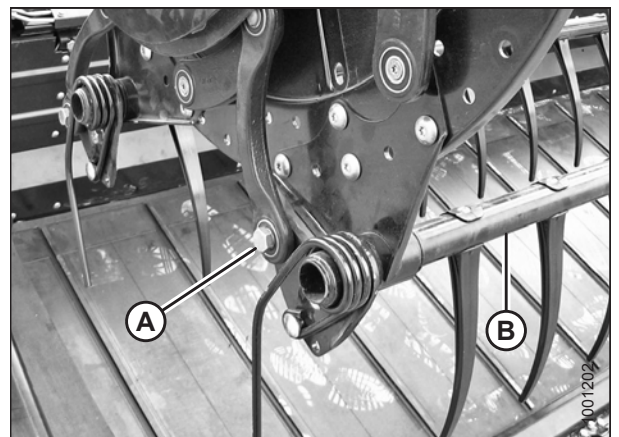


Figure 5.237: Cam End

MAINTENANCE AND SERVICING

13. Release the bushing clamps (A) at the cam disc using a small screwdriver to separate the serrations. Move the clamps off the bushings.

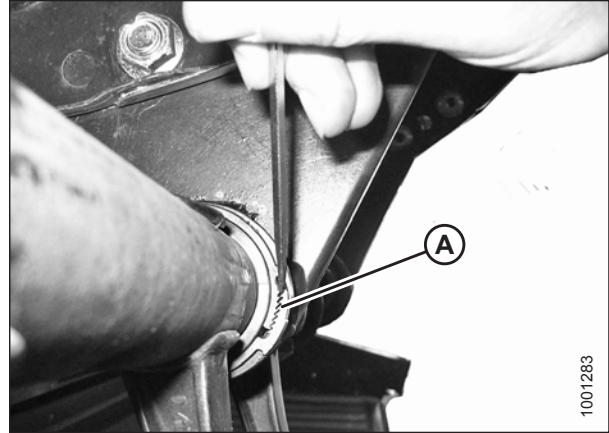


Figure 5.238: Bushing Clamp

14. Slide the tine tube (A) outboard to expose the bushing (B).
15. Remove the bushing halves (B). If required, remove the next tine or plastic finger so the arm can slide off the bushing. Refer to the following procedures if necessary:
 - [Removing Plastic Fingers, page 449](#)
 - [Removing Steel Fingers, page 447](#)

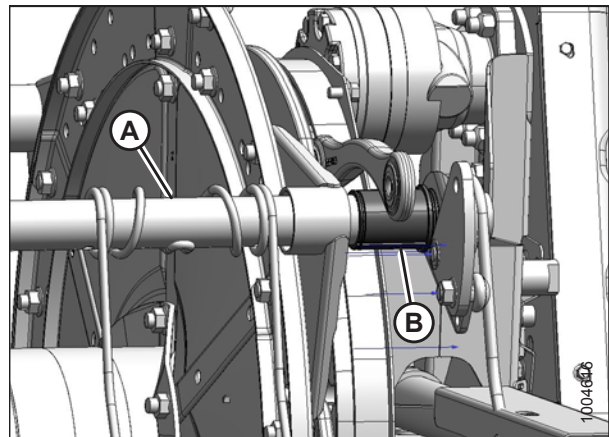


Figure 5.239: Cam End

Tine tube bushings (if installed)

16. Locate the support (A) that requires a new bushing.
17. Remove the four bolts (B) securing channels (C) to the support (A).
18. Remove screw (E) and remove the finger (D) if it is too close to the support to allow access to the bushing. Refer to [Removing Plastic Fingers, page 449](#).

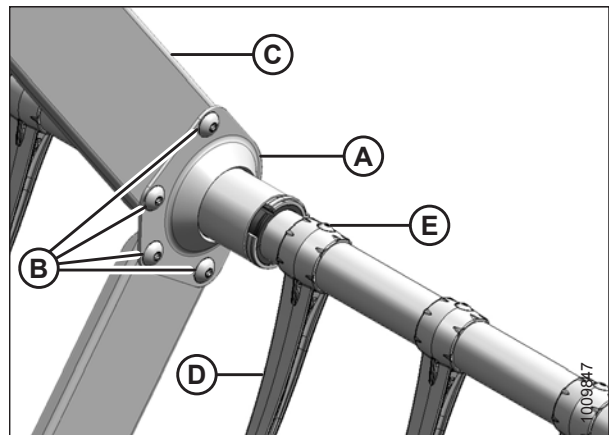


Figure 5.240: Tine Tube Support

MAINTENANCE AND SERVICING

19. Release the bushing clamps (A) using a small screwdriver to separate the serrations. Move the clamps off the bushings.

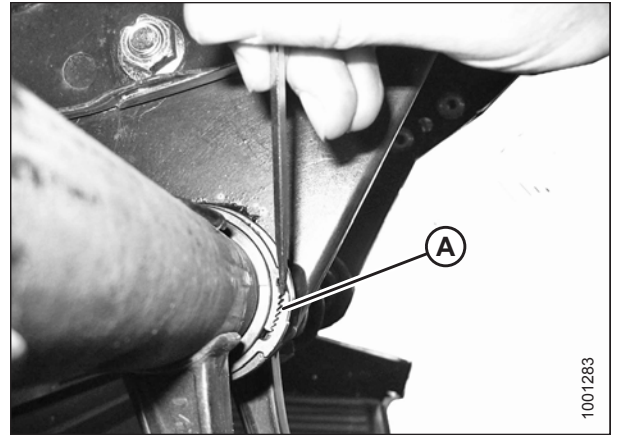


Figure 5.241: Bushing Clamp

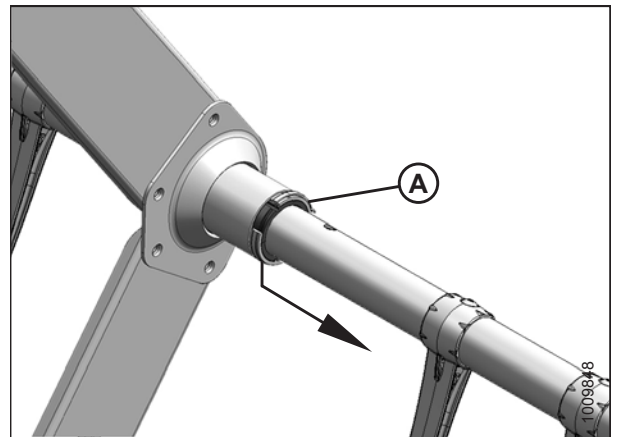


Figure 5.242: Bushing Clamp

MAINTENANCE AND SERVICING

20. Slide the support (A) off the bushing halves (B).

NOTE:

Two tine tubes have opposite supports (C). Rotate the supports until the flanges clear the channels before moving them off the bushing (B). Move the tine tube outwards slightly if necessary.

21. Remove the bushing halves (B).

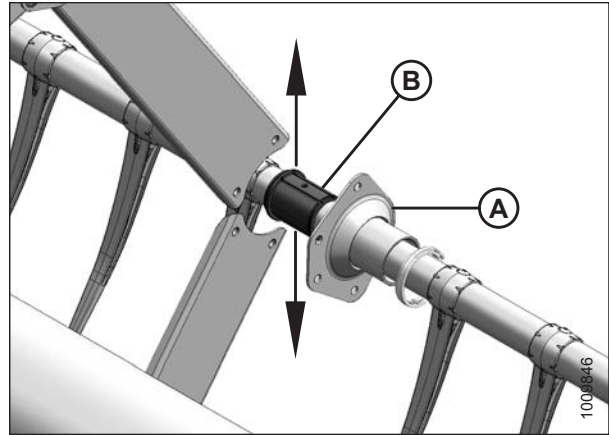


Figure 5.243: Support

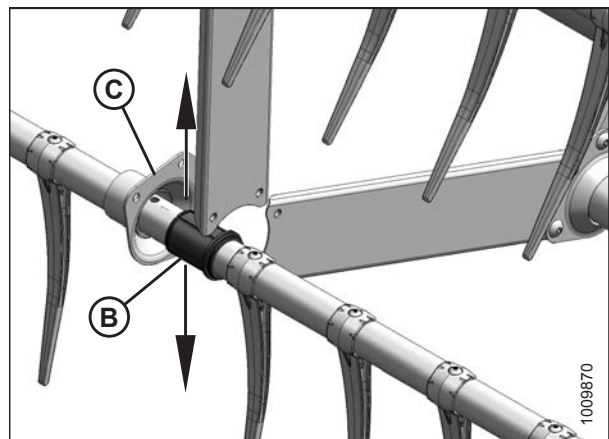


Figure 5.244: Opposite Support

Installing Bushings on Five-, Six-, or Nine-Bat Reels

WARNING

To avoid bodily injury from fall of raised reel, always engage reel safety props before going under raised reel for any reason.

IMPORTANT:

Ensure tine tube is supported at all times to prevent damage to the tube or other components.

NOTE:

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.

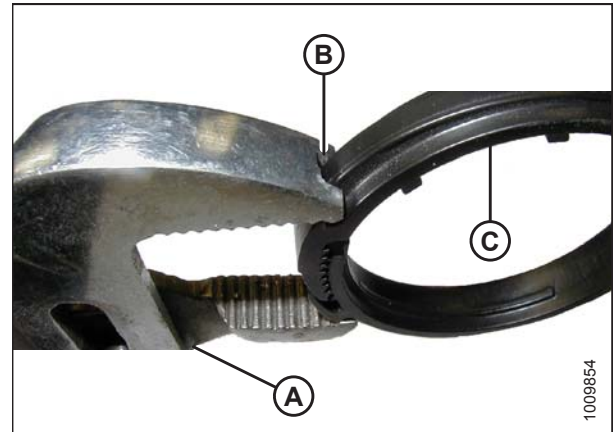


Figure 5.245: Modified Pliers

Cam end bushings

1. Position the bushing halves (B) on the tine tube (A) with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in the tine tube.
2. Slide the tine tube (A) towards the tail end of the reel to insert the bushing (B) into the reel arm. If the tine tube supports are installed, ensure the bushings at those locations slide into the support.
3. Reinstall the previously removed fingers or tines. Refer to the following procedures as necessary:
 - [Removing Plastic Fingers, page 449](#)
 - [Removing Steel Fingers, page 447](#)

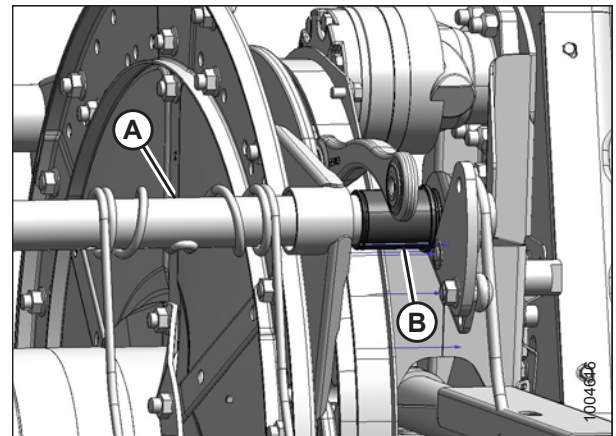


Figure 5.246: Cam End

MAINTENANCE AND SERVICING

4. Install the bushing clamp (A) onto the tine tube adjacent to the flangeless end of the bushing (B).
5. Position the clamp (A) on the 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.

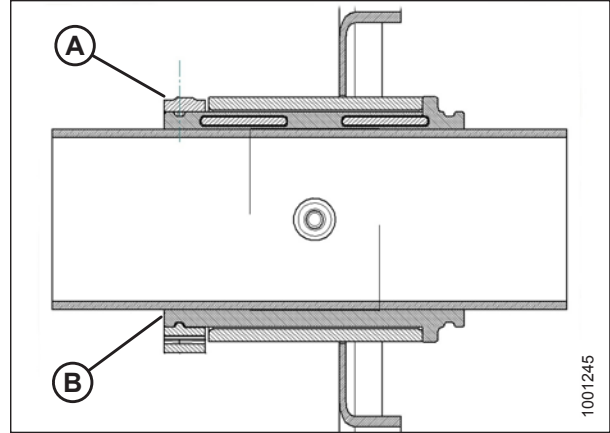


Figure 5.247: Bushing

6. Tighten the clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

IMPORTANT:

Overtightening clamp may result in breakage.

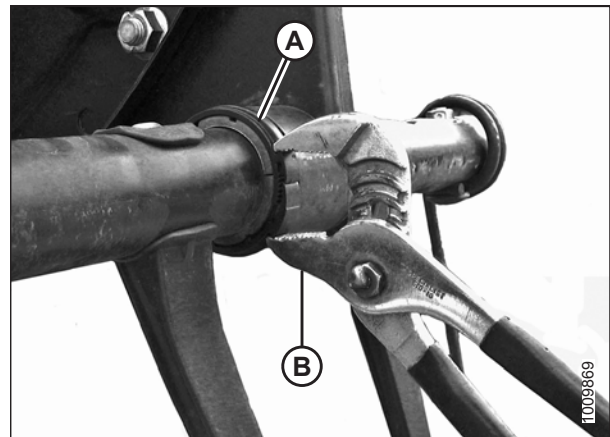


Figure 5.248: Installing Clamp

7. Line up the tine bar (B) with the cam arm and install bolt (A). Torque bolt to 165 Nm (120 lbf·ft).

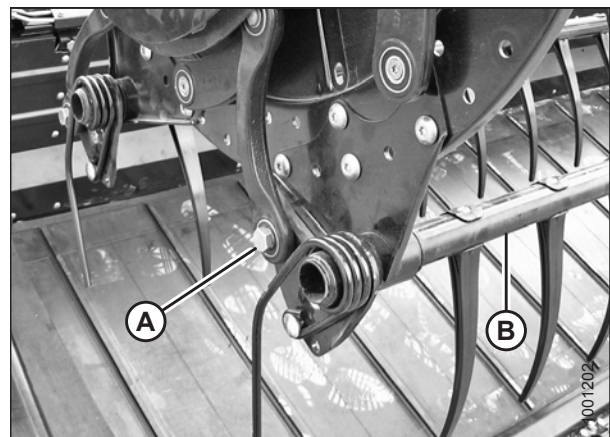


Figure 5.249: Cam End

MAINTENANCE AND SERVICING

8. Install the bolts (A) securing the arm (B) to the center disc.
9. Install the reel arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

NOTE:

There are no endshields on the center discs.

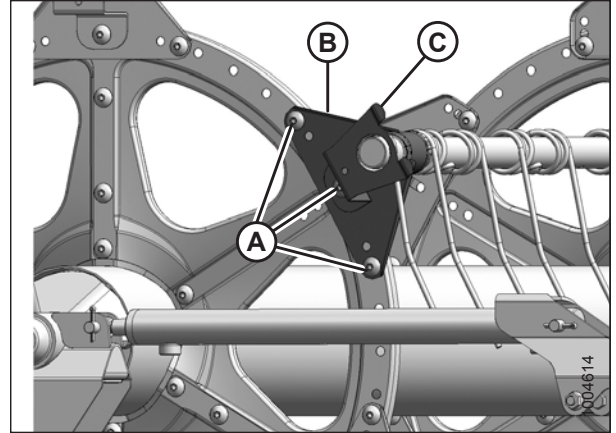


Figure 5.250: Tail End

10. Install the endshield support (A) at the applicable tine tube location at the cam end.
11. Reinstall the reel endshields. Refer to [Replacing Reel Endshields, page 464](#).

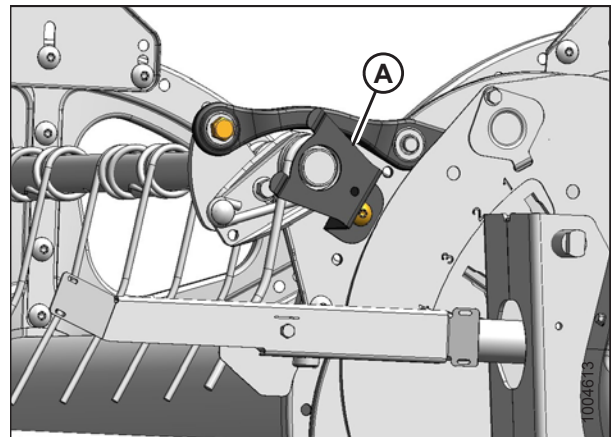


Figure 5.251: Cam End

Center disc and tail end bushings

12. Position the bushing halves (B) on the tine tube (A) with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in the tine tube.
13. Slide the reel arm (A) onto the bushing (B) and position against the disc at the original location.
14. Reinstall the previously removed fingers or tines. Refer to the following procedures as necessary:
 -
 -

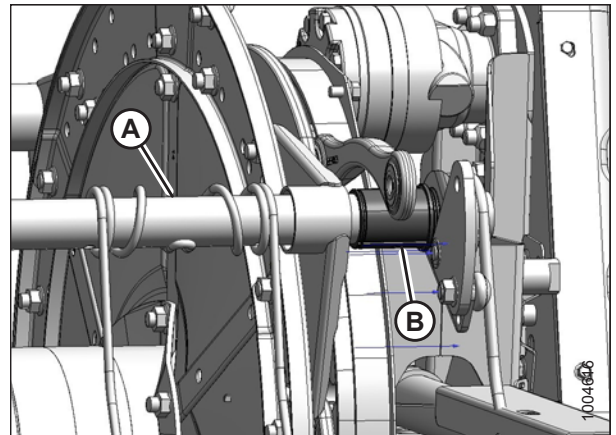


Figure 5.252: Cam End

MAINTENANCE AND SERVICING

15. Install the bushing clamp (A) onto the tine tube adjacent to the flangeless end of the bushing (B).
16. Position the clamp (A) on the 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.

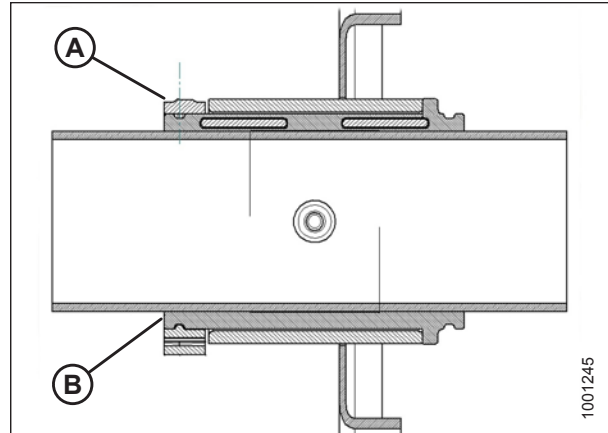


Figure 5.253: Bushing

17. Tighten the clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

IMPORTANT:

Overtightening clamp may result in breakage.

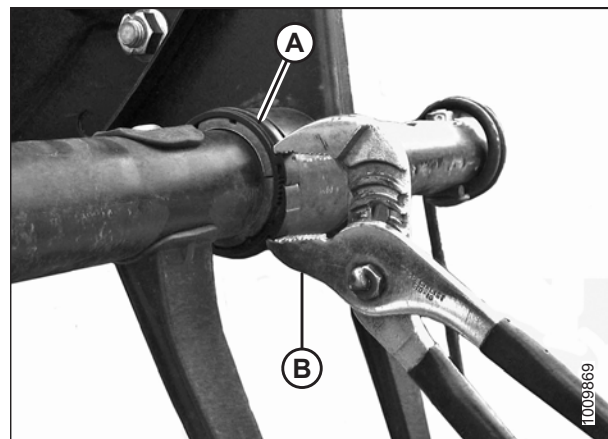


Figure 5.254: Installing Clamp

18. Install the bolts (A) securing the arm (B) to the center disc.
19. Install the reel arm (B) and endshield support (C) to the tail end of the reel at the applicable tine tube location and secure with bolts (A).

NOTE:

There are no endshields on the center discs.

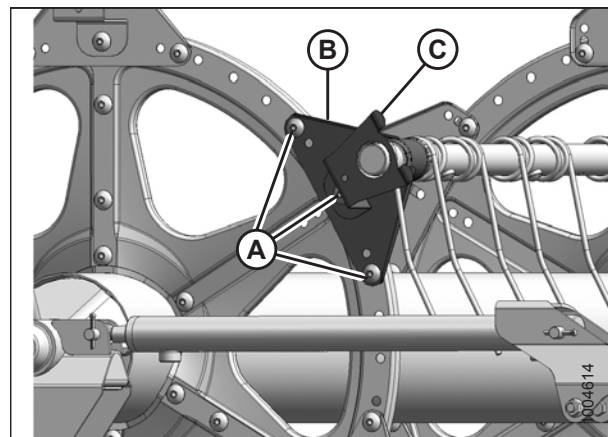


Figure 5.255: Tail End

Tine tube support (if installed) bushings

20. Position the bushing halves (B) on the tine tube (A) with the flangeless end adjacent to the reel arm, and position the lug in each bushing half into the hole in the tine tube.

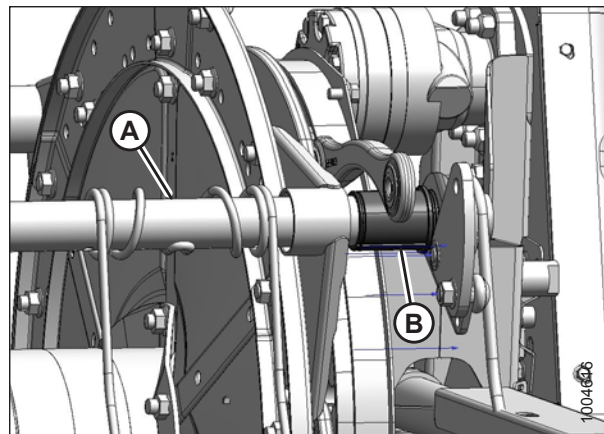


Figure 5.256: Cam End

21. Slide the support (A) onto the bushing (B). For the opposite tine tube, rotate the support (A) or slightly move the tine tube until it clears the channels (C).

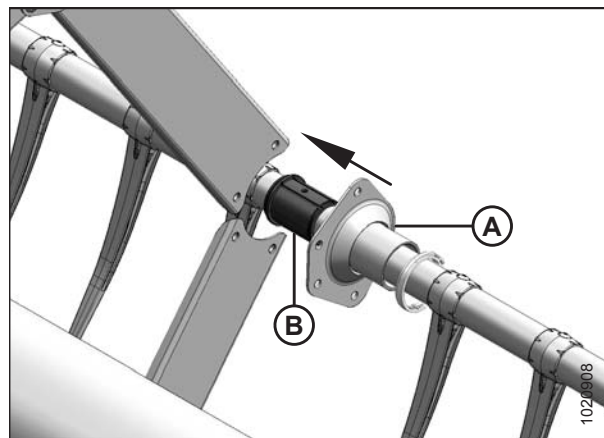


Figure 5.257: Support

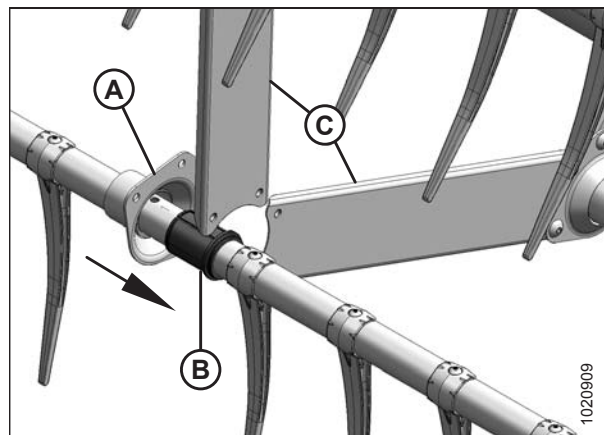


Figure 5.258: Opposite Support

MAINTENANCE AND SERVICING

22. Install the bushing clamp (A) onto the tine tube adjacent to the flangeless end of the bushing (B).
23. Position the clamp (A) on the 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.

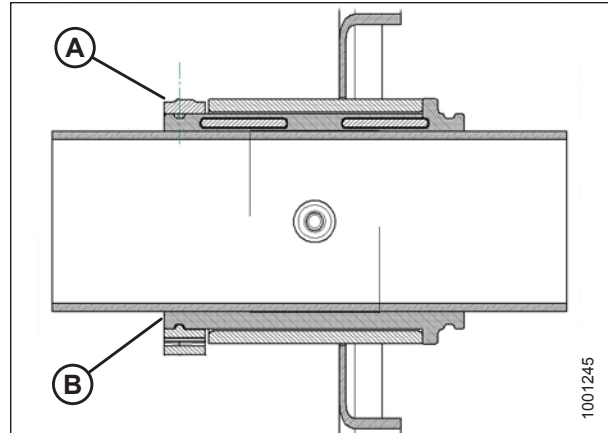


Figure 5.259: Bushing

24. Tighten the clamp (A) using modified channel lock pliers (B) until finger pressure will **NOT** move the clamp.

IMPORTANT:

Overtightening clamp may result in breakage.

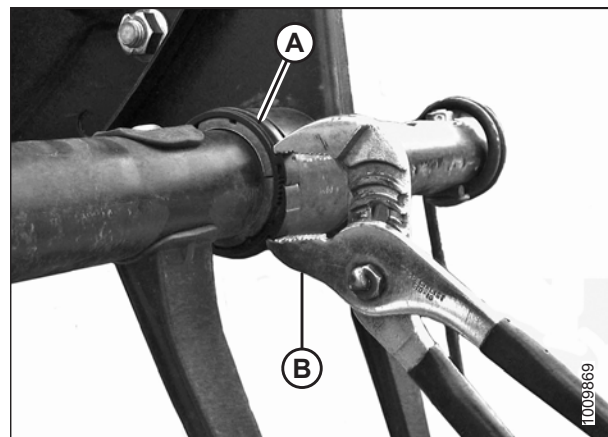


Figure 5.260: Installing Clamp

MAINTENANCE AND SERVICING

25. Reattach the channels (C) to the support (A) with screws (B) and nuts. Torque screws to 43 Nm (32 lbf·ft).
26. Reinstall any fingers (D) that were previously removed using screws (E). Refer to [Installing Plastic Fingers](#), page 450.

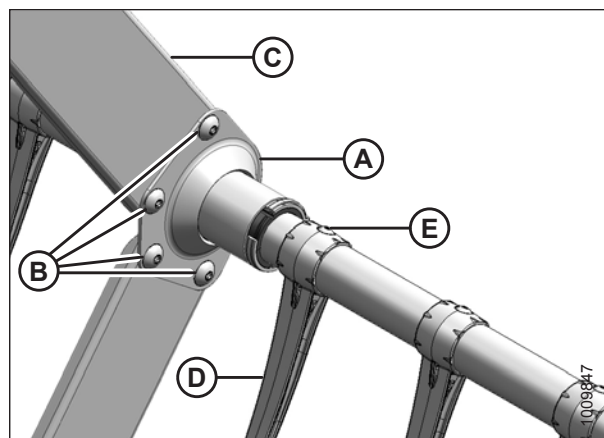


Figure 5.261: Support

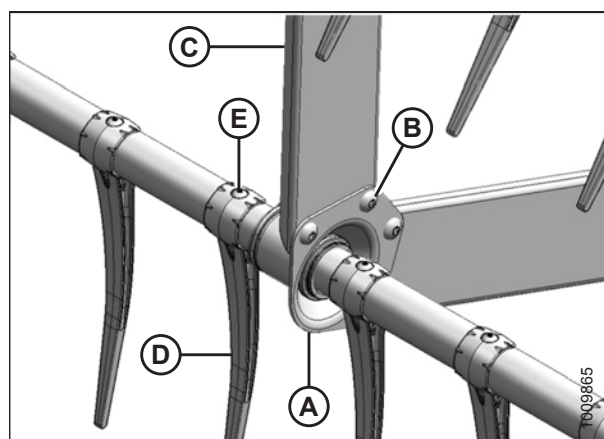


Figure 5.262: Opposite Support

5.15.6 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.

You can attach reel endshields to either end of the reel.

Replacing Reel Endshields

⚠ DANGER

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

1. Lower the header and reel.
2. Shut down the combine, and remove the key from the ignition.
3. Rotate the reel manually until the reel endshield (A) requiring replacement is accessible.
4. Remove three bolts (B).

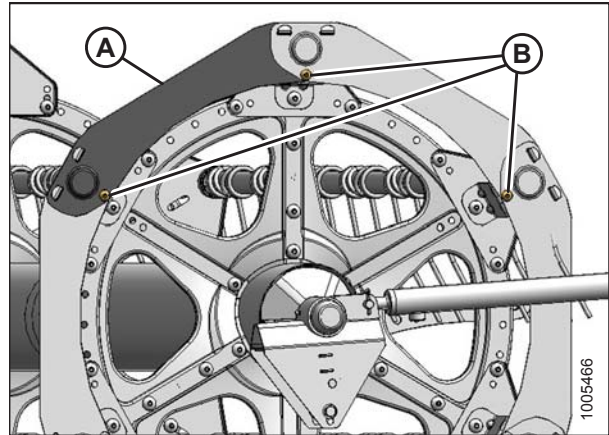


Figure 5.263: Reel Endshields

5. Lift end of reel endshield (A) off support (B).

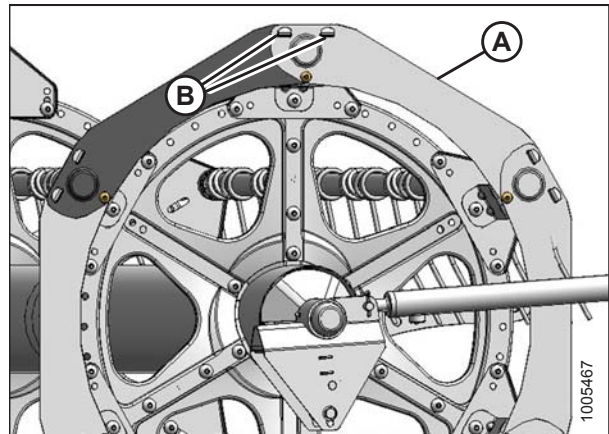


Figure 5.264: Reel Endshields

MAINTENANCE AND SERVICING

6. Remove the reel endshield from the supports.

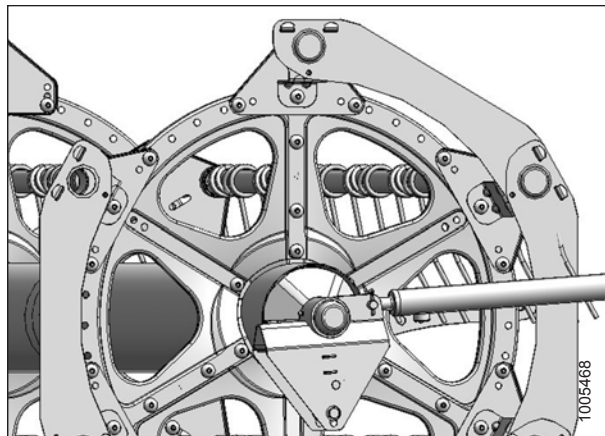


Figure 5.265: Reel Endshields

7. Remove the reel endshield (A) from support (B).
8. Install new reel endshield (C) onto support (B).
9. Reattach reel endshield (A) onto support (B) ensuring it is installed on top of the reel endshield (C).
10. Reinstall bolts (D).
11. Tighten all hardware.

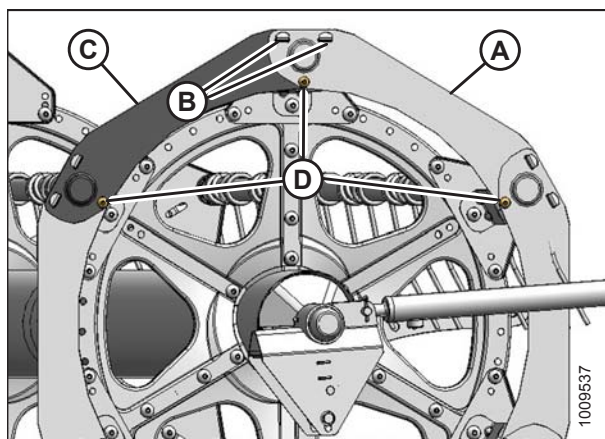


Figure 5.266: Reel Endshields

Replacing Reel Endshield Supports

DANGER

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

1. Lower the header and reel.
2. Shut down the combine, and remove the key from the ignition.
3. Rotate the reel manually until the reel endshield requiring replacement is accessible.
4. Remove bolt (B) from support (A).
5. Remove bolts (C) from support (A) and two adjacent supports.
6. Move the reel endshields (A) away from the tine tube and rotate the support (B) towards the reel to remove it.
7. Insert tabs of new support (B) into the slots in the reel endshields (A). Ensure the tabs engage both reel endshields.
8. Secure support (B) to the disc with bolt (C) and nut. Do not tighten.
9. Secure the reel endshields (A) to support (B) with bolt (C) and nut. Do not tighten.
10. Reattach the supports with bolts (C) and nuts.
11. Check the clearance between the tine tube and reel endshield support and adjust if necessary.
12. Torque nuts to 27 Nm (20 lbf·ft).

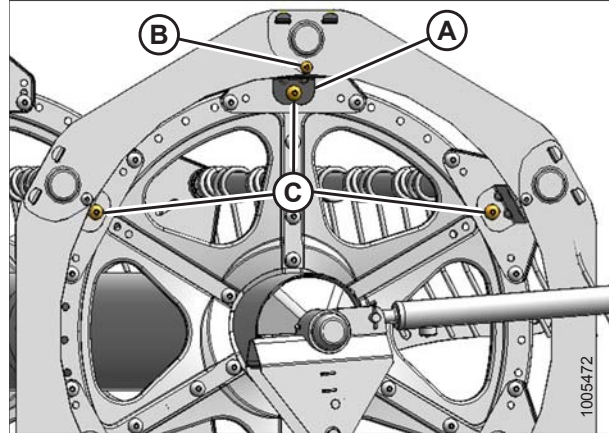


Figure 5.267: Reel Endshield Supports

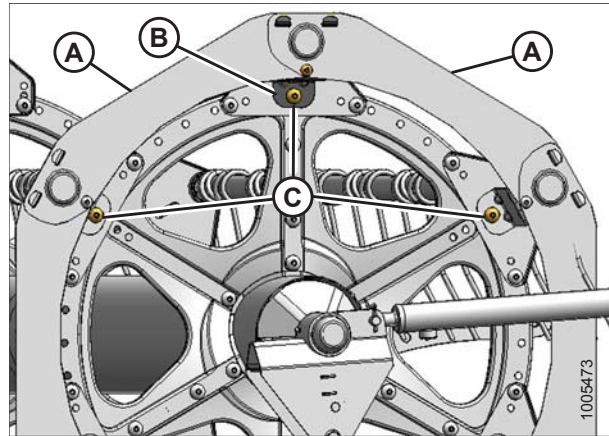


Figure 5.268: Reel Endshield Supports

5.16 Reel System

The hydraulically driven reel motor drives the chain case that is attached between the reels on a double-reel header.

5.16.1 Reel Drive Cover

Removing Reel Drive Cover



DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove six bolts (A) securing the upper cover (B) to the reel drive and lower cover (C).

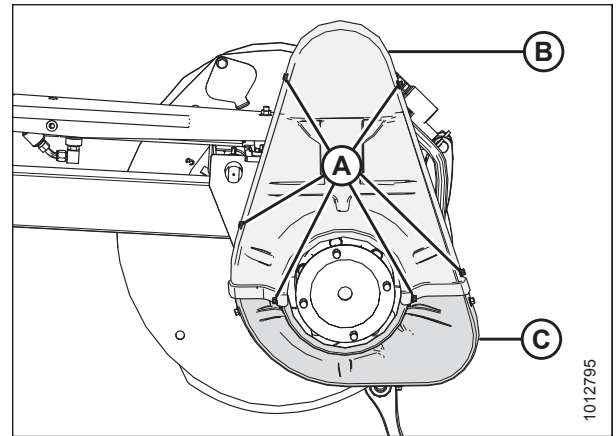


Figure 5.269: Drive Cover

3. Remove three bolts (A) and remove the lower cover (B) if necessary.

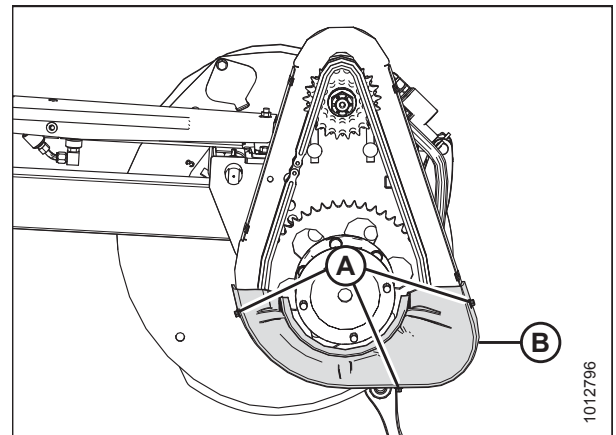


Figure 5.270: Lower Drive Cover (Upper Cover Removed)

Installing Reel Drive Cover

⚠ DANGER

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

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

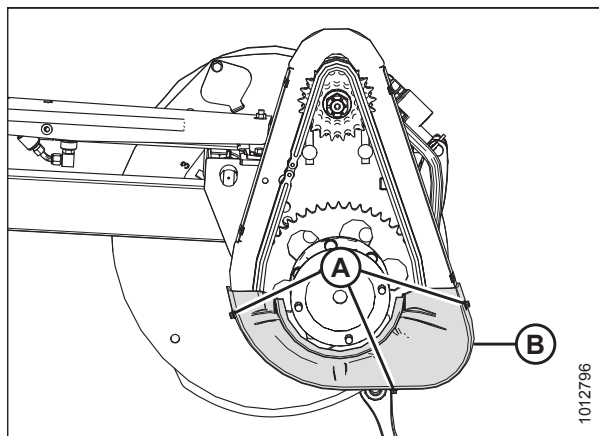


Figure 5.271: Lower Drive Cover

2. Position the upper drive cover (B) onto the reel drive and lower cover (C), and secure with six bolts (A).

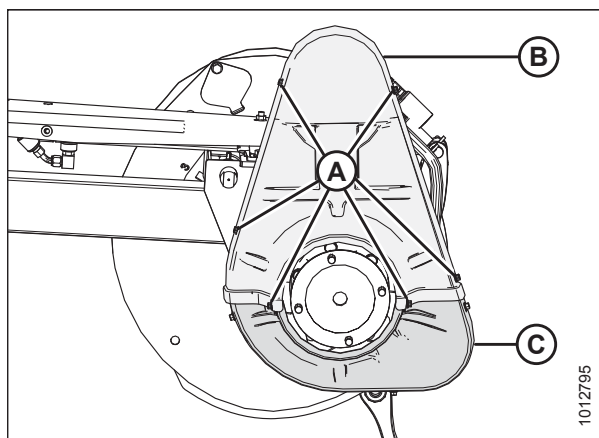


Figure 5.272: Drive Cover

5.16.2 Reel Drive Chain Tension

Loosening Reel Drive Chain

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).
3. Loosen six nuts (A). Slide the motor (B) and motor mount (C) down towards the reel shaft.

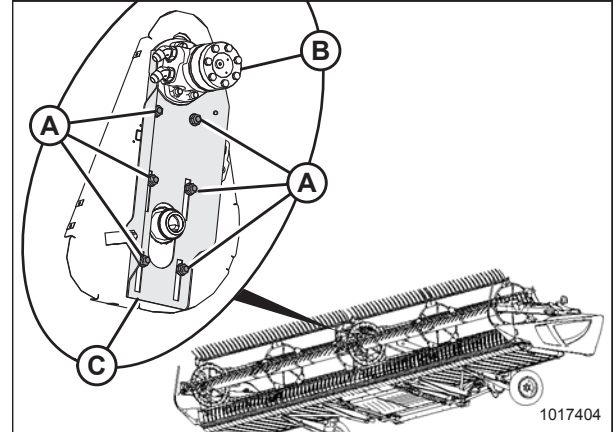


Figure 5.273: Reel Drive (Parts Removed for Clarity)

Tightening Reel Drive Chain

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Ensure the six bolts (A) securing the motor mount to the chain case are loose.

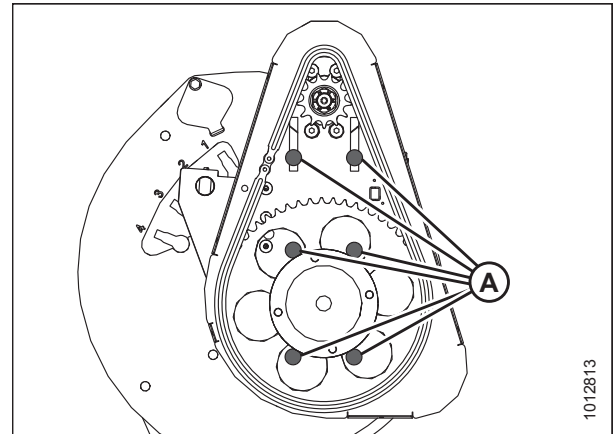


Figure 5.274: Single-Reel Drive Shown – Double Reel Similar

MAINTENANCE AND SERVICING

- Slide the motor (A) and motor mount (B) upwards until the chain (C) is tight.

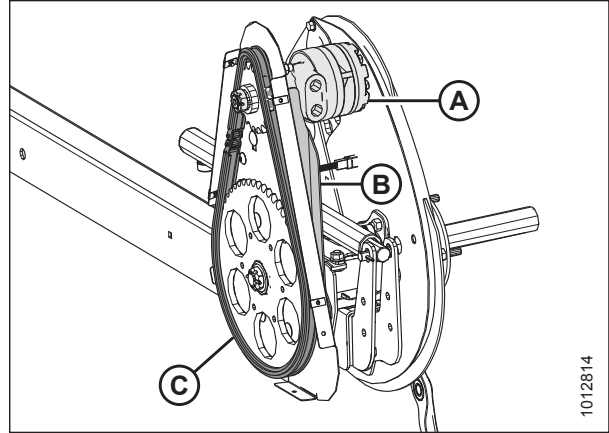


Figure 5.275: Single-Reel Drive Shown – Double Reel Similar

- Tighten six nuts (A).
- Ensure there is 3 mm (1/8 in.) of slack at the chain midspan. Adjust if necessary.
- Torque nuts (A) to 73 Nm (54 lbf·ft).
- Install the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

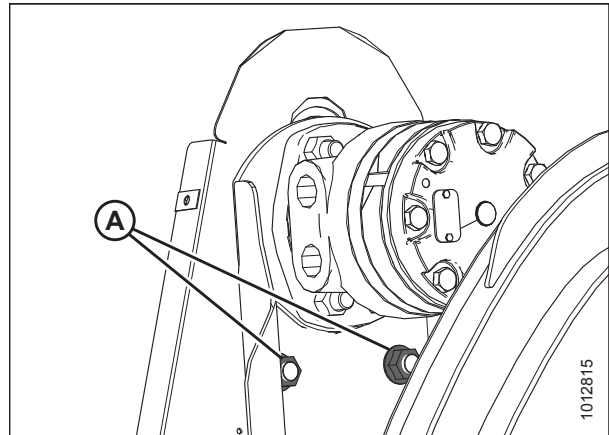


Figure 5.276: Single-Reel Drive Shown – Double Reel Similar

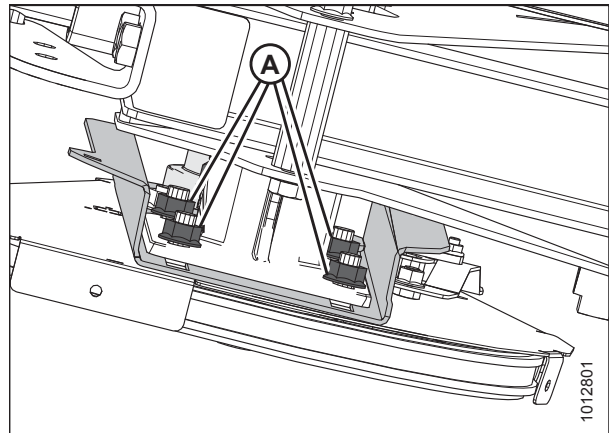


Figure 5.277: Single-Reel Drive – Viewed from Underside of Reel

5.16.3 Reel Drive Sprocket

For Case IH and New Holland combine models, configure the combine according to the reel sprocket size in order to optimize the auto reel to ground speed control. Refer to the combine service manual for more information.

Removing Reel Drive Sprocket

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Loosen the drive chain (A). Refer to [Loosening Reel Drive Chain, page 469](#).
3. Remove the drive chain (A) from the drive sprocket (B).

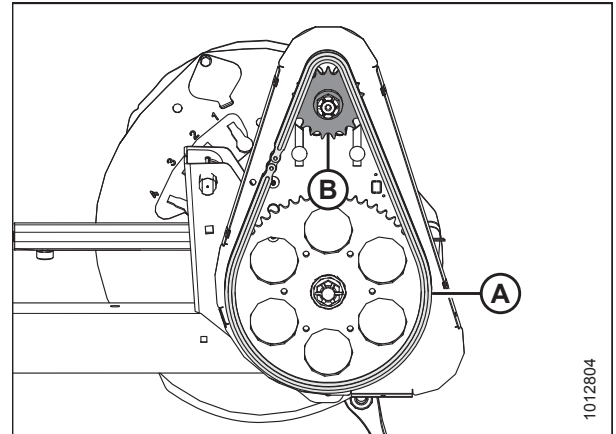


Figure 5.278: Reel Drive

4. Remove the cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
5. Remove the drive sprocket (D). Ensure the key remains in the shaft.

IMPORTANT:

To avoid damaging the motor, use a puller if the drive sprocket does not come off by hand. Do **NOT** use a pry bar and/or hammer to remove the drive sprocket (D).

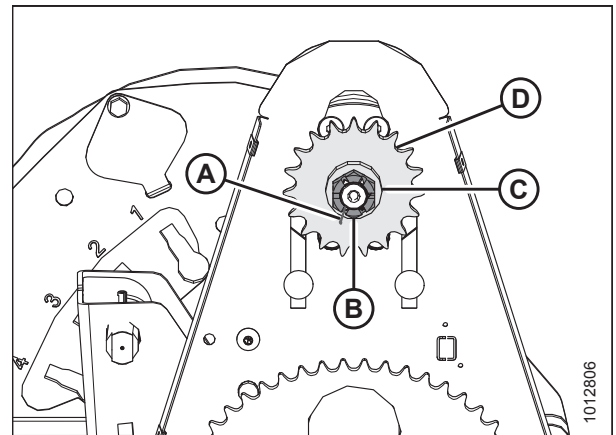


Figure 5.279: Reel Drive

Installing Reel Drive Sprocket

DANGER

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

1. Align the keyway in sprocket (D) with the key on the motor shaft, and slide the sprocket onto the shaft. Secure with flat washer (C) and slotted nut (B).
2. Torque slotted nut (B) to 54 Nm (40 lbf-ft).
3. Install cotter pin (A). If necessary, tighten the slotted nut (B) to the next slot to install the cotter pin.

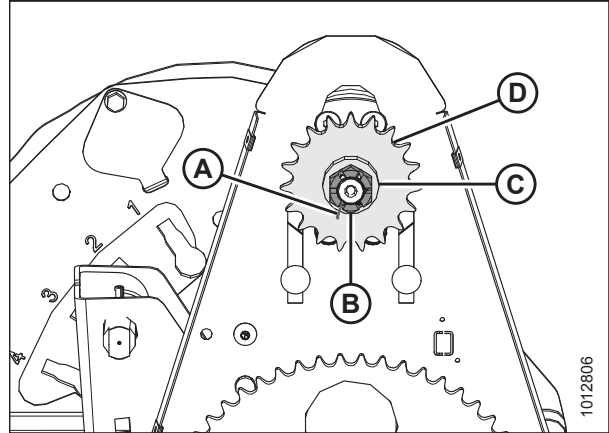


Figure 5.280: Reel Drive

4. Install the drive chain (A) onto the drive sprocket (B).
5. Tighten the drive chain. Refer to [Tightening Reel Drive Chain, page 469](#).

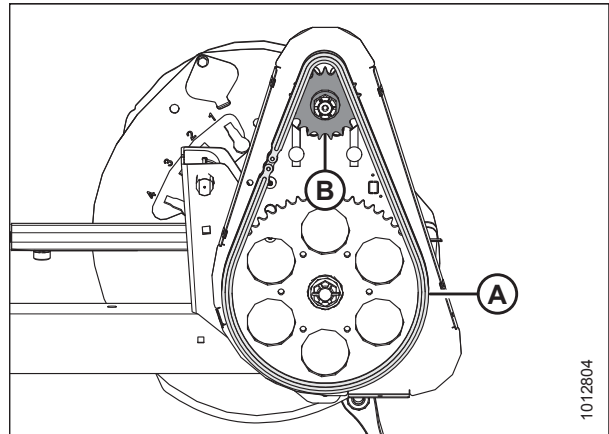


Figure 5.281: Reel Drive

5.16.4 Double-Reel U-Joint

The double-reel drive U-joint allows each reel to move independently from the other.

Lubricate the U-joint according to the specifications. Refer to [5.3.6 Lubrication and Servicing, page 332](#).

Replace the U-joint if severely worn or damaged. Refer to [Removing Double-Reel U-Joint, page 473](#).

Removing Double-Reel U-Joint

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).
3. Support the inboard end of the right reel with a front end loader and nylon slings (A) (or equivalent lifting device).

IMPORTANT:

Avoid damaging or denting the center tube by supporting the reel as close to the end disc as possible.

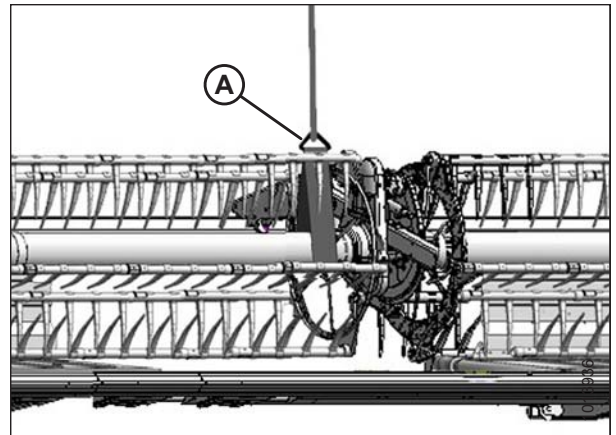


Figure 5.282: Supporting Reel

4. Remove the six bolts (A) attaching the U-joint flange (B) to the driven sprocket (C).
5. Remove the U-joint.

NOTE:

It may be necessary to move the right reel sideways for the U-joint to clear the tube.

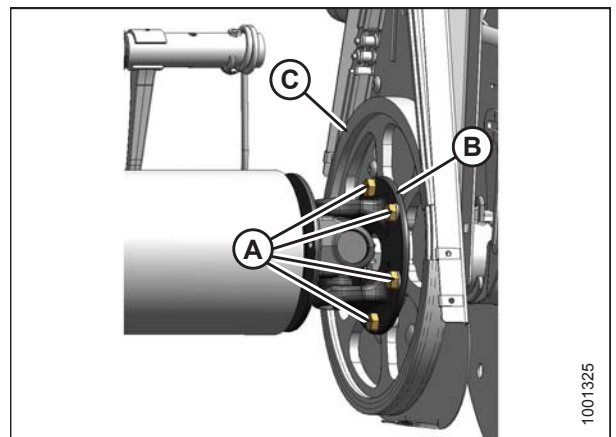


Figure 5.283: U-Joint

Installing Double-Reel U-Joint

NOTE:

It may be necessary to move the right reel sideways for the U-joint to clear the reel tube.

1. Position the U-joint flange (B) onto the driven sprocket (C) as shown. Install six bolts (A) and hand-tighten. Do **NOT** torque the bolts.

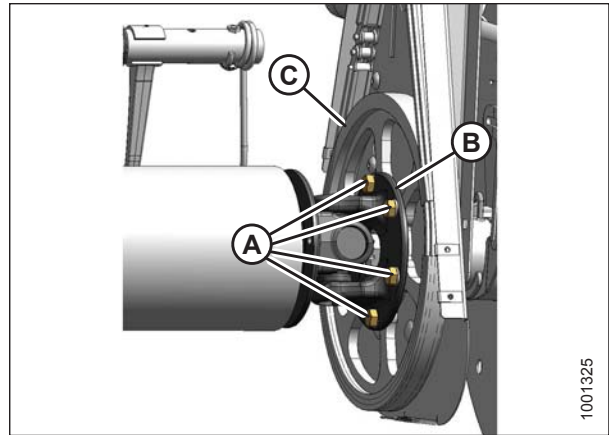


Figure 5.284: U-Joint

2. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
3. Rotate the reel until the holes in the end of the reel tube and U-joint flange (B) line up.
4. Apply Loctite® #243 (or equivalent) to four 1/2 in. bolts (A) and secure with lock washers.
5. Torque to 102–115 Nm (75–85 lbf-ft).

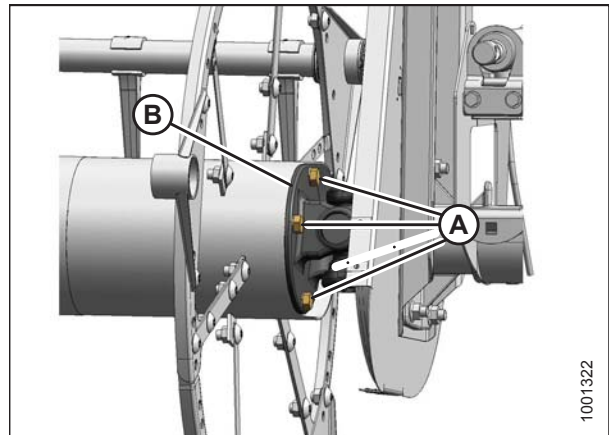


Figure 5.285: U-Joint

6. Remove the temporary reel support (A).
7. Install the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

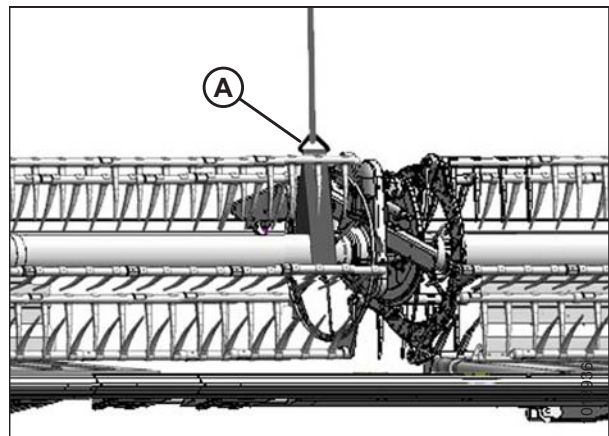


Figure 5.286: Supporting Reel

5.16.5 Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems occur with the motor, remove it and have it serviced at your MacDon Dealer.

Removing Reel Drive Motor

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Loosen the drive chain. Refer to [Loosening Reel Drive Chain, page 469](#).
3. Remove the drive sprocket. Refer to [Removing Reel Drive Sprocket, page 471](#).
4. Mark the hydraulic lines (A) and their locations in the motor (B) to ensure correct reinstallation.
5. Disconnect the hydraulic lines (A) at the motor (B). Cap or plug open ports and lines.
6. Remove four nuts and bolts (C), and remove the motor (A). Retrieve the spacer (if installed) from between the motor (B) and the motor mount.
7. If motor is being replaced, remove hydraulic fittings from old motor and install in new motor using the same orientation. Refer to [8 Reference, page 517](#) for fitting installation guidelines.

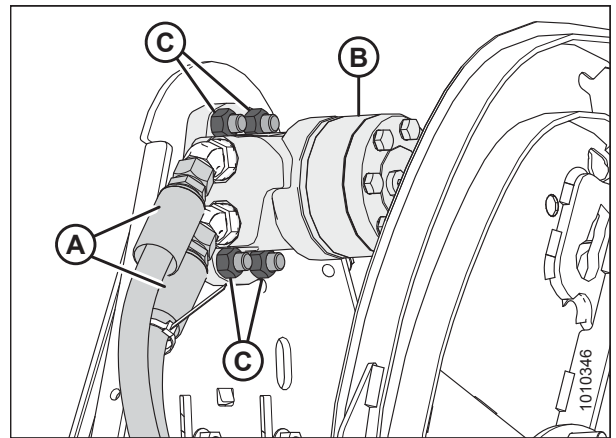


Figure 5.287: Reel Motor and Hoses

Installing Reel Drive Motor

1. Slide the motor mount (A) up or down so the motor mounting holes (B) are accessible through the openings in the chain case.

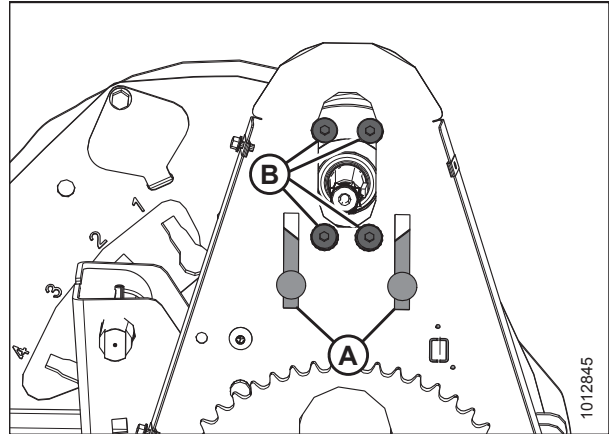


Figure 5.288: Reel Drive Motor Mounting Holes

2. Attach the motor (A) (and spacer if previously removed) to the motor mount (B) with four 1/2 x 1-3/4 in. countersunk bolts and nuts (C).
3. Torque nuts (C) to 73 Nm (54 lbf-ft).
4. If installing a new motor, install the hydraulic fittings (not shown) from the original motor and torque to 110–120 Nm (81–89 lbf-ft).

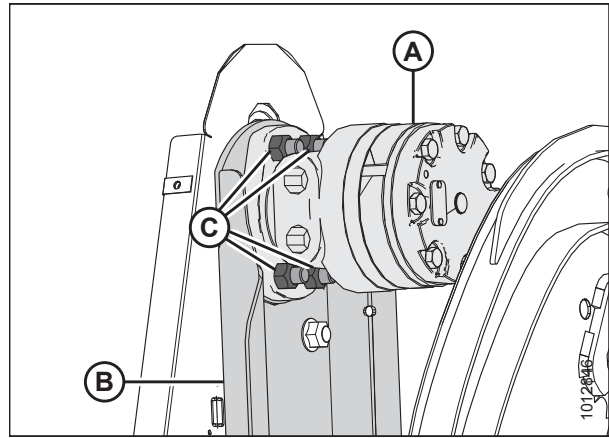


Figure 5.289: Reel Drive Motor

5. Remove the caps or plugs from the ports and lines and connect the hydraulic lines (A) to the hydraulic fittings (B) on the motor (C).

NOTE:

Ensure the hydraulic lines (A) are installed at their original locations.

6. Install the drive sprocket. Refer to [Installing Reel Drive Sprocket, page 472](#).
7. Tighten the drive chain. Refer to [Tightening Reel Drive Chain, page 469](#).

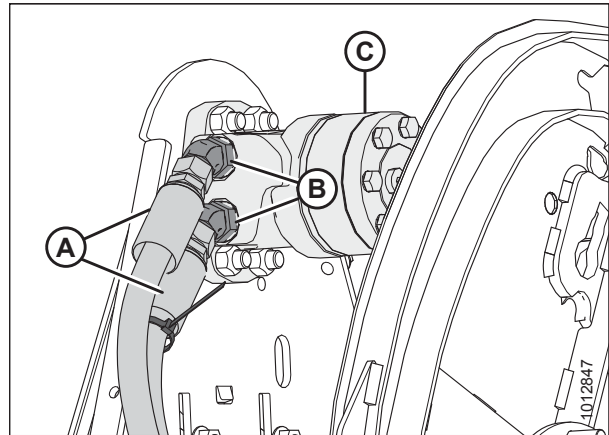


Figure 5.290: Reel Motor and Hoses

5.16.6 Replacing Drive Chain on Double Reel

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Shut down the combine, and remove the key from the ignition.
2. Loosen the drive chain. Refer to [Loosening Reel Drive Chain, page 469](#).
3. Support the inboard end of the right reel with a front end loader and nylon slings (A) (or equivalent lifting device).

IMPORTANT:

Avoid damaging or denting the center tube by supporting the reel as close to the end disc as possible.

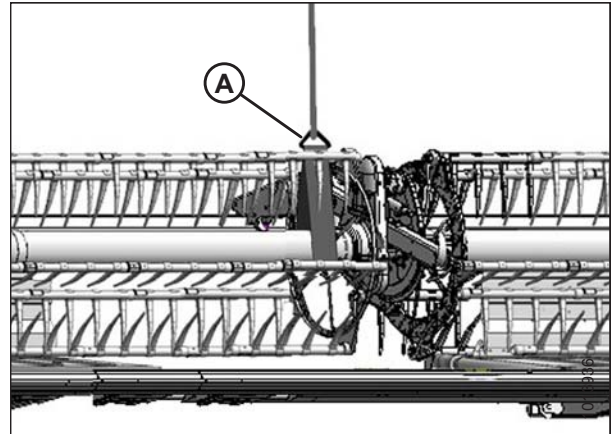


Figure 5.291: Supporting Reel

4. Remove the four bolts (A) securing the reel tube to the U-joint flange (B).

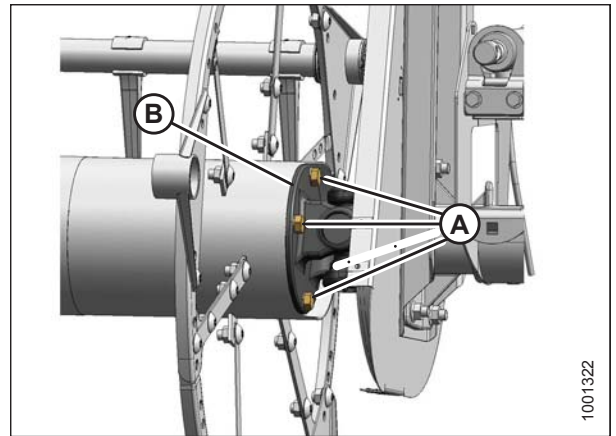


Figure 5.292: U-Joint

MAINTENANCE AND SERVICING

5. Move the right reel sideways to separate the reel tube (A) from the U-joint (B).
6. Remove the drive chain (C).
7. Route the new chain (C) over the U-joint (B) and position onto the sprockets.

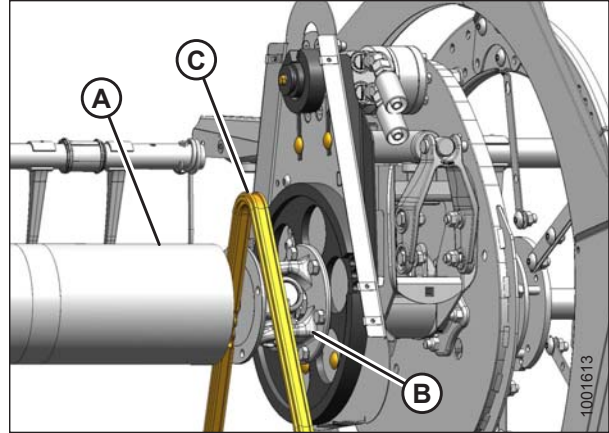


Figure 5.293: Replacing Chain

8. Position the right reel tube against the reel drive and engage the stub shaft into the U-joint pilot hole.
9. Rotate the reel until the holes in end of the reel tube and U-joint flange line up.
10. Apply Loctite® #243 (or equivalent) to four 1/2 in. bolts (A) and secure with lock washers.
11. Torque to 102–115 Nm (75–85 lbf-ft).

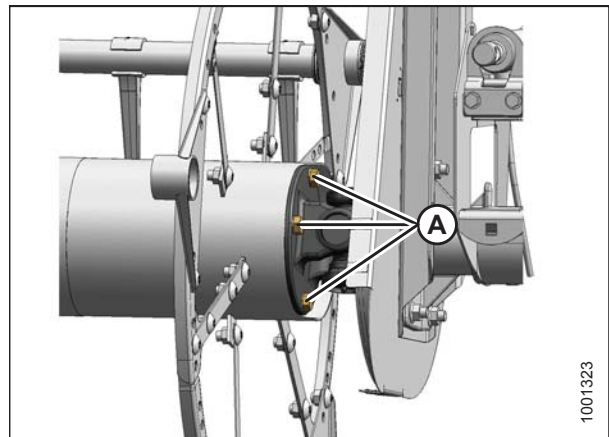


Figure 5.294: U-Joint

12. Remove the temporary reel support (A).

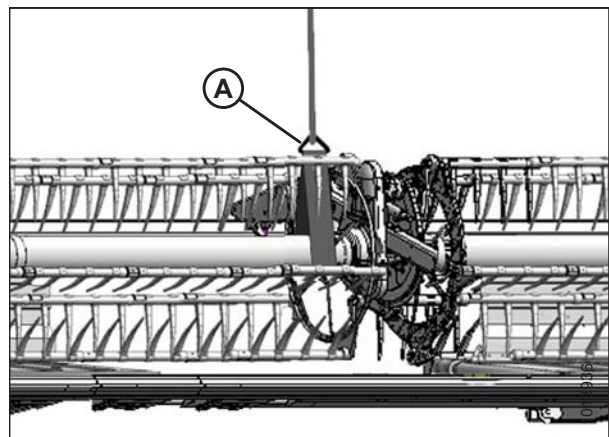


Figure 5.295: Supporting Reel

5.16.7 Replacing Drive Chain on Single Reel

1. Loosen the drive chain. Refer to [Loosening Reel Drive Chain, page 469](#).
2. Lift the chain (A) off the drive sprocket (B).
3. Lower the chain until free of the lower sprocket (C) and remove the chain from the drive.
4. Position the new chain (A) around the bottom teeth on the lower sprocket (C).
5. Lift the chain onto the drive sprocket (B) ensuring all the links are properly engaged in the teeth.
6. Tighten the drive chain. Refer to [Tightening Reel Drive Chain, page 469](#).

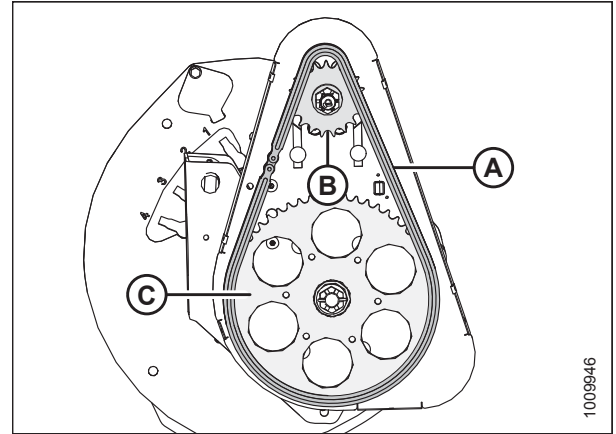


Figure 5.296: Reel Drive

5.16.8 Replacing Reel Speed Sensor

The reel speed sensors, and the procedures for replacing them, vary with the combine model.

Replacing AGCO (Challenger, Gleaner, and Massey Ferguson) Sensor

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).
3. Disconnect the electrical connector (A).

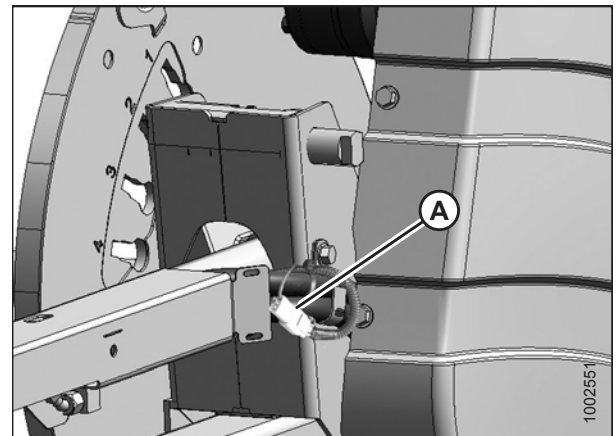


Figure 5.297: Electrical Harness

MAINTENANCE AND SERVICING

4. Cut the cable tie (A) securing the harness to the cover.
5. Remove two screws (B) and remove the sensor (C) and harness. Bend the cover (D) (if necessary) to remove the harness.
6. Feed the wire of the new sensor behind the cover (D) and through the chain case.
7. Locate the new sensor in support (E) and attach with two screws (B).
8. Adjust the gap between the sensor disc (F) and the sensor (C) to 5 mm (0.02 in.).

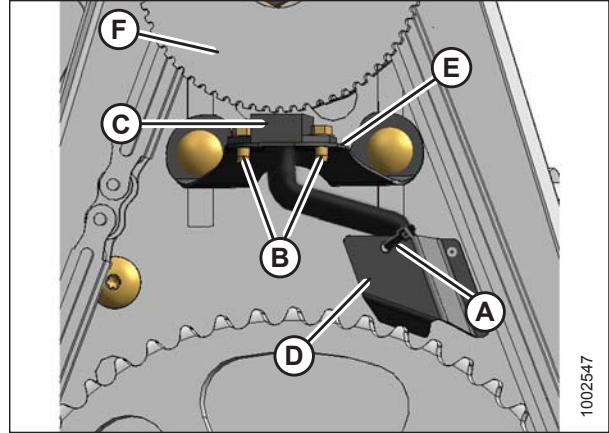


Figure 5.298: Speed Sensor

9. Connect the electrical harness (A).

IMPORTANT:

Ensure the sensor electrical harness does NOT contact the chain or sprocket.

10. Reinstall the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

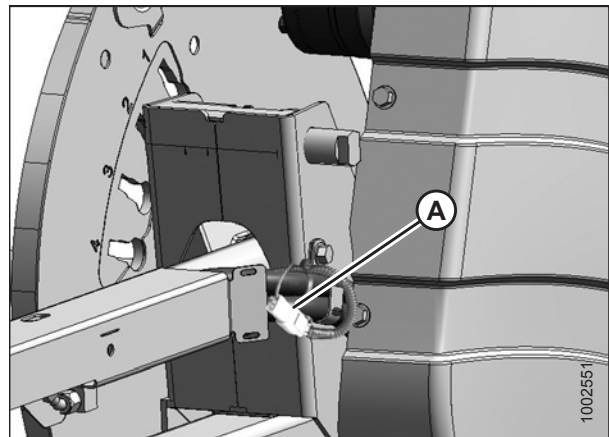


Figure 5.299: Electrical Harness

Replacing John Deere Reel Speed Sensor

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).
3. Disconnect the electrical connector (D).
4. Remove the top nut (C) and remove the sensor (B).
5. Remove the top nut from the new sensor and position the sensor into the support. Secure with top nut (C).
6. Adjust the gap between the sensor disc (A) and the sensor (B) to 3 mm (1/8 in.) using nut (C).
7. Connect to harness at (D).

IMPORTANT:

Ensure the sensor electrical harness does NOT contact the chain or sprocket.

8. Reinstall the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

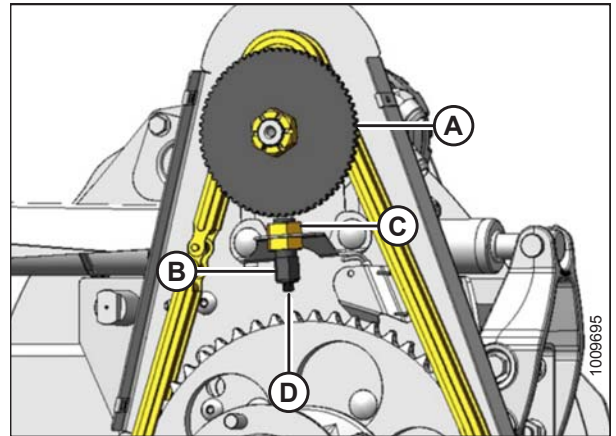


Figure 5.300: Speed Sensor

Replacing CLAAS 400 Series Reel Speed Sensor

DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).
3. Disconnect the electrical connector (C).
4. Remove the top nuts (D) and remove the sensor (B).
5. Remove the top nut from the new sensor and position the sensor into the support. Secure with top nut (D).
6. Adjust the gap between the sensor disc (A) and the sensor (B) to 3 mm (1/8 in.) using nuts (D).
7. Connect to harness at (C).

IMPORTANT:

Ensure the sensor electrical harness does NOT contact the chain or sprocket.

8. Reinstall the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

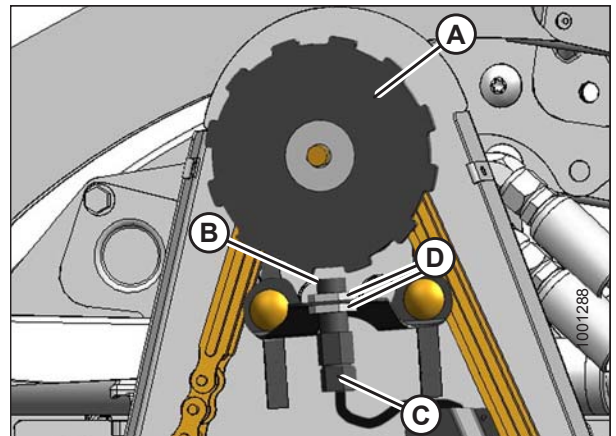


Figure 5.301: Speed Sensor

Replacing CLAAS 500/700 Series Reel Speed Sensor

⚠ DANGER

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

1. Shut down the combine, and remove the key from the ignition.
2. Remove the drive cover. Refer to [Removing Reel Drive Cover, page 467](#).

3. Disconnect the sensor's (A) electrical connector located behind chain case.

4. Remove cable ties (B).

5. Remove shield (C) and rivets (D)

6. Remove nut (E) and remove the sensor (A).

7. Position the new sensor (A) into the support (F). Secure with nut (E).

8. Adjust speed sensor to achieve a gap of 1–3 mm (1/16–1/8 in.) from the sensor disc (G).

9. Route harness as shown and secure with shield (C) and rivets (D).

10. Secure harness to sensor support with cable ties (B) as shown.

IMPORTANT:

Ensure the sensor electrical harness does **NOT** contact the chain or sprocket.

11. Reinstall the drive cover. Refer to [Installing Reel Drive Cover, page 468](#).

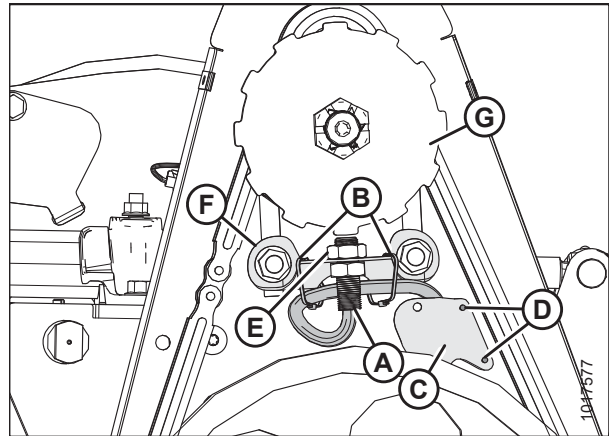


Figure 5.302: Speed Sensor

5.17 Transport System (Optional)

Refer to [6.4.4 Stabilizer / Slow Speed Transport Wheels, page 494](#) for more information.

5.17.1 Checking Wheel Bolt Torque

If a transport system is installed, adhere to the following procedure for torquing the wheel bolts:

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Turn off the engine and remove key.
2. Follow the bolt tightening sequence shown, and torque the wheel bolts to 110–120 Nm (80–90 ft·lbf).

IMPORTANT:

Whenever a wheel is removed and reinstalled, check the wheel bolt torque after one hour of operation and every 100 hours thereafter.

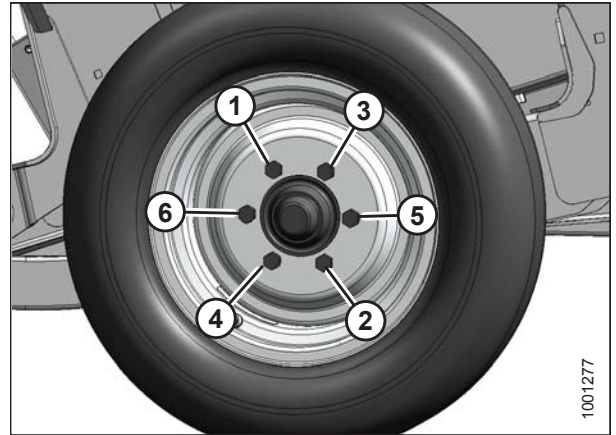


Figure 5.303: Bolt Tightening Sequence

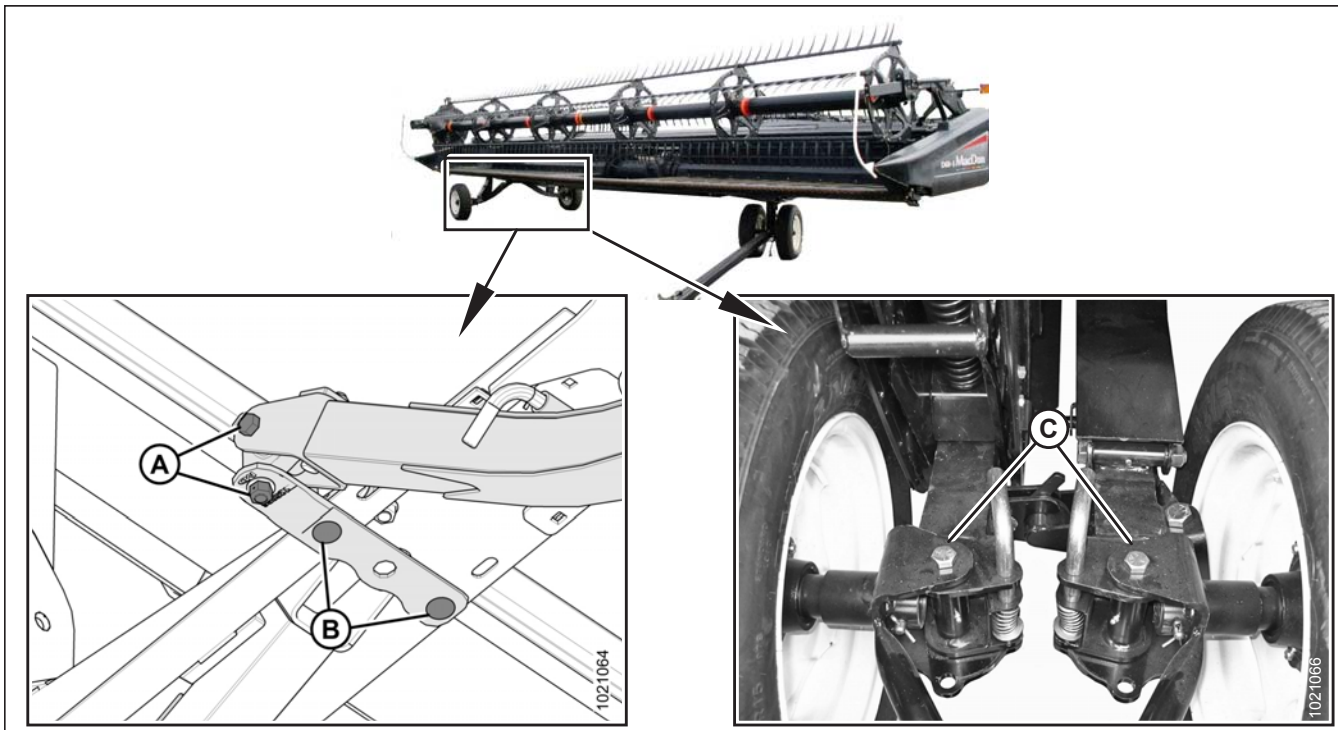
5.17.2 Checking Axle Bolt Torque

If a transport system is installed, adhere to the following procedure for torquing the axle bolts:

WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

Figure 5.304: Axle Bolts



1. Check and tighten axle bolts **DAILY** until torque is maintained as follows:

- (A): 244 Nm (180 ft·lbf)
- (B): 203 Nm (150 ft·lbf)
- (C): 244 Nm (180 ft·lbf)

5.17.3 Checking Tire Pressure

Check the tire inflation pressure and inflate according to the information provided in Table 5.5, page 485.

Table 5.5 Tire Pressure

Size	Load Range	Pressure
ST205/75 R15	D	448 kPa (65 psi)
	E	552 kPa (80 psi)

WARNING

- Service tires safely.
- 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.
- 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.

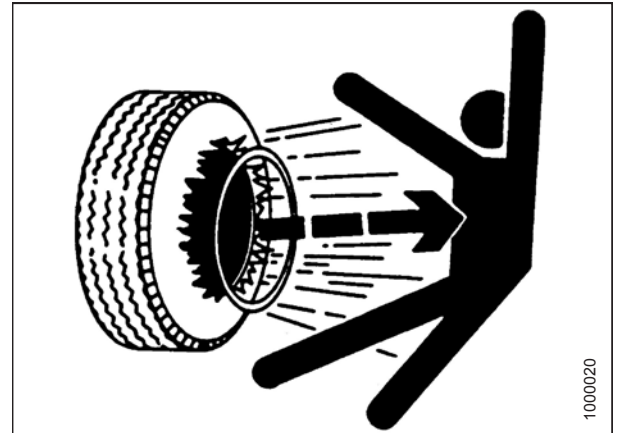


Figure 5.305: Inflation Warning

6 Options and Attachments

The following options and attachments are available for use with your header. See your MacDon Dealer for availability and ordering information.

6.1 Float Module

6.1.1 Hillside Extension Kit

The Hillside Extension kit allows FM100 Float Modules to operate on steep hillsides while maintaining oil supply to the suction side of pump.

MD #B6057

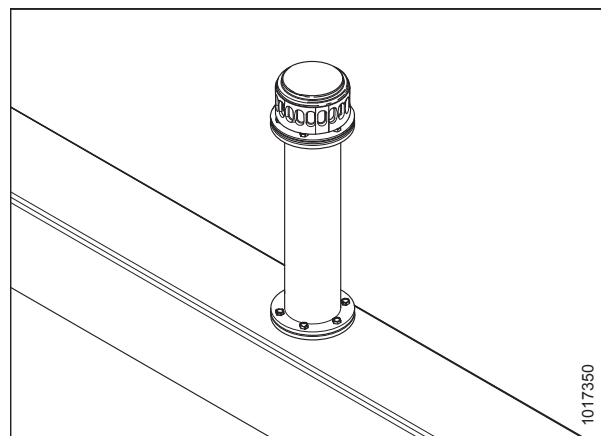


Figure 6.1: Hillside Extension Kit

6.2 Reel

6.2.1 Multi-Crop Rapid Reel Conversion Kit

For use on double-reel headers only, the multi-crop rapid reel conversion kit decreases the time required to change the fore-aft cylinder position on the reel support arm from the normal operating location to a farther aft location that minimizes crop disturbance. The kit also allows the reel fore-aft cylinders to be quickly moved to the normal operating location.

MD #B5943

NOTE:

The Multi-Crop Rapid Reel Conversion kit is not available for European configured FD1 Series headers.

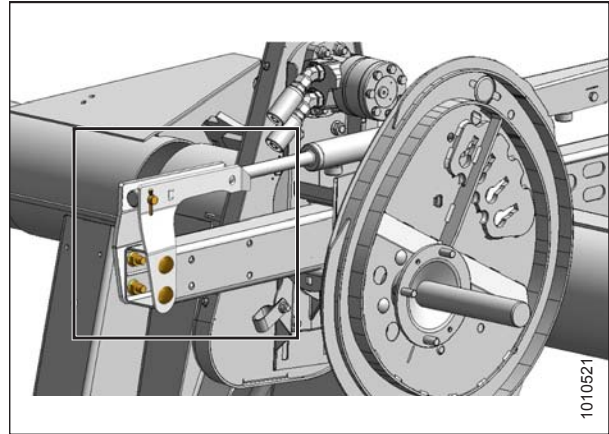


Figure 6.2: Center Arm – Left and Right Similar

6.2.2 Reel Arm Extension Kit (European Configured Headers Only)

This kit provides extensions for the outer reel support arms on a European configured FD1 Series header. These extensions provide the additional reel arm length required to properly install a vertical knife mount kit (MD #B5757, B5758) onto the header. The Reel Arm Extension kit also includes reel fore-aft brackets allowing quick reel repositioning from the reel's most forward position to its most rearward position.

MD #B6375

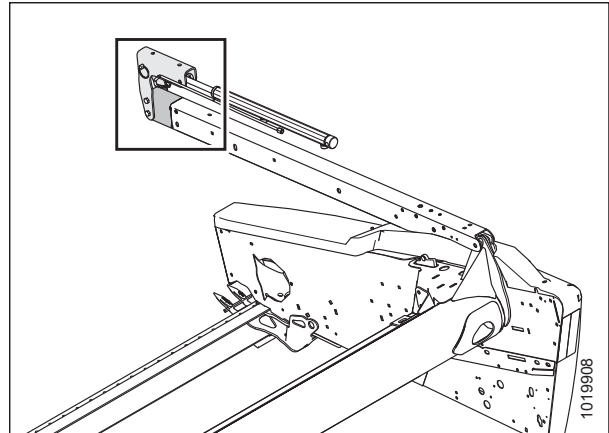


Figure 6.3: Right Arm – Center and Left Arms Similar (Parts Hidden for Clarity)

6.2.3 Lodged Crop Reel Finger Kit

The steel fingers (A) provided in the Lodged Crop Reel Finger kit attach to the ends of every other tine bar and help to clear material in heavy, hard-to-cut crops such as lodged rice.

Each kit contains three fingers for the cam end of the reel and three fingers for the tail end. Hardware and installation instructions are included in the kit.

MD #B4831

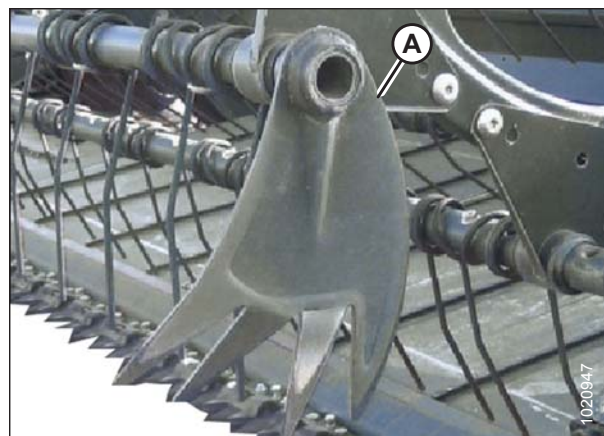


Figure 6.4: Lodged Crop Fingers

6.2.4 PR15 Tine Tube Reel Conversion Kit

These kits allow conversion from a six-bat reel to a nine-bat reel and conversion from a five-bat reel to a six-bat reel.

Order the following bundles according to your header size and type:

Five-bat to six-bat reels:

- 30 foot – Plastic Fingers MD #B6344
- 35 foot – Plastic Fingers MD #B6345

Six-bat to nine-bat reels:

- 30 foot – Plastic Fingers MD #B6347

NOTE:

You must also order additional endshields when converting the reel.

6.2.5 Reel Endshield Kit

The steel shields provided in the reel endshield kit attach to the ends of the reels and help to clear material in heavy, hard-to-cut crops. They are standard equipment on all headers (except nine-bat reels). Hardware and installation instructions are included in the kit.

See your MacDon Dealer for more information.

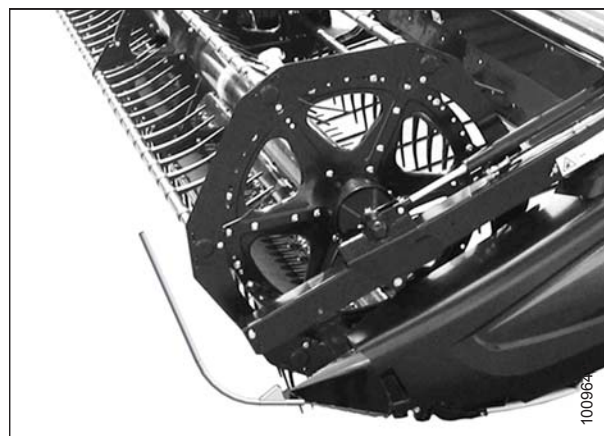


Figure 6.5: Reel Endshields

6.2.6 Tine Tube Reinforcing Kit

Tine tube reinforcing kits are available for five- and six-bat reels. They are designed to support high reel loads when cutting extremely heavy crops.

- Five-Bat Reels – MD #B5825
- Six-Bat Reels – MD #B5826

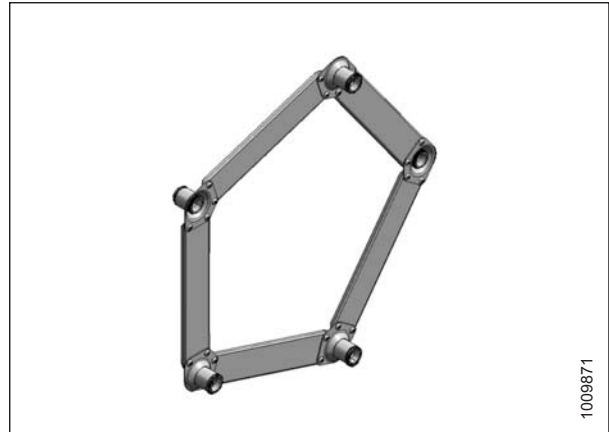


Figure 6.6: Five-Bat Reinforcing Kit Shown – Six-Bat Reinforcing Kit Similar

6.3 Cutterbar

6.3.1 Cutterbar Wearplate

Cutterbar wearplates are recommended for cutting on the ground when the soil is adhering to the steel.

Order one of the following bundles based on the header size:

- 30 foot – MD #B4839
- 35 foot – MD #B4840
- 40 foot – MD #B4841
- 45 foot – MD #B5114



Figure 6.7: Cutterbar Wearplates

6.3.2 Knifehead Shield

Knifehead shields attach to the endsheets and reduce the knifehead opening to prevent cut crop, particularly severely lodged crop, from accumulating over the knifehead and damaging the knife drive box and endsheet.

Order the following bundles according to your guard type:

- Regular Guards – MD #220101
- Stub Guards – MD #220103

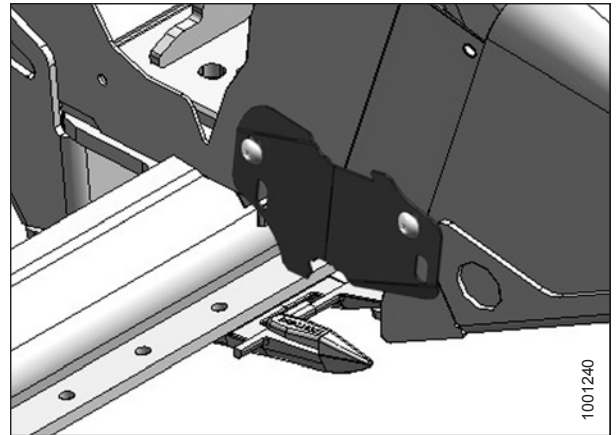


Figure 6.8: Knifehead Shield

6.3.3 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster shoes, are designed to cut tough crops.

Installation and adjustment instructions are included in the kit.

Order one of the following bundles according to your header size:

- 30 foot – MD #B5012
- 35 foot – MD #B5013

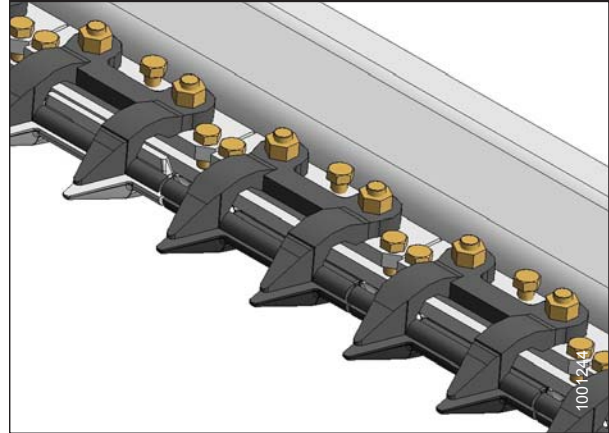


Figure 6.9: Stub Guards

6.3.4 FD1 Series Vertical Knife Mounts and Double Vertical Knife Hose Kits

Installation and adjustment instructions are included in the bundle.

Order the FD1 vertical knife bundles according to the left or right side:

For European configured FD1 headers:

- Left Vertical Knife – MD #B6137³¹
- Right Vertical Knife – MD #B6138³²

For non-European configured FD1 headers:

- Left Vertical Knife – MD #B5757
- Right Vertical Knife – MD #B5758

NOTE:

Vertical knife kit bundles are size-specific and are required to complete vertical knife installations on both European configured and non-European configured headers.

Order the following FD1 vertical knife hose kit bundles:

- Double Vertical Knife Hose, Flex 30 foot – MD #B6247
- Double Vertical Knife Hose, Flex 35 foot – MD #B6248
- Double Vertical Knife Hose, Flex 40 foot – MD #B6249
- Double Vertical Knife Hose, Flex 45 foot – MD #B6250

NOTE:

If mounting onto multiple non-European configured headers, you will also require the auxiliary vertical knife plumbing kit MD #B5406.

31. The Left Vertical Knife Mount kit (#B6137) cannot be installed onto the header by itself and must be installed with the Right Vertical Knife Mount kit (#B6138).

32. The Right Vertical Knife Mount kit (#B6138) can be installed onto the header either by itself or with the Left Vertical Knife Mount kit (#B6137).

6.4 Header

6.4.1 Divider Latch Kit

Divider latch kits attach to the endsheets. They allow for quick removal and storage of endsheet divider cones and, if required, reduce the transport width of the header. Installation instructions are included in the kit.

MD #B6158

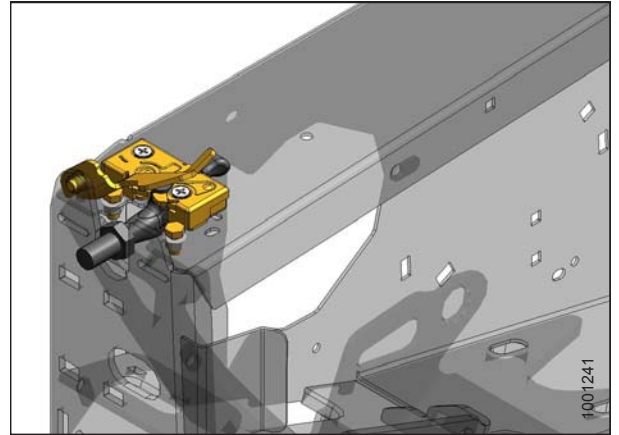


Figure 6.10: Divider Latch

6.4.2 Stabilizer Wheels

Stabilizer wheels help to stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights. Installation and adjustment instructions are included in the kit.

MD #C1986

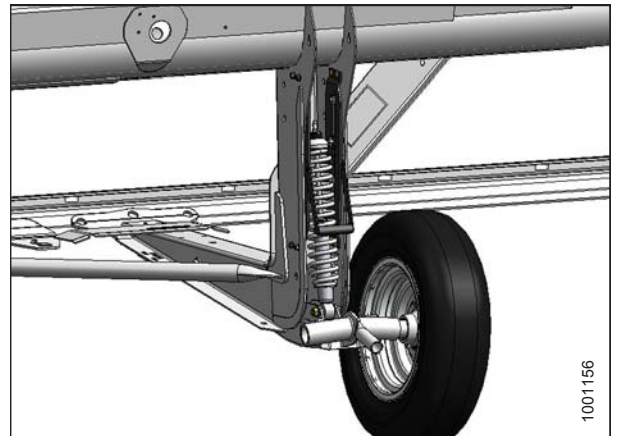


Figure 6.11: Stabilizer Wheel

6.4.3 Secondary Stabilizer Wheel

The secondary stabilizer wheel helps stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height. Installation and adjustment instructions are included with the kit.

Available as an attachment for use with 30-, 35-, 40-, and 45-ft. headers.

MD #B6179³³

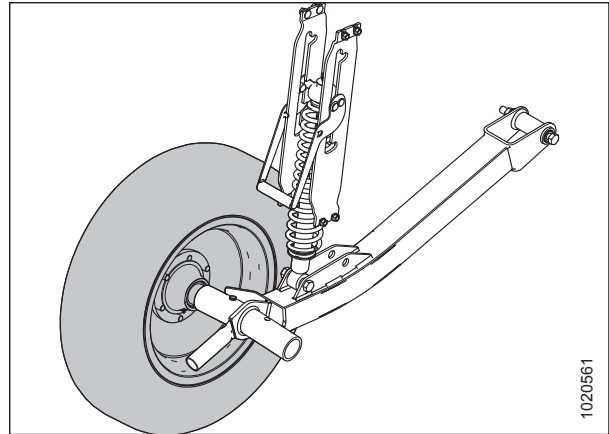


Figure 6.12: Secondary Stabilizer Wheel

6.4.4 Stabilizer / Slow Speed Transport Wheels

Stabilizer / slow speed transport wheels help to stabilize the header in field conditions that would otherwise cause the header to bounce, resulting in uneven cutting heights. This system is similar to the Stabilizer Wheel option. Refer to [6.4.2 Stabilizer Wheels, page 493](#).

Stabilizer / slow speed transport wheels are used to convert the header into transport mode for slow-speed towing behind a properly-configured combine (or agricultural tractor). A tow pole and installation instructions are included in the kit.

MD #C2007

6.4.5 FD1 Series Backsheet Extension Kit

The Backsheet Extension kit helps retain small seeds in shatter prone crops such as canola. They are usually used with headers equipped with upper cross augers (UCA).

A base kit is required for 30-foot FD1 headers and larger. Headers larger than 30 feet will need additional extension kits. Order the following bundles according to your header size:

- 30 foot – MD #B6355 FD1 Backsheet Extension
- 35 foot – MD #C2045 FD1 Backsheet Panel Extensions
- 40 foot – MD #C2046 FD1 Backsheet Panel Extensions
- 45 foot – MD #C2047 FD1 Backsheet Panel Extensions

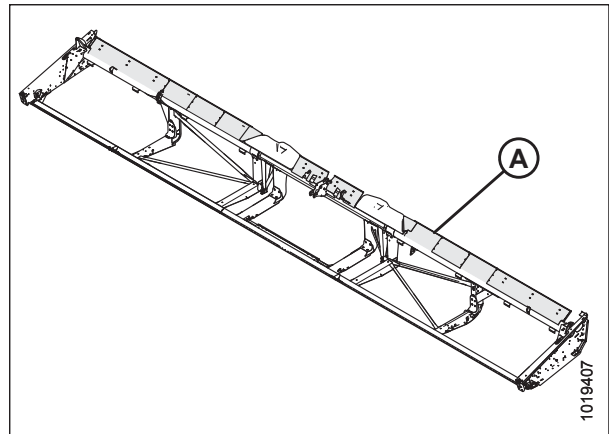


Figure 6.13: Backsheet Extensions

33. Kit consists of one wheel assembly; two kits are required to upgrade both sides of the header.

6.5 Crop Delivery

6.5.1 FM100 Dual Auto Header Height Control (AHHC) Sensor Kit

This kit adds two sensors to the float linkage, adding automatic lateral tilt compensation for the header. When installed, the combine will automatically tilt the feederhouse from side to side to follow uneven terrain during operation.

Installation instructions are included in the kit.

MD #B6211

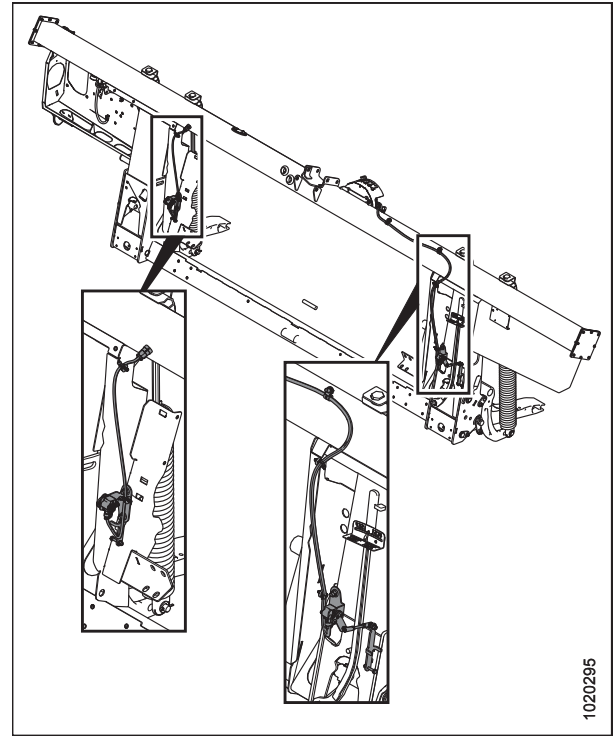


Figure 6.14: Dual AHHC Sensors

6.5.2 FM100 Feed Auger Flighting

Auger flighting (A) on the FM100 can be configured to specific combines and crop conditions. Refer to [4.1 Float Module Feed Auger Configurations, page 251](#) for combine/crop specific configurations.

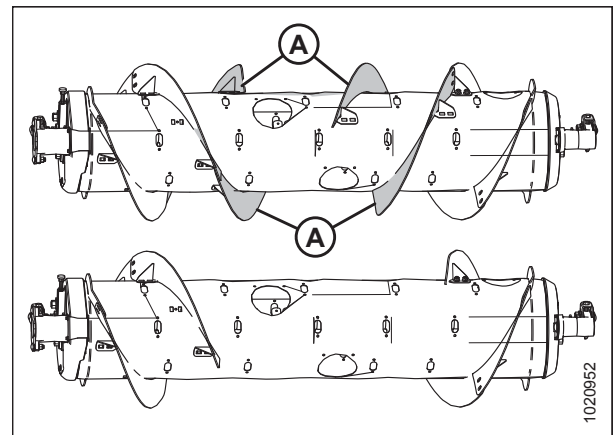


Figure 6.15: FM100 Feed Auger Flighting

6.5.3 In-Cab Draper Speed Control (ICDSC) Kit

Installing this kit allows Operators to adjust the side draper's speed from the combine's cab.

- MD #B6208 – Cab Draper Control, John Deere
- MD #B6385 – Cab Draper Control, Case New Holland
- MD #B6387 – Cab Draper Control, Generic

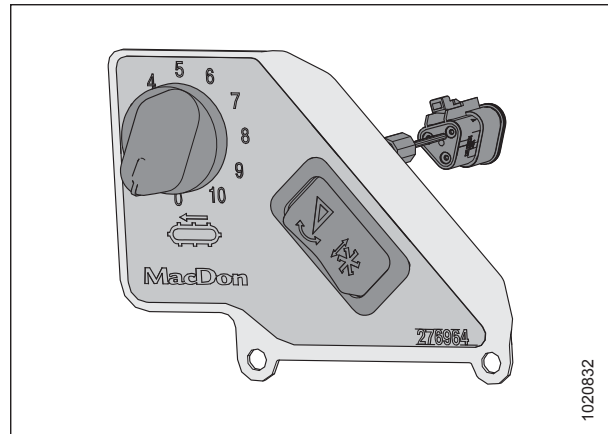


Figure 6.16: ICDSC Cab Control (John Deere Shown, Generic and Case New Holland Similar)

6.5.4 Draper Deflector (Narrow)

Narrow metal draper deflectors attach to the inboard side of the endsheets to prevent material from falling through the gap between the endsheet and the draper while minimizing reel carryover in bushy crops.

Refer to the header parts catalog for the necessary parts.

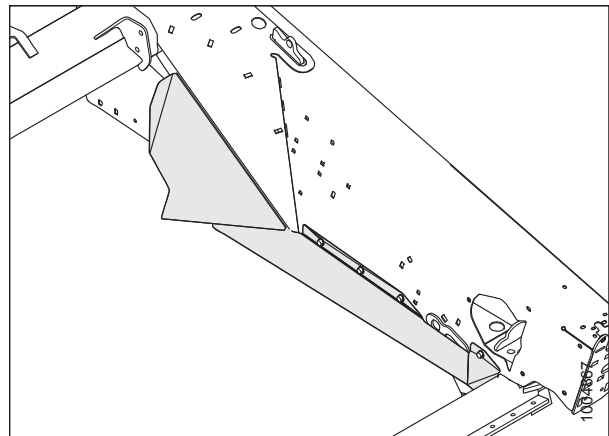


Figure 6.17: Draper Deflector (Narrow)

6.5.5 Draper Deflector (Wide)

Wide metal draper deflectors attach to the inboard side of the endsheets to prevent material from falling through the gap between the endsheet and the draper.

Refer to the header parts catalog for the necessary parts.

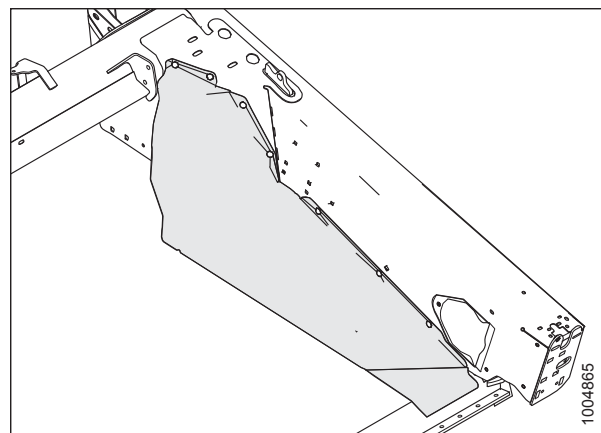


Figure 6.18: Draper Deflector (Wide)

6.5.6 Stripper Bars

Stripper bars improve feeding in certain crops such as rice. They are **NOT** recommended in cereal crops.

Select the stripper bar kit based on combine feeder house width. Refer to Table 6.1, page 497

NOTE:

B6043 is for John Deere S6X0 Series only.

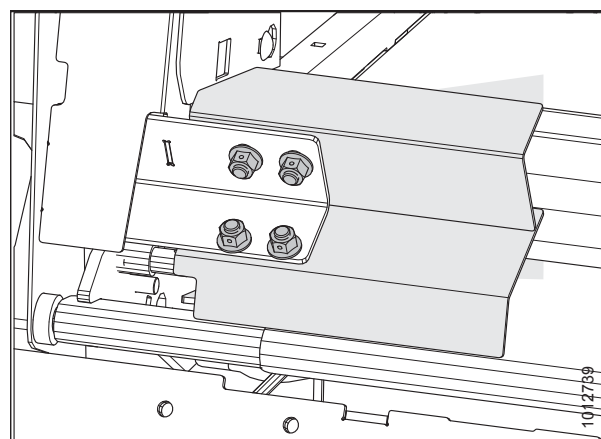


Figure 6.19: Stripper Bar

Table 6.1 Stripper Bar Configurations and Recommendations

Bundle	Stripper Bar Length	Opening Width (Installed on FM100)	Recommended Feeder House Width
B6042	265 mm (10-1/2 in.)	1317 mm (52 in.)	1250–1350 mm (49–65 in.)
B6043	265 mm (10-1/2 in.) (with cutout)	1317 mm (52 in.)	For John Deere S6X0 Series only
B6044	325 mm (13 in.)	1197 mm (47 in.)	For specialty crops only
B6045	365 mm (14-1/2 in.)	1117 mm (44 in.)	1100 mm (43-1/2 in.) and below
B6046	403 mm (16 in.)	1041 mm (41 in.)	For specialty crops only
B6213	515 mm (20 in.)	817 mm (32 in.)	For specialty crops only

6.5.7 Auger Dent Repair Kit

This kit allows operators to repair dents that the feed auger may have sustained during ordinary use.

MD #237563

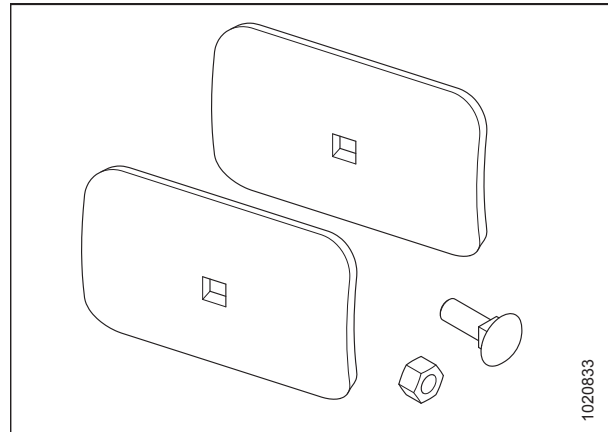


Figure 6.20: Auger Dent Repair Kit

6.5.8 Upper Cross Auger (UCA)

The upper cross auger (A) attaches in front of the backtube and improves crop feeding into the center of the header in heavy crop conditions. It is ideal for high-volume harvesting of forages, oats, canola, mustard and other tall, bushy, hard to feed crops.

Order from the following bundles according to your header size:

For North American headers:

- 30 foot – MD #B6392
- 35 foot – MD #B6394
- 40 foot – MD #B6396
- 45 foot³⁴ – MD #B6398

For export headers:

- 30 foot – MD #B6393
- 35 foot – MD #B6395
- 40 foot – MD #B6397
- 45 foot³⁴ – MD #B6399

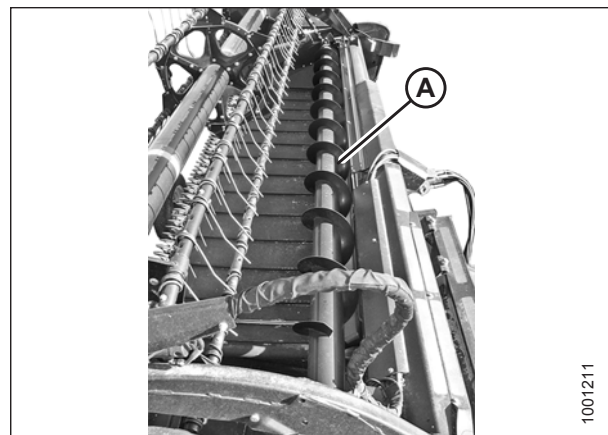


Figure 6.21: Upper Cross Auger

34. This is a 40-foot long auger and is backtube mounted (NOT a full length auger).

6.5.9 Rice Divider Rods

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. Installation instructions are included in the kit.

MD #B5609

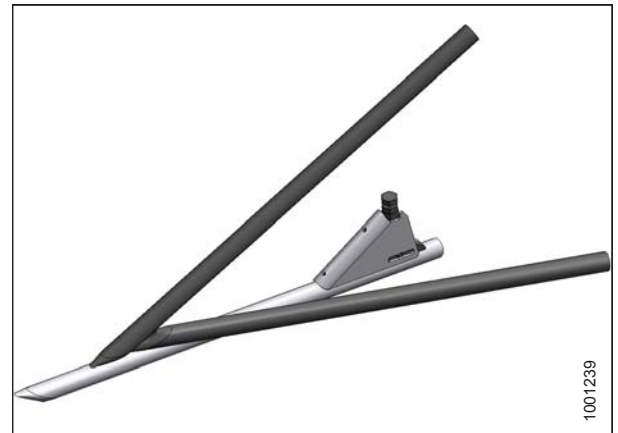


Figure 6.22: Rice Divider Rod

7 Troubleshooting

7.1 Crop Loss at Cutterbar

Symptom	Problem	Solution	Refer to
Does not pick up down crop	Cutterbar too high	Lower cutterbar	<ul style="list-style-type: none"> 3.7.1 Cutting off the Ground, page 49 3.7.2 Cutting on the Ground, page 54
	Header angle too low	Increase header angle	3.7.5 Header Angle, page 72
	Reel too high	Lower reel	3.7.10 Reel Height, page 79
	Reel too far back	Move reel forward	3.7.11 Reel Fore-Aft Position, page 84
	Ground speed too fast for reel speed	Increase reel speed or reduce ground speed	<ul style="list-style-type: none"> 3.7.6 Reel Speed, page 73 3.7.7 Ground Speed, page 74
	Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness	3.7.12 Reel Tine Pitch, page 96
		Install lifter guards	See your MacDon Dealer
Heads shattering or breaking off	Reel speed too fast	Reduce reel speed	3.7.6 Reel Speed, page 73
	Reel too low	Raise reel	3.7.10 Reel Height, page 79
	Ground speed too fast	Reduce ground speed	3.7.7 Ground Speed, page 74
	Crop too ripe	Operate at night when humidity is higher	—
Material accumulating in gap between cut-out in endsheet and knifehead	Crop heads leaning away from knifehead hole in endsheet	Add knifehead shields (except in damp or sticky soils)	5.8.8 Knifehead Shield, page 392
Strips of uncut material	Crowding uncut crop	Allow enough room for crop to be fed to cutterbar	—
	Broken knife sections	Replace broken sections	5.8.1 Replacing Knife Section, page 379
Excessive bouncing at normal field speed	Float set too light	Adjust header float	3.7.3 Header Float, page 55

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Divider rod running down standing crop	Divider rods too long	Remove divider rod	3.7.13 Installing Crop Dividers, page 99
Crop not being cut at ends	Reel not frowning or not centered in header	Adjust reel horizontal position or reel frown	<ul style="list-style-type: none"> 3.7.11 Reel Fore-Aft Position, page 84 5.15.2 Reel Frown, page 446
	Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely but still keep sections from lifting off guards	<ul style="list-style-type: none"> Adjusting Hold-Downs with Pointed Guards, page 389 Adjusting Hold-Downs with Stub Guards, page 390
	Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	5.8 Knives, page 379
	Header is not level	Level header	3.9 Levelling the Header, page 231
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position and/or finger pitch	<ul style="list-style-type: none"> 3.7.11 Reel Fore-Aft Position, page 84 3.7.12 Reel Tine Pitch, page 96
	Divider runs down thick crop at ends preventing proper feeding due to material bridging the cutter guards	Replace 3–4 end guards with stub guards	<ul style="list-style-type: none"> 5.8.7 Knife Guards, page 384 6.3.3 Stub Guard Conversion Kit, page 492 See your MacDon Dealer
Bushy or tangled crop flows over divider rod, builds up on endsheets	Divider rods providing insufficient separation	Install long divider rods	3.7.13 Installing Crop Dividers, page 99
Cut grain falling ahead of cutterbar	Ground speed too slow	Increase ground speed	3.7.7 Ground Speed, page 74
	Reel speed too slow	Increase reel speed	3.7.6 Reel Speed, page 73
	Reel too high	Lower reel	3.7.10 Reel Height, page 79
	Cutterbar too high	Lower cutterbar	<ul style="list-style-type: none"> 3.7.1 Cutting off the Ground, page 49 3.7.2 Cutting on the Ground, page 54

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Cut grain falling ahead of cutterbar (continued)	Reel too far forward	Move reel back on arms	3.7.11 Reel Fore-Aft Position, page 84
	Cutting at speeds over 10 km/h (6 mph) with 10-tooth reel drive sprocket	Replace with 19-tooth reel drive sprocket	5.16.3 Reel Drive Sprocket, page 471
	Worn or broken knife components	Replace components	5.8 Knives, page 379

7.2 Cutting Action and Knife Components

Symptom	Problem	Solution	Refer to
Ragged or uneven cutting of crop	Knife hold-downs not adjusted properly	Adjust hold-downs	<ul style="list-style-type: none"> • Adjusting Hold-Downs with Pointed Guards, page 389 • Adjusting Hold-Downs with Stub Guards, page 390
	Knife sections or guards are worn or broken	Replace all worn and broken cutting parts	5.8 Knives, page 379
	Knife is not operating at recommended speed	Check engine speed of combine	Refer to the combine operator's manual
	Ground speed too fast for reel speed	Reduce ground speed or increase reel speed	<ul style="list-style-type: none"> • 3.7.6 Reel Speed, page 73 • 3.7.7 Ground Speed, page 74 • Ground Speed
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position/ finger pitch	<ul style="list-style-type: none"> • 3.7.11 Reel Fore-Aft Position, page 84 • 3.7.12 Reel Tine Pitch, page 96
	Cutterbar too high	Lower cutting height	3.7.1 Cutting off the Ground, page 49 or 3.7.2 Cutting on the Ground, page 54
	Header angle too flat	Steepen header angle	3.7.5 Header Angle, page 72
	Bent knife causing binding of cutting parts	Straighten bent knife and align guards	5.8.7 Knife Guards, page 384
	Cutting edge of guards not close enough or parallel to knife sections	Align guards	

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Ragged or uneven cutting of crop (continued)	Tangled/tough-to-cut crop	Install stub guards	<ul style="list-style-type: none"> See your MacDon Dealer <i>Adjusting Hold-Downs with Pointed Guards, page 389 or Adjusting Hold-Downs with Stub Guards, page 390</i> <i>6.3.3 Stub Guard Conversion Kit, page 492</i>
	Reel too far back	Move reel forward	<i>3.7.11 Reel Fore-Aft Position, page 84</i>
	Loose knife drive belt	Adjust drive belt tension	<i>Tensioning Knife Drive Belts, page 404</i>
Knife plugging	Reel too high or too far forward	Lower reel or move reel rearward	<ul style="list-style-type: none"> <i>3.7.10 Reel Height, page 79</i> <i>3.7.11 Reel Fore-Aft Position, page 84</i>
	Ground speed too slow	Increase ground speed	<i>3.7.7 Ground Speed, page 74</i>
	Loose knife drive belt	Adjust drive belt tension	<i>Tensioning Knife Drive Belts, page 404</i>
	Improper knife hold-down adjustment	Adjust hold-down	<ul style="list-style-type: none"> <i>Adjusting Hold-Downs with Pointed Guards, page 389</i> <i>Adjusting Hold-Downs with Stub Guards, page 390</i>
	Dull or broken knife section	Replace knife section	<i>5.8.1 Replacing Knife Section, page 379</i>
	Bent or broken guards	Align or replace guards	<i>5.8.7 Knife Guards, page 384</i>
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position/ finger pitch	<ul style="list-style-type: none"> <i>3.7.11 Reel Fore-Aft Position, page 84</i> <i>3.7.12 Reel Tine Pitch, page 96</i>
	Steel pick-up fingers contacting knife	Increase reel clearance to cutterbar or adjust "frown"	<ul style="list-style-type: none"> <i>5.15.1 Reel Clearance to Cutterbar, page 442</i> <i>5.15.2 Reel Frown, page 446</i>

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Knife plugging (continued)	Float too heavy	Adjust springs for lighter float	3.7.3 Header Float, page 55
	Mud or dirt build-up on cutterbar	Raise cutterbar by lowering skid shoes	3.7.2 Cutting on the Ground, page 54
		Install cut-out sections	Installing Knifehead Shield, page 392
		Flatten header angle	3.7.5 Header Angle, page 72
	Knife is not operating at recommended speed	Check engine speed of combine or header knife speed	<ul style="list-style-type: none"> Refer to combine operator's manual Checking Knife Speed, page 78
Excessive header vibration	Knife hold-downs not adjusted properly	Adjust hold-downs	<ul style="list-style-type: none"> Adjusting Hold-Downs with Pointed Guards, page 389 Adjusting Hold-Downs with Stub Guards, page 390
	Knife not operating at recommended speed	Check engine speed of combine	Refer to combine operator's manual
	Excessive knife wear	Replace knife	<ul style="list-style-type: none"> 5.8.2 Removing Knife, page 381 5.8.5 Installing Knife, page 383
	Loose or worn knifehead pin or drive arm	Tighten or replace parts	5.8.1 Replacing Knife Section, page 379
Excessive vibration of float module and header	Incorrect knife speed	Adjust knife speed	Checking Knife Speed, page 78
	Driveline U-joints worn	Replace U-joints	See your MacDon Dealer
	Bent cutterbar	Straighten cutterbar	See your MacDon Dealer

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Excessive breakage of knife sections or guards	Knife hold-downs not adjusted properly	Adjust hold-downs	<ul style="list-style-type: none"> <i>Adjusting Hold-Downs with Pointed Guards, page 389</i> <i>Adjusting Hold-Downs with Stub Guards, page 390</i>
	Cutterbar operating too low in stony conditions	Raise cutterbar using skid shoes	<i>3.7.2 Cutting on the Ground, page 54</i>
	Float is set too heavy	Adjust float springs for lighter float	<i>3.7.3 Header Float, page 55</i>
	Bent or broken guard	Straighten or replace guard	<i>5.8.7 Knife Guards, page 384</i>
	Header angle too steep	Flatten header angle	<i>3.7.5 Header Angle, page 72</i>
Knife back breakage	Bent or broken guard	Straighten or replace guard	<i>5.8.7 Knife Guards, page 384</i>
	Worn knifehead pin	Replace knifehead pin	<ul style="list-style-type: none"> <i>5.8.3 Removing Knifehead Bearing, page 381</i> <i>5.8.4 Installing Knifehead Bearing, page 382</i>
	Dull knife	Replace knife	<ul style="list-style-type: none"> <i>5.8.2 Removing Knife, page 381</i> <i>5.8.5 Installing Knife, page 383</i>

7.3 Reel Delivery

Symptom	Problem	Solution	Refer to
Reel not releasing material in normal standing crop	Reel speed too fast	Reduce reel speed	3.7.6 Reel Speed, page 73
	Reel too low	Raise reel	3.7.10 Reel Height, page 79
	Reel tines too aggressive	Reduce cam setting	3.7.12 Reel Tine Pitch, page 96
	Reel too far back	Move reel forward	3.7.11 Reel Fore-Aft Position, page 84
Reel not releasing material in lodged and standing crop (reel fully lowered)	Reel tines too aggressive for standing crop	Reduce cam setting (one or two)	3.7.12 Reel Tine Pitch, page 96
Wrapping on reel end	Reel tines too aggressive	Reduce cam setting	3.7.12 Reel Tine Pitch, page 96
	Reel too low	Raise reel	3.7.10 Reel Height, page 79
	Reel speed too fast	Reduce reel speed	3.7.6 Reel Speed, page 73
	Crop conditions	Install optional endshields	See your macdon dealer
	Reel not centered in header	Center reel in header	5.15.3 Centering Double Reel, page 447
Reel releases crop too quickly	Reel tines not aggressive enough	Increase cam setting	3.7.12 Reel Tine Pitch, page 96
	Reel too far forward	Move reel back	3.7.11 Reel Fore-Aft Position, page 84
Reel will not lift	Reel lift couplers are incompatible or defective	Change quick coupler	See your MacDon Dealer
Reel will not turn	Quick couplers not properly connected	Connect couplers	Refer to the combine operator's manual
	Reel drive chain disconnected	Connect chain	5.16.6 Replacing Drive Chain on Double Reel, page 477
Reel motion uneven under no load	Excessive slack in reel drive chain	Tighten chain	Tightening Reel Drive Chain, page 469
Reel motion is uneven or stalls in heavy crops	Reel speed too fast	Reduce reel speed	3.7.6 Reel Speed, page 73
	Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch	3.7.12 Reel Tine Pitch, page 96

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Reel motion is uneven or stalls in heavy crops (continued)	Reel too low	Raise reel	3.7.10 Reel Height, page 79
	Relief valve on combine (not on combine float module) has low relief pressure setting	Increase relief pressure to manufacturer's recommendations	Refer to the combine operator's manual
	Low oil reservoir level on combine NOTE: Sometimes there is more than one reservoir	Fill to proper level	
	Relief valve malfunction	Replace relief valve	
	Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace with high torque (10-tooth or 14-tooth) reel drive sprocket	5.16.3 Reel Drive Sprocket, page 471
Plastic fingers cut at tip	Insufficient reel to cutterbar clearance	Increase clearance	5.15.1 Reel Clearance to Cutterbar, page 442
Plastic fingers bent rearward at tip	Reel digging into ground with reel speed slower than ground speed	Raise header	<ul style="list-style-type: none"> 3.7.1 Cutting off the Ground, page 49 3.7.2 Cutting on the Ground, page 54
		Decrease header tilt	3.7.5 Header Angle, page 72
		Move reel aft	3.7.11 Reel Fore-Aft Position, page 84
Plastic fingers bent forward at tip (opposite of above)	Reel digging into ground with reel speed faster than ground speed	Raise header	<ul style="list-style-type: none"> 3.7.1 Cutting off the Ground, page 49 3.7.2 Cutting on the Ground, page 54
		Decrease header tilt	3.7.5 Header Angle, page 72
		Move reel aft	3.7.11 Reel Fore-Aft Position, page 84
Plastic fingers bent close to tine tube	Excessive plugging at cutterbar with wads of crop accumulating at cutterbar while maintaining reel operation	Correct plugging/cutting issues	3.10 Unplugging the Cutterbar, page 233
		Stop reel before plugging becomes excessive	

7.4 Header and Drapers

Symptom	Problem	Solution	Refer to
Header lift insufficient	Low relief pressure	Increase relief pressure	See your MacDon Dealer
Insufficient side draper speed	Speed control set too low	Increase speed control setting	3.7.8 Draper Speed, page 75
	combine header drive too slow	Adjust to correct speed for combine model	Refer to the combine operator's manual
Insufficient feed draper speed	Relief pressure too low	Test side draper hydraulic system	See your MacDon Dealer
	Worn out gear pump	Replace gear pump	See your MacDon Dealer
	combine header drive too slow	Adjust to correct speed for combine model	Refer to the combine operator's manual
Feed draper will not move	Drapers are loose	Tighten drapers	5.14.3 Adjusting Draper Tension, page 427
	Drive or idler roller wrapped with material	Loosen draper and clean rollers	
	Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	
	Roller bearing seized	Replace roller bearing	5.14.6 Header Draper Roller Maintenance, page 434
	Low hydraulic oil	Fill combine hydraulic oil reservoir to full level	Refer to the combine operator's manual
Side draper will not move	Drapers are loose	Tighten drapers	5.14.3 Adjusting Draper Tension, page 427
	Drive or idler roller wrapped with material	Loosen draper and clean rollers	
	Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction	
	Roller bearing seized	Replace roller bearing	5.14.6 Header Draper Roller Maintenance, page 434
	Low hydraulic oil	Fill combine hydraulic oil reservoir to full level	Refer to the combine operator's manual
	Incorrect compensator setting at pump	Adjust compensator setting	See your MacDon Dealer

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Draper stalling	Material not feeding evenly off knife	Lower reel	3.7.10 Reel Height, page 79
		Install stub guards	<ul style="list-style-type: none"> • 5.8.7 Knife Guards, page 384 • 6.3.3 Stub Guard Conversion Kit, page 492 • See your MacDon Dealer
Hesitation in flow of bulky crop	Header angle too low	Increase header angle	3.7.5 Header Angle, page 72
	Material overload on drapers	Increase side draper speed	3.7.8 Draper Speed, page 75
		Install upper cross auger	Refer to 6.5.8 Upper Cross Auger (UCA), page 498
		Add flighting extensions	See your MacDon Dealer
Drapers back-feed	Drapers running too slow in heavy crop	Increase draper speed	3.7.8 Draper Speed, page 75
Crop is thrown across opening and under opposite side draper	Drapers running too fast in light crop	Reduce draper speed	3.7.8 Draper Speed, page 75
Material accumulates inside or under front edge of draper	Deck height improperly adjusted	Adjust deck height	5.14.5 Adjusting Deck Height, page 432
Material accumulating on end deflectors and releasing in bunches	End deflectors too wide	For headers with manual deck shift only, trim deflector or replace with narrow deflector (MD #172381)	3.10 Unplugging the Cutterbar, page 233

7.5 Cutting Edible Beans

Symptom	Problem	Solution	Refer to
Plants being stripped and complete or partial plants left behind	Header off ground	Lower header to ground and run on skid shoes and/or cutterbar	3.7.2 Cutting on the Ground, page 54
	Float set too light—rides on high spots and does not lower soon enough	Set float for the following conditions: - Dry ground: 100–150 lbf - Wet ground: 50–100 lbf	3.7.3 Header Float, page 55
	Reel too high	Fully retract reel cylinders	3.7.10 Reel Height, page 79
	Reel too high with cylinders fully retracted	Adjust reel height	3.7.10 Reel Height, page 79
	Finger pitch not aggressive enough	Adjust finger pitch	3.7.12 Reel Tine Pitch, page 96
	Reel too far aft	Move reel forward until the fingertips skim the soil surface with header on the ground and the center-link properly adjusted	3.7.11 Reel Fore-Aft Position, page 84
	Header angle too shallow	Lengthen center-link	Adjusting Header Angle, page 73
		Increase header angle can by fully retracting lift cylinders (if cutting on ground)	
	Reel too slow	Adjust reel speed to be marginally faster than ground speed	3.7.6 Reel Speed, page 73
	Ground speed too fast	Lower ground speed	3.7.7 Ground Speed, page 74
	Skid shoes too low	Raise skid shoes to highest setting	3.7.2 Cutting on the Ground, page 54
	Dirt packs on bottom of cutterbar and raises cutterbar off the ground	Install plastic wear strips on bottom of cutterbar and skid shoes	See your MacDon Dealer
	Dirt packing on bottom of cutterbar with plastic wear strips on cutterbar and raises cutterbar off the ground	Ground too wet – allow soil to dry	—
		Manually clean the bottom of cutterbar when excessive accumulation occurs	

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Plants being stripped and complete or partial plants left behind	Plastic wear strip for cutterbar has been installed over top of steel wear plates	Remove steel cutterbar wear plates when installing the plastic wear strips for cutterbar	—
	Header not level	Level header	3.9 Levelling the Header, page 231
	Worn or damaged knife sections	Replace sections or replace knife	5.8 Knives, page 379
	Parts of vines get caught in pointed guard tip. (Occurs more in row-cropped beans that are hilled from cultivating.)	Install stub guard conversion kit	6.3.3 Stub Guard Conversion Kit, page 492
Excessive losses at dividers	Divider rod running down crop and shattering pods	Remove divider rod	3.7.13 Installing Crop Dividers, page 99
	Vines and plants build up on endsheet	Install divider rod	
Plant vines pinched between top of draper and cutterbar	Cutterbar fills with debris when draper to cutterbar gap is properly adjusted	Raise header fully at each end of field (or as required) and shift decks back and forth to help clean out cutterbar	—
	Shifting the decks with header raised does not clean out cutterbar debris.	Manually remove debris from cutterbar cavity to prevent damaging the drapers	
Crop accumulating at guards and not moving rearward onto drapers	Reel finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.7.12 Reel Tine Pitch, page 96
	Reel too high	Lower reel	3.7.10 Reel Height, page 79
	Minimum reel clearance to cutterbar setting too high	Adjust minimum reel height with cylinders fully retracted	5.15.1 Reel Clearance to Cutterbar, page 442
	Reel too far forward	Reposition reel	3.7.11 Reel Fore-Aft Position, page 84
Crop wrapping around reel	Reel too low	Raise reel	3.7.10 Reel Height, page 79

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Reel shattering pods	Reel too far forward	Reposition reel	3.7.11 Reel Fore-Aft Position, page 84
	Reel speed too high	Reduce reel speed	3.7.6 Reel Speed, page 73
	Bean pods are too dry	Cut at night when heavy dew is present and pods have softened	—
	Reel finger pitch not aggressive enough	Increase finger aggressiveness (cam position)	3.7.12 Reel Tine Pitch, page 96
Cutterbar guards breaking	Float insufficient	Increase float	3.7.3 Header Float, page 55
	Excessive number of rocks in field	Consider installing optional stub guards Tip: Install a few guards on one section of the cutterbar and compare the performance of the two different guard styles	<ul style="list-style-type: none"> • 5.8.7 Knife Guards, page 384 • 6.3.3 Stub Guard Conversion Kit, page 492
Cutterbar pushing too much debris and dirt	Header too heavy	Readjust float to make header lighter	<ul style="list-style-type: none"> • 3.7.3 Header Float, page 55 • Checking and Adjusting Header Float, page 56
	Header angle too steep	Decrease header angle with lift cylinders	3.7.5 Header Angle, page 72
		Shorten the center-link	
	Regular guards push dirt and plug with debris or plug with debris and then push dirt	Install stub guard kit	6.3.3 Stub Guard Conversion Kit, page 492
	Insufficient support for header	Install center skid shoes on header	3.7.2 Cutting on the Ground, page 54
Crop wrapping around reel ends	Uncut crop interfering on reel ends	Add reel endshields	Refer to the header parts catalog
Cutterbar fills up with dirt	Excessive gap between top of front of draper and cutterbar	Adjust front deck supports to achieve proper clearance between cutterbar and draper	5.14.5 Adjusting Deck Height, page 432
		Raise header fully at each end of field (or as required) and shift decks back and forth to help clean out cutterbar	—

TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Reel occasionally carries over plants in same location	Reel fingers (steel) bent and hooking plants from crop flow on drapers	Straighten fingers (steel)	—
	Dirt accumulation on end of fingers preventing plants from dropping off fingers onto drapers	Raise reel	3.7.10 Reel Height, page 79
		Adjust reel fore-aft position to move fingers out of the ground	3.7.11 Reel Fore-Aft Position, page 84
Cutterbar pushing too much dirt in certain locations for length of field	Tire tracks or row crop ridges	Cut at angle to crop rows or ridges to allow knife and guards to clean out more effectively	—
	Rolling land along length of field	Cut at 90° to undulations (provided knife floats across without digging in)	
Reel carries over an excessive amount of plants or wads	Excessive accumulation of crop on drapers (up to height of reel center tube)	Increase draper speed	3.7.8 Draper Speed, page 75
	Finger pitch too far back	Increase finger pitch	3.7.12 Reel Tine Pitch, page 96

8 Reference

8.1 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

Jam Nuts

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by $f=0.65$.

Self-Tapping Screws

Standard torque is to be used (not to be used on critical or structurally important joints).

8.1.1 Metric Bolt Specifications

Table 8.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

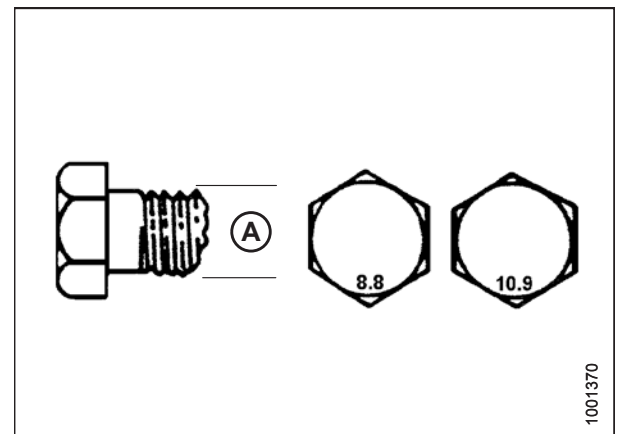


Figure 8.1: Bolt Grades

REFERENCE

Table 8.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

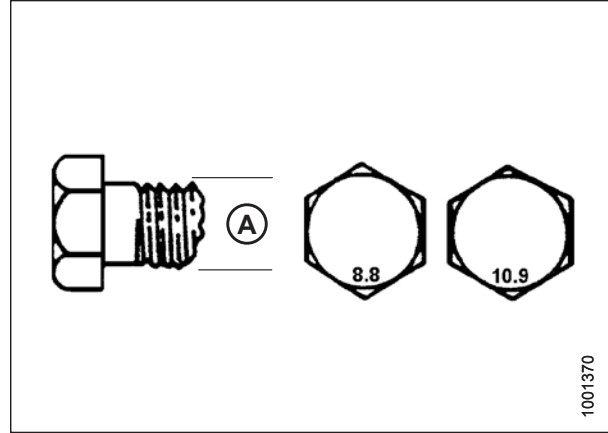


Figure 8.2: Bolt Grades

Table 8.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf-ft) (*lbf-in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

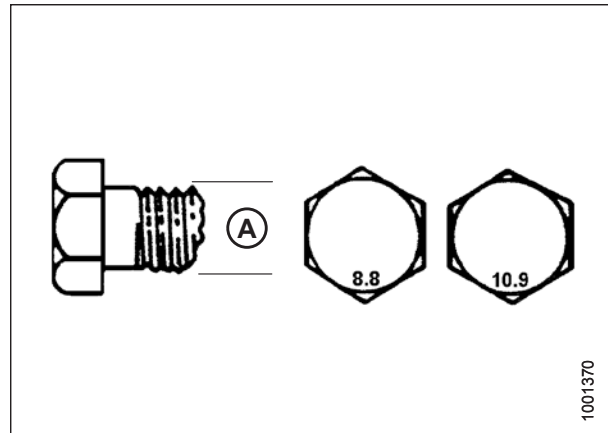


Figure 8.3: Bolt Grades

REFERENCE

Table 8.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

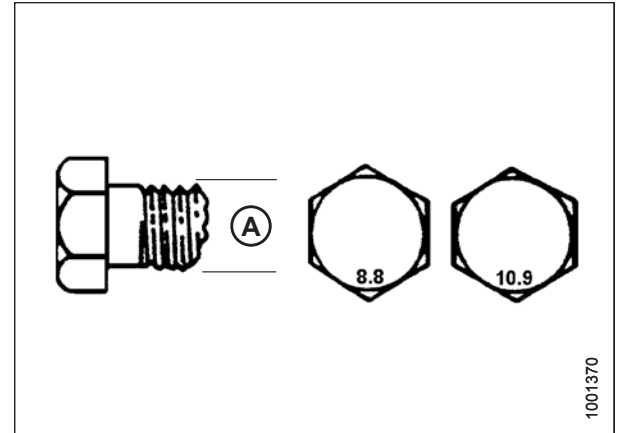


Figure 8.4: Bolt Grades

8.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 8.5 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf-ft	Nm	lbf-ft
M3	—	—	—	1
M4	—	—	4	2.6
M5	—	—	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	—	—	—	—
M16	—	—	—	—

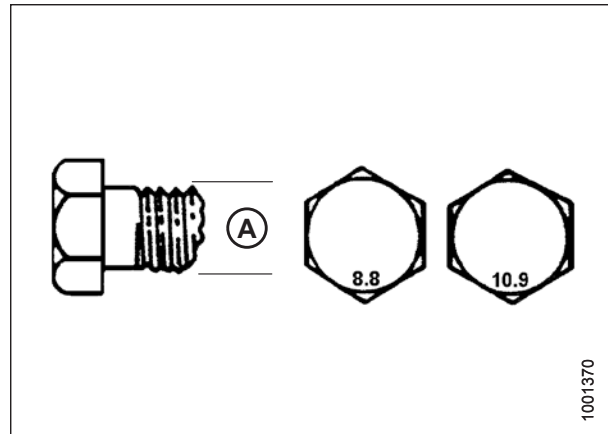


Figure 8.5: Bolt Grades

8.1.3 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 8.6, page 520.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

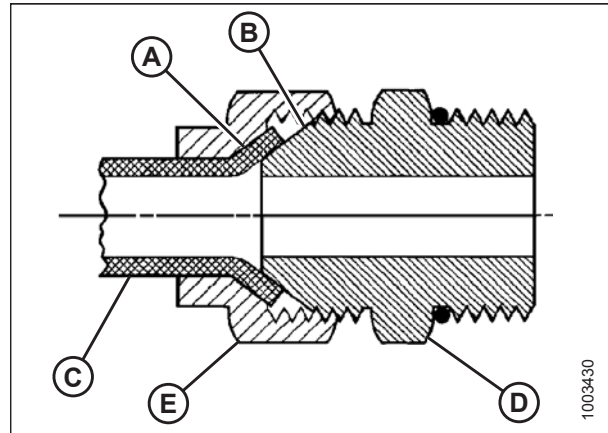


Figure 8.6: Hydraulic Fitting

Table 8.6 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value ³⁵		Flats from Finger Tight (FFFT)	
		Nm	lbf-ft	Tube	Swivel Nut or Hose
-2	5/16–24	4–5	3–4	—	—
-3	3/8–24	7–8	5–6	—	—
-4	7/16–20	18–19	13–14	2-1/2	2
-5	1/2–20	19–21	14–15	2	2

35. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

Table 8.6 Flare-Type Hydraulic Tube Fittings (continued)

SAE Dash Size	Thread Size (in.)	Torque Value ³⁶		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-6	9/16–18	30–33	22–24	2	1-1/2
-8	3/4–16	57–63	42–46	2	1-1/2
-10	7/8–14	81–89	60–66	1-1/2	1-1/2
-12	1-1/16–12	113–124	83–91	1-1/2	1-1/4
-14	1-3/16–12	136–149	100–110	1-1/2	1-1/4
-16	1-5/16–12	160–176	118–130	1-1/2	1
-20	1-5/8–12	228–250	168–184	1	1
-24	1-7/8–12	264–291	195–215	1	1
-32	2-1/2–12	359–395	265–291	1	1
-40	3–12	—	—	1	1

36. Torque values shown are based on lubricated connections as in reassembly.

8.1.4 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

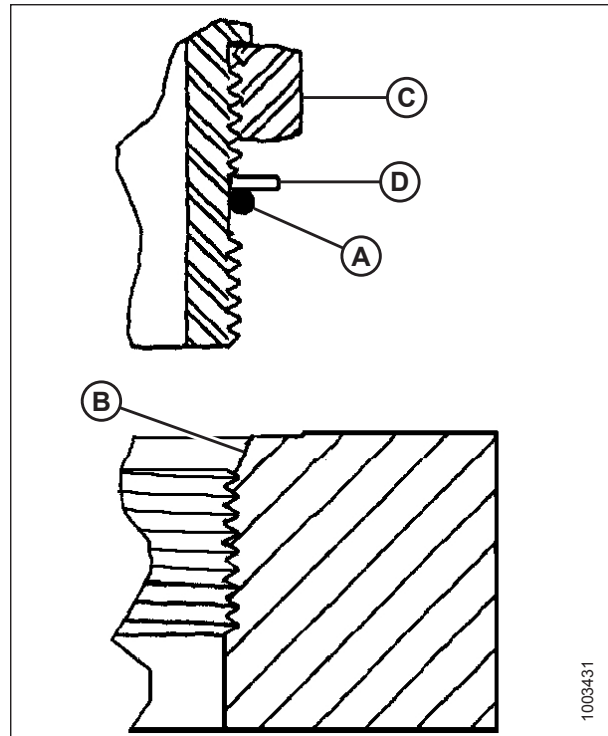


Figure 8.7: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).
8. Check final condition of fitting.

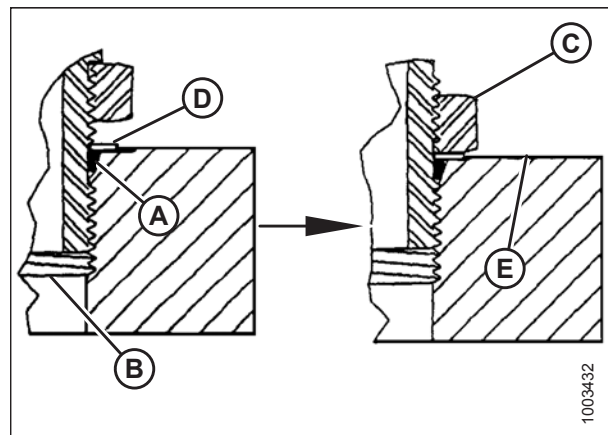


Figure 8.8: Hydraulic Fitting

REFERENCE

Table 8.7 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ³⁷	
		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

37. Torque values shown are based on lubricated connections as in reassembly.

REFERENCE

8.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to values in Table 8.8, [page 524](#).
6. Check final condition of fitting.

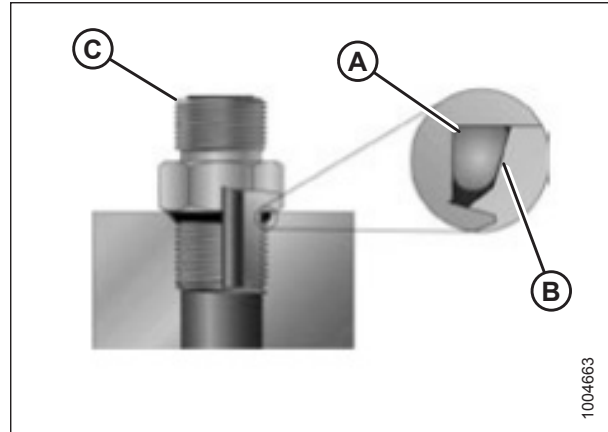


Figure 8.9: Hydraulic Fitting

Table 8.8 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ³⁸	
		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

³⁸ Torque values shown are based on lubricated connections as in reassembly.

8.1.6 O-Ring Face Seal (ORFS) Hydraulic Fittings

1. Check components to ensure that sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.



Figure 8.10: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table 8.9, page 525.

NOTE:

If applicable, hold hex on fitting body (E) to prevent rotation of fitting body and hose when tightening fitting nut (D).

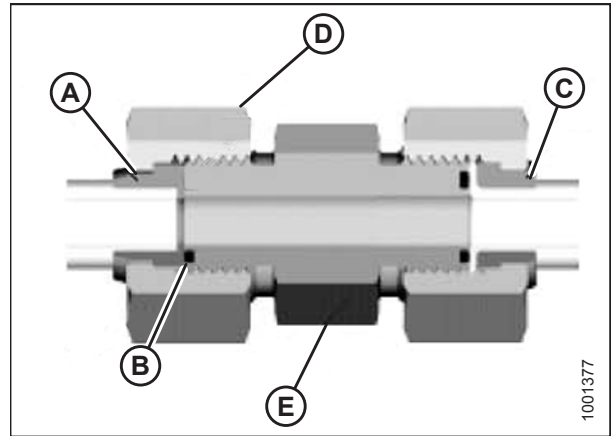


Figure 8.11: Hydraulic Fitting

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check final condition of fitting.

Table 8.9 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ³⁹	
			Nm	lbf·ft
-3	Note ⁴⁰	3/16	—	—
-4	9/16	1/4	25–28	18–21
-5	Note ⁴⁰	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

39. Torque values and angles shown are based on lubricated connection as in reassembly.

40. O-ring face seal type end not defined for this tube size.

REFERENCE

Table 8.9 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ⁴¹	
			Nm	lbf·ft
-14	Note ⁴⁰	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

8.1.7 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table 8.10, page 526. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

NOTE:

Overtorque failure of fittings may not be evident until fittings are disassembled.

Table 8.10 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended T.F.F.T.	Recommended F.F.F.T.
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

41. Torque values and angles shown are based on lubricated connection as in reassembly.

8.2 Conversion Chart

Table 8.11 Conversion Chart

Quantity	Imperial/Standard Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	acres	acres	$\times 0.4047 =$	hectares	ha
Flow	US gallons per minute	gpm	$\times 3.7854 =$	liters per minute	L/min
Force	pounds force	lbf	$\times 4.4482 =$	Newtons	N
Length	inch	in.	$\times 25.4 =$	millimeters	mm
	foot	ft.	$\times 0.305 =$	meters	m
Power	horsepower	hp	$\times 0.7457 =$	kilowatts	kW
Pressure	pounds per square inch	psi	$\times 6.8948 =$	kilopascals	kPa
			$\times .00689 =$	megapascals	MPa
			$\div 14.5038 =$	bar (Non-SI)	bar
Torque	pound feet or foot pounds	lbf·ft	$\times 1.3558 =$	Newton meters	Nm
	pound inches or inch pounds	lbf·in	$\times 0.1129 =$	Newton meters	Nm
Temperature	degrees Fahrenheit	°F	$(^{\circ}\text{F}-32) \times 0.56 =$	Celsius	°C
Velocity	feet per minute	ft/min	$\times 0.3048 =$	meters per minute	m/min
	feet per second	ft/s	$\times 0.3048 =$	meters per second	m/s
	miles per hour	mph	$\times 1.6063 =$	kilometers per hour	km/h
Volume	US gallons	US gal	$\times 3.7854 =$	liters	L
	ounces	oz.	$\times 29.5735 =$	milliliters	ml
	cubic inches	in ³	$\times 16.3871 =$	cubic centimeters	cm ³ or cc
Weight	pounds	lb.	$\times 0.4536 =$	kilograms	kg

8.3 Unloading and Assembly

Refer to the instructions for your specific header for unloading, assembly, and setup procedures that are included with your shipment. The instruction part numbers are shown in the following table:

Shipping Destination	Header Description	MacDon Instruction Part Number
North America	FD1 Series FlexDraper® Combine Header and FM100 Float Module	MD #214068
Export (anywhere other than North America)	FD1 Series FlexDraper® Combine Header and FM100 Float Module	MD #214069

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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 .12 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	2.2 liters (2.3 quarts)
			Main drive gearbox	2.5 liters (2.6 quarts)
Hydraulic Oil	Single grade trans-hydraulic oil. Recommended brands: <ul style="list-style-type: none"> • 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	75 liters (20 US gallons)

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Printed in Canada