MacDon

A40D and A40DX Auger Header

Operator's Manual

262334 Revision A

Original Instruction

The Harvesting Specialists.

MacDon A40D Auger Header

Published November 2023

EC Declaration of Conformity

EC Declaration of Conformity

[1] MacDon

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

[2] Auger Header

[3] MacDon A Series

[4] As per Shipping Document

[5] November 14, 2023

[6] _____
Adrienne Tankeu
Product Integrity

EN

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

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

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

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

Place and date of declaration: [5]

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

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

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

BG

Ние, [1]

декларираме, че следният продукт:

Тип машина: [2]

Наименование и модел: [3]

Сериен номер(а) [4]

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

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

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

Място и дата на декларацията: [5]

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

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

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

CZ

My, [1]

Prohlašujeme, že produkt:

Typ zařízení: [2]

Název a model: [3]

Sériové(á) číslo)a): [4]

splňuje všechna relevantní ustanovení směrnice 2006/42/EC.

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

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

Místo a datum prohlášení: [5]

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

Jméno a adresa osoby oprávněné k vyplnění technického souboru:

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

DA

Vi, [1]

erklærer, at prduktet:

Maskintype [2]

Navn og model: [3]

Serienummer (-numre): [4]

Opfylder alle bestemmelser i direktiv 2006/42/EF.

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

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

Sted og dato for erklæringen: [5]

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

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

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

DE

Wir, [1]

Erklären hiermit, dass das Produkt:

Maschinentyp: [2]

Name & Modell: [3]

Seriennummer (n): [4]

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

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

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

Ort und Datum der Erklärung: [5]

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

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

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

ES

Nosotros [1]

declaramos que el producto:

Tipo de máquina: [2]

Nombre y modelo: [3]

Números de serie: [4]

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

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

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

Lugar y fecha de la declaración: [5]

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

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

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

ET

Meie, [1]

deklareerime, et toode

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumbrid: [4]

vastab kõigile direktiivi 2006/42/EÜ asjakohastele sätetele.

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

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

Deklaratsiooni koht ja kuupäev: [5]

Deklaratsiooni koostamiseks volitatud isiku nimi ja allkiri: [6]

Tehnilise dokumendi koostamiseks volitatud isiku nimi ja aadress:

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

FR

Nous soussignés, [1]

Déclarons que le produit :

Type de machine : [2]

Nom et modèle : [3]

Numéro(s) de série : [4]

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

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

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

Lieu et date de la déclaration : [5]

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

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

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

The Harvesting Specialists MacDon

EC Declaration of Conformity

IT

Noi, [1]

Dichiariamo che il prodotto:

Tipo di macchina: [2]

Nome e modello: [3]

Numero(i) di serie: [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Luogo e data della dichiarazione: [5]

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

Nome e persona autorizzata a compilare il file tecnico:

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

HU

Mi, [1]

Ezennel kijelentjük, hogy a következő termék:

Gép típusa: [2]

Név és modell: [3]

Szériaszám(ok): [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

A nyilatkozattétel ideje és helye: [5]

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

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

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

LT

Mes, [1]

Pareiškiame, kad šis produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

atitinka taikomus reikalavimus pagal Direktyvą 2006/42/EB.

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklaracijos vieta ir data: [5]

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

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

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

LV

Mēs, [1]

Deklarējam, ka produkts:

Mašīnas tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

Atbilst visām būtiskajām Direktīvas 2006/42/EK prasībām.

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Deklarācijas parakstīšanas vieta un datums: [5]

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

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

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

NL

Wij, [1]

Verklaren dat het product:

Machinetype: [2]

Naam en model: [3]

Serienummer(s): [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plaats en datum van verklaring: [5]

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

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

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

PO

My niżej podpisani, [1]

Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

spełnia wszystkie odpowiednie przepisy dyrektywy 2006/42/WE.

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data i miejsce oświadczenia: [5]

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

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

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

PT

Nós, [1]

Declaramos, que o produto:

Tipo de máquina: [2]

Nome e Modelo: [3]

Número(s) de Série: [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Local e data da declaração: [5]

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

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

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

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul mașinii: [2]

Denumirea și modelul: [3]

Număr (numere) serie: [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Data și locul declarației: [5]

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

Numele și semnătura persoanei autorizate pentru întocmirea cărții tehnice:

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

SR

Mi, [1]

Izjavljujemo da proizvod

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Ispunjava sve relevantne odredbe direktive 2006/42/EC.

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Datum i mesto izdavanja deklaracije: [5]

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

Ime i adresa osobe ovlašæene za sastavljanje tehnièke datoteke:

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

SV

Vi, [1]

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Plats och datum för intyget: [5]

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

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

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

SL

Mi, [1]

izjavljamo, da izdelek:

Vrsta stroja: [2]

Ime in model: [3]

Serijska/-e številka/-e: [4]

ustreza vsem zadevnim določbam Direktive 2006/42/ES.

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Kraj in datum izjave: [5]

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

Ime in naslov osebe, pooblaščene za pripravo tehnične datoteke:

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

SK

My, [1]

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

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

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

EN ISO 4254-1:2013

EN ISO 4254-7:2009

Miesto a dátum prehlásenia: [5]

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

Meno a adresa osoby oprávnenej zostaviť technický súbor:

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

UK Declaration of Conformity

[1] MacDon

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

[2] Auger Header

[3] MacDon A Series

[4] As per Shipping Document

[5] November 14, 2023

[6] _____
Adrienne Tankeu
Product Integrity

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

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

Designated standards used are :

EN ISO 4254-1:2015

EN ISO 4254-7:2017

Place and date of declaration: [5]

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

Introduction

This manual describes the operating and maintenance procedures for MacDon model A40D and A40DX Auger Headers, including a Grass Seed version.

Your Machine

An A40D Auger Header is factory-configured to connect to an M Series Windrower, while an A40DX Auger Header is factory-configured to connect to an M1 or M2 Series Windrower.

NOTE:

STANDARD A40D headers (model year 2017 and later) can be converted to A40DX using conversion kit B5998. Installation of the supplied Reel Speed Sensor kit (MD #318022) is **NOT** required. **GRASS SEED** A40D headers (model year 2017 and later) can be converted to A40DX using conversion kit B6384. Installation of the supplied Reel Speed Sensor kit (MD #318022) is **REQUIRED**. Both standard and grass seed auger headers manufactured in model year 2016 and prior **CANNOT** be converted to A40DX headers.

Model	Configuration	Knife	Size m (ft.)	Features
A40D, A40DX	Windrower header only	Double	4.3, 4.9, and 5.5 (14, 16, and 18)	Separate hydraulic auger, knife, and reel drives: grass seed option

Your Warranty

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

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

Your Manual

Carefully read the information provided in this manual before attempting to operate or maintain an A40D or A40DX Auger Header.

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.

Use this manual as your first source of information about the machine. Use the Table of Contents and the Index to guide you to specific topics. Study the Table of Contents to familiarize yourself with how the information is organized. If you follow the instructions provided here, your header/pull-type will work well for many years.

Keep this manual handy for frequent reference, and to pass on to new Operators or Owners. Contact your Dealer if you need assistance, information, or additional copies of this manual.

Conventions

The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the header is the side that faces the crop; the back of the header is the side that connects to the windrower.
- Unless otherwise noted, use the standard torque values provided in Chapter *7.1 Recommended Torques, page 233*.

NOTE:

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

NOTE:

This manual is currently available in English and in Russian. The Russian translation of this manual can be ordered from MacDon, downloaded from the MacDon Dealer Portal (*https://portal.macdon.com*) (login required), or downloaded from the MacDon international website (*http://www.macdon.com/world*).

Summary of Changes

At MacDon, we're continuously making improvements: occasionally these improvements affect product documentation. The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
Throughout manual	Added M2 Series Windrower content.	Technical Publications
EC Declaration of Conformity, page i	Updated the EC Declaration of Conformity and added UK Declaration of Conformity.	Technical Publications
Introduction, page v	Removed a note that is no longer applicable.	Technical Publications
1.8 Decommissioning and Disposing of Agricultural Equipment, page 10	Added topic.	ISO 3600 Standard
1.10 Safety Sign Locations, page 13	Added illustration that shows the conditioning devices entanglement hazard decal (MD #320514).	ECN 64527
1.11 Understanding Safety Signs, page 16	Removed header crushing hazard decal (MD #304464 and MD #41980).	Technical Publications, Safety
	Added conditioning devices entanglement hazard decal (MD #320514) content.	ECN 64527
3.1 Attaching A40DX Auger Header to M2 Series Windrower, page 29	Added topic.	Technical Publications
3.2 Detaching A40DX Auger Header from M2 Series Windrower, page 33	Added topic.	Technical Publications
3.8.4 Setting Auger Position, page 79	Added content for clarity.	Product Support
3.8.3 Adjusting Reel Speed, page 79	Added an important statement.	Product Support
3.8.9 Checking and Adjusting Float – M2 Series Windrowers, page 90	Added topic.	Technical Publications
Checking Float – M2 Series Windrowers, page 90	Added topic.	Technical Publications
Removing and Restoring Float – M2 Series Windrowers, page 92	Added topic.	Technical Publications
Setting Float Options with Fixed Deck – M2 Series Windrowers, page 93	Added topic.	Technical Publications
Setting Float Options with Fixed Deck – M1 Series Windrowers, page 98	Added topic.	Technical Publications
Positioning Side Deflectors, page 104	Added a step.	Technical Publications
3.9.1 Recommended Settings and Checks for A40DX GSS Auger Header, page 110	Added topic.	Product Support
4.4 Adjusting Auger Cover, page 130	Added topic.	Product Support
Lubrication Points: Knife and Gearbox, page 140	Removed redundant footnote.	Technical Publications
Removing Knife Drive Box Pulley, page 163	Revised the title for clarity.	Technical Publications
Installing Knife Drive Box Pulley, page 163	Revised the title for clarity.	Technical Publications
Changing Knife Drive Box Oil, page 163	Updated the quantity of the knife drive box lubricant from 2.2 liters to 2.1 liters.	ECN 63317

Section	Summary of Change	Internal Use Only
	Replaced the hazard statement.	Technical Publications
4.15 Replacing Skid Shoe Wear Plate, page 218	Revised the hazard statement.	Technical Publications
5.1.6 Hose Bundle Storage Kit, page 225	Added topic.	ECN 55422
5.1.7 Reel Speed Control Kit, page 226	Added topic.	Product Support
O-Ring Boss Hydraulic Fittings – Adjustable, page 238	Updated the torque specs in the table to match Parker recommended torque values.	ECN 64539
O-Ring Boss Hydraulic Fittings – Non-Adjustable, page 240	Updated the torque specs in the table to match Parker recommended torque values.	ECN 64539
O-Ring Face Seal Hydraulic Fittings, page 240	Corrected torque values in the table: • Size -6: rounded up lbf·ft and replaced 29–32 with 30–32. • Size -24: corrected “Thread Size” from 1–2 to 2.	Technical Publications
Inside back cover	Updated the quantity of the knife drive box lubricant from 2.2 liters to 2.1 liters.	ECN 63317
–	Removed the “Unloading and Assembly” topic.	Technical Publications
–	Removed redundant “Haying” division.	Technical Publications
–	Removed redundant “Recommended Torques” division.	Technical Publications

Model and Serial Number

Record the model number, serial number, and model year of the header in the spaces below. The header serial number plate is located on the top of the left end frame (A).

Header Model Number: _____

Header Serial Number: _____

Model Year: _____

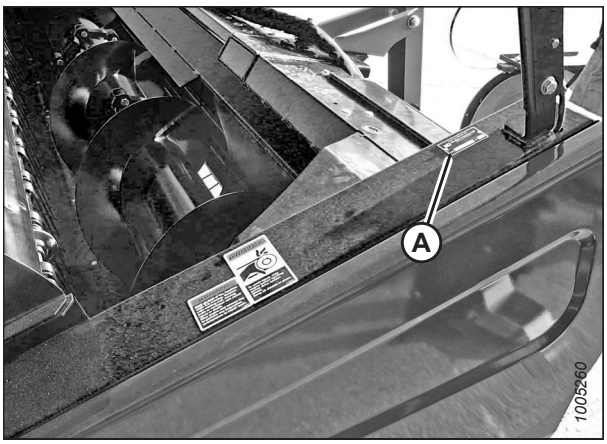


Figure 1: Header Serial Number Plate Location

Chapter 1: Safety

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

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

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

CAUTION

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

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

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

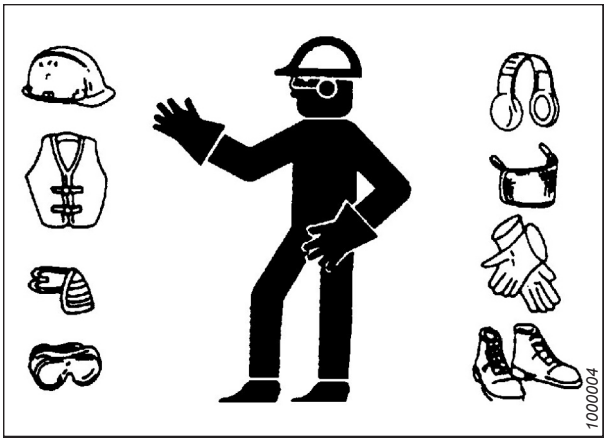


Figure 1.2: Safety Equipment

In addition, take the following precautions:

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

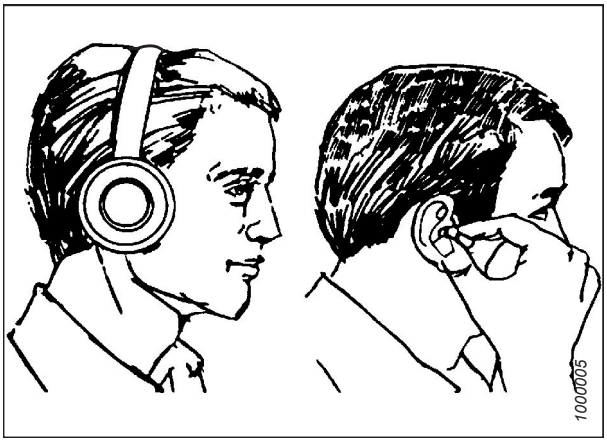


Figure 1.3: Safety Equipment

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

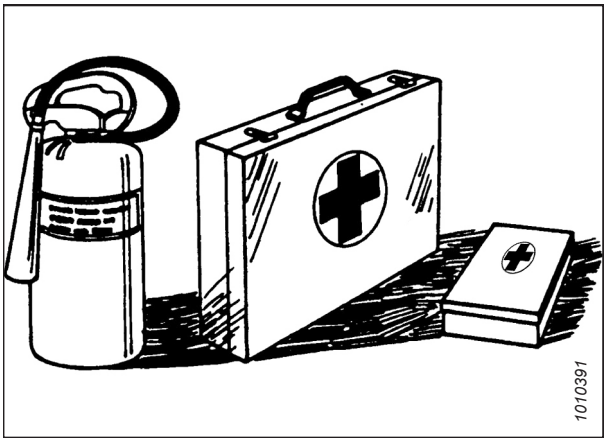


Figure 1.4: Safety Equipment

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

Figure 1.5: Safety around Equipment

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

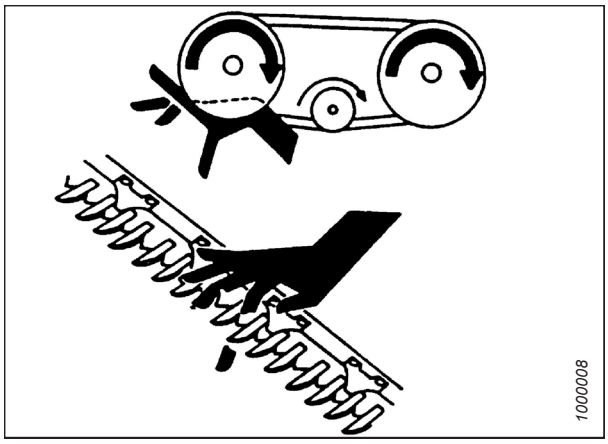


Figure 1.6: Safety around Equipment

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

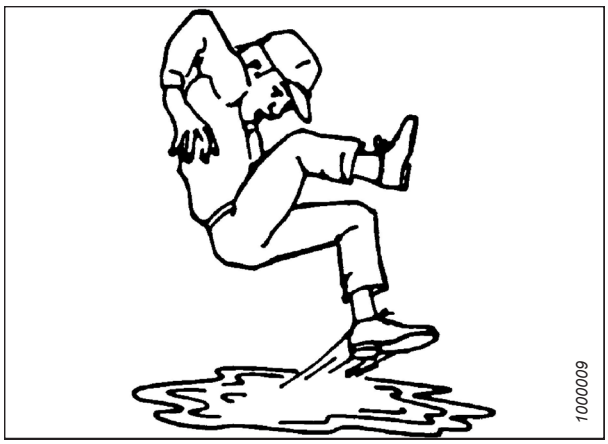


Figure 1.7: Safety around Equipment

1.4 Operational Safety

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

CAUTION

- **Follow all safety and operational instructions given in your operator's manual. If you do not have a windrower manual, get one from your Dealer and read it thoroughly.**
- **Never attempt to start windrower engine or operate the machine, except from the operator's seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Do NOT allow riders on windrower.**
- **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.**
- **If cutting ditch banks, use extreme caution. If the header hits an obstruction, front of the windrower will usually swerve towards the ditch.**
- **When working on inclines, travel uphill or downhill when possible. Be sure to keep windrower transmission in gear when travelling downhill.**
- **Never attempt to get on or off a moving windrower.**
- **Do NOT get off the windrower while the machine is in operation.**
- **To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key from ignition before adjusting or removing plugged material from the machine.**
- **Operate only in daylight or good artificial light.**

CAUTION

Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure as follows:

- **Engage the windrower brake.**
- **Disengage the PTO.**
- **Shut down the engine, and remove the key from the ignition.**
- **Wait for all movement to stop.**
- **Dismount and engage the cylinder stops before inspecting the raised machine.**

1.5 Owner/Operator Responsibilities

Owning and operating heavy equipment comes with certain duties.

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the pull-type. 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 others to operate the pull-type, 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. Immediately correct mistakes to prevent accidents.**
- **Do NOT modify the machine. Unauthorized modifications may impair function and/or safety and affect machine life.**
- **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.**
- **Ensure that the tractor is properly equipped to safely operate the pull-type. This may include adding ballast according to tractor operator's manual requirements for attachments of this size and mass.**

1.6 Maintenance Safety

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

To ensure your safety while maintaining the machine:

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

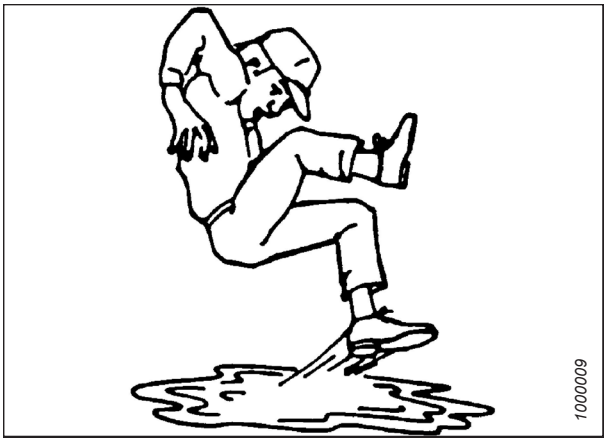


Figure 1.8: Wet Floors Present Safety Risks

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

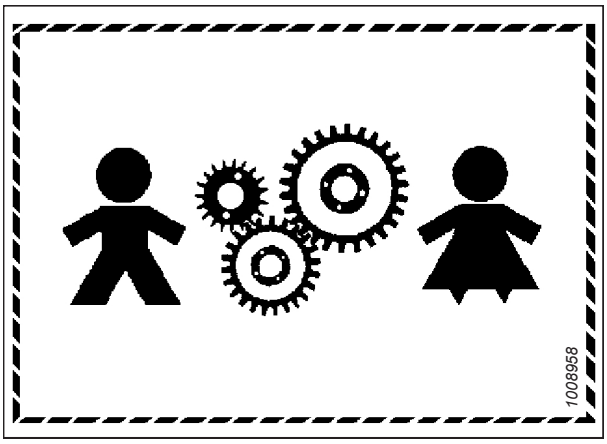


Figure 1.9: Equipment is NOT Safe for Children

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

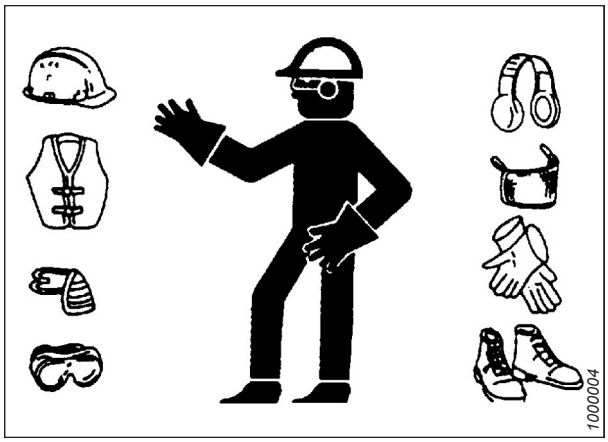


Figure 1.10: Personal Protective Equipment

1.7 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. Follow the proper safety procedures when inspecting hydraulic fluid leaks and servicing hydraulic equipment.

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

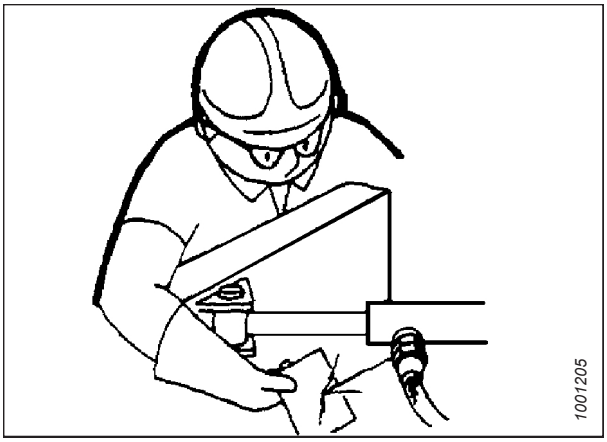


Figure 1.11: Testing for Hydraulic Leaks

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

Figure 1.12: Hydraulic Pressure Hazard

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

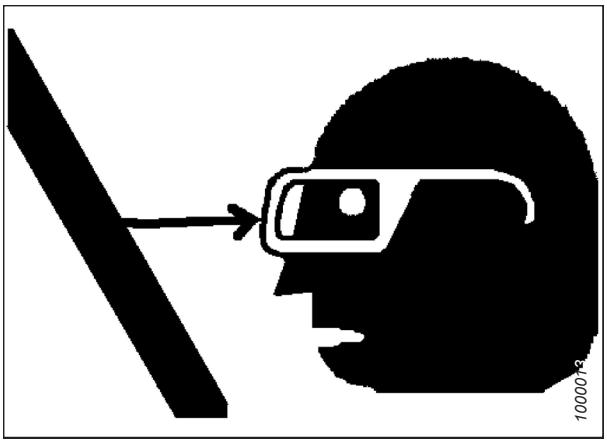


Figure 1.13: Safety around Equipment

1.8 Decommissioning and Disposing of Agricultural Equipment

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

Comply with local regulations and authorities.

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

Figure 1.14: Symbol for Do NOT Dispose with Domestic Waste

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

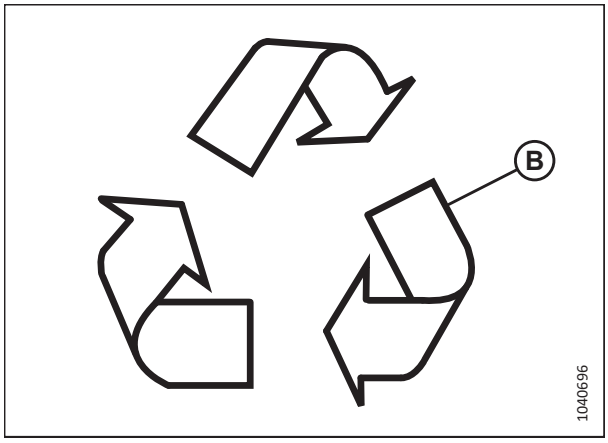


Figure 1.15: Symbol for Recycle as Labelled

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

1.9 Safety Signs

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

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

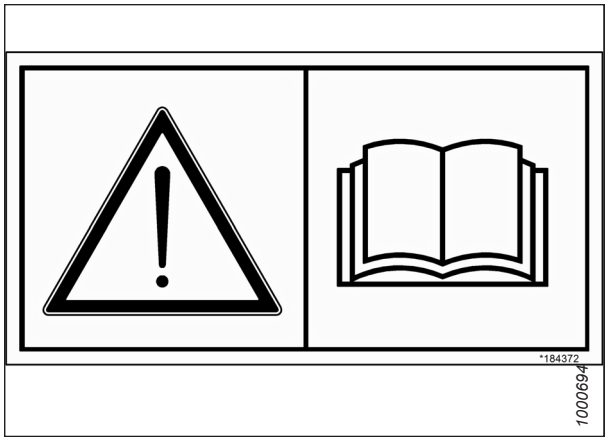


Figure 1.16: Operator's Manual Decal

1.9.1 Installing Safety Decals

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

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

1.10 Safety Sign Locations

Safety signs are factory-installed in many different locations on the header.

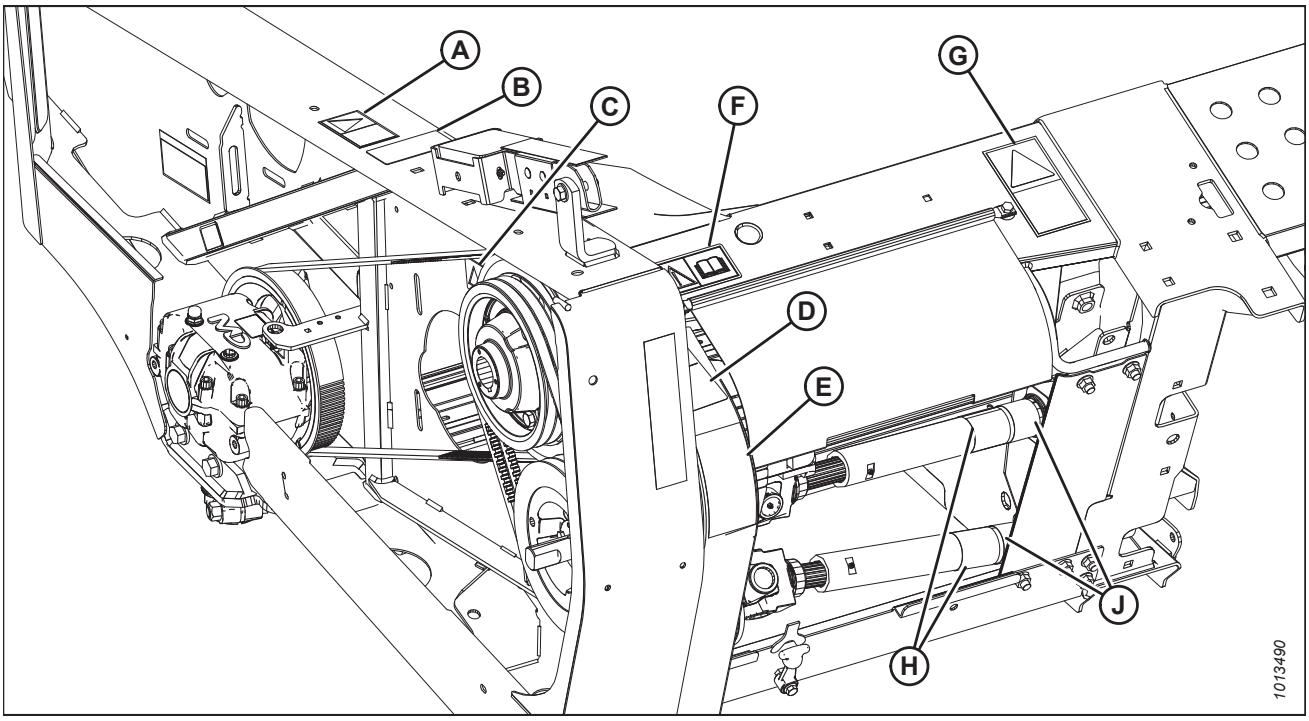


Figure 1.17: Left Side of Header

A - MD #174632
B - MD #184422
C - MD #166452
D - MD #174436
E - MD #171288
F - MD #184372
G - MD #194464
H - MD #194521
J - #36651

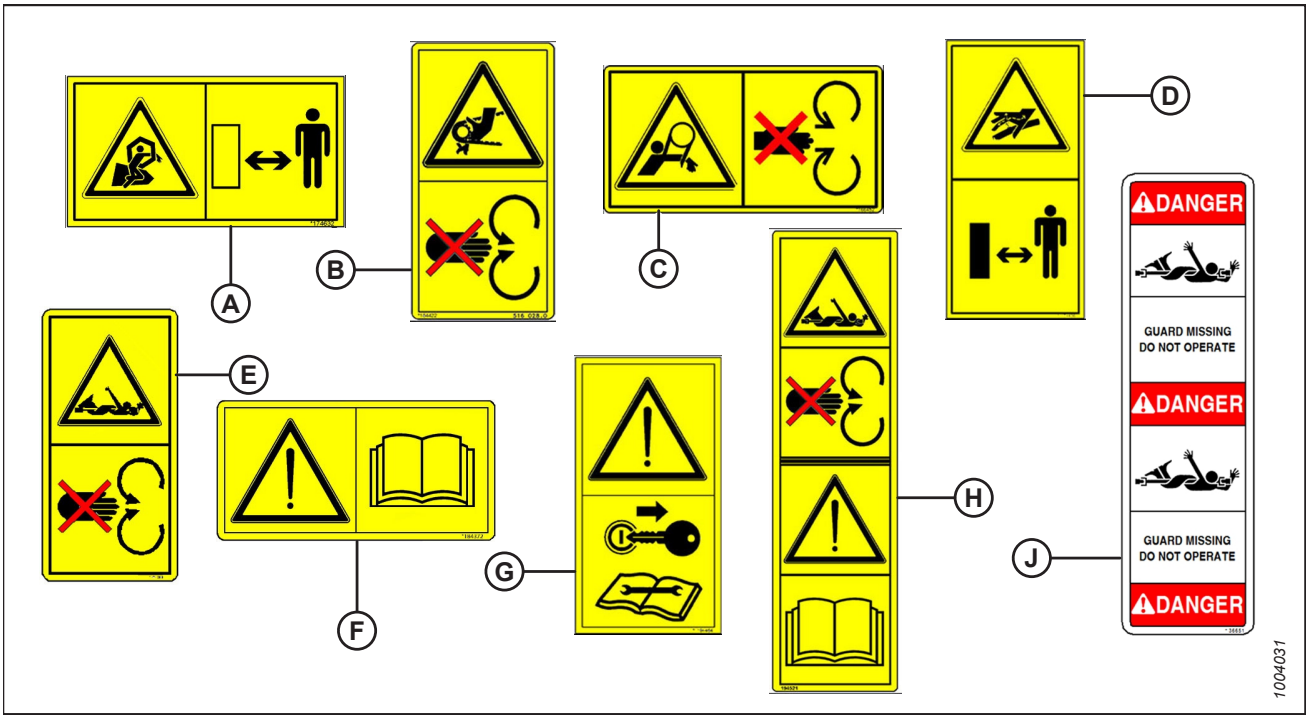


Figure 1.18: Decals on Left Side of Header

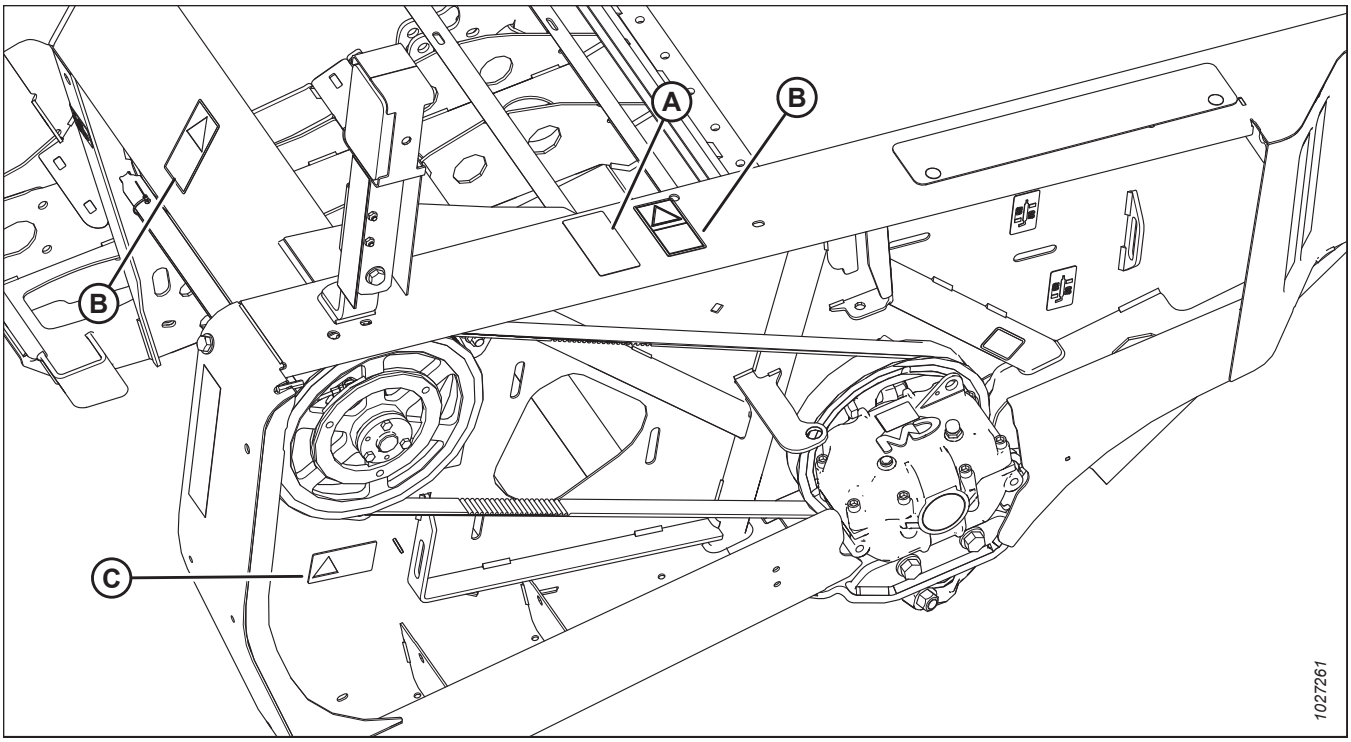


Figure 1.19: Right Side of Header

A - MD #184422 **B - MD #170638** **C - MD #166452**

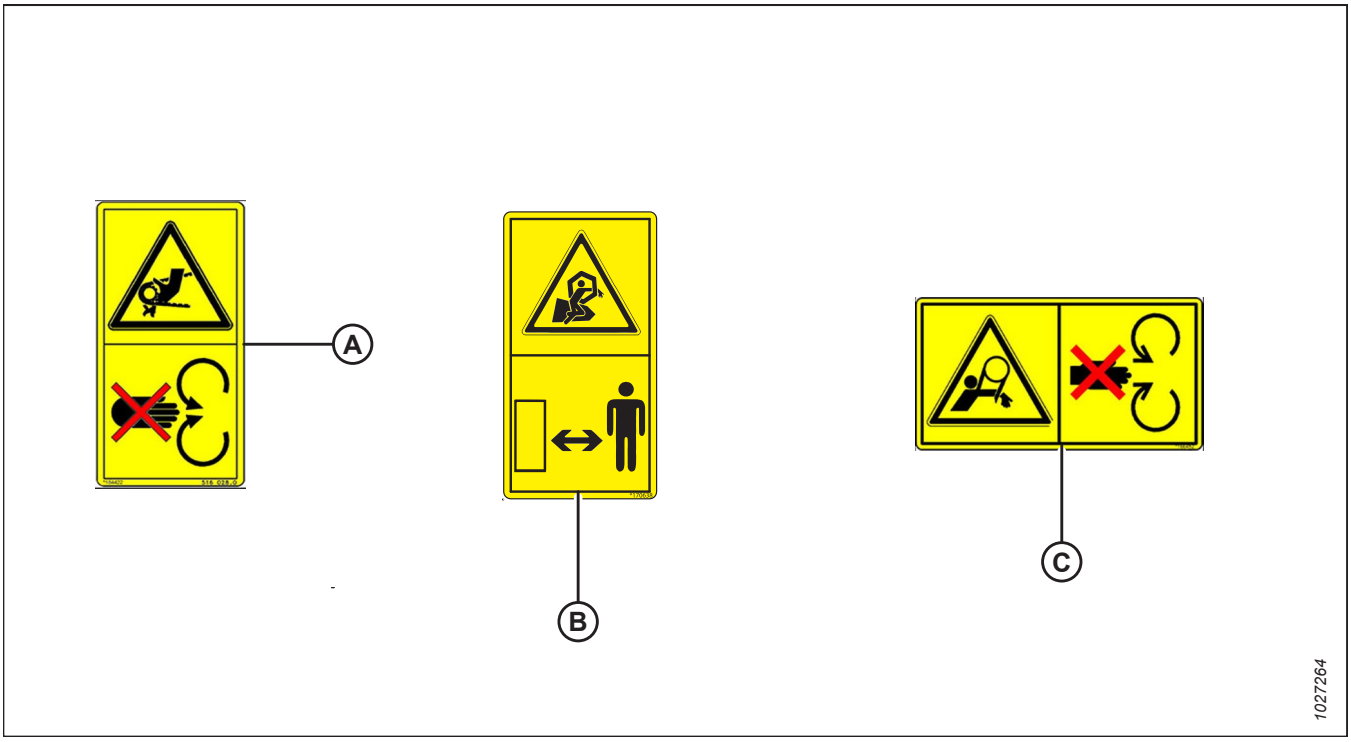


Figure 1.20: Decals on Right Side of Header

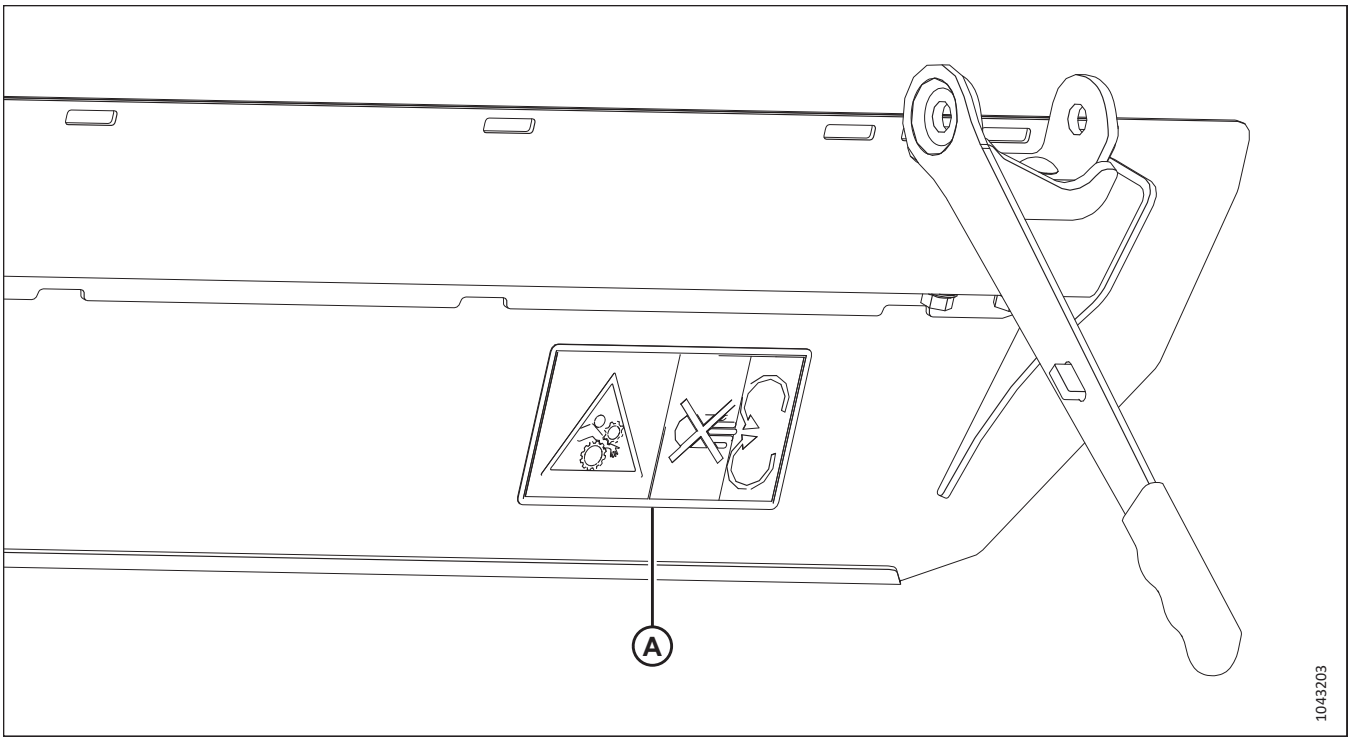


Figure 1.21: Center Deflector

A - MD #320514

1.11 Understanding Safety Signs

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

MD #36651

Driveline entanglement hazard

DANGER

- A rotating driveline contact can cause death—**KEEP AWAY!**

Do **NOT** operate without:

- Stopping the engine and removing the key before opening the shield.
- All driveline guards and equipment shields in place.

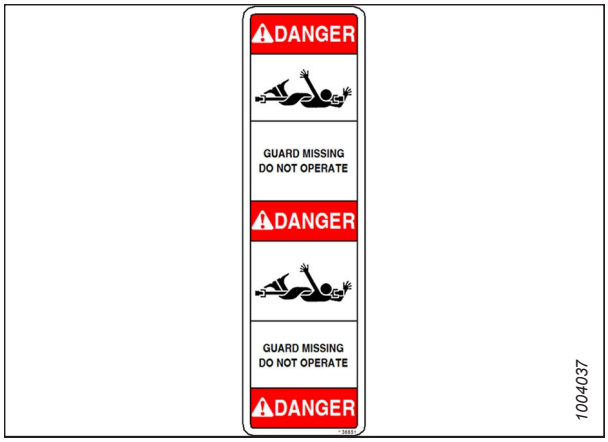


Figure 1.22: MD #36651

MD #113482

General hazard pertaining to machine operation and servicing

DANGER

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

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

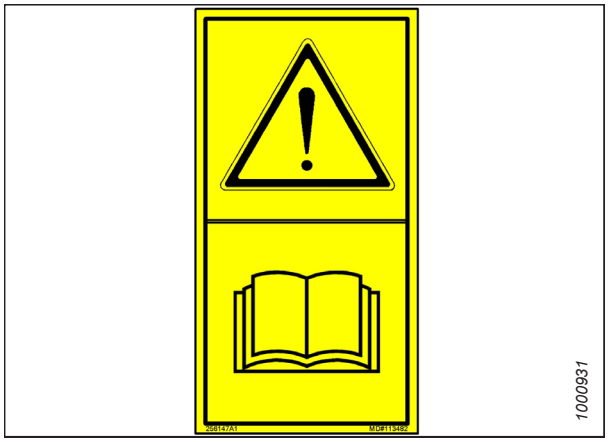


Figure 1.23: MD #113482

MD #166452

Hand and arm entanglement hazard

WARNING

To prevent injury:

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

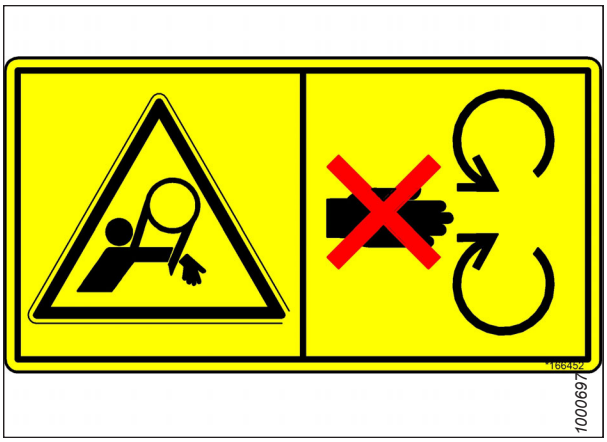


Figure 1.24: MD #166452

MD #166466

High-pressure oil hazard

WARNING

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

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

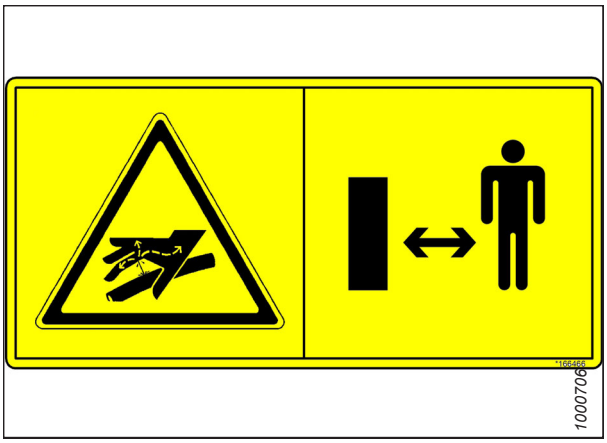


Figure 1.25: MD #166466

MD #170638

Reel entanglement hazard

DANGER

To prevent injury from entanglement with rotating reel:

- Stand clear of header while machine is running.

Figure 1.26: MD #170638

MD #171281

Hot fluid spray hazard

CAUTION

To prevent injury:

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

Figure 1.27: MD #171281

MD #171288

Auger entanglement hazard

DANGER

To prevent injury:

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

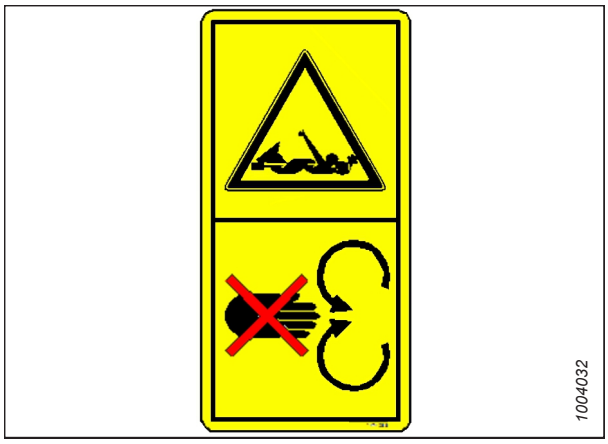


Figure 1.28: MD #171288

MD #174436

High-pressure oil hazard

WARNING

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

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

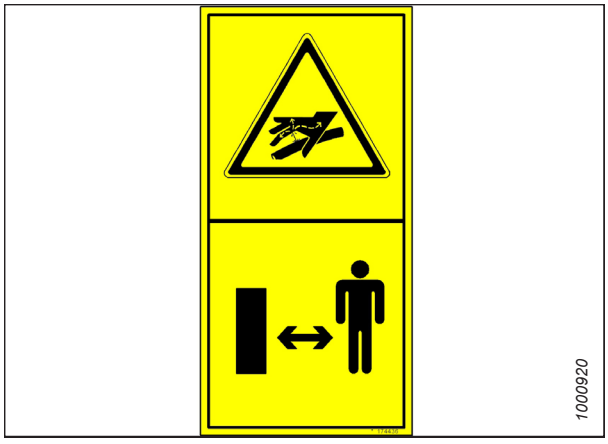


Figure 1.29: MD #174436

MD #174632

Reel entanglement hazard

DANGER

To prevent injury from entanglement with the rotating reel:

- Stand clear of the header while the machine is running.

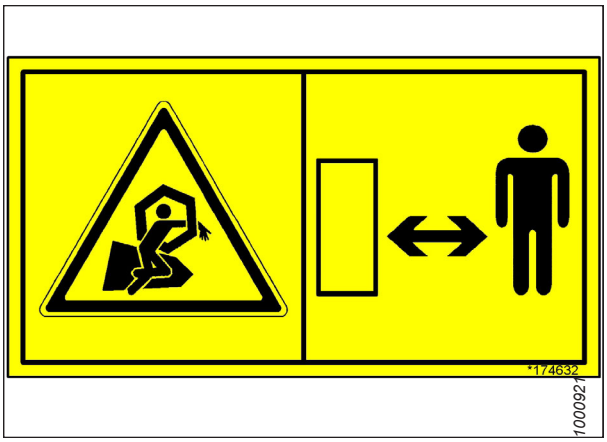


Figure 1.30: MD #174632

MD #184372

General hazard pertaining to machine operation and servicing

DANGER

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

- 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 these safety instructions with all machine Operators every year.
- Ensure that all safety signs are installed and are legible.
- Make certain that bystanders are clear of the header before starting the engine and during operation of the header.
- Keep riders off of the machine.
- Keep all shields in place. Stay clear of moving parts.
- Disengage the header drive, put the transmission into Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Before servicing a header in the raised position, engage the windrower's cylinder safety props.
- Display a slow-moving vehicle emblem and activate the header's warning lights when operating the header on roadways (unless these actions are prohibited by law).

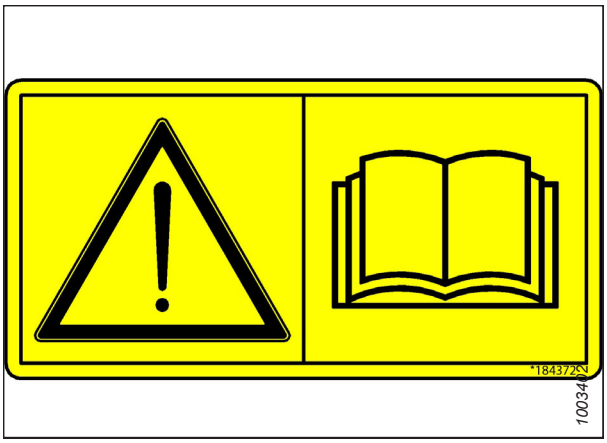


Figure 1.31: MD #184372

MD #184422

Hand and arm entanglement hazard

WARNING

To prevent injury:

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

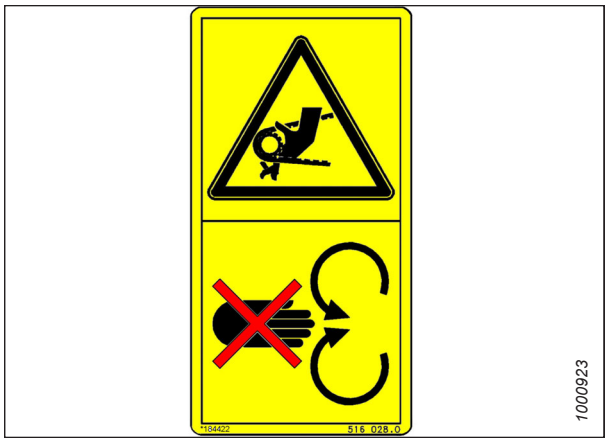


Figure 1.32: MD #184422

MD #194464

General hazard

DANGER

To prevent injury or death:

- Stop engine and remove key before service.
- Read the windrower and header manuals for inspection and maintenance instructions.

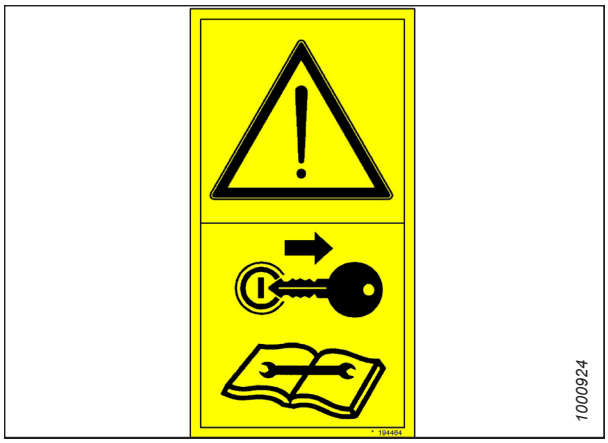


Figure 1.33: MD #194464

MD #194521

Auger entanglement hazard

DANGER

To prevent injury from entanglement with rotating auger:

- Stand clear of header while machine is running.
- Do **NOT** operate without shields in place.
- Stop engine and remove key before opening shield.

General hazard pertaining to machine operation and servicing.

DANGER

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

- Read the operator's manual and follow 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 from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety locks to prevent lowering of header or reel before servicing in the raised position.
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

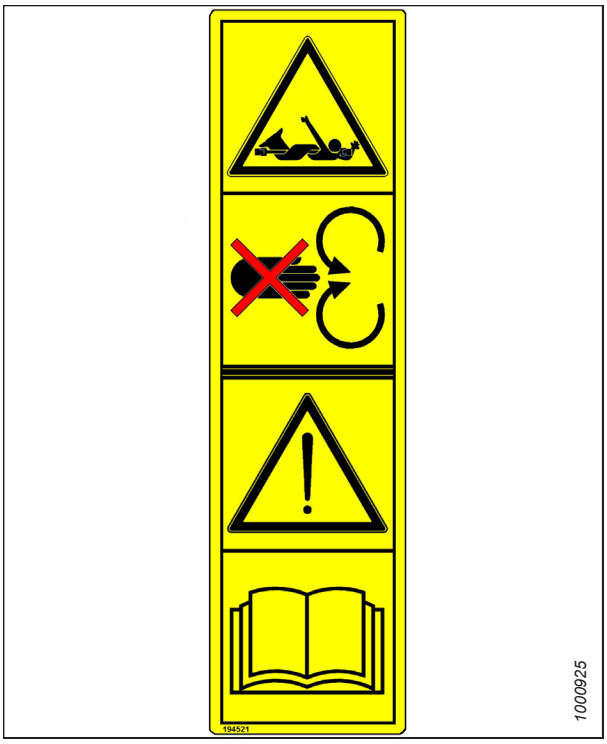


Figure 1.34: MD #194521

MD #304865

Header crushing hazard

WARNING

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

- Do **NOT** lift the header at the marked locations.
- Only use locations marked for this purpose to lower the header from the vertical to the horizontal position.

Figure 1.35: MD #304865

MD #320514

Conditioning devices entanglement hazard

WARNING

To prevent injury:

- Stop the engine and remove the key from the ignition before servicing.
- Do **NOT** reach into moving parts while the machine is running.

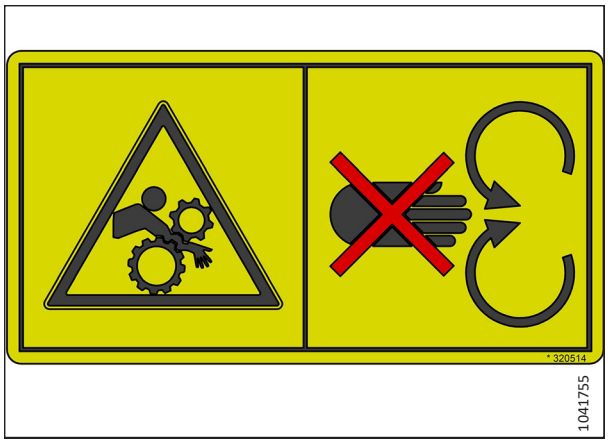


Figure 1.36: MD #320514

Chapter 2: Product Overview

The product overview provides the dimensions, details, and performance criteria for the various sizes and configurations.

2.1 Definitions

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

Table 2.1 Definitions

Term	Definition
A Series Header	MacDon A30S, A30D, A40D, A40DX, standard and Grass Seed auger headers
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode in which the Operator's seat faces the header
CDM	The cab display module in an M Series Windrower
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
DK	Double knife
DWA	Double Windrow Attachment
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
Export header	The header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	A reference position in which the given sealing surfaces or components are making contact with each other. The fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
GSS	Grass Seed
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 and lays crop into a windrow when attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for the original 37° flared fitting
Knife	A cutting device found on a header's cutterbar which uses a reciprocating cutter (also called a sickle) to cut crop so that it can be fed into the header
M Series Windrowers	MacDon M100, M105, M150, M155, M155*E4*, M200, and M205 Windrowers
M1 Series Windrowers	MacDon M1170, M1170*NT*, M1170*NT5*, and M1240 Windrowers
M2 Series Windrowers	MacDon M2170, M2170*NT*, and M2260 Windrowers
n/a	Not applicable
N-DETENT	The slot opposite the NEUTRAL position on the operator's console of M Series SP Windrowers
North American header	The header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit

Table 2.1 Definitions (continued)

Term	Definition
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-Ring Seal
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)
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when it is inserted into a mating part.
Self Propelled (SP) Windrower	Self-propelled machine consisting of a power unit and a header. It is designed to cut and lay crops into windrows for later harvest
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time
spm	Strokes per minute
SST	Slow speed transport
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Timed (knife drive)	Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm), foot-pounds (lbf·ft), or inch-pounds (lbf·in)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Untimed (knife drive)	Unsynchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor or from two hydraulic motors
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
Windrower	The power unit for a header

2.2 Product Specifications

NOTE:

Specifications and design are subject to change without notice, or obligation to revise previously sold units.

Table 2.2 A40D and A40DX Auger Header Specifications

Cutterbar			
Effective cutting width	4.3 m (14 ft.) header		4496 mm (14 ft. 9 in.)
Effective cutting width	4.9 m (16 ft.) header		4953 mm (16 ft. 3 in.)
Effective cutting width	5.5 m (18 ft.) header		5410 mm (17 ft. 9 in.)
Double-knife drive: hydraulic motor to two “B” belts/timing belts to enclosed heavy duty (MD) knife drive boxes			Standard
Knife stroke			76 mm (3 in.)
Knife speed (strokes per minute)	Factory	No load	1400–1950
Knife speed (strokes per minute)	Factory	Load	1400–1950
Knife speed (strokes per minute)	Switching pulleys	No load	1400–1950
Knife speed (strokes per minute)	Switching pulleys	Load	1400–1950
Double heat-treated forged pointed guards (GSS headers fitted with stub guards)			Standard
Bolted over-serrated knife sections – 9 serrations per inch			Standard
Center overlap			3 mm (1/8 in.)
Cutterbar lift range (measured at guard tip)	Below ground		150 mm (5 3/4 in.)
Cutterbar lift range (measured at guard tip)	Above ground		900 mm (35 3/8 in.)
Guard angle (cutterbar on ground)			7 to 17 1/2 degrees
Replaceable, abrasion-resistant cutterbar wearplates			Standard
Inner skid shoes, adjustable set of two (can be relocated to outboard location)			Standard
Outer skid shoes or gauge rollers			Optional (Required for GSS header)
Outer gauge rollers			Optional
Auger			
Diameter	Overall		508 mm (20 in.)
Diameter	Tube O.D.		254 mm (10 in.)
Undershot, center feed			Standard
Flighting	Width		127 mm (5 in.)
Flighting	Thickness		6 mm (1/4 in.)
Pitch			590 mm (23 1/4 in.)
Rubber feed fingers			Standard
Stripper bars (three per side)			Standard
Auger drive	Hydraulic, 15.9 cu in. (261 cc) per rev direct mounted motor		Standard
Auger speed	SP windrower		230–320 rpm
Replaceable high density polyethylene auger pans: two-piece design			Standard
Rock drop tines at discharge opening with discharge angle adjustment			Standard

Table 2.2 A40D and A40DX Auger Header Specifications (continued)

Delivery opening width		2430 mm (95 11/16 in.)
Reel		
Oval closed section bats with end caps. **NOTE:** Grass Seed Special model has standard seven-bat reel		6 bats optional 7 bat
Steel fingers		6 mm (1/4 in.) diameter
Reel radius (to finger tip)		540 mm (22 in.)
Single piece tine bar with replaceable polyethylene bearings		N/A
Sectioned tine bar with regreasable ball bearings		Standard
Drive	Hydraulic motor: 14.2 cu in. (232 cc) /rev to enclosed gearbox	Standard
Reel speed	M100/M105/M205 SP hydraulic variable	50–85 rpm
Reel speed	M150/M155/M155*E4*/M200 SP hydraulic variable	15–85 rpm
Reel speed	M1170/M1240 and M2170/M2260 SP hydraulic variable (with variable speed kit installed)	15–85 rpm
Reel speed	M1170/M1240 and M2170/M2260 SP hydraulic variable (standard reel)	50–85 rpm
Hay Conditioner		
Roll-type		Intermeshing steel bars
Roll size	Length	2590 mm (102 in.)
Roll size	Overall	233 mm (9 3/16 in.)
Roll size	Tube	168 mm (6 5/8 in.)
Drive: 44 cc. hydraulic piston motor to enclosed gearbox		Standard
Roll speed	SP windrower	601–810 rpm
Plug Prevention / Unplugging		
Self-propelled	Reverse hydraulic flow to three motors (reverses knife, auger, reel, and conditioner)	Optional
Swath Forming Shield		
Swath width range		915 mm (36 in.) to 2540 mm (100 in.)
Header-mounted adjustable baffle		Standard
Attachment		Windrower
Adjustable side deflectors		Standard
Frame And Structure		
Two amber transport lights		Standard
Header width		Nominal cut width plus 480 mm (18 7/8 in.)
Header attachment		Windrower
Spare knife storage		Lean bar
Tool and parts storage compartment		N/A
Header Hydraulics Connection		
Direct coupled hoses		N/A

Table 2.2 A40D and A40DX Auger Header Specifications (continued)

Hydraulic quick couplers	Standard
Attachments And Accessories	
Header reversing wrench and guard straightening tool	Standard
Double Windrow Attachment (DWA) M150/M155/M200/M205 windrowers (non GSS headers only)	Optional

Chapter 3: Operation

This chapter will describe the operating procedures for the A40D and A40DX Windrower Auger Header.

3.1 Attaching A40DX Auger Header to M2 Series Windrower

The header's hydraulic and electrical multicoupler will need to be connected to the windrower before operation.

Refer to your windrower operator's manual for procedures to mechanically attach an A40DX Auger Header to an M2 Series Windrower and for modifications to the windrower hydraulic connections (if required).

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.

CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Shut down the engine, and remove the key from the ignition.
2. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.
3. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

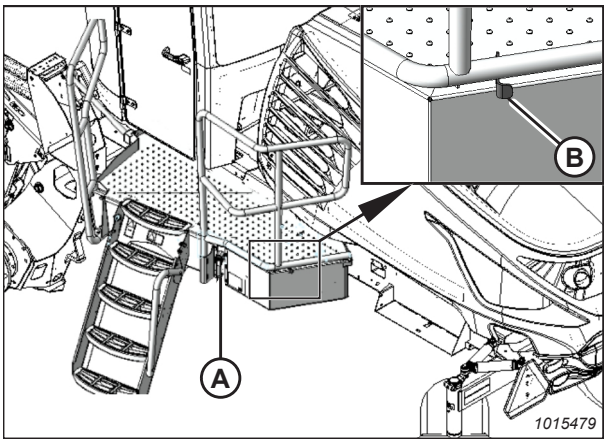


Figure 3.1: Left Platform

4. Retrieve hydraulic multicouplers (A) and electrical harness (B) from the header.

5. Route the hose/harness bundle toward the windrower through support (C).

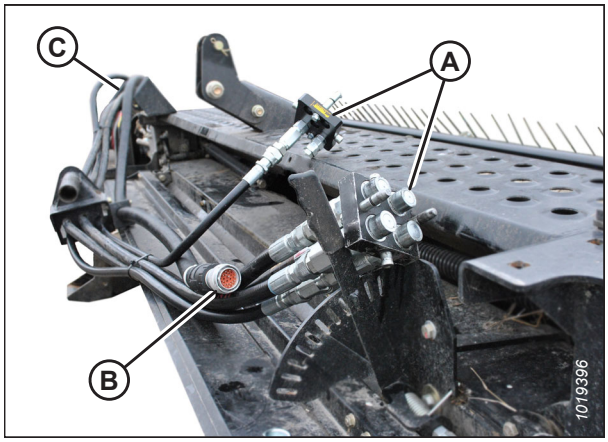


Figure 3.2: Hydraulic Hoses in Storage Position

6. Insert hose support (B) into hole (A) in the windrower's left leg. Route header hose bundle (C) under the windrower to the hydraulic and electrical couplers.

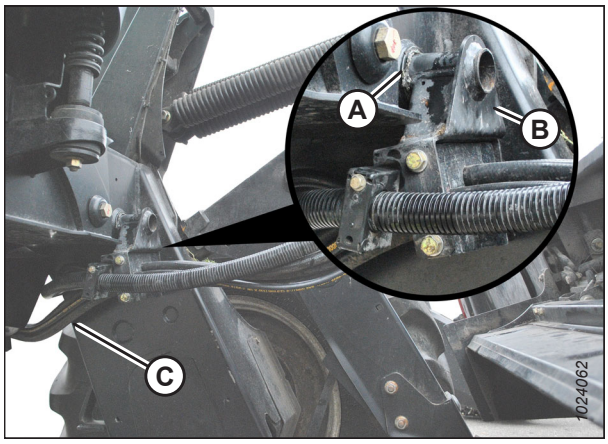


Figure 3.3: Multicoupler

7. Clean the multicouplers and receptacles to prevent contamination of the hydraulic system.

8. Push button (A) on the rear multicoupler receptacle and rotate handle (B) away from the windrower.

9. Open cover (C). Position multicoupler (D) onto the receptacle. Align the pins in the coupler with the slots in handle (B) and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (A) pops out.

10. Push button (E) on the front multicoupler receptacle and rotate handle (F) away from the windrower.

11. Open cover (G) and position multicoupler (H) onto the receptacle. Align the pins in the coupler with the slots in the handle, and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (E) snaps out.

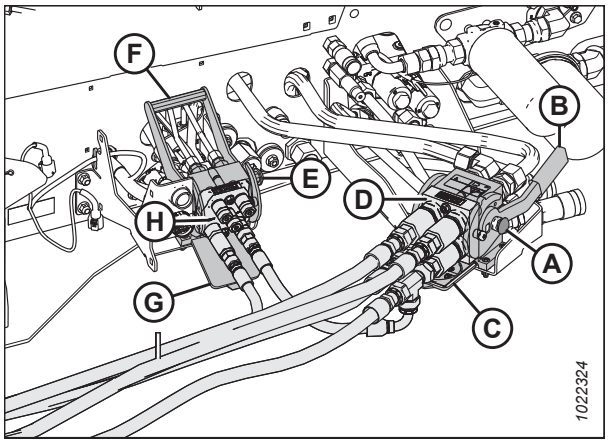


Figure 3.4: Knife/Reel/Auger Drive Multicoupler

12. **If a rotary disc header is being replaced by an auger header:** Remove hose (A) from storage location (B). Connect hose (A) to knife pressure receptacle (C) on the frame.

    NOTE:

    Hose quick disconnect (C) is present only on the following configurations:

    - M2170 Windrowers equipped with the R1 Series Hydraulic Drive kit (B6845)
    - M2260 Windrowers configured for draper or auger headers

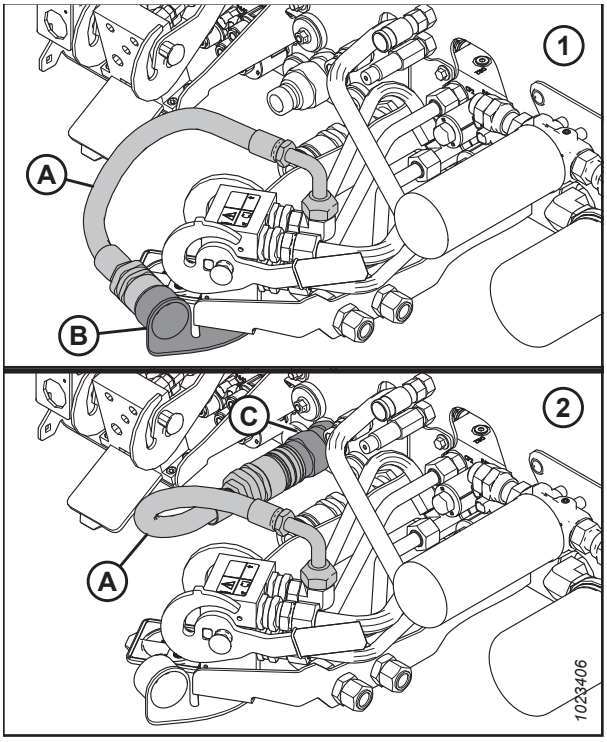


Figure 3.5: Knife Pressure Hose Positions

1 - Hose in Storage Position (Rotary Configuration)
2 - Hose to Knife Pressure Receptacle (Auger/Draper Configuration)

13. Remove the cover from receptacle (A). Connect the header's electrical harness to the receptacle.

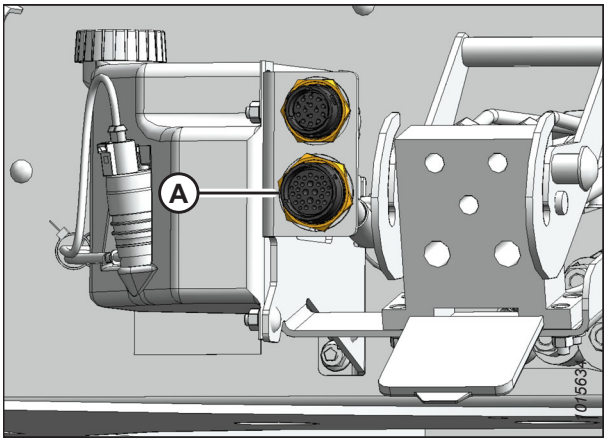


Figure 3.6: Electrical Connectors

14. Push latch (A) to unlock platform (B).

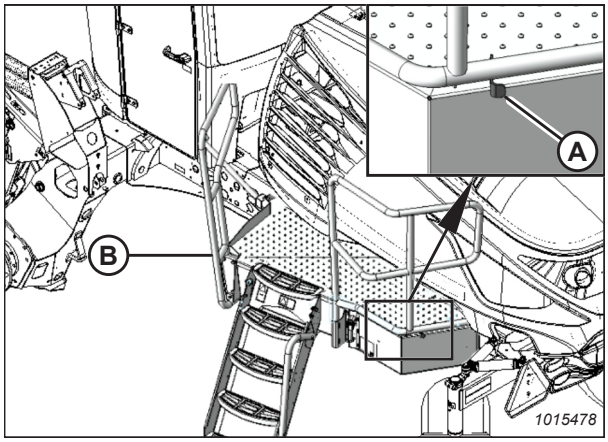


Figure 3.7: Left Platform

15. Pull platform (A) toward the cab until it stops and the latch is engaged.

16. If this is the first time the header is connected to the windrower, calibrate the header. For instructions, refer to the windrower operator's manual.

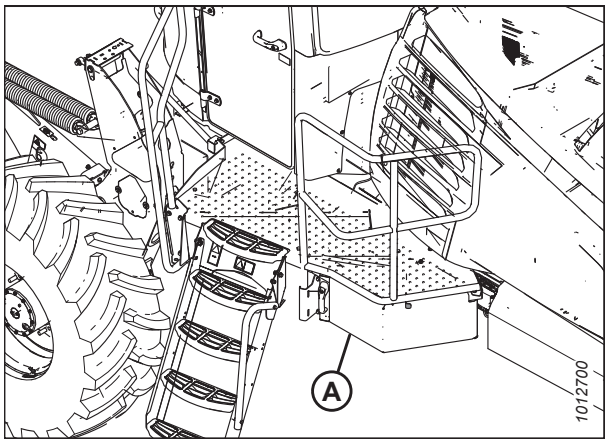


Figure 3.8: Left Platform

3.2 Detaching A40DX Auger Header from M2 Series Windrower

Detaching the A40DX electrical and hydraulic connections from the windrower is a simple procedure because of the multicoupler.

Refer to your windrower operator's manual for procedures to mechanically detach the auger header from the M2 Series Windrower.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Approach platform (A) on the left side of the windrower. Ensure that the cab door is closed.
3. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

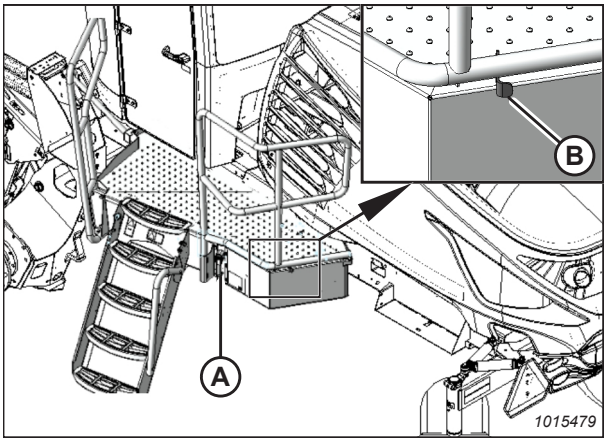


Figure 3.9: Left Platform

4. Disconnect header drive hydraulics (A) and electrical harness (B) from the windrower.

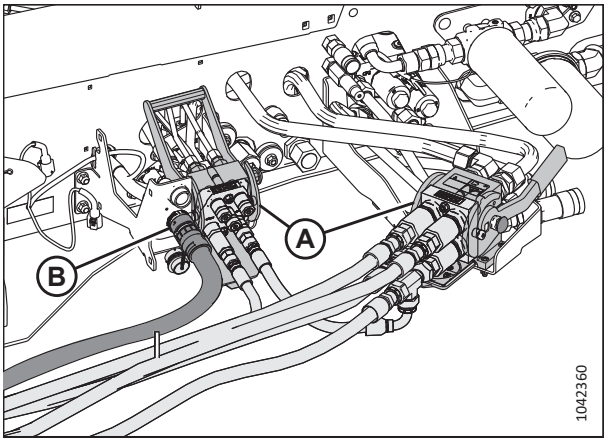


Figure 3.10: Header Drive Hydraulics

5. Push latch (A) to unlock platform (B).

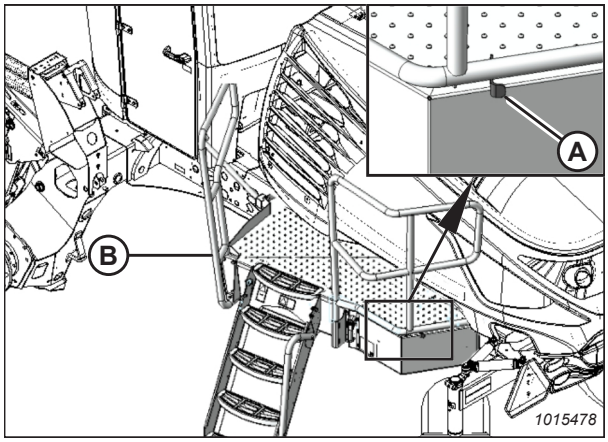


Figure 3.11: Left Platform

6. Pull platform (A) toward the cab until it stops and the latch is engaged.

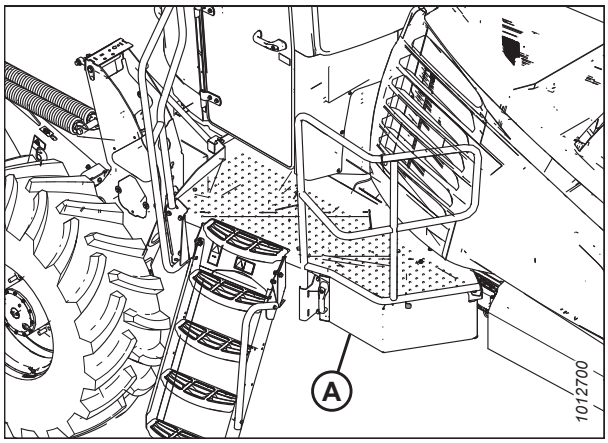


Figure 3.12: Left Platform

7. Remove hose support (A) from the windrower's left leg.

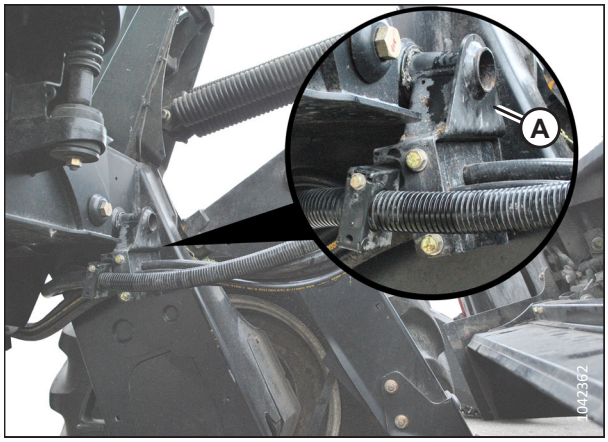


Figure 3.13: Multicoupler

8. Place hydraulics/electrical bundle (A) in the storage position on the header.

9. Detach the header from the windrower. For instructions, refer to your windrower operator's manual.

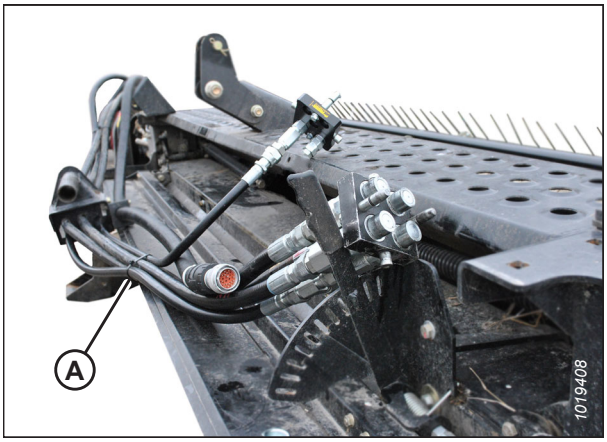


Figure 3.14: Hydraulics Hoses in Storage Position

3.3 Attaching A40DX Auger Header to M1 Series Windrowers

The header's hydraulic multicoupler must be connected to the windrower before operation.

DANGER

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

This procedure also applies to A40D Series Headers equipped with the Auger Header Compatibility kit (B5998) or the A40D SP Grass Seed Auger Conversion kit (B6384). Refer to your windrower operator's manual for procedures to mechanically attach an A40DX Auger Header to an M1 Series Windrower and for modifications to the windrower hydraulic connections (if required).

IMPORTANT:

If attempting to attach an A40D Header to an M1170 or M1240 Windrower, the M1 Series Conversion kit (B5998) or the A40D SP Grass Seed Auger Conversion kit (B6384) must first be installed. These kits include a new manifold and hose bundle required for operation with an M1 Series Windrower, and effectively converts an A40D header into an A40DX header.

Header drive hydraulic hoses and electrical harness are located on the left, cab-forward side of the windrower. To connect the hydraulic and electrical bundle from an A40DX header to an M1 Series Windrower, follow these steps:

1. Shut down the engine, and remove the key from the ignition.
2. Route header hose bundle through hose guide (A) on header as shown.

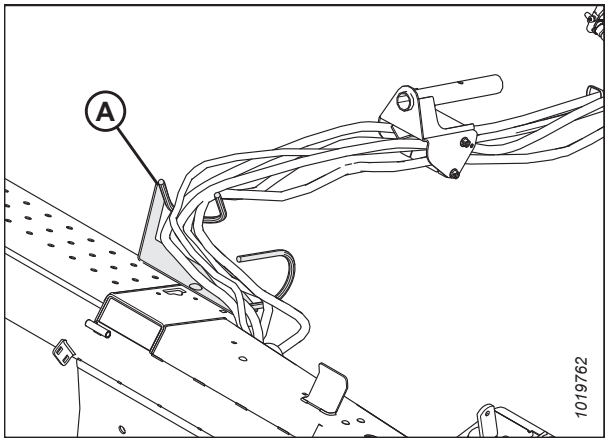


Figure 3.15: Hose Bundle

3. Insert hose support (B) into hole (A) in the windrower left leg, and route header hose bundle (C) under the windrower to the hydraulic and electrical couplers.

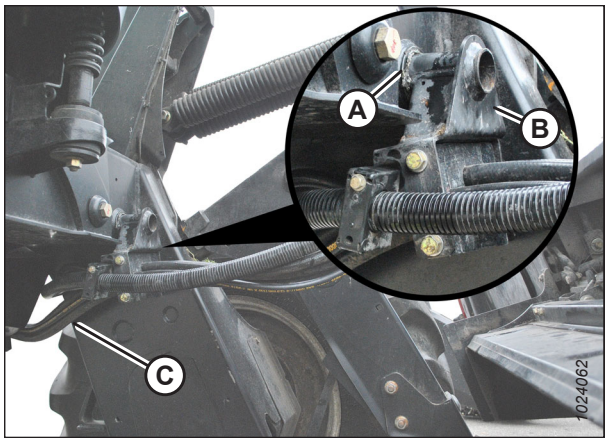


Figure 3.16: Hose Support

4. If attaching to a rotary disc-ready windrower, ensure knife drive hose (A) is connected to coupler (B).

   NOTE:

   Hose (A) provides power to run the knife/conditioner.

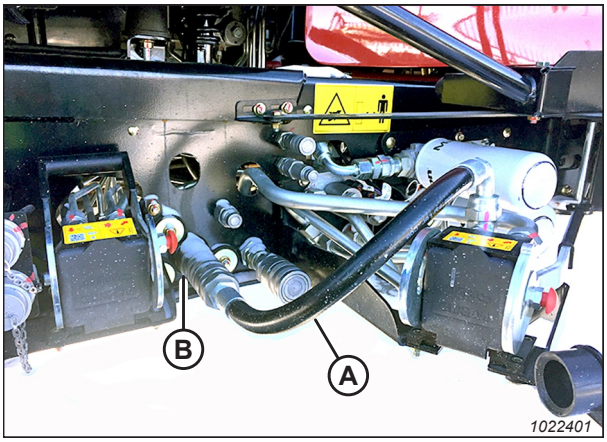


Figure 3.17: M1170/M1240 – Rotary Disc Header Configured

NOTE:

M1170, M1170NT, M1170NT5, M2170,and M2170NT Windrowers with standard auger/draper configuration do **NOT** require the knife drive hose; only the two multicouplers (A) are used to connect the auger header.

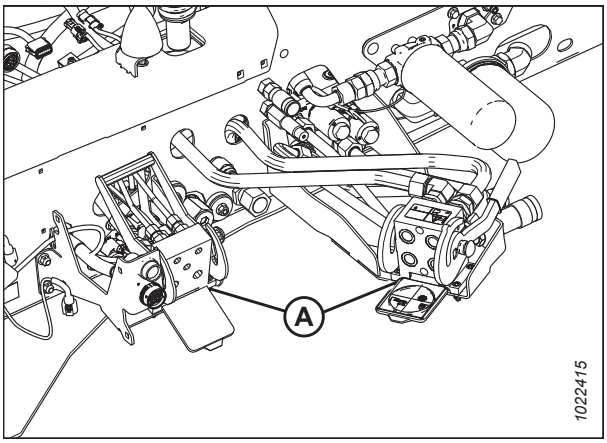


Figure 3.18: M1170 Standard Configuration – Auger/ Draper Ready

5. Clean the multicouplers and the receptacles to prevent contamination.
6. Push button (A) on the rear multicoupler receptacle and pull handle (B) away from the windrower.
7. Open cover (C) and position multicoupler (D) onto the receptacle. Align the pins in the coupler with the slots in handle (B), and push the handle towards the windrower so that the coupler is locked onto the receptacle and button (A) snaps out.
8. Push button (E) on the front multicoupler receptacle and pull handle (F) away from the windrower.
9. Open cover (H) and position multicoupler (G) onto the receptacle. Align the pins in the coupler with the slots in the handle, and push handle (F) towards the windrower so that the coupler is locked onto the receptacle and button (E) snaps out.

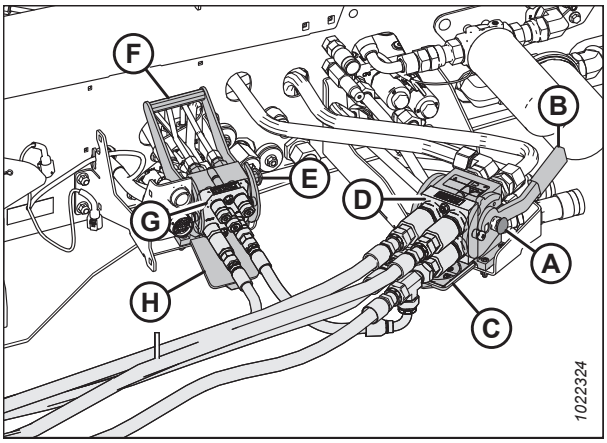


Figure 3.19: Multicouplers

10. Remove the cover from receptacle (A) and connect the electrical harness from the header.

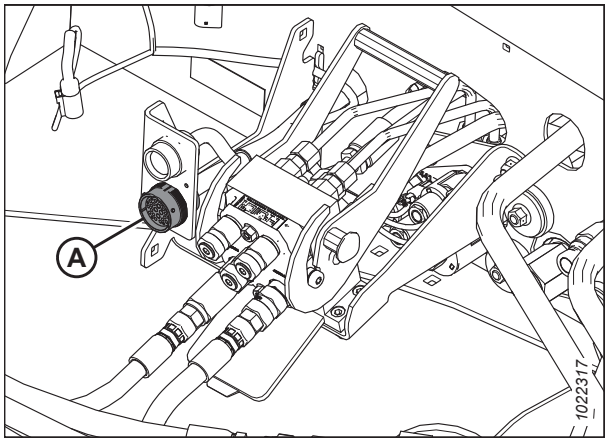


Figure 3.20: Windrower Electrical Connector

A40DX Grass Seed headers and A40DX headers equipped with Reel Speed Control kit (B6604)

A40DX Grass Seed headers have a factory-installed reel speed kit and includes a second electrical connection required for attaching to an M1 or M2 Series Windrower. The Reel Speed Control kit (B6604) is an available option for an A40DX header.

Complete the following step when connecting an A40DX Grass Seed header (or an A40DX header with B6604 equipped) to an M1 or M2 Series Windrower:

11. Remove the cover from receptacle (A) on the windrower and connect electrical harness (B) from the header.

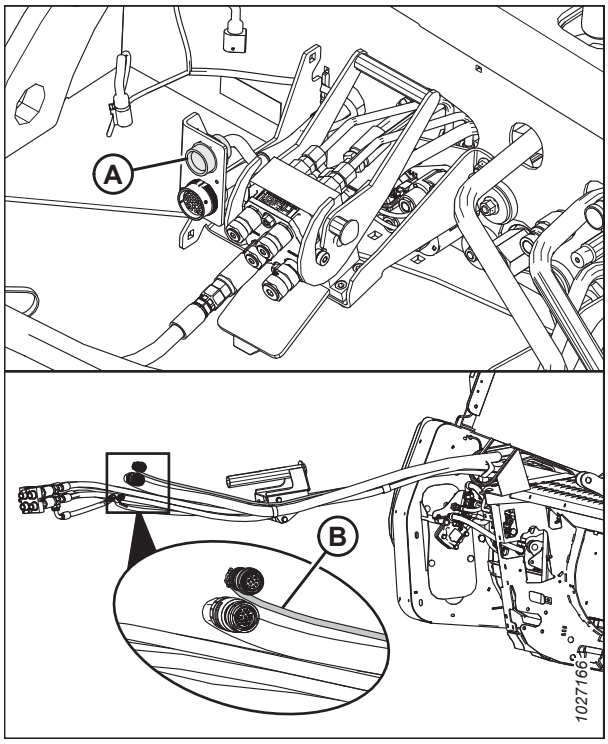


Figure 3.21: Electrical Connection

3.4 Detaching A40DX Auger Header from M1 Series Windrower

Follow these steps to detach an A40DX header's hydraulics and electrical connections from an M1 Series Windrower.

Refer to your windrower operator's manual for procedures to mechanically detach the auger header from the M1 Series Windrower.

DANGER

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

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

2. Disconnect header electrical harness (A) from the receptacle on the windrower multicoupler.

   NOTE:

   If the auger header is equipped with the reel speed control kit, also disconnect reel speed harness (B) from the upper receptacle.

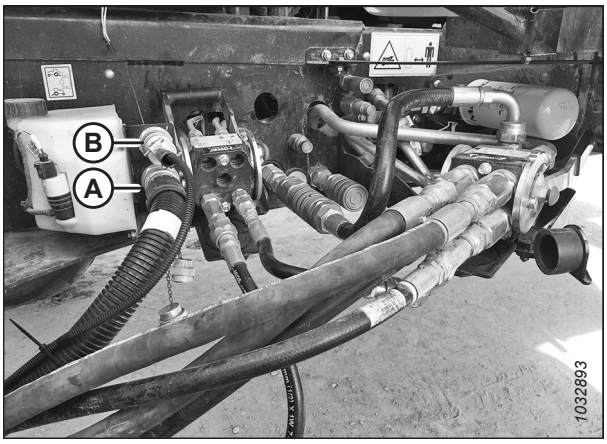


Figure 3.22: Windrower Electrical Connector

3. Push button (E) on the front multicoupler, and pull handle (F) away from the windrower.

4. Remove multicoupler (G) from the receptacle and set it aside. Clean the multicouplers and the receptacles to prevent contamination. Install the caps and the plugs on the hoses and the fittings (if equipped).

5. Close cover (H) and push handle (F) towards the windrower until button (E) snaps out.

6. Push button (A) on the rear multicoupler, and pull handle (B) away from the windrower.

7. Remove multicoupler (D) from the receptacle and set it aside. Clean the multicouplers and the receptacles to prevent contamination. Install the caps and the plugs on the hoses and the fittings (if equipped).

8. Close cover (C) and push handle (B) towards the windrower until button (A) snaps out.

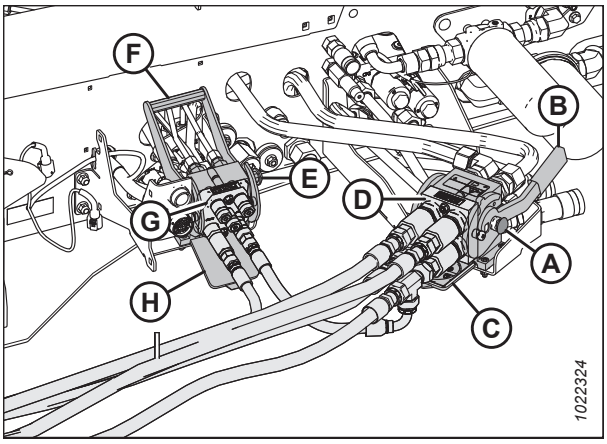


Figure 3.23: Multicouplers

9. Remove hose support (B) from hole (A) in the windrower left leg, and remove header hose bundle (C) from the windrower.

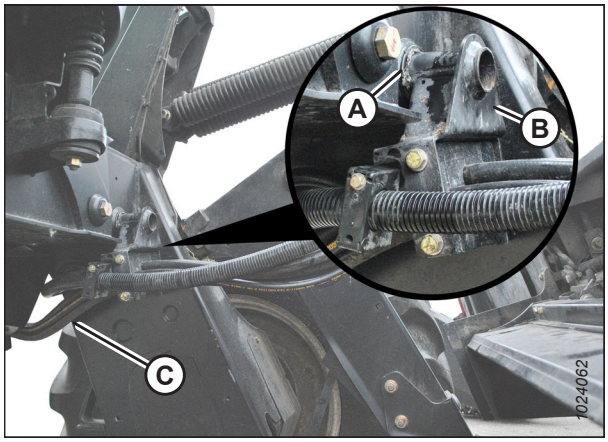


Figure 3.24: Hose Support

10. Keeping hose bundle (A) in hose guide (B), store the hose bundle on top of header walkway (C), away from the windrower.
11. Detach the header from the windrower. For instructions, refer to your windrower operator's manual.

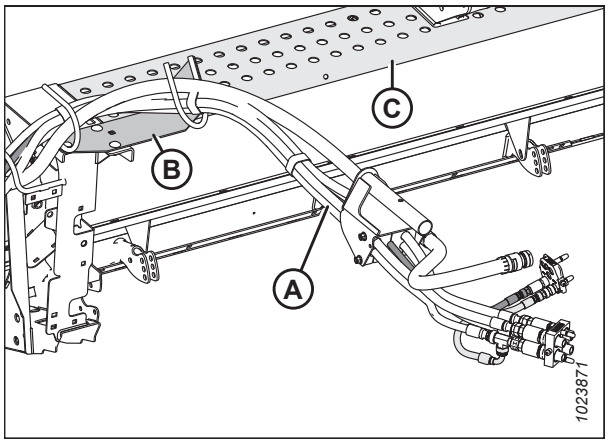


Figure 3.25: Detached Header Hydraulics Bundle

3.5 Attaching A40D Auger Headers to M Series Self-Propelled Windrowers

The header drive hydraulic hoses and electrical harness are located on the left cab-forward side of the windrower.

IMPORTANT:

M150, M155, M155*E4*, and M200 Self-Propelled Windrowers with the M Series Reverser kit (B4656) installed need to have the reverser valve hose plumbing changed if switching between a D Series Draper Header with a conditioner to an A40D Auger Header. Changing this plumbing prevents improper operation and damage to the reel drive motor.

Refer to *3.5.5 Configuring Reverser Valve Jumper Hose for A40D Auger Header, page 64* and (if necessary) to M Series Reverser Kit Installation Instructions (MD #169213), available from our dealer-only site (*https://portal.macdon.com*) (login required).

NOTE:

Header reel motor hose routing must be properly configured before attaching the header to a windrower. Hose routing on the header is factory-configured for M150, M155, M155*E4*, and M200 Self-Propelled Windrowers. Header hose routing must be reconfigured if the header is being used on M100, M105, or M205 Self-Propelled Windrowers.

Refer to the following procedures:

- *3.5.4 Attaching A40D Auger Header to an M205 Self-Propelled Windrower, page 59*
- *3.5.6 Routing A40D Auger Header Hydraulic Drive Hoses, page 65*

Refer to your windrower operator's manual for procedures to mechanically attach the auger header to the windrower, and for modifications (if required) to the windrower hydraulic connections.

3.5.1 Attaching A40D Auger Header to M100 or M105 Self-Propelled Windrower

The header's hydraulic multicoupler must be connected to the windrower before operation.

DANGER

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

M100 and M105 Self-Propelled Windrowers are factory-equipped with four header drive hoses (A) on the left side.

Figure 3.26: Header Drive Hoses

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

2. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

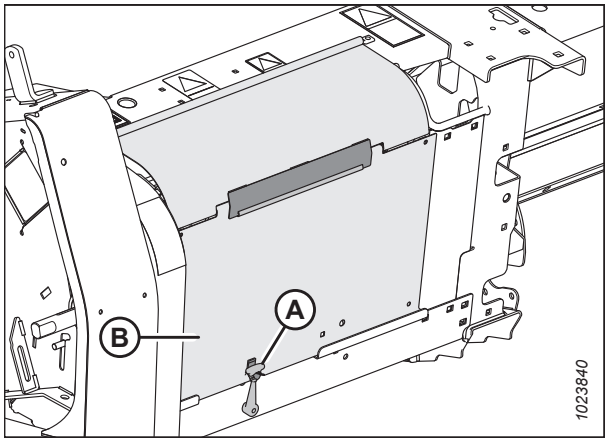


Figure 3.27: Driveshield – Headers Sold in North America

3. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

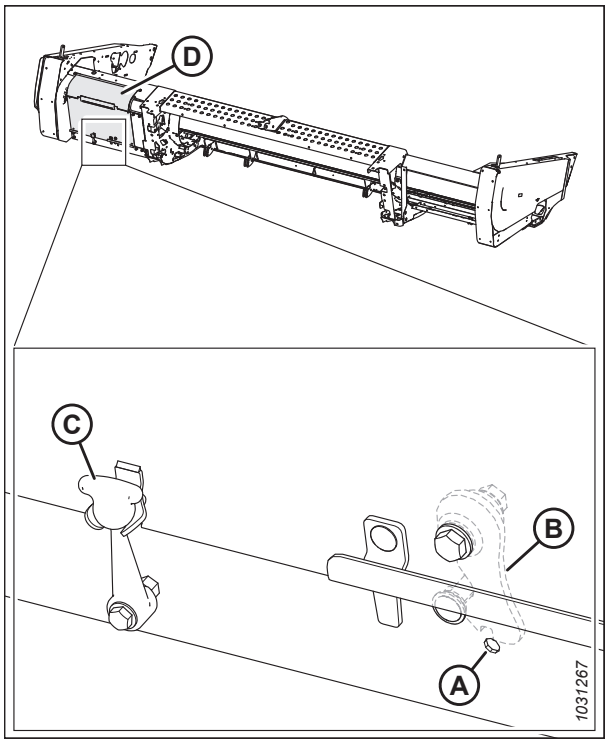


Figure 3.28: Driveshield – Headers Sold outside North America

The driveshield is shown in the open position.

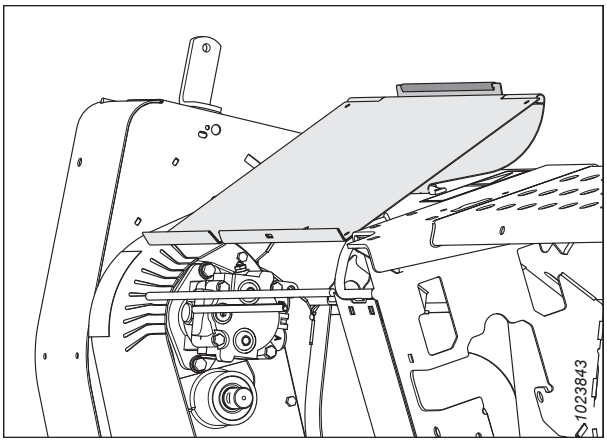


Figure 3.29: Driveshield Open

4. Remove cap (A) from the electrical connector and remove the connector from the support bracket.
5. Disengage and rotate lever (B) counterclockwise to the raised position to release the hose bundle (C).

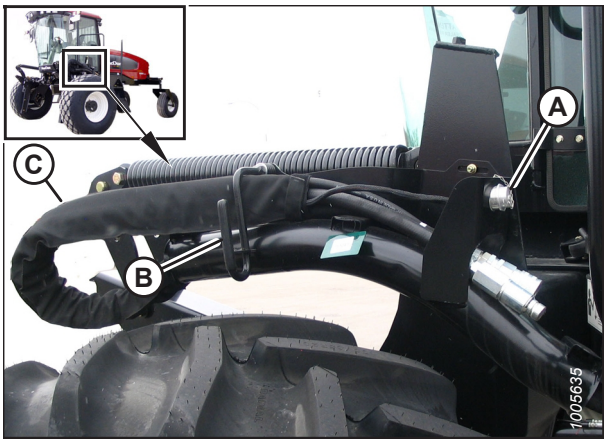


Figure 3.30: Support Bracket and Hose Bundle

6. Move hose/electrical bundle (A) to the header.
7. Route bundle (A) from the windrower through support (B) and access hole (C) in the header frame alongside existing hose bundle (D) from the header.
8. Remove the cover on header electrical receptacle (E).
9. Push the connector onto the receptacle and turn the collar on the connector to lock it in place.
10. Attach the cover to the mating cover on the windrower wiring harness.
11. Remove the caps from the hydraulic couplers. Clean them if necessary.

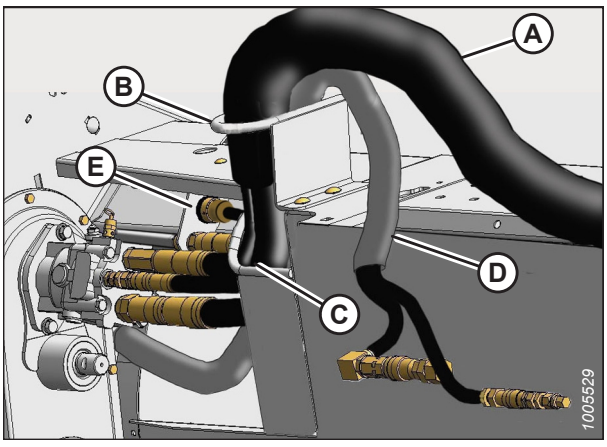


Figure 3.31: Hose and Electrical Bundle – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

12. Push the hose connectors onto the mating receptacles as shown until the collars on the receptacles snap into the lock position.

    NOTE:

    The hoses attached to the connectors are not shown in the illustrations at right.

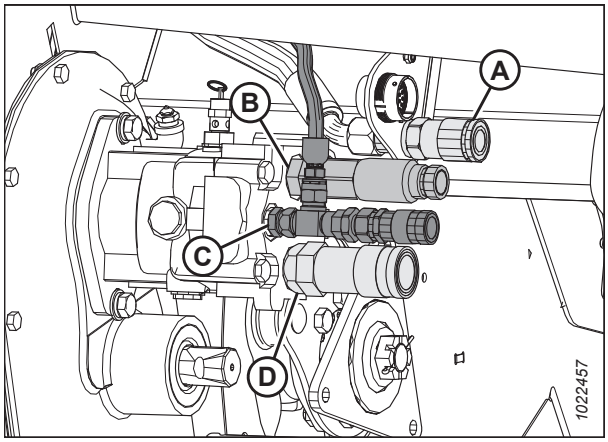


Figure 3.32: A40D Header – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

A - Reel Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

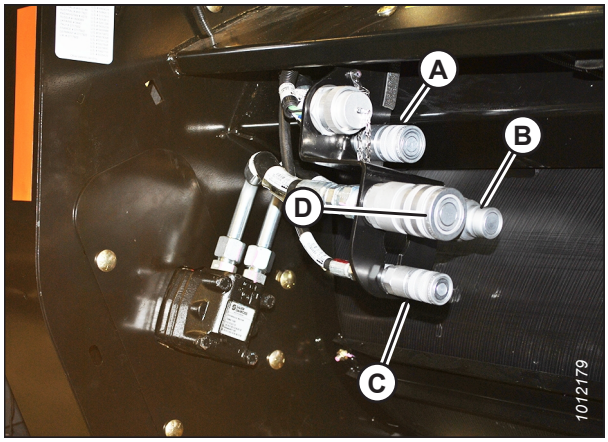


Figure 3.33: A40D Grass Seed Header Hose Connectors

A - Reel and Auger Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

13. Route the auger return and reel pressure hose bundle (A) from the header to the windrower, and position the bundle above existing hose support (C) as shown.

14. Secure the bundle with three straps (D), and lower lever (B).

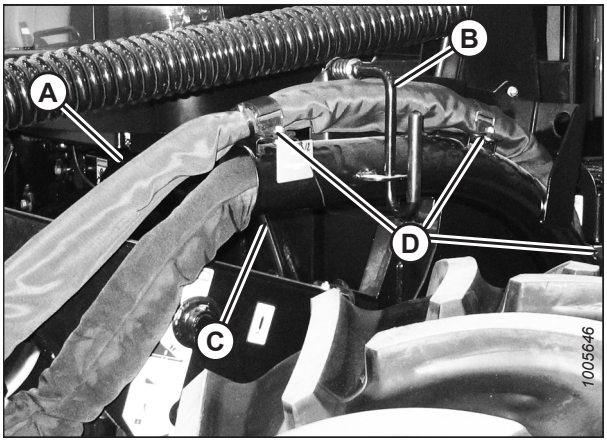


Figure 3.34: Auger Return and Reel Pressure Hose Bundle

15. If valve blocks are **NOT** configured as shown (A), install the required fittings as described in the unloading and assembly instructions that were supplied with your A40D Auger Header.

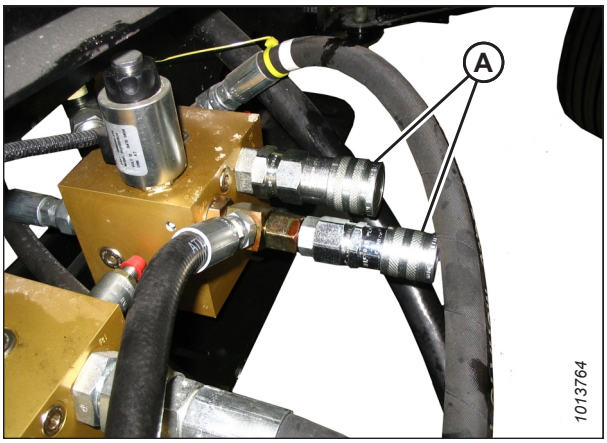


Figure 3.35: Valve Block Configuration

16. Push auger/reel pressure (A) and auger/reel return (B) hose couplers onto the mating receptacles on the valve block until the collar on the receptacle snaps into the lock position.

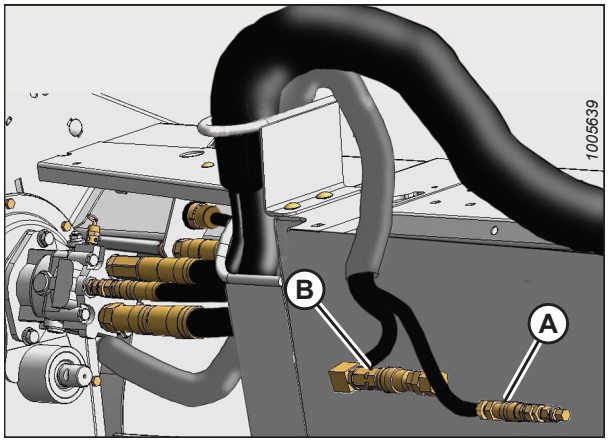


Figure 3.36: Auger/Reel Pressure and Auger/Reel Return Hose Couplers – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

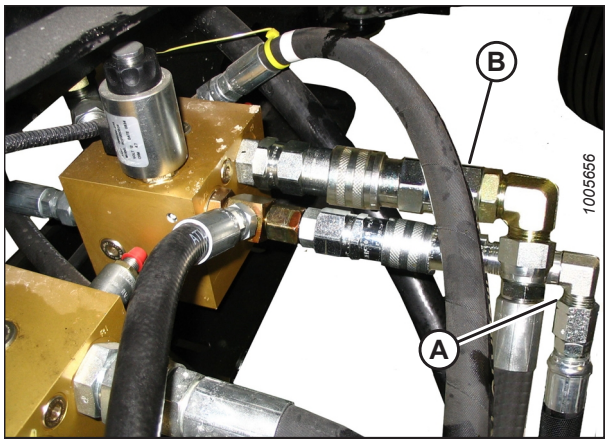


Figure 3.37: Auger/Reel Pressure and Auger/Reel Return Valve Block Receptacles

17. Check the hose routing at the reel motor.

    NOTE:

    The hose routing depends on which windrower model the header is being attached to. The header is factory configured for M150, M155, M155*E4*, and M200 Self-Propelled Windrowers.

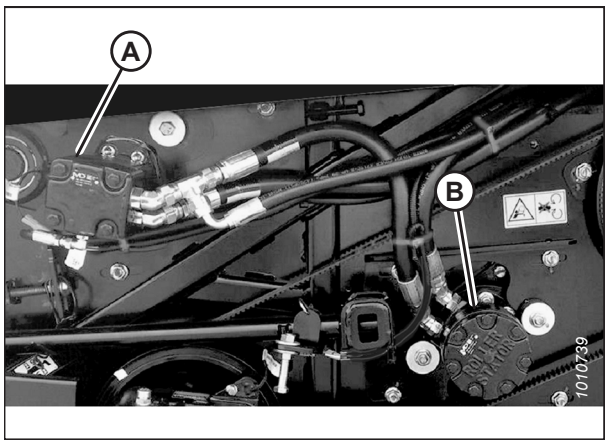


Figure 3.38: Factory Routing M150, M155, and M200

A - Reel Motor **B - Auger Motor**

18. For procedure to change hose routing for M100 or M105 Self-Propelled Windrowers, refer to *3.5.6 Routing A40D Auger Header Hydraulic Drive Hoses, page 65*.

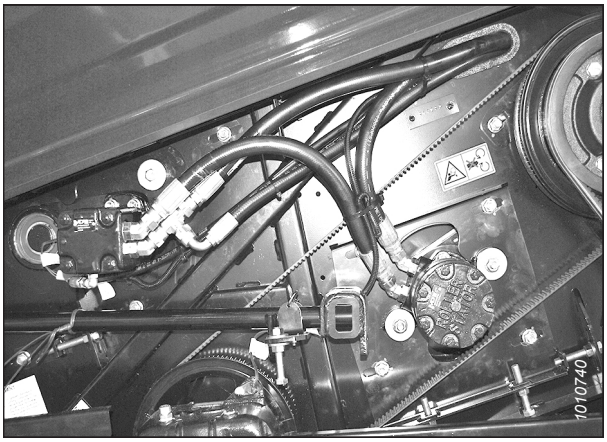


Figure 3.39: Modified Routing M100, M105, and M205

3.5.2 Attaching A40D Auger Header to an M150, M155, or M155*E4* Self-Propelled Windrower

The header's hydraulic multicoupler must be connected to the windrower before operation.

DANGER

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

M150, M155, and M155*E4* Self-Propelled Windrowers are factory-equipped with four header drive hoses (A) on the left side.

Figure 3.40: Header Drive Hoses

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

2. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

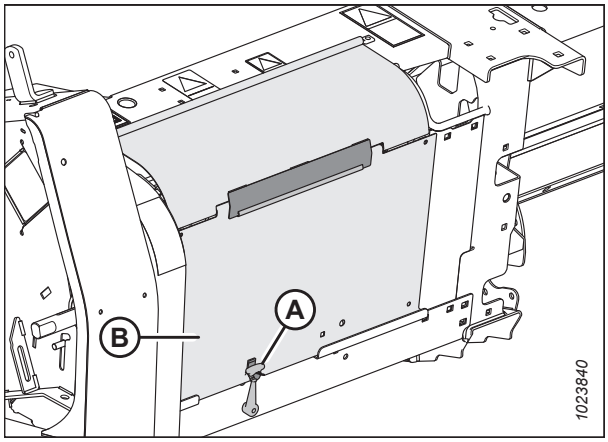


Figure 3.41: Driveshield – Headers Sold in North America

3. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

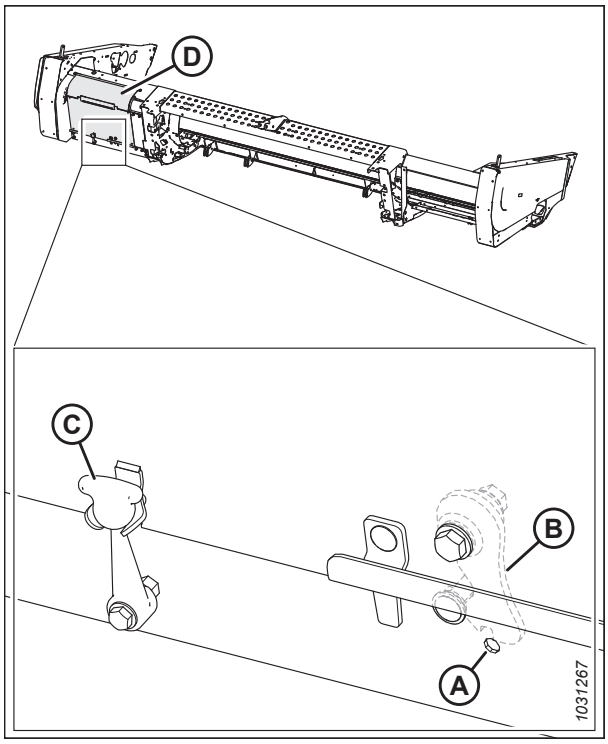


Figure 3.42: Driveshield – Headers Sold outside North America

The driveshield is shown in the open position.

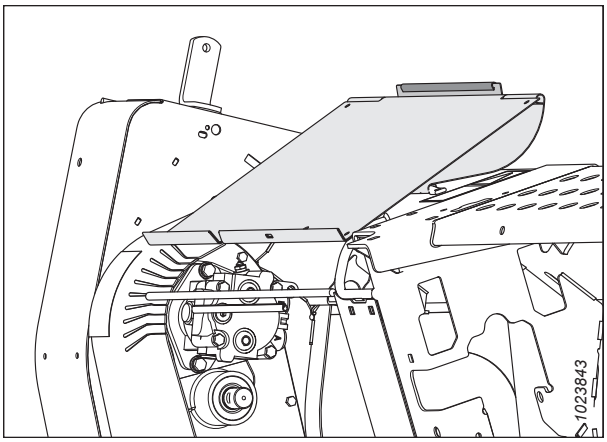


Figure 3.43: Driveshield Open

4. Remove cap (A) from the electrical connector and remove the connector from the support bracket.
5. Disengage and rotate lever (B) counterclockwise to the raised position to release hose bundle (C).

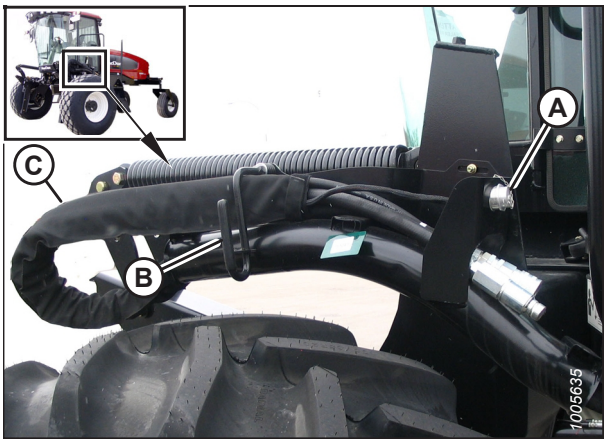


Figure 3.44: Support Bracket and Hose Bundle

6. Move hose/electrical bundle (A) to the header.
7. Route bundle (A) from the windrower through support (B) and access hole (C) in the header frame alongside existing hose bundle (D) from the header.
8. Remove the cover on header electrical receptacle (E).
9. Push the connector onto the receptacle and turn the collar on the connector to lock it in place.
10. Attach the cover to the mating cover on the windrower wiring harness.
11. Remove the caps from hydraulic couplers. Clean them if necessary.

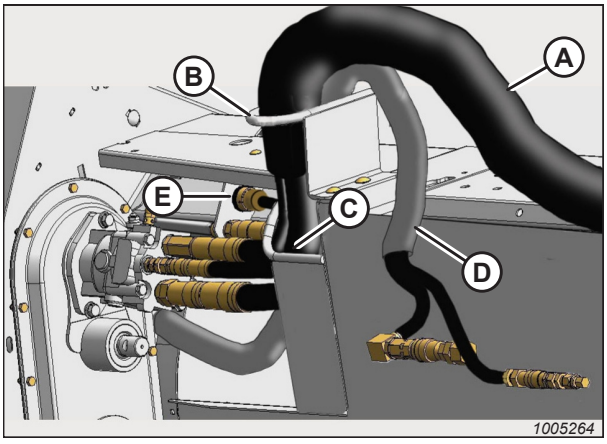


Figure 3.45: Hose and Electrical Bundle – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

12. Push the hose connectors onto the mating receptacles as shown until the collars on the receptacles snap into the lock position.

    NOTE:

    The hoses attached to the connectors are not shown in the illustrations at right.

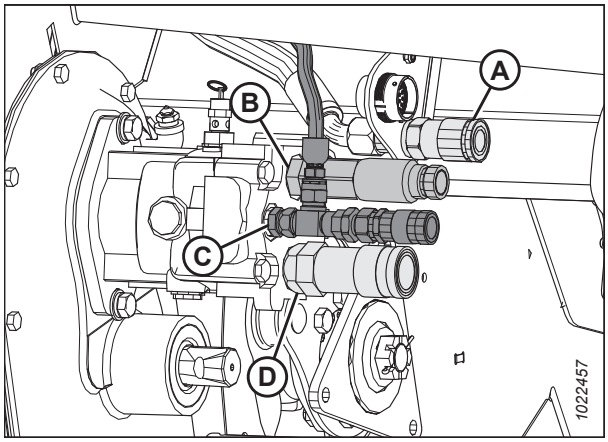


Figure 3.46: A40D Header – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

A - Reel Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

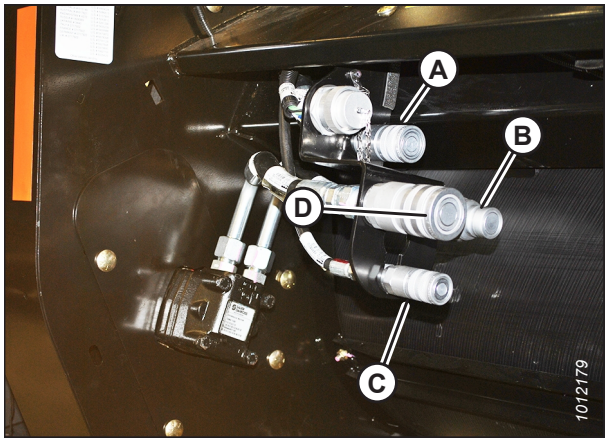


Figure 3.47: Grass Seed Header Hose Connectors

A - Reel and Auger Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

13. Route the auger return and reel pressure hose bundle (A) from the header to the windrower and position the bundle above existing hose support (C) as shown.

14. Secure the bundle with three straps (D), and lower lever (B).

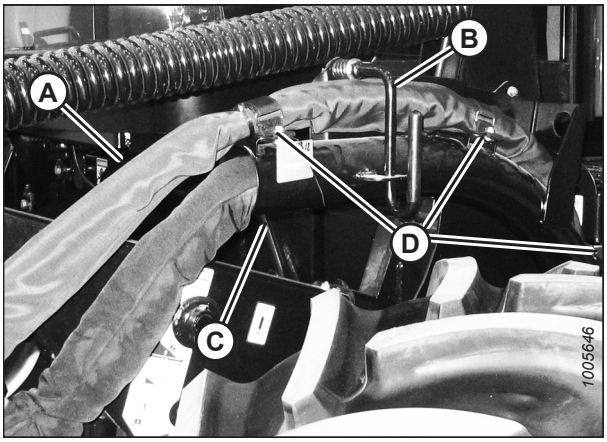


Figure 3.48: Auger Return and Reel Pressure Hose Bundle

15. If valve blocks are **NOT** configured as shown at right, install the required fittings as described in the A40D and A40DX Auger Header Unloading and Assembly Instructions, which were supplied with your A40D Auger Header.

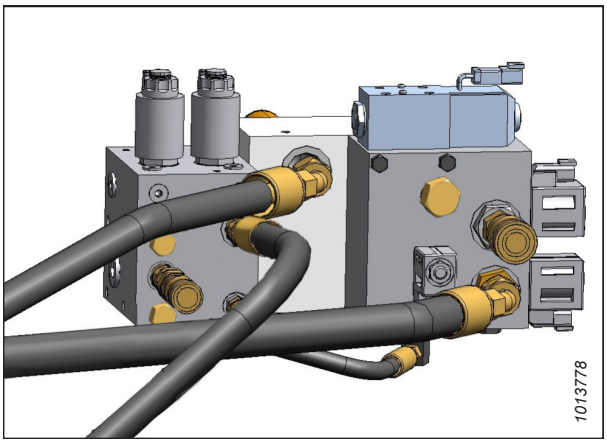


Figure 3.49: M150/M155/M155*E4* with Reverser Valve

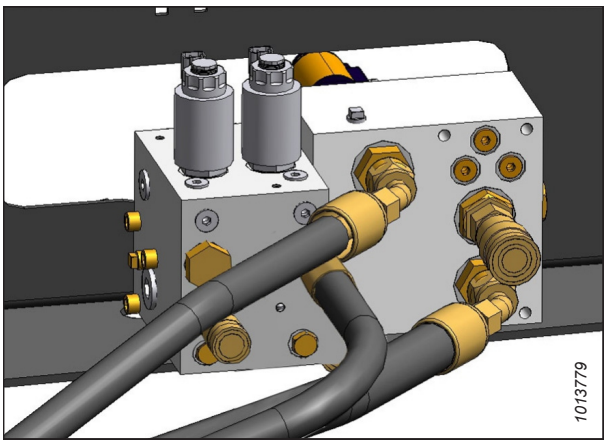


Figure 3.50: M150/M155/M155*E4* without Reverser Valve

16. Locate auger pressure (A) and auger/reel return (B) hoses.

17. Proceed to *3.5.5 Configuring Reverser Valve Jumper Hose for A40D Auger Header, page 64*.

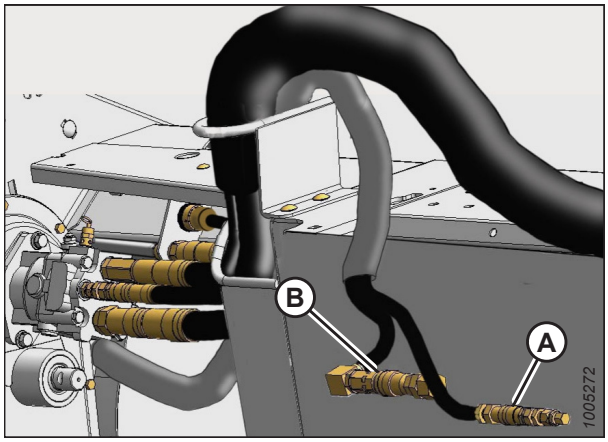


Figure 3.51: Auger Pressure and Auger/Reel Return Hose Couplers – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

18. Push auger pressure (A) and auger/reel return (B) hose couplers onto the mating receptacles on the valve block until the collar on the receptacle snaps into the lock position.

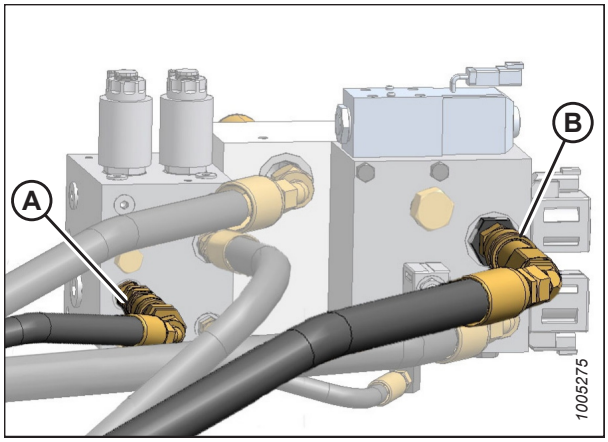


Figure 3.52: M150/M155/M155*E4* with Reverser Valve

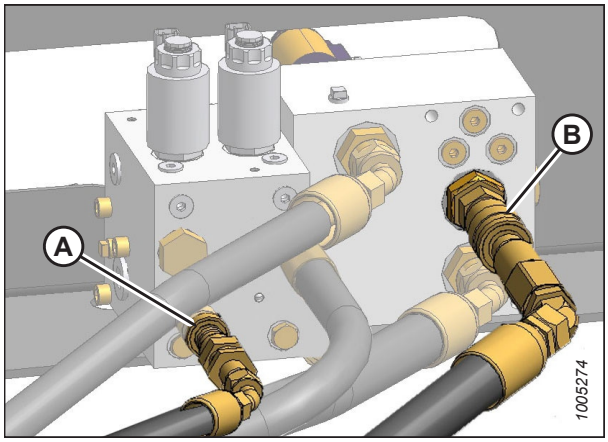


Figure 3.53: M150/M155/M155*E4* without Reverser Valve

3.5.3 Attaching A40D Auger Header to M200 Self-Propelled Windrower

The header's hydraulic multicoupler must be connected to the windrower before operation.

DANGER

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

The M200 Self-Propelled Windrower requires four drive hoses (A) to run an A40D Auger Header.

Figure 3.54: Drive Hoses

If only three drive hoses are present, before following the procedure below, configure the M200 to run an A40D Auger Header by installing kit B4651. The kit includes an additional hose (A), hardware, and installation instructions.

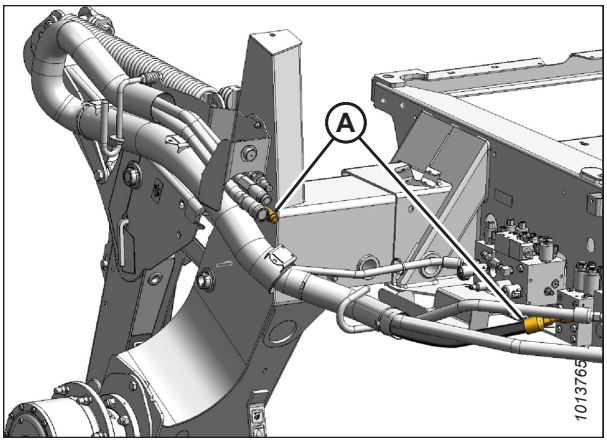


Figure 3.55: Auger Header Drive and Draper Header Reel Drive and Lift Plumbing Kit (B4651)

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

2. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

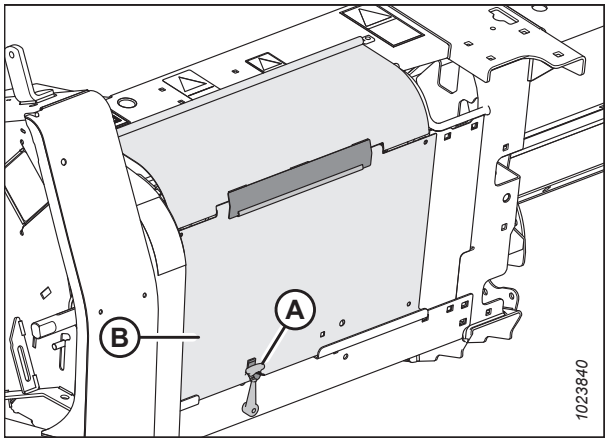


Figure 3.56: Driveshield – Headers Sold in North America

3. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

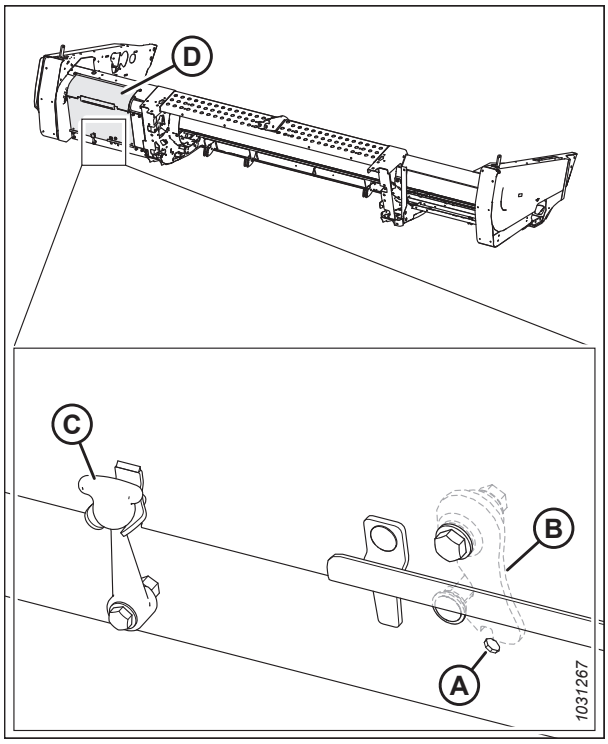


Figure 3.57: Driveshield – Headers Sold outside North America

The driveshield is shown in the open position.

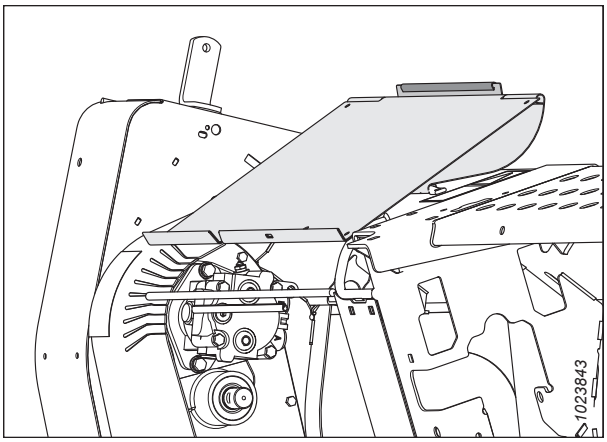


Figure 3.58: Driveshield Open

4. Remove cap (A) from the electrical connector, and remove the connector from the support bracket.
5. Disengage and rotate lever (B) counterclockwise to the raised position to release hose bundle (C).

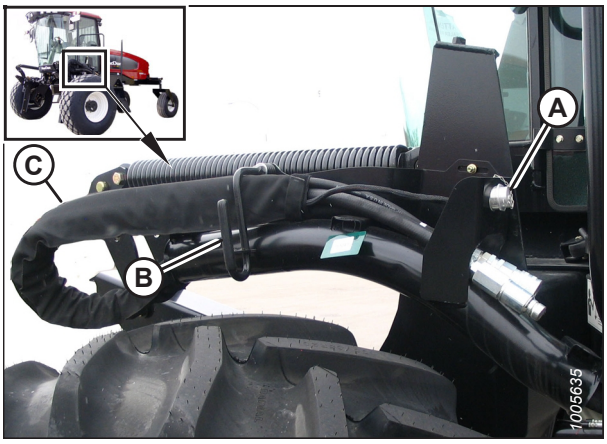


Figure 3.59: Support Bracket and Hose Bundle

6. Move hose/electrical bundle (A) to the header.
7. Route bundle (A) from the windrower through support (B) and access hole (C) in the header frame alongside existing hose bundle (D) from the header.
8. Remove the cover on header electrical receptacle (E).
9. Push the connector onto the receptacle, and turn the collar on the connector to lock it in place.
10. Attach the cover to the mating cover on the windrower wiring harness.
11. Remove the caps from the hydraulic couplers. Clean them if necessary.

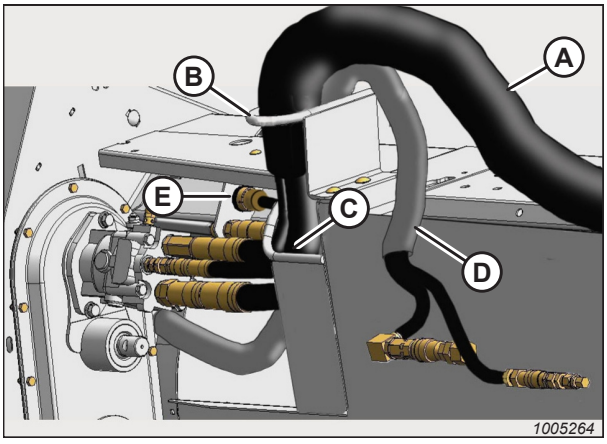


Figure 3.60: Hose and Electrical Bundle – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

12. Push the hose connectors onto the mating receptacles as shown until the collars on the receptacles snap into the lock position.

    NOTE:

    The hoses attached to the connectors are not shown in the illustrations at right.

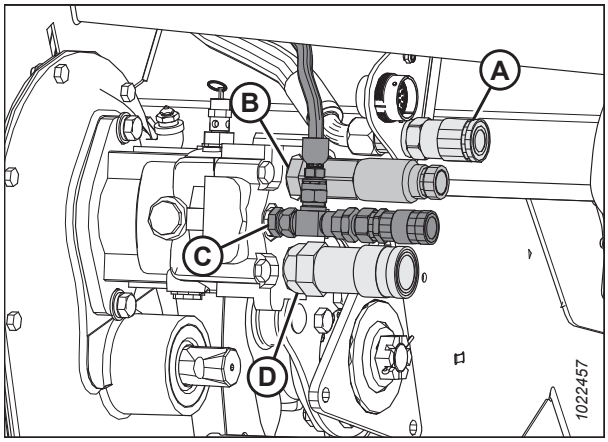


Figure 3.61: A40D Header – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

A - Reel Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

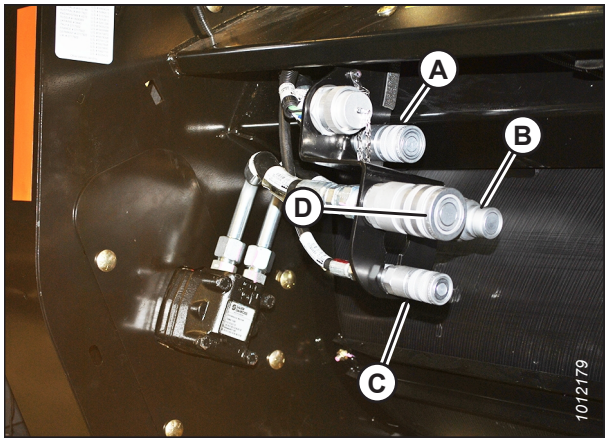


Figure 3.62: Grass Seed Header Hose Connectors

A - Reel and Auger Pressure
B - Knife and Conditioner Return
C - Case Drain
D - Knife and Conditioner Pressure

13. Route the auger return and reel pressure hose bundle (A) from the header to the windrower, and position the bundle above existing hose support (C) as shown.

14. Secure the bundle with three straps (D), and lower lever (B).

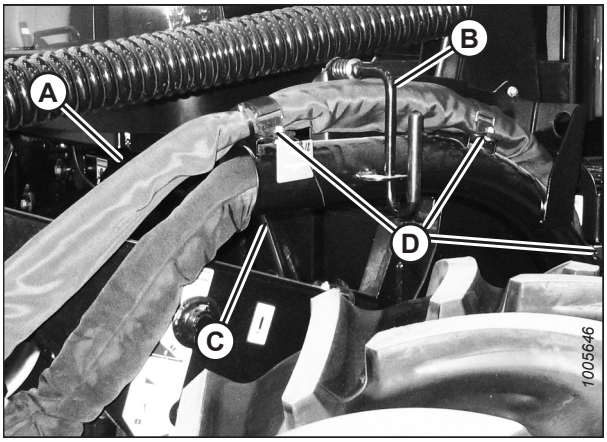


Figure 3.63: Auger Return and Reel Pressure Hose Bundle

15. If valve blocks are **NOT** configured as shown at right, install the required fittings as described in the unloading and assembly instructions supplied with your A40D Auger Header.

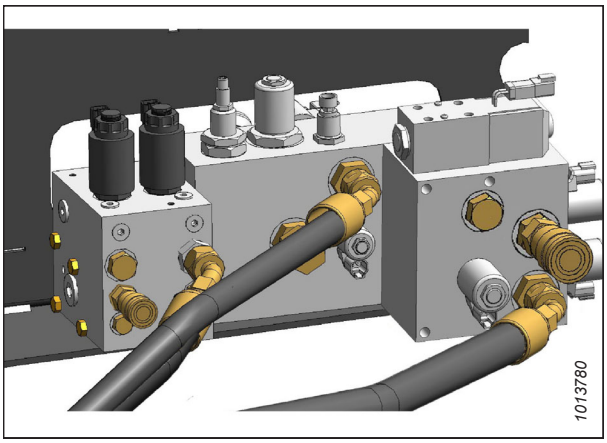


Figure 3.64: M200 with Reverser Valve

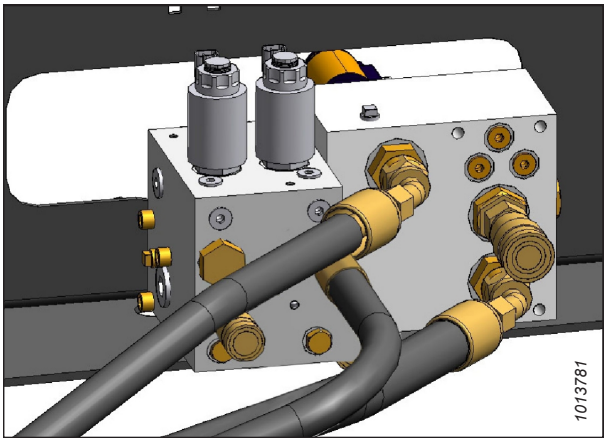


Figure 3.65: M200 without Reverser Valve

16. Locate auger pressure (A) and auger/reel return (B) hoses.

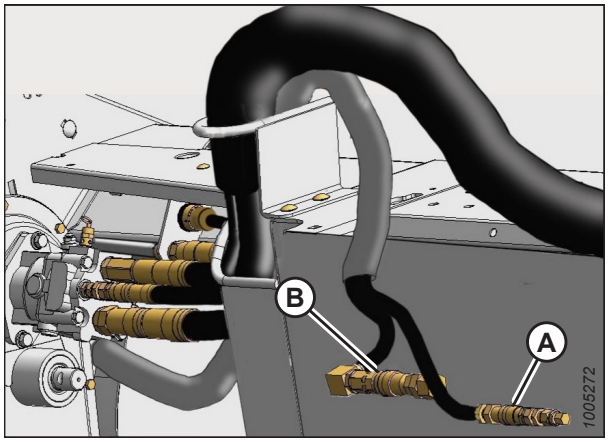


Figure 3.66: Auger Pressure and Auger/Reel Return Hose Couplers – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown (5.5 m [18 ft.] Header Similar)

17. Push auger pressure (A) and auger/reel return (B) hose couplers onto the mating receptacles on the valve block until the collar on the receptacle snaps into the lock position.

18. If valve blocks are **NOT** configured as shown above, install the required fittings as described in the unloading and assembly instructions supplied with your A40D Auger Header.

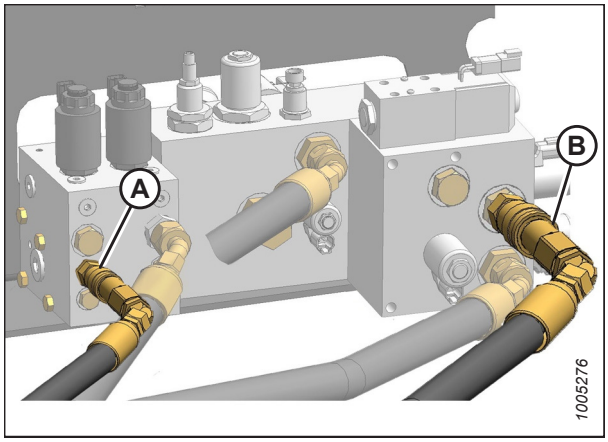


Figure 3.67: M200 with Reverser Valve

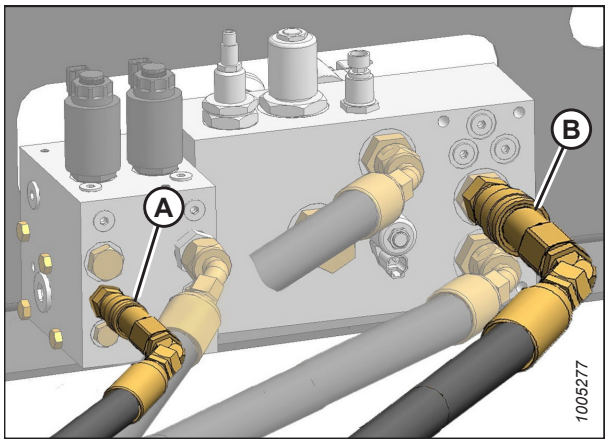


Figure 3.68: M200 without Reverser Valve

19. Proceed to *3.5.5 Configuring Reverser Valve Jumper Hose for A40D Auger Header, page 64*.

3.5.4 Attaching A40D Auger Header to an M205 Self-Propelled Windrower

The header's hydraulic multicoupler must be connected to the windrower before operation.

DANGER

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

The M205 Self-Propelled Windrower must be equipped with an auger drive basic kit and a completion kit as shown at right. If necessary, order and install the following kits shown in the table below. Installation instructions are supplied with the kits.

Kit Description	MacDon Part Number
Base kit	B5491
Reverser kit[1]	B5492
Coupler	B5497

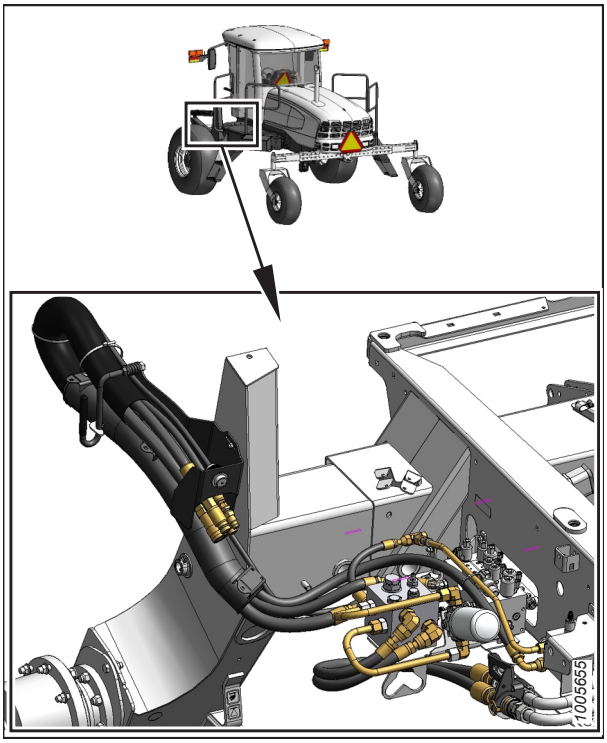


Figure 3.69: Auger Drive Basic Kit and Completion Kit Installed

1. Shut down the engine, and remove the key from the ignition.
2. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

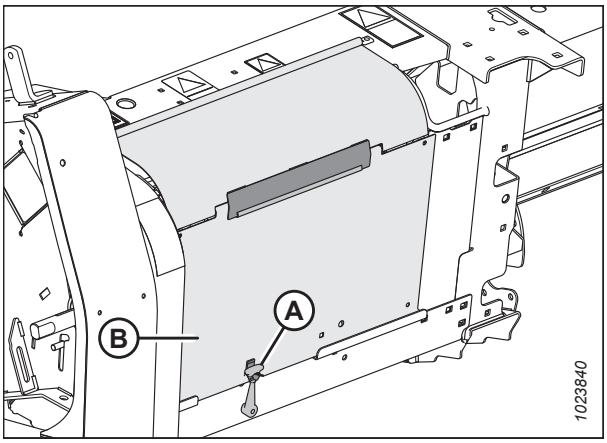


Figure 3.70: Driveshield – Headers Sold in North America

1. Reverser kit is **REQUIRED**. Install prior to hook-up.

3. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

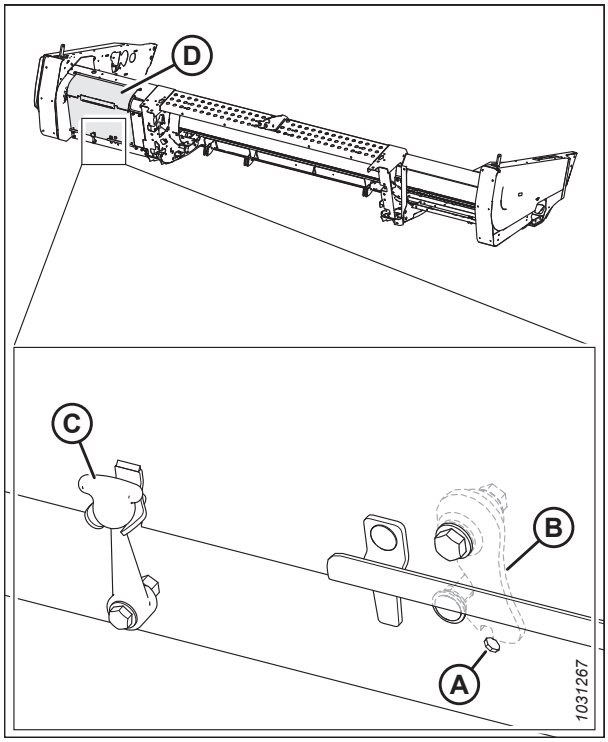


Figure 3.71: Driveshield – Headers Sold outside North America

The driveshield is shown in the open position.

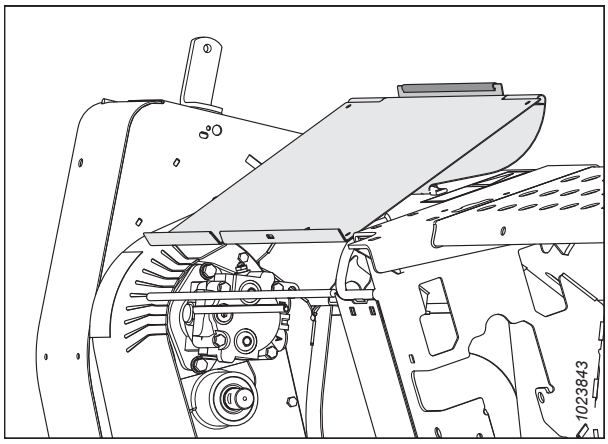


Figure 3.72: Driveshield Open

4. Remove cap (A) from the electrical connector and remove the connector from the support bracket.
5. Disengage and rotate lever (B) counterclockwise to the raised position to release the hose bundle (C).

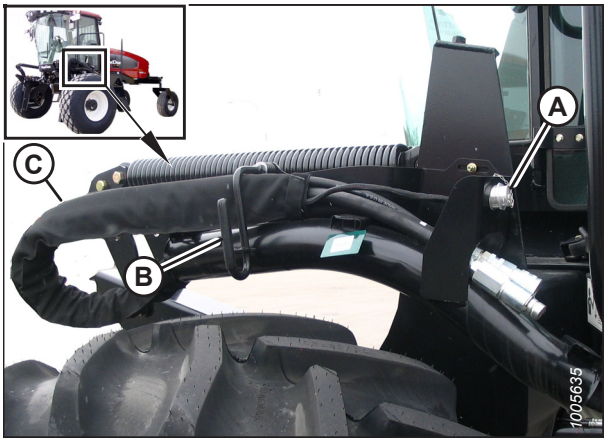


Figure 3.73: Support Bracket and Hose Bundle

6. Move hose/electrical bundle (A) to the header.
7. Route bundle (A) from the windrower through support (B) and access hole (C) in the header frame alongside existing hose bundle (D) from the header.
8. Remove the cover from header electrical receptacle (E).
9. Push the connector onto the receptacle and turn the collar on the connector to lock it in place.
10. Attach the cover to the mating cover on the windrower wiring harness.
11. Remove the caps from the hydraulic couplers. Clean them if necessary.

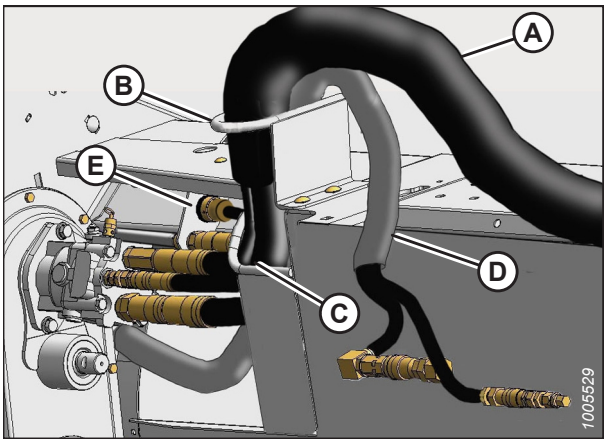


Figure 3.74: Hose and Electrical Bundle – 4.9 m (16 ft.) Header Shown, 5.5 m (18 ft.) Header Similar

12. **A40D standard headers:** Push the following hose connectors onto the mating receptacles as shown until the collars on the receptacles snap into lock position:
    - Reel/auger pressure (A)
    - Knife and conditioner return (B)
    - Case drain (C)
    - Knife and conditioner pressure (D)

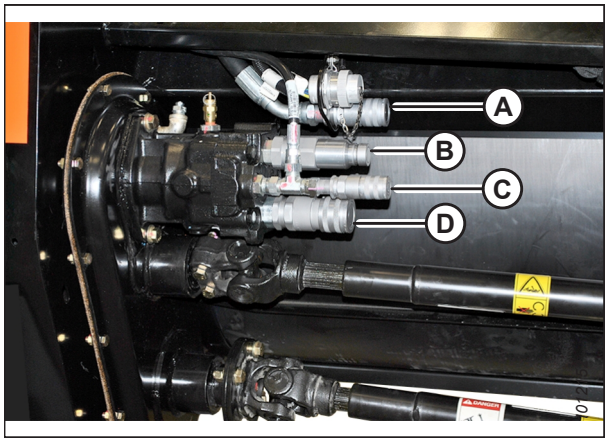


Figure 3.75: A40D Hose Connections – 4.9 m (16 ft.) Header Shown

Figure 3.76: A40D Hose Connections – 5.4 m (18 ft.) Header Shown

13. **A40D GSS headers:** Push the following hose connectors onto the mating receptacles as shown until the collars on the receptacles snap into lock position:
    - Reel/auger pressure (A)
    - Knife and conditioner return (B)
    - Case drain (C)
    - Knife and conditioner pressure (D)

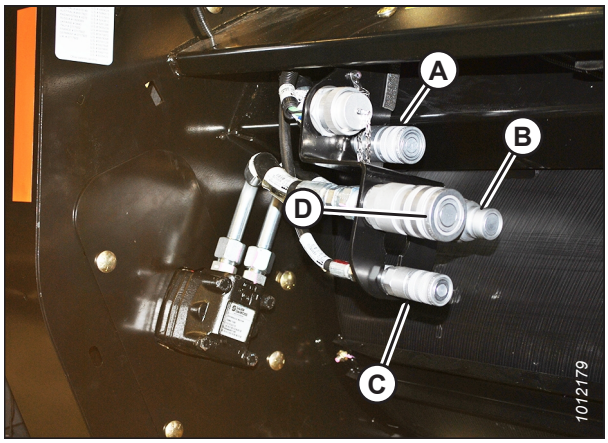


Figure 3.77: A40D GSS Hose Connections – 4.9 m (16 ft. header)

14. Route auger return/reel pressure hose bundle (A) from the header to the windrower, and position the bundle above existing hose support (C) as shown.

15. Secure the bundle with three straps (D), and lower lever (B).

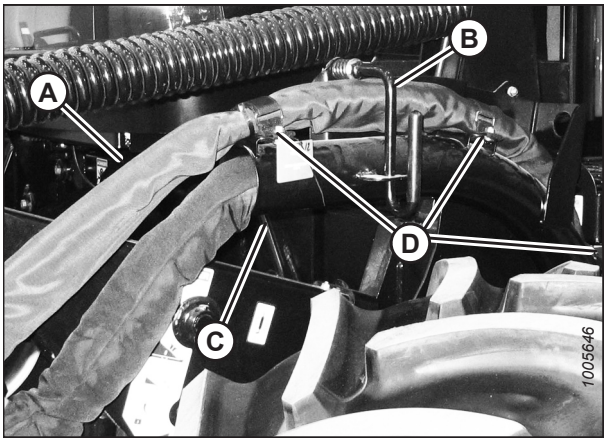


Figure 3.78: Auger Return and Reel Pressure Hose Bundle

16. Push auger/reel pressure (A) and auger/reel return (B) hose couplers onto the mating receptacles on the manifold until the collar on the receptacle snaps into the lock position.

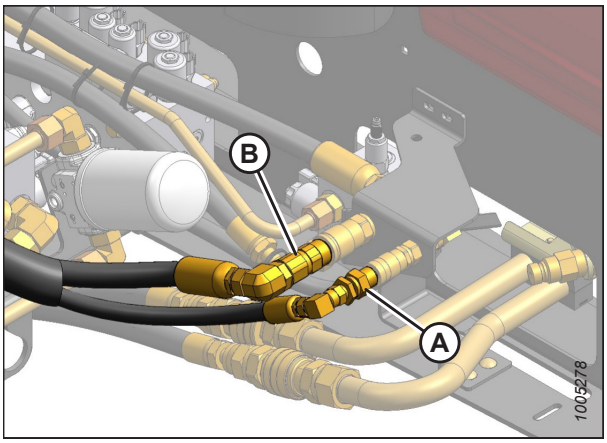


Figure 3.79: Auger/Reel Pressure and Auger/Reel Return Hose Couplers

17. Check reel pressure line (A) connection to the reel drive motor (B). Connect the reel pressure line to a different port on the reel motor port depending on the model of windrower:

    - If attaching the header to an M150, M155, M155E4, or M200, do **NOT** change the reel pressure connection to the motor, **UNLESS** switching to windrower models M100, M105, or M205. All model years of A40D / A40D GSS are factory-configured for M150, M155, M155E4, and M200.
    - Before attaching the header to an **M100, M105, or M205** move the reel pressure line connection (A) to the other port (C). Refer to *3.5.6 Routing A40D Auger Header Hydraulic Drive Hoses, page 65*.

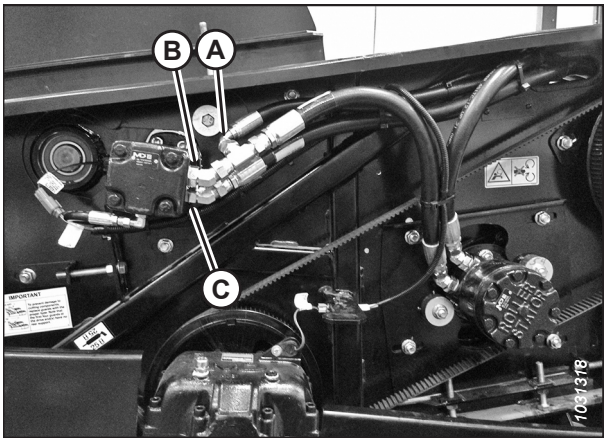


Figure 3.80: A40D/A40D GSS Header – Factory Configuration for M150, M155, M155*E4* and M200

3.5.5 Configuring Reverser Valve Jumper Hose for A40D Auger Header

An optional reverser valve block may have been installed to reverse the header drive in the event of plugging on the M150, M155, and M200 Self-Propelled Windrowers. A jumper hose on this valve block has a specific routing for each model of header.

NOTE:

If a reverser valve block (A) has been installed, the jumper hose (B) must be routed for the correct header model. Do **NOT** operate the header unless the hose is routed as shown.

NOTE:

ONLY for draper headers with conditioner installed and **ONLY** for the M150, M155, and M200 Self-Propelled Windrowers: CR is routed to port R4 (not shown) on the reverser block. When switching from draper header to auger header, jumper hose (B) must be routed according to the header being operated to prevent draper header reel damage and improper operation.

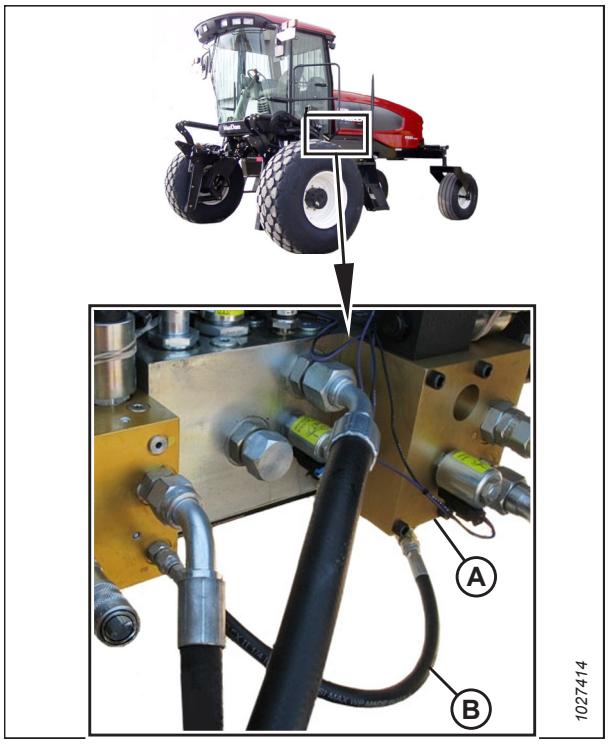


Figure 3.81: A40D Hose (B) Position (A40D on M200 Shown; M150, M155, and M155*E4* Similar)

To reroute the jumper hose from the draper header position to A40D position, follow these steps:

1. Move the left windrower platform to the open position to expose the hydraulic valve blocks.
2. Disconnect jumper hose (B) from 90 degree fitting (C) at port R4 on reverser valve block (A).
3. Rotate 90 degree fitting (D) under the reverser valve block so that the hose can be routed to port C2 at (C) as shown in Figure *3.83, page 65*.

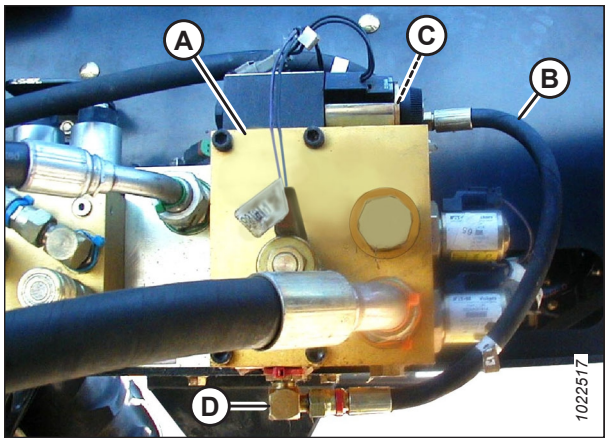


Figure 3.82: Draper Header Hose Position (M150 Shown; M200, M155, and M155*E4* Similar)

4. Remove the cap from port C2 fitting (A) on header drive valve block (B).
5. Connect jumper hose (C) to port C2 fitting (A) on header drive valve block (B).
6. Install the previously removed cap onto the 90 degree fitting in port R4 on reverser valve block (D).
7. Move the left windrower platform back to the normal operating position.

   NOTE:

   The draper header reverser function is suppressed unless the hay conditioner is activated in Windrower Setup using the cab display module (CDM).

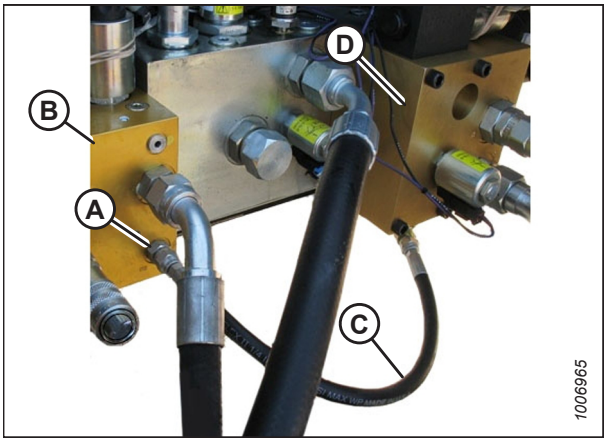


Figure 3.83: Connected Jumper Hose

3.5.6 Routing A40D Auger Header Hydraulic Drive Hoses

The A40D Auger Header hydraulic drive hose routing depends on the windrower model to which the header is being attached.

A40D Headers are factory-configured for M150, M155, M155*E4*, and Self-Propelled M200 Windrowers as shown in Figure *3.90, page 68*.

To route hoses for M100, M105, and M205 Self-Propelled Windrowers, proceed as follows:

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Press a screwdriver against the latch in opening (A) and lift it to open the header left endshield. The shield will latch at location (B) to stay open.

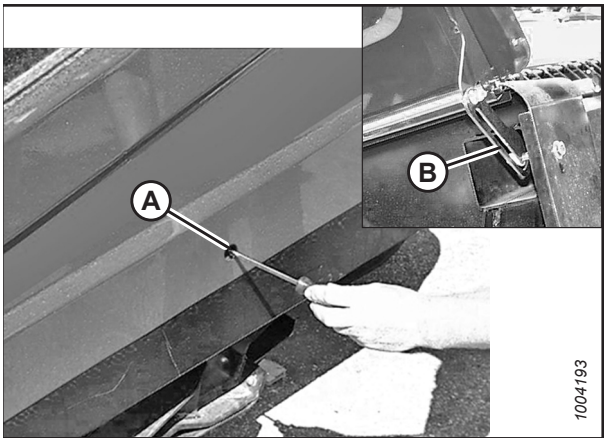


Figure 3.84: Left Endshield

3. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

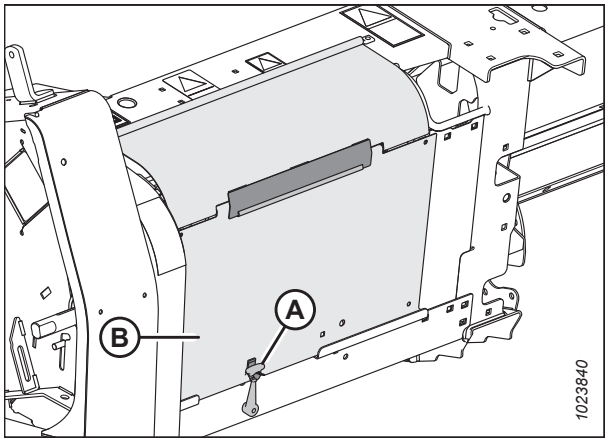


Figure 3.85: Driveshield – Headers Sold in North America

4. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

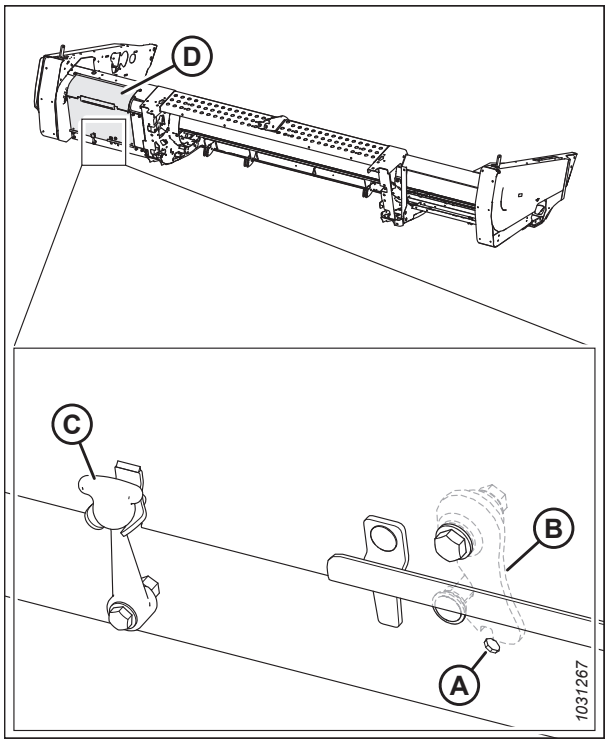


Figure 3.86: Driveshield – Headers Sold outside North America

The driveshield is shown in the open position.

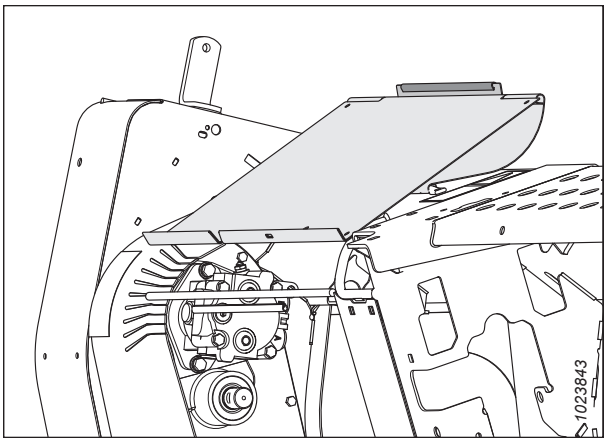


Figure 3.87: Driveshield Open

5. Loosen bulkhead nut (A) on auger and reel pressure coupler (B). This allows auger and reel pressure hose (C) to rotate freely.

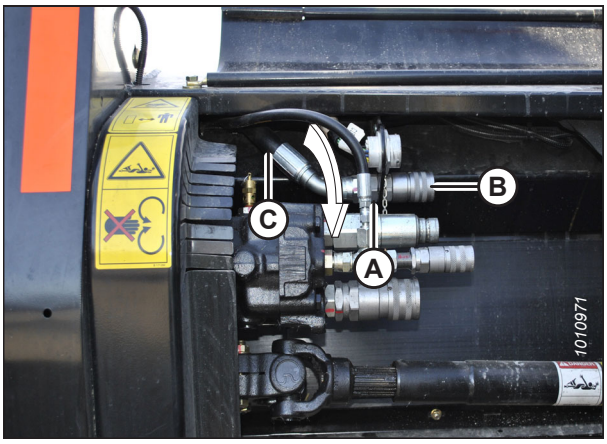


Figure 3.88: Auger and Reel Pressure Coupler and Hose – 4.9 m (16 ft.) Header Shown

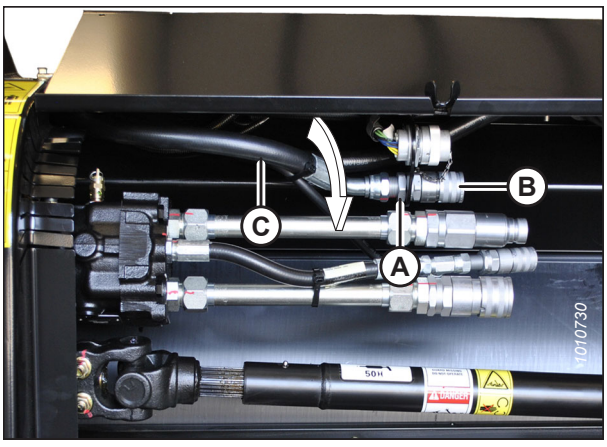


Figure 3.89: Auger and Reel Pressure Coupler and Hose – 5.5 m (18 ft.) Header Shown

6. Disconnect the hoses as follows:
   a. Disconnect hose (A) from tee (B).
   b. Disconnect tee (B) from the reel motor upper port.
   c. Disconnect hose (C) from the reel motor lower port.
7. Cut cable ties (D) at locations shown in the illustration.

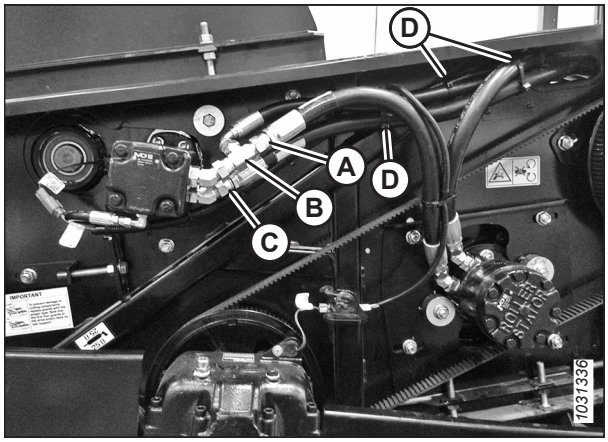


Figure 3.90: Factory Configuration – M150, M155, M155*E4*, and M200

8. Reconnect the hoses as follows:
   a. Reroute hose (E) behind hose (A) and (F) to hose (C) and connect tee (B) to the lower port fitting.
   b. Reroute hose (C) above hose (E) and (F) and connect hose (C) to tee (B). Tighten hose (C).
   c. Loosen the 45° fittings at both ports. This allows room for wrenches when tightening tee (B) to the lower port.
   d. Connect hose (A) to the upper port fitting as shown and check the orientation of the 45° fitting.

      NOTE:

      Ensure that hose (A) is routed in front of hose (C) and hose (E).

   e. Confirm the orientation of the upper port 45° fitting, back-off tee (B), and tighten the upper port fitting in the position determined. Tighten hose (A).
   f. Check the orientation of the lower port 45° fitting and tighten it.
   g. Connect tee (B) to the lower port 45° fitting and tighten it.

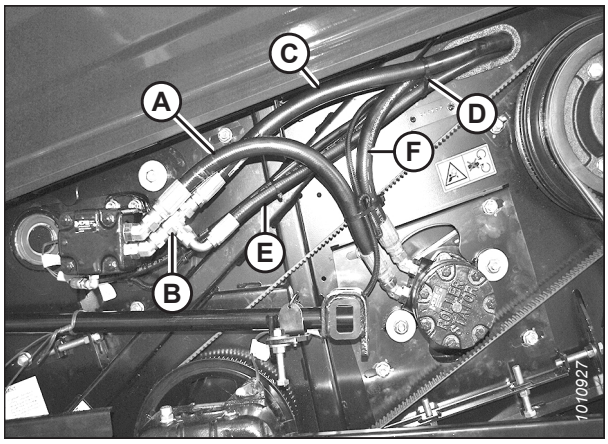


Figure 3.91: Adjusted Configuration – M100, M105, and M205

9. Secure the hose routing with cable ties (A) as shown.

   IMPORTANT:

   Ensure that electrical harness (B) and reel motor case drain hose (C) are secured to hose (D) and that there is at least 25 mm (1 in.) clearance between hose bundle (E) and knife drive timing belt (F).

   IMPORTANT:

   Ensure there is enough clearance between the hoses and any hardware that may need to be accessed to adjust the reel or auger.

10. Orient the fittings and, if necessary, use a cable tie to ensure a minimum clearance of 20 mm (3/4 in.) between hoses and bolt at location (G).

11. Orient the fittings to provide a minimum of 10 mm (3/8 in.) clearance between the hoses and unplug the tool at location (H).

12. Orient the fittings to provide a minimum of 200 mm (7 7/8 in.) clearance between the end panel and the hoses in location (J).

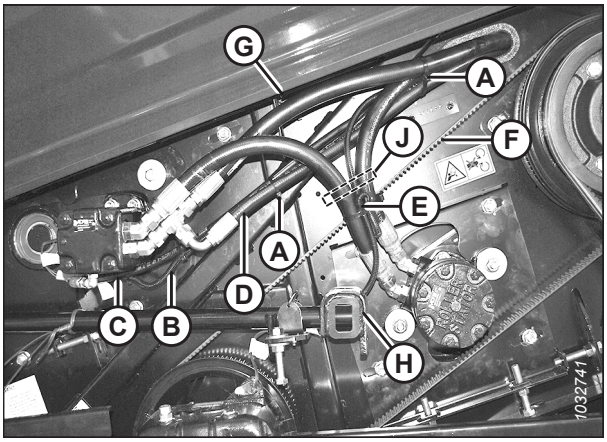


Figure 3.92: Adjusted Configuration – M100, M105, and M205

13. Rotate coupler (B) and hose (C) downward as shown until the slack has been sufficiently reduced. Tighten bulkhead nut (A).

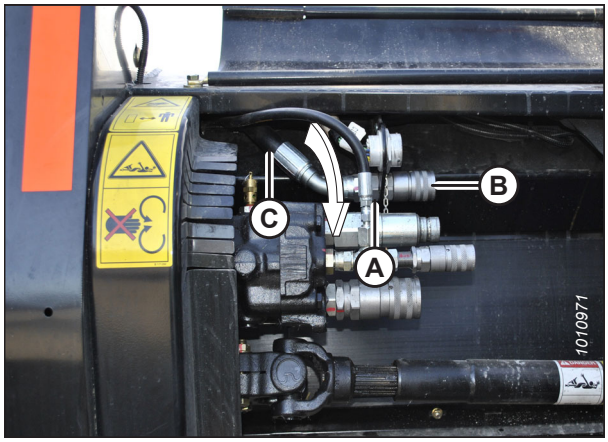


Figure 3.93: Auger and Reel Pressure Coupler and Hose – 4.3 m and 4.9 m (14 ft. and 16 ft.) Header Shown

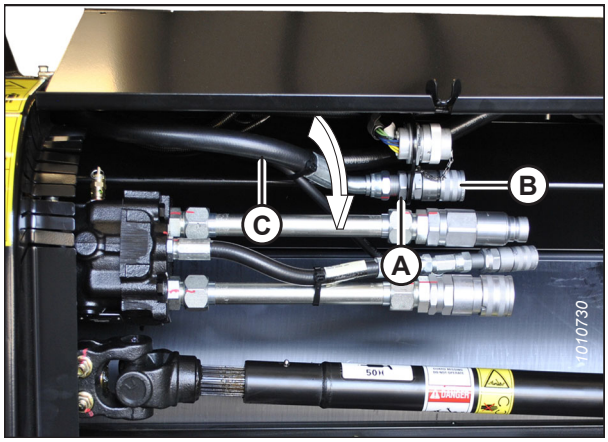


Figure 3.94: Auger and Reel Pressure Coupler and Hose – 5.5 m (18 ft.) Header Shown

14. **Headers sold in North America:** Close driveshield (B) and engage rubber latch (A).

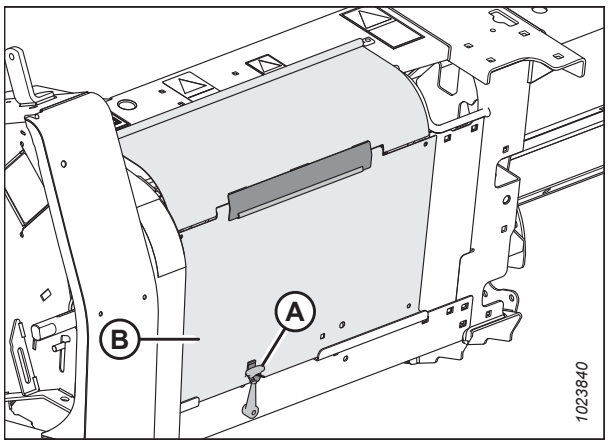


Figure 3.95: Driveshield – Headers Sold in North America

15. **Headers sold outside North America:** Close driveshield (A). Latch (B) will automatically latch. Engage rubber latch (C).

16. Close the driveshield before engaging the header.

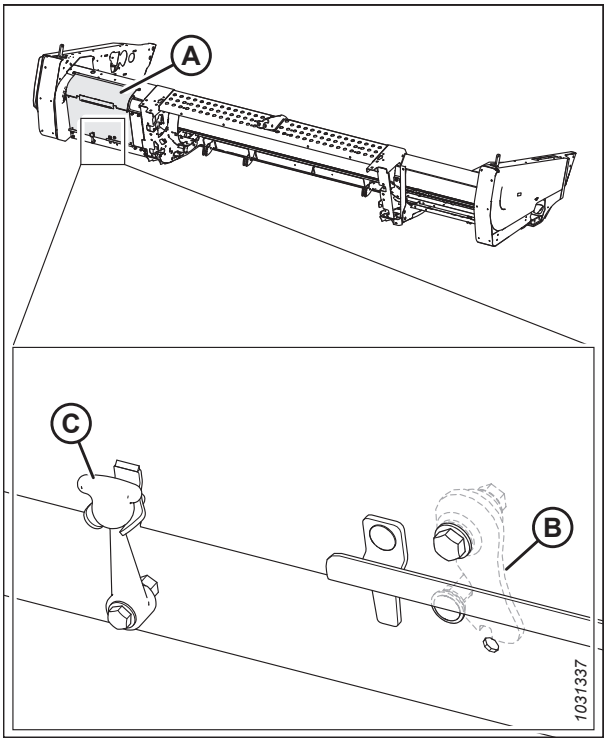


Figure 3.96: Driveshield – Headers Sold outside North America

3.6 Detaching A40D Auger Header from M Series Self-Propelled Windrower

Folow this procedure to detach an A40D Auger Header from an M Series Self-Propelled Windrower.

DANGER

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

1. Move the left cab-forward platform to the rear of the windrower.
2. Refer to the illustration relevant to your equipment, and disconnect hydraulic hoses (A) and (B) from the windrower valve(s).

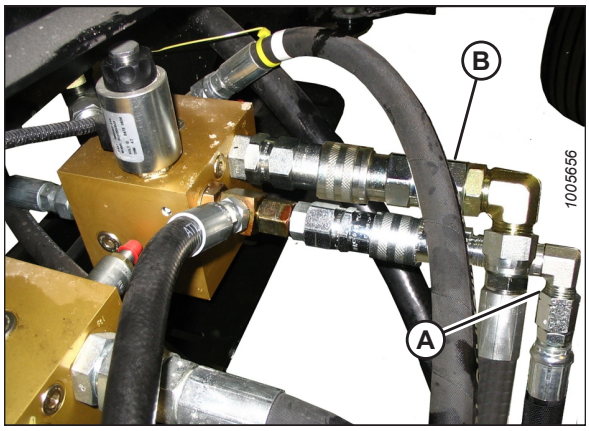


Figure 3.97: M100 and M105

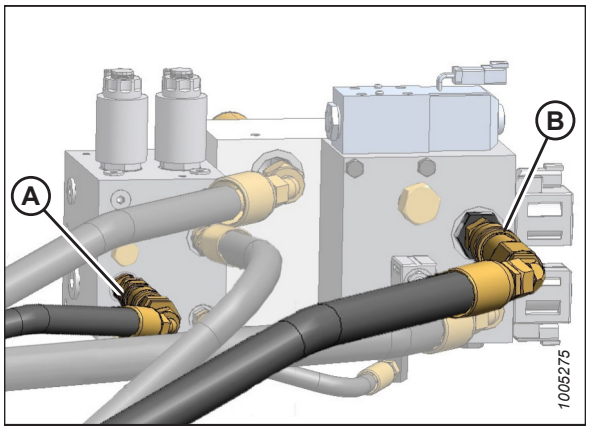


Figure 3.98: M150 with Reverser Valve – M155 and M155*E4* Similar

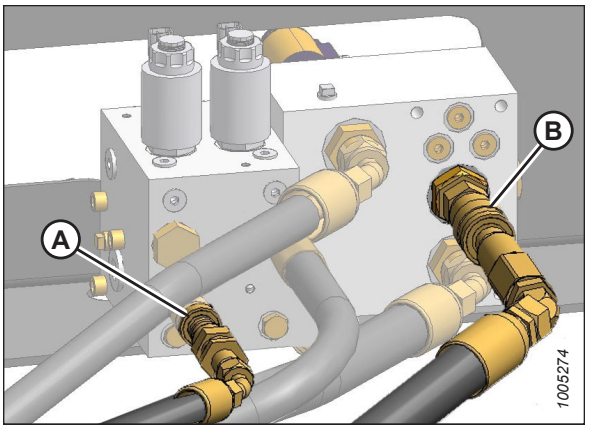


Figure 3.99: M150 without Reverser Valve – M155 and M155*E4* Similar

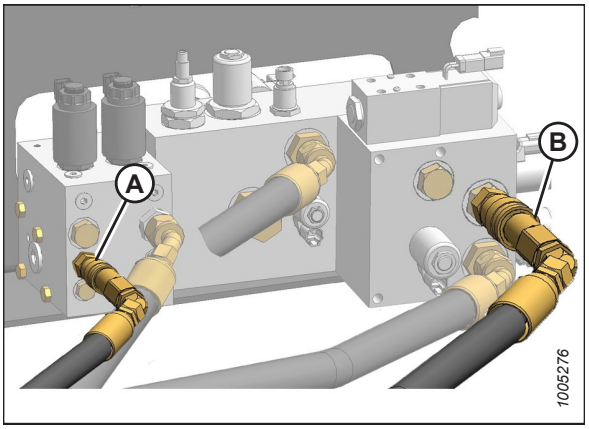


Figure 3.100: M200 with Reverser Valve

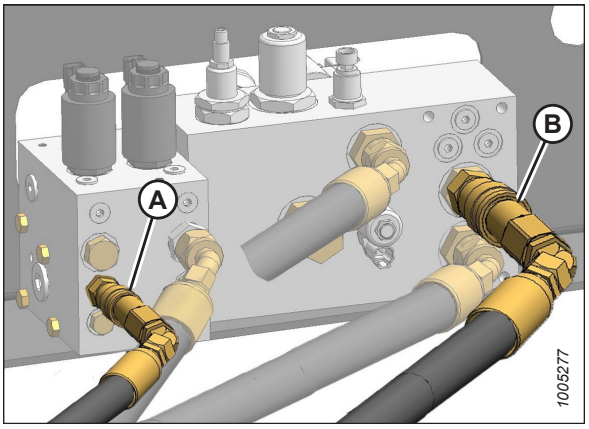


Figure 3.101: M200 without Reverser Valve

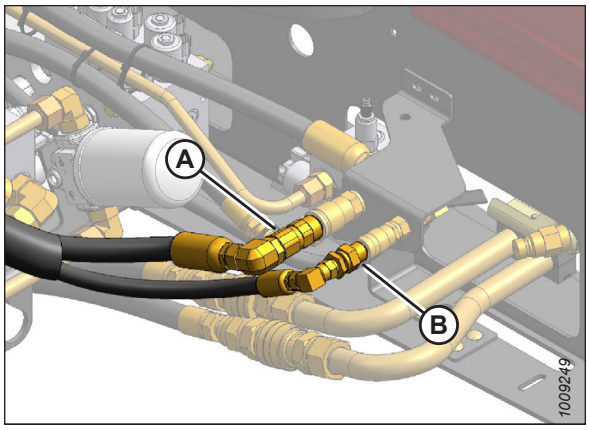


Figure 3.102: M205

3. Raise lever (B) on hose support (C), and undo three adjustable straps (D).
4. Move hose bundle (A) to store on the header walkway.
5. Install the caps on the connectors and the hose ends (if equipped).

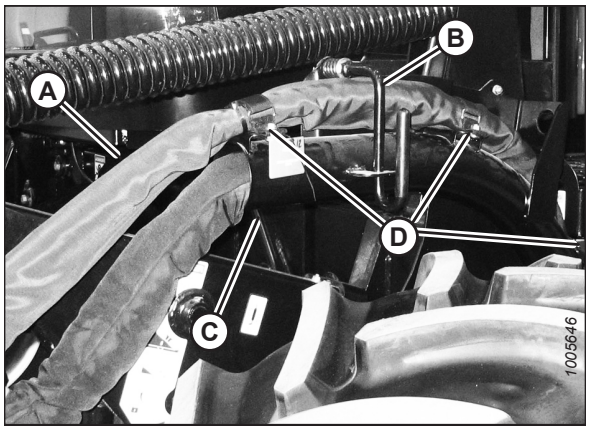


Figure 3.103: Hose Bundle

6. **A40D standard headers:** At the header, disconnect electrical connector (E) by turning the collar counterclockwise, and pulling the connector to disengage. Disconnect the hoses from the following hoses:

   - Reel/auger pressure (A)
   - Knife and conditioner return (B)
   - Case drain (C)
   - Knife and conditioner pressure (D)

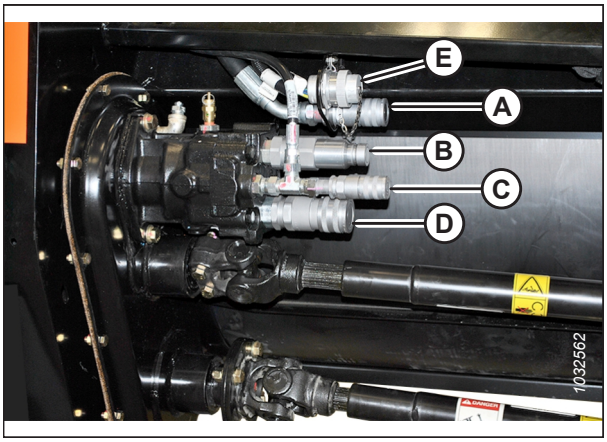


Figure 3.104: A40D Hose Connections – 4.9 m (16 ft.) Header Shown

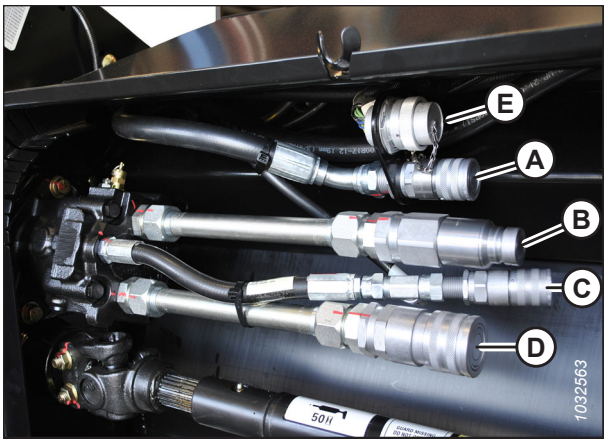


Figure 3.105: A40D Hose Connections – 5.4 m (18 ft.) Header Shown

7. **A40D GSS headers:** At the header, disconnect electrical connector (E) by turning collar counterclockwise, and pulling the connector to disengage. Disconnect the hoses from the following hoses:

   - Reel/auger pressure (A)
   - Knife and conditioner return (B)
   - Case drain (C)
   - Knife and conditioner pressure (D)

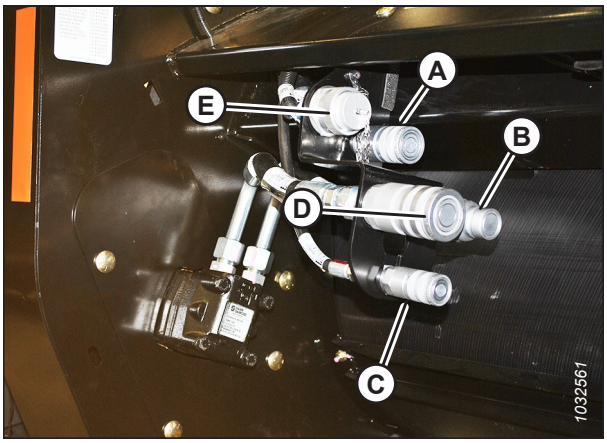


Figure 3.106: A40D GSS Hose Connections – 4.9 m (16 ft. header)

8. Move hose bundle (A) from the header, and position it on the left of the windrower with the hose ends in support (B) and under lever (C).
9. Rotate lever (C) clockwise, and push it to engage the bracket.
10. Position the electrical harness through support (B), and attach the cap to the electrical connector.
11. Close the driveshield, and move the windrower platform to the closed position.
12. Check to ensure the hoses and the electrical harness clear the tire.
13. Detach the header from the windrower. For instructions, refer to your windrower operator's manual.

Figure 3.107: Hose Bundle Storage

3.7 Header Lift Cylinder Lock-Out Valves

Refer to your windrower operator’s manual for information about the lift cylinder lock-out valves.

3.8 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 allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages will affect the performance of the header. You will quickly become adept at adjusting the machine to give you the desired results.

Table 3.1 Header Adjustments

Variable	Refer to
Lean bar position	*3.8.1 Setting Lean Bar, page 78*
Auger speed	*3.8.2 Adjusting Auger Speed, page 79*
Reel speed	*3.8.3 Adjusting Reel Speed, page 79*
Auger position	*3.8.4 Setting Auger Position, page 79*
Reel position	*3.8.5 Setting Reel Position, page 82*
Tine aggressiveness adjustment	*3.8.6 Setting Tine Aggressiveness, page 87*
Cutting height	*3.8.8 Setting Cutting Height, page 89*
Header angle	*3.8.7 Adjusting Header Angle, page 88*
Header float	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Feed pan / rock drop tine position	*3.8.12 Setting Feed Pan and Rock Drop Tine Position, page 100*
Roll gap	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Roll timing	*4.14.11 Checking and Adjusting Roll Timing, page 216*
Roll alignment	*4.14.10 Checking/Adjusting Roll Alignment, page 213*
Roll tension	*3.8.14 Adjusting Conditioner Roll Tension, page 102*
Forming shields	*3.8.15 Positioning Forming Shields, page 103*
Tall crop dividers	*3.13.1 Adjusting Tall Crop Dividers, page 119*
Ground speed	*3.12 Selecting Ground Speed, page 118*

3.8.1 Setting Lean Bar

Use the lean bar adjustment to accommodate different crop heights.

The lean bar (A) should strike the upper portion of the crop (roughly 2/3 of the crop height), leaning it away from the header, and exposing the stalks to the knife.

IMPORTANT:

To prevent structural damage to the header, do **NOT** operate with the lean bar removed.

To extend or retract lean bar (A), reposition the hardware in the adjustment holes as required.

On crops over 1.52 m (5 ft.) high, an optional tall crop divider kit (B4690) is available that includes lean bar extensions to raise the lean bar. For more information refer to *3.13.1 Adjusting Tall Crop Dividers, page 119*.

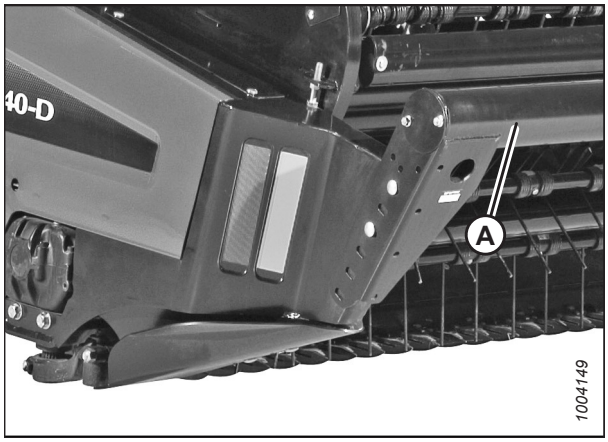


Figure 3.108: Auger Header Lean Bar

3.8.2 Adjusting Auger Speed

An A40 Auger Header features a hydraulic direct drive auger with operating speed range of 230 to 320 rpm, and is controlled from the operator's station on the self-propelled windrower.

For instructions, refer to your windrower operator's manual.

3.8.3 Adjusting Reel Speed

An A40 Auger Header features a hydraulic direct drive reel with operating speed ranges of 50 to 85 rpm for M100, M105, M200, and M205 Self-Propelled Windrowers, as well as M1170, M1240, M2170, and M2260 Windrower models with standard reel configuration.

Operating speed ranges of 15 to 85 rpm are available for M150, M155, and M155*E4* Self-Propelled Windrowers, as well as M1170, M1240, M2170, and M2260 Windrower models with reel variable speed kit installed.

IMPORTANT:

The reel speed should be run slightly faster than the ground speed. Running the reel at +1.2 relative to the ground speed is recommended.

NOTE:

The A40DX GSS headers are factory-fitted with reel variable speed option.

For instructions, refer to your windrower operator's manual.

3.8.4 Setting Auger Position

The auger position has been factory-set, and should not normally require adjustment.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *4.1 Preparing for Servicing, page 125*.

For nearly all conditions, the auger performs best when it is set as close as possible to the stripper bars without rubbing. This is especially important in grass and other crops that have a tendency to wrap.

Component wear may cause clearances to become excessive, resulting in feeding problems and uneven windrows.

To make adjustments to auger position, refer to these sections depending on your equipment:

- *Adjusting Auger Fore-Aft Position, page 80*
- *Adjusting Vertical Position, page 81*

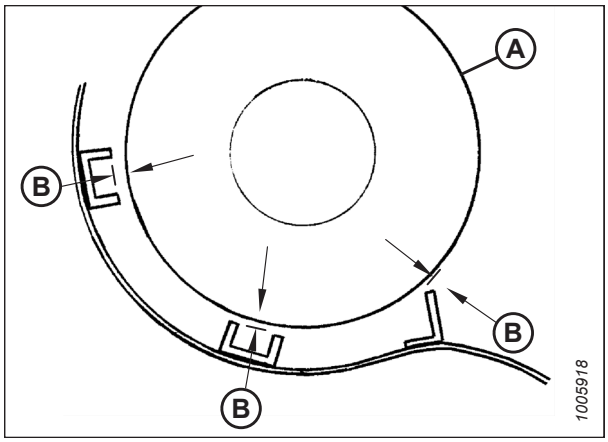


Figure 3.109: Clearance between Auger and Stripper Bars on the Auger Pan

A - Auger
B - Clearance 1–4 mm (1/32–5/32 in.)

NOTE:

In heavier crops, it may be necessary to remove the front stripper bar for smoother crop flow across the auger. However, the bottom and the rear stripper bars must remain in place. Refer to *4.13 Stripper Bar, page 192*.

NOTE:

Auger to stripper bar adjustment is most accurately checked and set with the header in the working position.
The auger should clear the stripper bars on the auger pan by approximately 1–4 mm (1/32–5/32 in.). Shimming the stripper bars may be required. For instructions, refer to *4.13 Stripper Bar, page 192*.

Adjusting Auger Fore-Aft Position

Follow this procedure to adjust the auger fore-aft position.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Loosen four nuts (A).
4. Loosen the jam nut on adjuster bolt (B), and turn bolt (B) to adjust the auger fore-aft position.
5. Tighten the jam nut.
6. Tighten nuts (A).

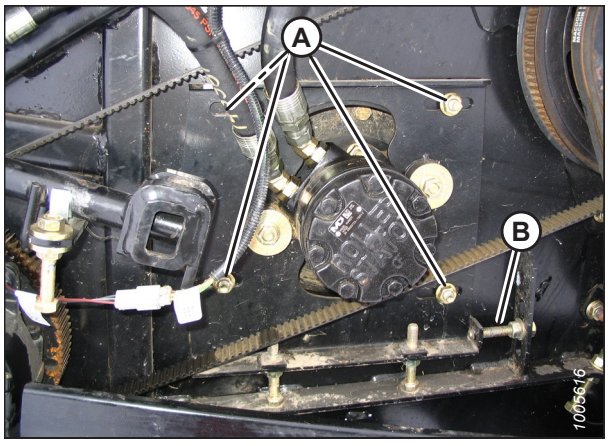


Figure 3.110: A40D Left Side

7. Open the right endshield.
8. Loosen four nuts (A).
9. Loosen the jam nut on adjuster bolt (B), and turn bolt (B) to adjust the auger fore-aft position.
10. Tighten the jam nut.
11. Tighten nuts (A).
12. Close the endshields before engaging the header.

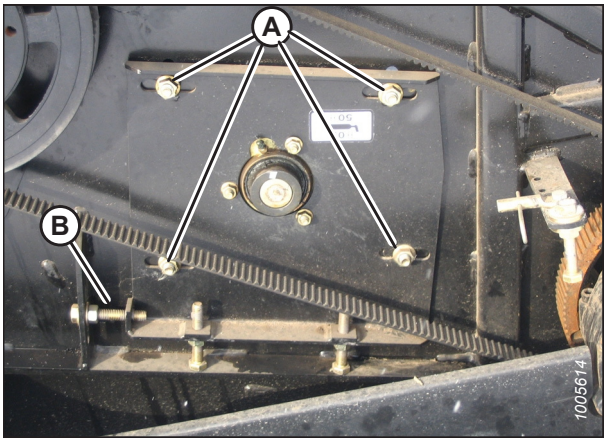


Figure 3.111: A40D Right Side

Adjusting Vertical Position

Follow this procedure to adjust the auger header's vertical position.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Loosen four nuts (A).
4. Loosen the jam nuts on adjuster bolts (B), and turn bolts (B) to adjust the auger vertical position.
5. Tighten the jam nuts.
6. Tighten nuts (A).

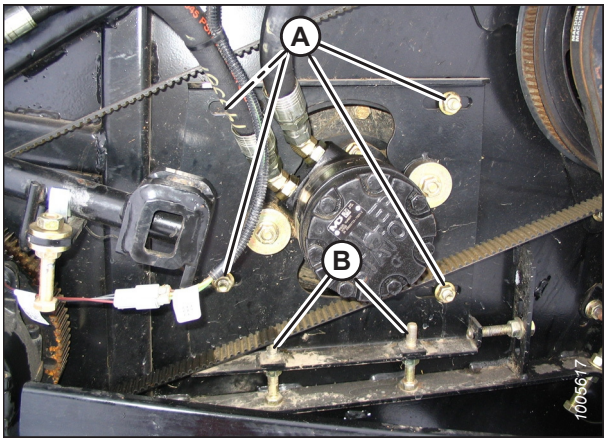


Figure 3.112: A40D Left Side

7. Open the right endshield.
8. Loosen four nuts (A).
9. Loosen the jam nut on adjuster bolts (B), and turn bolts (B) to adjust the auger fore-aft position.
10. Tighten the jam nut.
11. Tighten nuts (A).
12. Close the endshields before engaging the header.

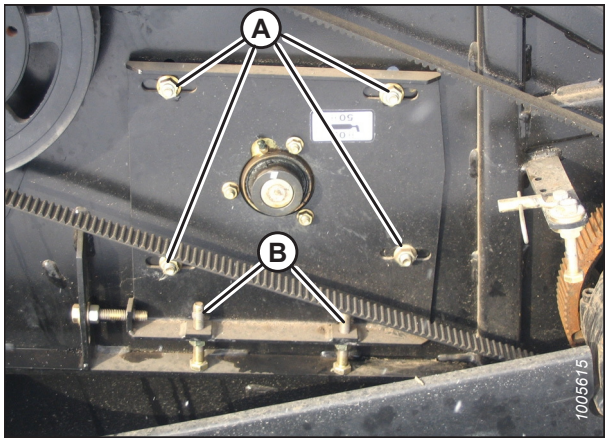


Figure 3.113: A40D Right Side

3.8.5 Setting Reel Position

The reel position has been found to be a critical factor in achieving good results in adverse conditions.

The reel position is factory-set for average straight standing crop. It can be adjusted both vertically and horizontally (fore-aft) for different crop conditions.

See table below for recommended reel position in unusual crop conditions:

Crop Condition	Reel Position
Crop down or lodged	Forward and down (also increase reel speed)
Wet or dead material collects on cutterbar and plugs knife	Back and down (close to guards)
Short crop	Back
Thick stemmed or heavy standing	Up and forward

To make adjustments to the reel position, refer to the following sections:

- *Adjusting Reel Fore-Aft Position, page 83*
- *Adjusting Reel Vertical Position, page 84*

Adjusting Reel Fore-Aft Position

Follow this procedure to adjust the reel fore-aft position.

The reel fore-aft offset is factory-set to 816 mm (32 3/8 in.) as measured from the inside edge of the reel tube to the back frame member as shown in the illustration at right.

NOTE:

The reel must be adjusted equally on both sides.

Figure 3.114: Measuring Reel Fore-Aft Offset

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Loosen four nuts (A).
4. Loosen the jam nut on adjuster bolt (B), and turn bolt (B) to adjust the reel fore-aft position.
5. Tighten the jam nut.
6. Tighten nuts (A).

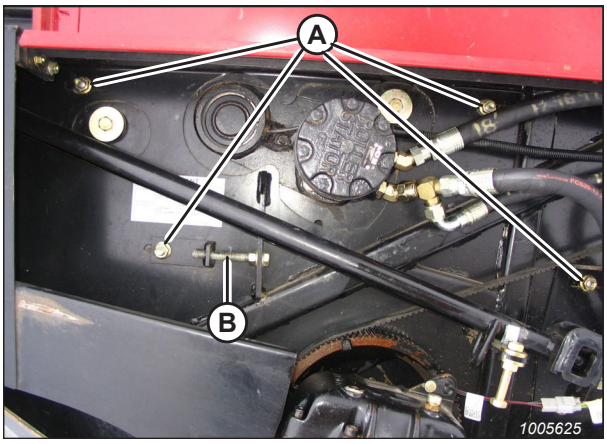


Figure 3.115: Auger Header Left Side

7. Open the right endshield.
8. Loosen four nuts (A).
9. Loosen the jam nut on adjuster bolt (B), and turn bolt (B) to adjust the reel fore-aft position.
10. Tighten the jam nut.
11. Tighten nuts (A).
12. Close the driveshields before engaging the header.

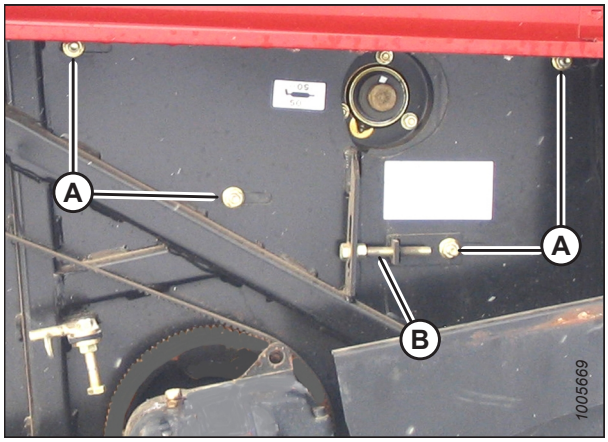


Figure 3.116: Auger Header Right Side

Adjusting Reel Vertical Position

Follow this procedure to adjust the reel vertical position.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Loosen four nuts (A).

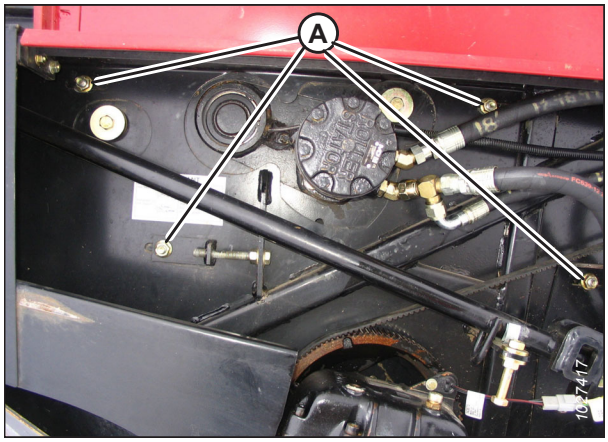


Figure 3.117: Auger Header Left Side

4. Loosen the jam nuts on adjuster bolts (A), and turn bolts (A) to raise or lower the reel.
5. Tighten jam nuts (A).

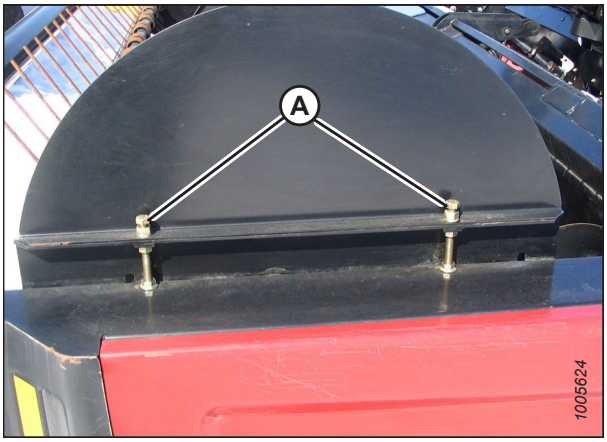


Figure 3.118: Auger Header Left Side

6. Tighten nuts (A).

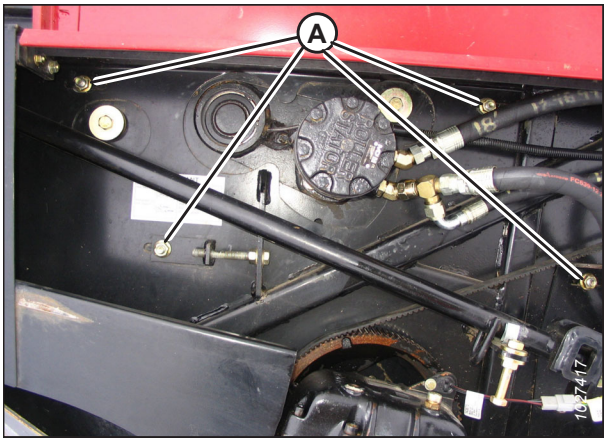


Figure 3.119: Auger Header Left Side

7. Open the right endshield.
8. Loosen four nuts (A).

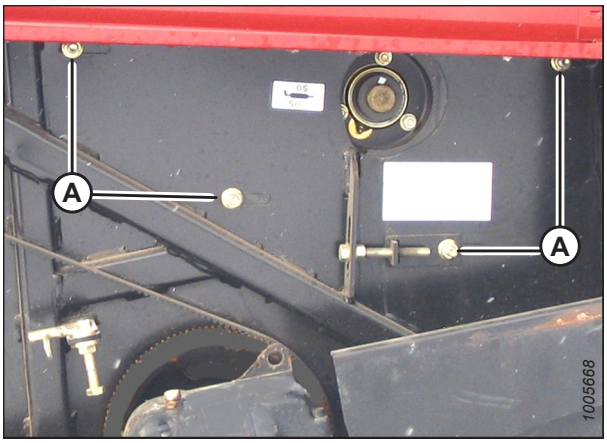


Figure 3.120: Auger Header Right Side

9. Loosen the jam nuts on adjuster bolts (A), and turn bolts (A) to adjust the reel vertical position.

   NOTE:

   The factory setting at forward adjuster bolt should be 12 mm (15/32 in.) lower than at rear adjuster bolt. If tine aggressiveness has changed, then the adjuster bolt offset may not equal factory settings. Always measure the adjuster bolt offset and maintain throughout the vertical adjustment.

10. Tighten the jam nuts.

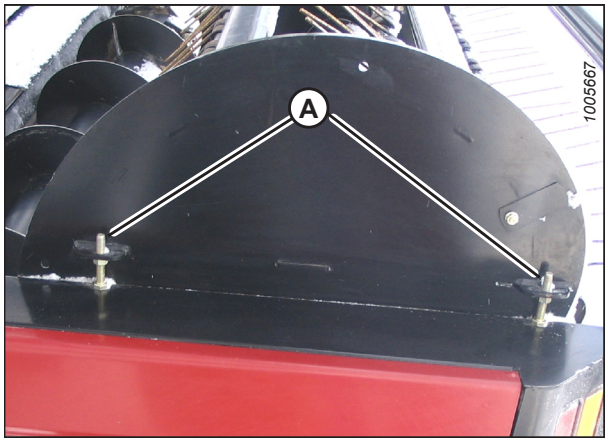


Figure 3.121: Auger Header Left Side

11. Tighten nuts (A).
12. Close the endshields before engaging the header.
13. Check that the reel rotates freely.

    NOTE:

    Manually rotate the reel, and ensure that tines do not contact the header pan, otherwise damage to the pan will result. If necessary, grind off the excessive length from the tine if the tine length varies considerably. Remove any sharp edges or burrs from the tine.

14. Check that the reel is evenly adjusted.

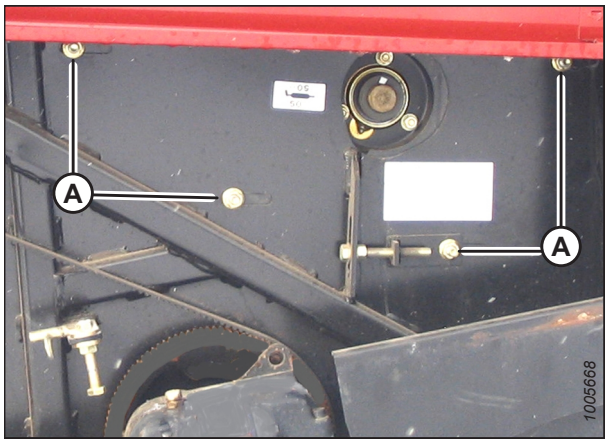


Figure 3.122: Auger Header Right Side

Checking Reel Tine to Header Pan Clearance

The reel tine to header pan clearance must be checked to ensure that the reel rotates freely.

IMPORTANT:

The dimensions at right are provided as guidelines only. Tines may slightly contact the guards, but **NOT** the knife sections or the auger pan.

1. Rotate the reel slowly by hand, and check the tine clearance at the knife and the pan. Flex the tines to simulate crop-loaded position to ensure the tine clearances to the knife sections and the auger pan are adequate for working conditions.
2. Check that the reel rotates freely.

   NOTE:

   If there are a few reel tines that are touching the pan while the rest are at the correct height, trim the longer tines to match the rest. Be sure to adjust both sides of the reel.

   Ensure that tines do **NOT** contact plastic header pan.

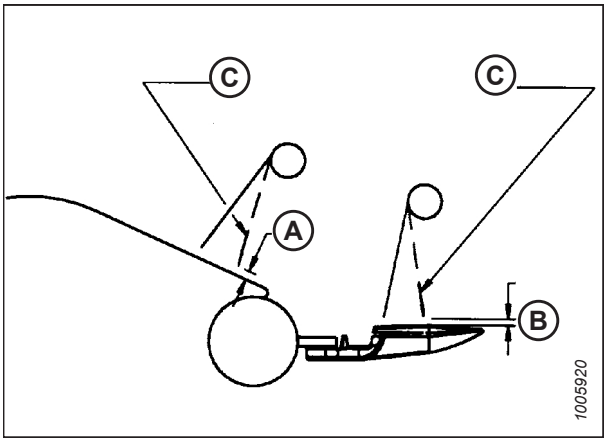


Figure 3.123: Reel Tine Clearance

A - 2–10 mm (2/25–2/5 in.)
B - 2 mm (2/25 in.) Minimum to Knife Section
C - Flex Fingers Back when Checking Clearance

3.8.6 Setting Tine Aggressiveness

Follow this procedure to properly set the tine aggressiveness.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Shut down the engine, and remove the key from the ignition.
2. Open the right endshield.
3. At the right side of the reel (cam end) **ONLY**, loosen four nuts (A).

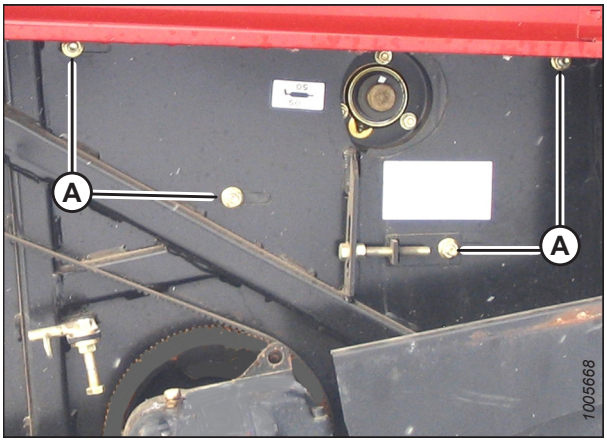


Figure 3.124: Auger Header Right Side

4. Loosen the jam nuts on bolts (A), and turn the bolts to rotate the cam to the desired position. Viewed from the right side, rotate the cam clockwise to obtain more aggressive tine action.

   NOTE:

   The factory setting at forward adjuster bolt should be 12 mm (15/32 in.) lower than at rear adjuster bolt. If tine aggressiveness has changed, then the adjuster bolt offset may not equal factory settings. Always measure the adjuster bolt offset and maintain throughout the vertical adjustment.

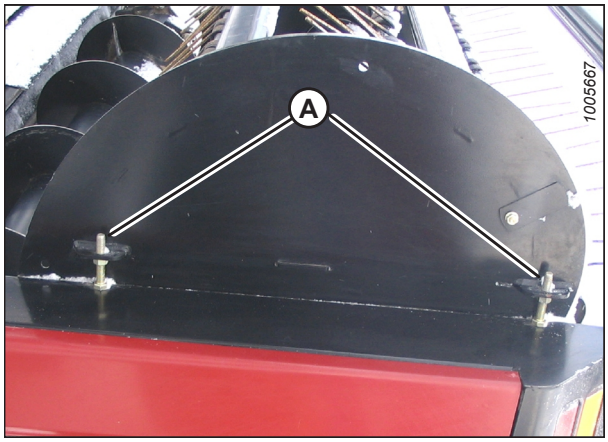


Figure 3.125: Auger Header Right Side

5. Tighten nuts (A), and the jam nuts on the bolts.
6. Ensure that the chain and/or the belt are **NOT** overtightened. Adjust them to the recommended tension if required.
7. Ensure that there is no contact between the reel tines and the header pan. For instructions, refer to *Checking Reel Tine to Header Pan Clearance, page 86*.

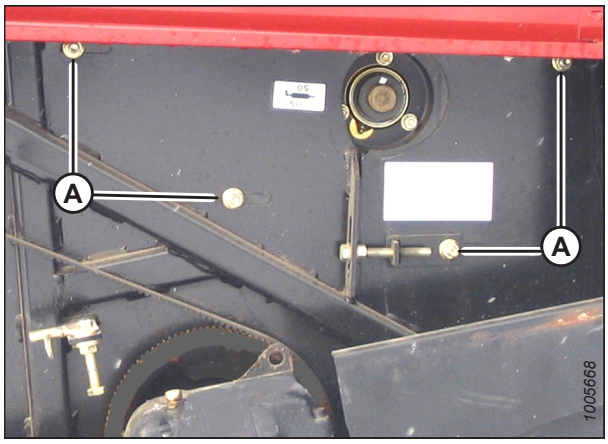


Figure 3.126: Auger Header Right Side

3.8.7 Adjusting Header Angle

The header angle can be hydraulically adjusted from the cab without shutting down the windrower.

1. Adjust the header angle from the cab using hydraulic cylinder (A).

   NOTE:

   Some M100, M105, M150, and M155 models are equipped with a mechanical link. For instructions on adjusting header angle, refer to your windrower operator's manual.

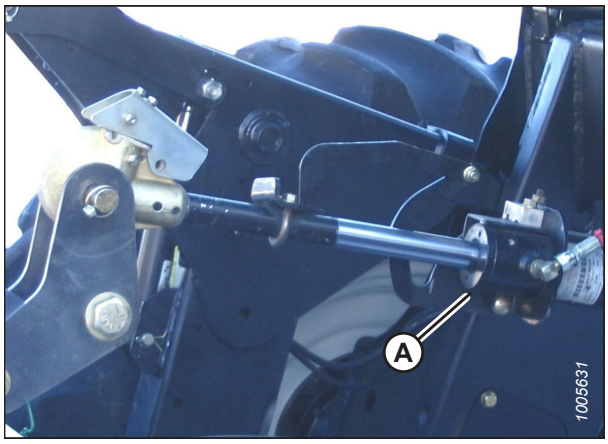


Figure 3.127: Header Angle Hydraulic Cylinder

3.8.8 Setting Cutting Height

Follow this procedure to set the desired cutting height.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Raise the header, and engage the header lift cylinder lock-out valves.
2. Remove pins (A) at each skid shoe or gauge roller.
3. Raise or lower the skid shoe or the gauge roller to the desired position.
4. Replace pins (A).

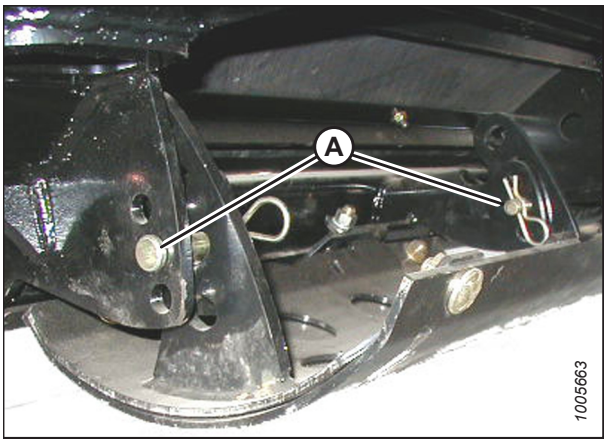


Figure 3.128: Skid Shoe

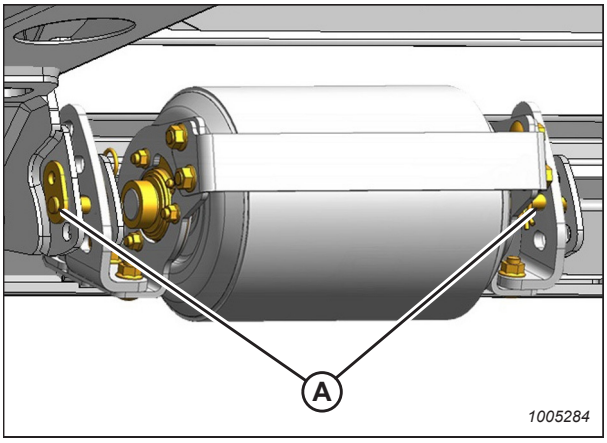


Figure 3.129: Gauge Roller

5. Check that the skid shoes or the gauge rollers are adjusted to the same position.
6. Check the header float, and adjust it if required. For instructions, refer to *3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99* for more information.

   NOTE:

   The two inboard skid shoes are standard equipment. The inboard shoes can be moved to the outboard position OR outboard positions can be fitted with either the gauge rollers or the skid shoes.

3.8.9 Checking and Adjusting Float – M2 Series Windrowers

The windrower is equipped with float springs that are fully adjustable with hydraulic cylinders. Spring tension is adjustable from zero to maximum tension through the HarvestTouch™ Display.

The header float feature allows the header to follow the contours of the ground closely as the windrower moves forward. The header is able to respond to sudden changes in elevation or obstacles quickly. The float setting is ideal when the cutterbar rides along the ground with minimal bouncing, and without scooping or pushing soil.

IMPORTANT:

- Configure the header float setting to be as light as possible, while limiting the amount of bouncing produced by the header. Doing so will reduce the amount of wear placed on knife components, and will prevent the header from scooping soil.
- Prevent the header from bouncing excessively by operating at a slower ground speed when the float setting is light. A bouncing header results in raggedly cut crop.
- Adjust the float when adding or removing optional attachments which change the weight of the header.

Checking Float – M2 Series Windrowers

The instructions in this section will show you how to check the header float setting by measuring the force required to lift the header.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Use HEADER TILT switches (A) on the ground speed lever (GSL) to set the center-link to the mid-range position (5.0) on the HarvestTouch™ Display.
3. Using HEADER DOWN switch (B), lower the header fully.
4. Ensure the header is level with the ground with zero tilt.

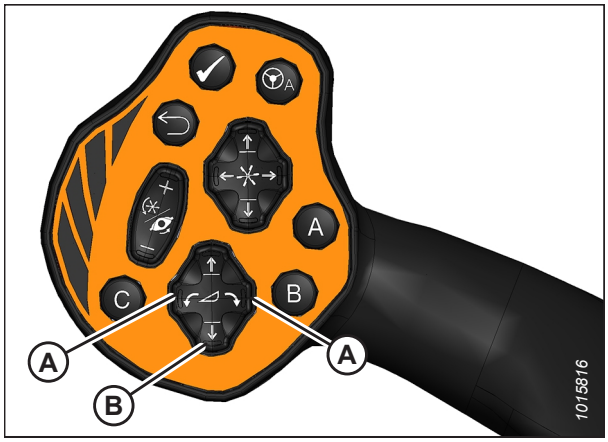


Figure 3.130: GSL

5. Shut down the engine, and remove the key from the ignition.
6. Grasp one end of the header and lift it up. Lifting force should be 335–380 N (75–85 lbf) and should be the same at both ends.
7. Restart the engine and adjust the float as needed. For instructions, refer to *Setting Float – M2 Series Windrowers, page 91*.

   NOTE:

   Increasing the float value on the HarvestTouch™ Display makes the header feel lighter.

Setting Float – M2 Series Windrowers

The float can be set for windrowing with the cutterbar on the ground.

The optimum float setting lets the header follow the contour of the terrain.

1. Set the center-link to the mid-range position (**5.0** on the HarvestTouch™ Display). For instructions, refer to the windrower operator's manual.

2. When cutting on the ground, lower the header until the cutterbar is on the ground.

   NOTE:

   To minimize scooping rocks when operating at the flattest header angle, lower the header skid shoes. For instructions, refer to the header operator's manual.

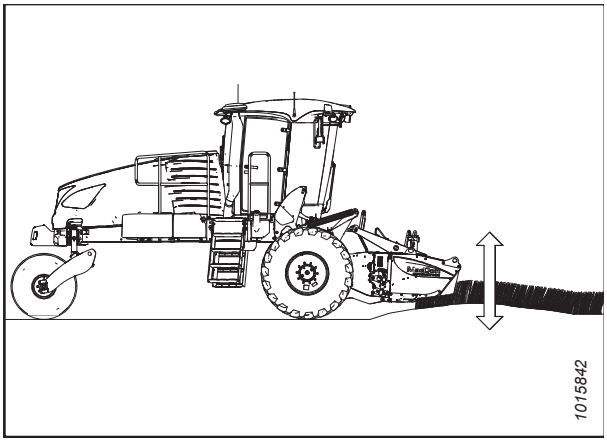


Figure 3.131: Header Float – Cutterbar on Ground

3. Press FLOAT SETTINGS icon (A) on the HarvestTouch™ Display to show the float setting page.

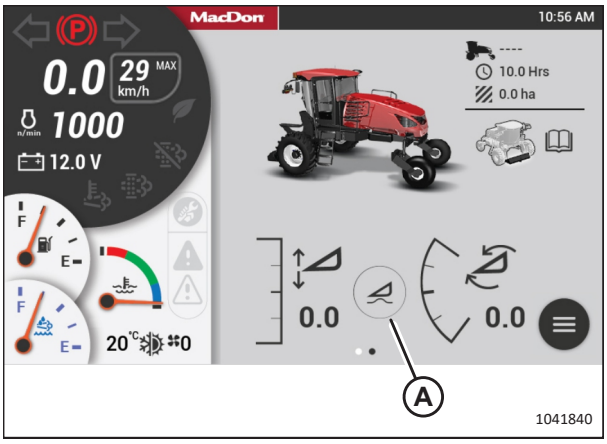


Figure 3.132: HarvestTouch™ Display

4. Press arrows (A) to adjust left or right float settings.

   NOTE:

   Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to optimize field performance.

5. Press switch (B) to remove or resume the header float.

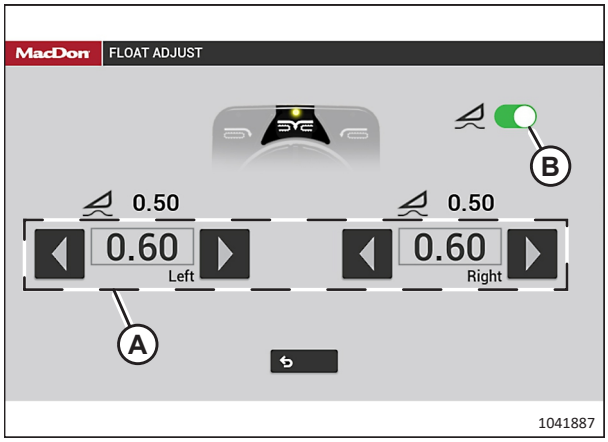


Figure 3.133: HarvestTouch™ Display

Removing and Restoring Float – M2 Series Windrowers

The header float can be removed and restored using the HarvestTouch™ Display.

1. Disengage the safety props on both lift cylinders as follows:

   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

   b. Repeat the previous step for the opposite cylinder.

   NOTE:

   If the safety prop will **NOT** disengage, raise the header to release the prop.

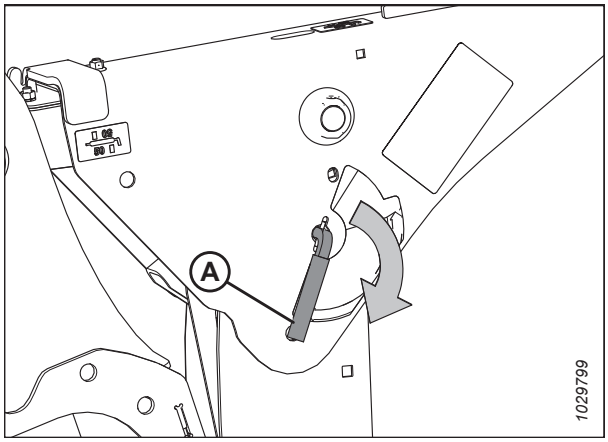


Figure 3.134: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

2. Start the engine.

3. Press HEADER DOWN switch (A) on the ground speed lever (GSL) to fully lower the rotary disc header.

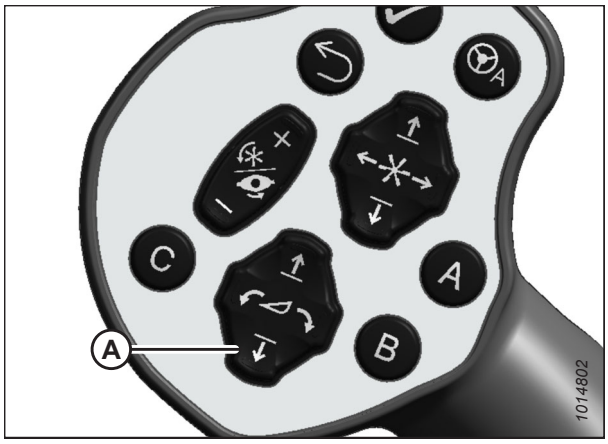


Figure 3.135: Ground Speed Lever (GSL)

4. Press FLOAT SETTINGS icon (A) on the HarvestTouch™ Display to show the float setting page.

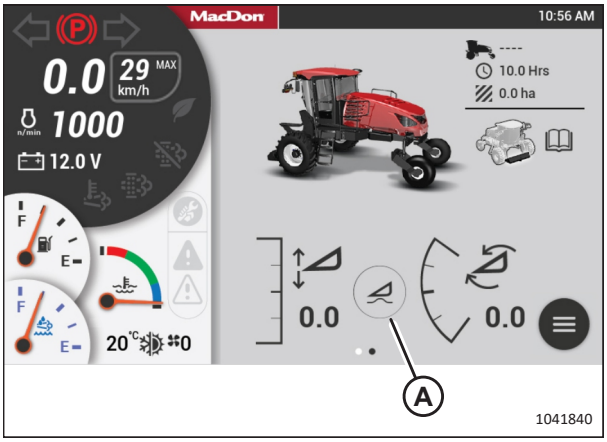


Figure 3.136: HarvestTouch™ Display

5. Press float switch (A) on the FLOAT ADJUST page to remove or restore the header float.
6. Shut down the engine, and remove the key from the ignition.

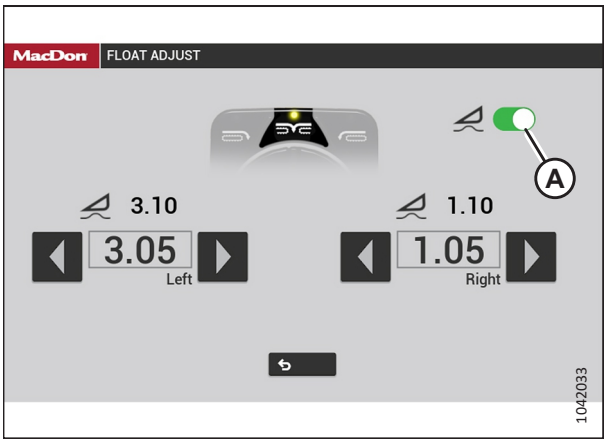


Figure 3.137: HarvestTouch™ Display

Setting Float Options with Fixed Deck – M2 Series Windrowers

When using an auger header, the DECK SHIFT buttons can be used to store three float settings. This is useful when ground conditions vary, or when having one side lighter is desirable (such as cutting along wheel tracks or irrigation borders).

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine and use HEADER TILT switches (A) and (B) on the ground speed lever (GSL) to set header tilt to the mid-range position.

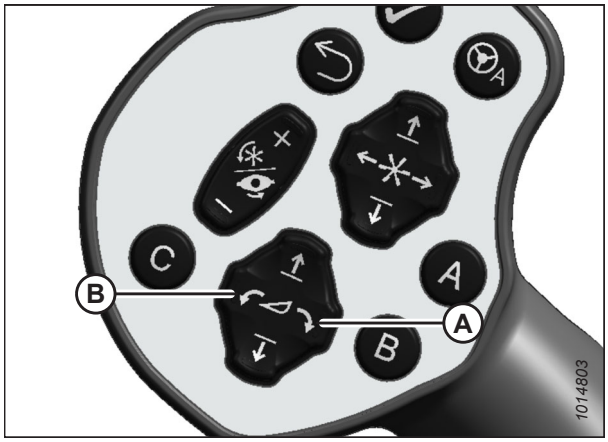


Figure 3.138: GSL

2. Engage the header by pushing and holding down HEADER ENGAGE switch (A), and pulling up on collar (B).

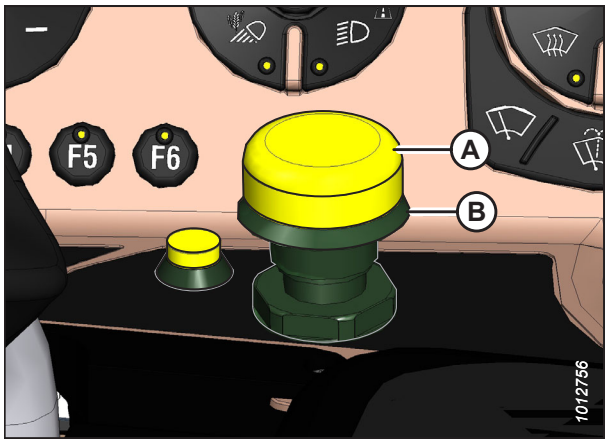


Figure 3.139: Header Engage Switch

3. Select one of the following deck positions using the DECK SHIFT switches on the operator's console:
   - Right-side delivery (A)
   - Center delivery (B)
   - Left-side delivery (C)

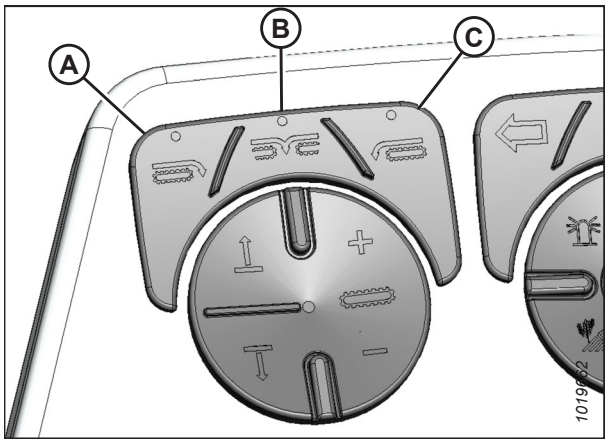


Figure 3.140: Header Deck Shift Switches

4. Disengage the header by pushing down on HEADER ENGAGE switch (A).

5. Adjust the float setting for the selected deck position. For instructions, refer to *Setting Float – M2 Series Windrowers, page 91*.

6. Repeat the previous steps for the other deck positions.

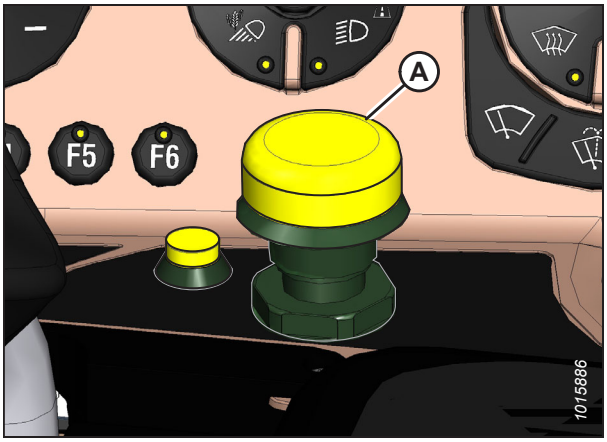


Figure 3.141: Header Engage Switch

3.8.10 Checking and Adjusting Float – M1 and M2 Series Windrowers

Header float on M1 and M2 Series Windrowers are completely adjustable from the cab through Harvest Performance Tracker (HPT) or HarvestTouch™ Display.

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

Checking Float – M1 Series Windrowers

You can check the header float setting by measuring the force required to lift the header.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.

2. Use HEADER TILT switches (A) on the ground speed lever (GSL) to set the center-link to the mid-range position.

3. Using HEADER DOWN switch (B), lower the header fully. The header lift cylinders will fully retract.

4. Ensure the header is level with the ground with zero tilt.

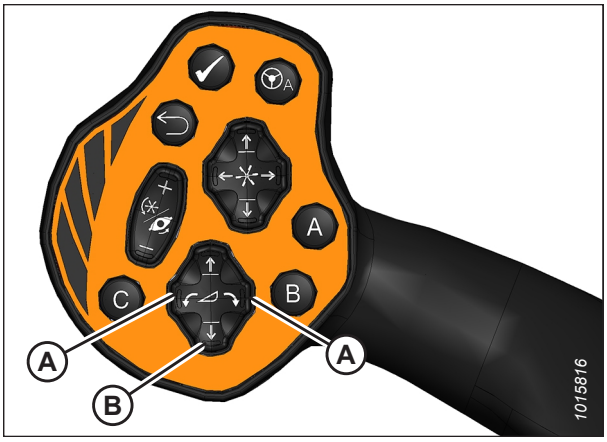


Figure 3.142: Ground Speed Lever (GSL)

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

6. Grasp one end of the header and lift it up. The lifting force should be 335–380 N (75–85 lbf) and should be the same at both ends.

7. Restart the engine, and adjust the float as needed. For instructions on adjusting the float, refer to *Setting Float – M1 Series Windrowers, page 96*.

   NOTE:

   Increasing the float makes the header feel lighter.

Setting Float – M1 Series Windrowers

The float can be set for windrowing with the cutterbar on the ground.

The optimum float setting lets the header follow the contour of the terrain.

1. Set the center-link to the mid-range position (**5.0** on the Harvest Performance Tracker [HPT]). For instructions, refer to the windrower operator's manual.
2. Lower the header until the cutterbar is on the ground.

   NOTE:

   To minimize scooping rocks when operating at the flattest header angle, lower the header skid shoes. For instructions, refer to the header operator's manual.

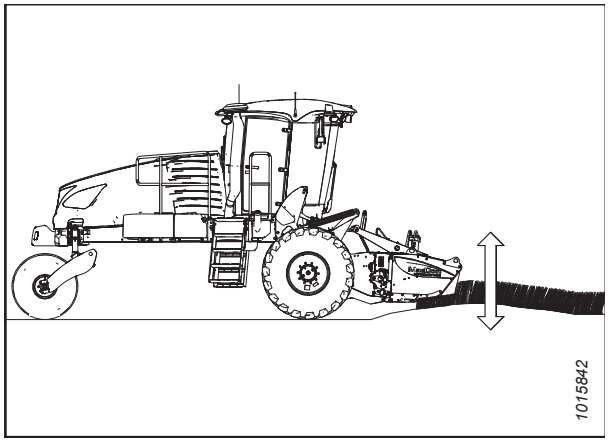


Figure 3.143: Header Float – Cutterbar on Ground

3. Press rotary scroll knob (A) on the to display the QuickMenu page.
4. Rotate scroll knob (A) to highlight header float icon (B) and press the scroll knob to select.

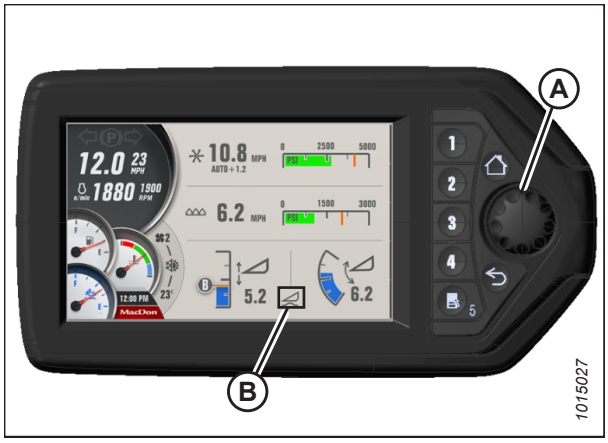


Figure 3.144: HPT Run Screen

5. Turn scroll knob (A) to highlight left (B) or right float (C) and press knob (A) to activate the selection.

6. Rotate scroll knob (A) to adjust the float setting and press the knob.

   NOTE:

   Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to optimize field performance.

7. Press soft key 3 (D) to remove or resume the header float.

Figure 3.145: HPT Float Settings

Removing and Restoring Float – M1 Series Windrowers

The header float can be removed and restored using the Harvest Performance Tracker (HPT).

1. To display the QuickMenu page, press rotary scroll knob (A) on the HPT or press F1 on the console.

2. Rotate scroll knob (A) to highlight HEADER FLOAT icon (B) and press the scroll knob to select.

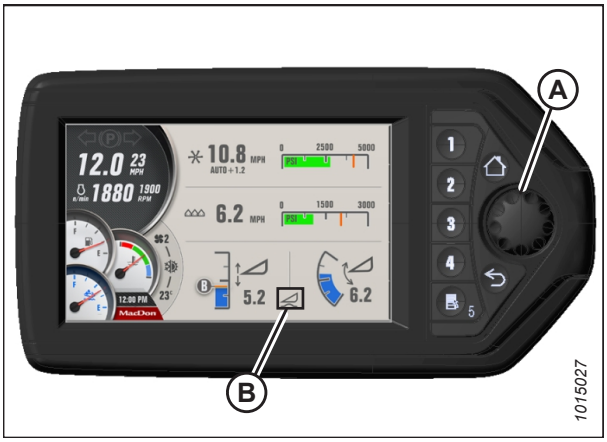


Figure 3.146: HPT Run Screen

3. Press soft key 3 (A) to remove or restore the header float.

   NOTE:

   If the header float is active, the icon at soft key 3 will say REMOVE FLOAT; if the header float has been removed, the icon will say RESTORE FLOAT.

Figure 3.147: HPT Display – Adjusting Float

Setting Float Options with Fixed Deck – M1 Series Windrowers

When an M1 Series Windrower not equipped with the deck shift feature is paired with an A40DX Auger Header, the DECK SHIFT buttons can be used to store three different float settings. This is useful when cutting in varying ground conditions, or when having one side lighter is desirable (such as cutting along wheel tracks or irrigation borders).

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine and use HEADER TILT switches (A) and (B) on the ground speed lever (GSL) to set header tilt to the mid-range position.

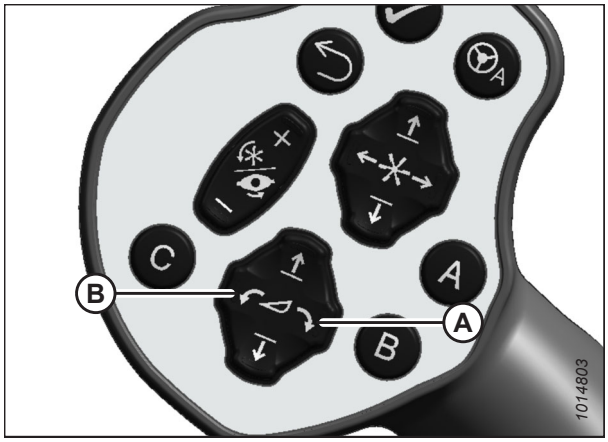


Figure 3.148: GSL

2. Engage the header by pushing and holding down HEADER ENGAGE switch (A), and pulling up on collar (B).

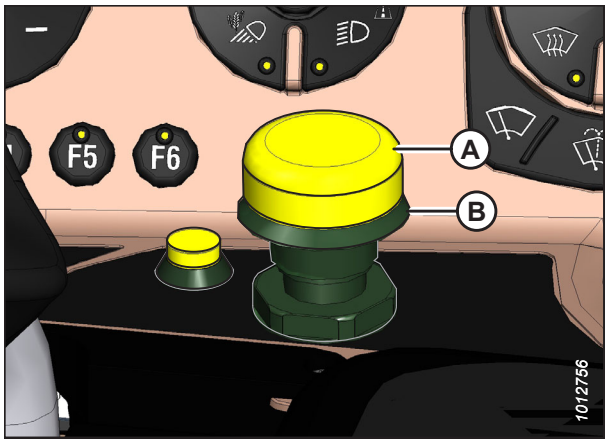


Figure 3.149: Header Engage Switch

3. Select one of the following deck positions using the DECK SHIFT switches on the operator's console:
   - Right-side delivery (A)
   - Center delivery (B)
   - Left-side delivery (C)

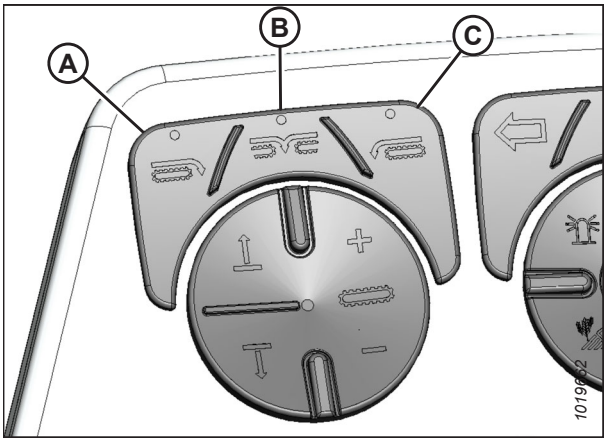


Figure 3.150: Header Deck Shift Switches

4. Disengage the header by pushing down on HEADER ENGAGE switch (A).
5. Adjust the float setting for the selected deck position. For instructions, refer to *Setting Float – M1 Series Windrowers, page 96*.
6. Repeat previous steps for the other deck positions.

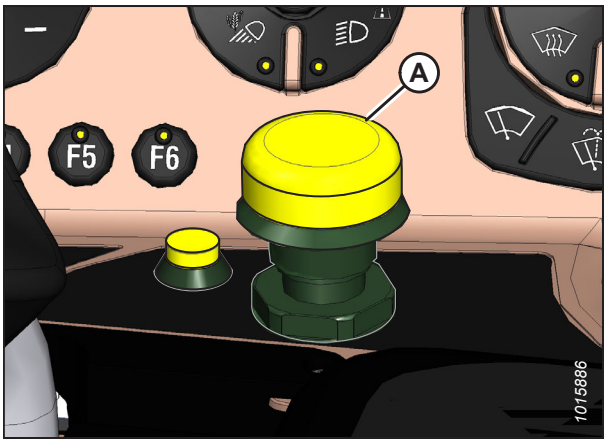


Figure 3.151: Header Engage Switch

3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers

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

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

NOTE:

Always check the float with the header set in the working position (with the header fully lowered to the ground and the header angle set to the desired cutting height per crop type and conditions).

To check and adjust the float, follow these steps:

1. Start the engine, and lower the header to the ground.
2. Using the header tilt switches on the in-cab controls, set the header center-link to the mid-range position (**5.0** on the cab display module). Refer to your windrower operator's manual for detailed instructions.

3. Lower the header fully with the lift cylinders fully retracted.
4. Set left and right float fine adjustments to mid-range position (**5.0** on the cab display module). For instructions, refer to your windrower operator's manual.
5. Shut down the engine, and remove the key from the ignition.
6. Check the float by grasping the lean bar and lifting. The lifting force should be 335–380 N (75–85 lbf) and should be approximately the same at both ends.
7. If necessary, perform the following steps to adjust the float:
   a. Raise the header fully, shut down the engine, and remove the key from the ignition.
   b. Turn drawbolt (A) clockwise to increase the float (makes the header lighter) or counterclockwise to decrease the float (makes the header heavier).

      NOTE:

      The illustration shows the top of the windrower wheel leg member.

   c. Recheck the float.

Figure 3.152: Drawbolt

3.8.12 Setting Feed Pan and Rock Drop Tine Position

The rear of the feed pan is adjustable up and down to raise or lower the feed pan and rock drop tines.

- Lowering the feed-pan helps prevent plugging in heavy crop.
- Raising the feed-pan helps to form an even windrow in light crop.

DANGER

To avoid bodily injury or death from fall of raised machine, always lock-out lift cylinders before going under header for any reason.

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

3. Loosen nut (A) on both sides, and align pointer (B) at each side of the rock drop tine support with one of slots (C) to match the crop condition.

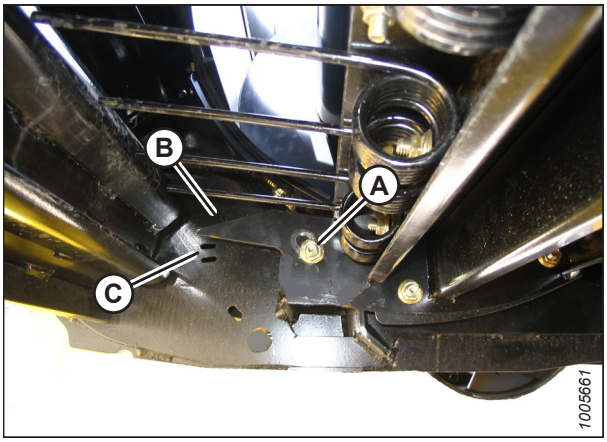


Figure 3.153: Rock Drop Tine Support

Crop Condition	Light	Normal	Heavy
Slot	Upper	Center	Lower

4. Tighten the hardware on both sides.
5. Disengage the safety props.

3.8.13 Adjusting Conditioner Roll Gap

The roll gap determines the amount of conditioning.

- To reduce conditioning, increase the roll gap.
- To increase conditioning, decrease the roll gap.

The conditioner roll gap is factory-set at 6 mm (1/4 in.).

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Loosen and back-off upper jam nut (A), on both sides of the conditioner.
2. **To increase the roll gap,** turn lower nut (B) clockwise to raise the link, and increase gauge (C) setting.
3. **To decrease the roll gap,** turn lower nut (B) counterclockwise to lower the link, and decrease gauge (C) setting.
4. Tighten jam nuts (A) on both sides.

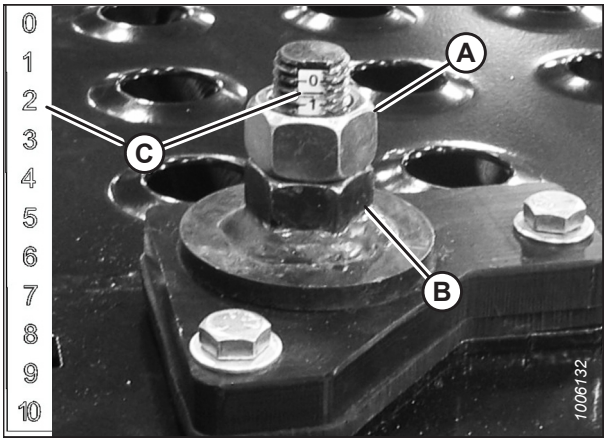


Figure 3.154: Roll Gap Adjustment Gauge

5. Loosen bolt (A), and rotate cover (B) to expose access port (C).
6. Inspect the space between the roll bars at both ends of the rolls at access port (C).

   IMPORTANT:

   Roll timing and alignment are critical when the roll gap is decreased because:

   - Conditioning is affected
   - The bars may contact each other
7. Check the roll timing and the alignment when reducing the roll gap. For instructions, refer to:
   - *4.14.11 Checking and Adjusting Roll Timing, page 216*
   - *4.14.10 Checking/Adjusting Roll Alignment, page 213*
8. Close cover (B), and tighten bolt (A).

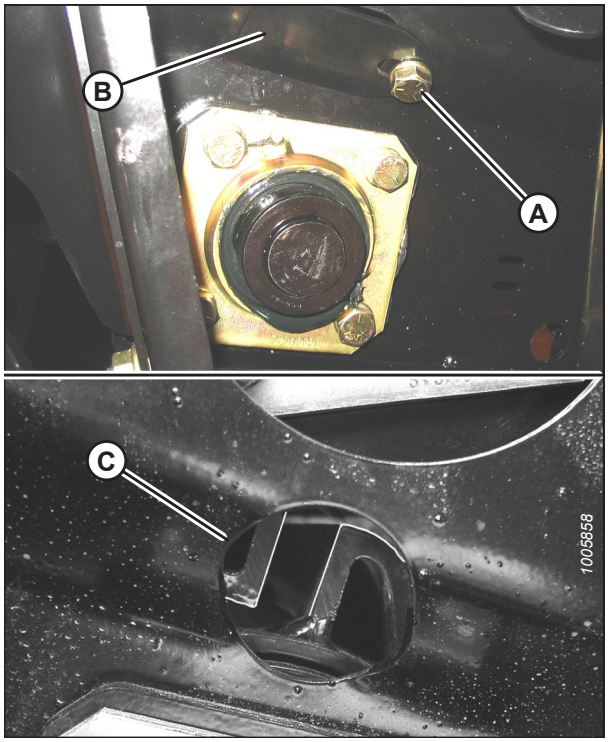


Figure 3.155: Conditioner Roll Access Port

3.8.14 Adjusting Conditioner Roll Tension

The roll tension (the force holding the rolls together) is factory-set, and is adjustable. There is a spring for each end of the roll.

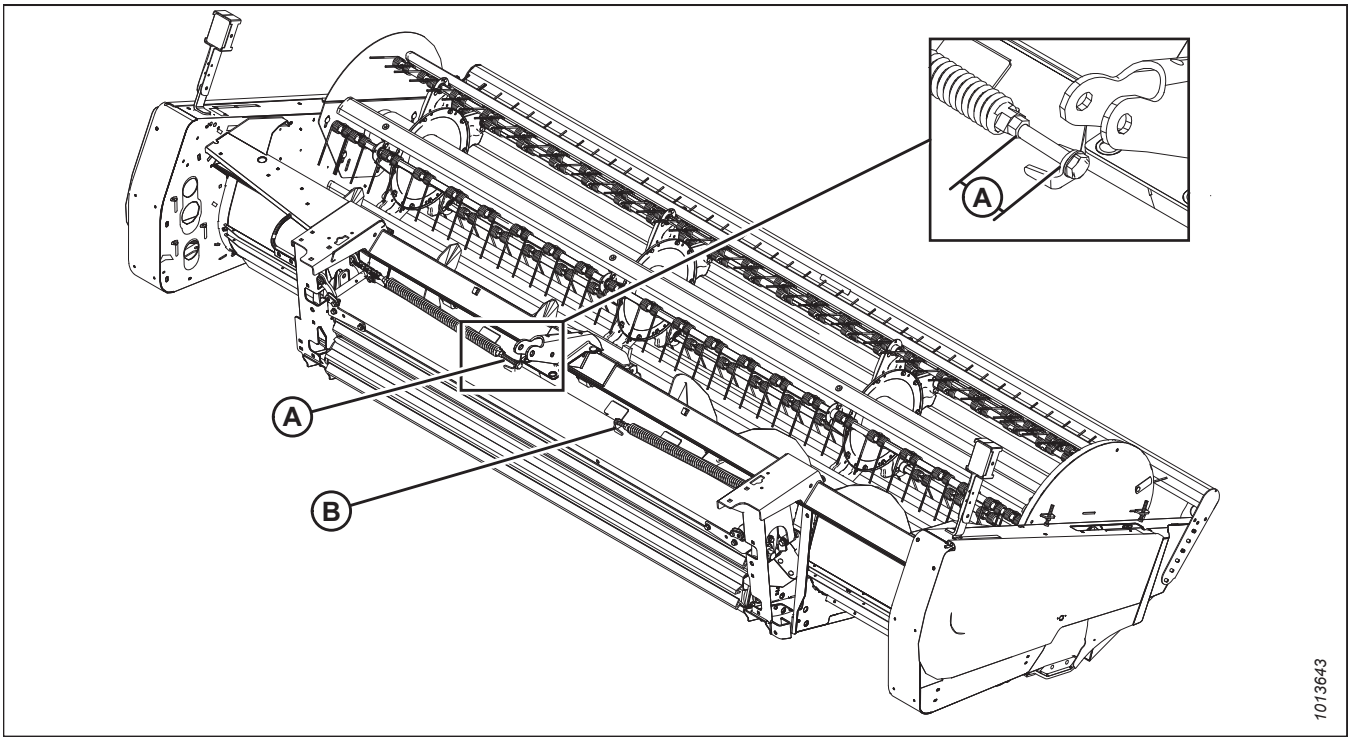


Figure 3.156: Conditioner Roll Tension Springs

Table 3.2 Conditioner Roll Tension Factory Settings

Left spring (A)	81–91 mm (3 3/16–3 9/16 in.)
Right spring (B)	41–51 mm (1 5/8–2 in.)

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. **To increase the roll tension,** loosen jam nut (B) at spring insert, and turn spring drawbolt (C) clockwise to tighten the spring. Tighten jam nut (B).
4. **To decrease the roll tension,** loosen jam nut (B) at spring insert, and turn spring drawbolt (C) counterclockwise to loosen the spring. Tighten jam nut (B).

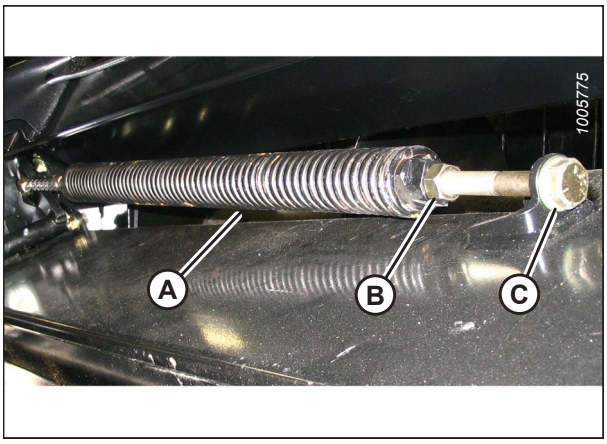


Figure 3.157: Roll Tension Spring

3.8.15 Positioning Forming Shields

The position of the forming shields controls the width and placement of the windrow.

WARNING

Keep hands and feet away from discharge opening. Keep everyone several hundred feet away from your operation. Never direct the discharge toward anyone. Stones or other foreign objects can be ejected with force.

The decision on forming shield position (settings between 915–2346 mm [36–92 in.]) should be made based on the following factors:

- Weather conditions (rain, sun, humidity, wind)
- Type and yield of the crop
- Drying time available
- Method of processing (green feed, bales, silage)

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to *3.14 Haying Tips, page 122* for more information.

Where weather conditions permit or when drying is not critical, for example, when cutting for silage or green feed, a narrower windrow may be preferred for ease of pick up.

Positioning Side Deflectors

The position of the side forming shields controls the width and placement of the windrow.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

To ensure windrow placement is centered with respect to carrier/drive wheels, adjust both side deflectors to the same hole position on the adjuster bar.

1. Shut down the engine, and remove the key from the ignition.
2. Set the forming shield side deflectors to the desired width by repositioning the adjuster bars as follows:
   a. Remove lynch pin (A).
   b. Move adjuster bar (B) to another hole.
   c. Reinstall lynch pin (A).

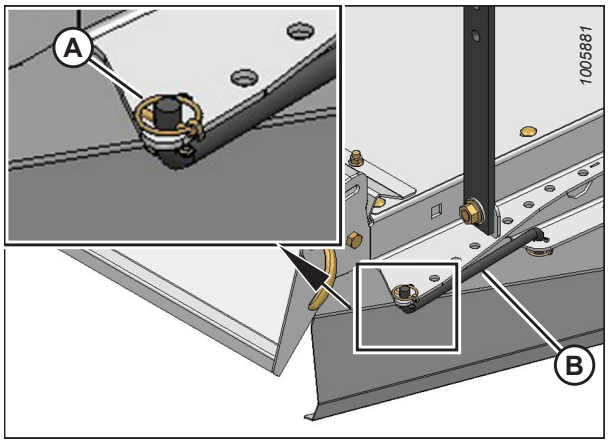


Figure 3.158: Forming Shield Side Deflector

3. If the forming shield attachment is too tight or too loose, tighten or loosen nut (A) as required.

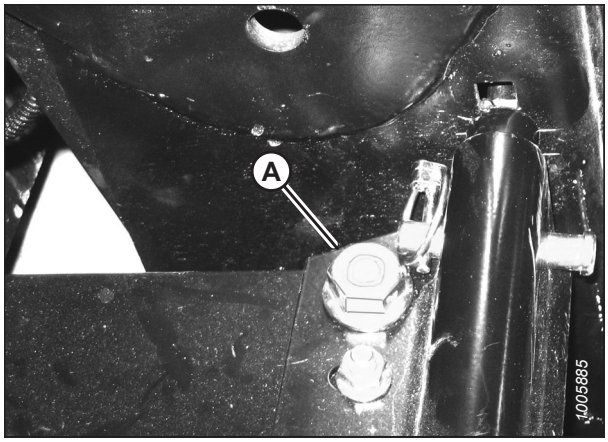


Figure 3.159: Forming Shield Adjustment Nut

Positioning Rear Deflector (Fluffer Shield)

The rear deflector slows the crop exiting the conditioner rolls, directs the flow downward, and fluffs the material.

WARNING

To prevent accidental movement of windrower, return ground speed lever (GSL) to Park, center steering wheel to lock, shut off engine, and remove key.

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

2. For more crop control in light material, lower rear deflector (A) by pushing down on one side of the deflector, and then on the other side. Locking handles (B) are located at either end of the deflector, and may be loosened slightly.

3. For heavier crops, raise rear deflector (A) by pulling up on one side, and then on the other side.

   NOTE:

   For even windrow formation, ensure that the deflector is **NOT** twisted.

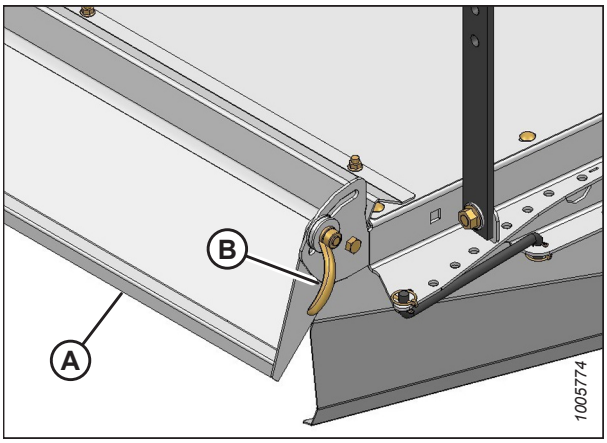


Figure 3.160: Rear Deflector

3.9 Recommended Operating Settings

These settings are intended as a starting point. Operators should fine-tune to crop and field conditions.

Refer to Table *3.3, page 107*.

Table 3.3 Recommended Operating Settings

Field Conditions				Operating Variables						
Crop Type	Crop Condition (tons per acre)	Terrain	Stubble Height mm (in.)	Header Angle	Knife Speed (spm)	Reel Speed (rpm)	Auger Speed	Float	Feed Pan Position	Roll Gap mm (in.)
Alfalfa	>3	Smooth	0	Steep	1600–1800	73–77	High	Normal	Lower slot	16 (5/8)
Alfalfa	>3	Rocky	0	Shallow	1600–1800	73–77	High	Light	Lower slot	16 (5/8)
Alfalfa	2–3	Smooth	0	Steep	1600–1800	70–75	Normal	Normal	Center slot	13 (1/2)
Alfalfa	2–3	Rocky	0	Shallow	1600–1800	70–75	Normal	Light	Center slot	13 (1/2)
Alfalfa	<2	Smooth	0	Steep	1600–1800	65–70	Low	Normal/ Heavy	Upper slot	10 (3/8)
Alfalfa	<2	Rocky	0	Shallow	1600–1800	65–70	Low	Light	Upper slot	10 (3/8)
Alfalfa	Lodged	Smooth	0	Steep	1600–1800	73–77	High	Heavy	Variable	Refer to above
Alfalfa	Lodged	Rocky	0	Shallow	1600–1800	73–77	High	Light/ Normal	Variable	Refer to above
Timothy	>2.5	Smooth	64–76 (2.5–3)	Steep	1850–1950	70–75	Normal/ High	Normal	Lower slot	10 (3/8)
Timothy	>2.5	Rocky	64–76 (2.5–3)	Shallow	1850–1950	70–75	Normal/ High	Light	Lower slot	10 (3/8)
Timothy	<2.5	Smooth	64–76 (2.5–3)	Steep	1850–1950	65–70	Low	Normal	Center slot	6 (1/4)
Timothy	<2.5	Rocky	64–76 (2.5–3)	Shallow	1850–1950	65–70	Low	Light	Center slot	6 (1/4)
Timothy	Lodged	Smooth	64–76 (2.5–3)	Steep	1850–1950	70–75	Normal/ High	Heavy	Variable	Refer to above
Timothy	Lodged	Rocky	64–76 (2.5–3)	Shallow	1850–1950	70–75	Normal/ High	Light/ Normal	Variable	Refer to above
Sudan/Tall Crop	>3	Smooth	152 (6)	Steep	1700–1850	70–75	High	Normal	Lower slot	19 (3/4)
Sudan/Tall Crop	>3	Rocky	152 (6)	Shallow	1700–1850	70–75	High	Light	Lower slot	19 (3/4)
Sudan/Tall Crop	<3	Smooth	152 (6)	Steep	1700–1850	65–70	Low	Normal	Center slot	16 (5/8)

Table 3.3 Recommended Operating Settings (continued)

Field Conditions				Operating Variables						
Crop Type	Crop Condition (tons per acre)	Terrain	Stubble Height mm (in.)	Header Angle	Knife Speed (spm)	Reel Speed (rpm)	Auger Speed	Float	Feed Pan Position	Roll Gap mm (in.)
Sudan/Tall Crop	<3	Rocky	152 (6)	Shallow	1700–1850	65–70	Low	Light	Center slot	16 (5/8)
Sudan/Tall Crop	Lodged	Smooth	152 (6)	Steep	1700–1850	70–75	Normal/ High	Heavy	Variable	Refer to above
Sudan/Tall Crop	Lodged	Rocky	152 (6)	Shallow	1700–1850	70–75	Normal/ High	Light/ Normal	Variable	Refer to above
Triticale (winter forage)	>10	Smooth	0	Steep	1600–1800	70–75	High	Normal	Lower slot	25 (1)
Triticale (winter forage)	>10	Rocky	0	Shallow	1600–1800	70–75	High	Light	Lower slot	25 (1)
Triticale (winter forage)	<10	Smooth	0	Steep	1600–1800	60–65	Normal/ High	Normal/ Heavy	Center slot	25 (1)
Triticale (winter forage)	<10	Rocky	0	Medium	1600–1800	60–65	Normal/ High	Light	Center slot	25 (1)
Triticale (winter forage)	Lodged	Smooth	0	Steep	1600–1800	70–75	Normal/ High	Heavy	Variable	Refer to above
Triticale (winter forage)	Lodged	Rocky	0	Medium	1600–1800	70–75	Normal/ High	Light/ Normal	Variable	Refer to above
Wild/ Grass Hay	>3.5	Smooth	0	Steep	1850–1950	73–77	High	Normal	Lower slot	10 (3/8)
Wild/ Grass Hay	>3.5	Rocky	0	Shallow	1850–1950	73–77	High	Light	Lower slot	10 (3/8)
Wild/ Grass Hay	2–3	Smooth	0	Steep	1850–1950	70–75	Normal	Normal	Center slot	6 (1/4)
Wild/ Grass Hay	2–3	Rocky	0	Shallow	1850–1950	70–75	Normal	Light	Center slot	6 (1/4)

Table 3.3 Recommended Operating Settings (continued)

Field Conditions				Operating Variables						
Crop Type	Crop Condition (tons per acre)	Terrain	Stubble Height mm (in.)	Header Angle	Knife Speed (spm)	Reel Speed (rpm)	Auger Speed	Float	Feed Pan Position	Roll Gap mm (in.)
Wild/ Grass Hay	<2	Smooth	0	Steep	1850–1950	65–70	Low/ Normal	Normal/ Heavy	Upper slot	6 (1/4)
Wild/ Grass Hay	<2	Rocky	0	Medium	1850–1950	65–70	Low/ Normal	Light/ Normal	Upper slot	6 (1/4)
Wild/ Grass Hay	Lodged	Smooth	0	Steep	1850–1950	73–77	Normal/ High	Heavy	Variable	Refer to above
Wild/ Grass Hay	Lodged	Rocky	0	Medium	1850–1950	73–77	Normal/ High	Light/ Normal	Variable	Refer to above

3.9.1 Recommended Settings and Checks for A40DX GSS Auger Header

Follow the recommended settings and checks to prevent reel stalling and reduced reel drive performance on A40DX GSS Auger Headers.

Ensure the differential auger reel control (DARC) is set up correctly.

- The minimum software levels should be HPAN203586W and MCAN203587T.
- Ensure that the DARC feature is enabled in the HarvestTouch™ and Harvest Performance Tracker (HPT) under Header Attachments.
- The reel speed sensor will automatically be disabled when the DARC is enabled.

Ensure the reel position settings are at factory configuration.

- The reel fore/aft position should be set to 816 mm (32 3/8 in.).
- The reel vertical position is set on both the left and the right sides of the reel.
  - On the left side, the adjuster bolts should be set equally in order to provide a proper tine to cutterbar/pan clearance.
  - On the right side, the adjuster bolts should have an offset where the front bolt is 12 mm (15/32 in.) lower than the rear bolt. This offset maintains the factory setting cam adjustment.

Ensure the stripper bars are installed correctly.

- The header is factory equipped with 3 sets of stripper bars – front, bottom, and rear.
- Ensure that the auger to stripper bar clearance of 1-4 mm (2/32-5/32 in.) is maintained.
- In some heavy crop conditions, it may be beneficial to remove the front stripper bar completely. The bottom and the rear stripper bars must remain in place.

Ensure adequate reel speed.

- The reel speed must be run slightly faster than the ground speed. Running the reel at +1.2 relative to the ground speed is recommended.

3.10 Unplugging Conditioner and Knife

The M1 Series Windrowers are equipped with a header drive reversing function as standard equipment. M Series Self-Propelled Windrowers (including M150, M155, M155*E4*, and M200) can be equipped with the Header Drive Reverser kit (B4656). This kit is not available for M100 or M105 Self-Propelled Windrowers.

On windrowers with this equipment installed, reverse the hydraulic flow to the knife, auger, reel, and conditioner hydraulic motors to help remove any plugged material from the header.

If the reverser is not installed, proceed through the following instructions.

DANGER

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

1. Stop the forward movement of the windrower, and shut down the header.
2. Lift the cutterbar about 300 mm (12 in.).
3. Back up about 1 m (3 ft.) while slowly engaging the header.
4. If the plug does not clear, raise the machine.
5. Engage the windrower brake.
6. Shut down the engine, and remove the key from the ignition.
7. Engage the header lift cylinder lock-out valves.

WARNING

Exercise caution when working around the cutterbar. Blades are sharp and can cause serious injury. Wear heavy gloves when working around or handling knife.

8. Clean off the cutterbar and the area under the reel by hand.
9. Retrieve wrench (A) from the storage inside the left drive compartment.

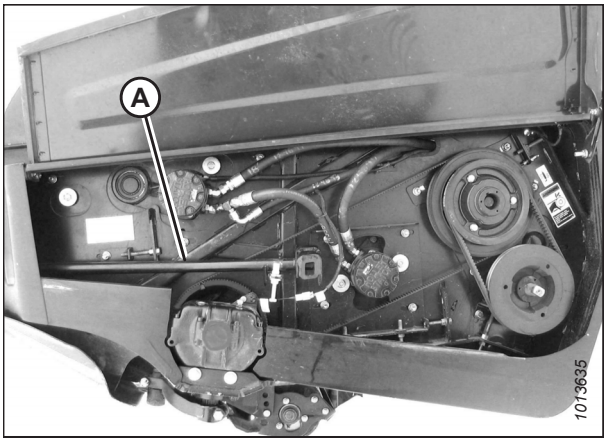


Figure 3.161: Wrench Location – A40D

10. Use the wrench on the left end of primary driveshaft (A) to turn the rolls forward until the plug clears.

11. Return the wrench to the storage location, and secure it in place with a pin.

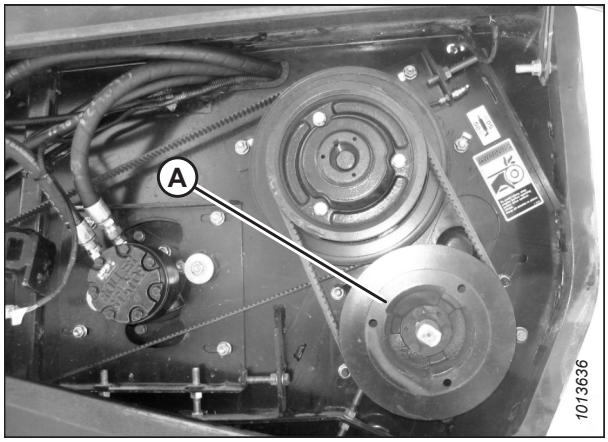


Figure 3.162: Primary Driveshaft

WARNING

Return the unplug wrench to the storage location, and close the left driveshield before restarting the machine.

NOTE:

If plugging persists, refer to *6 Troubleshooting, page 227*.

3.11 Grass Seed Special

The grass seed auger header has several features to adapt it to this special application.

Some of these features include:

3.11.1 Stub Guards and Hold-Downs

The cutterbar is equipped with stub guards for effective cutting in tough grass crops.

Refer to *4.8.7 Guards, page 147* for maintenance of these components.

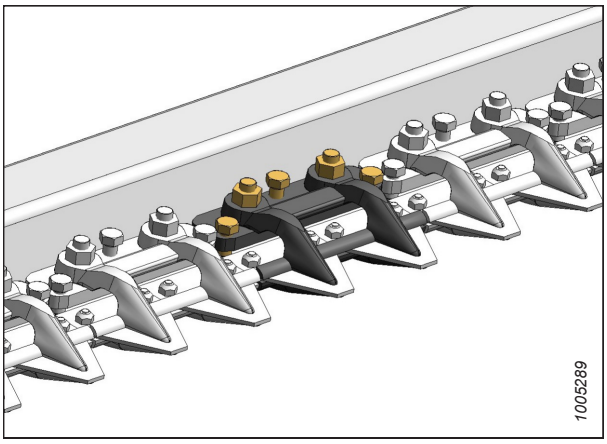
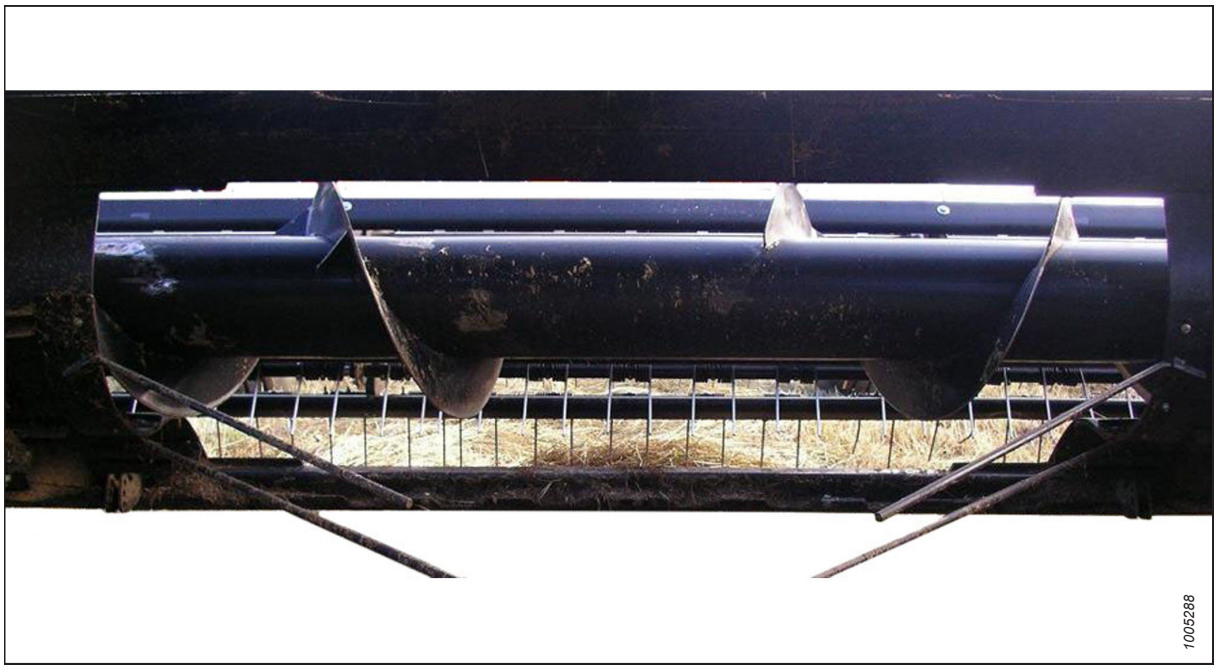


Figure 3.163: Cutterbar Stub Guards

3.11.2 Special Auger Design for Grass Seed Special

The center beaters and the beater supports have been removed to reduce auger wrapping.

Figure 3.164: Grass Seed Auger



3.11.3 Seven-Bat Reel

A seventh bat is added to the reel body, for smoother reel action and better crop feed into the header.

Figure 3.165: Grass Seed Reel

3.11.4 Auger Pan Extensions

The grass seed header is equipped with adjustable auger pan extensions that allow adjustment of delivery opening to vary the windrow characteristics.

Installing and Adjusting Pan Extensions

Follow this procedure to install the pan extensions.

1. Remove deflectors (A) from their shipping positions on the header and unwrap them.

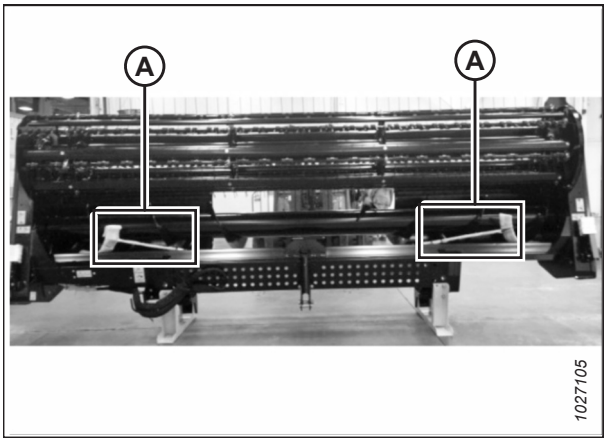


Figure 3.166: Shipping Configuration

2. Remove nut and bolt (A), nut and washers (B), and nuts (C) from the pan extension. Retain the hardware.

   NOTE:

   The illustrations in this procedure show the left pan extension. The instructions are similar for installing and adjusting the right pan extension.

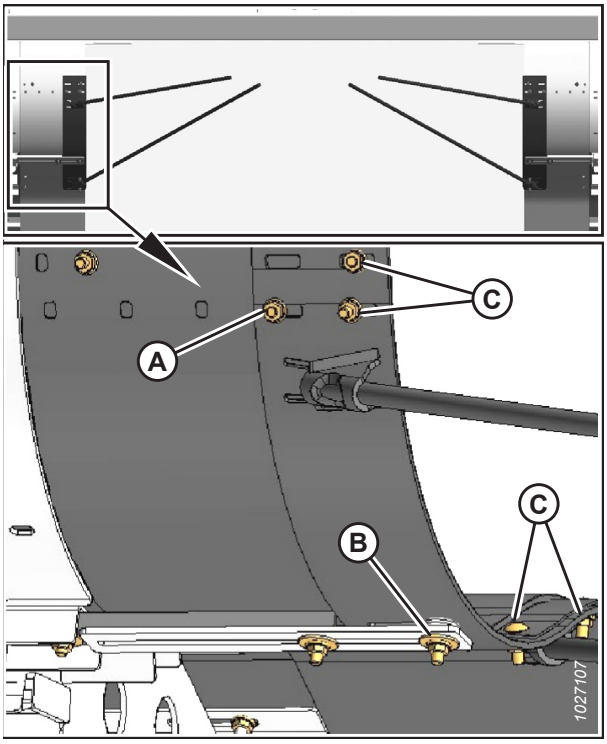


Figure 3.167: Pan Extension – Wide Setting

3. Install left deflector (A) using nuts and bolts (B) and nut, bolt, and five washers (C) retained from the previous step. Torque all the nuts to 11.5 Nm (102 lbf·in / 8 lbf·ft).

   NOTE:

   Do **NOT** install nut (D) if the pan extension's width will be adjusted.

   NOTE:

   Do **NOT** torque nuts if the pan extension's width will be adjusted.

4. Repeat the steps for installing the pan extension on the opposite side of the header.

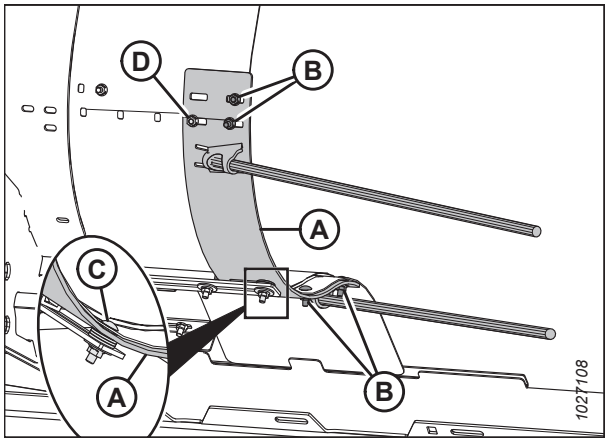


Figure 3.168: Left Side Deflector and Hardware

Adjusting the Pan Extension's Width

5. Remove nut and bolt (A).
6. Loosen nut (B), but do **NOT** remove it.
7. Slide pan extension (C) with the swath forming rods inboard to the desired position, aligning the holes on the pan extension and the header.

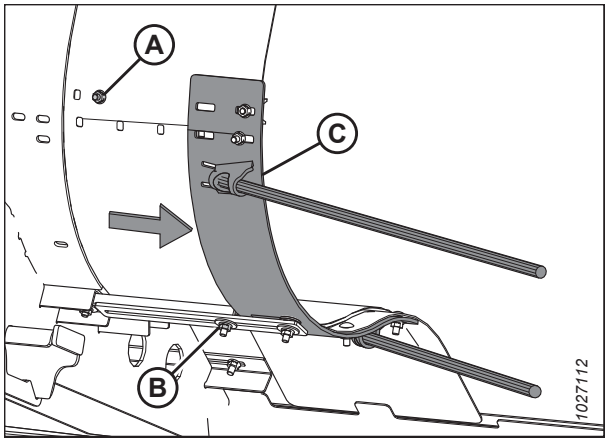


Figure 3.169: Left Side Pan Extension

8. Replace bolt and nut (A). Torque nut (A) and nut (B) to 11.5 Nm (102 lbf·in / 8 lbf·ft).
9. Install nut and bolt (C) and torque it to 11.5 Nm (102 lbf·in / 8 lbf·ft).
10. Repeat the steps for adjusting the pan extension on the right side of the header.

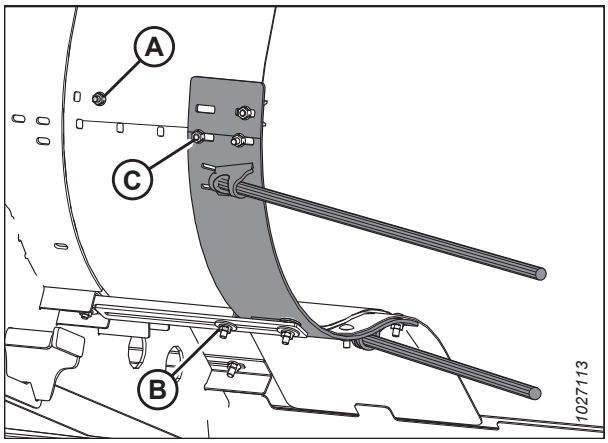


Figure 3.170: Left Side Pan Extension

3.11.5 Windrow Forming Rods

The forming rods are provided to assist in forming the narrow windrows preferred for this application.

Bend the rods to modify the windrow shape. Use the forming rods in conjunction with the auger pan extensions to achieve the width and the shape of the desired windrows.

Figure 3.171: Windrow Forming Rods

3.12 Selecting Ground Speed

Choose a ground speed that allows the knife to cut the crop smoothly and evenly.

CAUTION

Reduce the speed when turning, crossing slopes, or when travelling over rough ground.

Windrower ground speed **SHOULD NOT EXCEED** 13 km/h (8 mph). For most crop conditions, a ground speed of 8 km/h (5 mph) has been found satisfactory.

The chart below indicates the relationship between the ground speed and the area cut for three header sizes. For example, at a ground speed of 8 km/h (5 mph) with a 4.9 m (16 ft.) header, the area cut would be approximately 4 hectares (10 acres) per hour.

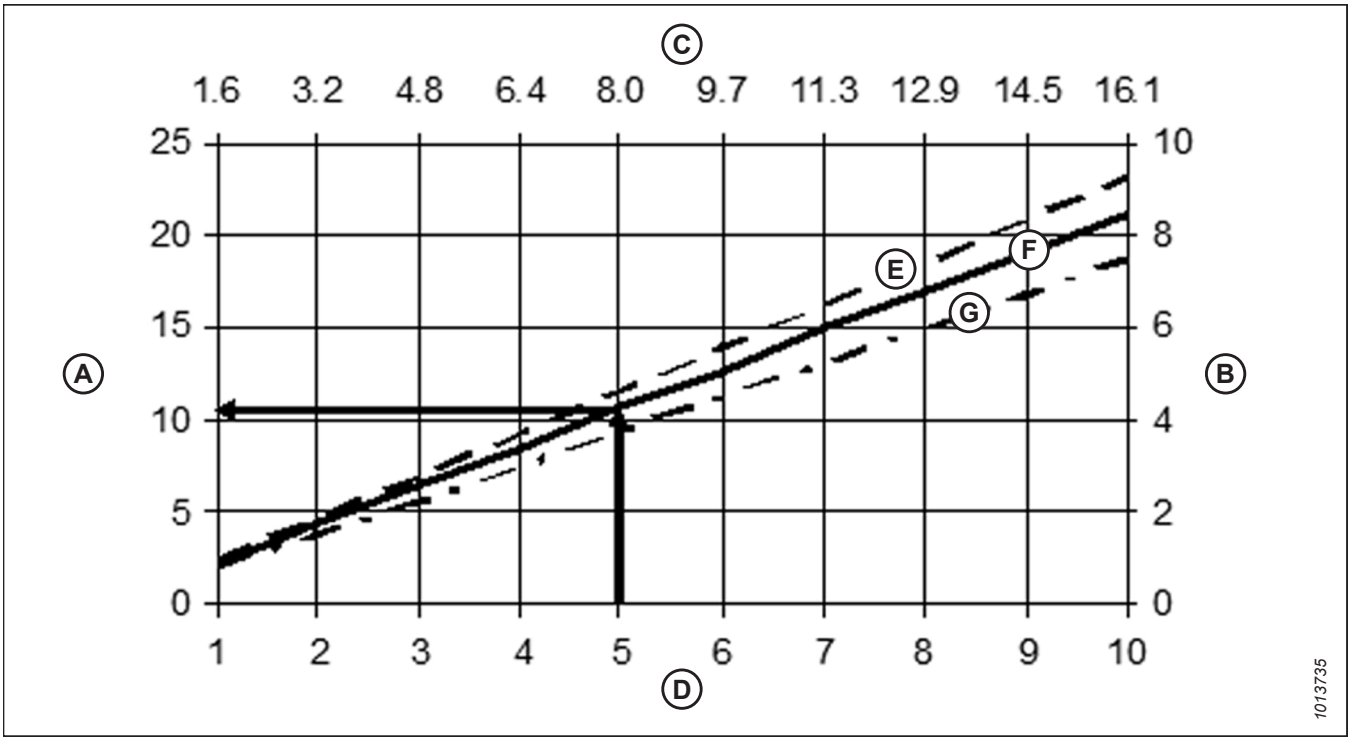


Figure 3.172: Ground Speed and Area Cut

A – Acres/Hour
B – Hectares/Hour
C – Kilometers/Hour
D – Miles/Hour
E – 5.5 m (18 ft.)
F – 4.9 m (16 ft.)
G – 4.3 m (14 ft.)

3.13 Tall Crop Dividers

The tall crop dividers attach to the ends of the header for clean crop dividing, and reel entry in tall crops. They can be easily adjusted to suit the crop, or removed when not required.

3.13.1 Adjusting Tall Crop Dividers

The tall crop divider can be adjusted by aligning it with the alternate hole location.

1. Loosen U-bolt (A).
2. Remove bolts (B), and reposition divider (C) to align with alternate hole location (D).
3. Reinstall bolts (B), and tighten them.
4. Tighten U-bolt (A).

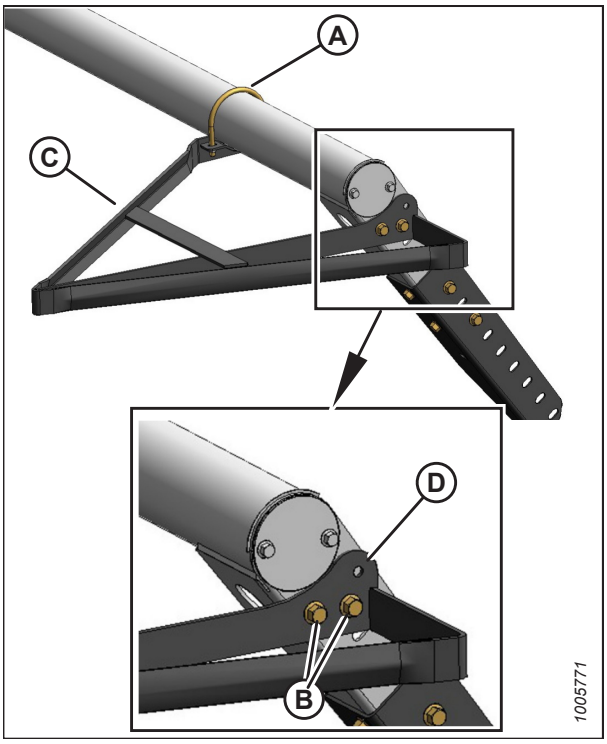


Figure 3.173: Tall Crop Divider

3.13.2 Removing Tall Crop Dividers

Follow these steps to remove the tall crop dividers.

1. Remove U-bolt (A) and bolts (B), and remove the divider. Repeat for the other divider.
2. Remove the bolts attaching the lean bar to the header.

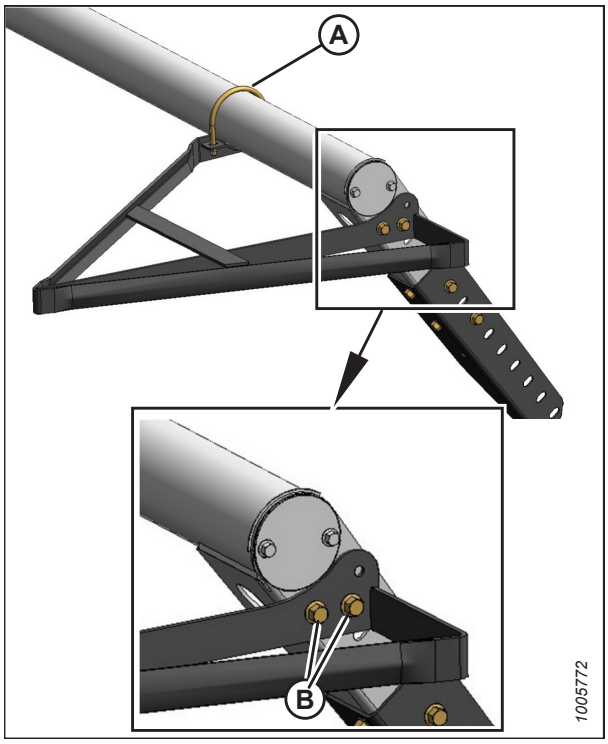


Figure 3.174: Tall Crop Divider

3. Remove bolts (A) attaching extensions (B) to lean bar (C), and remove the extensions.

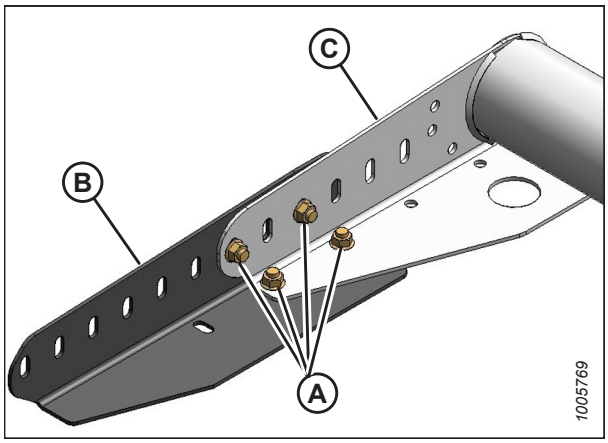


Figure 3.175: Lean Bar

4. Reposition the lean bar on the header at the desired height, and install existing carriage bolts (A)—two per side. Tighten the bolts.

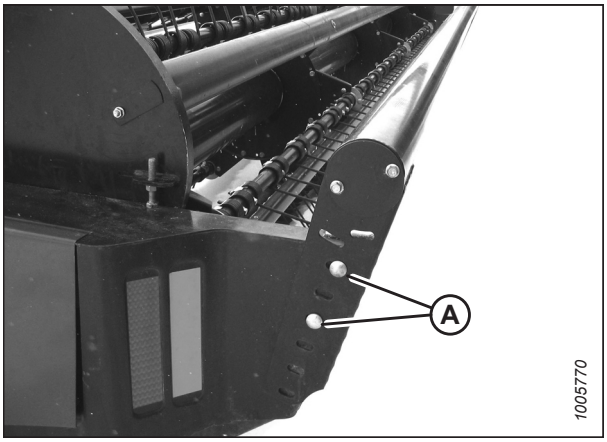


Figure 3.176: Lean Bar

3.14 Haying Tips

To optimize haying, refer to the variety of processes below in order to best manage the variables of the crop.

3.14.1 Curing

Curing crops quickly helps maintain the highest quality of crop material. Approximately 5% of protein is lost from hay for each day that it lays on the ground after cutting.

Leaving the windrow as wide and fluffy as possible results in the quickest curing. Cured hay should be baled as soon as possible.

3.14.2 Topsoil Moisture

Topsoil moisture is an important consideration when determining the timing of hay cutting and the type of windrow needed.

Table 3.4 Topsoil Moisture Levels

Level	% Moisture	Condition
Wet	Over 45%	Soil is muddy
Damp	25–45%	Shows footprints
Dry	Under 25%	Surface is dusty

- On wet soil, do **NOT** create a wide and thin windrow. A narrower, thicker windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, the moisture from the soil is absorbed by the hay above it. Determine the moisture level of the toposil before you begin cutting. Use a soil moisture tester or estimate the level.
- If the ground is wet due to irrigation, wait until the soil moisture level drops below 45%.
- If the ground is wet due to frequent rains, cut the hay when the weather allows. Let the hay lie on wet ground until it dries to the moisture level of the ground.
- Cut hay will dry only to the moisture level of the ground beneath it, so consider moving the windrow to drier ground.

3.14.3 Weather and Topography

Time your hay cutting so that the cut hay is able to cure as rapidly as possible.

- Cut as much hay as possible by midday. Drying conditions are best in the afternoon.
- Sun-facing slopes receive up to 100% more exposure to the sun's heat than slopes that do not face the sun. If the hay is to be baled and chopped, consider baling sun-facing slopes and chopping slopes that do not face the sun.
- When the relative humidity is high, the evaporation rate is low and so hay dries slowly.
- Humid air is trapped around the windrow in calm conditions. Raking or tedding will expose the hay to fresher and drier air.
- Cut hay perpendicular to the direction of the prevailing winds, if possible.

3.14.4 Windrow Characteristics

The shape and density of the windrow is an important factor with respect to how rapidly the hay cures.

Refer to *3.8 Operating Variables, page 78* for instructions on adjusting the header.

Table 3.5 Recommended Windrow Characteristics

Characteristic	Advantage
High and fluffy	Enables airflow through the windrow, which is more important to the curing process than direct sunlight
Consistent formation (not bunching)	Permits an even flow of material into the baler, chopper, etc.
Even distribution of material across windrow	Results in even and consistent bales to minimize handling and stacking problems
Properly conditioned	Prevents excessive leaf damage

3.14.5 Driving on Windrow

Driving on previously cut windrows that will not be raked can lengthen the drying time by a full day. If practical, set the machine's forming shields to produce a narrower windrow which the machine can straddle. However, driving on the windrow in high-yield crops may be unavoidable if a full width windrow is necessary.

3.14.6 Raking and Tedding

Raking or tedding speeds up the drying process; however, the resulting leaf loss may outweigh the benefits. There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

Large windrows on damp or wet ground should be turned over when the moisture levels reach 40–50%. Hay should not be raked or tedded at moisture levels below 25% or excessive yield loss will result.

3.14.7 Using Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, allowing moisture to escape from cut crop and evaporate faster. However, treated hay lying on wet ground will absorb ground moisture faster, even if a hay drying agent is used.

Before deciding to use a drying agent, carefully compare the costs and benefits of doing so.

Chapter 4: Maintenance and Servicing

The following instructions are provided to assist you in the use of the header. Detailed maintenance and service information is contained in the technical service manual that is available from your Dealer. A parts catalog is provided with your shipment.

4.1 Preparing for Servicing

Observe all safety precautions before beginning service on the machine.

CAUTION

To avoid personal injury, before servicing the header or opening the drive covers:

- **Fully lower the header. If necessary to service in the raised position, always engage the safety props.**
- **Place all controls in NEUTRAL or PARK.**
- **Shut down the engine, and remove the key from the ignition.**
- **Wait for all moving parts to stop.**

4.2 Opening/Closing Driveshield

This procedure is for opening and closing the driveshield over the conditioner drivelines.

DANGER

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

Opening driveshield

1. Shut down the engine, and remove the key from the ignition.
2. **Headers sold in North America:** Disengage rubber latch (A) and open driveshield (B).

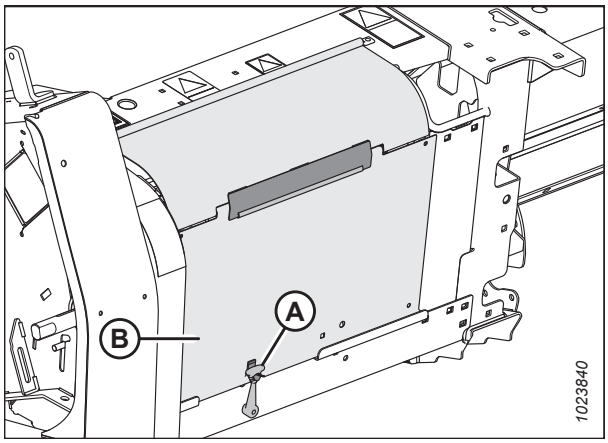


Figure 4.1: Driveshield – Headers Sold in North America

3. **Headers sold outside North America:** Insert a tool into hole (A) and pry to release latch (B). Disengage rubber latch (C) and open driveshield (D).

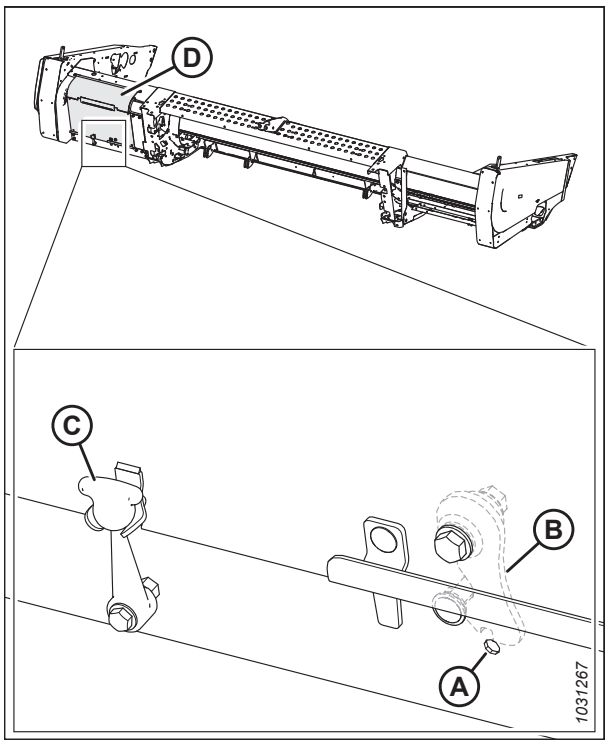


Figure 4.2: Driveshield – Headers Sold outside North America

The driveshield shown in the open position.

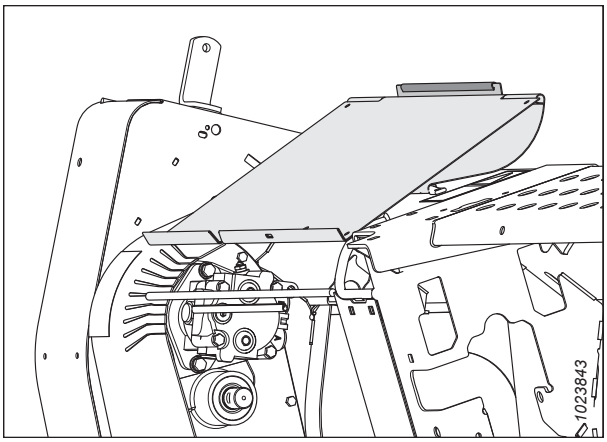


Figure 4.3: Driveshield Open

Closing driveshield

1. **Headers sold in North America:** Close driveshield (B) and engage rubber latch (A).

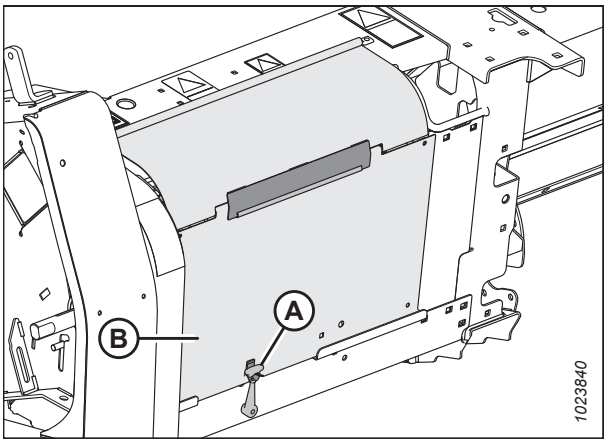


Figure 4.4: Driveshield – Headers Sold in North America

2. **Headers sold outside North America:** Close driveshield (A). Latch (B) will automatically latch. Engage rubber latch (C).

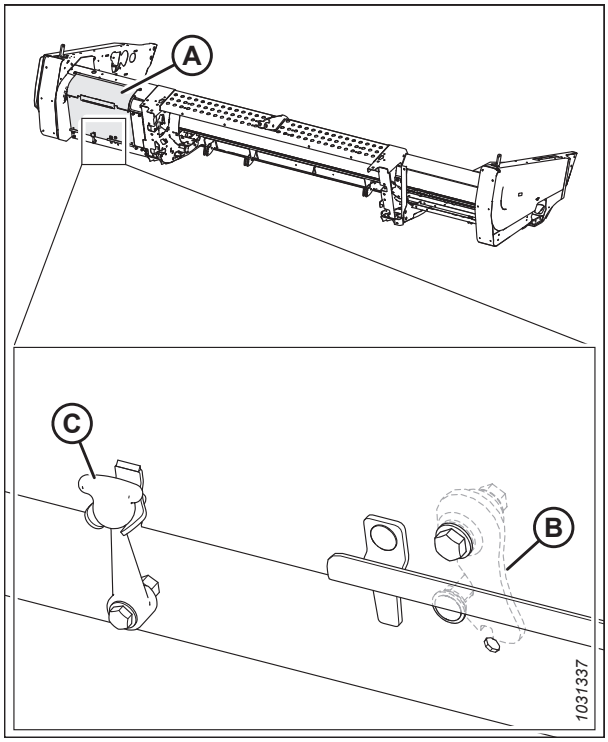


Figure 4.5: Driveshield – Headers Sold outside North America

4.3 Opening/Closing Endshields

This procedure is for opening and closing the endshields at each end of the machine.

To open the endshields:

CAUTION

Ensure shield lock engages in the open position as shown at (B) before letting go of shield.

1. Insert screwdriver or equivalent into opening (A) at the base of the endshield and push the screwdriver to release the latch.
2. Pull the bottom and lift the endshield until shield support (B) engages bolt. Check that support (B) is engaged before releasing the hold on the shield.

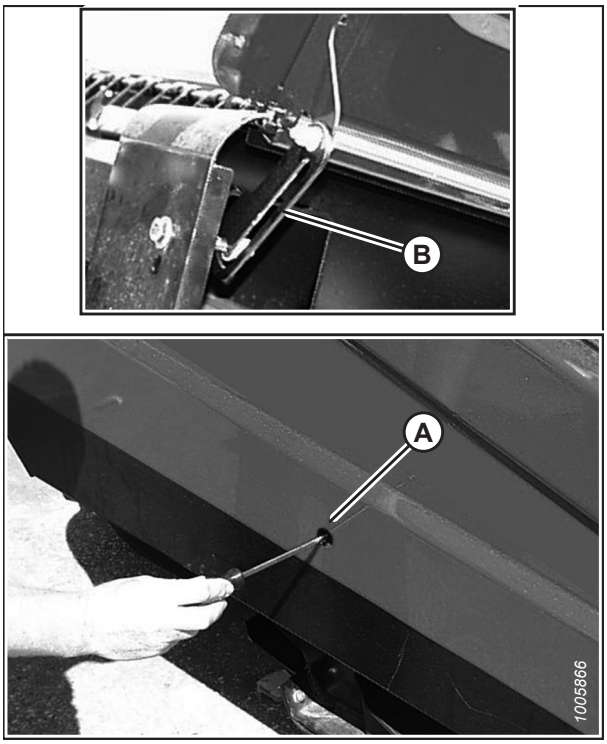


Figure 4.6: Screwdriver against Latch

To close the endshields:

3. Grasp the endshield at the top and push it slightly and move support (B) inboard to disengage the endshield.
4. Lower the endshield to about 300 mm (12 in.) from the closed position.
5. Release the endshield so that it drops to the closed position and the shield will self-latch.

4.4 Adjusting Auger Cover

Auger covers are installed only on the windrower headers to keep the debris from obstructing the operator's view.

DANGER

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

1. Locate cover support (A) and loosen two carriage bolts (B) and lock nuts. Repeat for the opposite end.
2. Adjust the position of cover support (A) to ensure 6 mm (1/4 in.) minimum clearance between plastic cover extension (C) and the auger flighting at both ends of the cover.
3. Tighten carriage bolts (B).

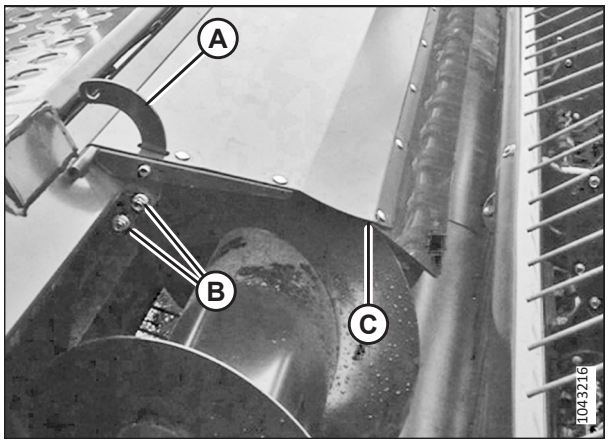


Figure 4.7: Auger Cover

4.5 Maintenance Requirements

Periodic maintenance requirements are organized according to service intervals.

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine's life.

When servicing the machine, refer to the specific headings in this section and use only fluids and lubricants specified in chart on the inside back cover of this manual.

Log hours of operation, use the maintenance record, and keep copies of your maintenance records. Refer to *4.5.1 Maintenance Schedule/Record, page 132*.

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.).

CAUTION

Carefully follow all safety messages, refer to *1 Safety, page 1*.

4.5.1 Maintenance Schedule/Record

Auger Header																
Maintenance Record	**Action:**	**✓ - Check**					**♦ - Lubricate**					**▲ - Change**				
	Hour meter reading															
	Date															
	Serviced by															
Break-in		Refer to *4.5.2 Break-in Inspection, page 133*.														
100 Hours or Annually																
✓	Conditioner drive gearbox lubricant level															
✓	Knife drive box bolt torque															
✓	Knife drive box Lubricant level															
End of Season		Refer to *4.5.4 Storage, page 133*.														
10 Hours or Daily																
✓	Hydraulic Hoses and Lines[2]															
♦	Sections, guards, And hold-downs[2]															
✓	Knife hold-downs[2]															
✓	Knife assembly[2]															
✓	Knife drive box bolt torque - First 10 hours only															
25 Hours																
♦	Knifehead															
50 Hours																
♦	Auger shaft bearings															
♦	Gauge roller bearings															
♦	Main driveshaft bearings															
♦	Tine bar bearings															
♦	Reel shaft bearings															
▲	Conditioner gearbox oil - First 50 hours only															
♦	Conditioner universal shafts															
♦	Roll pivots															
♦	Conditioner shaft bearings															
♦	Knife drive cross-shaft															
▲	Knife drive box oil - First 50 hours only															

2. A record of daily maintenance is not normally required, but is at the owner/operator's discretion.

Auger Header																	
Maintenance Record	Action:	✓ - Check					♦ - Lubricate					▲ - Change					
1000 Hours or 3 Years																	
▲	Conditioner drive gearbox lubricant																
▲	Knife drive box lubricant																

4.5.2 Break-in Inspection

Hours	Item	Check	Reference
5	Hardware	Torque	*7.1 Recommended Torques, page 233*
5, 25, and 50	Knife drive belt	Tension	*4.9.1 Header Knife Drive, page 167*
10	Knife drive box mounting bolts	Torque	*Checking Mounting Bolts, page 159*

Replace or tighten any missing or loose hardware. Refer to *7.1 Recommended Torques, page 233*.

4.5.3 Preseason Checks

CAUTION

- **Review the operator's manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the header and note hazard areas.**
- **Be sure all 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.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

Perform the following checks at the beginning of each operating season:

1. Adjust tension on knife drive belt. Refer to *4.8 Cutterbar, page 143*.
2. Check oil levels and lubricate bearings. Refer to the following sections:
   - *Lubrication Points: Knife and Gearbox, page 140*
   - *4.6.2 Lubrication Points, page 135*
3. Perform all annual maintenance. Refer to *4.5.1 Maintenance Schedule/Record, page 132*.

4.5.4 Storage

Do the following 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 in a dry, protected place if possible. If stored outside, always cover header with a waterproof canvas or other protective material.
3. Raise header, and engage header lift cylinder lock-out valves.
4. If possible, block up the header to take weight off tires.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Loosen drive belts.
7. Lubricate header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components. Oil knife components to prevent rust.
8. Check for worn components, and repair.
9. Check for broken components and order replacement from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
10. Replace or tighten any missing or loose hardware. Refer to *7.1 Recommended Torques, page 233*.
11. Remove divider rods (if equipped) to reduce space required for inside storage.

4.6 Lubrication

Greasing points are marked on the machine by decals showing a grease gun and the grease interval in hours of operation.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *4.1 Preparing for Servicing, page 125*.

CAUTION

Refer to inside back cover for recommended greases.

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to *4.5.1 Maintenance Schedule/Record, page 132*.

4.6.1 Greasing Procedure

Some header components need to be lubricated in order to perform their function correctly and prevent machine damage.

DANGER

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

The greasing points are marked on the machine by decals showing a grease gun (A) and grease interval (B) in hours of operation.

Use the recommended lubricants specified in this manual on the inside back cover.

1. Wipe the grease fitting with a clean cloth before greasing it to avoid injecting dirt and grit.
2. Inject the grease through the fitting with a grease gun until the grease overflows the fitting, except where noted.
3. Leave excess grease on the fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If the fitting will not take grease, remove and clean the fitting and the lubricant passageway thoroughly. Replace the fitting if necessary.

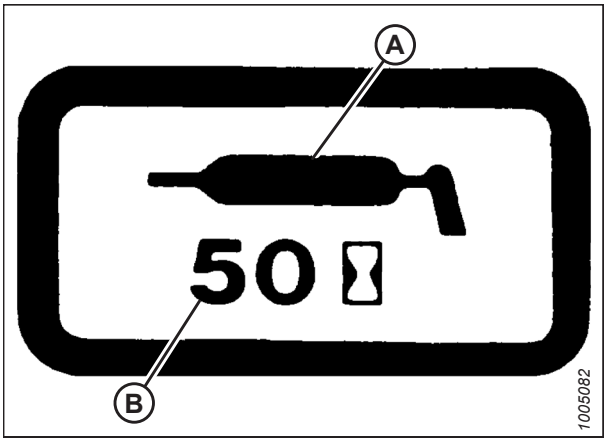


Figure 4.8: Grease Interval Decal

4.6.2 Lubrication Points

Lubrication requirements depend on the model of the header that is being serviced.

Refer to the lubrication points for your specific model:

- *Lubrication Points: Auger Header, page 136*
- *Lubrication Points: Hay Conditioner, page 138*
- *Lubrication Points: Drivelines, page 139*

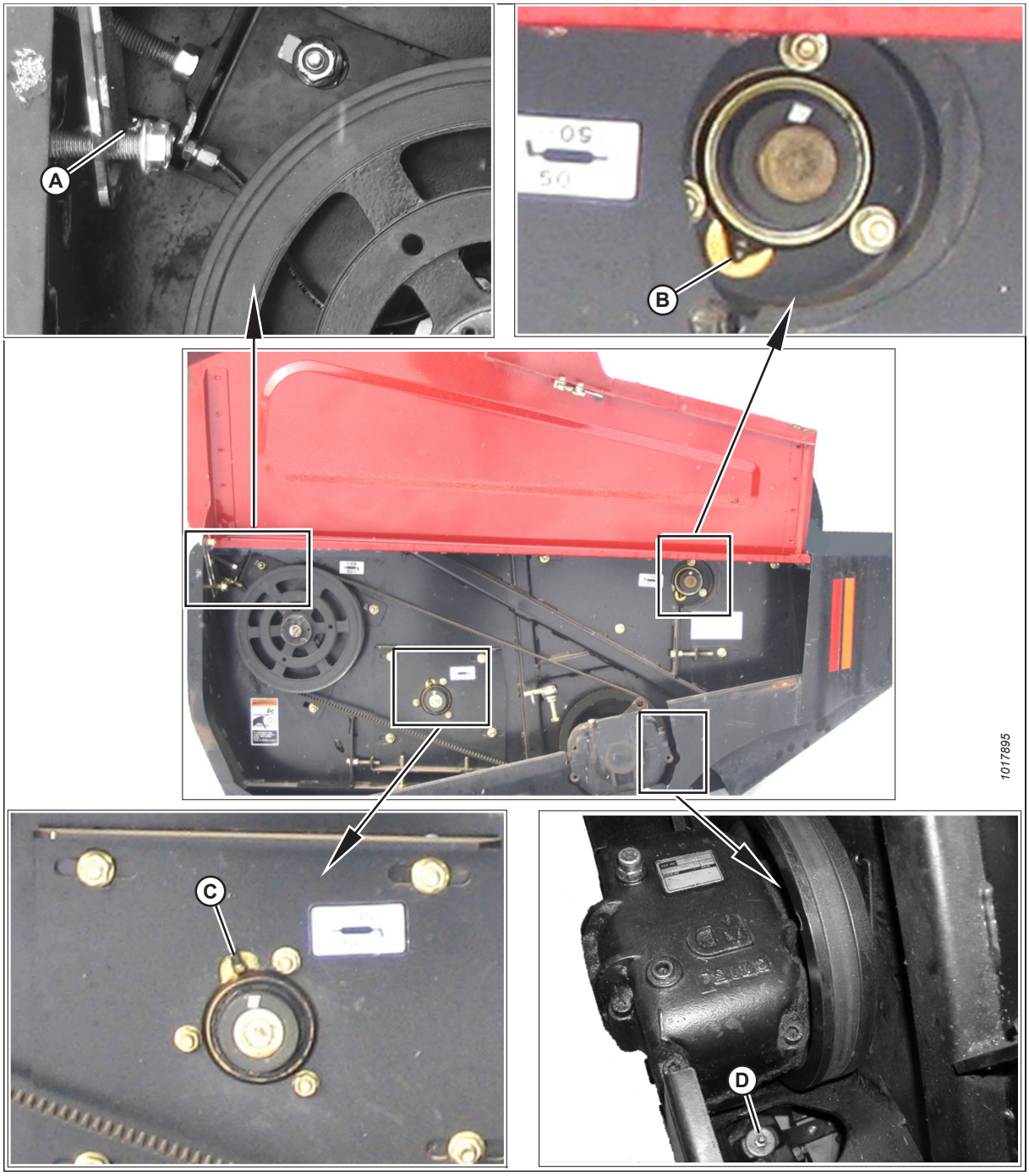
Lubrication Points: Auger Header

There are several points on the auger header which will require lubrication.

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base. To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease the lubrication points. If more than 6 to 8 pumps of grease gun are required to fill the cavity, replace the seal in the knifehead.

Figure 4.9: A40D, A40DX Header Right Side

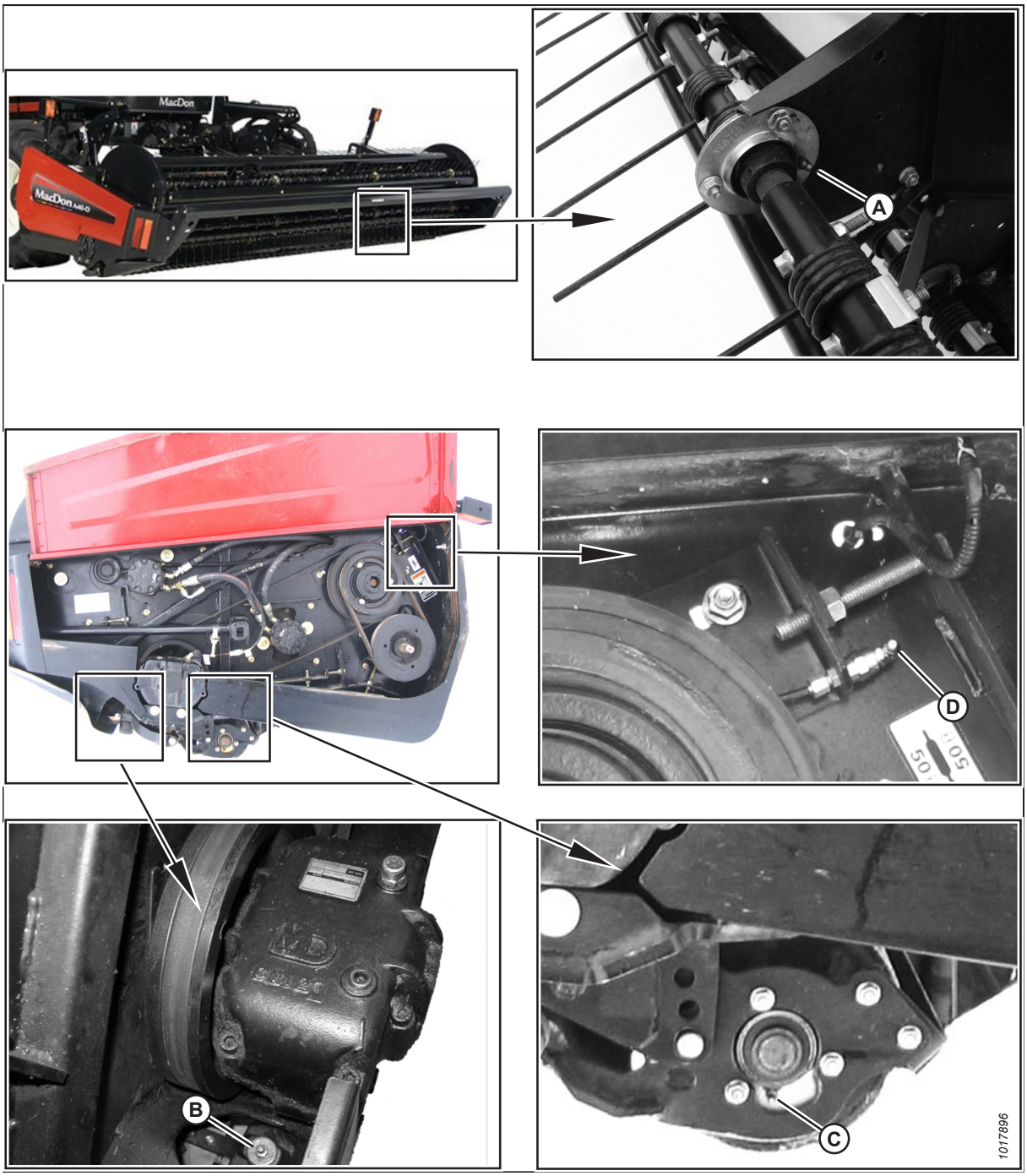


A - Knife Drive Bearing (1 Place) (50 Hours)
B - Reel Shaft Bearing (1 Place) (50 Hours)
C - Auger Shaft Bearing (1 Place) (50 Hours)
D - Knifehead Bearing (1 Place) (25 Hours)

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base. To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease the lubrication points. If more than 6 to 8 pumps of grease gun are required to fill the cavity, replace the seal in the knifehead.

Figure 4.10: A40D, A40DX Header Left Side



A - Tine Bar Bearing (4 Places Each Tine Bar) (50 Hours)
B - Knifehead Bearing (1 Place) (25 Hours)
C - Gauge Roller Bearings (2 Places) Both Sides - If Installed (50 Hours)
D - Knife Drive Bearing (1 Place) (50 Hours)

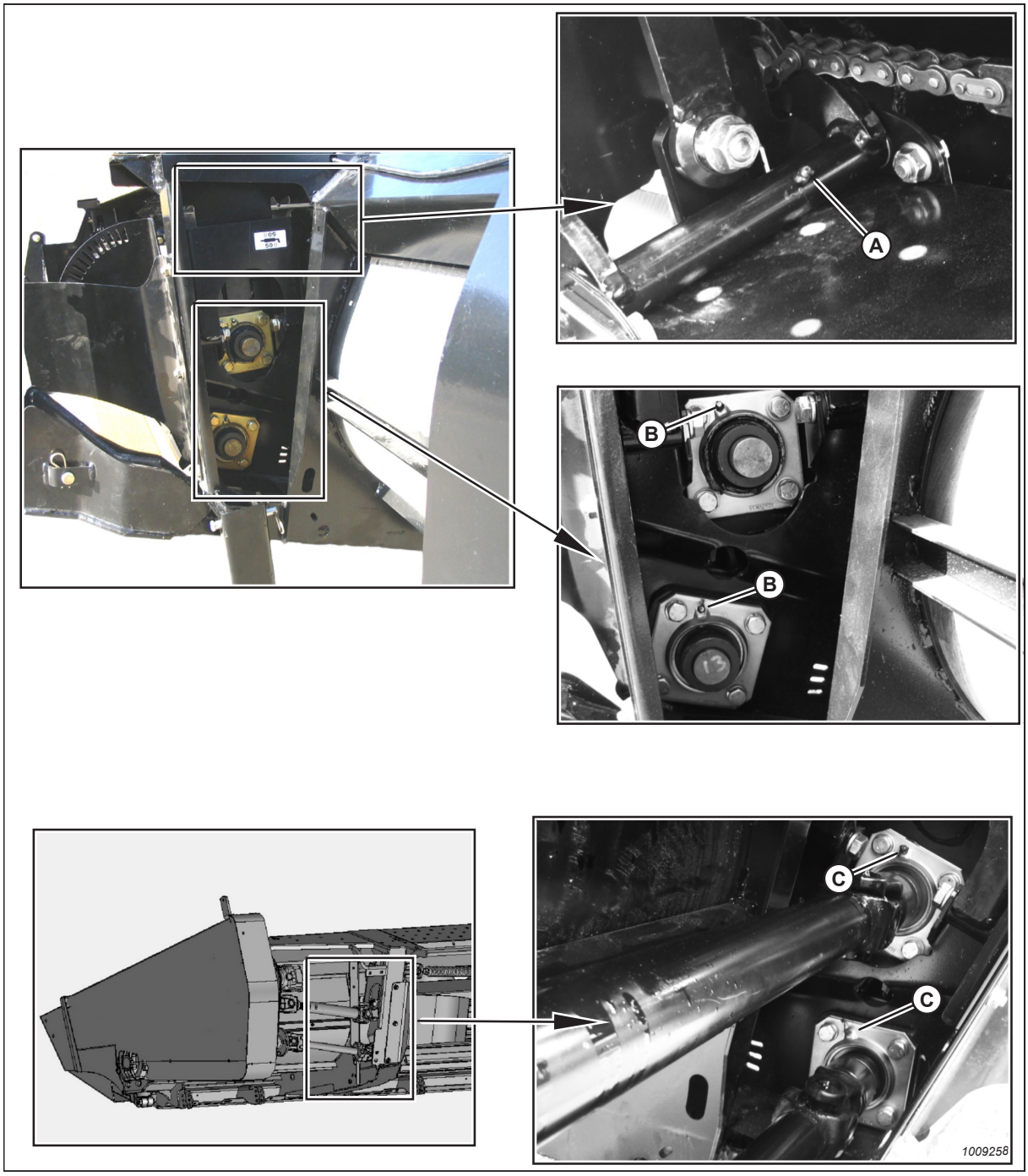
Lubrication Points: Hay Conditioner

There are several points on the hay conditioner which will require lubrication.

NOTE:

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

Figure 4.11: Hay Conditioner



A - Roll Pivot (1 Place - Both Sides) **B - Roll Shaft Bearings (2 Places)** **C - Roll Shaft Bearings (2 Places)**

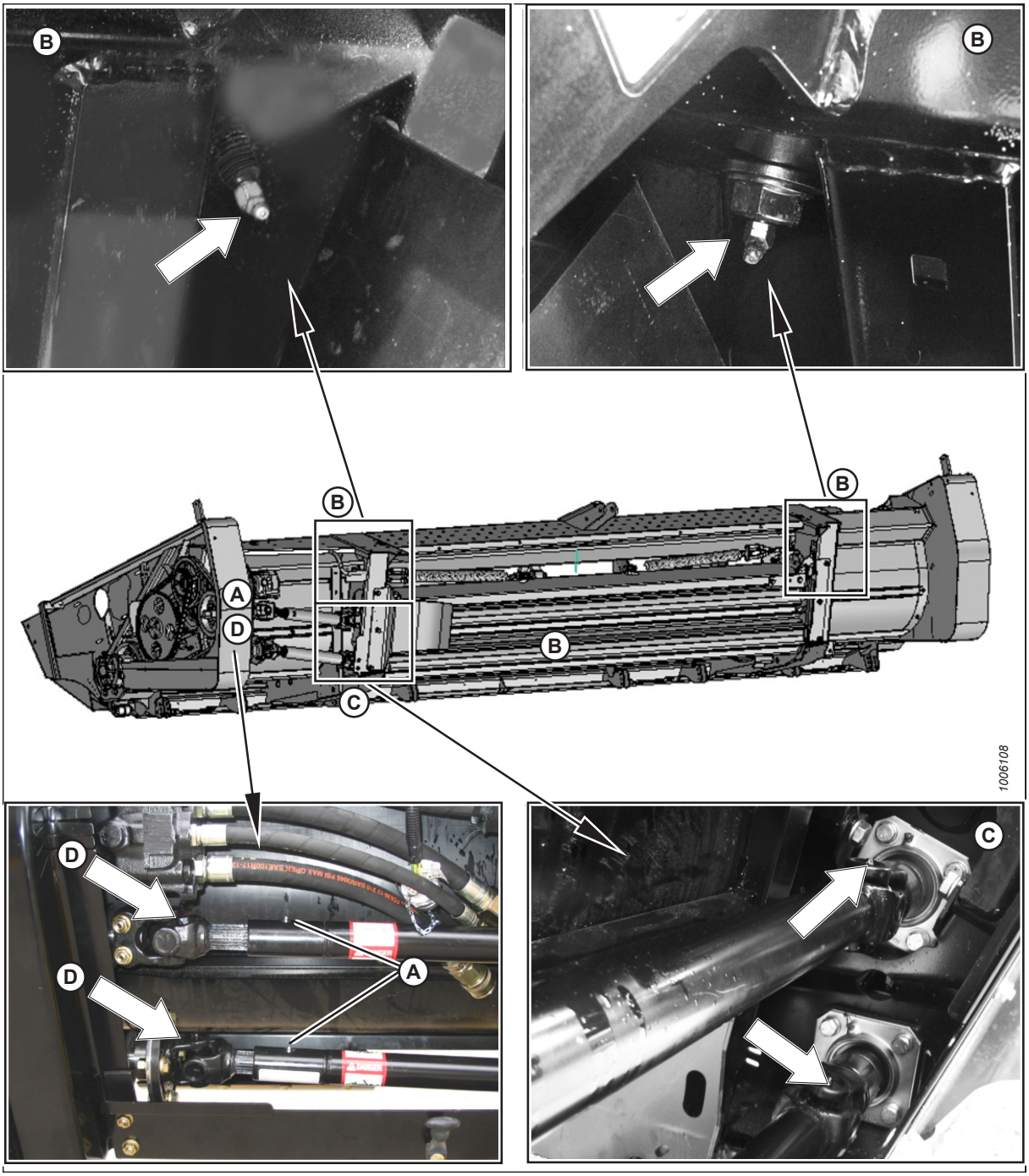
Lubrication Points: Drivelines

There are several points on the drivelines which will require lubrication.

NOTE:

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base. To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease the lubrication points. If more than 6 to 8 pumps of grease gun are required to fill the cavity, replace the seal in the knifehead.

Figure 4.12: Drivelines



A - Driveline Shafts (2 Places) (50 hours) - NOTE: 10% Moly Grease Is Recommended For Driveline Shaft Slip Joints ONLY.
B - Cross Shafts (2 Places) (50 Hours) **C - Driveline Universals (2 Places) (50 Hours)** **D - Driveline Universals (2 Places) (50 Hours)**

Lubrication Points: Knife and Gearbox

There are several points on the knife and the gear which will require lubrication.

Refer to the following illustration to identify the various locations that require lubrication. Refer to the inside back cover of this manual for proper oil recommendations.

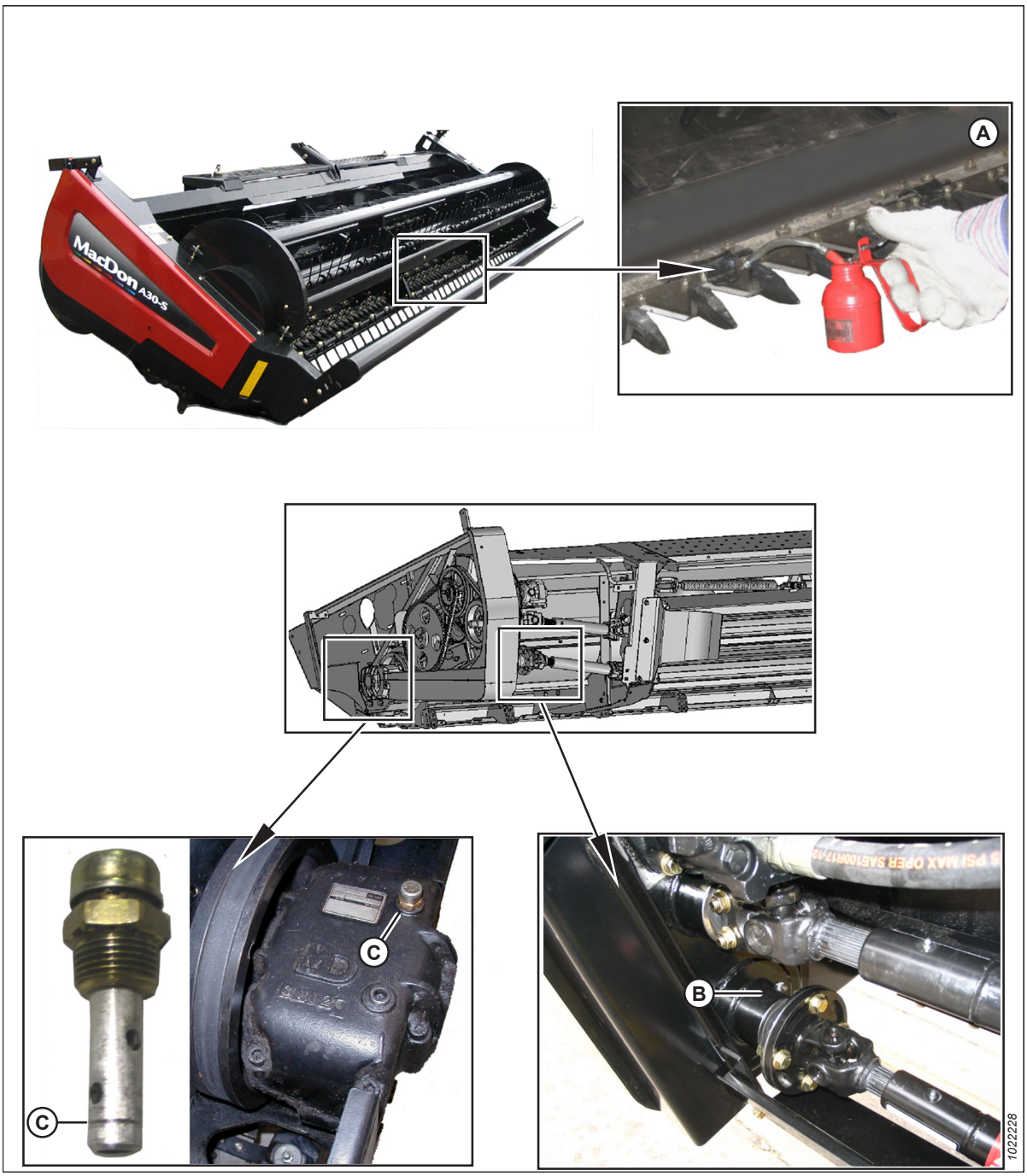


Figure 4.13: Knife and Gearbox

A - Oil the Knife Daily Except in Sandy Soil (SAE 30)
B - Check the Roll Gearbox (1 Place)[4]
C - Knife Drive Box (2 Places)[3]

3. Check oil level with the header down on level ground.
4. Header should be on the ground.

4.6.3 Installing Sealed Bearings

Sealed bearings are held in place on a shaft with a locking collar and a flangette.

Follow these steps to install sealed bearings:

1. Clean the shaft and coat it with rust preventative.
2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

   NOTE:

   The locking cam is only on one side of the bearing.
3. Install (but do **NOT** tighten) flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch.

   NOTE:

   The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.
5. Tighten the flangette bolts.
6. Loosen the flangette bolts on the mating bearing by one turn and retighten it. This will allow the bearing to line up.

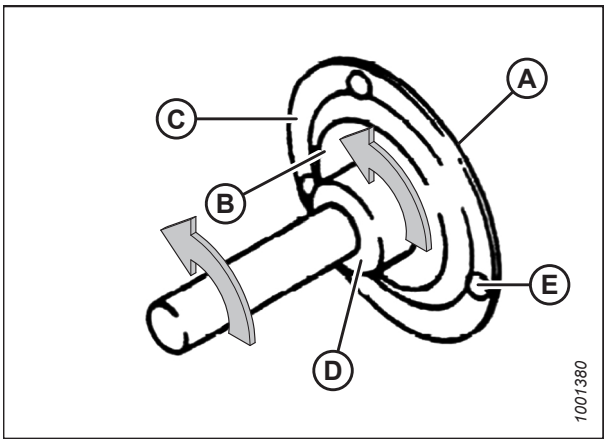


Figure 4.14: Sealed Bearing

4.7 Hydraulics

For hydraulics information about self-propelled windrower headers, contact your Dealer.

4.7.1 Servicing Header Hydraulics

Refer to your windrower operator's manual for hydraulic system maintenance procedures for self-propelled windrower headers.

4.7.2 Checking 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.**
- **Use a piece of cardboard or paper to search for leaks.**

Figure 4.15: Hydraulic Pressure Hazard

IMPORTANT:

Keep the hydraulic coupler tips and the connectors clean. Dust, dirt, water and foreign material are the major causes of hydraulic system damage. Do **NOT** attempt to service the hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.

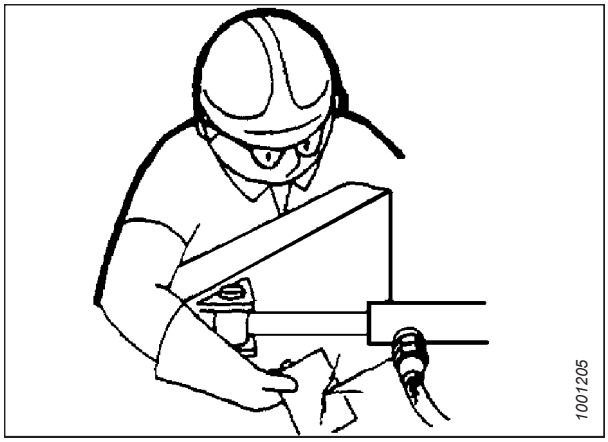


Figure 4.16: Cardboard to Search for Leaks

4.8 Cutterbar

This chapter covers maintenance and servicing of the entire cutting assembly.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *4.1 Preparing for Servicing, page 125*.

WARNING

Exercise caution when working around the cutterbar. Blades are sharp and can cause serious injury. Wear heavy gloves when working around or handling knife.

WARNING

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

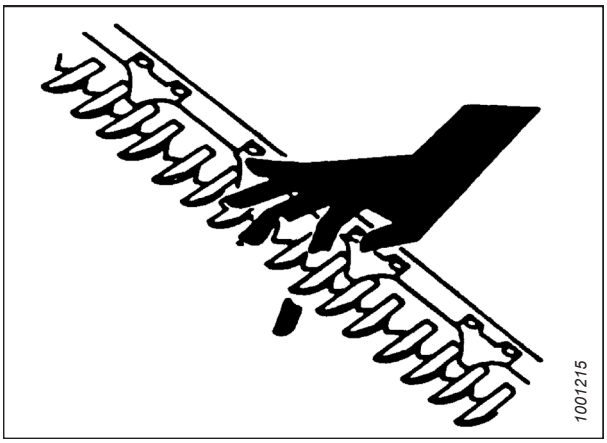


Figure 4.17: Safety around Equipment

4.8.1 Replacing Knife Section

Check daily that sections are firmly bolted to the knife back, and are not worn or broken. Replace broken knife sections as required. A worn or broken knife section can be replaced without removing the knife from the cutterbar.

WARNING

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

WARNING

Stand behind the knife while you are removing it to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

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

2. Stroke the knife as required to expose the knife sections.
3. Remove lock nuts (A), and lift section (B) off of the bolts.

   IMPORTANT:

   Do **NOT** mix heavy and light knife sections on the same knife.
4. Clean any dirt off of the back of the knife, and position the new knife section onto the installed bolts.
5. Secure the knife with the lock nuts, and tighten the nuts to the required torque specification.

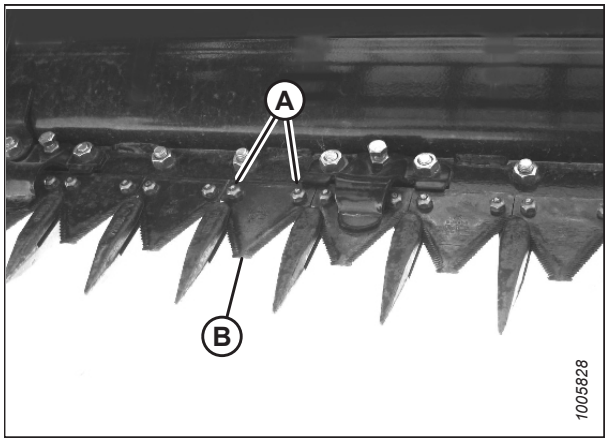


Figure 4.18: Knife Section

4.8.2 Removing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the lean bar.

DANGER

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

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from the cutting edges. Wear heavy gloves when handling a knife.

1. Lower the header onto blocks, or raise the header fully. Shut the engine off, and remove the key from the ignition. If raising the header, engage the safety props.
2. Stroke the knife manually to its outer limit.
3. Clean the area around the knifehead.
4. Remove bolt (A).
5. Remove grease fitting (B) from the pin.
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 upward 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.

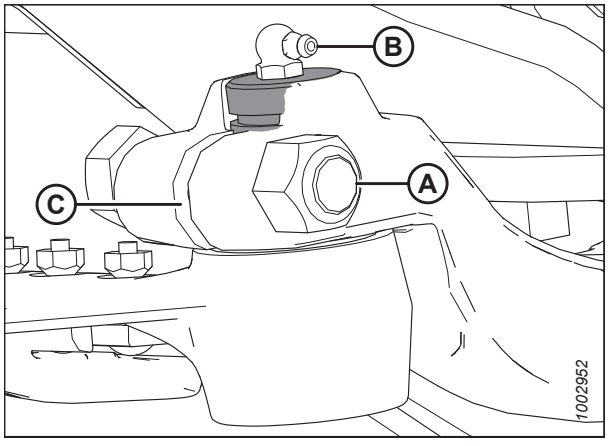


Figure 4.19: Knifehead

4.8.3 Installing Knife

The cutterbar knife is designed to easily be replaced if worn or damaged. A spare knife can be stored in the lean bar.

DANGER

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

WARNING

Stand to the rear of the knife during removal to reduce the risk of injury from cutting edges. Wear heavy gloves when handling the knife.

1. Lower the header onto blocks, or raise the header fully. Shut the engine off, and remove the key from the ignition. If raising the header, engage the safety props.
2. Slide the knife into place and align the knifehead with the output arm.
3. To make it easier to install the knifehead pin, remove the grease fitting from the pin.
4. Install knifehead pin (A) through the output arm and into the knifehead. Tap knifehead pin (A) down, and make sure the pin is seated at the bottom of the knifehead.
5. Set groove (B) in the knifehead pin 1.5 mm (1/16 in.) above output arm (C). Secure it with 5/8 in. x 3 in. hex head bolt and nut (D), and torque the hardware to 217 Nm (160 lbf·ft).
6. Using a feeler gauge, check that the gap at location (E) is 0.25 mm (0.01 in.).

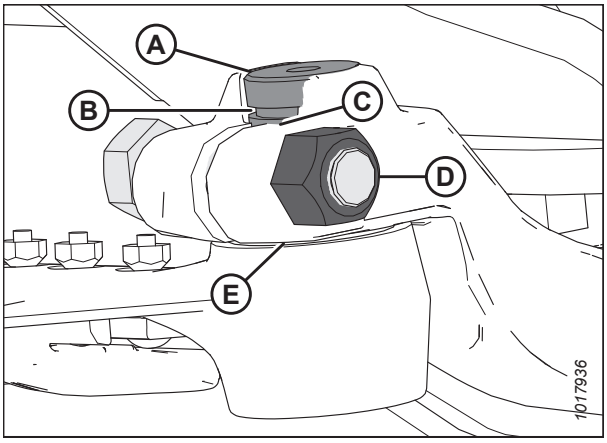


Figure 4.20: Knifehead

7. Install grease fitting (A) into the knifehead pin, and turn the grease fitting for easy access.

   IMPORTANT:

   Grease the knifehead just enough to start a slight downward movement. Overgreasing the knifehead will lead to knife misalignment, causing the guards to overheat and the drive systems to overload.

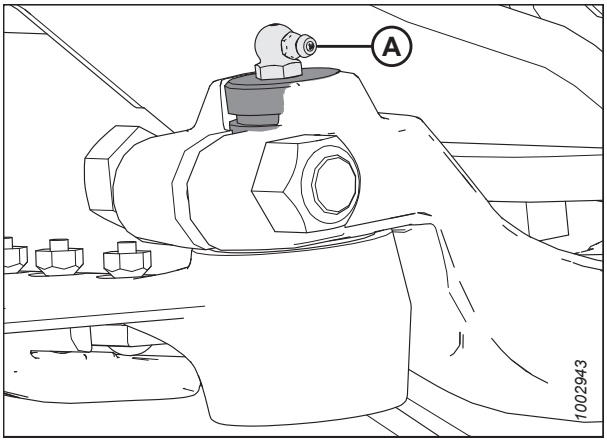


Figure 4.21: Knifehead

4.8.4 Removing Knifehead Bearing

The knifehead bearing allows the knifehead pin to rotate within the knifehead as the drive arm strokes the knife back and forth. If the bearing is worn or damaged, it will need to be replaced.

1. Remove the knife. For instructions, refer to *4.8.2 Removing Knife, page 144*.
2. Using a flat-ended tool with approximately the same diameter as plug (D), tap out seal (B), bearing (C), plug (D), and O-ring (E) from the underside of the head.

   NOTE:

   The seal can be replaced without removing the bearing. When changing the seal, check pin (A) and the needle bearing for wear. Replace the seal if necessary.

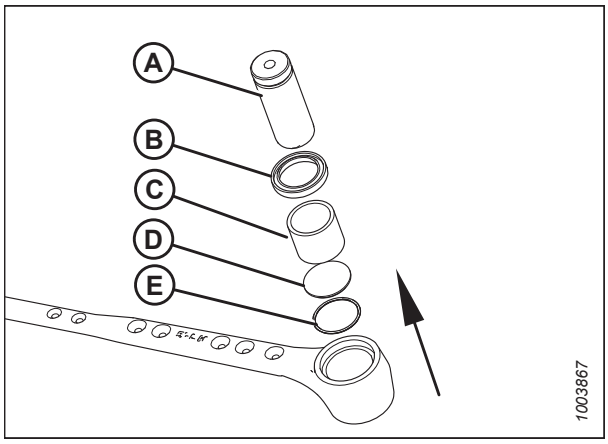


Figure 4.22: Bearing Removal

4.8.5 Installing Knifehead Bearing

The knifehead bearing, seals, and greasing interval protect the knifehead from the forces of the knife drive output arm. The seals and bearing require inspection and, when worn, replacement to prevent damage.

1. Place O-ring (E) and plug (D) into the knifehead.

   IMPORTANT:

   Install the bearing with the stamped end (the end with the identification markings) facing up.

   NOTE:

   It may be necessary to temporarily remove the grease fitting from the knifehead during installation of the knifehead pin. This will allow any trapped air to escape and the knifehead pin will seat correctly.
2. Use a flat-ended tool with the same approximate diameter as bearing (C), and push the bearing into the knifehead until the top of the bearing is flush with the step in the knifehead.
3. Install seal (B) into the knifehead with the lip facing outwards.

   IMPORTANT:

   To prevent premature knifehead or knife drive box failure, ensure there is a tight fit between knifehead pin (A) and the needle bearing, and between the knifehead pin and the output arm.

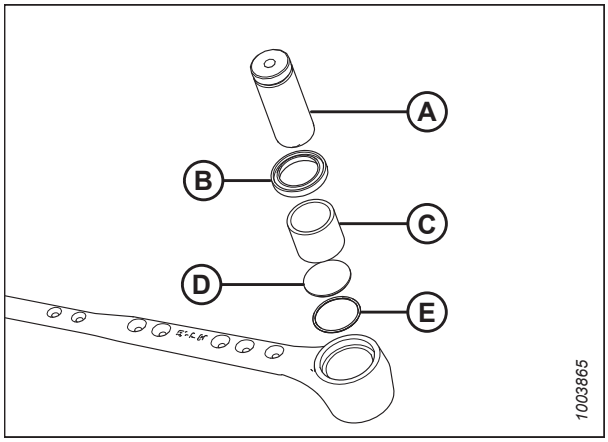


Figure 4.23: Knifehead Bearing Assembly

4. Install the knife. For instructions, refer to *4.8.3 Installing Knife, page 145*.

4.8.6 Removing Spare Knife from Storage

For double-knife headers, a spare knife with knifehead may be stored inside lean bar (A):

- The left knife is stored at the left end of the lean bar.
- The right knife is stored at the right end of the lean bar.

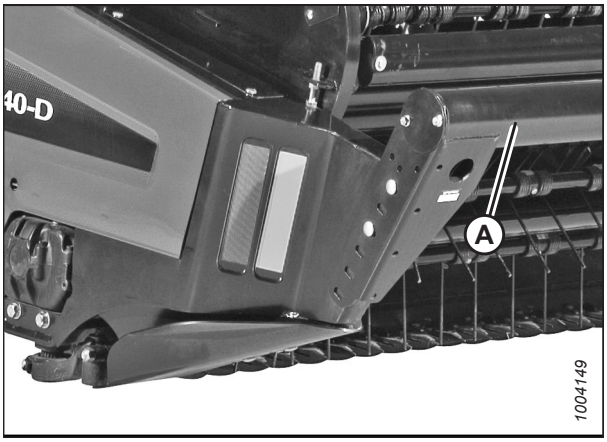


Figure 4.24: Spare Knife Location – Double Knife

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove bolts (A) from the lean bar end cap.
3. Pull out the end cap and plastic storage tube assembly with the knife inside.
4. Slide the knife from the storage tube.
5. Replace the storage tube inside the lean bar.
6. Reinstall bolts (A) and tighten them.

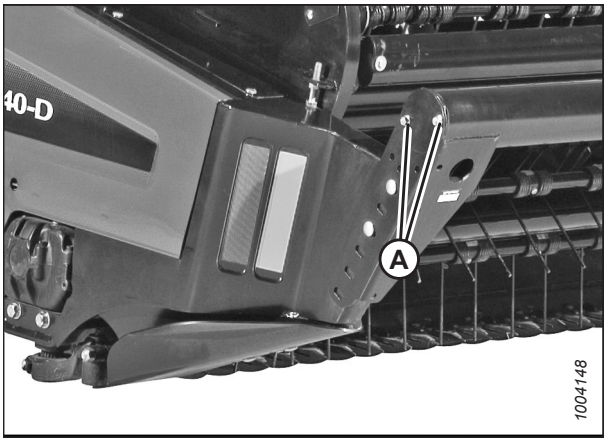


Figure 4.25: Spare Knife – Double Knife

4.8.7 Guards

Guards protect the knife from damage from rocks and other debris, and provide a surface for the knife to cut against, much like a pair of scissors. It is important to adjust the guards properly.

Auger headers can be equipped with two types of guards: pointed or stub.

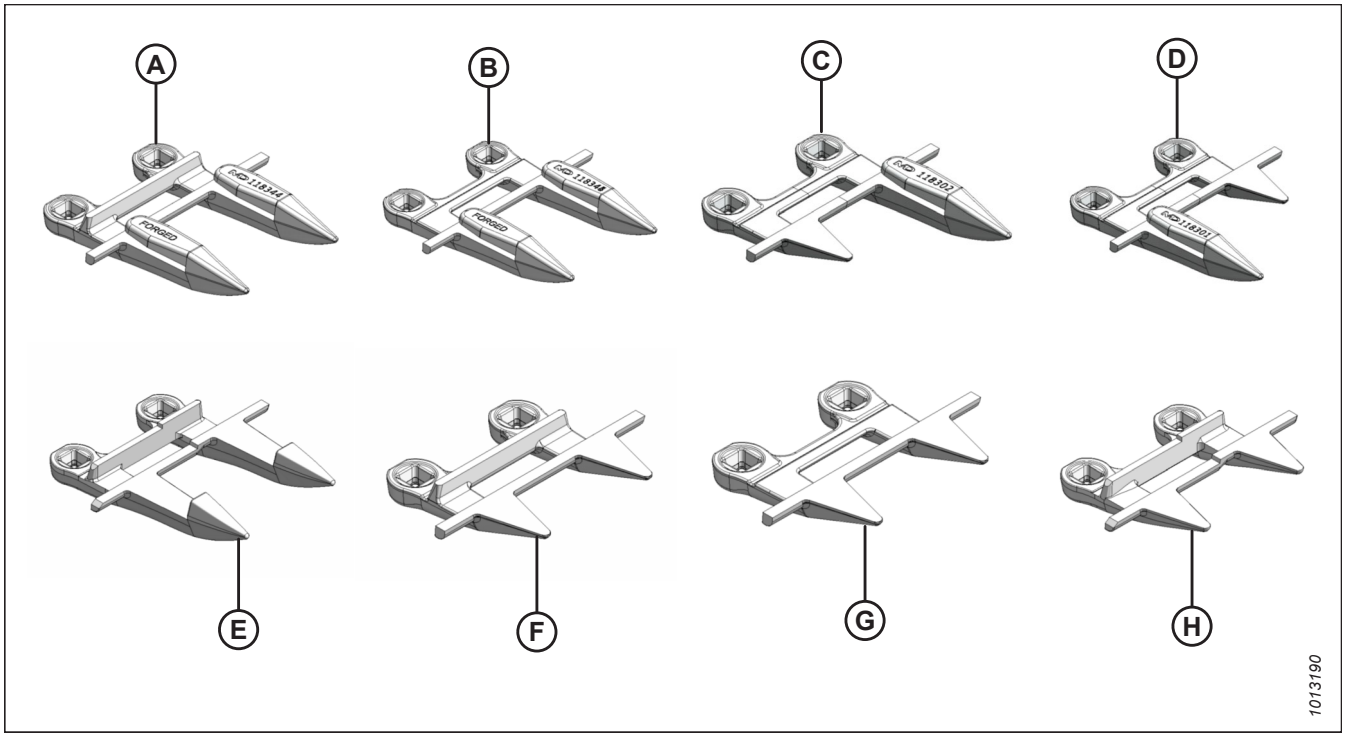
- Pointed guards are suitable for most standing crops and cutting conditions.
- Stub guards improve cutting performance in tough, stringy grass type crops, and crops that need to be cut close to the ground.

Guards are also designed slightly differently depending on where they are installed along the cutterbar:

- *Outboard Left* – Located at left end of cutterbar. Does not have a ledger to allow for slight fore/aft motion from the knife drive box.
- *Outboard Right* – Located at right end of cutterbar. Does not have a ledger to allow for slight fore/aft motion from the knife drive box (double-knife headers).
- *Center* – Located at center of cutterbar on double-knife headers. Has a stepped ledger to allow for knife overlap.

- *Drive End* – Located at the drive end of cutterbar, next to outboard guard. Similar to standard but does not have a ledger to allow for slight fore/aft motion from the knife drive box.
- *Standard* – Standard guard used at all other locations.

Figure 4.26: Guard Configurations



A - Pointed Standard (MD #118344)
B - Pointed Drive End (No Ledger) (MD #118345)
C - Pointed Right Outboard (MD #118302)
D - Pointed Left Outboard (MD #118301)
E - Pointed Center (MD #124338)
F - Stub Standard (MD #118346)
G - Stub Drive End (No Ledger) (MD #118347)
H - Stub Center (MD #124775)

DANGER

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

Check daily that guards are firmly bolted to the cutterbar, and not worn or broken. Replace broken guards as required. A worn or broken guard can be replaced without removing knife from cutterbar.

Aligning Guard

Check daily to ensure that guards are aligned to obtain proper shear cut between knife section and guard. Knife sections should contact shear surface of each guard.

DANGER

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

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

2. Retrieve tool (A) from the left side of header.

Figure 4.27: Wrench Location

3. To adjust guard tips downward, position the tool as shown at right, and push the tool down.

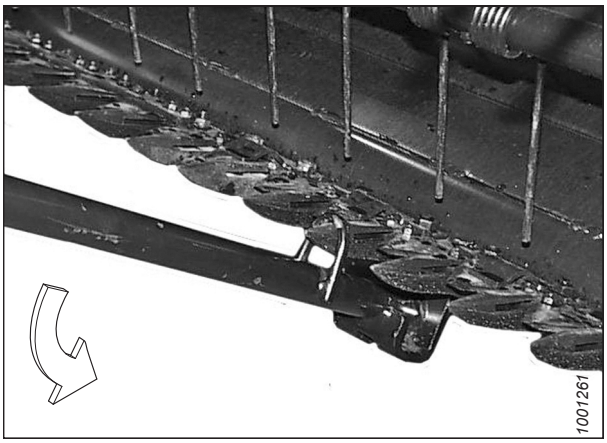


Figure 4.28: Guard Tip – Downward Adjustment

4. To adjust guard tips upward, position the tool as shown at right, and pull the tool up.

   NOTE:

   If tangled or fine-stemmed material is difficult to cut, replace guards with stub guards. If crop material is tough, install stub guards with a top guard and adjuster plate. A stub guard conversion kit for the header is available from your Dealer.

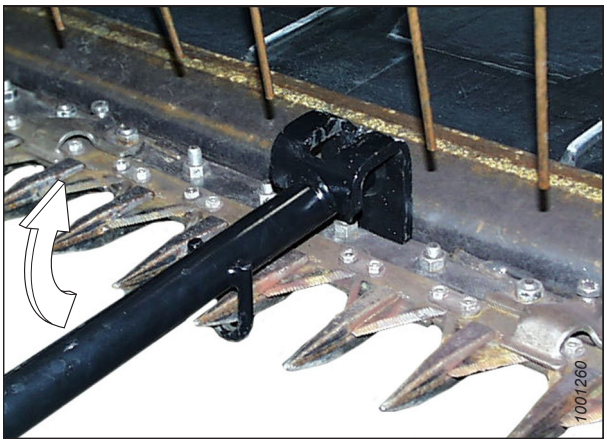


Figure 4.29: Guard Tip – Upward Adjustment

Replacing Pointed Guards and Hold-Downs

Check daily that guards are firmly bolted to the cutterbar, and not worn or broken. Replace broken guards as required. A worn or broken guard can be replaced without removing knife from cutterbar. This procedure describes the replacement of pointed guards and hold-downs on single- and double-knife headers.

DANGER

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

Pointed standard guard and hold-down

Follow this procedure to replace standard pointed guards and hold-downs on single- and double-knife headers, except the double knife center guard and hold-down. Refer to *double knife pointed center guard and hold-down* in this section.

1. Shut down the engine, and remove the key from the ignition.
2. Stroke the knife so that knife sections are spaced midway between the guards.
3. Remove two nuts (A) and carriage bolts (B) that attach guard (C) and hold-down (D) to the cutterbar.
4. Remove guard (C) and hold-down (D).
5. Position new guard (C) on cutterbar, and install carriage bolts (B).
6. Install hold-down (D), and secure with nuts (A). Tighten nuts to 68 Nm (50 lbf·ft).
7. Check and adjust clearance between hold-down and knife. Refer to *4.8.8 Hold-Downs, page 156*.

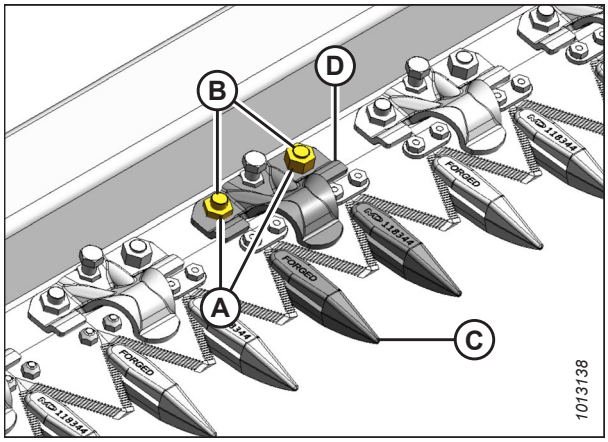


Figure 4.30: Pointed Guards

IMPORTANT:

The second, third, and fourth outboard guards (A) on drive side of the header do **NOT** have a ledger (B) as shown for normal guard (C). Ensure that the proper replacement is installed.

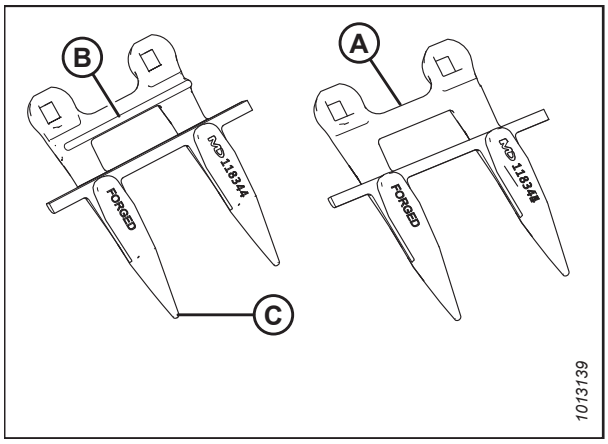


Figure 4.31: Pointed Guards

Double knife pointed center guard and hold-down

IMPORTANT:

Ensure center guard (B) has offset (A) in ledgers and that hold-down accommodates overlapping knives.

NOTE:

Replace adjacent guards when replacing center guard.

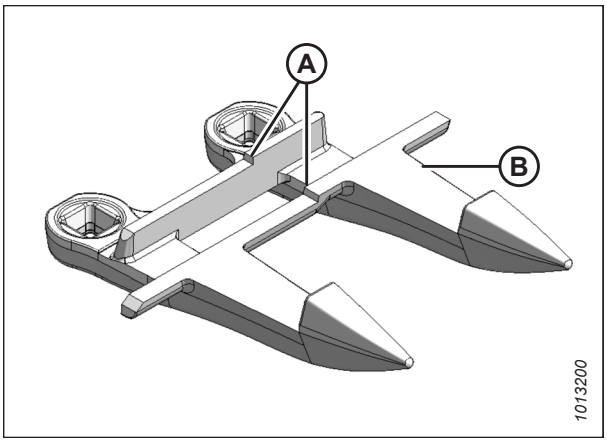


Figure 4.32: Pointed Center Guard

1. Remove two nuts (A), and carriage bolts (B) that attach guard (C), adjuster bar (D), and hold-down (E) to the cutterbar.
2. Remove guard (C), hold-down (E), and adjuster bar (D).
3. Position new guard (C) on cutterbar, and install carriage bolts (B).
4. Install adjuster bar (D) and hold-down (E), and secure it with nuts (A). Tighten the nuts to 68–92 Nm (50–68 lbf·ft).

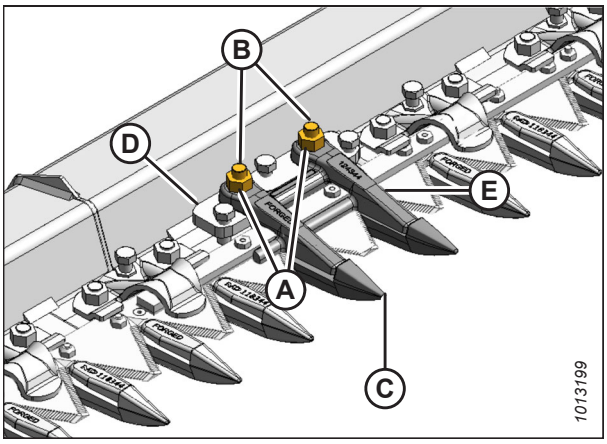


Figure 4.33: Center Guard

5. Check that cutting surfaces (A) of center and adjacent guards are aligned. Adjust as required as per *Aligning Guard, page 148*.
6. Check and adjust clearance between hold-down and knife. Refer to *4.8.8 Hold-Downs, page 156*.

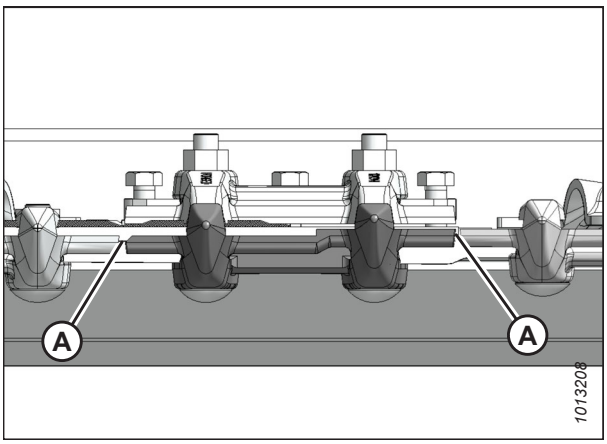


Figure 4.34: Guard Alignment

Replacing Pointed Center Guard on Double-Knife Header

Check daily that guards are firmly bolted to the cutterbar, and not worn or broken. Replace the guards as required. A worn or broken guard can be replaced without removing knife from cutterbar. This procedure applies to the center guard where the two knives overlap on a double-knife header.

IMPORTANT:

Replace adjacent guards when replacing center guard.

IMPORTANT:

Ensure center guard (A) has offset (B) cutting surface.

IMPORTANT:

Ledger surfaces of center and adjacent guards must be vertically aligned to avoid interference with knife sections.

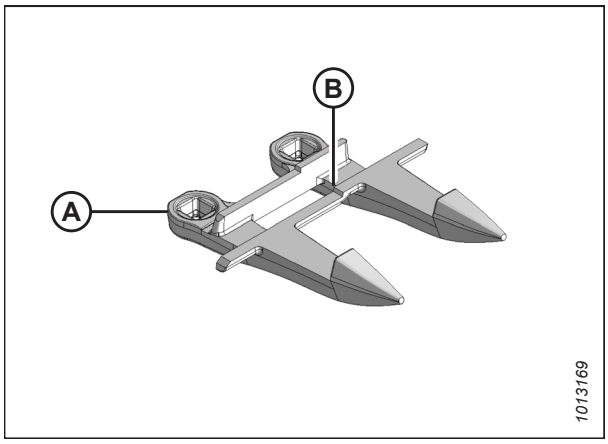


Figure 4.35: Center Guard – Double Knife

IMPORTANT:

Hold-down (A) must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacement is the correct part.

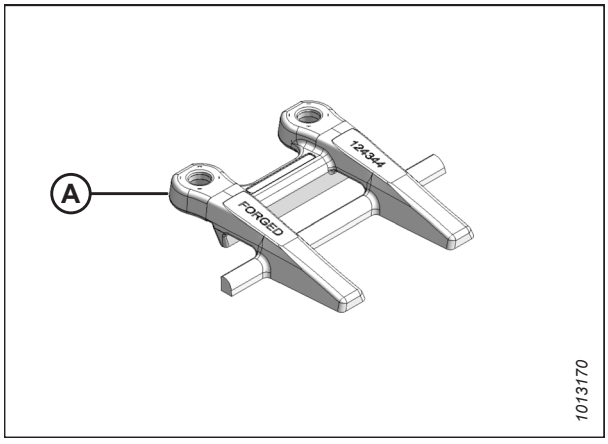


Figure 4.36: Center Hold-Down – Double Knife

1. Stroke the knife so that knife sections are spaced midway between the guards.
2. Remove two nuts (A) and bolts (B) that attach center guard (C) and hold-down (D) to cutterbar.
3. Remove guard (C), hold-down (D), and adjuster bar (E).
4. Position new guard (C) on cutterbar and install two 7/16 x 2 3/4 in. carriage bolts (B).
5. Position adjuster bar (E) and hold-down (D) on cutterbar and install nuts (A).
6. Torque nuts to 68–92 Nm (50–68 lbf·ft).

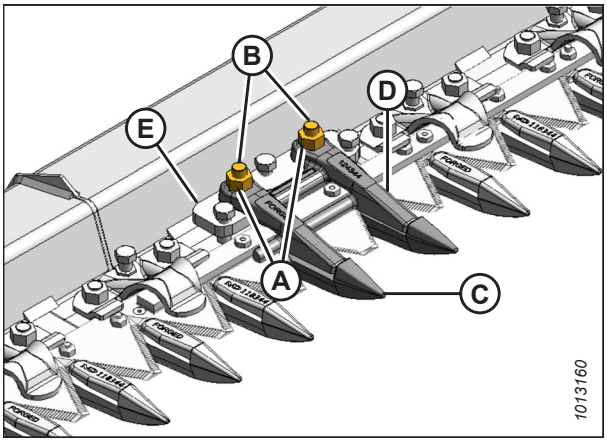


Figure 4.37: Pointed Center Guard

7. Check clearance between hold-down (D) and section. Refer to *Adjusting Knife Hold-Down: Center Guard – Double-Knife Header, page 158*.

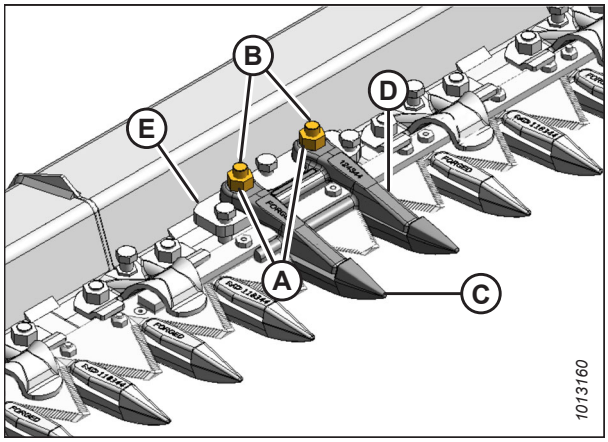


Figure 4.38: Pointed Center Guard

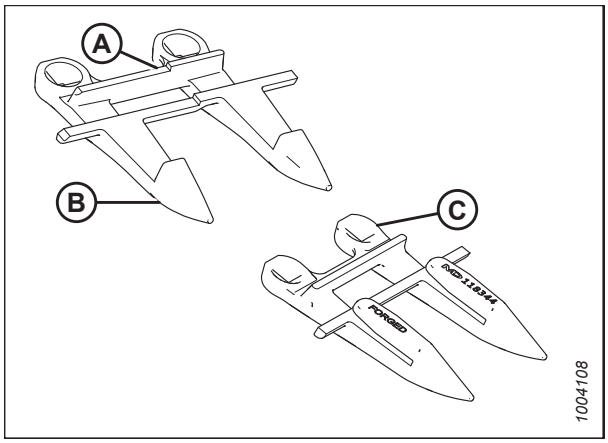


Figure 4.39: Pointed Guard Identification

A - Offsets **B - Center Guard**
C - Normal Guard

Replacing Center Stub Guard on Double-Knife Header

Check daily that guards are firmly bolted to the cutterbar, and not worn or broken. Replace the guards as required. A worn or broken guard can be replaced without removing knife from cutterbar. This procedure applies to the center guard where the two knives overlap on a double-knife header.

IMPORTANT:

Replace adjacent guards when replacing center guard.

IMPORTANT:

Ensure center guard (A) has offset cutting surface (B).

IMPORTANT:

Ledger surfaces of center and adjacent guards must be vertically aligned to avoid interference with knife sections.

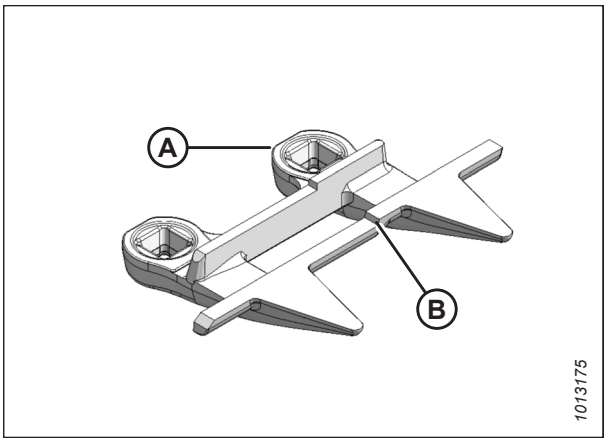


Figure 4.40: Center Guard – Double Knife

IMPORTANT:

Hold-down (A) must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacement is the correct part. Hold-down is actually an inverted stub guard (MD #118346).

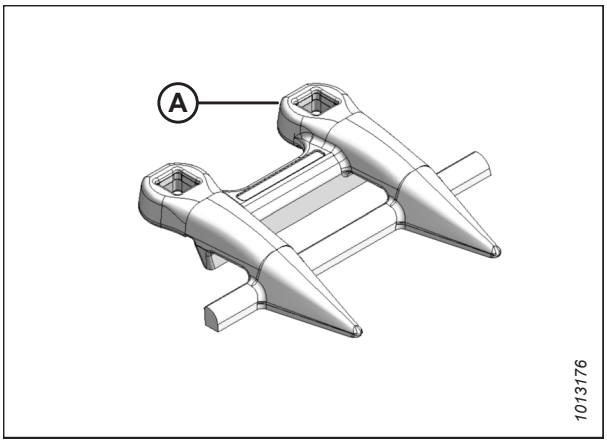


Figure 4.41: Center Hold-Down – Double Knife

1. Remove two nuts (A) and bolts that attach center guard (B) and top guide (C) to cutterbar.
2. Remove guard, top guide, and adjuster bar (D).

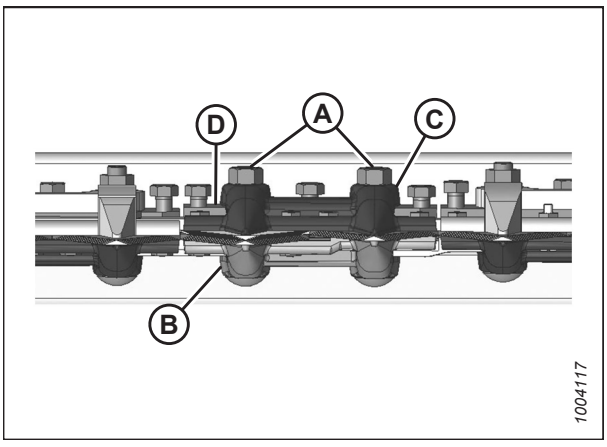


Figure 4.42: Stub Guard Replacement

IMPORTANT:

Ensure center guard (B) has offset cutting surfaces.

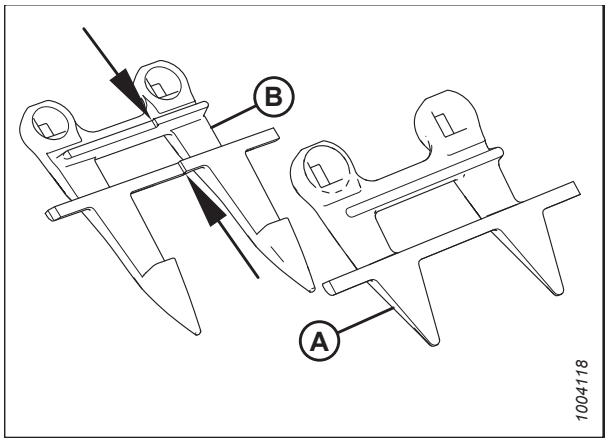


Figure 4.43: Stub Guard Identification

A - Normal Guard **B - Center Guard**

NOTE:

Top guide (C) (which is an inverted stub guard) must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacement is correct part.

IMPORTANT:

Ledger surfaces of center and adjacent guards must be vertically aligned to avoid interference with knife sections.

3. Position replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do **NOT** tighten the hardware.

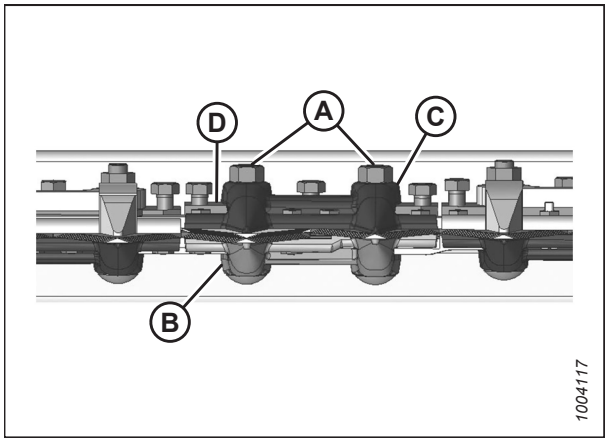


Figure 4.44: Stub Guard Adjustment

4. Check and adjust clearance between hold-down and knife. Refer to *4.8.8 Hold-Downs, page 156*.

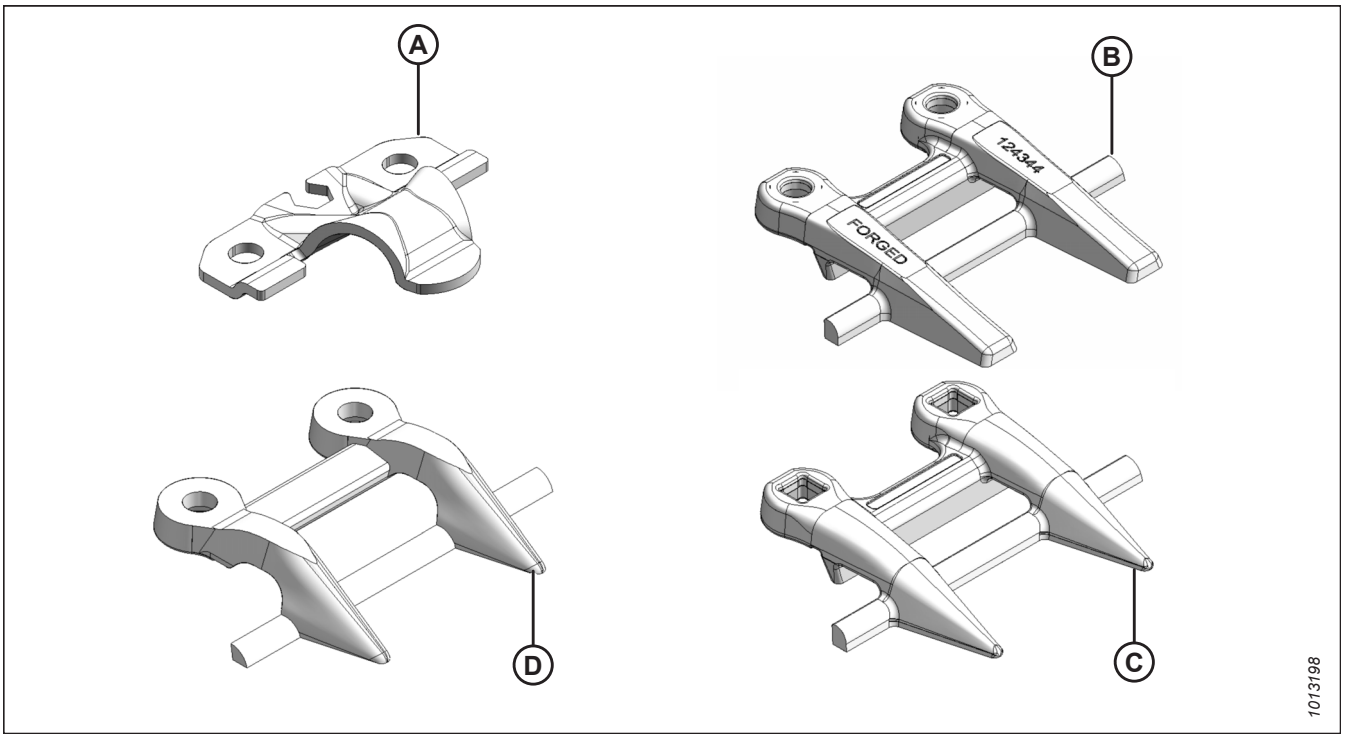
4.8.8 Hold-Downs

Hold-downs (also referred to as guides) keep the knife in contact with the guard cutting surface. It is important to adjust the hold-downs properly.

Hold-downs are designed to accommodate specific guard locations and guard types:

- Center hold-down – Located at the center of the cutterbar on double-knife headers. Allows for knife overlap.
- Standard hold-down – Used at all other locations.

Figure 4.45: Hold-Downs



A - Pointed Standard (MD #118162)
B - Pointed Center Double Knife (MD #124344)
C - Stub Center Double Knife (MD #118346)
D - Stub Standard (MD #034359)

DANGER

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

Check daily that the knife hold-downs are set to prevent the knife sections from lifting off the guards, but still permit the knife to slide without binding.

Adjusting Knife Hold-Down: Center Guard – Double-Knife Header

To adjust the hold-down at the double-knife center pointed guard, follow the recommended adjustment procedure provided here.

1. Torque nuts (A) to 46 Nm (35 lbf·ft).
2. Turn adjuster bolts (B). Using a feeler gauge, the clearance from the hold-down to knife section (C) should be:
   - 0.1–0.4 mm (0.004–0.016 in.) at the guide tip (C)
   - 0.1–1.0 mm (0.004–0.040 in.) at rear of guide (D)
3. Torque nuts (A) to 72 Nm (53 lbf·ft).
4. After adjusting all the hold-downs, run the header at a low engine speed, and listen for noise due to insufficient clearance. An insufficient clearance will cause the knife and the guards to overheat.

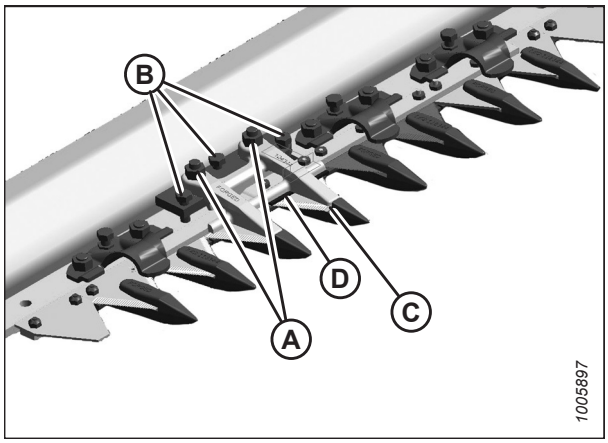


Figure 4.46: Knife Hold-Down – Double Knife

Adjusting Knife Hold-Down: Stub Guard – Double-Knife Header

To adjust the hold-down at the double-knife stub guard, follow the recommended adjustment procedure provided here.

1. Torque nuts (A) to 46 Nm (35 lbf·ft).
2. Turn adjuster bolts (B). Using a feeler gauge, the clearance from the hold-down to the knife section should be:
   - 0.1–0.4 mm (0.004–0.016 in.) at the guide tip (C)
   - 0.1–1.0 mm (0.004–0.040 in.) at rear of guide (D)
3. Torque nuts (A) to 72 Nm (53 lbf·ft).
4. After adjusting all the hold-downs, run the header at a low engine speed, and listen for noise due to insufficient clearance. An insufficient clearance will cause the knife and the guards to overheat.

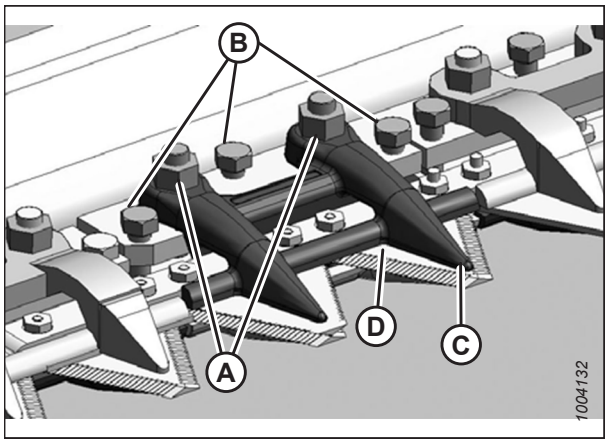


Figure 4.47: Stub Guard – Double Knife

4.8.9 Knife Drive Box

The knife drive box converts rotational motion from the windrower header driveshaft to reciprocating motion for the knife.

Heavy-duty oil bath knife drive box (A) uses tapered roller bearings on the input shaft and the yoke for increased durability. The pulley and drive arm connections are straight splines with clamping bolts.

Check the oil level in knife drive box (A) with the dipstick that is incorporated into breather (B).

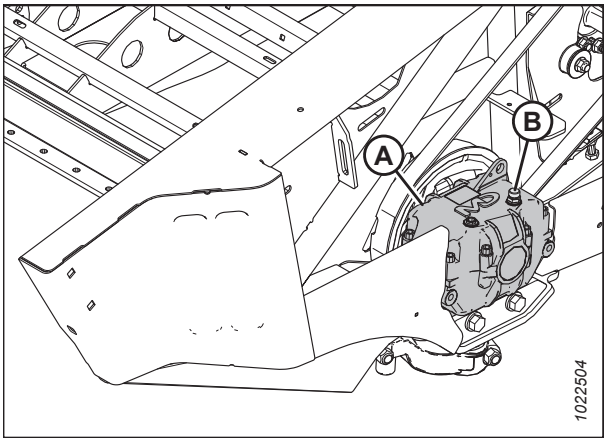


Figure 4.48: Knife Drive Box

Checking Mounting Bolts

The mounting bolts must be checked occasionally to maintain the performance of the header.

DANGER

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

Check the torque of four knife drive box mounting bolts (A) after the first 10 hours of operation, and every 100 hours thereafter. Torque the bolts to 270 Nm (200 lbf·ft). When tightening the bolts, start with the side mounting bolts.

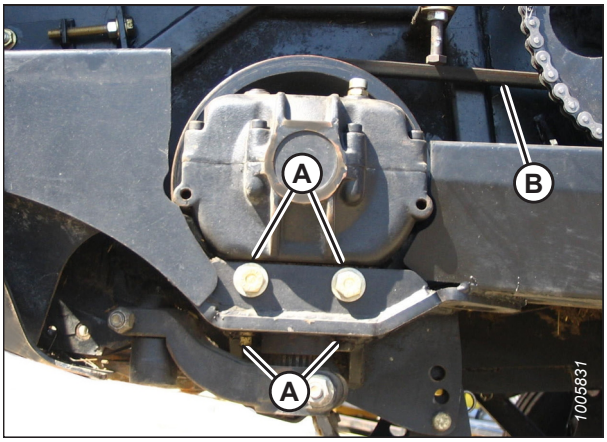


Figure 4.49: Knife Drive Box

Removing Knife Drive Box

The knife drive box may need to be removed for repair.

1. Loosen knife drive belt (A), and slip off the knife drive box pulley. Refer to the following sections:
   - *Checking and Adjusting Left Timing Belt Tension, page 169*
   - *Checking and Adjusting Right Timing Belt Tension, page 172*

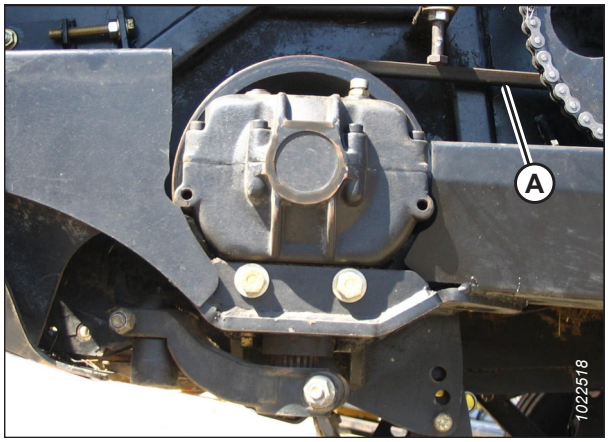


Figure 4.50: Knife Drive Box

2. Stroke the knife to its outer limit.
3. Clean the area around the knifehead.
4. Remove grease fitting (A) from knifehead pin (B).
5. Remove nut and bolt (C).
6. Insert a screwdriver in the groove of pin (B), and pry up on the pin to free the knife.

NOTE:

You do **NOT** have to remove the pin from the arm.

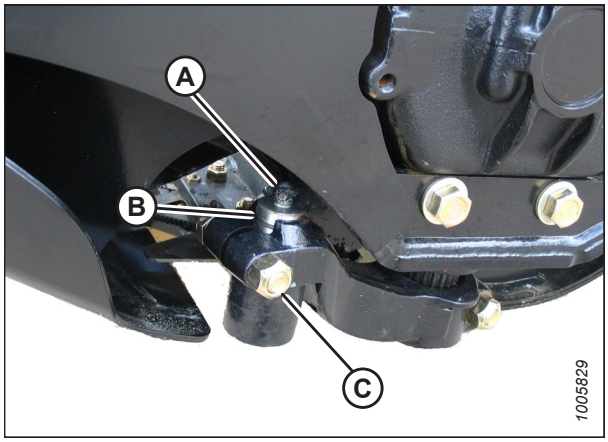


Figure 4.51: Knifehead

7. Remove bolt (A) from the pitman arm.
8. Remove pitman arm (B) from the knife drive box output shaft.

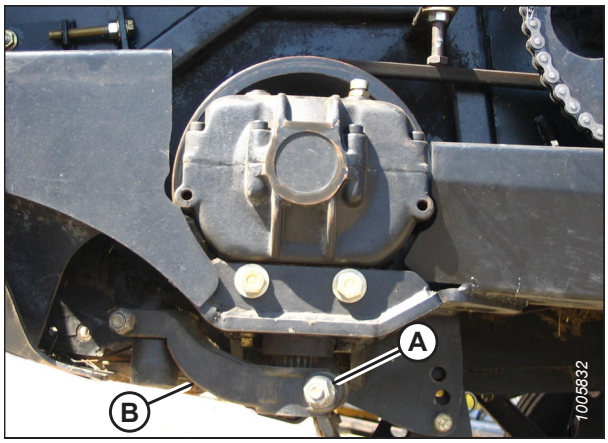


Figure 4.52: Pitman Arm

9. Remove bolts (A) attaching the knife drive box to the frame.
10. Remove the knife drive box.

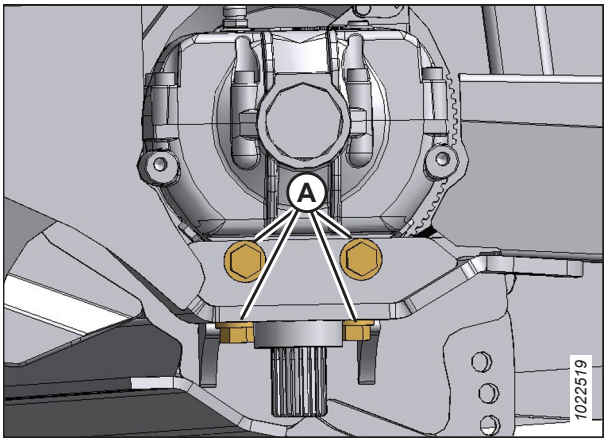


Figure 4.53: Knife Drive Box Bolts

Installing Knife Drive Box

To install a knife drive box, follow the recommended installation procedure provided here.

1. Position the knife drive box as shown, and install four bolts (A). Torque the side bolts, and then torque the bottom bolts to 270 Nm (200 lbf·ft).

   IMPORTANT:

   Use only Grade L9 bolts and flat washers.

2. Apply medium-strength threadlocker (Loctite® 243 or equivalent) in two bands (B) around the shaft as shown, with one band at the end of the shaft, and one band approximately midway.

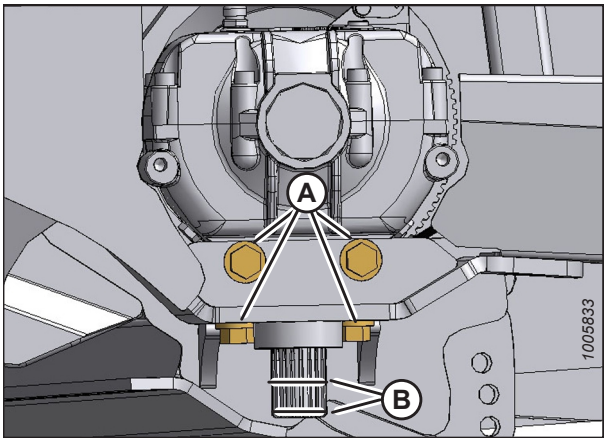


Figure 4.54: Knife Drive Box

3. Slide pitman arm (A) onto the knife drive box output shaft.
4. Rotate the knife drive box pulley to ensure the pitman arm just clears the frame to ensure proper placement on the splines. Remove arm (A), and reposition on the splines as required.
5. Rotate the knife drive box pulley to locate the pitman arm at the furthest outboard position.

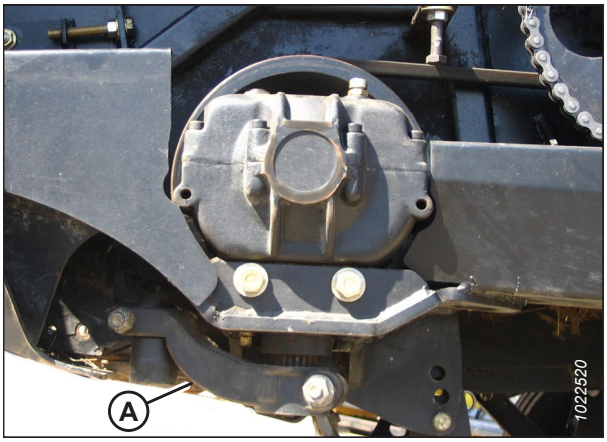


Figure 4.55: Pitman Arm

6. Slide pitman arm (C) up or down on the shaft until it just contacts knifehead (B) (0.25 mm [0.010 in.]) gap.
7. Install bolt (E) and nut, and torque the hardware to 217 Nm (160 lbf·ft).
8. Align knifehead (B) with pitman arm (C).
9. Install knifehead pin (A) in pitman arm (C), and tap it down into the knifehead, ensuring the pin is bottomed out in the knifehead.

   NOTE:

   It may be necessary to temporarily remove the grease fitting from the knifehead during installation of the knifehead pin. This will allow any trapped air to escape and knifehead pin will seat correctly.
10. Tap the underside of the knifehead until the pin is flush with the upper face of the pitman arm (C).
11. Carefully adjust to achieve a 0.25 mm (0.010 in.) gap at (D) with the knife laying flat on the first few guards.
12. Replace bolt (C) and nut.
13. Tighten the nut to 220 Nm (160 lbf·ft).
14. Replace knifehead pin (B).
15. Replace grease fitting (A) in the pin.
16. Install the drive belt onto the knife drive box pulley and tighten it. Refer to the following sections:
    - *Checking and Adjusting Left Timing Belt Tension, page 169*
    - *Checking/Adjusting V-Belt Tension on Left Side, page 167*
    - *Checking and Adjusting Right Timing Belt Tension, page 172*

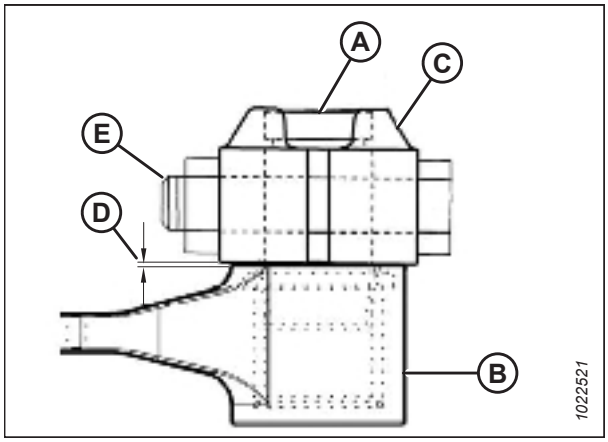


Figure 4.56: Knifehead

A - Knifehead Pin B - Knifehead C - Pitman Arm
D - Gap: 0.25 mm (0.010 in.) E - Bolt

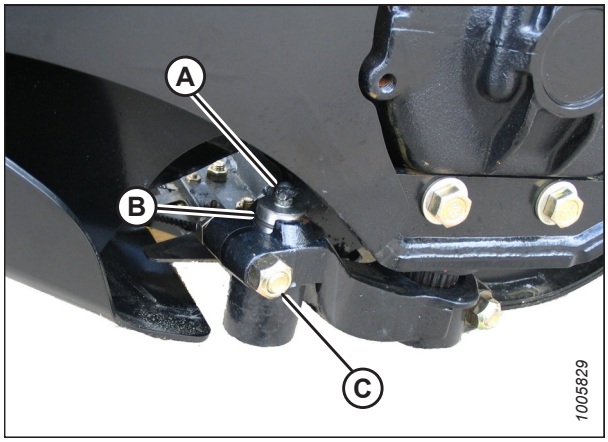


Figure 4.57: Knifehead

Removing Knife Drive Box Pulley

To remove the knife drive box pulley, follow the recommended removal procedure provided here.

1. Remove knife drive box. Refer to *Removing Knife Drive Box, page 160*.
2. Loosen nut and bolt (A) from pulley.
3. Remove pulley using a three-jaw puller.

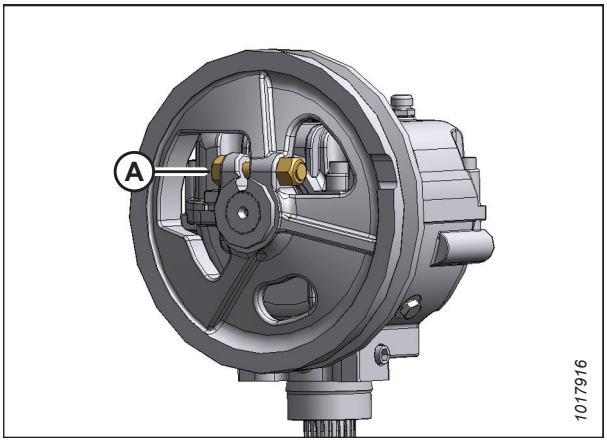


Figure 4.58: Knife Drive Box Pulley

Installing Knife Drive Box Pulley

The knife drive box pulley is driven by the knife drive motor and the knife drive belt.

1. Remove any rust or paint from the inner spline. For replacement parts, remove oil/grease with a degreasing agent.
2. Apply medium-strength threadlocker (Loctite® 243 or equivalent) in two bands around shaft (A), with one band at the end of the spline, and one band approximately midway.
3. Install the pulley on the shaft until it is flush with the end of the shaft, and secure the pulley with bolt (A) and nut. Torque the bolts to 217 Nm (160 lbf·ft).

Figure 4.59: Knife Drive Box

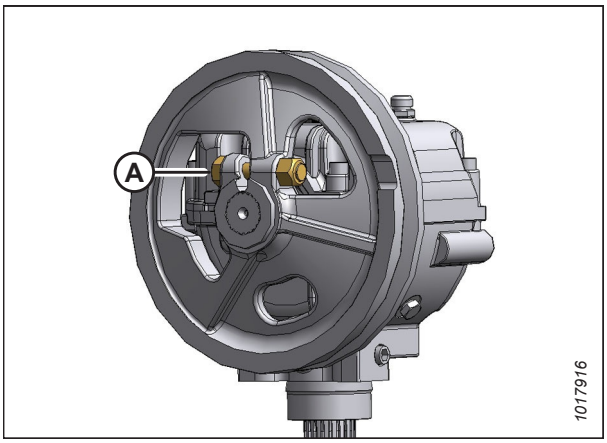


Figure 4.60: Knife Drive Box Pulley

Changing Knife Drive Box Oil

Change knife drive box lubricant after the first 50 hours operation, and every 1000 hours (or 3 years) thereafter.

To change the knife drive box lubricant, follow these steps:

DANGER

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

1. Raise the header, and place a suitable container under the knife drive box drain to collect oil.
2. Engage the safety props.
3. Remove breather/dipstick (A) and drain plug (B), and allow the oil to drain.
4. Replace the drain plug and add oil to the required level. Use gear lubricant, SAE 85W-140, API Service Class GL-5, 2.1 liters (2.2 quarts).
5. Disengage the safety props.

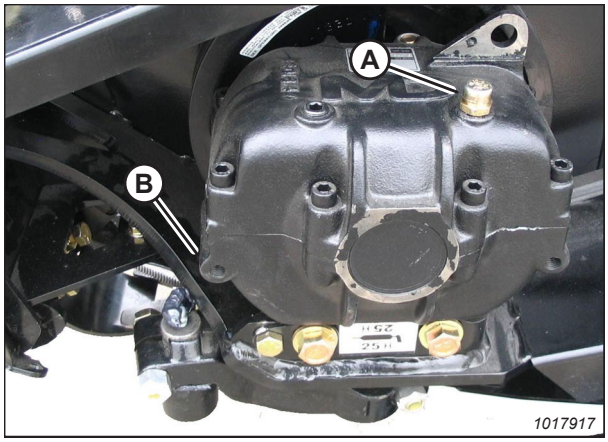


Figure 4.61: Knife Drive Box Breather

4.8.10 Adjusting Knife Timing

Double-knife A40D Auger Headers require that the knives are properly timed to move in opposite directions. Knives moving in the same direction will cause unnecessary vibration.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove right knife drive belt (A), if it is not already removed.

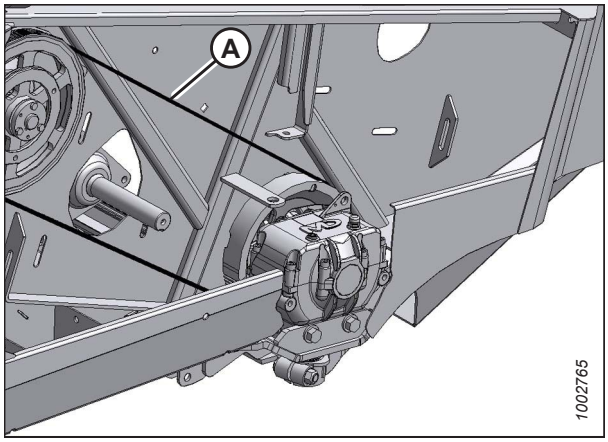


Figure 4.62: Right Knife Drive Belt

3. Rotate the left knife drive box driven pulley (A) clockwise until the left knife is at the center of the inboard stroke (moving towards center of header).

   NOTE:

   Center stroke is when the knife points are centered between guard points.

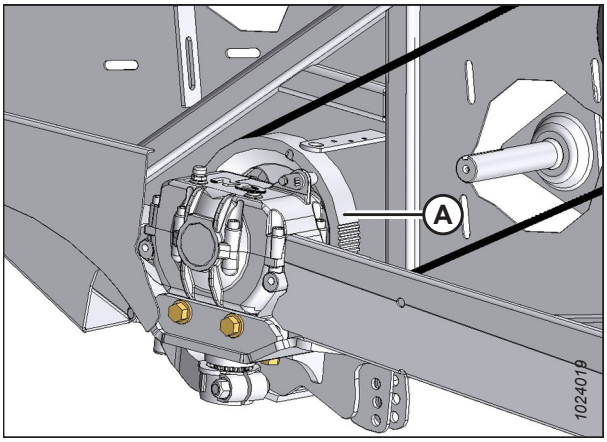


Figure 4.63: Knife Position Adjustment

4. Rotate the right knife drive box pulley counterclockwise until the right knife is at the center of the inboard stroke.

   NOTE:

   Secure the knives to prevent movement when installing the belts.

CAUTION

To maintain timing, the knife drive box driver and driven pulleys must NOT rotate as the belt is tightened.

5. Install the right knife drive box drive belt and tension it.

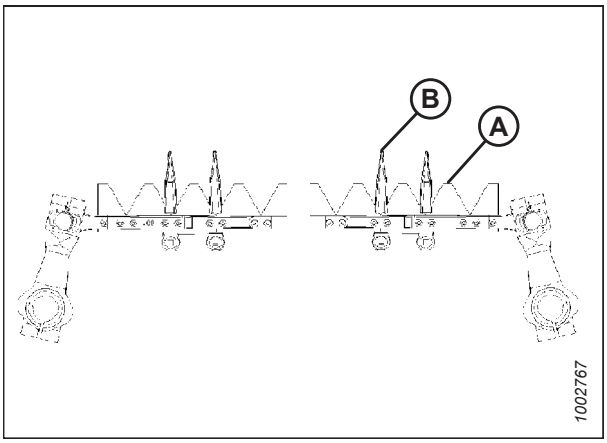


Figure 4.64: Knife Sections Centered Between Knife and Guard Points

A - Knife Point **B - Guard Point**

6. Check that timing belt (A) is properly seated in the grooves on both the driver and the driven pulley on the right, and is tensioned correctly. The belt should be tensioned to a 14 mm (9/16 in.) deflection. This is achieved by applying 22–30 N (5–6.5 lbf) to the belt at midspan.

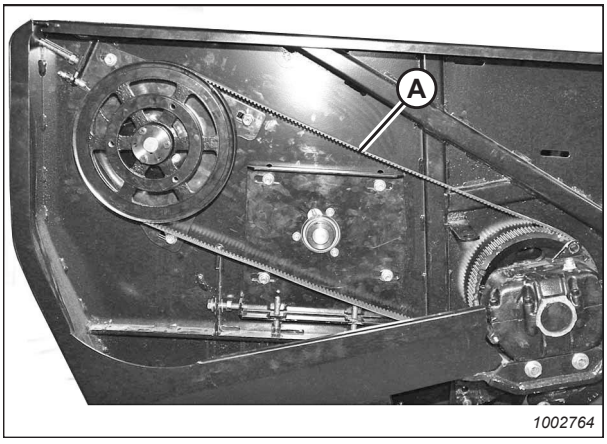


Figure 4.65: Timing Belt – Right Side

7. Check for correct knife timing by rotating driveshaft (A) slowly with unplugging wrench (B), and observe where the knives overlap at the center of the header.

   IMPORTANT:

   The knives must move in opposite directions, and must begin moving at exactly the same time.

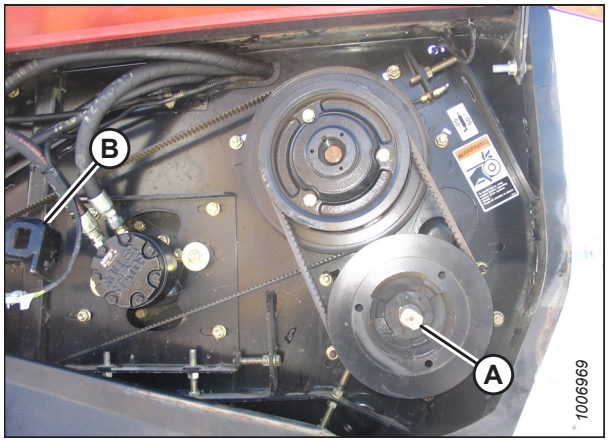


Figure 4.66: Knife Timing

8. If the timing is correct, skip the remaining steps.
9. If the timing is off, loosen the right timing belt sufficiently to allow skipping the belt one or more teeth as required.
   a. **If the right knife LEADS left knife,** rotate right driven pulley (A) clockwise.
   b. **If the right knife LAGS left knife,** rotate right driven pulley (A) counterclockwise.
   c. Tighten the right timing belt.

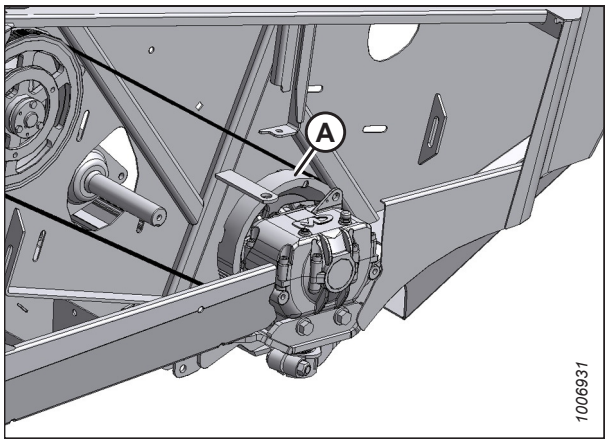


Figure 4.67: Knife Timing

4.9 Header Drive Systems

The A40D/A40DX Auger Headers has three drive systems: the knife drive, the reel drive, and the auger drive.

4.9.1 Header Knife Drive

The A40D and A40DX double-knife headers have a windrower-powered hydraulic motor that drives each knife on the header with two belt-driven knife drive boxes.

Checking/Adjusting V-Belt Tension on Left Side

To check and adjust the V-belt tension on the left side, follow this procedure.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Apply a force of 35–50 N (8–12 lbf) on each belt at midspan (D). The belt should deflect 4 mm (3/16 in.). If necessary, adjust as follows:
   a. Loosen three nuts (A), and the jam nut on adjuster bolt (B).
   b. Turn adjuster bolt (B) to move pulley (C) to achieve the required deflection at (D).
   c. Tighten the jam nut at location (B), and three nuts (A).
4. Close the endshield.

   NOTE:

   Readjust the tension of the new belts after 5 hours of operation.

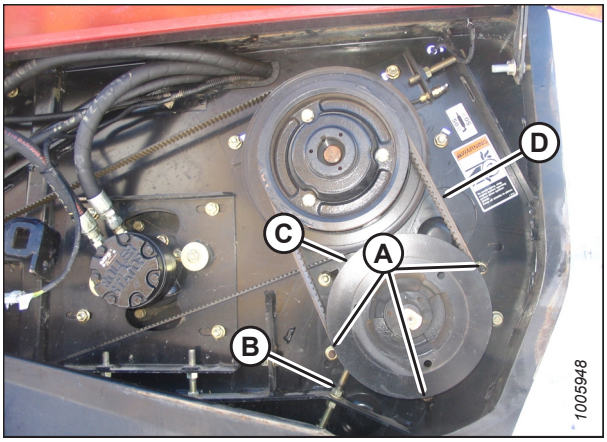


Figure 4.68: Left Side V-Belt

Removing Left V-Belts

To remove the left drive V-belts, follow these steps.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.

3. Loosen three nuts (A) and jam nut on adjuster bolt (B).
4. Turn adjuster bolt (B) so that drive belts (C) can be slipped off pulleys (D) and (E).

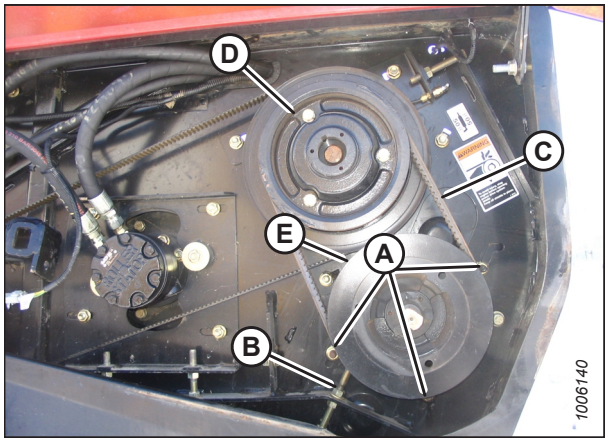


Figure 4.69: Left V-Belt

Installing Double V-Belts

To install the double V-belts, follow these steps.

DANGER

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

IMPORTANT:

Belts are a matched set. Even if only one belt is damaged, replace both drive belts.

NOTE:

When installing the new belt, never pry the belt over the pulley. Fully loosen the adjusting screw, then tension the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Slip belts (A) onto pulleys (B) and (C).

   IMPORTANT:

   To prolong the belt and the drive life, do **NOT** over-tighten the belts.
3. Turn adjuster bolt (D) to move pulley (B) until a force of 35–50 N (8–12 lbf) applied at midspan to each belt deflects each belt (A) 4 mm (3/16 in.).
4. Tighten the jam nut at location (D), and three nuts (E).
5. Close the endshield.

   NOTE:

   Readjust the tension of a new belt after 5 hours of operation.

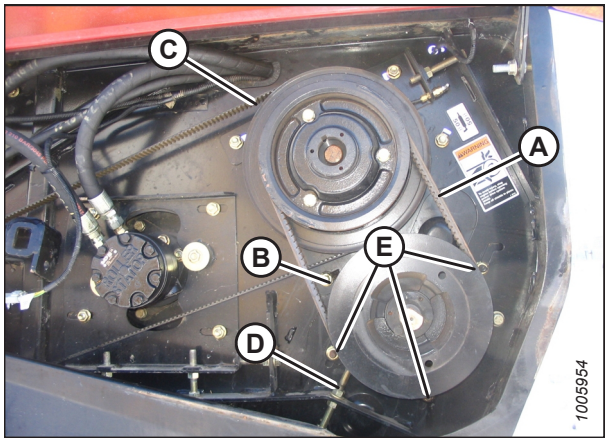


Figure 4.70: Left V-Belt

Checking and Adjusting Left Timing Belt Tension

To check and adjust the tension of the left timing belt, follow these steps.

DANGER

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

IMPORTANT:

To prolong the belt and the drive life, do **NOT** over-tighten belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Apply a force of 22–30 N (5–6.5 lbf) on belt (A) at midspan. The belt should deflect 14 mm (9/16 in.). If necessary, adjust as follows:
   a. Loosen three nuts (B) and the jam nut on adjuster bolt (C).
   b. Turn adjuster bolt (C) to move pulley (D) until the required tension is achieved.
   c. Tighten the jam nut at location (C) and three nuts (B).
4. Close the endshield.

   NOTE:

   Readjust the tension of the new belt after 5 hours of operation.

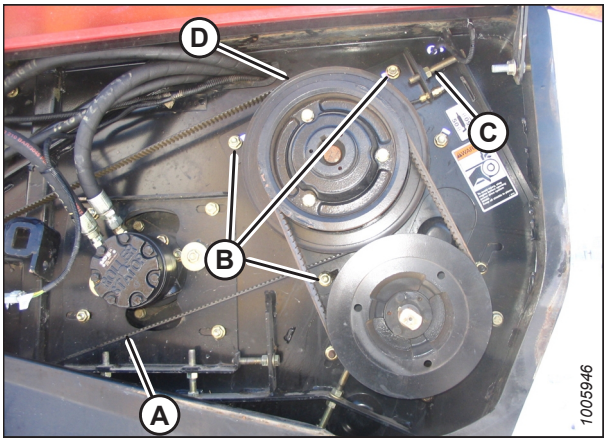


Figure 4.71: Left Timing Belt

Removing Timing Belt from Left Side

To remove the knife drive timing belt from the left side of an auger header, follow these steps.

1. Shut down the engine, and remove the key from the ignition.
2. Open the shield on the header's left side.
3. Loosen three bolts (A) that lock the bottom drive pulley in place.
4. Loosen adjusting bolt (B) to loosen the belts.

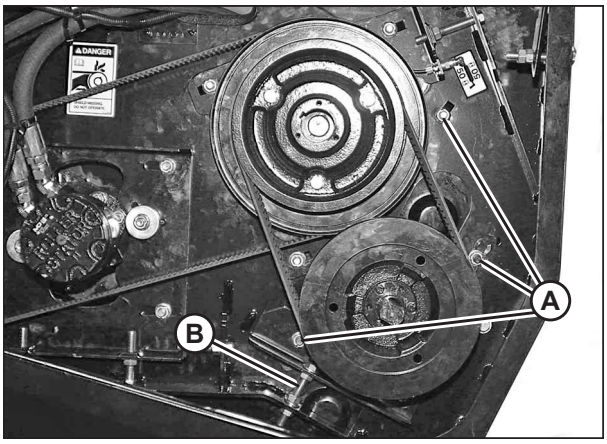


Figure 4.72: Gearbox Locking Bolts

5. Loosen three bolts (A) that lock the pulley in position.
6. Loosen adjusting bolt (B); this will loosen the knife drive belt.
7. Remove the two belts (C) that drive the cross shaft.
8. Remove knife drive timing belt (D) from the rear pulley.

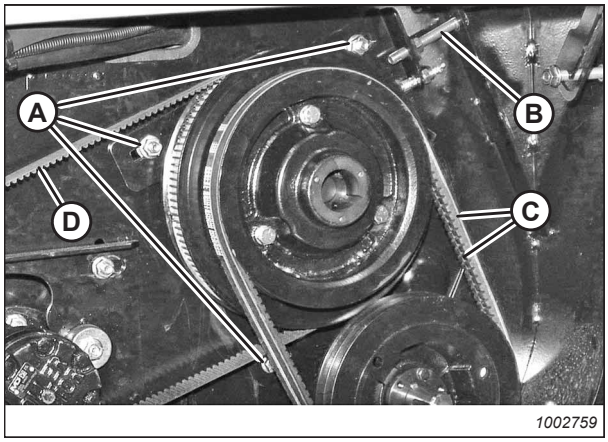


Figure 4.73: Belts Tension Bolts

9. Open the access panel (A) beside the knife drive box. Line up the belt with the notch machined into the knife drive box pulley. Rotate the pulley with the belt in the notch until it is free for removal.

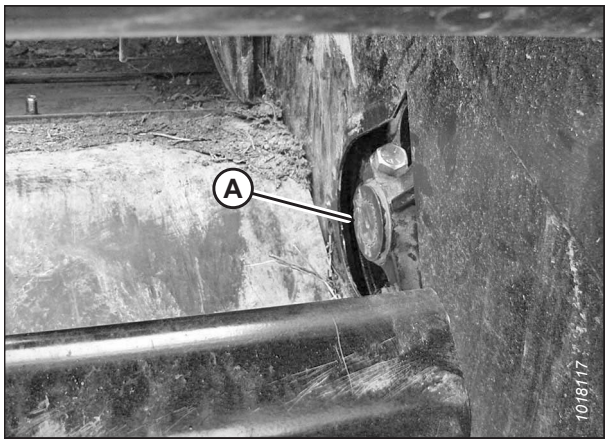


Figure 4.74: Knife Drive Belt Access Panel

NOTE:

Mark the ports and hoses and place port caps or plastic bags with tie wraps to prevent contamination.

10. To completely remove the belt, you will need to remove two hoses (A) off of the auger drive motor, and disconnect knife speed harness (B).

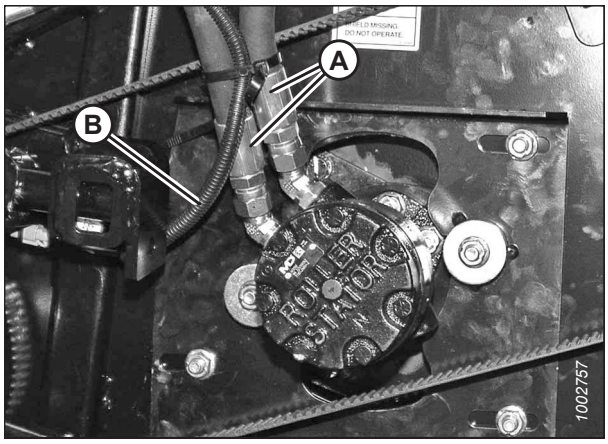


Figure 4.75: Auger Hoses

Installing Left Timing Belt

To install the left timing belt, follow these steps.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Route the knife drive timing belt from the inboard side of the endsheet through opening (A).

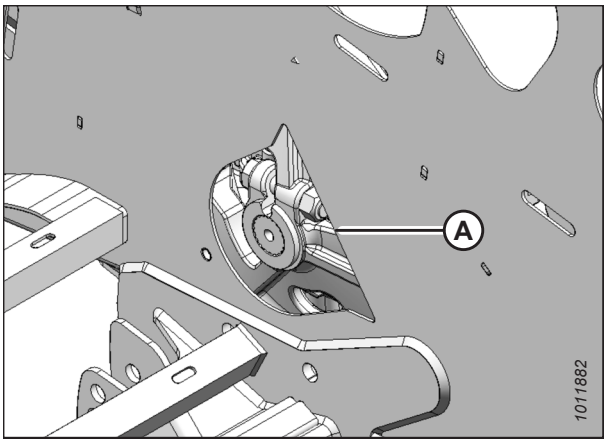


Figure 4.76: Left Inboard Opening

3. Position knife drive belt (A) onto knife drive box pulley (B).
4. Route knife drive belt (A) onto knife drive pulley (C).
5. Turn adjuster bolt (D) to move pulley (C) until a force of 22–30 N (5–6.5 lbf) deflects belt 14 mm (9/16 in.) at knife drive belt midspan (A).

   IMPORTANT:

   To prolong belt and drive life, do **NOT** over-tighten the belts.

   NOTE:

   When installing the new belt, never pry the belt over the pulley. Fully loosen the adjusting screw, then tension belt.

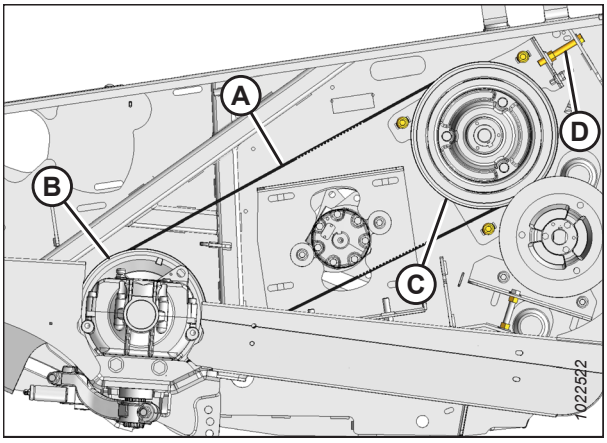


Figure 4.77: Left Timing Belt

6. Tighten adjuster bolt jam nut (A) and three nuts (B) on the knife drive pulley.
7. Reconnect hoses onto hydraulic motor (C).
8. Install the knife drive V-belts. For instructions, refer to *Installing Double V-Belts, page 168*.

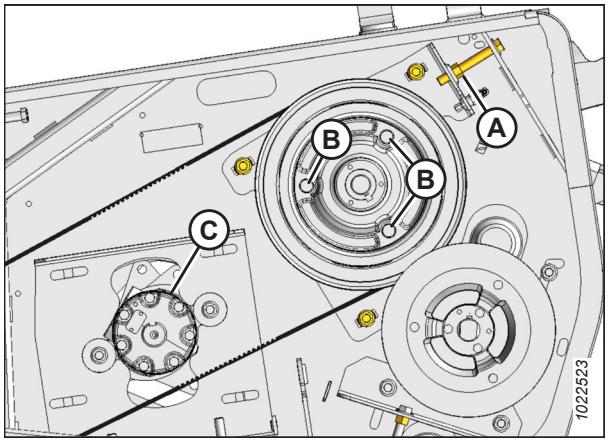


Figure 4.78: Left Timing Belt

9. Install cover (B) in endsheet and secure with bolt (A).
10. Close the endshield.

NOTE:

Readjust the tension of a new belt after 5 hours of operation.

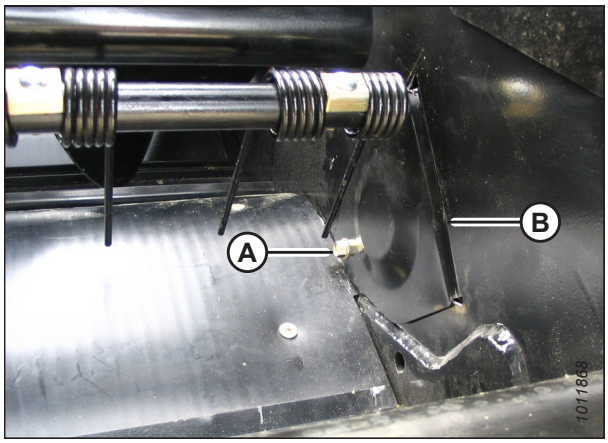


Figure 4.79: Left Inboard Cover

Checking and Adjusting Right Timing Belt Tension

To check and adjust the tension on the right timing belt, follow these steps.

DANGER

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

IMPORTANT:

To prolong the belt and the drive life, do **NOT** over-tighten the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the right endshield.

3. Apply a force of 22–30 N (5–6.5 lbf) on belt (D) at midspan. The belt should deflect 14 mm (9/16 in.). If necessary, adjust as follows:

   a. Loosen three nuts (A) and the jam nut on adjuster bolt (B).

   b. Turn adjuster bolt (B) to move pulley (C) until the required tension is achieved.

   c. Tighten the jam nut at location (B) and three nuts (A).

4. Close the endshield.

   NOTE:

   Readjust the tension of a new belt after 5 hours of operation.

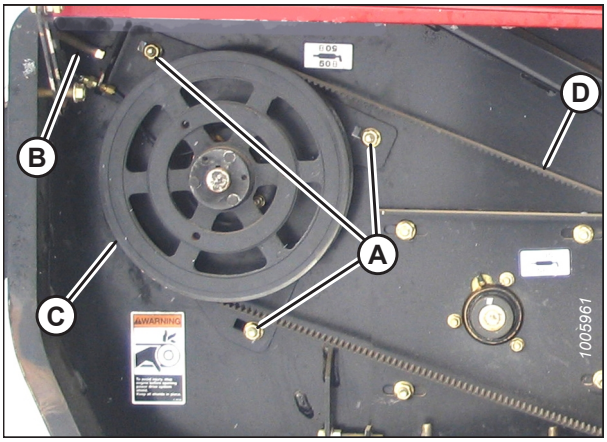


Figure 4.80: Right Timing Belt

Removing Right Timing Belt

To remove the timing belt on the right side of the header, follow these steps.

DANGER

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

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

2. Remove bolt (A) and remove cover (B) in the right endsheet.

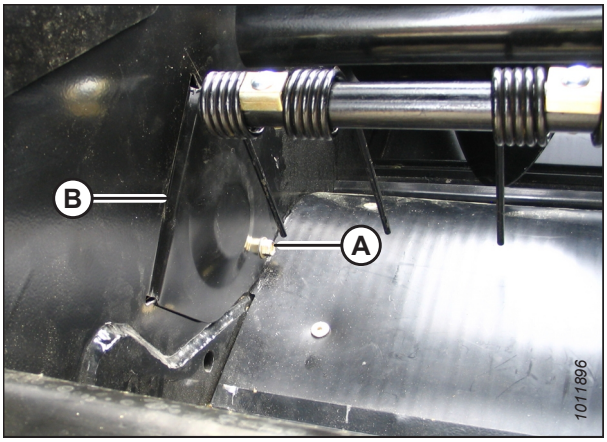


Figure 4.81: Right Inboard Cover

3. Open the right endshield.
4. Loosen three nuts (A), and the jam nut on adjuster bolt (B).
5. Turn adjuster bolt (B) so that knife drive belt (C) can be slipped off pulley (D).
6. Remove belt (C) from pulley (E) and remove the belt through the hole in the endsheet.

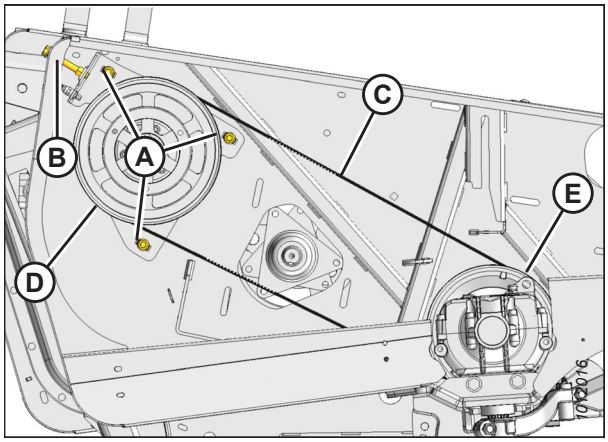


Figure 4.82: Right Timing Belt

Installing Right Timing Belt

To install the timing belt on the right side of the header, follow these steps.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Route the knife drive timing belt from the inboard side of the endsheet through opening (A).

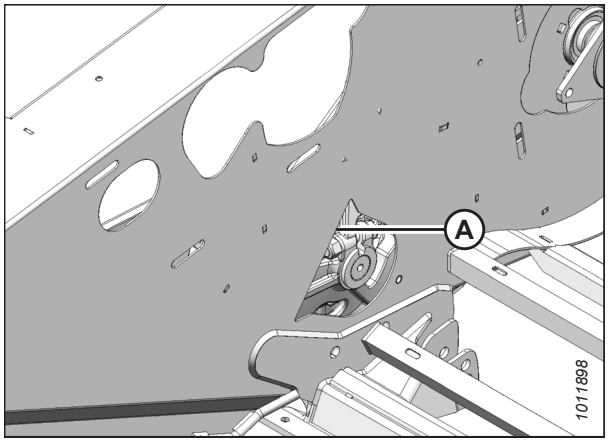


Figure 4.83: Right Inboard Opening

3. Position belt (C) onto knife drive box pulley (E) and knife drive pulley (D) as shown.

   IMPORTANT:

   To prolong the belt and the drive life, do **NOT** over-tighten the belts.

   NOTE:

   When installing the new belt, **NEVER** pry the belt over the pulley. Fully loosen the adjusting screw, then tension the belt.

4. Turn adjuster bolt (B) to move pulley (C) until a force of 22–30 N (5–6.5 lbf) deflects belt (C) 14 mm (9/16 in.) at midspan.

5. Tighten the jam nut at location (B) and three nuts (A).

6. Install cover (B) in endsheet at the knife drive box and secure it with bolt (A).

7. Close the endshield.

   NOTE:

   Readjust the tension of a new belt after 5 hours of operation.

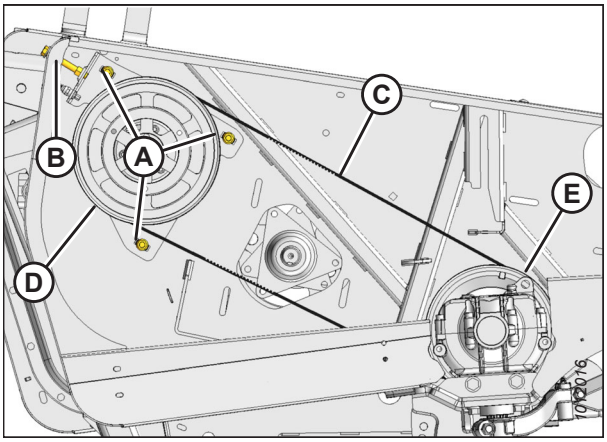


Figure 4.84: Right Timing Belt

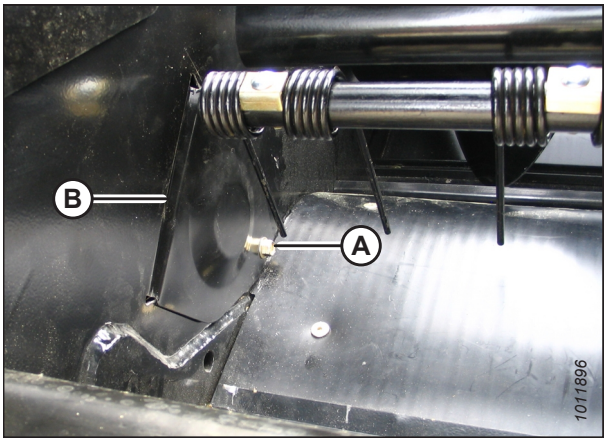


Figure 4.85: Right Inboard Cover

4.9.2 Header Reel Drive

The reel drive gearbox is a sealed, factory-assembled unit on A40D and A40DX Auger Headers. The reel drive gearbox requires no scheduled maintenance, but if service is required, contact your Dealer.

4.9.3 Header Auger Drive

The auger on an A40D and A40DX Header is driven directly from a hydraulic motor that is powered by the windrower hydraulics.

4.10 Reel Tines and Tine Bar Bearings

Separate procedures are required to replace reel tines, depending on their location on the reel.

Refer to the following topics for these procedures:

- *4.10.1 Replacing Tine and Bearing: Cam End – Disc #1, page 176*
- *4.10.2 Replacing Tine and Bearing: Disc #2, page 180*
- *4.10.3 Replacing Tine and Bearing: Center Section X, page 184*
- *4.10.4 Replacing Tine and Bearing: Opposite Cam – Section Y, page 186*
- *4.10.5 Replacing Tine: Tine Bar Extension – Section Z, page 188*

IMPORTANT:

Keep the reel tines in good condition. Straighten or replace the reel tines as required.

4.10.1 Replacing Tine and Bearing: Cam End – Disc #1

Follow the provided procedure to properly replace the tines and bearings at cam-end reel disc sectors.

NOTE:

Apply a light coating of anti-seize compound to the tine tube connections and all bolts prior to reassembly.

Replace the tines and the bearing at disc #1 (A) as follows:

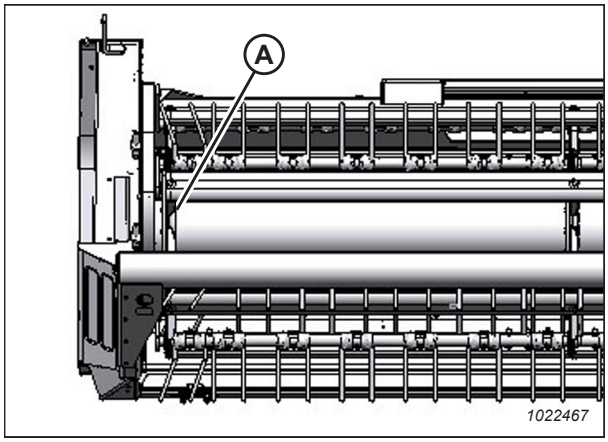


Figure 4.86: Cam End Disc

1. Loosen the bolt on cover (A), and slide the cover to expose the hole in the cam disc. Rotate the reel, and align the bearing with the hole.

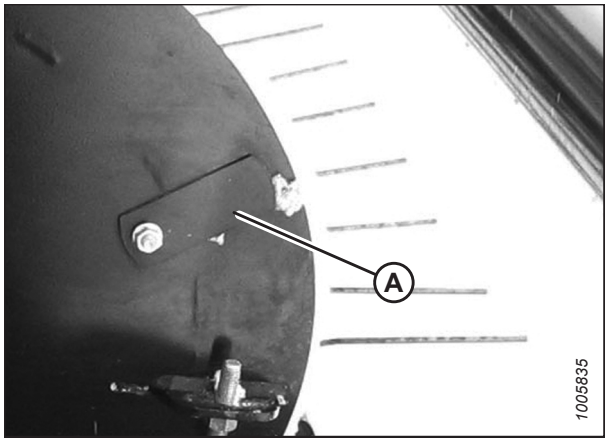


Figure 4.87: Cam Disc

2. Remove cam follower bearing bolt (A), bearing (B), and nut.
3. Disengage cam arm (C) from the cam track with a pry bar.
4. Remove flangette mounting bolts (D).

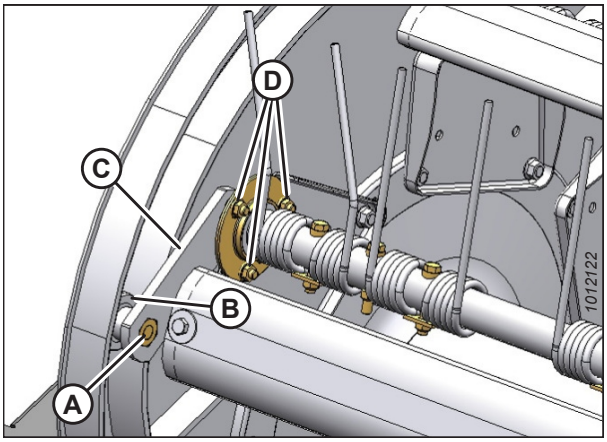


Figure 4.88: Cam Follower

5. Remove nuts (A), keepers (B), and shoulder bolts (C) that connect cam arm (D) and end tines (E) to the tine bar.

   IMPORTANT:

   The tine attachment hardware and the configuration may vary between Tine Bar Type A and Tine Bar Type B. Identify the locations so that the tine hardware will be reinstalled at the same locations. Both Tine Bar Type A and Tine Bar Type B configurations are required to stagger the tines on the reel bat and ensure all of the crop is picked up.

6. Position the end of the tine bar clear of the cam disc, then remove cam arm assembly (D), complete with bearing assembly.

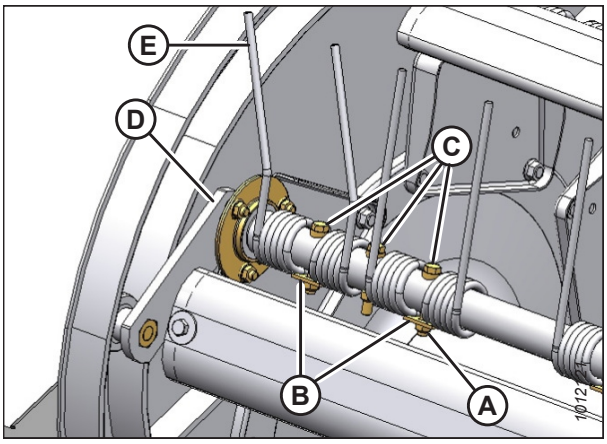


Figure 4.89: Tine Bar Type B

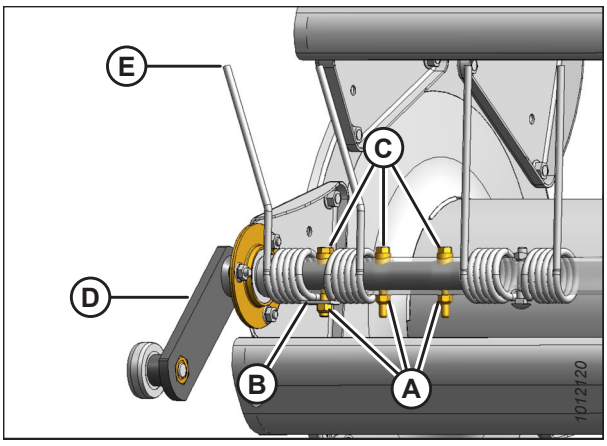


Figure 4.90: Tine Bar Type A

A - Nuts
B - Keepers
C - Shoulder Bolts
D - Cam Arm Assembly
E - End Tines

7. Replace bearing (A). Refer to *4.6.3 Installing Sealed Bearings, page 141*.

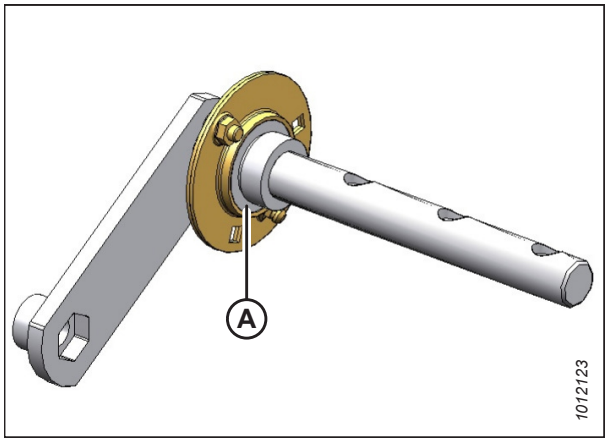


Figure 4.91: Cam Arm Assembly

8. Replace the tines as follows:
   a. Remove bolt (A) and keeper (B) on tine to be replaced.
   b. Remove the bolts and the keepers on the tines as required to facilitate the replacement of the damaged or worn tine.
   c. Slide the tines off the tine bar.
   d. Install the replacement tine on the tine bar and secure with bolt (A) and keeper (B). Install the nut with the flat side against the tine bar.
   e. Slide the remaining tines onto the tine bar and attach them to the tine bar. Do **NOT** install the bolts in the end tines at this time.

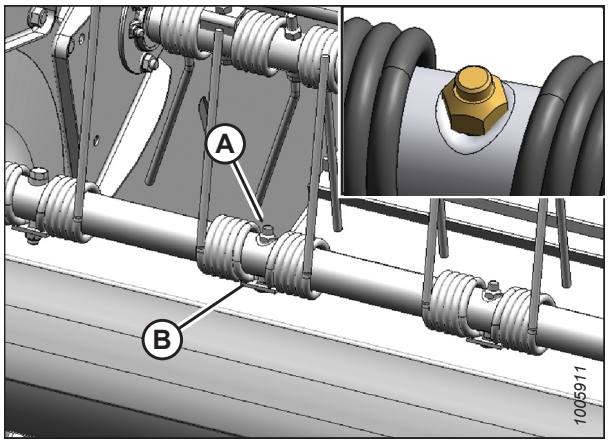


Figure 4.92: Tine Installation

9. Install cam arm assembly (A), complete with bearing onto the tine bar.
10. Engage cam arm (A) into the cam track as shown.
11. Attach bearing flangettes with bolts (B). Tighten the bolts to 31–36 Nm (23–26 lbf·ft).
12. Lock the bearing.

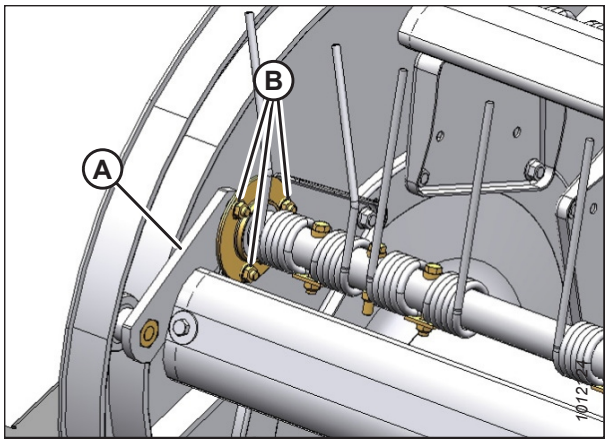


Figure 4.93: Cam End Tine Bar

IMPORTANT:

Replace the hardware at the cam end of the tine bar with the hardware as specified in the following steps.

13. Position the tines as shown and install bolts (A) with the keepers, spacers (B), and nuts (C).
14. Install bolts (D), spacers (B), and nuts (C) between the tines as shown.
15. Alternate the hardware configuration to include both Type A Tine Bar and Type B Tine Bar configurations:
    a. 5/16 x 2 1/2 in. carriage bolt (A)
    b. Spacer (B)
    c. Lock nut (C)
    d. 5/16 x 2 in. hex head bolt (D)

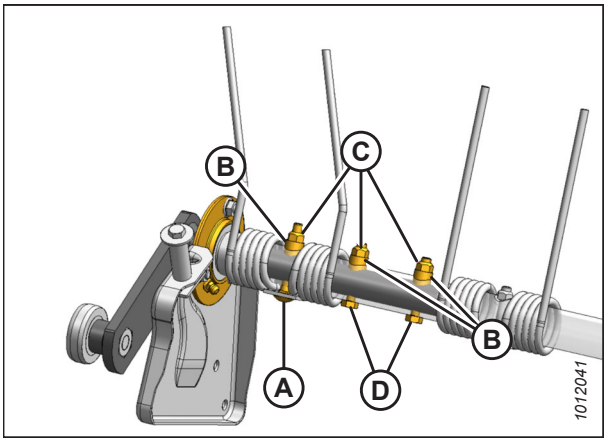


Figure 4.94: Type A Tine Bar

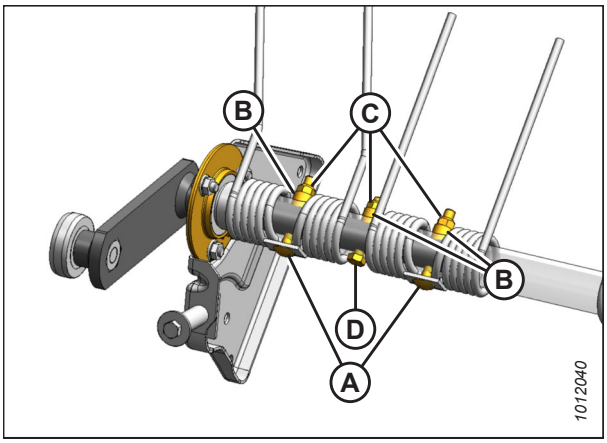


Figure 4.95: Type B Tine Bar

A - Carriage Bolts **B - Spacers**
C - Lock Nuts **D - Hex Head Bolt**

16. Install cam follower bearing (A) with bolt (B). Apply medium-strength threadlocker (Loctite® 262 or equivalent) to the bolt threads, and torque the bolt to 122 Nm (90 lbf·ft).

    IMPORTANT:

    Install the nut with the distorted thread **TOWARDS** the bolt head.

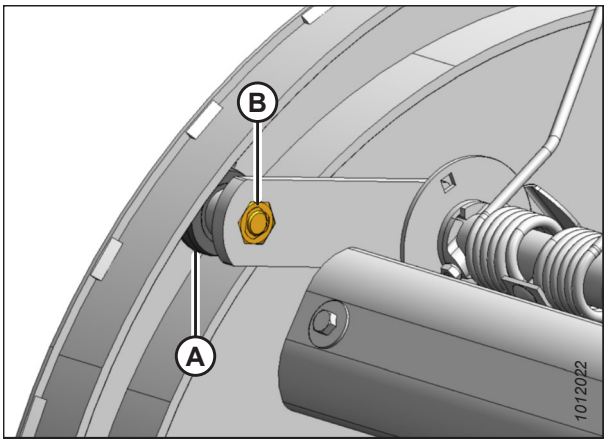


Figure 4.96: Cam Arm Bearing

17. Reposition cover (A) on the cam, and tighten the bolt.

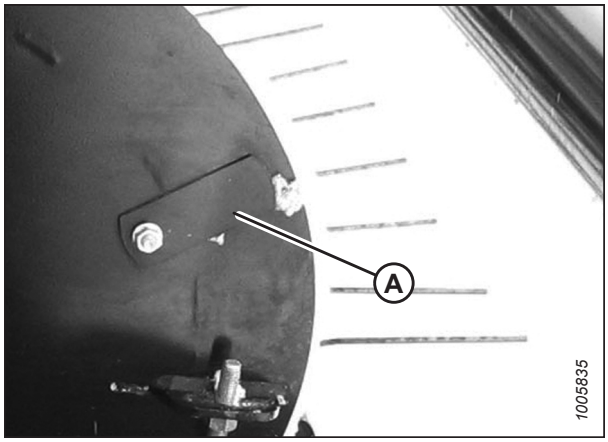


Figure 4.97: Cover

4.10.2 Replacing Tine and Bearing: Disc #2

Follow the provided procedure to properly replace the tines and the bearings at disc #2.

Replace tine and bearing at disc #2 (A) as follows:

The location of disc #2 (A) is shown on the illustration at right.

IMPORTANT:

The tine attachment hardware and configuration may vary between Tine Bar Type A and Tine Bar Type B. Identify the locations so that tine hardware will be reinstalled at the same locations. Both Tine Bar Type A and Tine Bar Type B configurations are required to stagger the tines on the reel bat and ensure all of the crop is picked up.

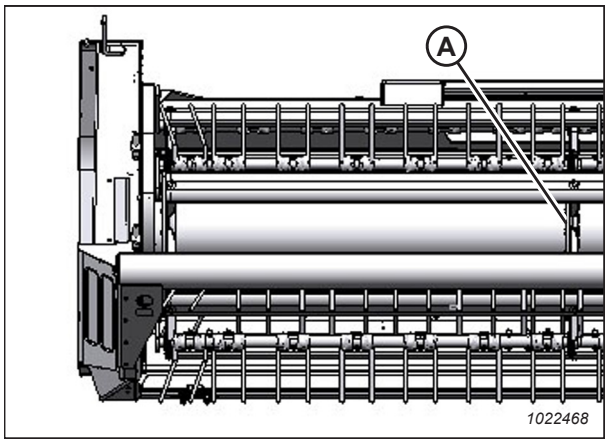


Figure 4.98: Cam End Disc

Type A tine bars

1. Remove flangette mounting bolts (A) at reel disc #2.
2. Remove shoulder bolts (B) and keeper (C) from the tine bar.
3. Separate left tine bar (D) with bearing from center tine bar (E).
4. Remove the tine from center tine bar (E).

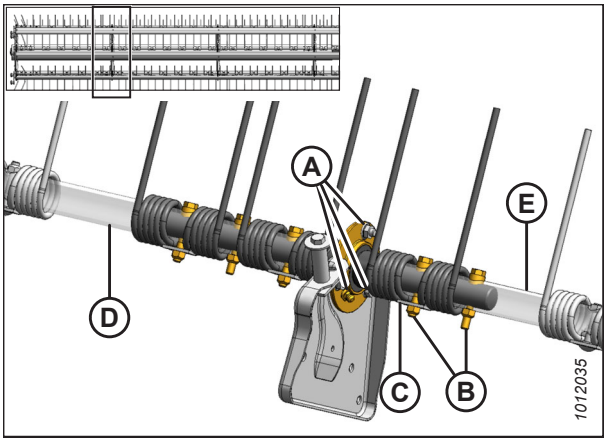


Figure 4.99: Tine Bar Type A

5. Remove bearing (A) from tine bar connecting shaft (B). Refer to *4.6.3 Installing Sealed Bearings, page 141*.
6. Remove nuts (C), shoulder bolts (D), keepers (E) from left tine bar (F) and remove tines (G).

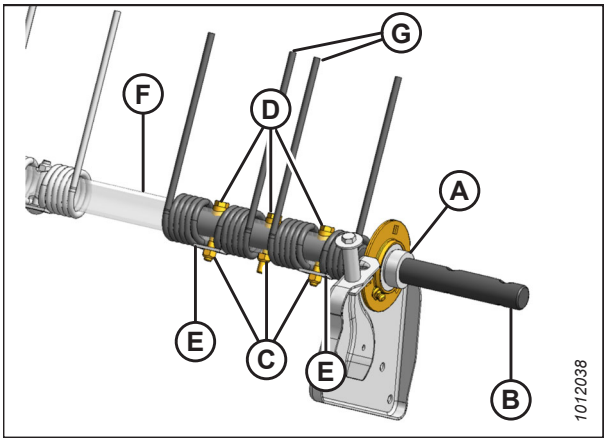


Figure 4.100: Tine Bar Type A

7. Replace the tines as follows:
   a. Remove bolt (A) and keeper (B) on the tine to be replaced.
   b. Remove the bolts and the keepers on the tines as required to facilitate the replacement of the damaged or worn tine.
   c. Slide the tines off the tine bar.
   d. Install the replacement tine on the tine bar and secure it with bolt (A) and keeper (B). Install the nut with the flat side against the tine bar.
   e. Slide the remaining tines onto the tine bar and attach them to the tine bar. Do **NOT** install the bolts in the end tines at this time.

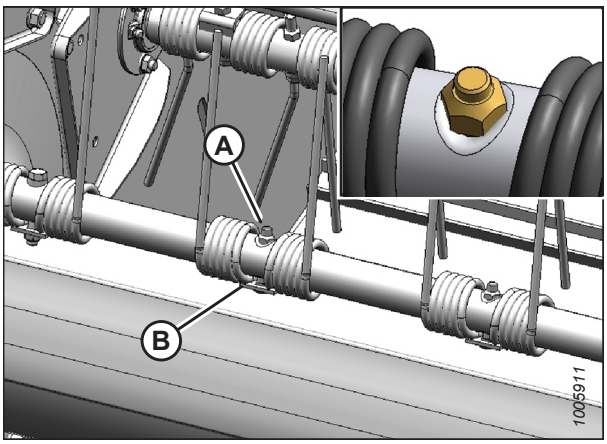


Figure 4.101: Tine Installation

8. Install end tines (G) onto left tine bar (F) with shoulder bolts (D), keepers (E), and nuts (C).
9. Assemble new bearing (A) with flangettes onto connecting shaft (B). Refer to *4.6.3 Installing Sealed Bearings, page 141*.

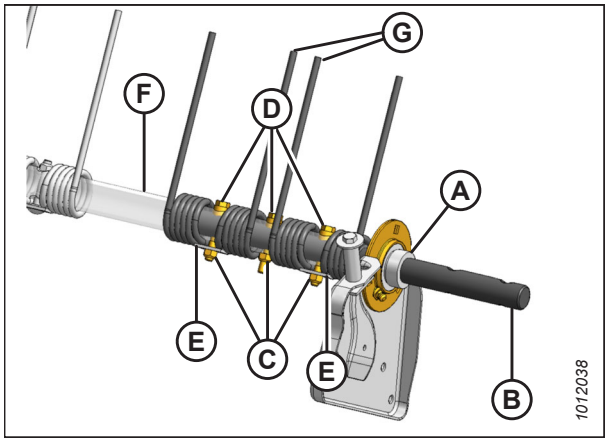


Figure 4.102: Tine Bar Type A

10. Slip the new tine onto center tine bar (E).
11. Assemble left tine bar (D) to center tine bar (E) and secure it with shoulder bolts (B), keeper (C), and nuts.
12. Install the tine bar onto reel disc with hardware (A). Tighten the bolts to 31–36 Nm (23–26 lbf·ft).

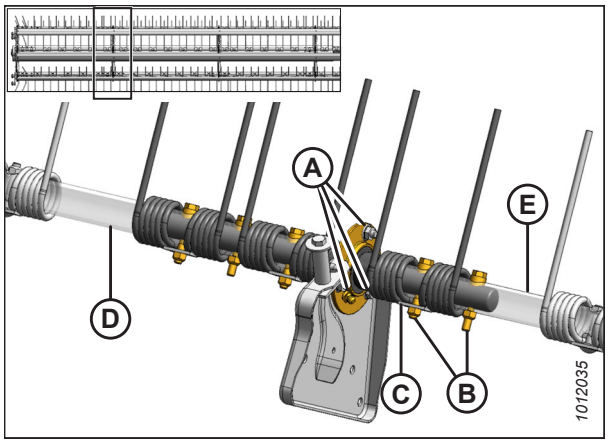


Figure 4.103: Tine Bar Type A

Type B tine bars

13. Remove flangette mounting bolts (A) at reel disc #2.
14. Remove shoulder bolts (B) and keeper (C) from tine bar.
15. Separate left tine bar (D) with bearing from center tine bar (E).
16. Remove the tine from center tine bar (E).

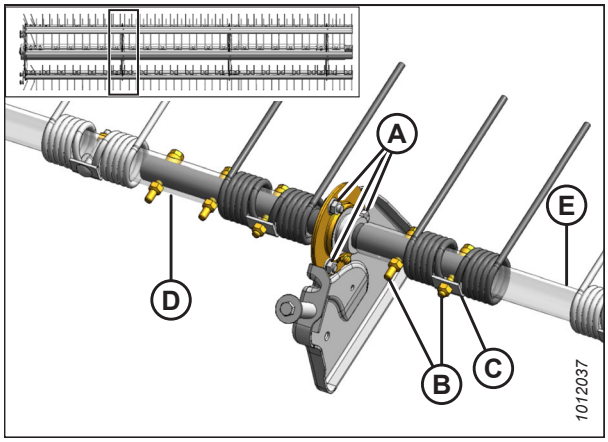


Figure 4.104: Tine Bar Type B

17. Remove bearing (A) from tine bar connecting shaft (B). Refer to *4.6.3 Installing Sealed Bearings, page 141*.

18. Remove nut (C), shoulder bolt (D), and keeper (E) from left tine bar (F) and remove tine (G).

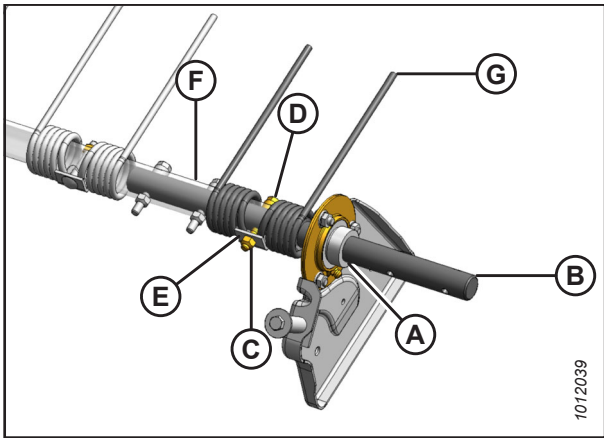


Figure 4.105: Tine Bar Type B

19. Install new tine (G) onto left tine bar (F) with shoulder bolt (D), keeper (E), and nut (C).

20. Assemble new bearing (A) with flangettes onto connecting shaft (B). Refer to *4.6.3 Installing Sealed Bearings, page 141*.

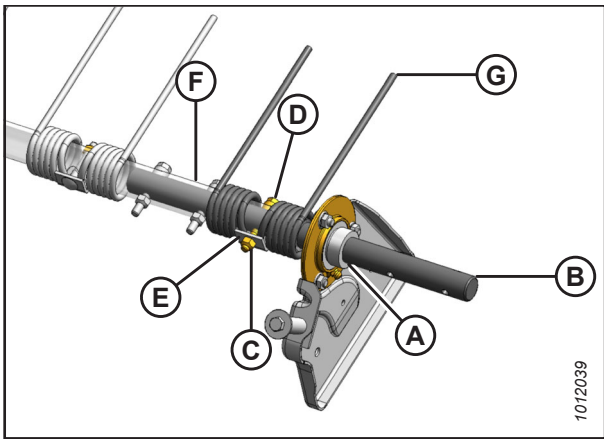


Figure 4.106: Tine Bar Type B

21. Replace the tines as follows:

    a. Remove bolt (A) and keeper (B) on the tine to be replaced.

    b. Remove the bolts and the keepers on the tines as required to facilitate the replacement of the damaged or worn tine.

    c. Slide the tines off the tine bar.

    d. Install the replacement tine on the tine bar and secure it with bolt (A) and keeper (B). Install the nut with the flat side against the tine bar.

    e. Slide the remaining tines onto the tine bar and attach them to tine bar. Do **NOT** install the bolts in the end tines at this time.

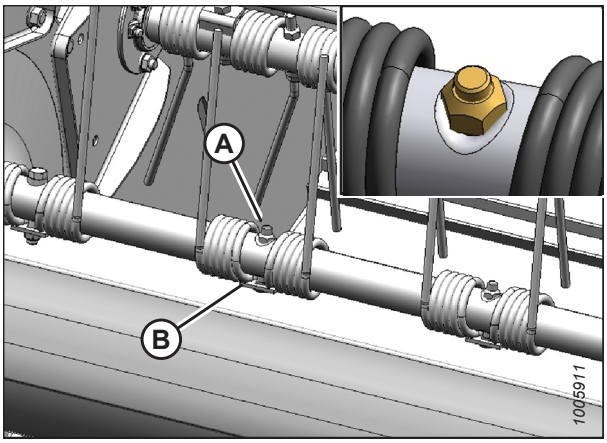


Figure 4.107: Tine Installation

22. Slip the new tine onto center tine bar (E).
23. Assemble left tine bar (D) to center tine bar (E) and secure it with shoulder bolt (B) and nut.
24. Secure the tine onto center tine bar (E) with shoulder bolt (B), keeper (C), and nut.
25. Install the tine bar onto the reel disc with hardware (A). Tighten the bolts to 31–36 Nm (23–26 lbf·ft).

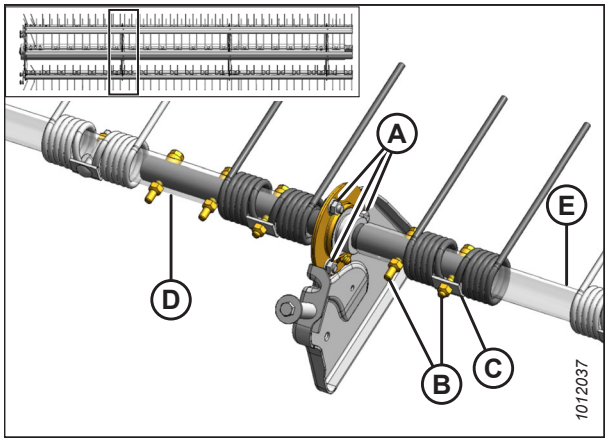


Figure 4.108: Tine Bar Type B

4.10.3 Replacing Tine and Bearing: Center Section X

Follow the provided procedure to properly replace the tines and the bearings at center section **X**.

The location of center section **X** (X) is shown at the illustration at right.

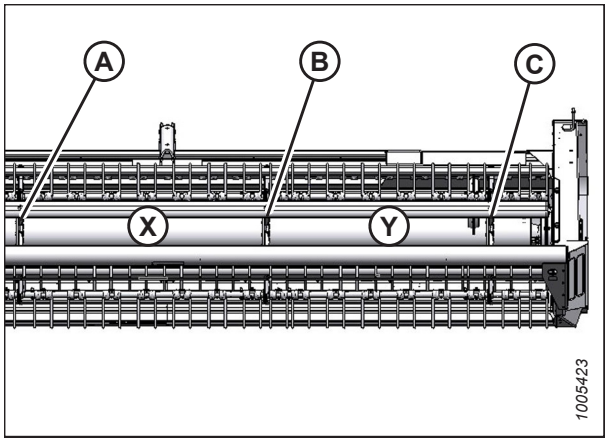


Figure 4.109: Center Section X

A - Disc #2
B - Disc #3
C - Disc #4
X - Section X
Y - Section Y

1. Remove flangette mounting bolts (A) at reel discs #3 and #4.

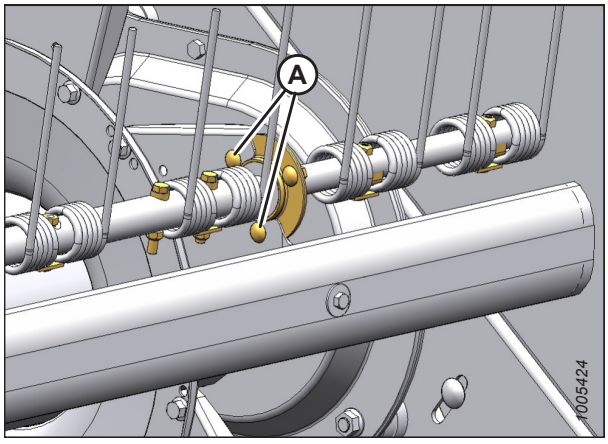


Figure 4.110: Disc #4

2. Remove shoulder bolts (B) and keeper (C) connecting tine bar sections **X** and **Y** at reel disc #3.
3. Lift the tine bar away from the reel arms, and remove complete tine bar section **Y** (including reel bearings at discs #3 and #4).
4. To replace the tine bar bearing, refer to *4.6.3 Installing Sealed Bearings, page 141*.

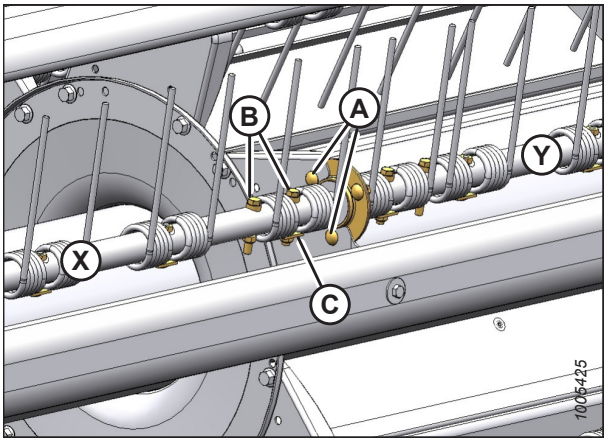


Figure 4.111: Disc #3

A - Flangette Mounting Bolts **B - Shoulder Bolts**
C - Keeper **X - Section X**
Y - Section Y

5. Remove the tine as follows:
   a. Remove bolt (A) and keeper (B) on the tine to be replaced.
   b. Remove the bolts and the keepers on the tines as required to facilitate the replacement of the damaged or worn tine.
   c. Slide the tines off the tine bar.
   d. Install the tines on the tine bar, and secure them with bolts (A) and keepers (B). Install the nut with the tapered side against the tine bar. Do **NOT** install the bolts in the end tines at this time.

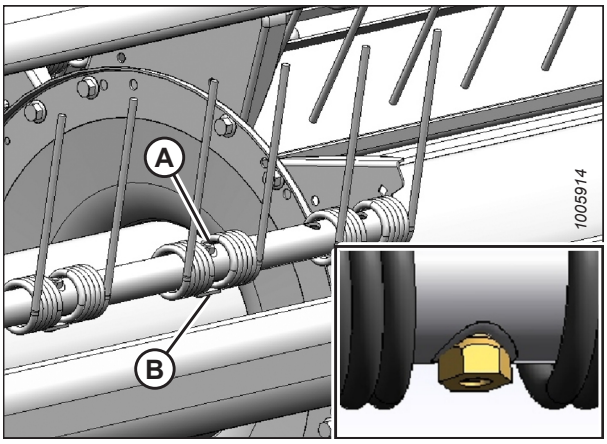


Figure 4.112: Disc #3

6. Assemble tine bar section **Y** (including reel bearings at discs #3 and #4) to tine bar section **X** at reel disc #3.
7. Position the tines as shown, and install shoulder bolts (B) with keeper (C).

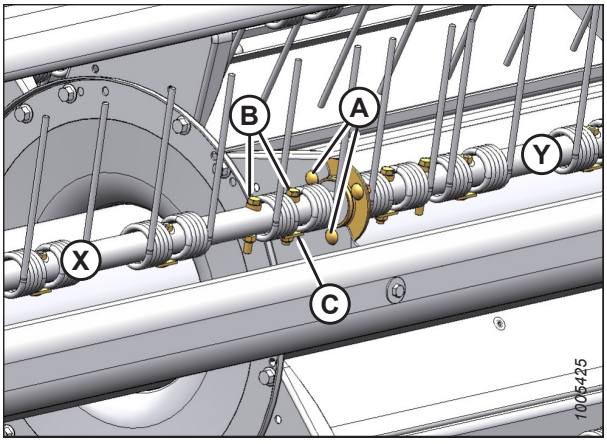


Figure 4.113: Disc #3

A - Flangette Mounting Bolts **B - Shoulder Bolts**
C - Keeper **X - Section X**
Y - Section Y

8. Attach the bearing flangettes to the reel arm at discs #3 and #4 with bolts (A). Tighten the bolts to 31–36 Nm (23–26 lbf·ft).

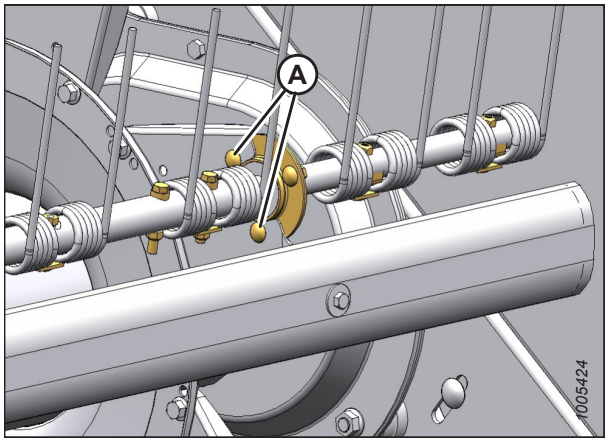


Figure 4.114: Disc #4

4.10.4 Replacing Tine and Bearing: Opposite Cam – Section Y

Follow the provided procedure to properly replace the tines and the bearings on the opposite cam at section **Y**.

The location of center section **Y** (Y) is shown on the illustration at right.

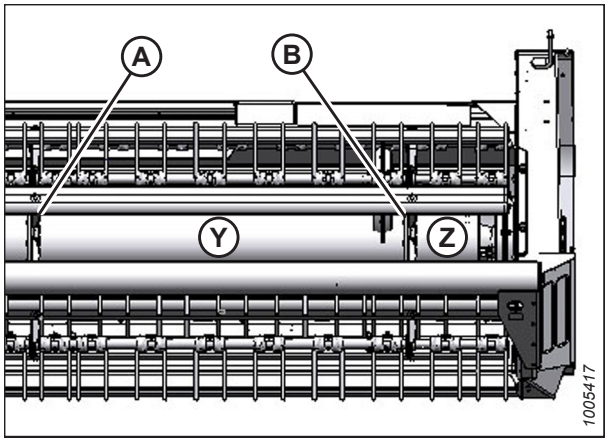


Figure 4.115: Opposite Cam – Section Y

A - Disc #3
B - Disc #4
Y - Section Y
Z - Section Z

1. Remove shoulder bolts (A) and keeper (B) connecting tine bar sections **Z** and **Y** at reel disc #4.
2. Remove flangette mounting bolts (C) at reel disc #4.
3. Lift the tine bar away from the reel arms, and remove complete tine bar section **Z**, complete with the bearing assembly.
4. To replace the tine bar bearing, refer to *4.6.3 Installing Sealed Bearings, page 141*.

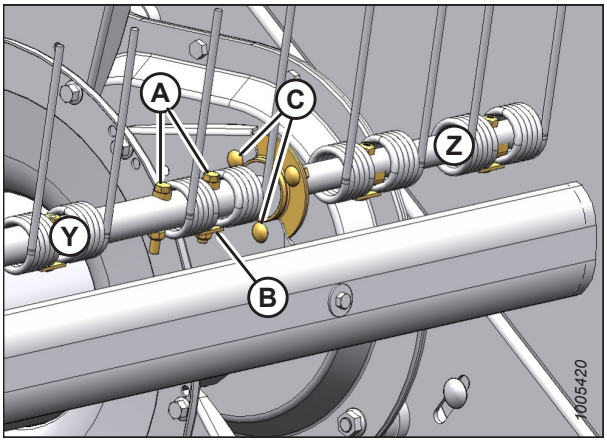


Figure 4.116: Disc #4

A - Shoulder bolts **B - Keeper**
C - Flangette Mounting Bolts **Y - Section Y**
Z - Section Z

5. Replace the tine as follows:
   a. Remove bolt (A) and keeper (B) on the tine to be replaced.
   b. Remove the bolts and the keepers on the tines as required to facilitate the replacement of the damaged or worn tine.
   c. Slide the tines off the tine bar.
   d. Install the tines on the tine bar, and secure them with bolts (A) and keepers (B). Install the nut with tapered side against the tine bar. Do **NOT** install the bolts in the end tines at this time.
6. Install tine bar extension **Z** including bearing to section **Y** at reel disc #4.

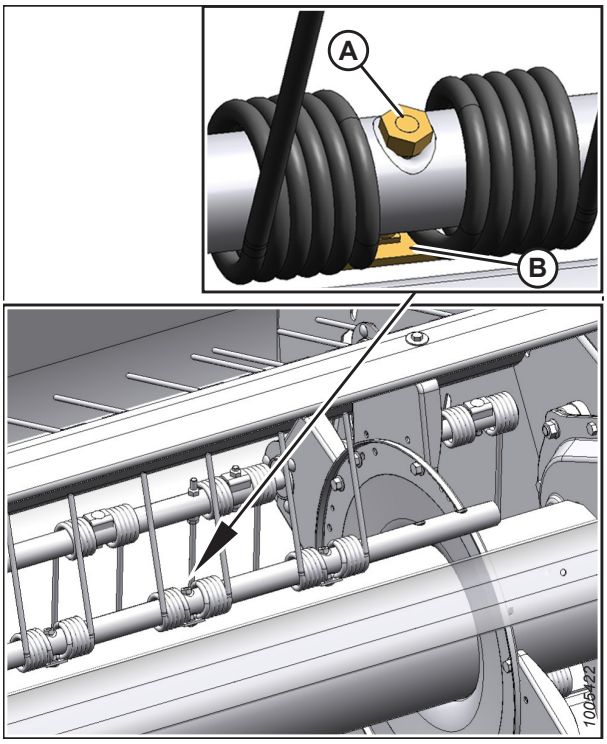


Figure 4.117: Disc #4

A - Bolt **B - Keeper**

7. Install shoulder bolts (A) and keeper (B) with the tine to connect the tine bar extension.
8. Install flangette mounting bolts (C) at reel disc #4. Tighten the bolts to 21–27 Nm (16–20 lbf·ft).

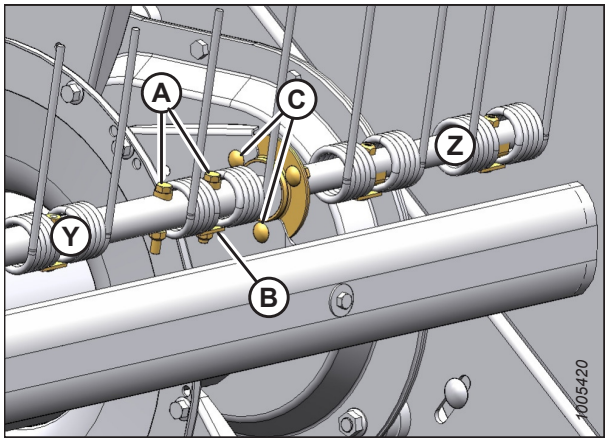


Figure 4.118: Disc #4

A - Shoulder Bolts
B - Keeper
C - Flangette Mounting Bolts
Y - Section Y
Z - Section Z

4.10.5 Replacing Tine: Tine Bar Extension – Section Z

Follow the provided procedure to properly replace the tines and the bearings on the tine bar extension at section **Z**.

The location of center section **Z** (Z) is shown on the illustration at right.

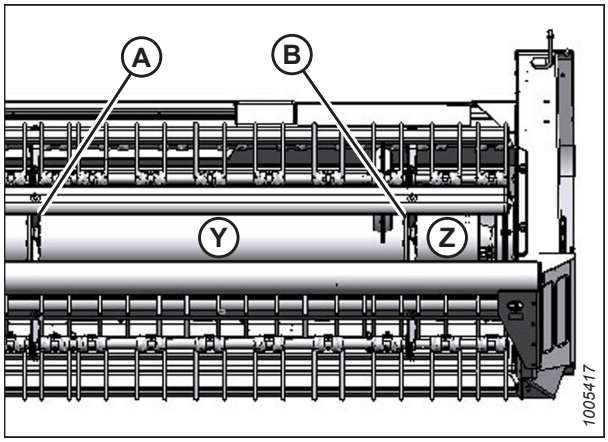


Figure 4.119: Tine Bar Extension – Section Z

A - Disc #3
B - Disc #4
Y - Section Y
Z - Section Z

1. Remove bolt (A) and keepers (B) on the tine to be replaced, and slide the tines off the tine bar.

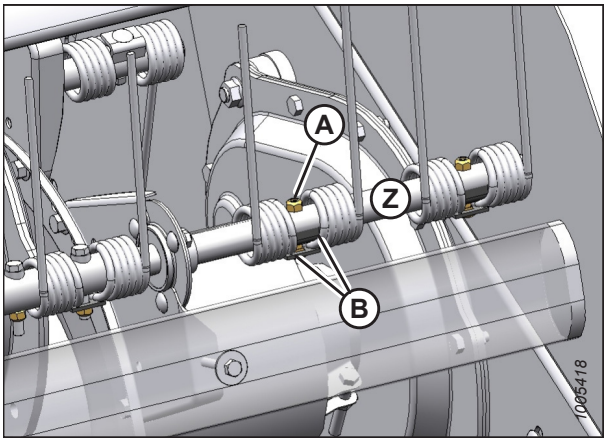


Figure 4.120: Disc #4

A - Bolt **B - Keepers**
Z - Section Z

2. Install the tines on the tine bar, and secure them with bolt (A) and two keepers (B). Tine (C) must be clamped between keepers (B). Install the nut with the flat side against the tine bar extension.

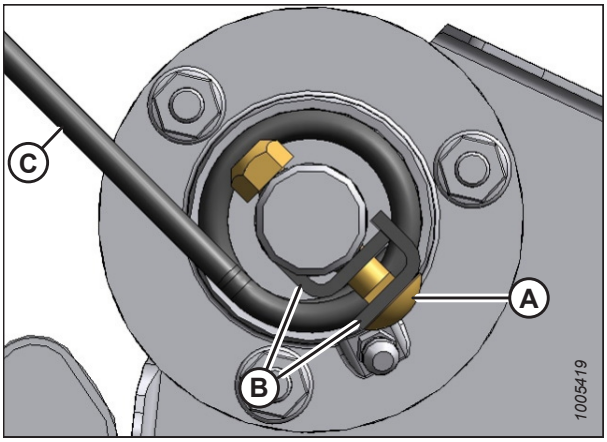


Figure 4.121: End View of Tine Bar

4.11 Straightening Auger Pans

The high density polyethylene auger pans are repairable and replaceable. Refer to your Dealer for details on replacing the pans.

IMPORTANT:

To prolong the life of the auger pan, be sure to check that the reel tines do **NOT** contact the pans when adjusting the reel position or the tine pitch.

Stones and other debris can deform the polyethylene pans. If this occurs, the pans can be straightened.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *4.1 Preparing for Servicing, page 125*, and *1 Safety, page 1*.

1. Heat the deformed area with a heat gun until the polyethylene is almost sticky.
2. Push out the dent, and then apply a cold wet rag. Keep wetting the rag in cold water, and applying it on the area until cool. This ensures the polyethylene retains its shape.

NOTE:

If the dent is too severe, and has stretched the polyethylene, it may be necessary to locally remove the polyethylene. Use a plastic welder to rejoin the material. Replacement pans are also available from your Dealer.

4.12 Replacing Rubber Fingers

Rubber fingers should be replaced if they are missing or damaged.

To replace a rubber finger, follow these steps:

1. Remove nut and bolt (A), and then remove finger (B).
2. Position the new finger in the holder, and then install the bolt and nut. The rubber finger should be free to move after the bolt is tightened.

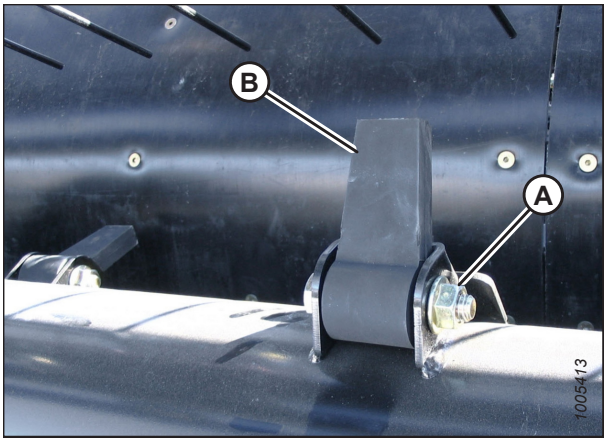


Figure 4.122: Auger Finger

4.13 Stripper Bar

Stripper bars help prevent the crop from wrapping around the auger and improve crop flow into the conditioner.

To maintain 1–4 mm (1/32–5/32 in.) clearance (B) between auger (A) flighting and stripper bars, bars may need replacing due to wear or damage. Shims may also need to be installed to compensate for local irregularities in the structure.

If auger position needs to be adjusted after adjusting stripper bars, refer to *3.8.4 Setting Auger Position, page 79*.

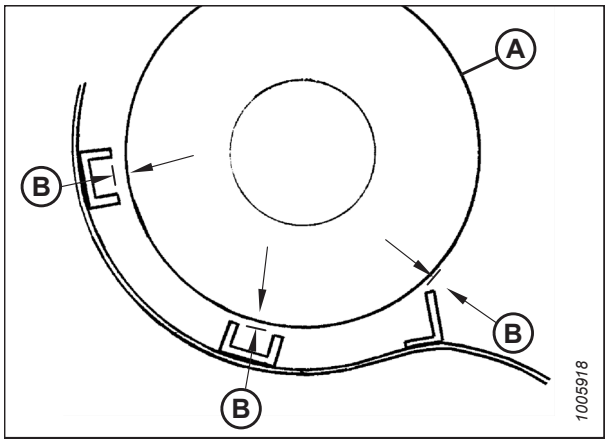


Figure 4.123: Auger to Stripper Bar Clearance

4.13.1 Removing Stripper Bar

Heavy crops may cause plugging across the auger due to restricted flow at the stripper bars. To address this problem, remove the lower stripper bar, and if necessary, the center stripper bar at each end of the header.

The location of lower stripper bar (A) and center stripper bar (B) are shown on the illustration at right.

DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, shut down the engine, remove the key, and engage the safety props before going under the machine.

DANGER

To avoid bodily injury or death from fall of raised machine, always lock-out lift cylinders before going under header for any reason.

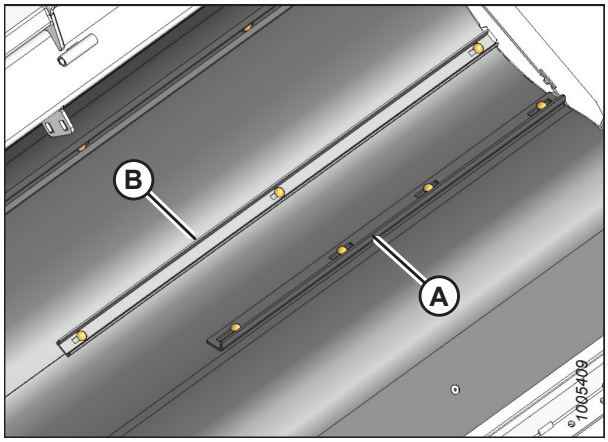


Figure 4.124: Stripper Bars

To remove a stripper bar, follow these steps:

1. Shut down the engine, and remove the key from the ignition.
2. Remove the bolts attaching the stripper bar to the pan.
3. Remove the nuts and bolts that secure the stripper bar to the pan.
4. Replace the bolts in the pan.

NOTE:

Special countersunk bolts are available from your Dealer.

4.13.2 Replacing Stripper Bars

To replace the stripper bars, follow these steps.

DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, shut down the engine, remove the key, and engage the safety props before going under the machine.

1. Remove four nuts and bolts (A) that secure each stripper bar (B) (both left and right side) to the pan, and remove the bars. There are six bars in total.
2. Position new bars (B) on pan as shown, with the upper flange on the front bar facing forward.
3. Install three bolts and nuts (A) in each bar, and torque the hardware to 203 Nm (150 lbf·ft).
4. Check the clearance between the auger and the stripper bars.
5. Loosen bolts (A), and add shims between the stripper bars and pan at bolt locations, as required to obtain clearance as shown.
6. Retighten the bolts to the specified torque.

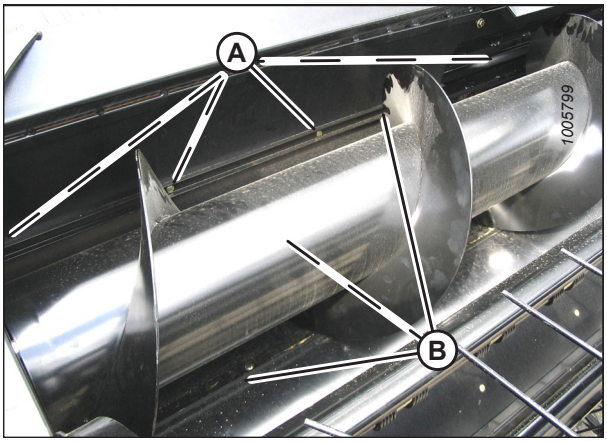


Figure 4.125: Stripper Bars

4.13.3 Installing Front Stripper Bar Extensions

Extensions for the front stripper bar are provided for installation (if required for certain crop conditions), especially in tall crops that cause material to bunch up at the ends of the conditioner rolls.

Stripper bar extensions will allow the auger to carry the crop more towards the center, rather than prematurely feeding it to the conditioner.

DANGER

To avoid bodily injury or death from the unexpected start-up or fall of a raised machine, shut down the engine, remove the key, and engage the safety props before going under the machine.

To install the front stripper bar extensions, follow these steps:

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

2. Raise the header, and engage the safety props.

3. Remove the nuts and carriage bolts (A) securing two extensions (B) to the underside of the header pan support. Retain the hardware for reinstallation.

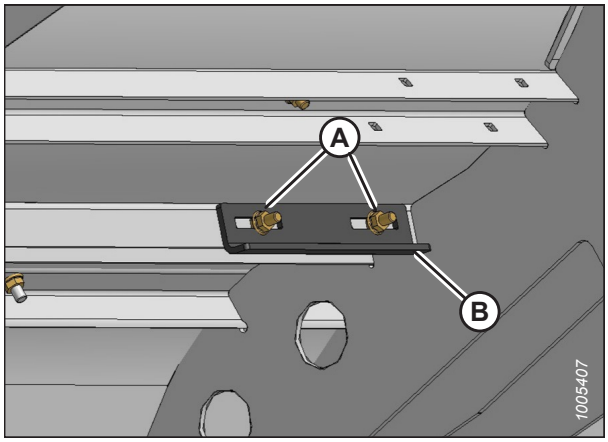


Figure 4.126: Stripper Bar Extension

4. Position extension (A) at the inboard end of the front stripper bars, and mark the locations of the two holes onto the pan.

5. Drill two 8 mm (5/16 in.) holes at these locations.

6. Install extension (A) with carriage bolts (C) retained from Step *3, page 194*.

7. Repeat the steps above for the other extension.

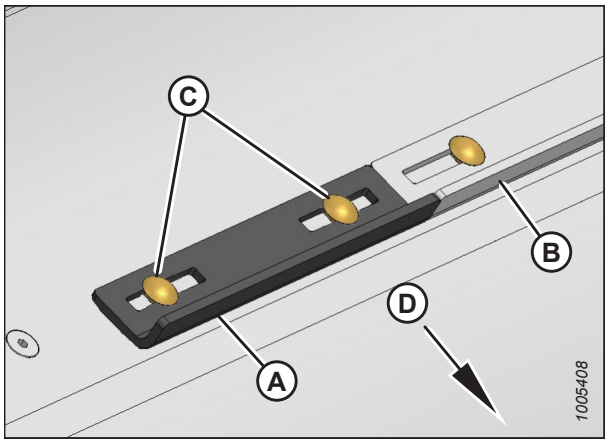


Figure 4.127: Stripper Bar Extension

A - Stripper Bar Extension
B - Stripper Bar
C - Carriage Bolts
D - Forward

4.14 Conditioner

Conditioner rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture, resulting in faster crop drying times.

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *4.1 Preparing for Servicing, page 125*.

4.14.1 Changing Gearbox Oil

Change the oil in the gearbox to maintain proper operation of the system.

DANGER

To avoid bodily injury or death from the unexpected startup of the machine, always shut down the engine and remove the key from the ignition before leaving the operator's seat for any reason.

NOTE:

Change the conditioner drive gearbox lubricant after the first 50 hours of operation, and every 1000 hours (or 3 years) thereafter.

To change the oil in the conditioner gearbox, follow these steps:

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Open driveshield (A). For instructions, refer to *4.2 Opening/Closing Driveshield, page 126*.

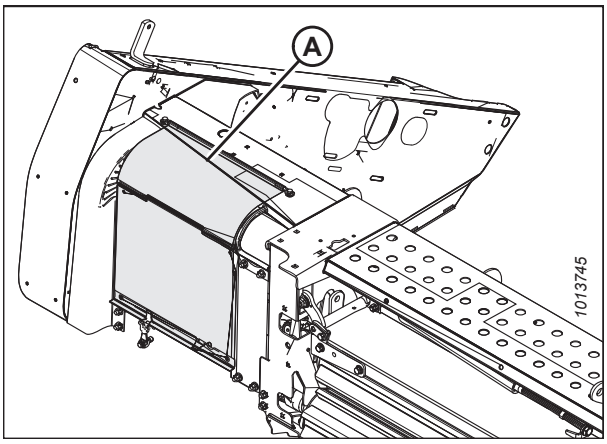


Figure 4.128: Driveshield

4. Place a suitable container under the gearbox drain to collect the oil.
5. Remove breather (A) and check plug (B).

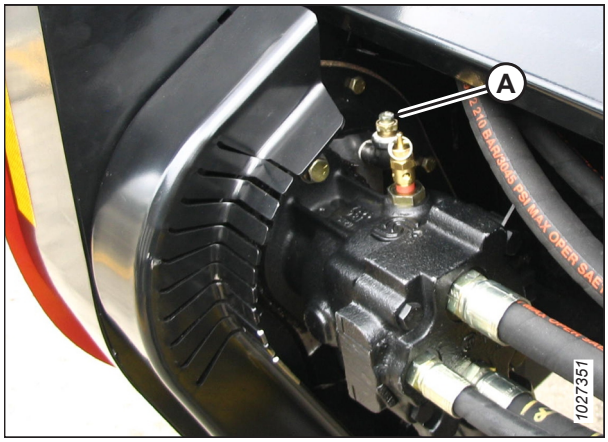


Figure 4.129: Gearbox Breather

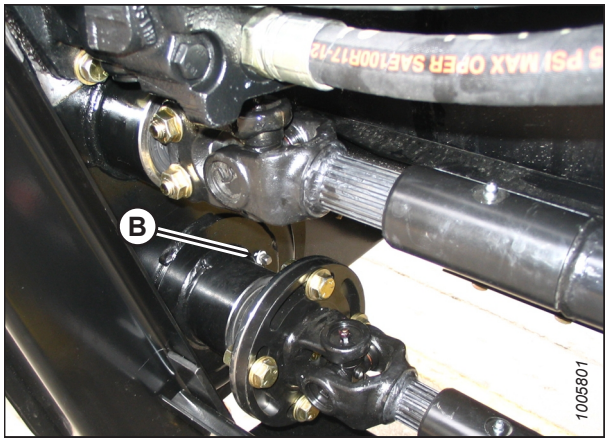


Figure 4.130: Check Plug

6. Remove drain plug (A) and allow the oil to drain. Replace the drain plug once the oil has drained.

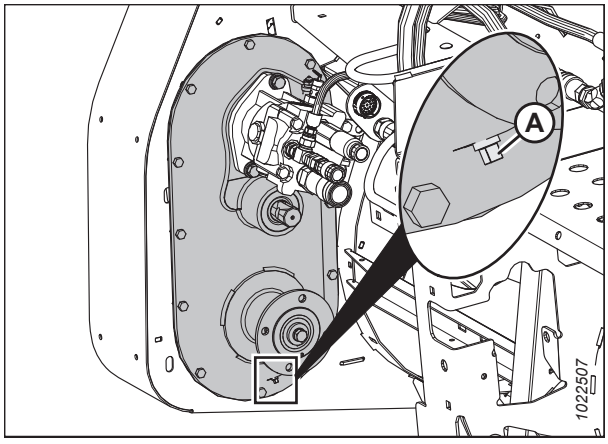


Figure 4.131: Gearbox Drain

7. Add oil at (A) to the required level. Refer to the inside back cover for the recommended lubricant.

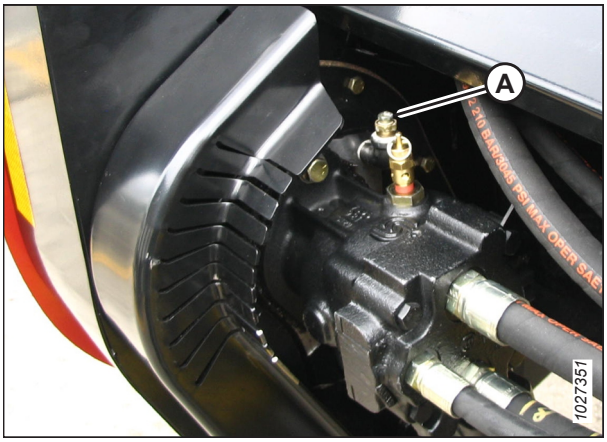


Figure 4.132: Gearbox Breather

NOTE:

The oil is at the required level when it runs out of check plug (B).

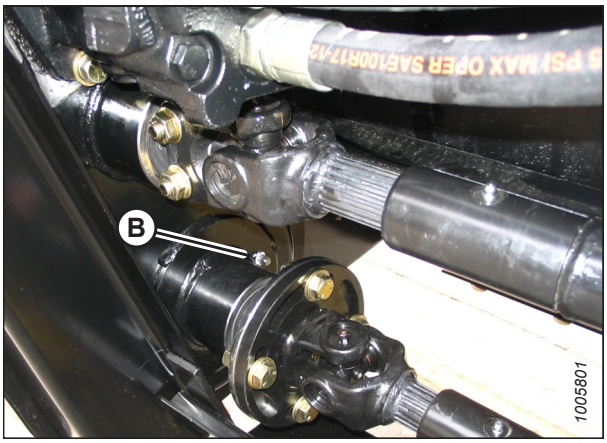


Figure 4.133: Check Plug

4.14.2 Removing Forming Shield

Follow the provided procedure to remove the forming shield.

DANGER

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

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

2. Remove hairpins (B), and the washers that secure straps (A) to the frame.
3. Hold onto the forming shield, and slip the straps off the pins. Lower the forming shield to the ground.

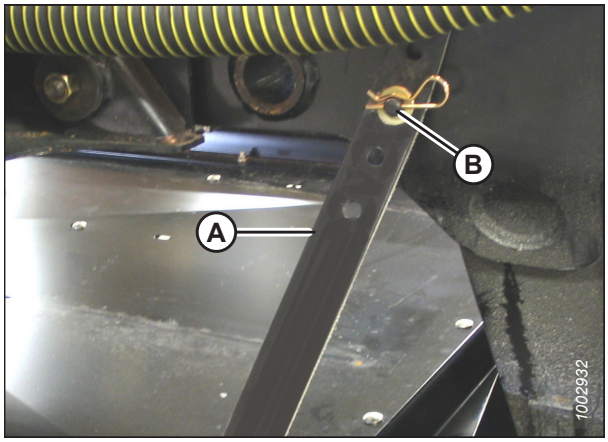


Figure 4.134: Forming Shield Straps

4. Remove two clevis pins (B) from the forward end of the forming shield.
5. Lift the forming shield off bolts (A) in the windrower legs, and lower it to the ground. Replace the clevis pins in the forming shield.
6. Slide the forming shield out from under the windrower, or drive the windrower away from the forming shield.

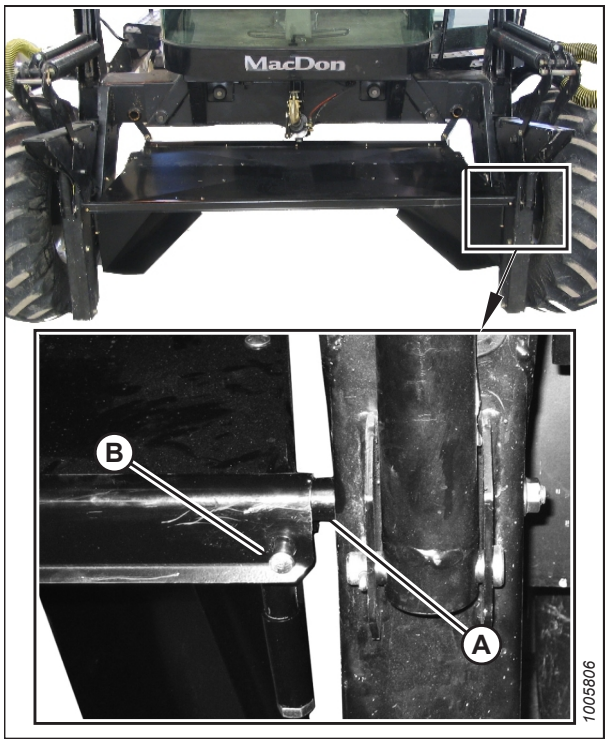


Figure 4.135: Forming Shield Attached to Windrower Legs

4.14.3 Disassembling Forming Shield

Follow this procedure to disassemble the forming shield.

1. Invert the forming shield onto top.
2. Remove lynch pin (A) from adjuster rods (B), and remove the rods from side deflectors (C).

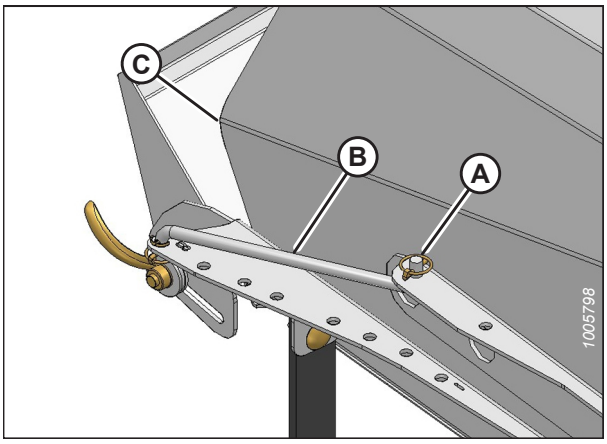


Figure 4.136: Forming Shield

3. Remove nut (A) from bolt (B), and lift deflector (C) and washer (D) off the forming shield. Repeat this step for the other deflector.

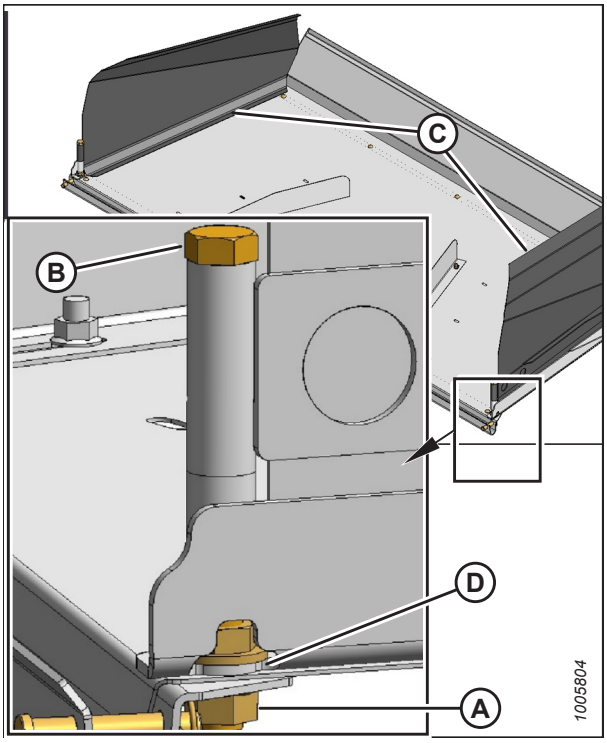


Figure 4.137: Forming Shield

4. Remove locking handles (A), and remove the bolts.
5. Remove fluffer shield (B) from the forming shield cover.

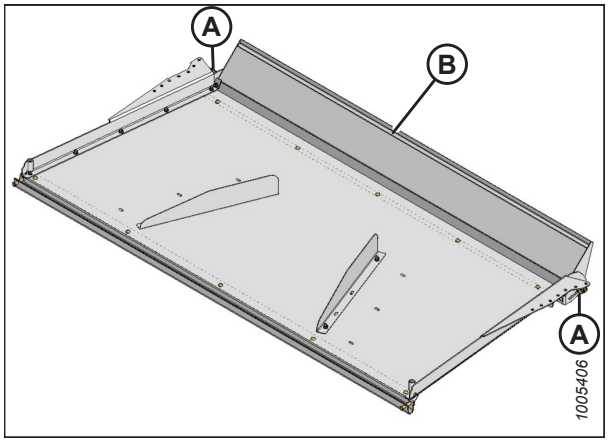


Figure 4.138: Cover

6. Remove bolts (A) to remove deflector fins (B) from the cover.

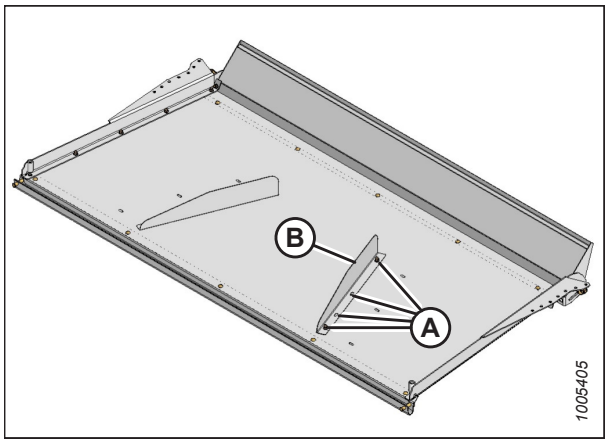


Figure 4.139: Cover

4.14.4 Assembling Forming Shield

The deflector fins, fluffer shield, locking handle,, and side deflectors will need to be secured to the forming shield cover.

To assemble the forming shield, follow these steps:

1. Attach deflector fins (B) to the forming shield cover with bolts (A).

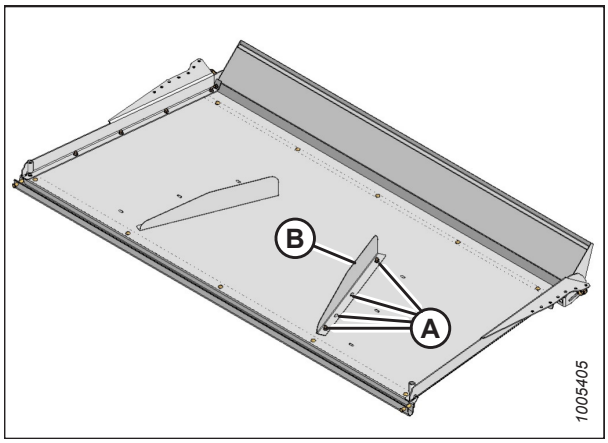


Figure 4.140: Cover

2. Attach fluffer shield (B) to the forming shield cover.

3. Attach locking handles (A) to the forming shield cover with bolts.

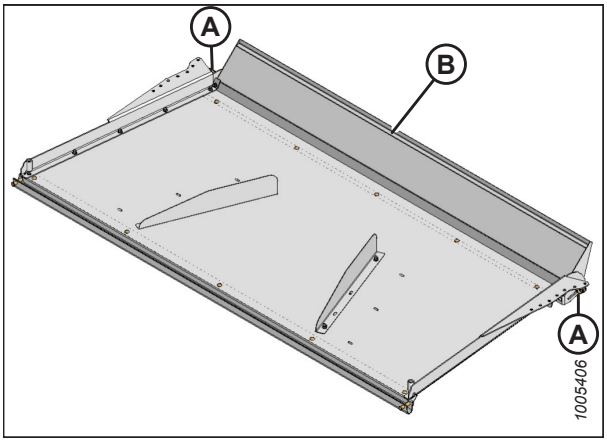


Figure 4.141: Cover

4. Attach side deflectors (C) and washers (D) to the forming shield cover with nuts (A) and bolts (B).

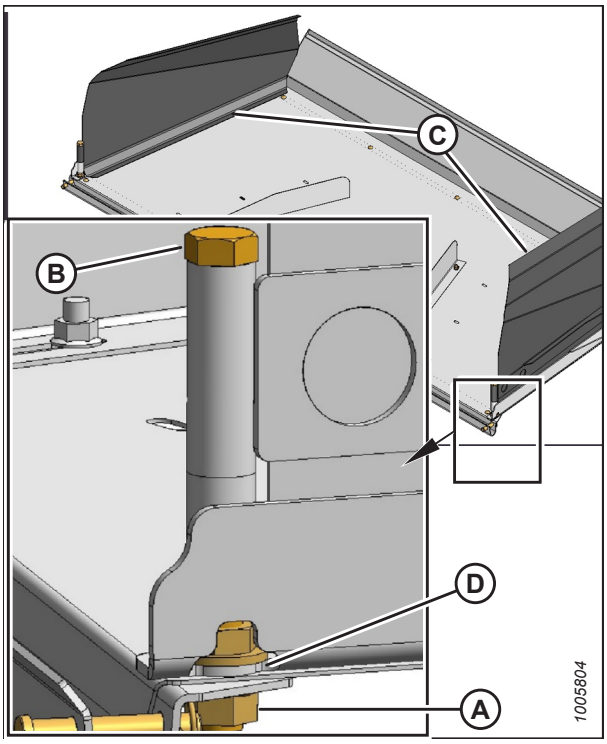


Figure 4.142: Forming Shield

5. Attach adjuster rods (B) to side deflectors (C) with lynch pin (A).

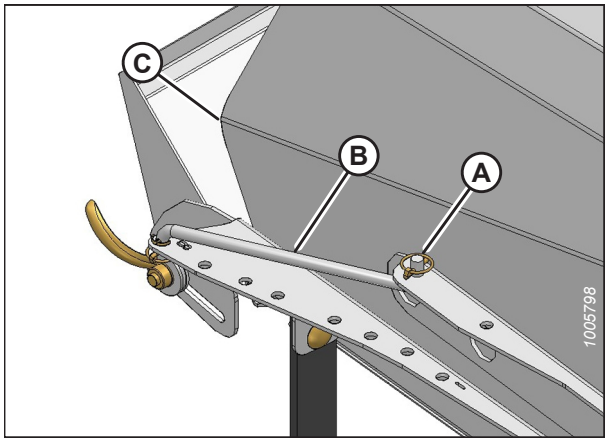


Figure 4.143: Forming Shield

4.14.5 Installing Forming Shield

Follow this procedure when installing the forming shield.

NOTE:

Forming shields are not compatible with narrow transport windrowers.

1. If attached, remove the header from the windrower for ease of installing the forming shield. For instructions. refer to the windrower operator's manual.

   NOTE:

   Do **NOT** install the two triangular-shaped plates from the forming shield kit. The triangular plates are used with rotary headers only.

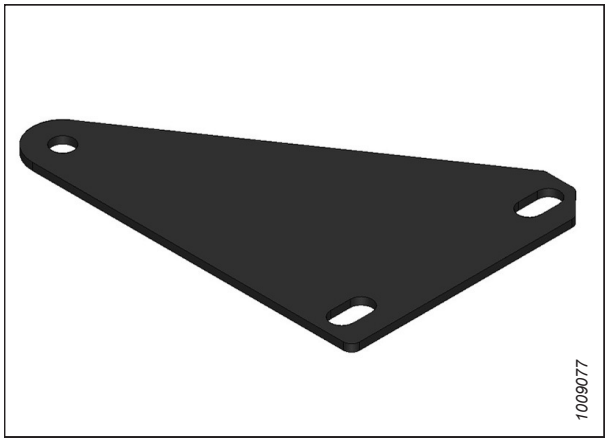


Figure 4.144: Triangular Plate

2. Install bolt (A) with spacer (B) and nut on each windrower leg in the upper hole.

   NOTE:

   This hardware is supplied with the forming shield kit.

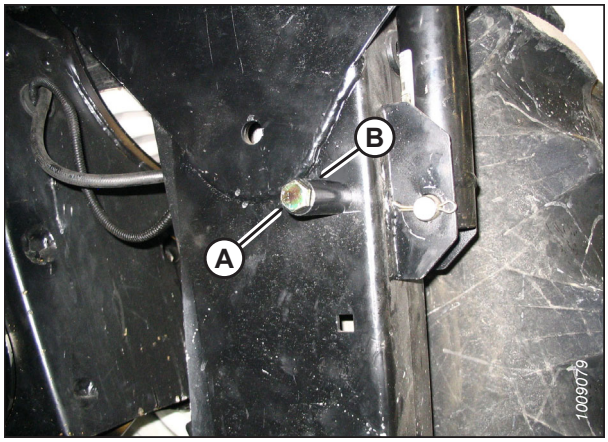


Figure 4.145: Windrower Leg

3. Remove two clevis pins (A) from the forward end of the forming shield.

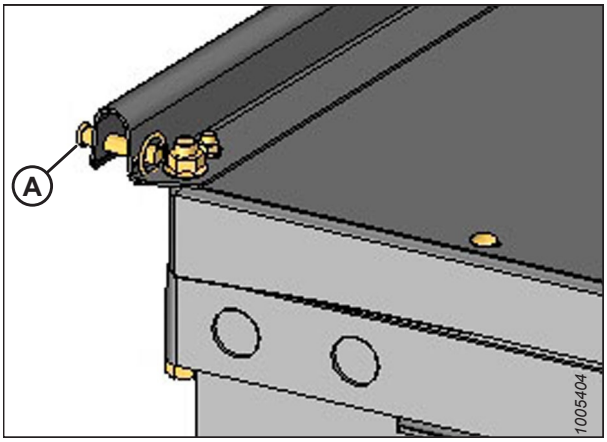


Figure 4.146: Forming Shield

4. Position forming shield (A) under the windrower frame.

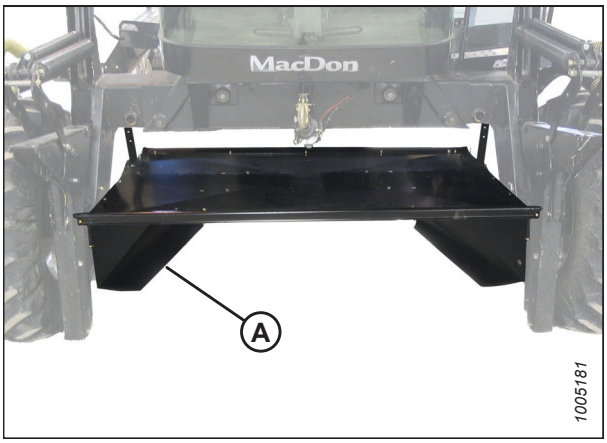


Figure 4.147: Forming Shield under the Windrower

5. Position the forming shield onto bolts (A) in the windrower legs and secure the forming shield with clevis pins (B) and hairpin.

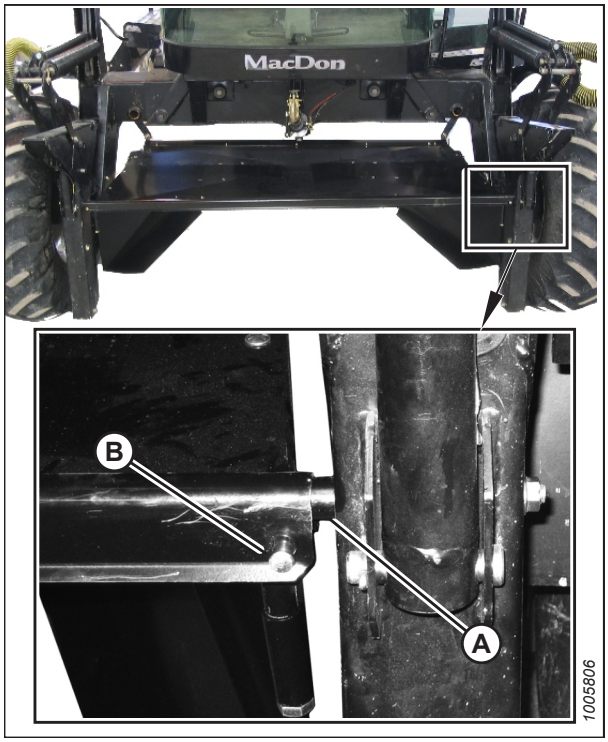


Figure 4.148: Forming Shield Attached to the Windrower Legs

6. Lift the aft end of the forming shield and attach straps (B) to pins (A) on the windrower frame. Install the washer and the hairpin to secure the strap. Use the middle hole and adjust the height to suit the crop.

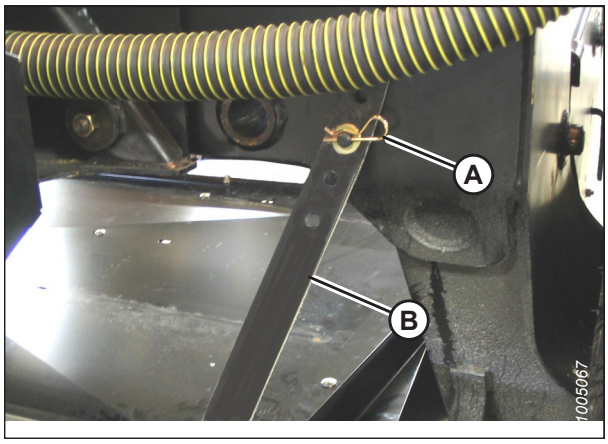


Figure 4.149: Forming Shield Attached to the Windrower Frame

7. Set the forming shield side deflectors to the desired width by positioning adjuster bars (A). Use the same hole location on both sides.
   - Position the deflectors at the narrowest setting for a narrow windrow (silage for example).
   - Position the deflectors at the widest setting for a wide windrow.

   Refer to *3.8.15 Positioning Forming Shields, page 103*.
8. Adjust fluffer shield (C) to the middle position. Loosen handles (B) if required. For instructions, refer to *Positioning Rear Deflector (Fluffer Shield), page 104*.

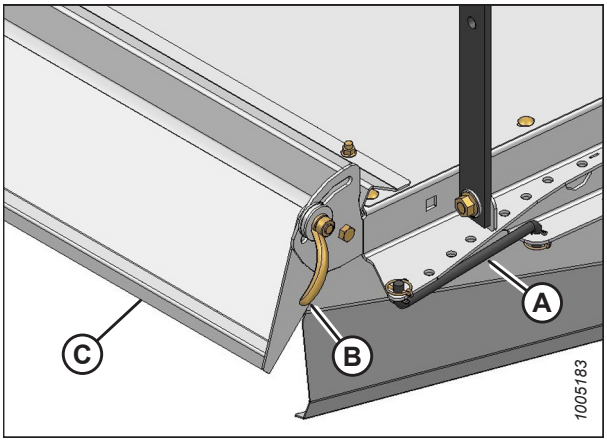


Figure 4.150: Side Deflectors and Fluffer Shield

4.14.6 Removing Header Drive Motor

This procedure applies to A40D and A40DX Auger Headers (excluding Grass Seed A40D and Grass Seed A40DX).

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open driveshield (A). For instruction, refer to *4.2 Opening/ Closing Driveshield, page 126*.

   IMPORTANT:

   Mark the hoses and make a diagram of the hose routing. This will be useful during reassembly.
3. Disconnect the hoses at the couplers on the motor.

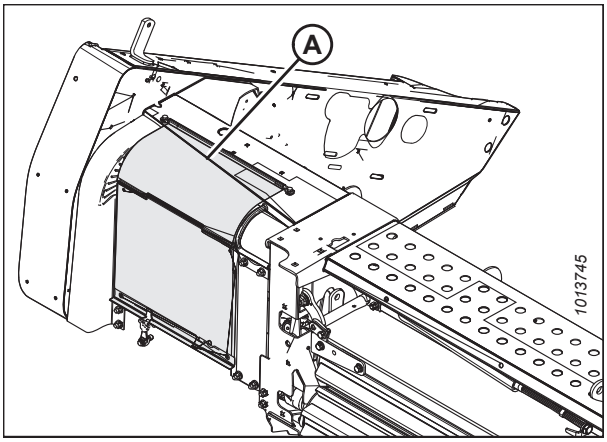


Figure 4.151: Driveshield

4. Remove two bolts (A) securing the motor to the gearbox, and remove the motor.

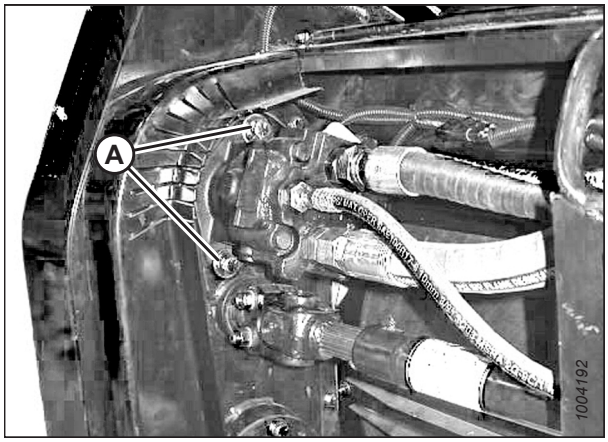


Figure 4.152: Header Drive Motor

4.14.7 Installing Header Drive Motor

This procedure applies to A40D and A40DX Auger Headers (excluding Grass Seed A40D and Grass Seed A40DX).

DANGER

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

Install the hydraulic motor onto the gearbox as follows:

1. Shut down the engine, and remove the key from the ignition.
2. Open driveshield (A). For instruction, refer to *4.2 Opening/ Closing Driveshield, page 126*.

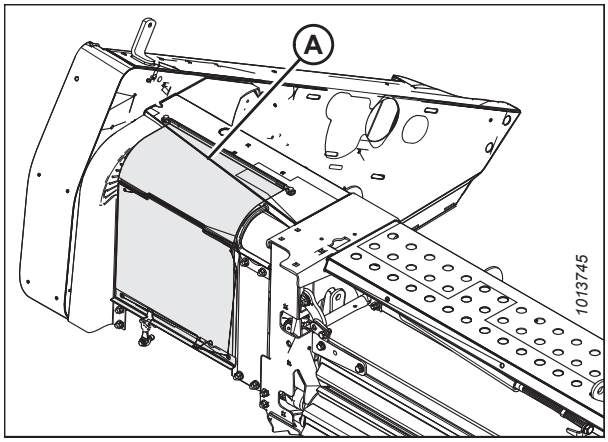


Figure 4.153: Driveshield

3. Apply a light coat of silicone to the motor flange.
4. Position the motor on the gearbox, as shown, until the mounting holes are aligned, and the pinion engages the gear in the gearbox.
5. Clean off the excess sealant from the motor flange and the gearbox face.
6. Install bolts (A) and washers, and torque the hardware to 102 Nm (75 lbf·ft).
7. Reconnect the hoses to the motor.

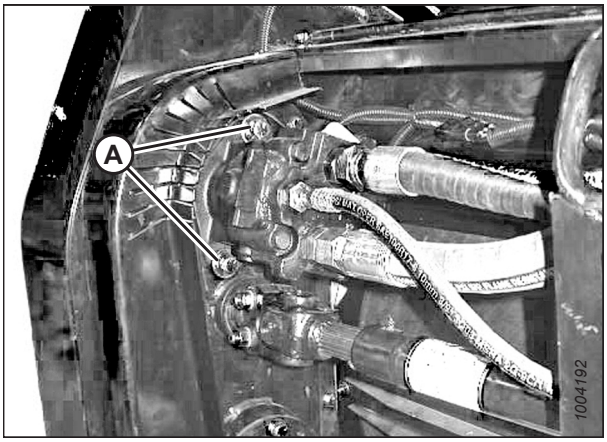


Figure 4.154: Motor – Single Knife

4.14.8 Removing Conditioner Gearbox

Follow this procedure when removing the conditioner gearbox.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open driveshield (A). For instructions, refer to *4.2 Opening/ Closing Driveshield, page 126*.

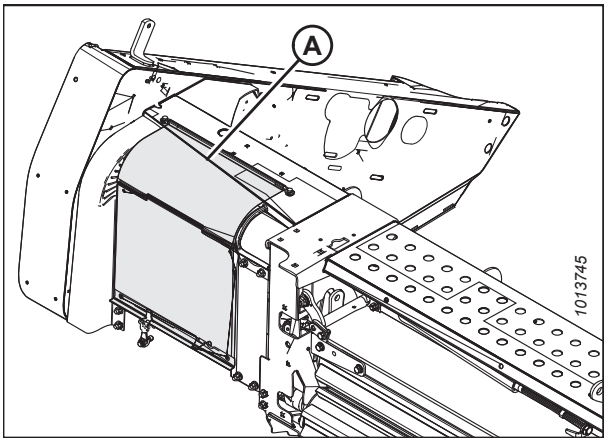


Figure 4.155: Driveshield

3. Remove two bolts (A) securing channel (B) to the frame.

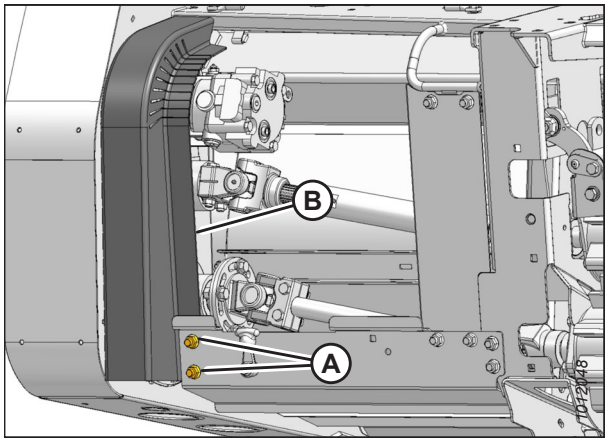


Figure 4.156: Conditioner Drive

4. Remove two hex bolts (A), and one carriage bolt (B) securing channel (C) to the endsheet and remove channel (C).

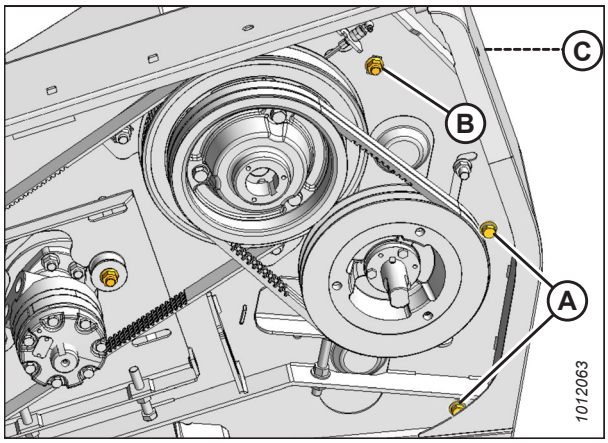


Figure 4.157: Header Drive

5. Remove two bolts (A) securing motor (B) to the gearbox. Do **NOT** disconnect the hoses.

   NOTE:

   The hoses have been removed from the illustration for clarity.

6. Carefully pull motor (B) from the gearbox and move it out of the work area.

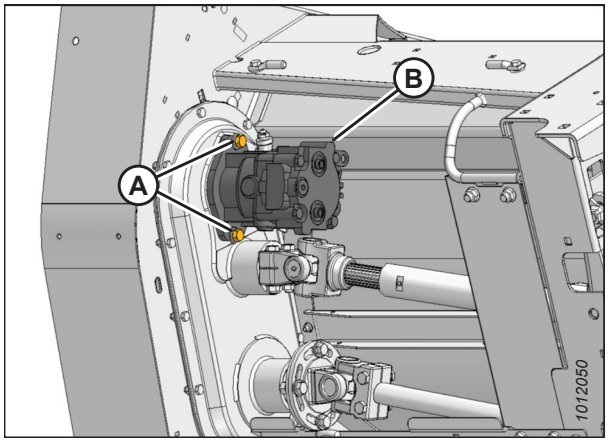


Figure 4.158: Gearbox Motor

7. Remove two bolts (A) in upper driveline (B).
8. Pull driveline (B) off the gearbox. If necessary, use a screwdriver or equivalent to spread the yoke. Move the driveline out of the work area.
9. Remove four bolts (C) from flange on lower driveline (D) and remove driveline from gearbox. Move driveline clear of work area.

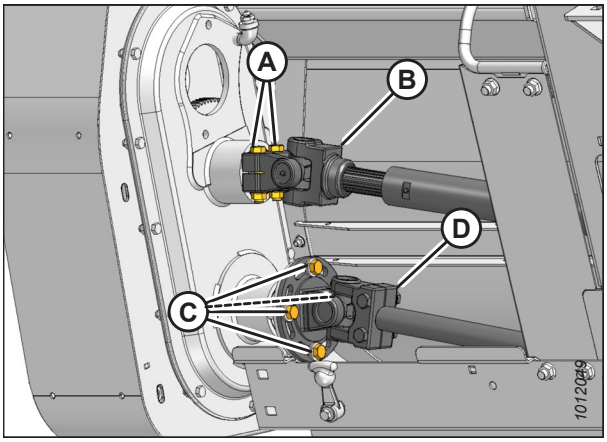


Figure 4.159: Drivelines

10. Remove knife drive V-belts (A). For instructions, refer to *Removing Left V-Belts, page 167*.
11. Remove three bolts (B) from tapered bushing (D).
12. Install two bolts (B) in two threaded holes (C) in bushing (D) and tighten the bolts to release the bushing.
13. Remove bushing (D) and the key.
14. Remove pulley (E).

CAUTION

Be sure to support the gearbox when removing the nuts. The gearbox weighs 34 kg (79 lb.).

15. Remove three nuts (A) securing gearbox (B) to the frame and remove gearbox (B).

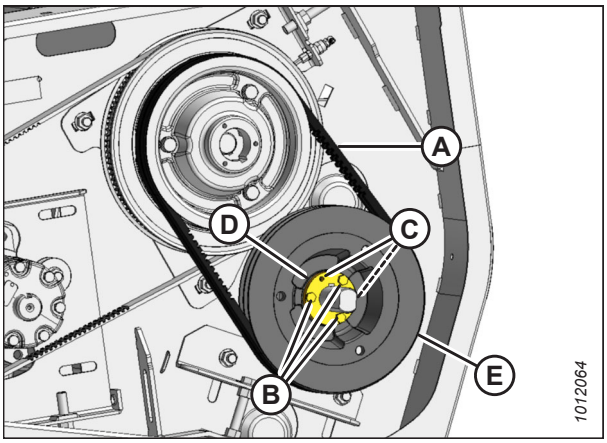


Figure 4.160: Knife Drive Belts

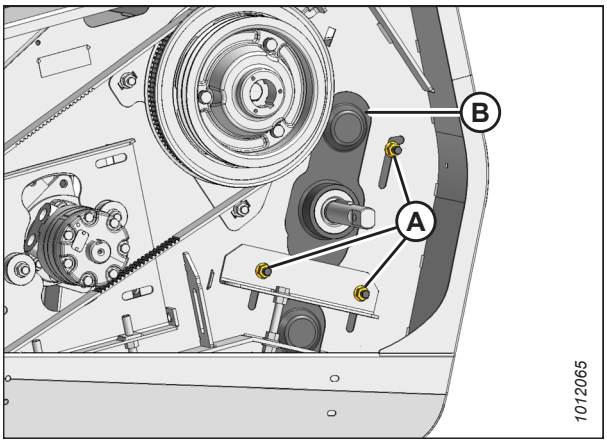


Figure 4.161: Conditioner Detachment

4.14.9 Installing Conditioner Gearbox

Follow this procedure to install the conditioner drive gearbox.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open driveshield (A). For instructions, refer to *4.2 Opening/ Closing Driveshield, page 126*.

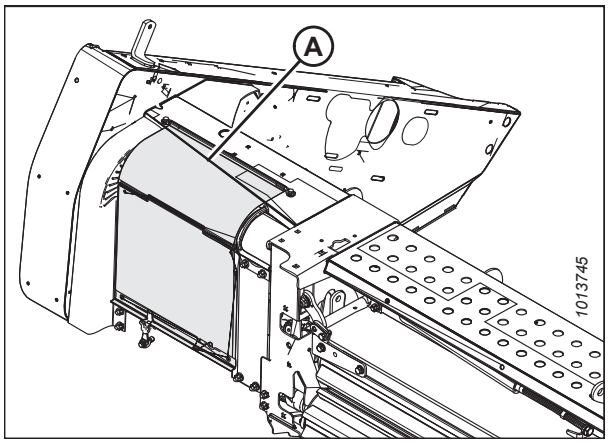


Figure 4.162: Driveshield

3. Position gearbox (B) as shown, picking up the three holes in the endsheet and secure the gearbox with three flanged lock nuts (A). Do **NOT** fully tighten the nuts.

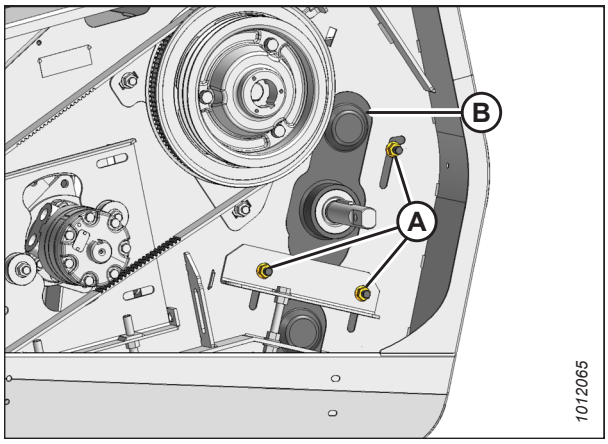


Figure 4.163: Conditioner Gearbox

4. Locate key (A) in the shaft.
5. Place pulley (B) onto the shaft.

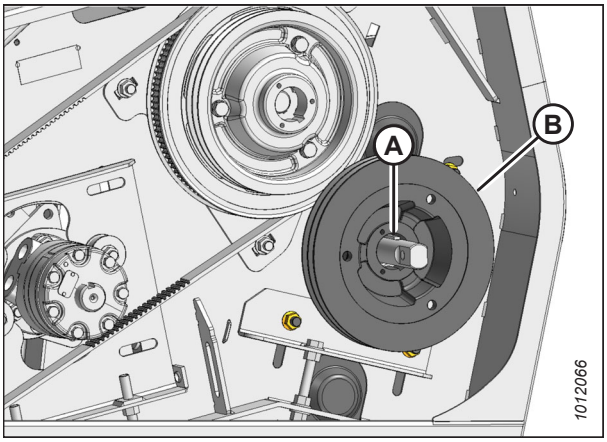


Figure 4.164: Gearbox Pulley

6. Place tapered bushing (A) onto shaft, align it with key (B) in the shaft and push bushing (A) into place.
7. Align the slot in pulley (C) with key (D) in the tapered bushing and slide pulley (C) onto bushing (A).
8. Align pulley (C) and the countershaft pulley (F) faces to within 1.5 mm (1/16 in.).
9. Install three bolts (E) in tapered bushing (A) and tighten them to 25 Nm (18 lbf·ft / 221 lbf·in).
10. Tap bushing (A) and torque the bolts. Repeat until the bolts no longer turn at 25 Nm (18 lbf·ft / 221 lbf·in).

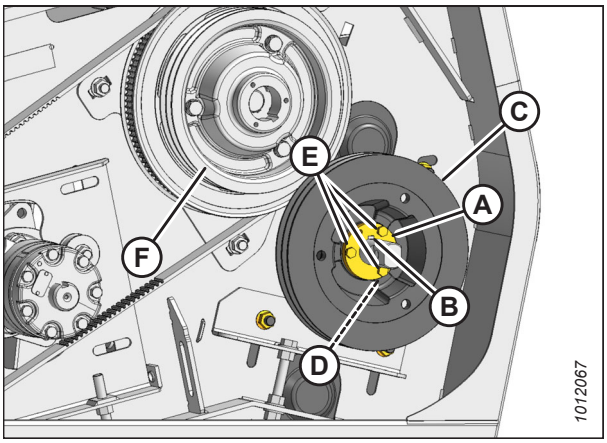


Figure 4.165: Gearbox Pulley

11. Install knife drive V-belts (A). For instructions, refer to *Installing Double V-Belts, page 168*.

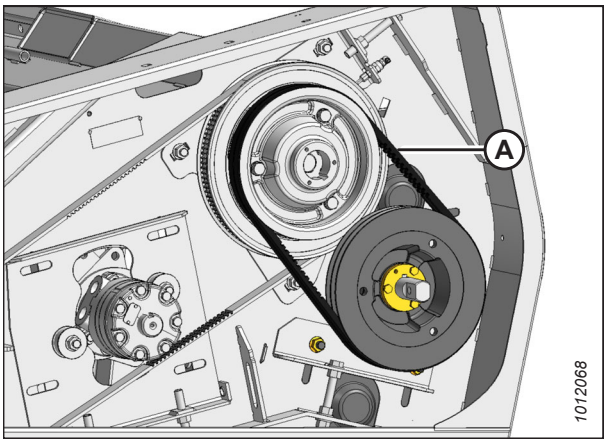


Figure 4.166: Header Drive

12. Remove oil level check plug (A) in the gearbox. If the oil does not run out of the plug, add oil to the required level. If oil is required, refer to the chart on the inside back cover of this manual.

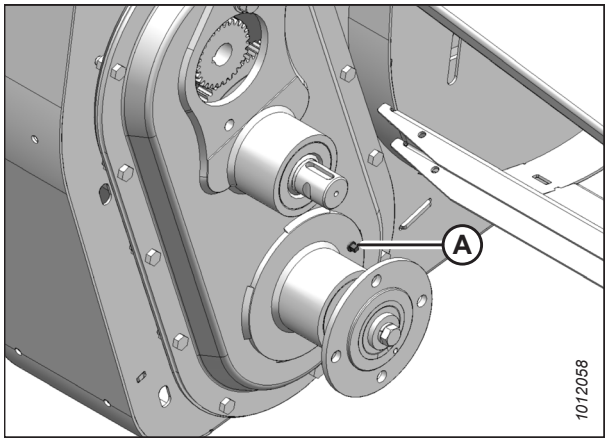


Figure 4.167: Gearbox

13. Align the keyway in upper driveline yoke (B) with the key in the gearbox shaft and attach yoke (B) to the shaft.
14. Install two hex head bolts (A) and flanged lock nuts to secure the yoke. Tighten the bolts.
15. Install the timing flange on lower driveline (D) onto the lower shaft on the gearbox with four hex head bolts (C), two flat washers (E) under each bolt head, lock washers (F) and plain nuts (G). Do **NOT** tighten the hardware.

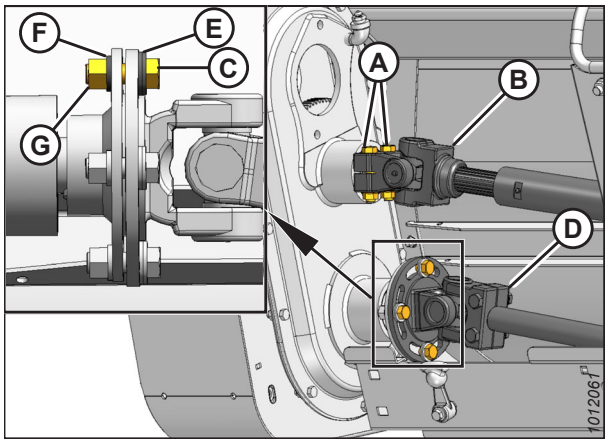


Figure 4.168: Upper and Lower Drivelines

16. Apply a light coat of silicone to the motor flange.
17. Position hydraulic motor (A) onto the gearbox as shown and secure it with two hex head bolts (B) with thread locking compound, two flat washers (C), and two lock washers (D). Torque the hardware to 112 Nm (83 lbf·ft).
18. Time the rolls. For instructions, refer to *4.14.11 Checking and Adjusting Roll Timing, page 216*.

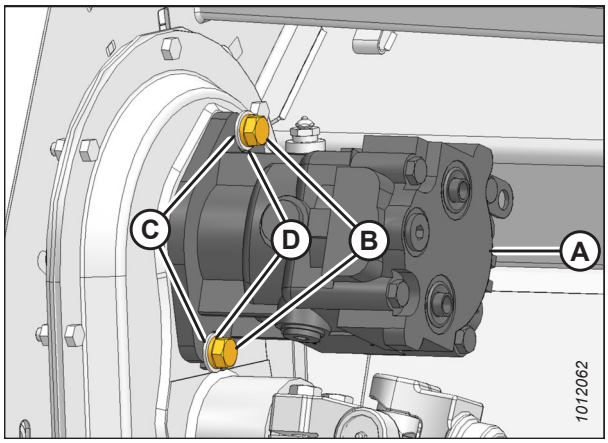


Figure 4.169: Hydraulic Motor

19. Position channel (B) against the endsheet as shown, picking up the three holes in the endsheet.
20. Install two carriage bolts and nuts (A) in the lower two holes.

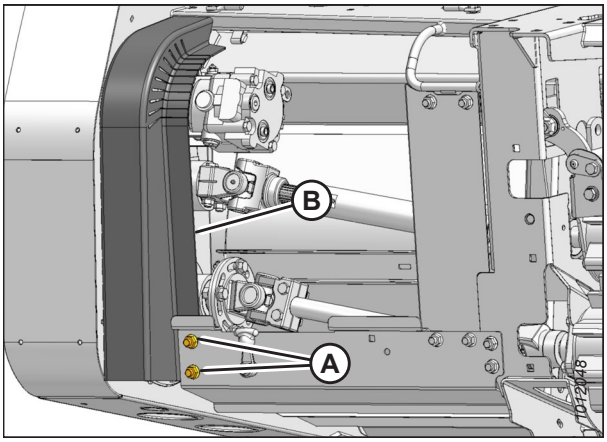


Figure 4.170: Conditioner Drive

21. Install the carriage bolt and nut in upper hole (B) with the head facing inboard.
22. Install the two hex bolts with lock washers and flat washers in remaining locations (A).
23. Tighten the hardware.
24. Close the conditioner driveshield and the endshield.

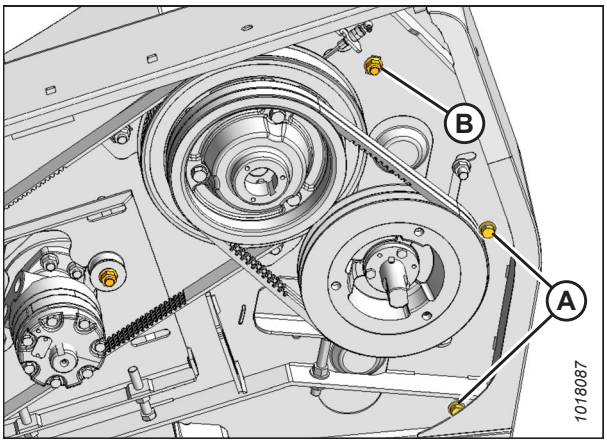


Figure 4.171: Header Drive

4.14.10 Checking/Adjusting Roll Alignment

Rolls are aligned at the factory, but adjustment is provided in case the rolls become misaligned during operation.

DANGER

To avoid bodily injury or death from the unexpected startup of the machine, always shut down the engine and remove the key from the ignition before leaving the operator's seat for any reason.

1. Lower the header until it rests on the ground.
2. Shut down the engine, and remove the key from the ignition.

3. Open driveshield (A). For instructions, refer to *4.2 Opening/ Closing Driveshield, page 126*.

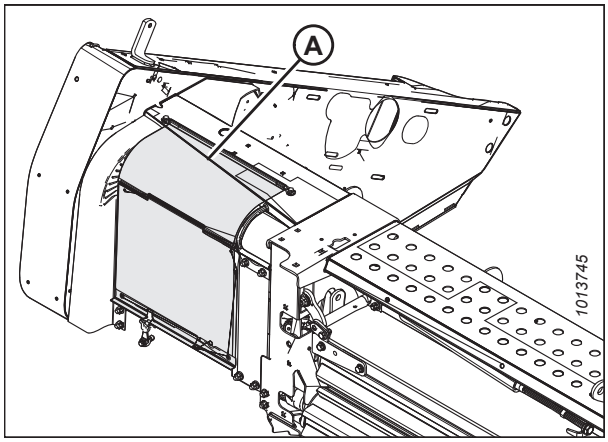


Figure 4.172: Driveshield

4. Locate roll alignment cover (A).

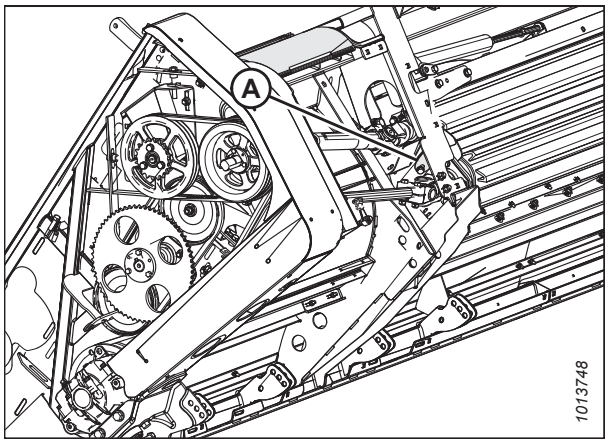


Figure 4.173: Roll Alignment Cover

5. Loosen bolt (A), and rotate cover (B) to expose the access port.

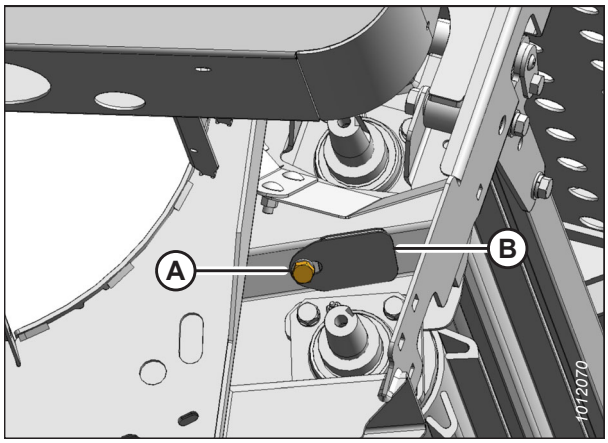


Figure 4.174: Roll Alignment

6. Examine roll bar spacing (X) at each end of the rolls. The rolls are aligned if (X) varies less than 1.6 mm (1/16 in.) from one end to the other.

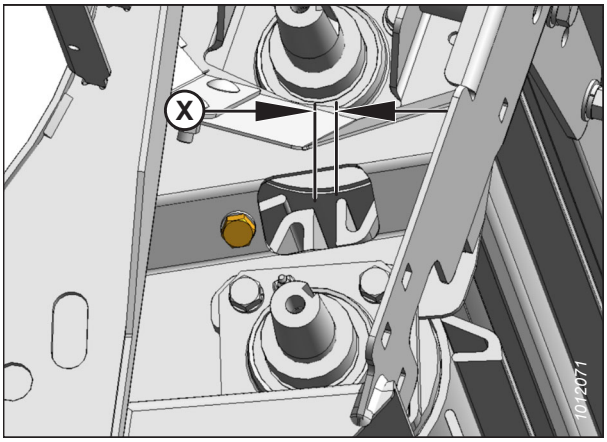


Figure 4.175: Roll Bar Spacing

7. If roll bar spacing (X) (as shown in Step *6, page 215*) varies more than 1.6 mm (1/16 in.), align the rolls as follows:
   a. Remove nuts and bolts (A), and remove shims (B). The shims can be lifted off the pivot rod.
   b. Move the upper roll until dimension (X) at both ends looking through the port (as shown in Step *6, page 215*) is within 1.6 mm (1/16 in.).
   c. Reinstall shims, ensuring hardened washer (C) is against the pivot tube.
   d. Reinstall bolts (A) and nuts.

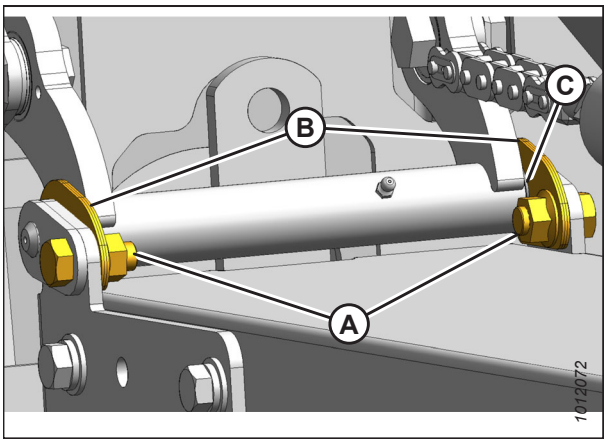


Figure 4.176: Adjustment

8. Operate the header, and recheck the alignment.
9. Close cover (B), and tighten bolt (A).
10. Close the conditioner driveshield.

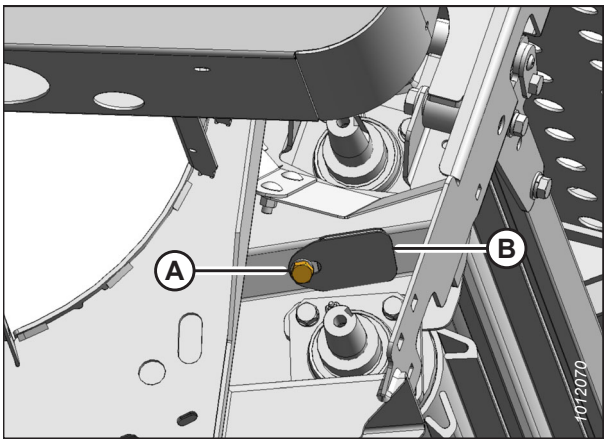


Figure 4.177: Access Cover

4.14.11 Checking and Adjusting Roll Timing

The rolls must be correctly timed with each steel bar on one roll centered between two bars of the other roll.

DANGER

To avoid bodily injury or death from fall of raised machine, always lock-out lift cylinders before going under header for any reason.

1. Lower the header until it rests on the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Open driveshield (A). For instructions, refer to *4.2 Opening/ Closing Driveshield, page 126*.

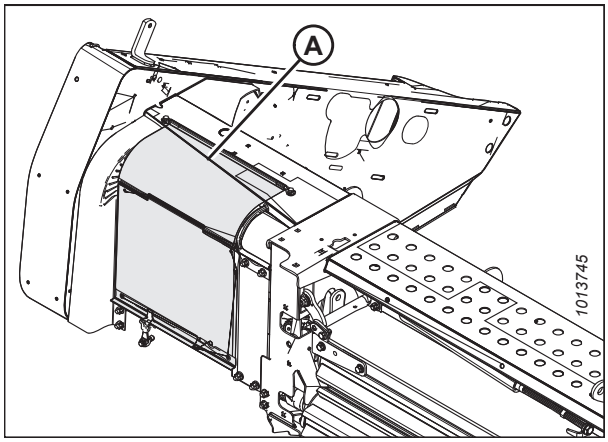


Figure 4.178: Driveshield

4. Loosen bolt (A), and rotate cover (B) to expose the access port at each end of the conditioner.

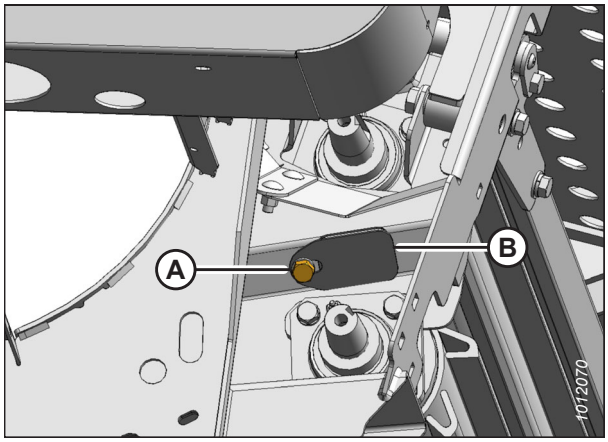


Figure 4.179: Access Cover

5. Examine roll spacing (X) at each end of the rolls. Each steel bar on one roll should be centered between two bars of the other roll so that distance (X) is 12 mm (1/2 in.).

   NOTE:

   If distance (X) varies more than 1.6 mm (1/16 in.) from one end to the other, the rolls should be realigned. For instructions, refer to *4.14.10 Checking/Adjusting Roll Alignment, page 213*.

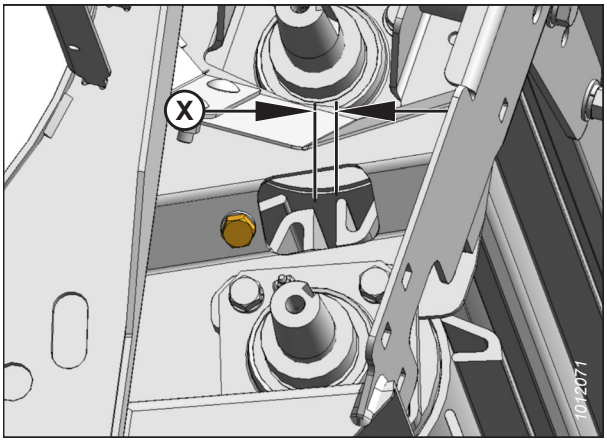


Figure 4.180: Roll Timing

6. If required, adjust the roll timing as follows:

   a. Loosen four bolts (A) in the slots of the yoke plate on the lower driveline.

   b. Turn the rolls to achieve the best timing.

   c. When roll timing is satisfactory, tighten bolts (A) to secure the position.

7. Recheck the distance between the bars at both ends. For instructions, refer to Step *5, page 217*.

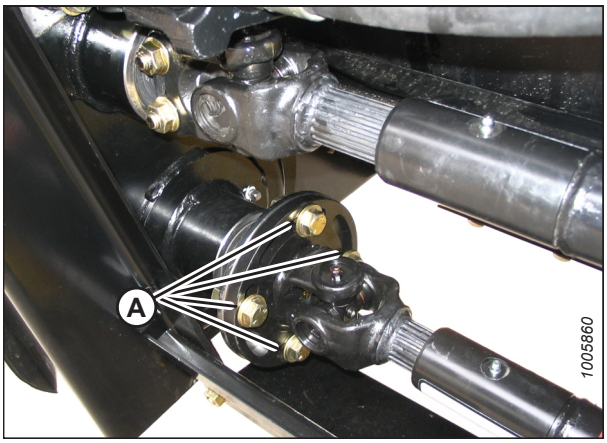


Figure 4.181: Timing Flange

8. Close cover (B), and tighten bolt (A).

9. Close the driveshield.

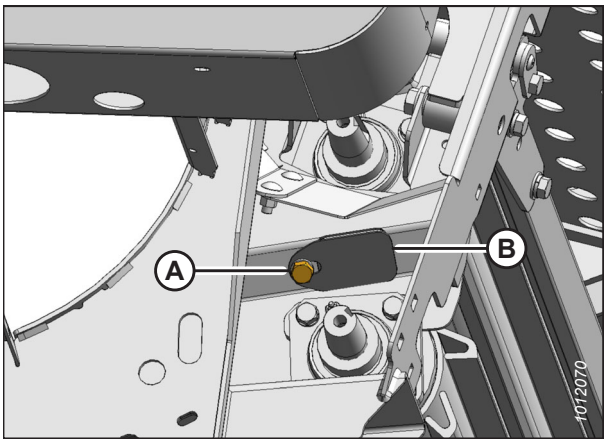


Figure 4.182: Access Cover

4.15 Replacing Skid Shoe Wear Plate

Skid shoes are equipped with replaceable wear plates that can be reversed for increased service life. It is recommended that wear plates be replaced when the skid shoe support bracket becomes exposed.

DANGER

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

To replace skid shoe wear plates, follow these steps:

1. Raise the header, and engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Remove bolts and clips (A) from the forward edge of skid shoe.

   NOTE:

   Use a socket and ratchet wrench to access the nuts.
4. Remove clevis pins (B), and disengage the tabs on the skid shoe from the slots in the cutterbar.

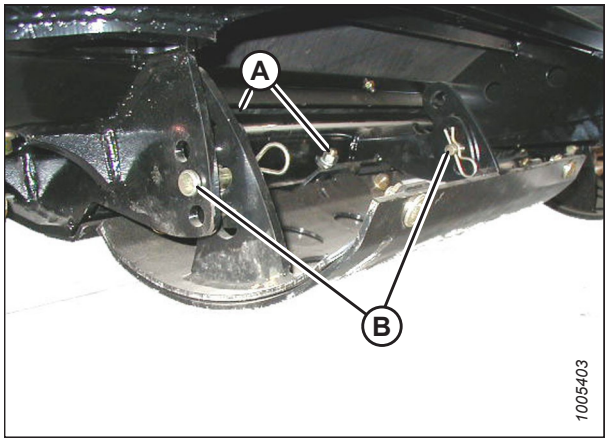


Figure 4.183: Skid Shoe

5. Remove eight bolts (A), and remove wear plates (B).
6. Position replacement wear plate (B) as shown.

   NOTE:

   The same wear plate can be reinstalled, but in the reverse position.
7. Secure the wear plate with bolts and nuts (A).

   IMPORTANT:

   If the bolt heads are worn down, replace the bolts with new 1/2 x 1 in. carriage bolts.

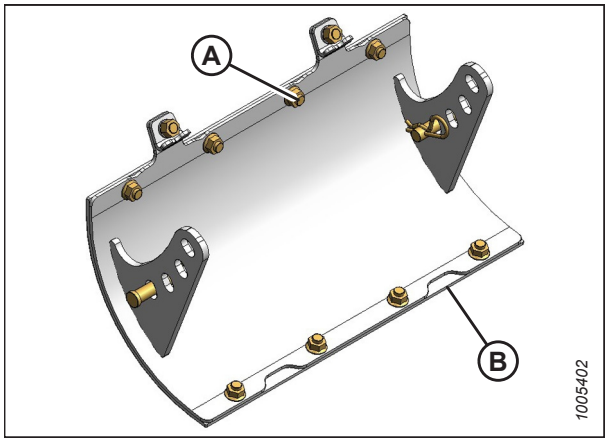


Figure 4.184: Replacement Wear Plate

8. Insert the tabs on the skid shoe into slots (A) on the cutterbar at the inboard mounting locations on the frame, and secure the tabs with clevis pin (B).

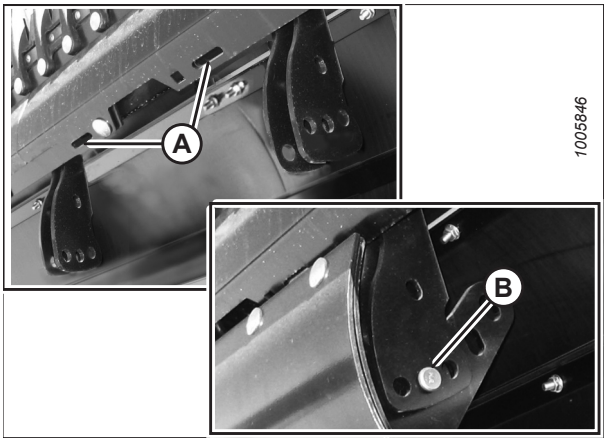


Figure 4.185: Inboard Cutterbar Mounting Location

9. Reinstall clips (A) with the bolts and nuts removed from Step *3, page 218* to secure the skid shoe to the cutterbar.

   NOTE:

   Use a socket and ratchet wrench to access the nuts.

10. Remove clevis pin (B), adjust the skid shoe to the desired height, and reinstall two clevis pins. Secure the clevis pins with lynch pins.

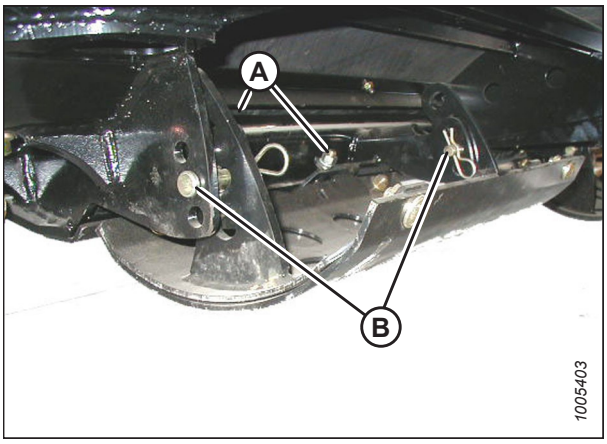


Figure 4.186: Skid Shoe

4.16 Gauge Rollers

Gauge rollers can be removed for replacement or repair.

4.16.1 Removing Gauge Rollers

The gauge rollers can be removed for replacement or repair.

DANGER

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

1. Raise the header, and engage the safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Remove bolts and clips (A) from the forward edge of the gauge roller assembly.

   NOTE:

   Use a socket and ratchet wrench to access the nuts.
4. Remove the hairpins on pins (B).
5. Support the gauge roller, and remove pins (B).
6. Disengage the tabs on the mounting plate from the slots in the cutterbar to remove the roller assembly.

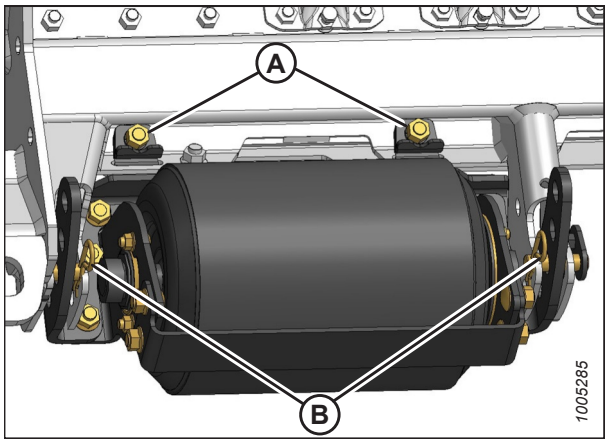


Figure 4.187: Gauge Roller

4.16.2 Installing Gauge Rollers

Follow this procedure to install the gauge rollers.

1. Position the gauge roller assembly below the cutterbar, and insert the tabs on the roller assembly into slots (A) in the frame.

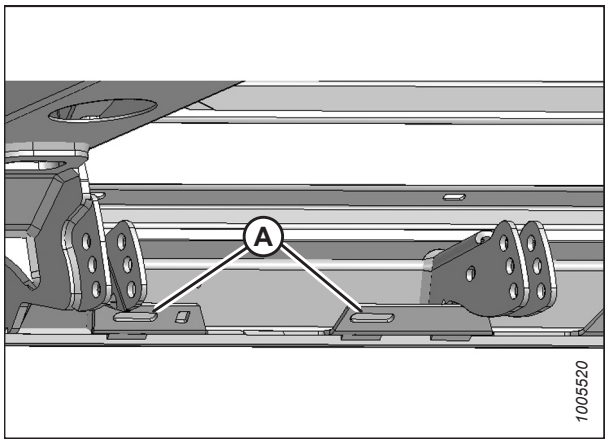


Figure 4.188: Gauge Roller Frame Location

2. Secure the gauge roller assembly with two pins (B) at the lowest position.
3. Attach clips (A) with the bolts and nuts to secure the roller assembly to the cutterbar.

   NOTE:

   Use a socket and ratchet wrench to access the nuts.

4. Tighten the nuts.

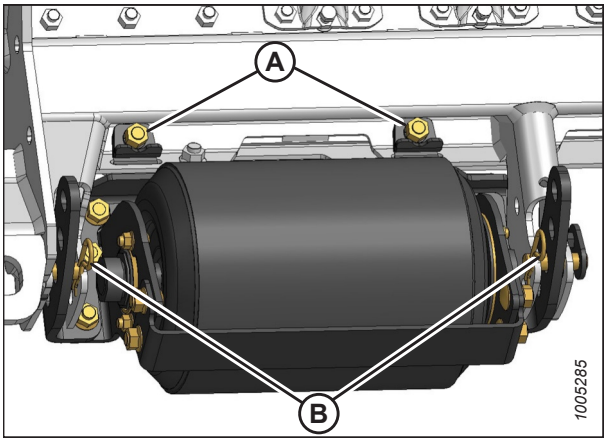


Figure 4.189: Gauge Roller Assembly

5. Remove pins (A), and adjust the rollers to the desired height. Reinstall two pins (A).
6. Ensure that nut (B) on each pin is seated in the adjacent hole in the support bracket.
7. Secure the pins with hairpins (C).

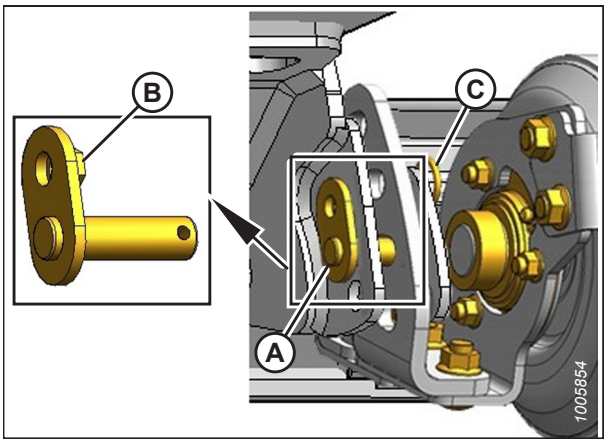


Figure 4.190: Support Bracket

4.17 Maintaining the Electrical System

Proper maintenance of the electrical system helps prevent the risk of accidents.

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

Keep the lights clean, and replace defective bulbs.

To replace the light bulbs, follow these steps:

1. Using a Phillips screwdriver, remove screws (A) from the fixture, and remove the plastic lens.
2. Replace the bulb, and reinstall the plastic lens and the screws.

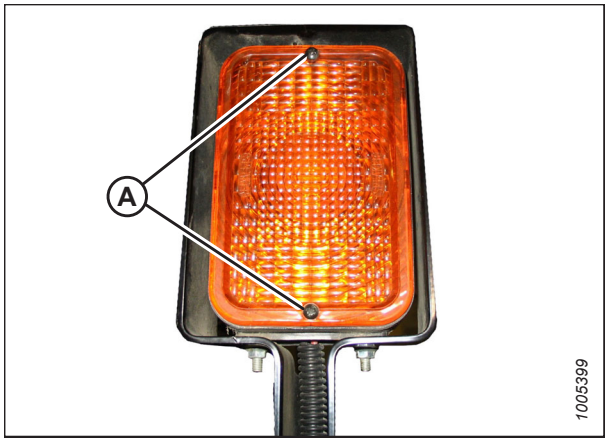


Figure 4.191: A40D Hazard Light

Chapter 5: Optional Equipment

The following options and attachments are available for use with your header. See your MacDon Dealer for availability and ordering information.

5.1 Options and Attachments

5.1.1 Additional Skid Shoes

In addition to the standard skid shoes, two additional skid shoes may be added for extra control of cutting height and protection of cutting components.

B4594

Figure 5.1: Skid Shoe

5.1.2 Gauge Roller Kit

The gauge roller kit replaces the outer skid shoes with rollers. They can be adjusted for varying cutting heights.

B4593

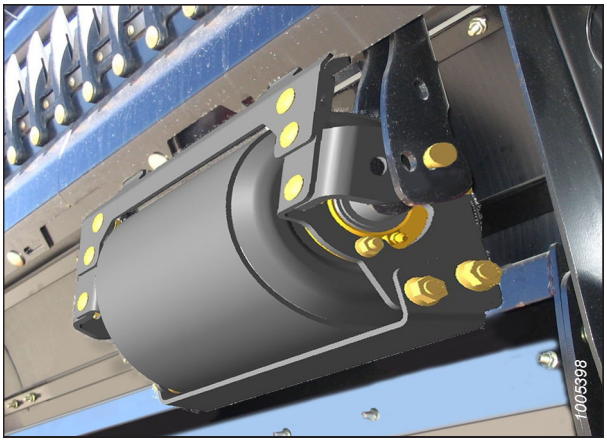


Figure 5.2: Gauge Roller

5.1.3 Replacement Reel Bat Kit

This kit consists of one complete bat assembly for ease of replacement.

Separate kits are available for different header widths:

- 4.3 m (14 ft.): B4716
- 4.9 m (16 ft.): B4717
- 5.5 m (18 ft.): B4718

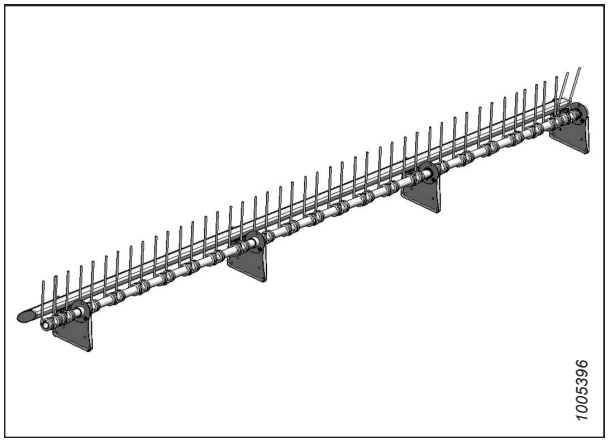


Figure 5.3: Reel Bat Assembly

5.1.4 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster plates are designed to cut tough crops.

Separate kits are available for different header widths:

- 4.3 m (14 ft.) Double-Knife: B4956
- 4.9 m (16 ft.) Double-Knife: B4715
- 5.5 m (18 ft.) Double-Knife: B4957

Installation and adjustment instructions are included with the kit.

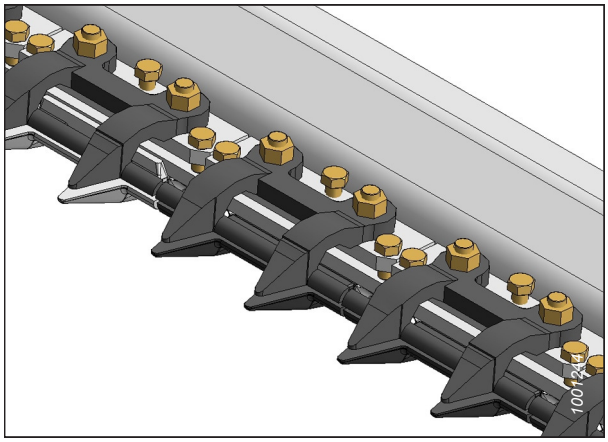


Figure 5.4: Stub Guards

5.1.5 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the header for clean crop dividing and reel entry in tall crops. The kit includes left and right dividers, lean bar extensions and attachment hardware.

B4690

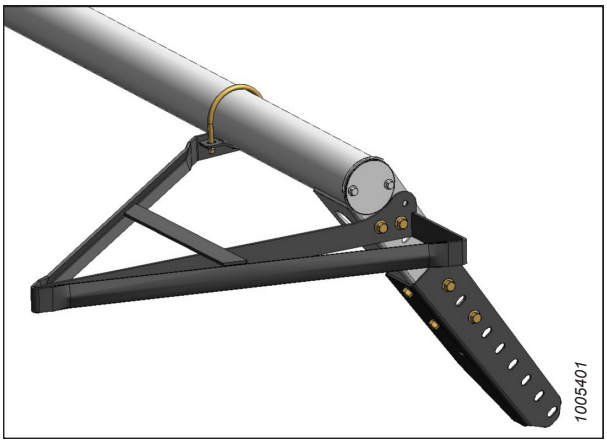


Figure 5.5: Tall Crop Divider (Left Side)

5.1.6 Hose Bundle Storage Kit

The Hose Bundle Storage kit enables you to store header hoses on the back of an A40DX or A40DX Grass Seed Auger Header when the header is not connected to a windrower.

B6704

Figure 5.6: Hose Bundle Storage

5.1.7 Reel Speed Control Kit

The Reel Speed Control kit is required to provide the variable reel speed function on the A40DX and A40DX Grass Seed (GSS) Header.

B6604 or MD #318001

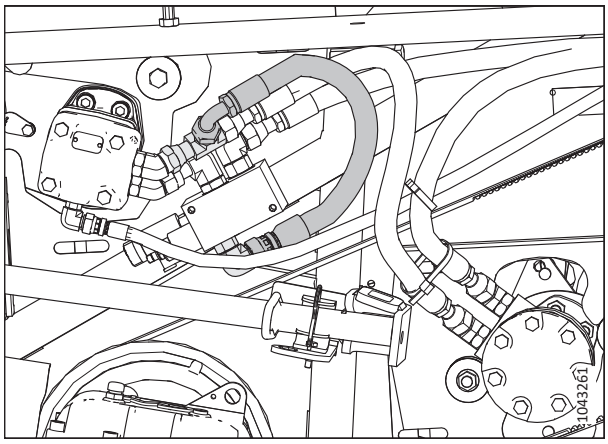


Figure 5.7: Reel Speed Control Kit

Chapter 6: Troubleshooting

A troubleshooting table is provided to help you diagnose and correct any problems you may encounter while operating your machine.

6.1 Header Performance

A troubleshooting table is provided to help you diagnose and correct any problems you may encounter regarding the header performance.

Problem	Solution	Section
Symptom: Carryover of crop on the reel		
Reel speed too fast	Reduce the reel speed (sprocket size).	*3.8.3 Adjusting Reel Speed, page 79*
Symptom: Material build-up on the header frame		
Auger speed too fast	Reduce the auger speed (sprocket size).	*3.8.2 Adjusting Auger Speed, page 79*
Very light crop	Reduce the windrower rpm.	—
Symptom: Insufficient conditioning of the stems		
Roll gap too large	Decrease the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Symptom: Leaves damaged, crushed or stripped off the stems		
Reel speed too fast	Reduce the reel speed.	*3.8.3 Adjusting Reel Speed, page 79*
Roll gap too small	Increase the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Rolls improperly timed	Adjust the roll timing.	*4.14.11 Checking and Adjusting Roll Timing, page 216*
Symptom: Slow crop drying		
Rolls not crimping crop sufficiently	Decrease the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Crop is spread too narrow	Adjust the forming shields for wider swath.	*3.8.15 Positioning Forming Shields, page 103*
Crop is bunched in windrow	Adjust the forming shields/baffle.	
Symptom: Excessive drying or bleaching of the crop		
Excessive crimping	Increase the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Crop is spread too wide in windrow	Adjust the forming shields.	*3.8.15 Positioning Forming Shields, page 103*
Symptom: Leaving small strip of flattened, uncut material		
Crowding of the uncut material	Steer the windrower slightly away from uncut crop.	—
Reel position incorrect	Move the reel forward and down.	*3.8.5 Setting Reel Position, page 82*
Knife sections or guards are worn or broken	Replace worn or broken parts.	*4.8.1 Replacing Knife Section, page 143* *4.8.7 Guards, page 147*
Symptom: Long stubble in the down crop		

Problem	Solution	Section
Cutting height too high	Lower the cutting height with skid shoes.	*3.8.8 Setting Cutting Height, page 89*
Ground speed too fast	Slow down.	*3.12 Selecting Ground Speed, page 118*
Header angle too flat for guards to pick up down crop	Increase the header angle.	*3.8.7 Adjusting Header Angle, page 88*
Reel position incorrect	Move the reel forward and down.	*3.8.5 Setting Reel Position, page 82*
Tine aggressiveness too low	Rotate the cam clockwise (viewed from RH end) for more aggressive tine action.	*3.8.6 Setting Tine Aggressiveness, page 87*
Symptom: Pulling material by the roots or tall material leaning into the machine		
Ground speed too slow	Increase the ground speed.	*3.12 Selecting Ground Speed, page 118*
Reel position incorrect	Move the reel forward and down.	*3.8.5 Setting Reel Position, page 82*
Symptom: Ragged or uneven cutting of the crop		
Bent or misaligned guards causing poor shearing action	Align the guards for proper shearing action.	*Aligning Guard, page 148*
Bent knife causing binding	Straighten the bent knife. Check the alignment, and adjust if necessary.	*4.8.2 Removing Knife, page 144*
Ground speed too fast	Slow down. Ground speed should not exceed 13 km/h (8 mph).	*3.12 Selecting Ground Speed, page 118*
Header angle too flat for guards to pick up down crop	Increase the header angle.	*3.8.7 Adjusting Header Angle, page 88*
Header float too light, causing bouncing	Adjust to heavier float setting.	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Reel position incorrect	Move the reel forward and down.	*3.8.5 Setting Reel Position, page 82*
Relief valve pressure too low	Replace the valve.	See Dealer
Knife drive belt too loose	Increase the belt tension.	*4.9.1 Header Knife Drive, page 167*
Knife sections or guards are worn or broken	Replace worn or broken parts.	*4.8.1 Replacing Knife Section, page 143* *4.8.7 Guards, page 147*
Symptom: Conditioner plugging; knife plugging; uneven formation and bunching of the windrow		
Ground speed too fast	Slow down.	*3.12 Selecting Ground Speed, page 118*
Roll gap too large for proper feeding	Decrease the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Roll gap too small in thick stemmed cane-type crops	Increase the roll gap.	—
Rolls improperly timed	Adjust the roll timing.	*4.14.11 Checking and Adjusting Roll Timing, page 216*
Extremely thick or wet undergrowth	Raise the cutting height to clear undergrowth.	*3.8.8 Setting Cutting Height, page 89*
	Consider the use of stub guards.	*4.8.7 Guards, page 147*

Problem	Solution	Section
Header float too heavy	Adjust to lighter float setting.	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Wet undergrowth	Cut when the undergrowth is dry.	—
Reel position incorrect	Move the reel back and down (close to guards).	*3.8.5 Setting Reel Position, page 82*
Knife drive belt too loose	Adjust the belt tension.	*4.9.1 Header Knife Drive, page 167*
Knife hold-downs improperly adjusted	Adjust the hold-downs so the knife works freely.	*4.8.8 Hold-Downs, page 156*
Knife sections or guards are worn or broken	Replace worn or broken parts.	*4.8.1 Replacing Knife Section, page 143* *4.8.7 Guards, page 147*
Reel not feeding properly in heavy crops	Decrease the ground speed.	*3.12 Selecting Ground Speed, page 118*
Bent or misaligned guards causing poor shearing action	Align the guards for proper shearing action.	*Aligning Guard, page 148*
Forming shields improperly adjusted - fluffer too low	Adjust the forming shields, raise the fluffer.	*3.8.15 Positioning Forming Shields, page 103*
Fluffer bypassing or dragging crop	Adjust the fluffer for proper crop control.	*3.8.15 Positioning Forming Shields, page 103*
Auger to stripper clearance too wide	Adjust the auger to stripper bars clearance.	*3.8.4 Setting Auger Position, page 79*
Roll gap too large	Adjust the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Conditioner running too slow	Maintain the rated knife / conditioner speed.	*2.2 Product Specifications, page 25*
Uneven crop flow across auger	Remove the front stripper bar or stripper bar extension if installed.	*4.13 Stripper Bar, page 192*
Excessive center feeding of crop	Remove the front stripper bar extensions if installed.	*4.13 Stripper Bar, page 192*
Build up of crop at ends of rolls, especially in tall crops	Add the front stripper bar extension.	*4.13 Stripper Bar, page 192*
Symptom: Uneven windrow formation in light crop		
Rear of feed pan too low	Raise the rock drop tine bar.	*3.8.12 Setting Feed Pan and Rock Drop Tine Position, page 100*
Symptom: Reel causes seed loss (e.g. grass seed)		
Reel speed too fast	Adjust the flow control on the windrower.	*3.8.3 Adjusting Reel Speed, page 79*
Header angle too steep, causing tines to contact ground	Flatten the header angle, and check the header float.	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Reel not correctly positioned	Lower the reel speed, move the reel rearward, as close as possible to the auger, and downward as close as possible to the knife and the pan.	*3.8.3 Adjusting Reel Speed, page 79* *3.8.5 Setting Reel Position, page 82*

Problem	Solution	Section
Symptom: Auger plugging in heavy grass seed		
Poor crop flow across auger	Remove the lower stripper bar and the middle stripper bar if necessary.	*4.13 Stripper Bar, page 192*
Symptom: Plugging at the delivery opening in heavy grass seed		
Opening too narrow	Move the pan extensions to the widest position.	*3.11 Grass Seed Special, page 113*
Symptom: Grass seed windrow too wide or too narrow		
Pan extensions not adjusted properly	Adjust the pan extensions.	*3.11 Grass Seed Special, page 113*

6.2 Mechanical

A troubleshooting table is provided to help you diagnose and correct any problems you may encounter regarding the mechanical aspect of the machine.

Problem	Solution	Section
Symptom: Auger and/or conditioner rolls damaged by stones		
Feed pan doesn't allow stones to fall through.	Lower the rock-drop tines.	*3.8.12 Setting Feed Pan and Rock Drop Tine Position, page 100*
Symptom: Excessive breakage of the knife sections or the guards		
Ground speed too high in stony conditions	Reduce the ground speed.	*3.12 Selecting Ground Speed, page 118*
Cutting height too low in stony conditions	Raise the cutting height with the skid shoes.	*3.8.8 Setting Cutting Height, page 89*
Header angle too steep in stony conditions	Decrease the header angle.	*3.8.7 Adjusting Header Angle, page 88*
Header float too heavy in stony conditions	Adjust to lighter float setting.	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Knife speed too slow	Maintain the proper rpm on the PTO. Check for proper match of the pump and the gear-drive at PTO.	*2.2 Product Specifications, page 25*
Guards, knife and hold-downs misaligned	Straighten the guards, align the hold-downs.	*4.8.7 Guards, page 147* *4.8.8 Hold-Downs, page 156*
Symptom: Excessive heating of the hydraulic oil		
Relief pressure too low	Replace the relief valve.	Refer to Dealer
Symptom: Header stalling in extremely tall, heavy crop (6+ tons per acre)		
Insufficient crop clearance at rear of feed pan	Lower the rock drop tines (rear of the header pan).	*3.8.12 Setting Feed Pan and Rock Drop Tine Position, page 100*, or *3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Insufficient crop clearance at rear of feed pan	Remove the rubber fingers from the auger at the delivery opening.	*4.12 Replacing Rubber Fingers, page 191*
Insufficient crop clearance at rear of feed pan	Increase the roll gap.	*3.8.13 Adjusting Conditioner Roll Gap, page 101*
Feeding aids for shorter, lighter crop impede flow of heavy or thick stemmed crops (cane, sudan grass etc.)	Remove the front set of stripper bars.	*4.13 Stripper Bar, page 192*
Symptom: Header turns while unloaded but slows or stops when starting to cut		
Low reservoir oil level	Add oil to the reservoir.	*4.7.1 Servicing Header Hydraulics, page 142*
Cold oil in system	Reduce the ground speed until the oil reaches the operating temperature.	*3.12 Selecting Ground Speed, page 118*
Defective motor	Repair the motor.	Refer to Dealer
Defective O-ring inside relief valve	Replace the relief valve.	Refer to Dealer
Defective pump	Repair the pump.	Refer to Dealer
Defective relief valve	Repair the relief valve.	Refer to Dealer

Problem	Solution	Section
Symptom: Knocking in knife drive		
Worn needle bearing in knifehead	Replace.	*4.8.4 Removing Knifehead Bearing, page 146*
Worn knifehead pin	Replace.	*4.8.3 Installing Knife, page 145*
Incorrect end guards	Replace with special end guards.	*4.8.7 Guards, page 147*
Symptom: Knife back breakage		
Dull knife	Replace.	*4.8.4 Removing Knifehead Bearing, page 146*
Worn knife head pin	Replace.	*4.8.3 Installing Knife, page 145*
Bent or broken guard	Straighten or replace.	*4.8.7 Guards, page 147*
Incorrect end guards at knifehead	Replace with the correct number of special guards.	*4.8.7 Guards, page 147*
Symptom: Windrower side drift		
Header is dragging on one end and pulling to that side.	Adjust the skid shoes to prevent the cutterbar dragging.	*3.8.8 Setting Cutting Height, page 89*
Header is dragging on one end and pulling to that side.	Adjust the header float.	*3.8.11 Checking and Adjusting Float – M Series Self-Propelled Windrowers, page 99*
Symptom: Lights malfunctioning		
Improper ground	Check for proper grounding between the light base and the header.	*4.17 Maintaining the Electrical System, page 222*
Burned out bulb	Replace the bulb.	*4.17 Maintaining the Electrical System, page 222*
Poor connection	Check connector at the windrower.	—

Chapter 7: Reference

The reference chapter provides additional information such as the torque specification and a unit conversion chart.

7.1 Recommended Torques

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

7.1.1 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

SAE Bolt Torque Specifications

The torque values provided in the following SAE bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 7.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	11.9	13.2	*106	*117
5/16-18	24.6	27.1	*218	*241
3/8-16	44	48	32	36
7/16-14	70	77	52	57
1/2-13	106	118	79	87
9/16-12	153	170	114	126
5/8-11	212	234	157	173
3/4-10	380	420	281	311
7/8-9	606	669	449	496
1-8	825	912	611	676

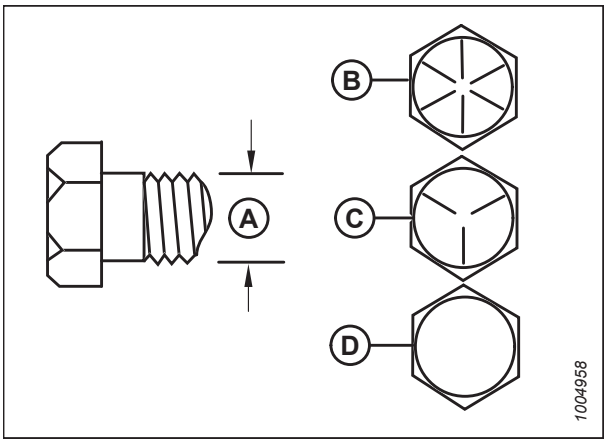


Figure 7.1: Bolt Grades

A - Nominal Size
B - SAE-8
C - SAE-5
D - SAE-2

Table 7.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	8.1	9	*72	*80
5/16-18	16.7	18.5	*149	*164
3/8-16	30	33	22	24
7/16-14	48	53	35	39
1/2-13	73	80	54	59
9/16-12	105	116	77	86
5/8-11	144	160	107	118
3/4-10	259	286	192	212
7/8-9	413	456	306	338
1-8	619	684	459	507

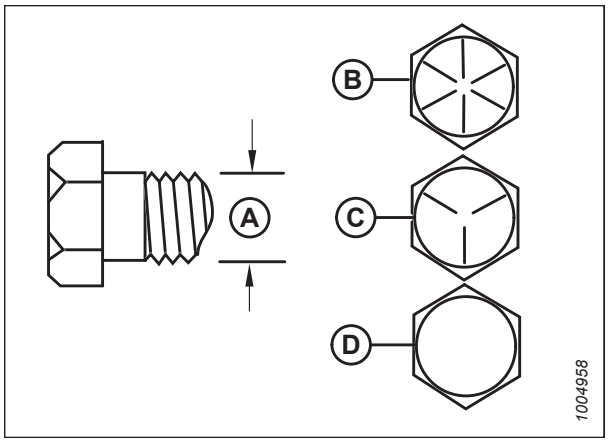


Figure 7.2: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 7.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	24	26	18	19
3/8-16	42	46	31	34
7/16-14	67	74	50	55
1/2-13	102	113	76	84
9/16-12	148	163	109	121
5/8-11	204	225	151	167
3/4-10	362	400	268	296
7/8-9	583	644	432	477
1-8	874	966	647	716

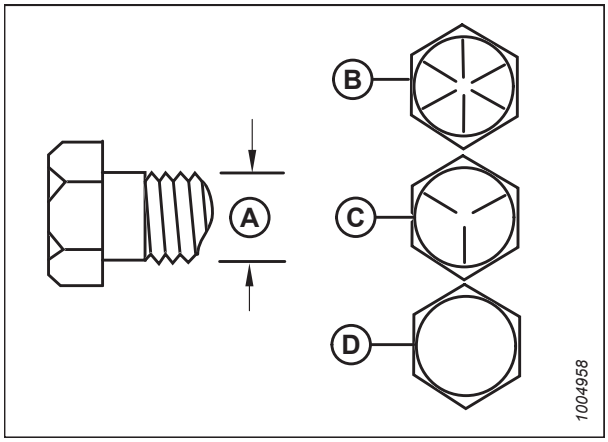


Figure 7.3: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 7.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	35	38	26	28
3/8-16	61	68	46	50
7/16-14	98	109	73	81
1/2-13	150	166	111	123
9/16-12	217	239	160	177
5/8-11	299	330	221	345
3/4-10	531	587	393	435
7/8-9	855	945	633	700
1-8	1165	1288	863	954

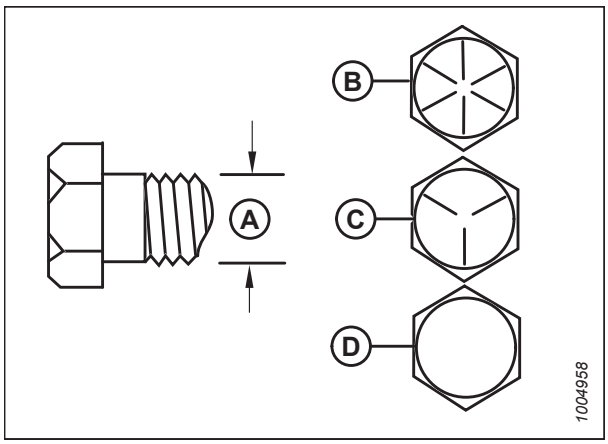


Figure 7.4: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

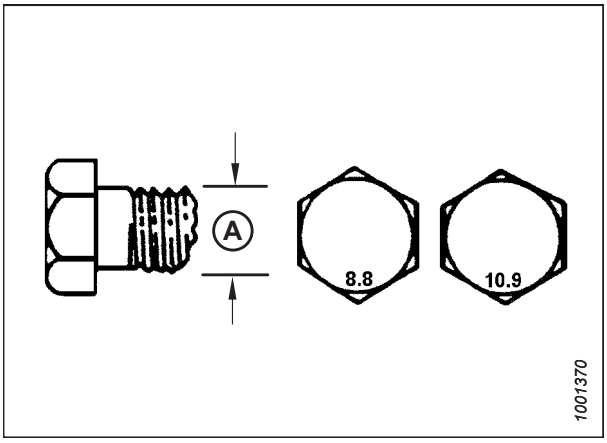


Figure 7.5: Bolt Grades

Table 7.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

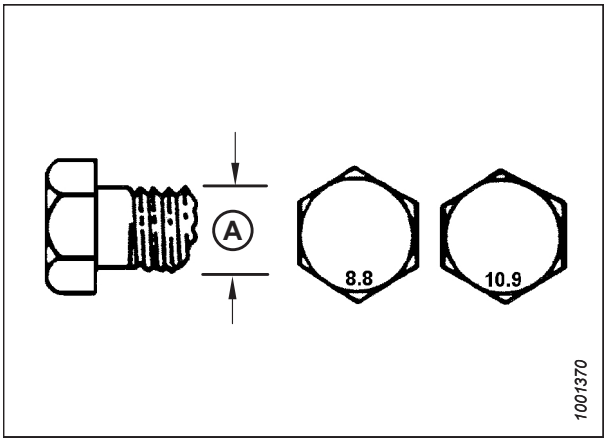


Figure 7.6: Bolt Grades

Table 7.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

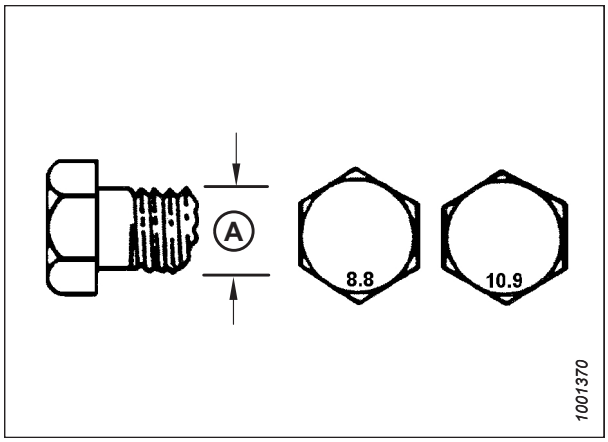


Figure 7.7: Bolt Grades

Table 7.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

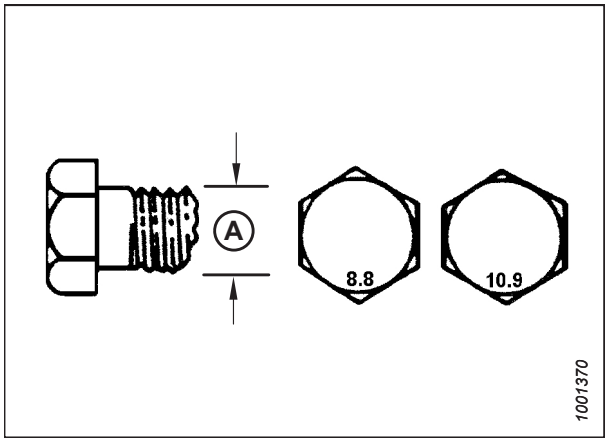


Figure 7.8: Bolt Grades

Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 7.9 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf·ft	Nm	lbf·ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

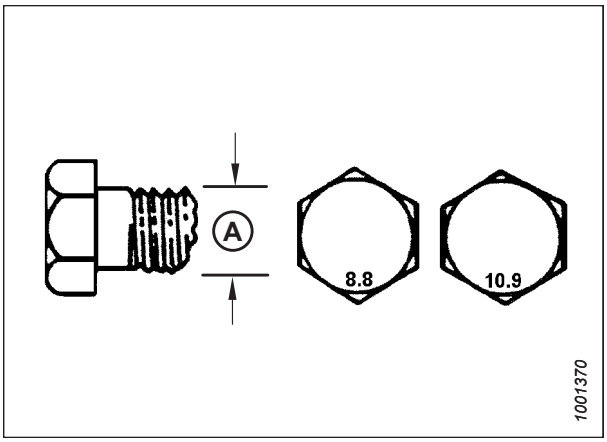


Figure 7.9: Bolt Grades

Flare-Type Hydraulic Fittings

The standard torque values are provided for flare-type hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto the fitting without lubrication until contact is made between the flared surfaces.
3. Torque fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in Table *7.10, page 237*.
4. Secure fitting (D) with two wrenches. Place one wrench on fitting body (D), and tighten nut (E) with the other wrench to the torque value shown in Table *7.10, page 237*.
5. Verify the final condition of connection.

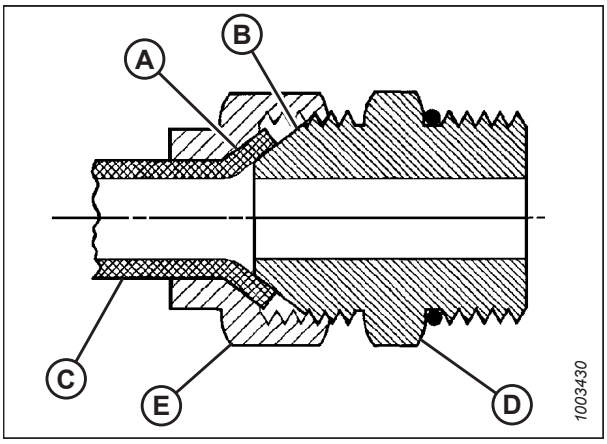


Figure 7.10: Hydraulic Fitting

Table 7.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[5]		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
-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

5. Torque values shown are based on lubricated connections as in reassembly.

Table 7.10 Flare-Type Hydraulic Tube Fittings (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[6]		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-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

O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and that it is pushed toward lock nut (C) as far as possible.
3. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

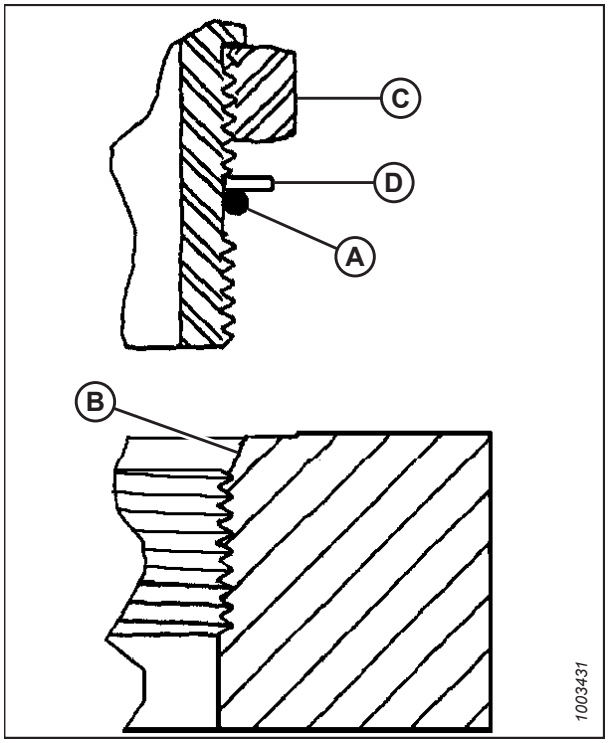


Figure 7.11: Hydraulic Fitting

6. Torque values shown are based on lubricated connections as in reassembly.

5. Install fitting (B) into the port until backup washer (D) and O-ring (A) contact part face (E).
6. Position the angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten it to the torque value indicated in the table. Use two wrenches, one on fitting (B) and the other on lock nut (C).
8. Verify the final condition of the fitting.

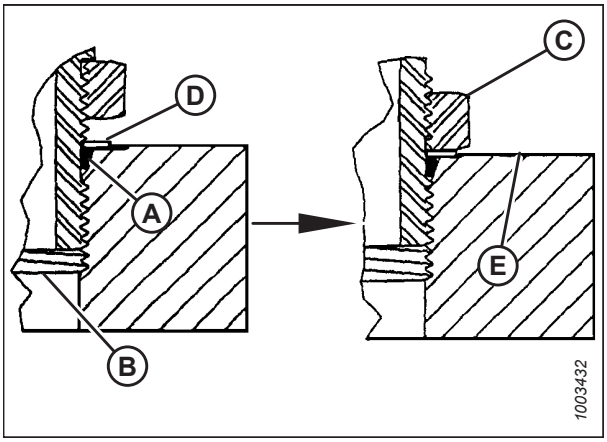


Figure 7.12: Hydraulic Fitting

Table 7.11 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[7]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

7. Torque values shown are based on lubricated connections as in reassembly.

O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *7.12, page 240*.
6. Verify the final condition of the fitting.

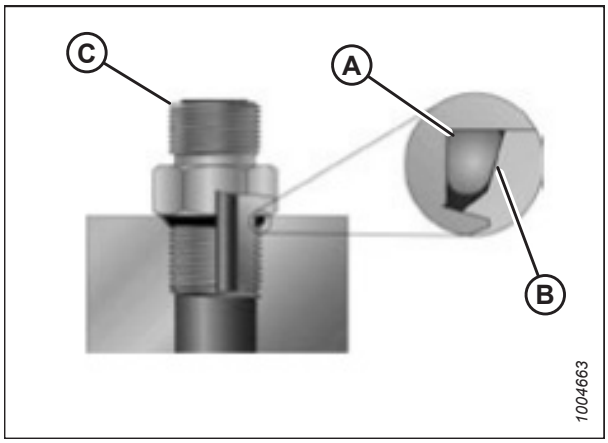


Figure 7.13: Hydraulic Fitting

Table 7.12 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[8]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table *7.13, page 241*.

8. Torque values shown are based on lubricated connections as in reassembly.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

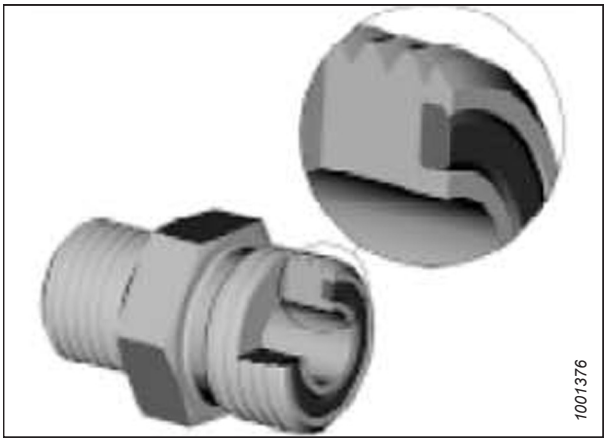


Figure 7.14: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table *7.13, page 241*.

   NOTE:

   If applicable, hold the hex flange on fitting body (E) to prevent the rotation of the fitting body and the hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Verify the final condition of the fitting.

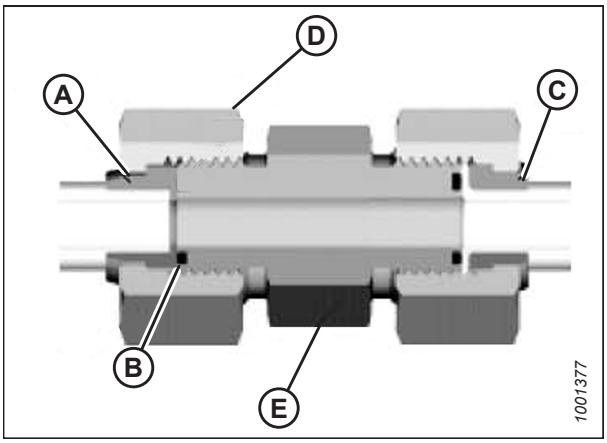


Figure 7.15: Hydraulic Fitting

Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[9]	
			Nm	lbf·ft
-3	Note[10]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[10]	5/16	–	–
-6	11/16	3/8	40–44	30–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[10]	7/8	–	–
-16	1 7/16	1	150–165	111–122

9. Torque values and angles shown are based on lubricated connection as in reassembly.
10. O-ring face seal type end not defined for this tube size.

Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[11]	
			Nm	lbf·ft
-20	1 11/16	1 1/4	205–226	151–167
-24	2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table *7.14, page 242*. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

   The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

Table 7.14 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

11. Torque values and angles shown are based on lubricated connection as in reassembly.

7.2 Conversion Chart

This manual uses both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 7.15 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	x 2.4710 =	acre	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newton	N	x 0.2248 =	pound force	lbf
Length	millimeter	mm	x 0.0394 =	inch	in.
Length	meter	m	x 3.2808 =	foot	ft.
Power	kilowatt	kW	x 1.341 =	horsepower	hp
Pressure	kilopascal	kPa	x 0.145 =	pounds per square inch	psi
Pressure	megapascal	MPa	x 145.038 =	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	x 14.5038 =	pounds per square inch	psi
Torque	Newton meter	Nm	x 0.7376 =	pound feet or foot pounds	lbf·ft
Torque	Newton meter	Nm	x 8.8507 =	pound inches or inch pounds	lbf·in
Temperature	degrees Celsius	°C	(°C x 1.8) + 32 =	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
Velocity	meters per second	m/s	x 3.2808 =	feet per second	ft/s
Velocity	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liter	L	x 0.2642 =	US gallon	US gal
Volume	milliliter	mL	x 0.0338 =	ounce	oz.
Volume	cubic centimeter	cm^3 or cc	x 0.061 =	cubic inch	$in.^3$
Weight	kilogram	kg	x 2.2046 =	pound	lb.

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Recommended Fluids and Lubricants

Your machine can operate at top efficiency **ONLY** if clean lubricants are used.

- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

Lubricant	Specification	Description	Use	Capacities
Grease	SAE Multi-Purpose	High temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2). Lithium base.	As required unless otherwise specified	—
Grease	SAE Multi-Purpose	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	2.1 liters (2.2 US qts)
Gear lubricant	SAE 85W-140	API service class GL-5	Conditioner drive gearbox	1 liter (1.06 US qts)
Hydraulic oil	SAE 15W-40	Compliant with SAE specs for API class SJ And CH-4 engine oil.	Lift and header drive systems reservoir	126 liters (33 US gal)

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