MacDon

R113
SP Disc Header

Operator's Manual

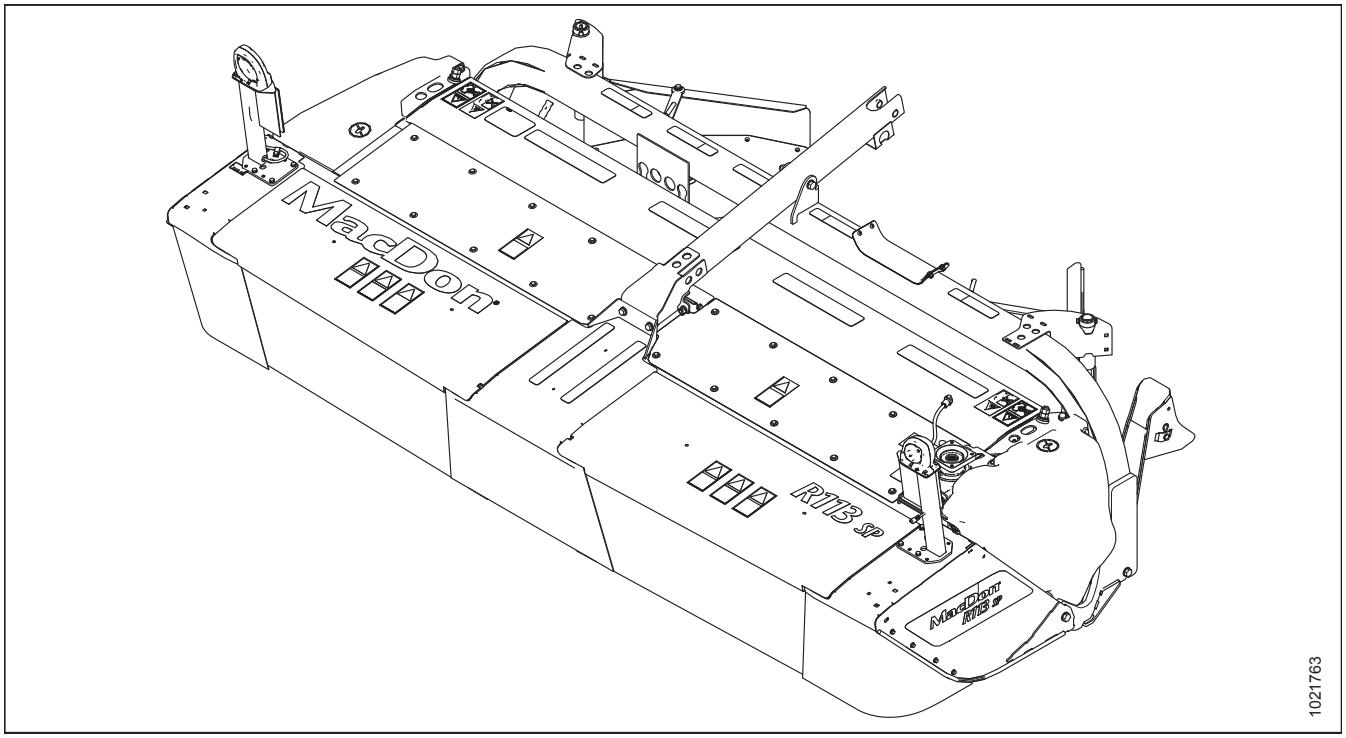
214077 Revision A

2017 Model Year

Original Instruction

The harvesting specialists.

R113 SP Disc Header



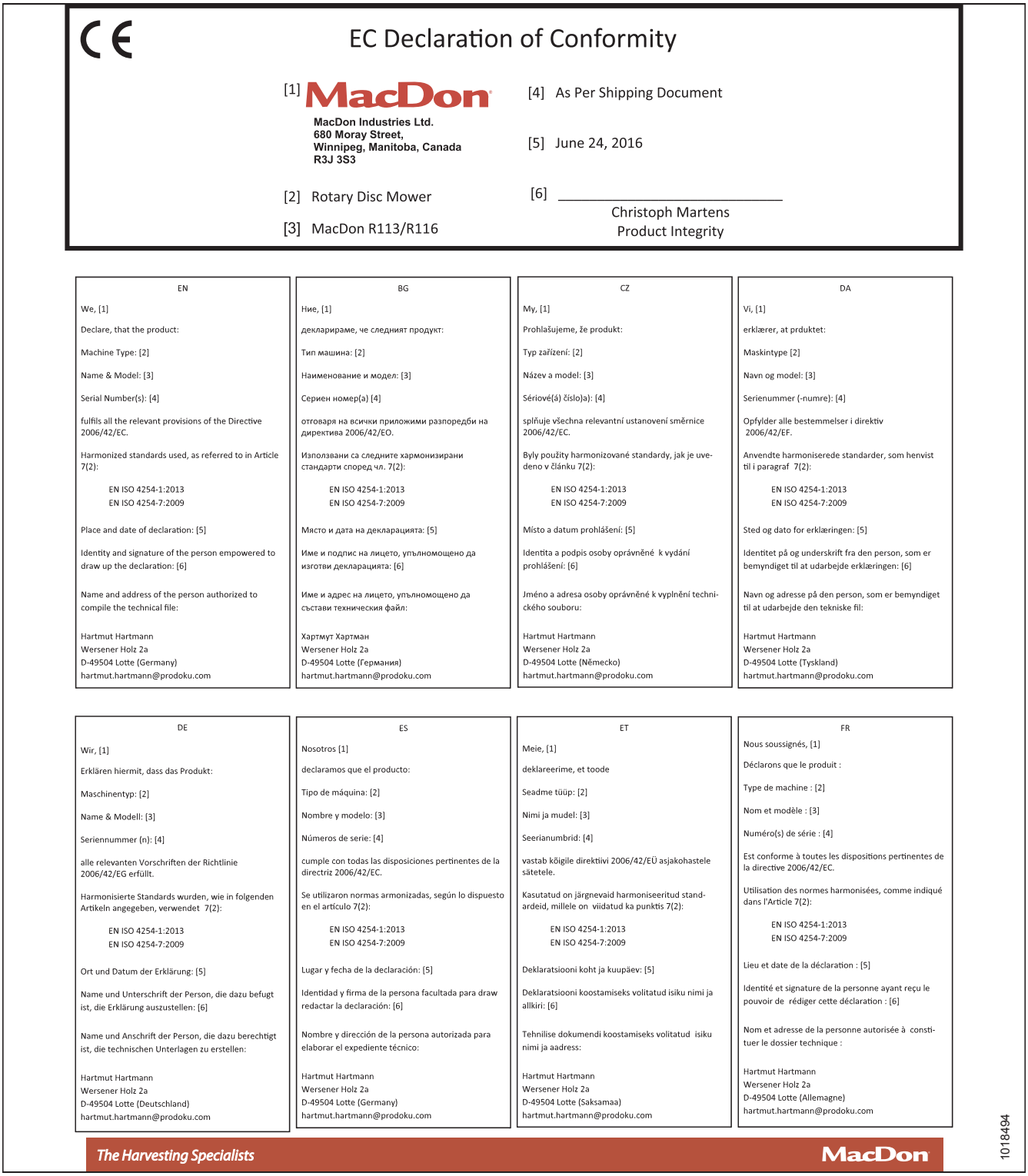
Published: April 2017

Noise Levels

The A-weighted sound pressure level inside the operator’s station of a typical self-propelled vehicle (e.g., M1170), when operated in conjunction with this R113 SP Disc Header, **is 70 dBA**. This measurement was taken in accordance with ISO 5131. The sound pressure level depends upon the rotary disc speed, crop conditions, as well the exact type of self-propelled vehicle used to power the R113.

Declaration of Conformity

Figure 1. EC Declaration of Conformity



EC Declaration of Conformity

[1] MacDon

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

[2] Rotary Disc Mower

[3] MacDon R113/R116

[4] As Per Shipping Document

[5] June 24, 2016

[6] _____
Christoph Martens
Product Integrity

EN

We, [1]

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

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

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

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

Place and date of declaration: [5]

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

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

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Germany)
hartmut.hartmann@prodoku.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:

Хартмут Хартман
Wersener Holz 2a
D-49504 Lotte (Германия)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Německo)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Tyskland)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Deutschland)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Germany)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Saksamaa)
hartmut.hartmann@prodoku.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 :

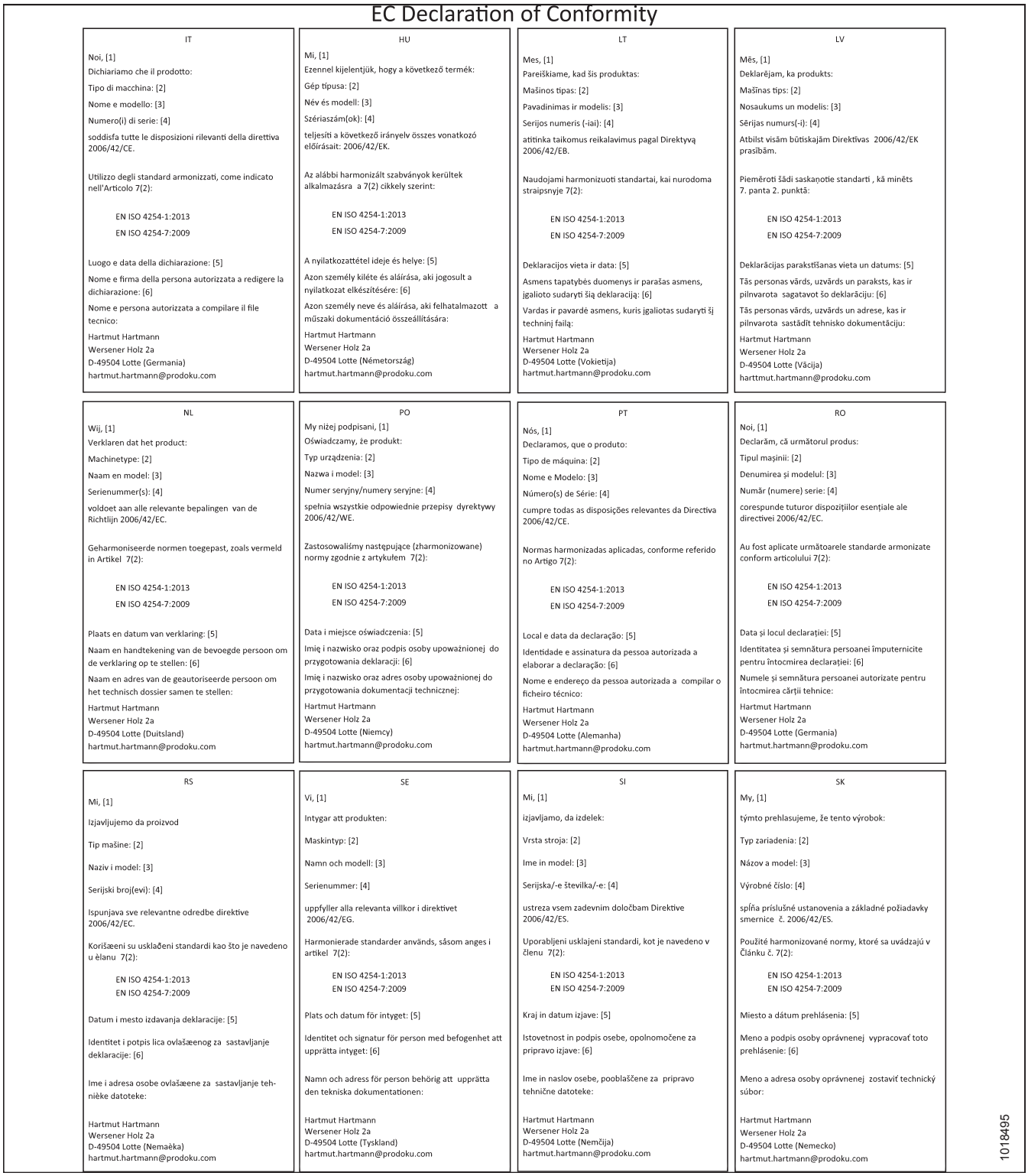
Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Allemagne)
hartmut.hartmann@prodoku.com

The Harvesting Specialists

MacDon

1018494

Figure 2. EC Declaration of Conformity



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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Germania)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Németország)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Vokietija)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Vācija)
harttmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Duitsland)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Niemcy)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Alemanha)
hartmut.hartmann@prodoku.com

RO

Noi, [1]

Declarăm, că următorul produs:

Tipul maşinii: [2]

Denumirea şi modelul: [3]

Număr (numere) serie: [4]

corespunde tuturor dispoziţiilor esenţiale 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 şi locul declaraţiei: [5]

Identitatea şi semnătura persoanei împuternicite pentru întocmirea declaraţiei: [6]

Numele şi semnătura persoanei autorizate pentru întocmirea cărţii tehnice:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Germania)
hartmut.hartmann@prodoku.com

RS

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 usklaðeni standardi kao što je navedeno u élanu 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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Nemaèka)
hartmut.hartmann@prodoku.com

SE

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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Tyskland)
hartmut.hartmann@prodoku.com

SI

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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Nemčija)
hartmut.hartmann@prodoku.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:

Hartmut Hartmann
Wersener Holz 2a
D-49504 Lotte (Nemecko)
hartmut.hartmann@prodoku.com

1018495

Introduction

This manual contains safety, maintenance, and service procedures for the MacDon R113 SP Disc Header.

Carefully read all the material provided before attempting to maintain or service the machine.

Use this manual as your first source of information about the machine.

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

The operator's manual and the parts catalog are stored in the plastic manual case at the right side of the header.

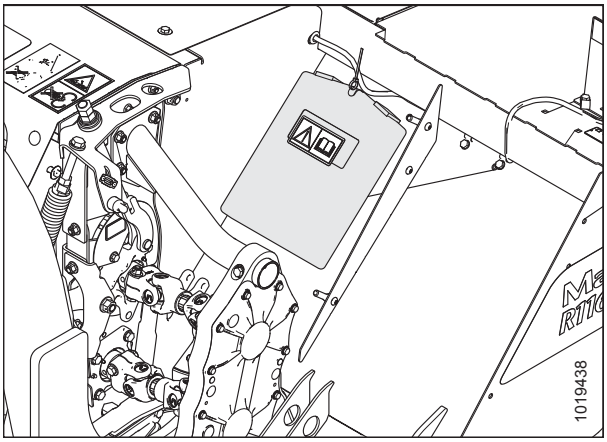


Figure 3. Manual Storage Location

Model and Serial Number

Record the model number, serial number, and model year of the header on the lines below.

R113 SP Disc Header

Header Model: _____

Serial Number: _____

Year: _____

The serial number plate (A) is located near the base of the right side hazard/signal light on the right edge of the header.

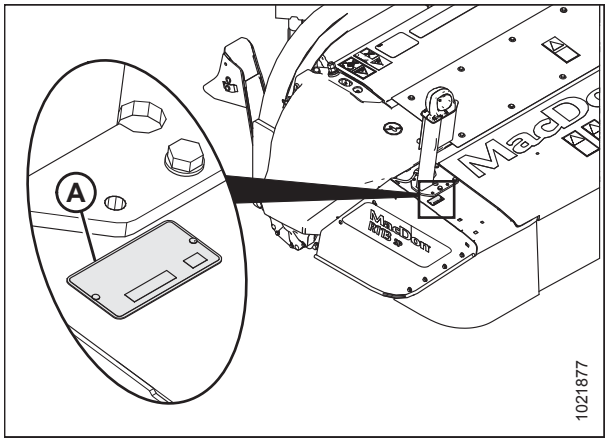


Figure 4. Header, Right Side

1 Safety

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

Three signal words, **DANGER, WARNING**, and **CAUTION**, are used to alert you to hazardous situations. The appropriate signal word for each situation has been selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for job at hand. Do **NOT** take chances. You may need the following:
  - Hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against loud noises.

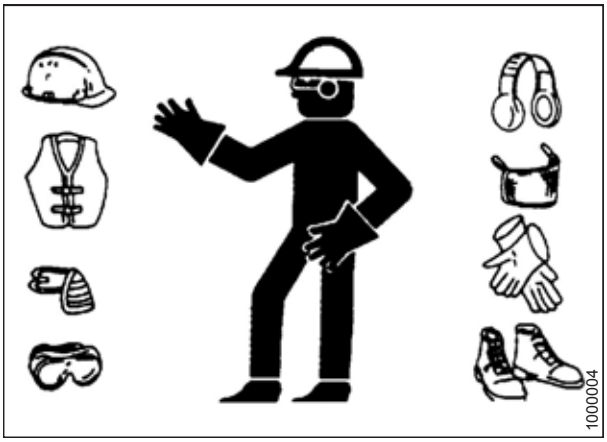


Figure 1.2: Safety Equipment

Figure 1.3: Safety Equipment

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

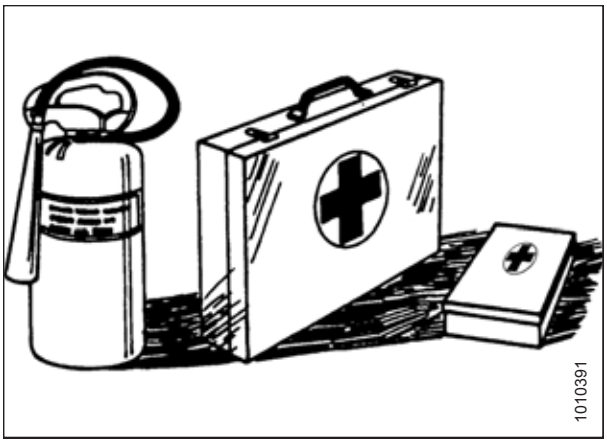


Figure 1.4: Safety Equipment

- Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.

Figure 1.5: Safety around Equipment

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

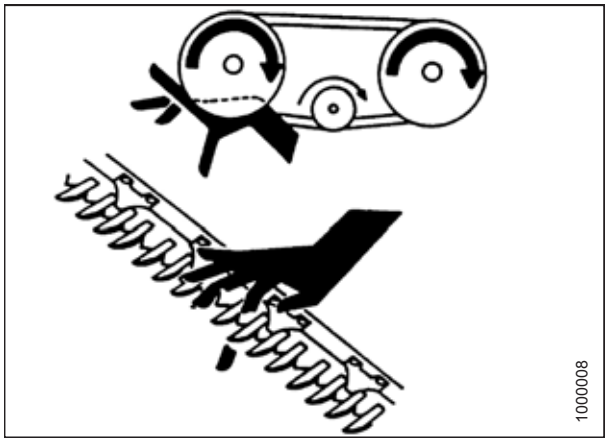


Figure 1.6: Safety around Equipment

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

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining machine:

- Review operator's manual and all safety items before operation and/or maintenance of machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Be sure electrical outlets and tools are properly grounded
  - Use adequate lighting for job at hand

Figure 1.8: Safety around Equipment

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

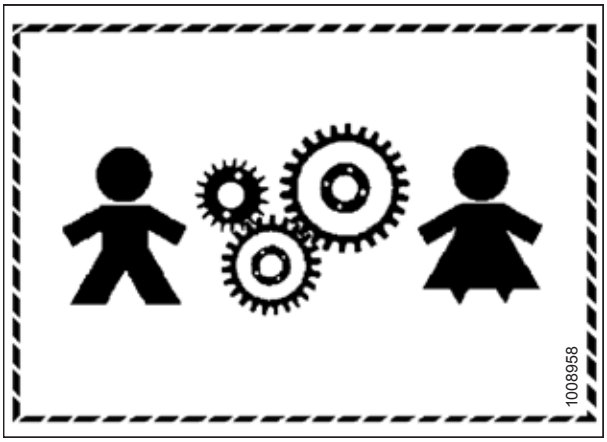


Figure 1.9: Equipment NOT Safe for Children

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

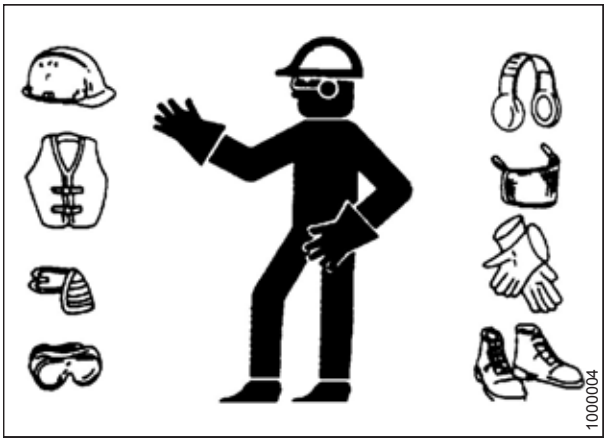


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

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

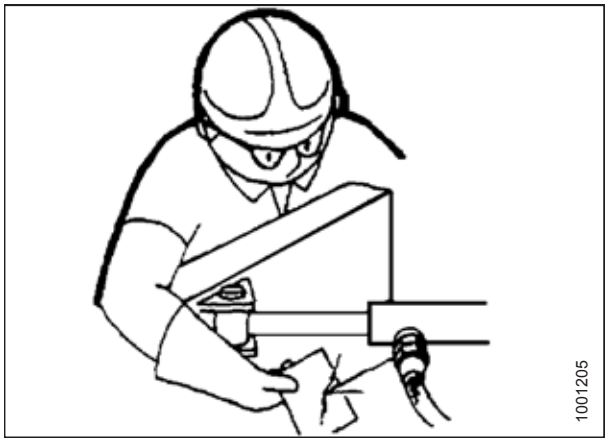


Figure 1.11: Testing for Hydraulic Leaks

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

Figure 1.12: Hydraulic Pressure Hazard

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

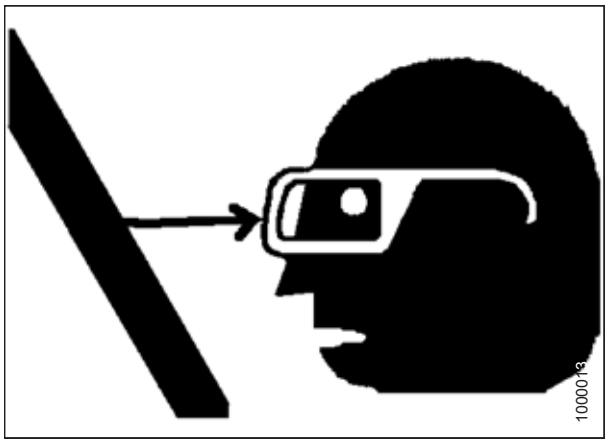


Figure 1.13: Safety around Equipment

1.6 Welding Precaution

Welding should never be attempted on the R113 SP Disc Header while it is connected to a windrower.

WARNING

Severe damage to sensitive, expensive electronics can result from welding on the header while it is connected to the windrower. It can be impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan. It is very important that welding on the header is not attempted while the header is connected to the windrower.

If an Operator needs to do any welding on the R113 SP Disc Header, the header should first be disconnected and removed from the windrower.

If it is unfeasible to disconnect the header from the windrower before attempting welding, refer to the windrower's technical manual (available from your Dealer) for welding precautions detailing all electrical components that must be disconnected first for safe welding.

1.7 Safety Signs

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

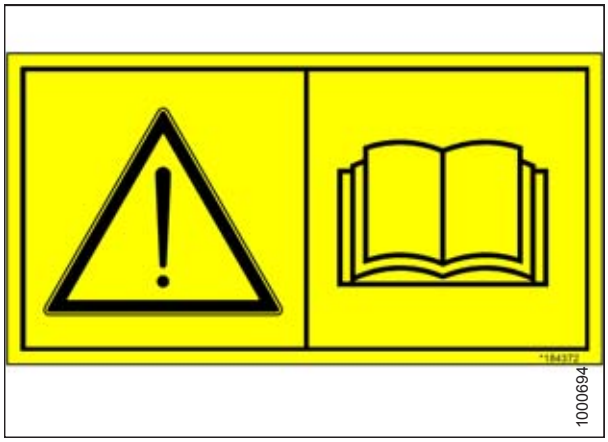


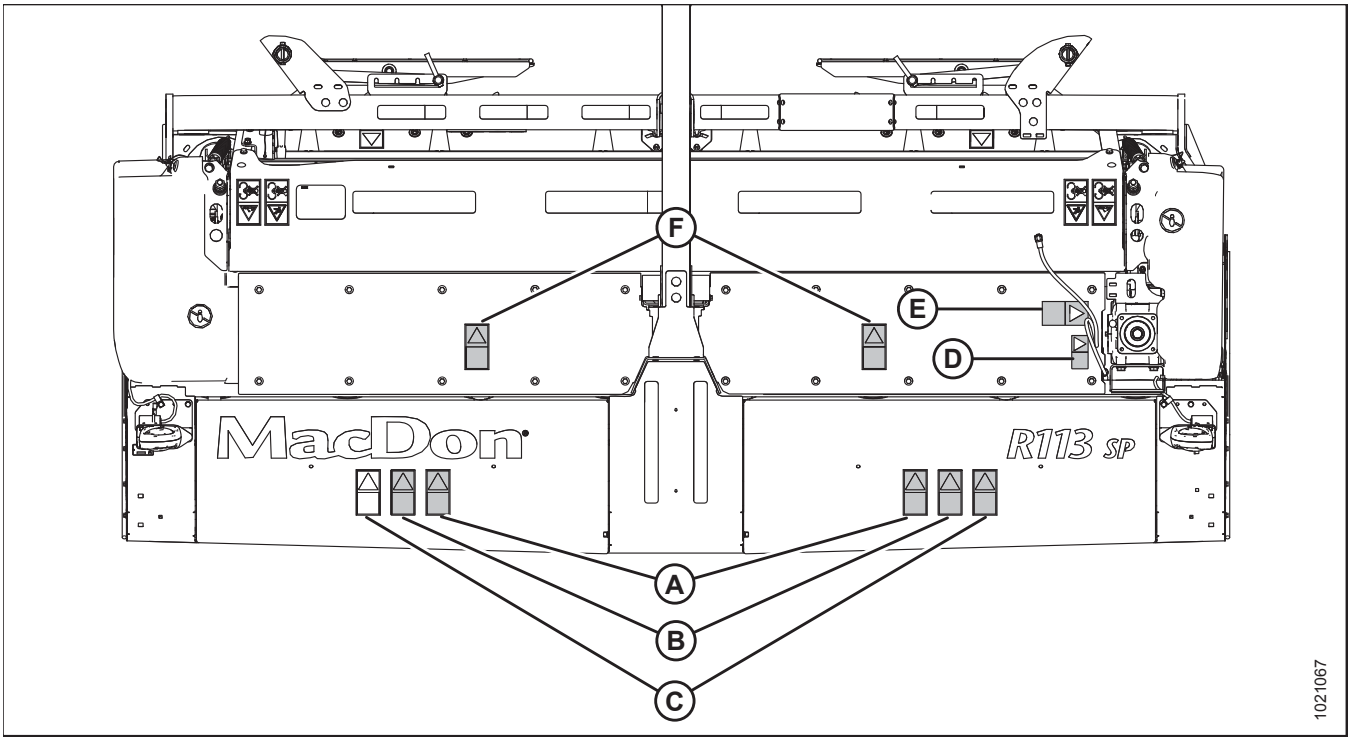
Figure 1.14: Operator's Manual Decal

1.7.1 Installing Safety Decals

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

1.8 Locating Safety Decals

Figure 1.15: Safety Sign Decal Locations Top View



A - MD #194466
B - MD #247167
C - MD #194465
D - MD #166466
E - MD #113482
F - MD #190546

Figure 1.16: Safety Sign Decals

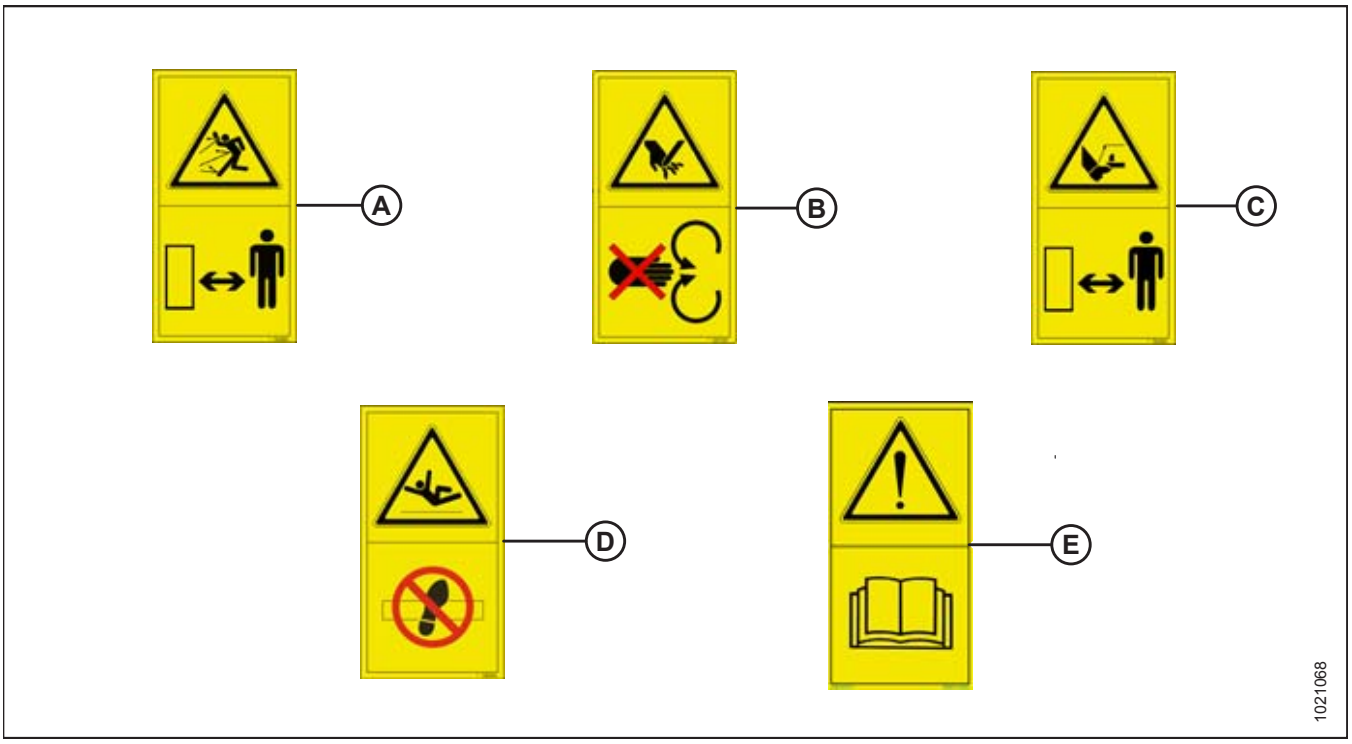
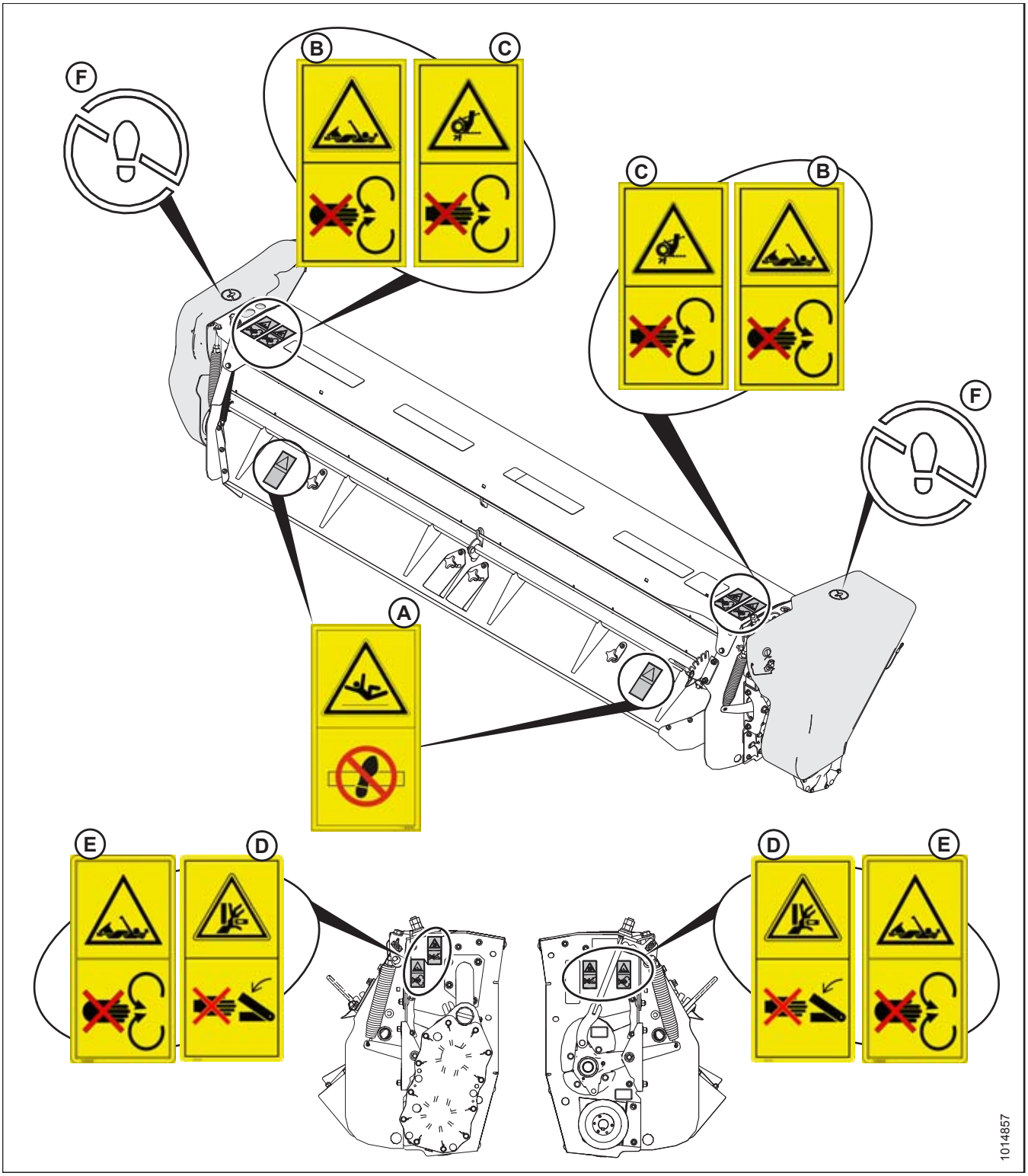


Figure 1.17: Safety Sign Decal Locations Roll Conditioner



A - MD #190546
B - MD #184385
C - MD #184371
D - MD #246959
E - MD #246956
F - NO STEP Symbol (Imprinted on Shield)

1.9 Understanding Safety Signs

NOTE:

This is a general list of safety sign definitions, and every decal may not necessarily be applied to your machine.

MD #113482

General hazard pertaining to machine operation and servicing.

CAUTION

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

Figure 1.18: MD #113482

MD #166466

Hydraulic pressure oil hazard

CAUTION

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

Figure 1.19: MD #166466

MD #184371

Open drive hazard

WARNING

- Guard missing. Do not operate.
- Keep all shields in place.

Figure 1.20: MD #184371

MD #184385

Entanglement hazard

CAUTION

- To avoid injury from entanglement with rotating auger, stand clear of self-propelled disc header while machine is running.

Figure 1.21: MD #184385

MD #190546

Slippery surface

WARNING—DON'T PLACE FOOT

- Do not use this area as a step or platform.
- Failure to comply could result in serious injury or death.

Figure 1.22: MD #190546

MD #194465

Rotating cutters

WARNING—STAND CLEAR

- Contact with blades or thrown objects can result in serious injury or death.
- Do not stand on or near machine when in operation.
- Do not operate with covers or curtains open or removed.
- Shut off tractor and remove key before opening covers.

Figure 1.23: MD #194465

MD #194466

Rotating fingers under hood

WARNING—STAND CLEAR

- Crop materials exiting at high speed.
- Stop machine, look, listen, and wait for all movement to stop before approaching.
- Failure to comply could result in death or serious injury.

Figure 1.24: MD #194466

MD #246956

Moving into working/transport position hazard

WARNING

- To avoid injury, read the tractor and self-propelled disc header manufacturer's manuals before moving into either transport or working position.

Figure 1.25: MD #246956

MD #246959

Pinch hazard

WARNING—KEEP AWAY

- Failure to comply could result in death or serious injury.

Figure 1.26: MD #246959

MD #247167

Rotating blades

WARNING

- Disengage power take-off, shut off tractor, and remove key before opening covers.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off due to inertia.

Figure 1.27: MD #247167

2 Product Overview

2.1 Product Specifications

NOTE:

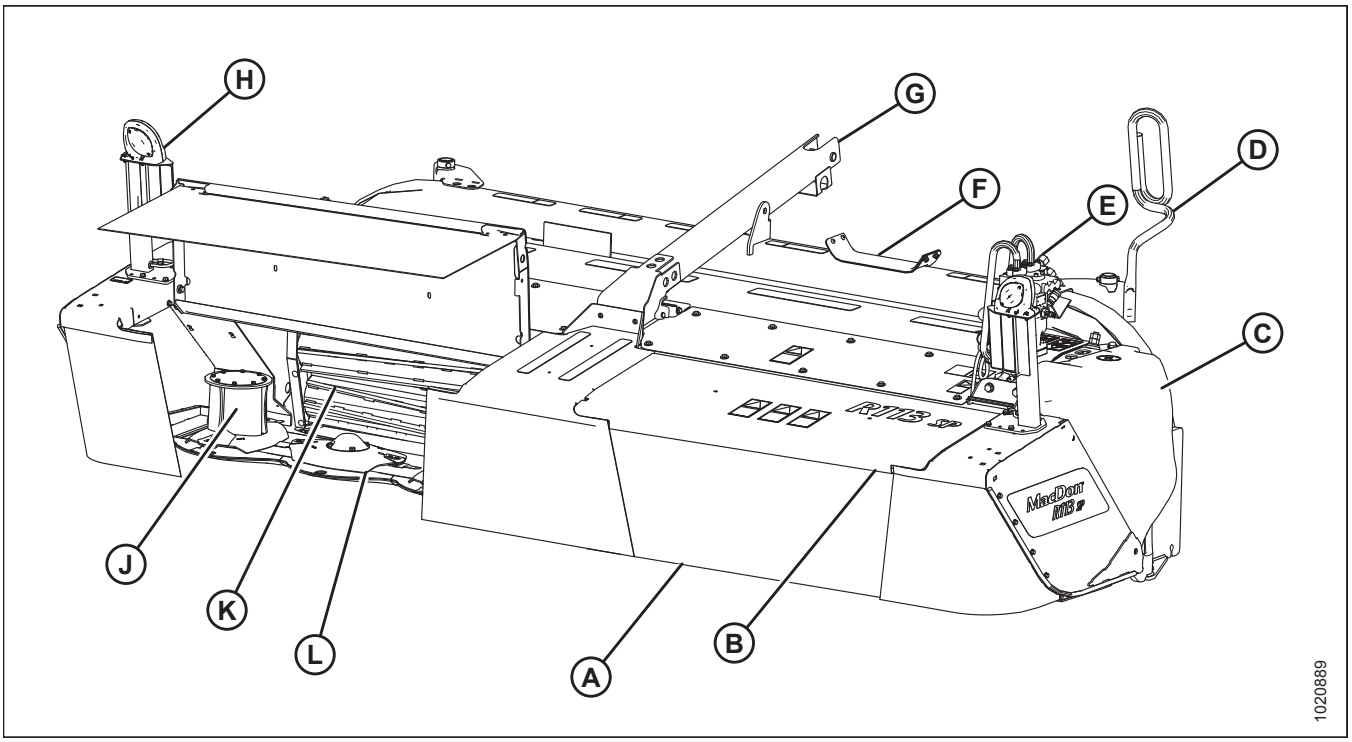
Specifications and design are subject to change without notice or obligation to revise previously sold units.

Frame and Structure	
Width (transport)	4063 mm (160 in.)
Weight: base machine and adaptor frame	2200 kg (4848 lb.)
Weight: base machine, adaptor frame, and steel conditioner	2690 kg (5920 lb.)
Weight: base machine, adaptor frame, and polyurethane conditioner	2708 kg (5959 lb.)
Compatible windrower	MacDon M155*E4* or M1170 Self-Propelled Windrower
Lighting	Left and right turn signals
Manual storage	Plastic case on header right driveshield
Cutterbar	
Number of cutting discs	Eight
Blades per disc	Two 11 degrees bevel down
Disc speed (full engine speed)	2500 rpm
Blade tip speed range	80.5 m/s (180 mph)
Effective cutting width	3978 mm (13 ft.)
Cutting height	25 mm (1 in.)
Cutting angle range	0–8 degrees below horizontal
Adjustable shoes	Standard
Gear train protection	Shearpin (safecut)
Converging Drums	Two drum type
Drives	
Hydraulic motor	Piston type into 90 degree gearbox
Cutterbar	Direct drive through 90 degree gearbox and universal shaft
Conditioner drive	Belt drive (4HB) from 90 degree gearbox to conditioner
Conditioner roll timing	Timing gearbox
Hay Conditioner Options	
Steel rolls	Optional
Roll type	Steel on steel chevron conditioner rolls

Frame and Structure	
Roll length	3275 mm (129 in.)
Roll diameter	229 mm (9.0 in.) / 179 mm (7.0 in.) OD Tube
Roll speed	1009 rpm
Polyurethane rolls	Optional
Roll type	Polyurethane intermeshing conditioner rolls
Roll length	3275 mm (129 in.)
Roll diameter	254 mm (10.0 in.) / 203 mm (8.0 in.) OD Tube
Roll speed	1009 rpm
Swath width	915–2540 mm (36–102 in.)
Forming shields	Full width adjustable baffle on conditioner with adjustable side deflectors on support frame
No conditioner	Optional (includes rear curtain)

2.2 Component Identification

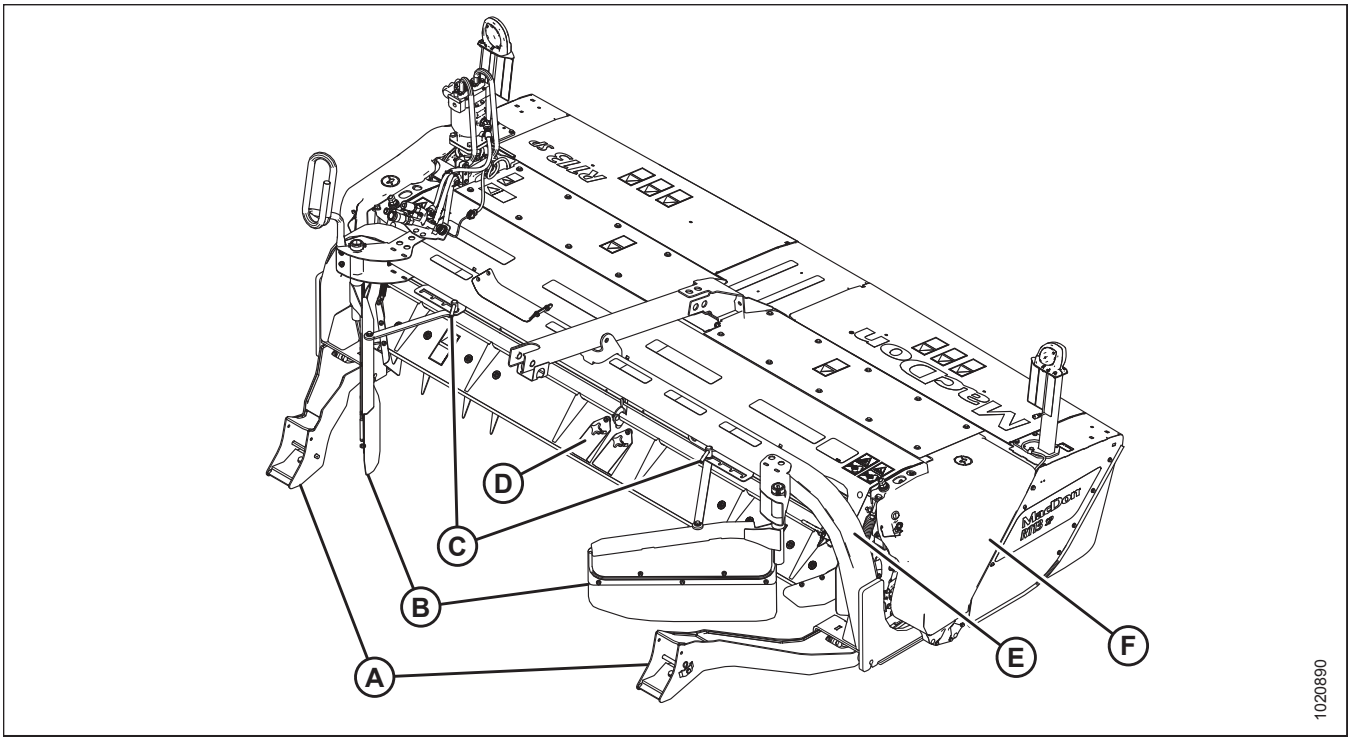
Figure 2.1: 13-Foot SP Disc Header



A - Front Curtains
B - Cutterbar Doors
C - Drive Shield (Left)
D - Hose Support[1]
E - Hydraulic Motor[2]
F - Hose Support
G - Center-Link Tube
H - Hazard / Brake Lights
J - Disc Drum (Right)
K- Conditioner Rolls
L- 8-Disc Cutterbar

1. M155*E4* Only
2. M155*E4* Series Motor Shown

Figure 2.2: 13-Foot SP Disc Header



A - Header Boots
B - Side Deflectors
C - Side Deflector Adjuster Handles
D - Rear Crop Baffle
E - Carrier Frame
F - Shield (Right)

2.3 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined vehicle gross weight
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
FFFT	Flats from finger tight
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
NPT	National Pipe Thread: A style of fitting used for low pressure port openings Threads on NPT fittings are uniquely tapered for an interference fit
ORB	O-ring boss: A style of fitting commonly used in port opening on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes This style of fitting is also commonly called ORS, which stands for O-ring seal
R1 Series header	MacDon R113 and R116 disc headers
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
SP disc header	Rotary disc header that connects to self-propelled machine (windrower, etc.)

Term	Definition
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism

3 Operation

3.1 Break-In Period

After attaching the self-propelled disc header to the self-propelled windrower for the first time, operate the machine slowly for five minutes, watching and listening from the self-propelled windrower seat for binding or interfering parts.

NOTE:

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

CAUTION

Before investigating an unusual sound or attempting to correct a problem, stop the engine, engage parking brake, and remove the key.

NOTE:

Perform the items specified in *4.3.1 Maintenance Schedule/Record, page 101*.

3.2 Daily Start-Up Check

Perform the following checks each day before startup:

CAUTION

- **Ensure windrower and self-propelled disc header are properly attached, all controls are in neutral, and windrower brakes are engaged.**
- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the self-propelled disc header to make sure no one is under, on, or close to it.**
- **Wear close-fitting clothing and protective shoes with slip resistant soles. As well, carry with you any protective clothing and personal safety devices that could be necessary throughout the day. Don't take chances.**
- **Remove foreign objects from the machine and surrounding area.**

Protect yourself. You may need the following:

- A hard hat
- Protective footwear with slip resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- A respirator or filter mask

Figure 3.1: Safety Equipment

Use proper hearing protection:

Be aware that exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against objectionable or loud noises.

Figure 3.2: Safety Equipment

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

   NOTE:

   Use proper procedure when searching for pressurized fluid leaks. Refer to *Hydraulic Hoses and Lines, page 163*.

2. Clean all lights and reflective surfaces on the machine, and check lights for proper operation.

3. Perform all daily maintenance. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

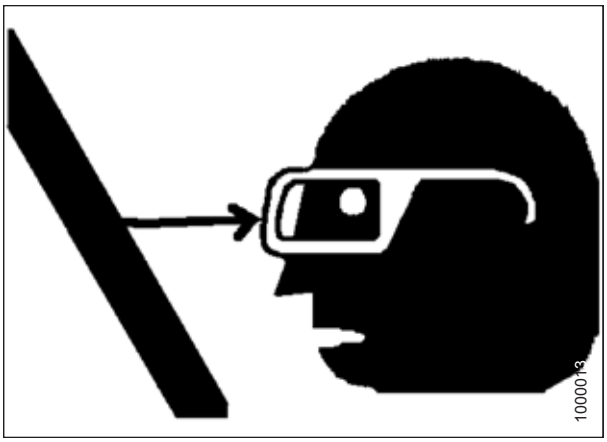


Figure 3.3: Safety around Equipment

3.3 Engaging and Disengaging Header Safety Props

Safety props are located on both header lift cylinders on the windrower.

Refer to relevant procedure for your windrower:

- M1 Series Self-Propelled Windrowers *3.3.1 Engaging and Disengaging Header Safety Props: M1170 Windrower, page 24*
- M Series Self-Propelled Windrowers *3.3.2 Engaging and Disengaging Header Safety Props: M155E4 Windrower, page 25*

3.3.1 Engaging and Disengaging Header Safety Props: M1170 Windrower

Safety props are located on both header lift cylinders on the windrower. Follow these steps to engage or disengage the header safety props:

DANGER

To avoid bodily injury from fall of raised header, always engage safety props when working on or around raised header, and before going under header for any reason.

1. Start the engine. Press the HEADER UP (A) switch to raise header to maximum height.

   NOTE:

   If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

   a. Press and hold the HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

2. Stop the engine and remove key from ignition.

Figure 3.4: Ground Speed Lever

3. Engage safety props on both lift cylinders as follows:

   a. Pull lever (A), rotate toward header to release, and lower the safety prop onto the cylinder.
   b. Repeat for opposite lift cylinder.

   IMPORTANT:

   Ensure the safety props engage over cylinder piston rods. If safety prop does not engage properly, raise the header until the safety prop fits over the rod.

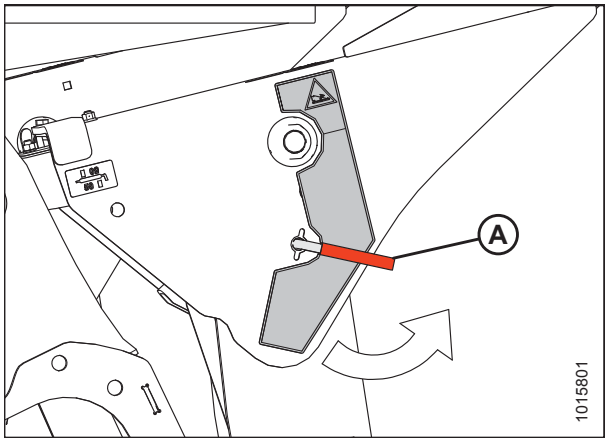


Figure 3.5: Cylinder Safety Prop

4. Disengage safety props by turning lever (A) away from header to raise safety prop until lever locks into vertical position.

   NOTE:

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

5. Repeat for opposite cylinder.

CAUTION

Check to be sure all bystanders have cleared the area.

6. Start the engine, choose a level area, and lower header to the ground. Stop the engine and remove the key.

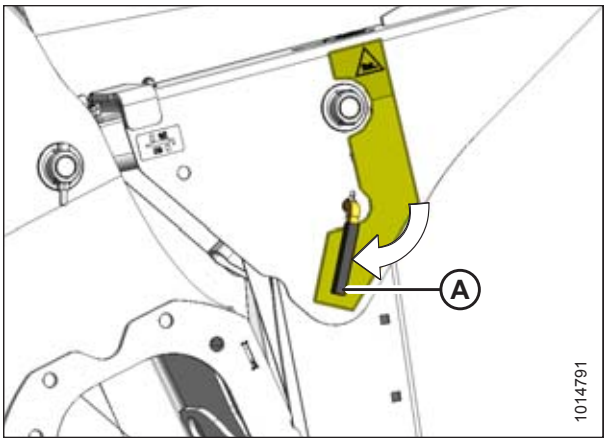


Figure 3.6: Safety Prop

3.3.2 Engaging and Disengaging Header Safety Props: M155*E4* Windrower

Safety props are located on both header lift cylinders on the windrower. Follow these steps to engage or disengage the header safety props:

DANGER

To avoid bodily injury from fall of raised header, always engage safety props when working on or around raised header, and before going under header for any reason.

Engage safety props as follows:

1. Start engine and press header up (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is required, proceed as follows:
   a. Press and hold the header up (A) switch until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

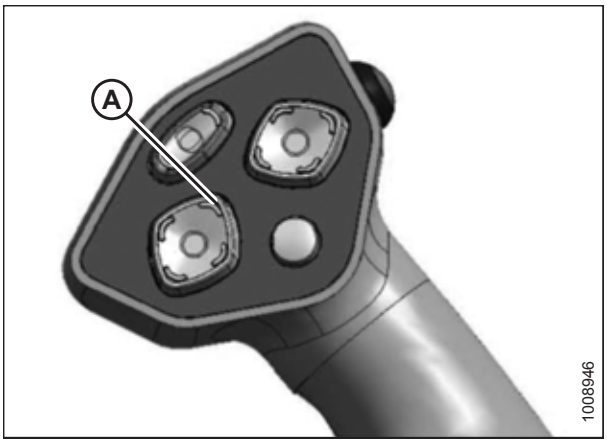


Figure 3.7: Ground Speed Lever (GSL)

3. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.

Figure 3.8: Safety Prop

Disengage safety props as follows:

1. Turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.
2. Start engine, choose a level area, and lower header to the ground.
3. Stop the engine and remove the key.

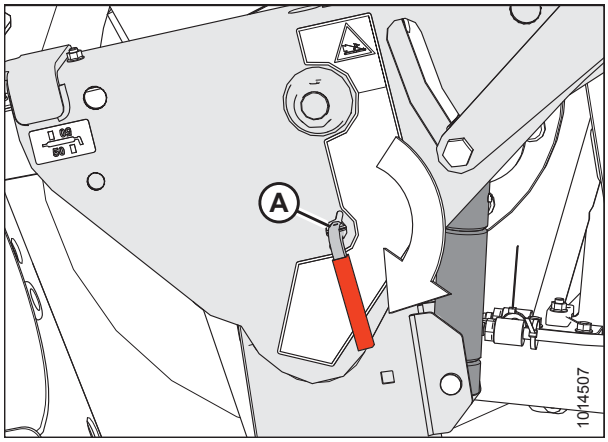


Figure 3.9: Safety Prop

3.4 Header Float

The M1170 and M155*E4* windrowers have different float adjustments. Although they both have float springs, the M1170 is completely adjustable from the cab through the Harvest Performance Tracker (HPT) and the M155*E4* has coarse adjustment done at the spring drawbolt and fine adjustment done through the Cab Display Module (CDM) in the windrower cab.

The header float feature allows the header to closely follow ground contours and respond quickly to sudden changes or obstacles. The float setting is ideal when the cutterbar is on the ground with minimal bouncing, scooping, or pushing soil.

IMPORTANT:

- Set header float as light as possible—without excessive bouncing—to avoid frequent breakage of knife components, scooping soil, or soil build-up at the cutterbar in wet conditions.
- Avoid excessive bouncing (resulting In a ragged cut) by operating at a slower ground speed when the float setting is light.
- Install applicable header options (skid shoes, etc.) before setting header float. If the slow speed transport (SST) tow bar will be stored on header during operation, set float with tow bar in place.
- Adjust the float when adding or removing optional attachments that affect the weight of the header.

For instructions for setting and adjusting the header float, refer to your windrower operator’s manual.

3.5 Attaching Header to Windrower

3.5.1 Attaching R1 SP Disc Header to M1170 Windrower

The windrower hydraulic center-link may be equipped with a self-aligning option that allows the Operator to control the vertical position of the center-link from the cab.

DANGER

To avoid bodily injury or death from 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. **Hydraulic center-link without self-alignment:** Relocate pin (A) in frame linkage as required to raise the center-link (B) until the hook is above the attachment pin on the header.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

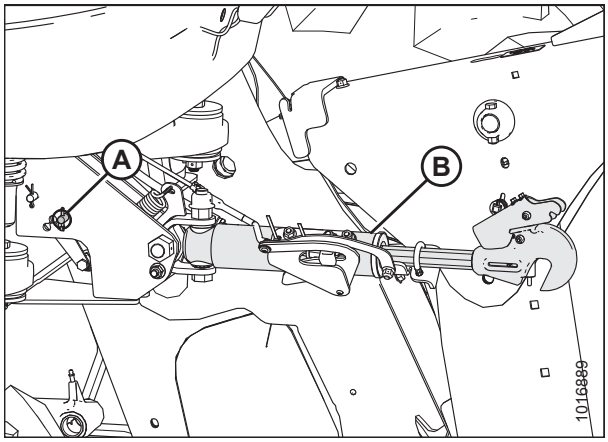


Figure 3.10: Hydraulic Center-Link

2. Remove hairpin (A) from clevis pin (B), and remove pin from header support (C) on both sides of header.

CAUTION

Check to be sure all bystanders have cleared the area.

3. Start windrower engine.

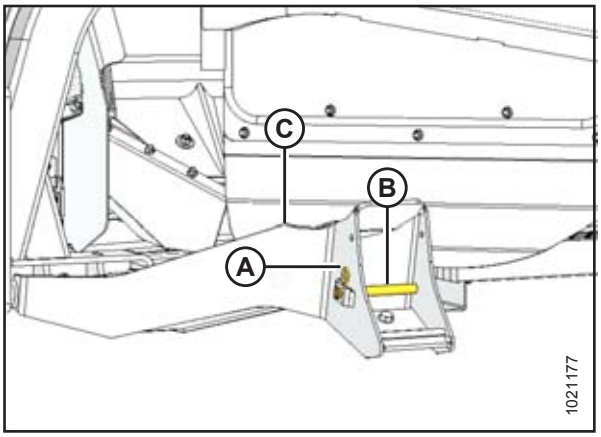


Figure 3.11: Header Support

CAUTION

To prevent damage to the header lift linkages when lowering header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released.

NOTE:

If not prompted by the Harvest Performance Tracker (HPT) display to remove float, remove float manually. Refer to windrower operator's manual for instructions.

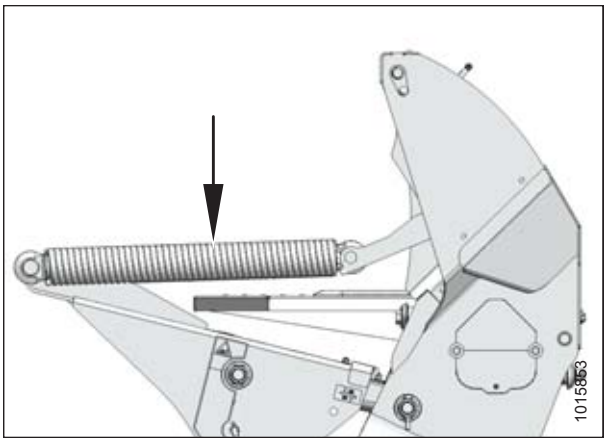


Figure 3.12: Header Float Spring

4. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract header lift cylinders.
5. **Hydraulic center-link with self-alignment:** Press the REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

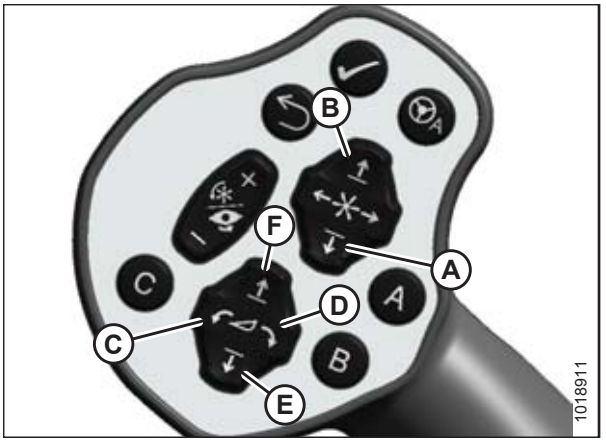


Figure 3.13: Ground Speed Lever

A - Reel Down
B - Reel Up
C - Header Tilt Down
D - Header Tilt Up
E - Header Down
F - Header Up

6. Drive the windrower slowly forward until the windrower feet (A) enter the header supports (B). Continue to drive slowly forward until feet engage the supports and header nudges forward.
7. Ensure that windrower feet (A) are properly engaged in header supports (B).

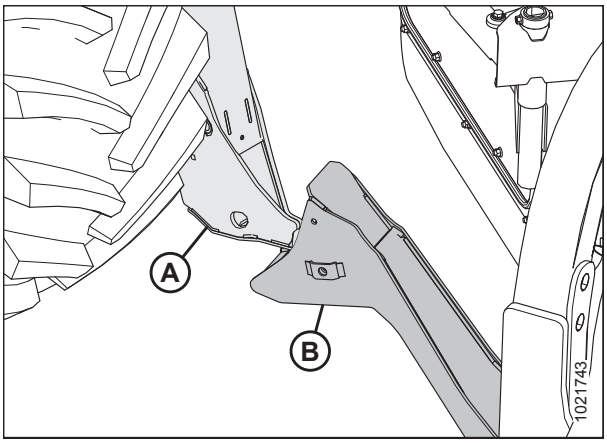


Figure 3.14: Header Support

8. ***Hydraulic center-link with optional self-alignment:***

   a. Adjust position of the center-link cylinder (A) with the switches on the GSL until the hook (B) is above the header attachment pin.

   IMPORTANT:

   Hook release (C) must be down to enable self-locking mechanism.

   b. If the hook release (C) is open (up), stop the engine and remove ignition key. Manually push the hook release (C) down after hook engages the header pin.
   c. Lower center-link (A) onto the header with REEL DOWN switch on the GSL until it locks into position (hook release [C] is down).
   d. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.

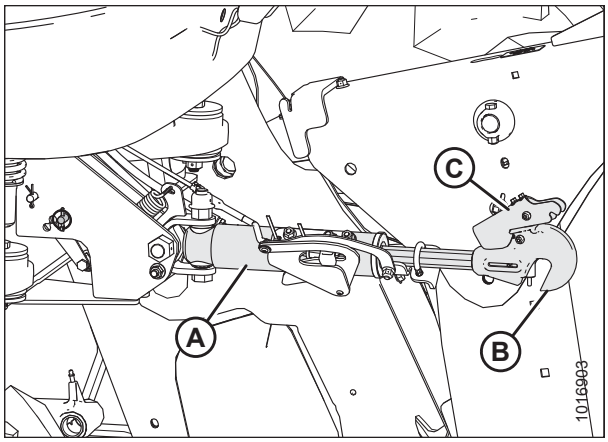


Figure 3.15: Hydraulic Center-Link

9. ***Hydraulic center-link without self-alignment:***

   a. Press HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract center-link cylinder until the hook is aligned with the header attachment pin.
   b. Stop the engine and remove the key.
   c. Push down on rod end of link cylinder (B) until hook engages and locks onto header pin.

   IMPORTANT:

   Hook release must be down to enable self-locking mechanism. If the hook release is open (up), manually push it down after hook engages pin.

   d. Check that center-link (A) is locked onto header by pulling upward on rod end (B) of cylinder.

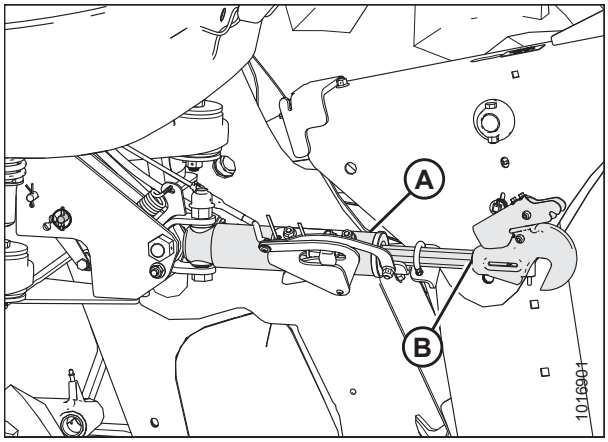


Figure 3.16: Hydraulic Center-Link

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

   e. Start engine.

10. Press the HEADER UP switch (A) to raise header to maximum height.

    NOTE:

    If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch (A) until both cylinders stop moving.
    b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

11. Stop the engine and remove the key.

Figure 3.17: Ground Speed Lever

12. Engage safety prop on lift cylinder as follows:

    a. Pull lever (A) and rotate toward header to release, and lower safety prop onto cylinder.
    b. Repeat for opposite lift cylinder.

    IMPORTANT:

    Ensure the safety props engage over the cylinder piston rods. If safety prop does not engage properly, raise header until prop fits over the rod.

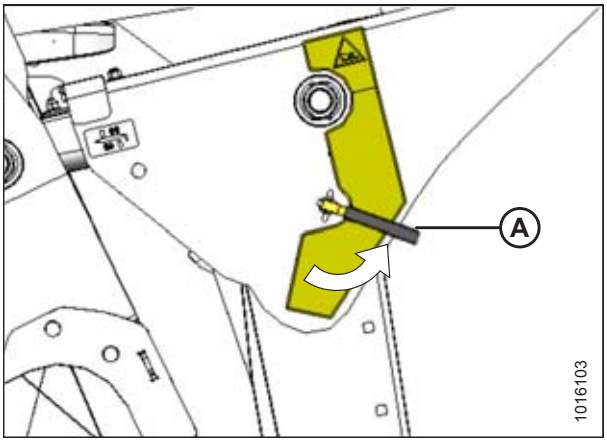


Figure 3.18: Cylinder Safety Prop

13. Install clevis pin (A) through support and foot and secure with hairpin (B). Repeat for opposite side.

    IMPORTANT:

    Ensure clevis pin (A) is fully inserted, and hairpin is installed behind bracket.

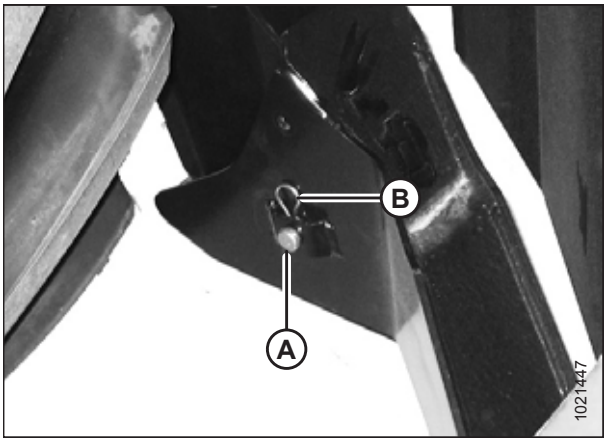


Figure 3.19: Header Support

14. Disengage safety prop by turning lever (A) downward to raise safety prop until lever locks into vertical position.

    NOTE:

    If safety prop will not disengage, raise header slightly.

15. Repeat for opposite side.

CAUTION

Check to be sure all bystanders have cleared the area.

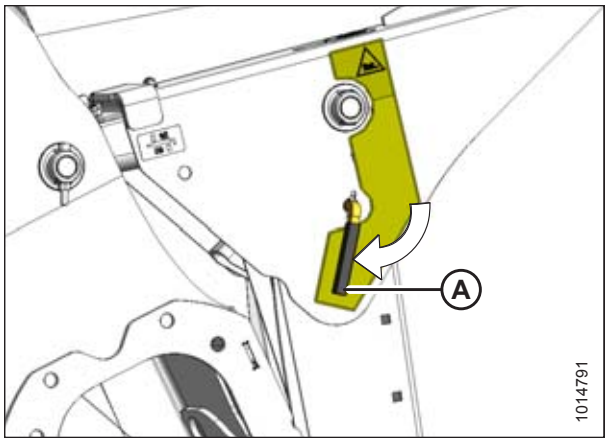


Figure 3.20: Cylinder Safety Prop

16. Start engine and press HEADER DOWN switch (A) on GSL to fully lower header.

    NOTE:

    If not prompted by the HPT display to restore float, restore float manually.

17. Stop the engine and remove the key.
18. Proceed to *3.5.4 Attaching Hydraulics and Electrical Connections, page 42*.

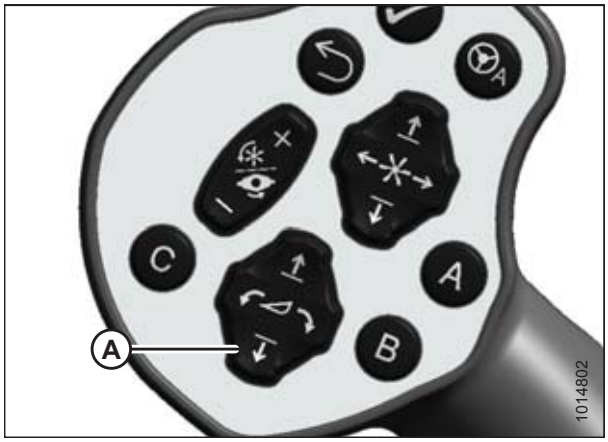


Figure 3.21: Ground Speed Lever

3.5.2 Attaching R1 Series SP Disc Header to M155*E4* Windrower: Self-Aligning Hydraulic Center-Link

1. Remove hairpin (B) from clevis pin (A) and remove clevis pin from the header supports (C) on both sides of the header.

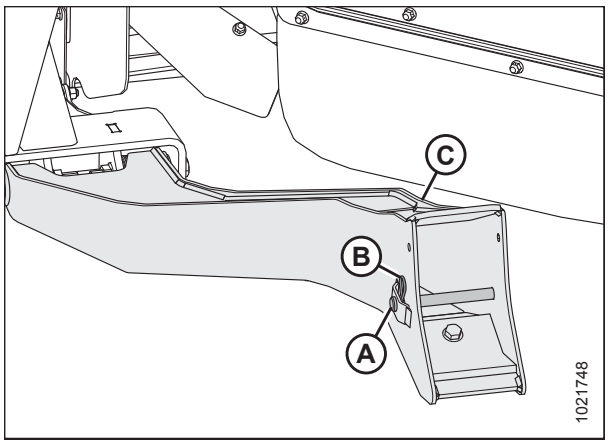


Figure 3.22: Header Support

CAUTION

To prevent damage to the lift system when lowering header lift linkages without a header or weight box attached to the windrower, ensure the float engagement pin is installed in storage position (B) and NOT in engaged position (A).

CAUTION

Check to be sure all bystanders have cleared the area.

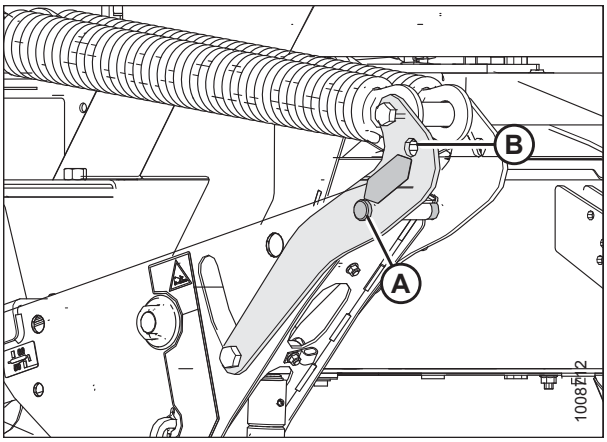


Figure 3.23: Header Float Linkage

IMPORTANT:

Before starting engine, remove protective cover from exhaust stack.

2. Start the engine and activate the HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract header lift cylinders.

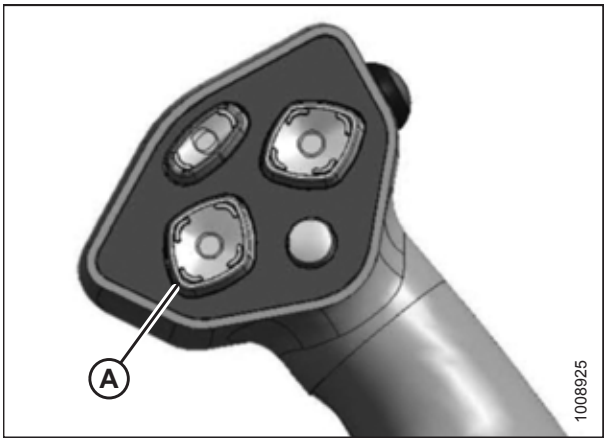


Figure 3.24: Ground Speed Lever

IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

3. Activate the REEL UP switch (A) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

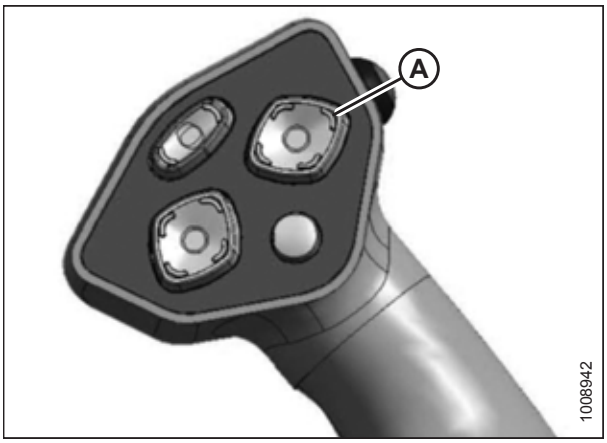


Figure 3.25: Ground Speed Lever

4. Drive the windrower slowly forward until the windrower feet (A) enter the header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

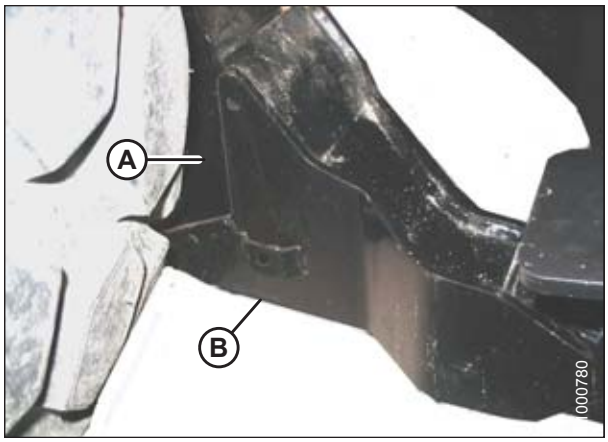


Figure 3.26: Header Support

5. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

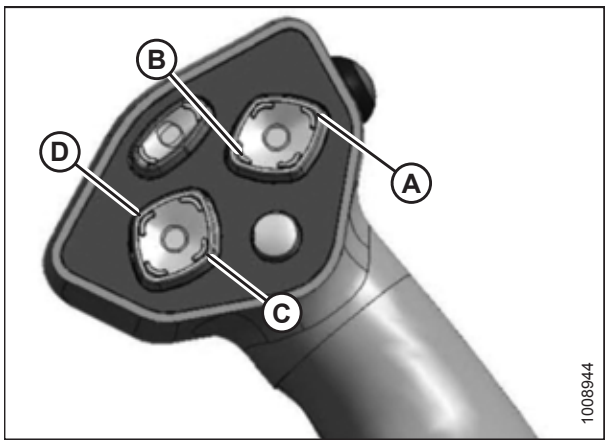


Figure 3.27: Ground Speed Lever

6. Adjust position of the center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

   IMPORTANT:

   Hook release must be down to enable self-locking mechanism. If the release is open (up), manually push it down after hook engages header pin.

7. Lower center-link (A) onto the header with REEL DOWN switch until it locks into position (hook release [B] is down).

8. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.

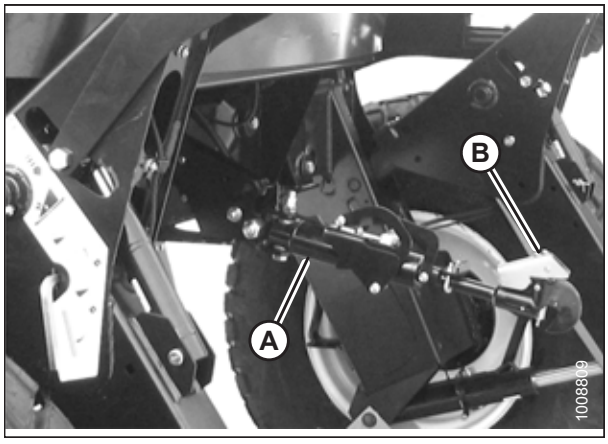


Figure 3.28: Hydraulic Center-Link

CAUTION

Check to be sure all bystanders have cleared the area.

9. Press the HEADER UP switch (A) to raise header to maximum height.

   NOTE:

   If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

   - Press and hold the HEADER UP switch until both cylinders stop moving.
   - Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

   NOTE:

   It may be necessary to repeat this procedure if there is air in the system.

10. Engage safety props on both lift cylinders as follows:

    a. Stop engine and remove key from ignition.
    b. Pull lever (A) and rotate towards the header to release and lower safety prop (B) onto the lift cylinder.
    c. Repeat for opposite lift cylinder.

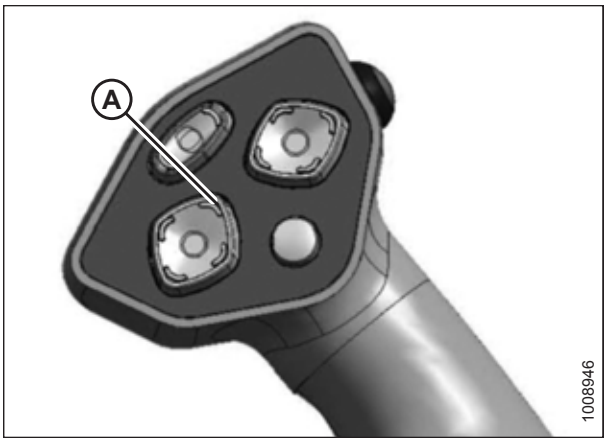


Figure 3.29: Ground Speed Lever

Figure 3.30: Safety Prop

11. Install clevis pin (A) through support and windrower lift member, and secure with hairpin (B). Repeat for opposite side.

    IMPORTANT:

    Ensure clevis pin (A) is fully inserted and hairpin is installed behind bracket.

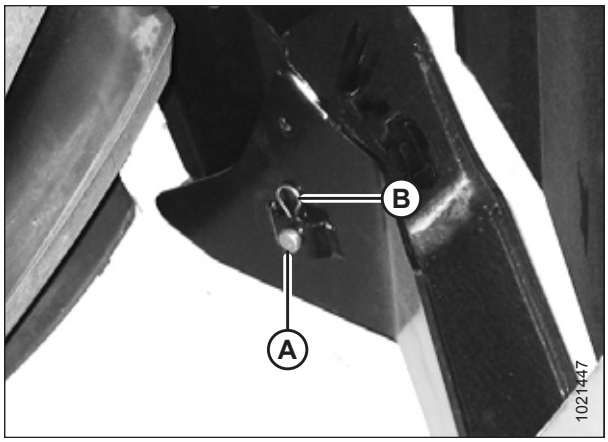


Figure 3.31: Header Support

12. Remove clevis pin from storage position (B) in linkage and insert into hole (A) to engage float springs. Secure with hairpin.

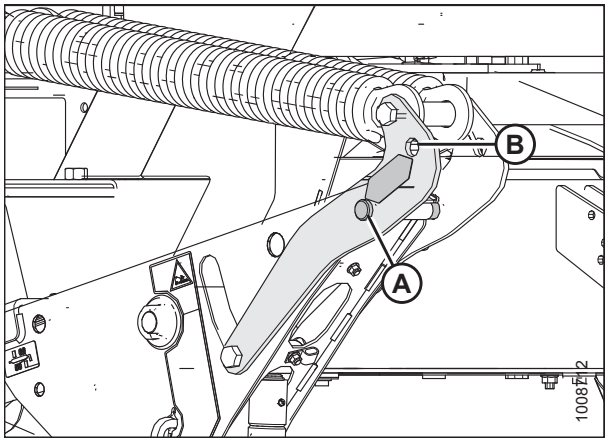


Figure 3.32: Header Float Linkage

13. Disengage safety prop by turning lever (A) downwards to release and lower stop until lever locks into vertical position.
14. Repeat for opposite safety prop.

CAUTION

Check to be sure all bystanders have cleared the area.

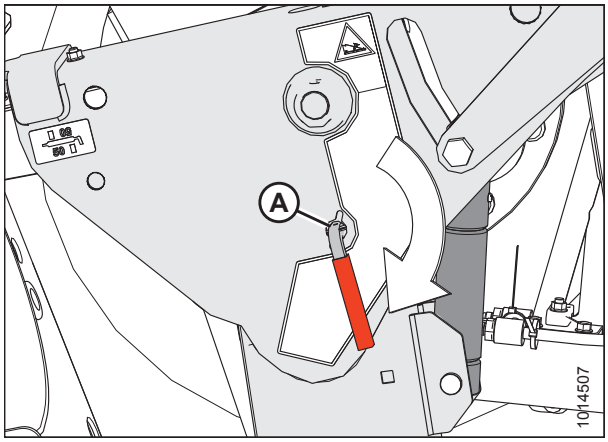


Figure 3.33: Safety Prop

15. Start the engine and activate the HEADER DOWN switch (A) on the GSL to fully lower the header.
16. Stop engine and remove key from ignition.

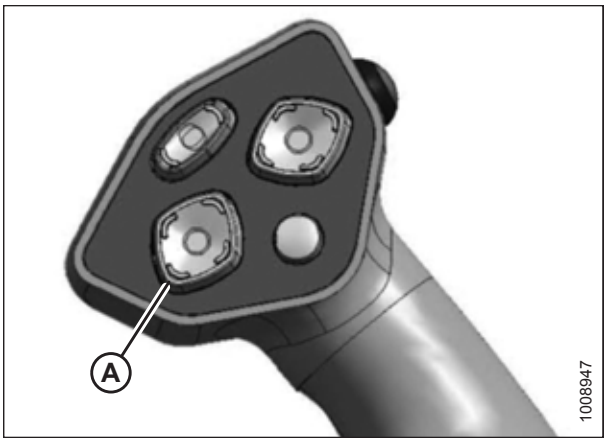


Figure 3.34: Ground Speed Lever

3.5.3 Attaching R1 Series SP Disc Header to M155*E4* Windrower: Hydraulic Center-Link without Self-Alignment

1. Remove hairpin (B) from clevis pin (A) and remove clevis pin from the header supports (C) on both sides of the header.

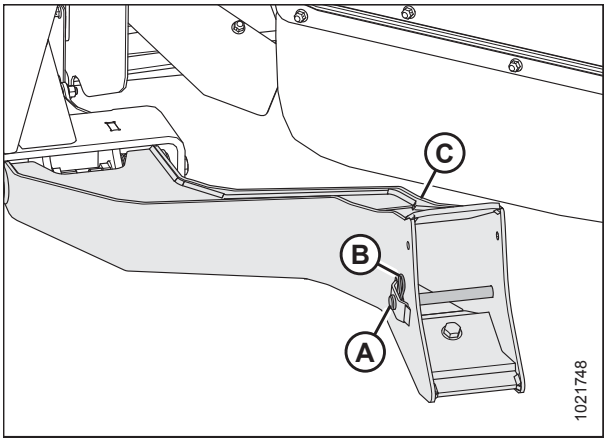


Figure 3.35: Header Support

CAUTION

To prevent damage to the lift system when lowering header lift linkages without a header or weight box attached to the windrower, ensure the float engagement pin is installed in storage position (B) and NOT in engaged position (A).

CAUTION

Check to be sure all bystanders have cleared the area.

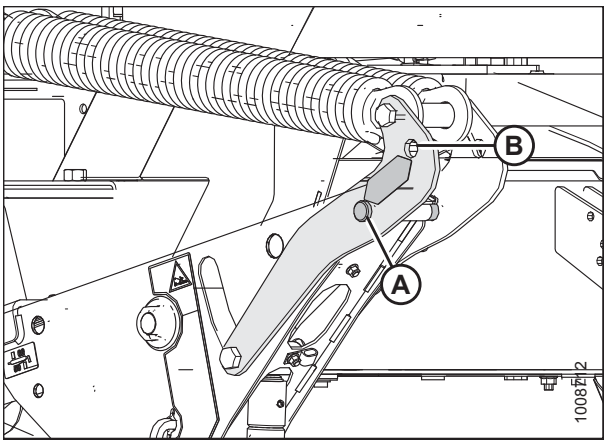


Figure 3.36: Header Float Linkage

IMPORTANT:

Before starting engine, remove protective cover from exhaust stack.

2. Start the engine and activate the HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract header lift cylinders.

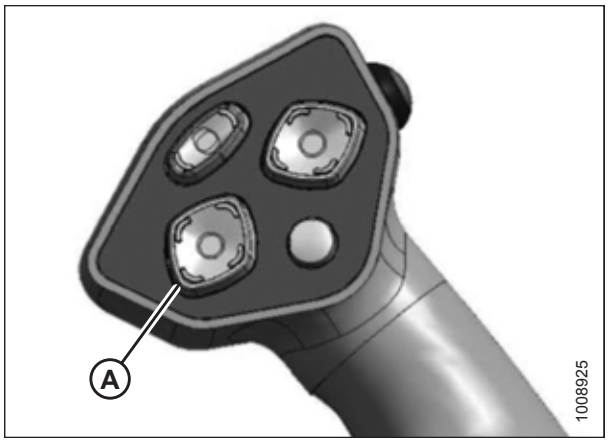


Figure 3.37: Ground Speed Lever

3. Relocate pin (A) in frame linkage as required to raise the center-link (B) until the hook is above the attachment pin on the header.

IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

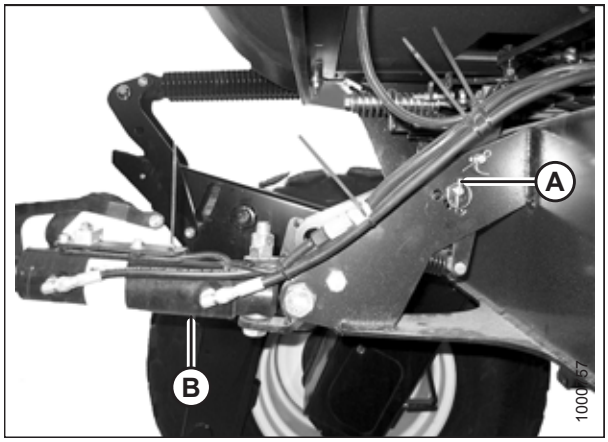


Figure 3.38: Hydraulic Center-Link

4. Drive the windrower slowly forward until the windrower feet (A) enter the header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

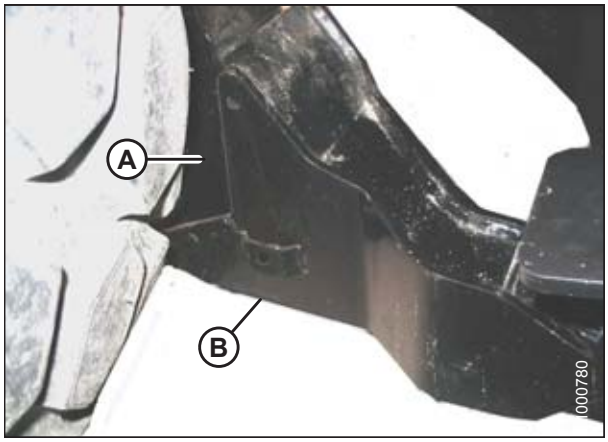


Figure 3.39: Header Support

5. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link
6. Stop engine and remove key from ignition.

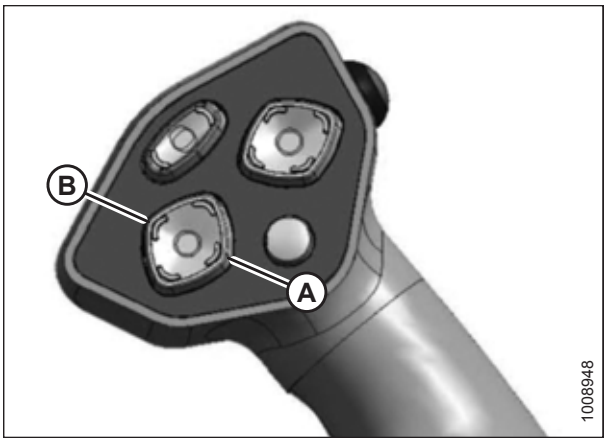


Figure 3.40: Ground Speed Lever

7. Push down on rod end of link cylinder (B) until hook engages and locks onto header pin.

   IMPORTANT:

   Hook release must be down to enable self-locking mechanism. If the release is open (up), manually push it down after hook engages header pin.
8. Check that center-link (A) is locked onto header by pulling upward on rod end (B) of cylinder.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

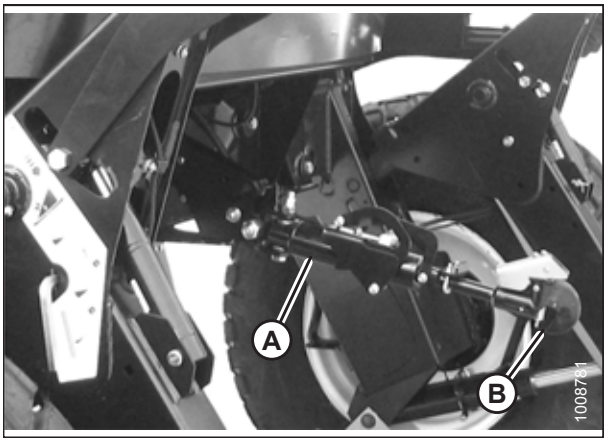


Figure 3.41: Hydraulic Center-Link

9. Start the engine.
10. Press the HEADER UP switch (A) to raise header to maximum height.

    NOTE:

    If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:
    - Press and hold the HEADER UP switch until both cylinders stop moving.
    - Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the system.

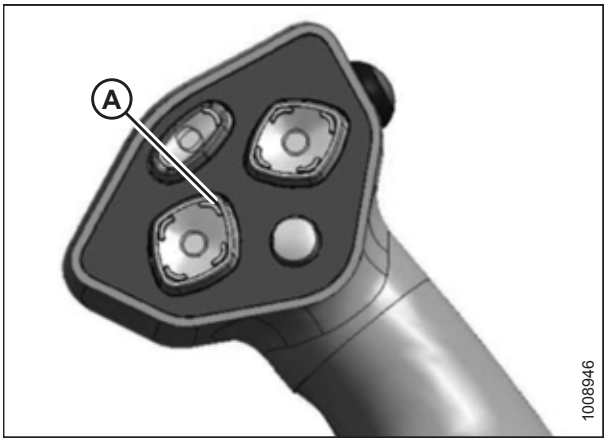


Figure 3.42: Ground Speed Lever

11. Engage safety props on both lift cylinders as follows:

    a. Stop engine and remove key from ignition.
    b. Pull lever (A) and rotate towards the header to release and lower safety prop (B) onto the lift cylinder.
    c. Repeat for opposite lift cylinder.

Figure 3.43: Safety Prop

12. Install clevis pin (A) through support and windrower lift member, and secure with hairpin (B). Repeat for opposite side.

    IMPORTANT:

    Ensure clevis pin (A) is fully inserted and hairpin is installed behind bracket.

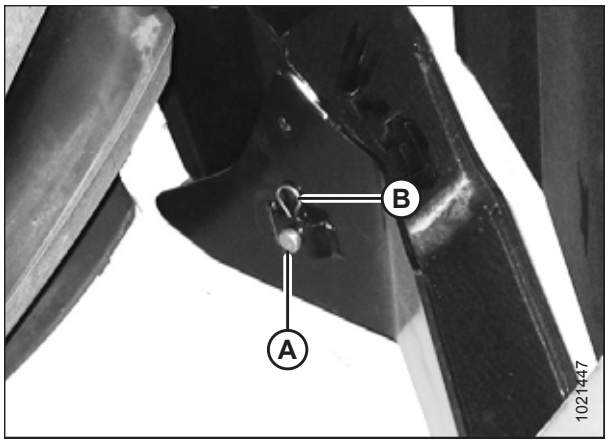


Figure 3.44: Header Support

13. Remove clevis pin from storage position (B) in linkage and insert into hole (A) to engage float springs. Secure with hairpin.

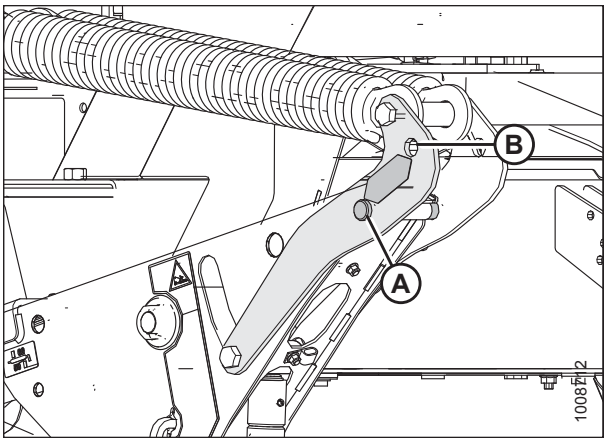


Figure 3.45: Header Float Linkage

14. Disengage safety prop by turning lever (A) downwards to release and lower stop until lever locks into vertical position.
15. Repeat for opposite safety prop.

CAUTION

Check to be sure all bystanders have cleared the area.

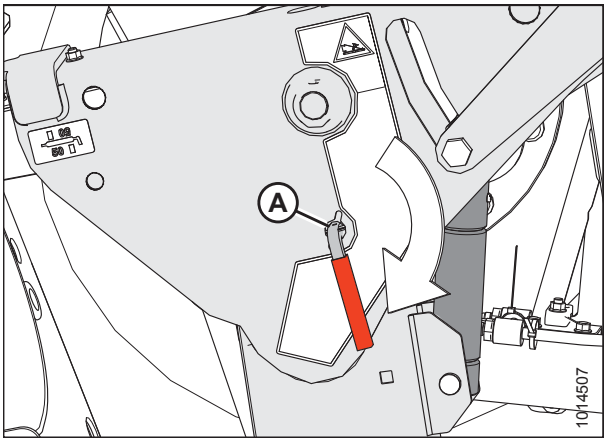


Figure 3.46: Safety Prop

16. Start the engine and activate the HEADER DOWN switch (A) on the GSL to fully lower the header.
17. Stop engine and remove key from ignition.

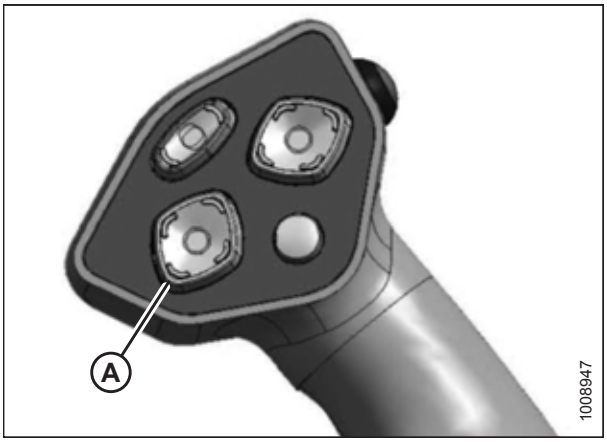


Figure 3.47: Ground Speed Lever

3.5.4 Attaching Hydraulics and Electrical Connections

The procedure for attaching the header hydraulic and electrical connections depends on the windrower model. Refer to the appropriate procedure:

- *Connecting R1 Series Hydraulics and Electrical: M1170 Windrowers, page 42*
- *Connecting R1 Series Hydraulics and Electrical: M155E4 Windrowers, page 44*

Connecting R1 Series Hydraulics and Electrical: M1170 Windrowers

NOTE:

Hydraulic drive kit (A) (MD #B6271) is required for a R113 13-foot self-propelled disc header to operate correctly on a M1170 Self-Propelled Windrower. To order this kit, contact your MacDon Dealer.

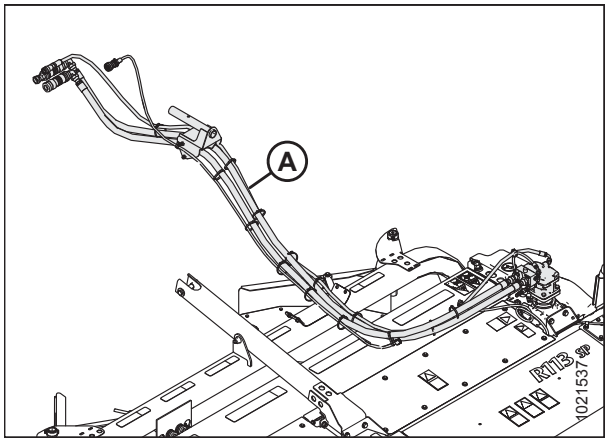


Figure 3.48: Hydraulic Drive Kit (MD #B6271)

1. Move the windrower's left-side (cab-forward) platform (A) to the OPEN position. Refer to your windrower operator's manual for instructions.
2. Retrieve hydraulic hoses from header.

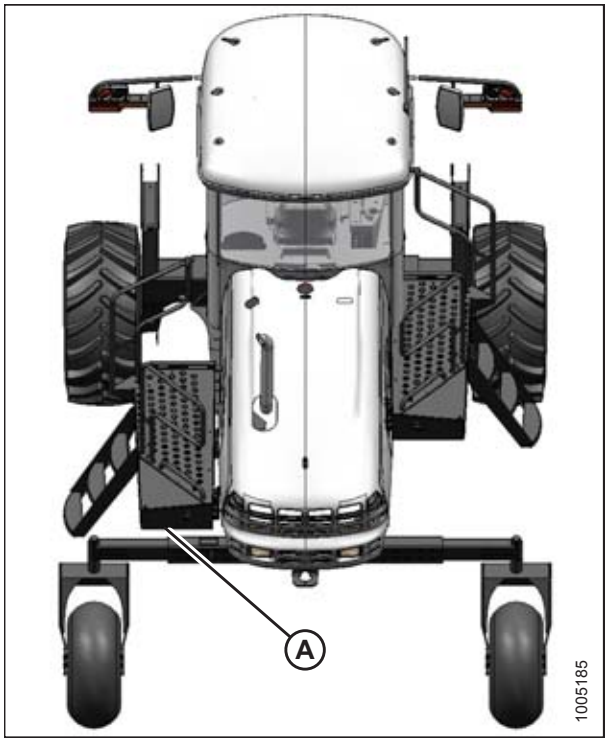


Figure 3.49: Windrower Left Platform in Open Position

3. Attach hose support (A) to windrower frame near left cab-forward leg, and route hose bundle under frame.

   NOTE:

   Route hoses as straight as possible and avoid rub/wear points that could damage hydraulic hoses.

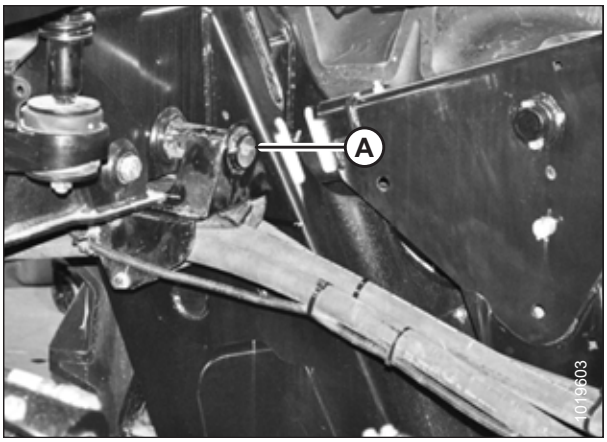


Figure 3.50: Hose Support Attachment

4. Rest hose bundle routed from windrower on header's hose support (A).
5. If necessary, use a clean rag to remove dirt and moisture from the couplers.

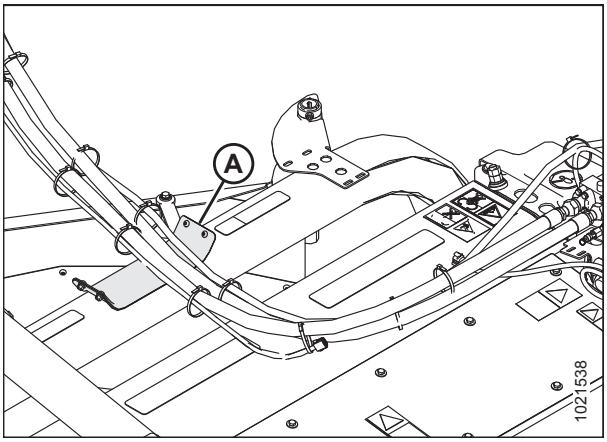


Figure 3.51: Hose Support

6. Connect header hydraulic hoses and electrical harness included in B6271 to header motor as follows:

   a. Connect pressure hose to receptacle (A).
   b. Connect return hose to receptacle (B).
   c. Connect case drain hose to receptacle (C).
   d. Connect the electrical harness to windrower electrical harness (D).

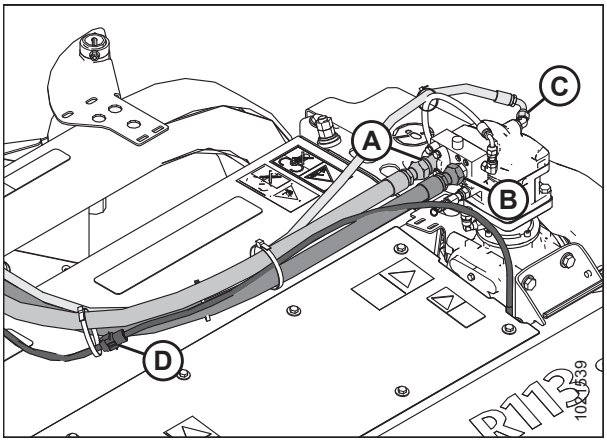


Figure 3.52: Header Hydraulics and Electrical Connections

7. Remove protective plugs (A) from return line fitting (B) and pressure line fitting (C).

   IMPORTANT:

   Keep open lines and ports clean.

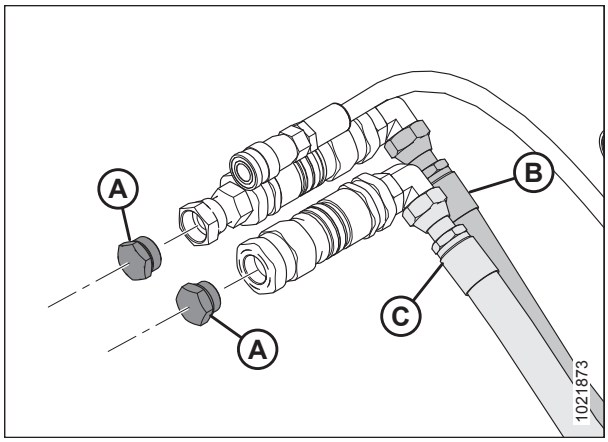


Figure 3.53: Protective Plugs

8. Connect hydraulic hoses and electrical harness to receptacles on windrower as follows:

   a. Connect pressure hose to receptacle (A).
   b. Connect return hose to receptacle (B).
   c. Connect case drain hose to receptacle (C).
   d. Connect the electrical harness to receptacle (D).

   NOTE:

   The hydraulic hoses should have enough slack to pass by the multicoupler (E) without coming into contact with it. This will protect the hoses from rubbing against the multicoupler and becoming damaged. You can increase slack in the hoses by loosening and adjusting the hose holder on the front windrower leg, and pulling the hoses backward toward the windrower.

9. Close the windrower's left side platform. Refer to windrower operator's manual for procedure.

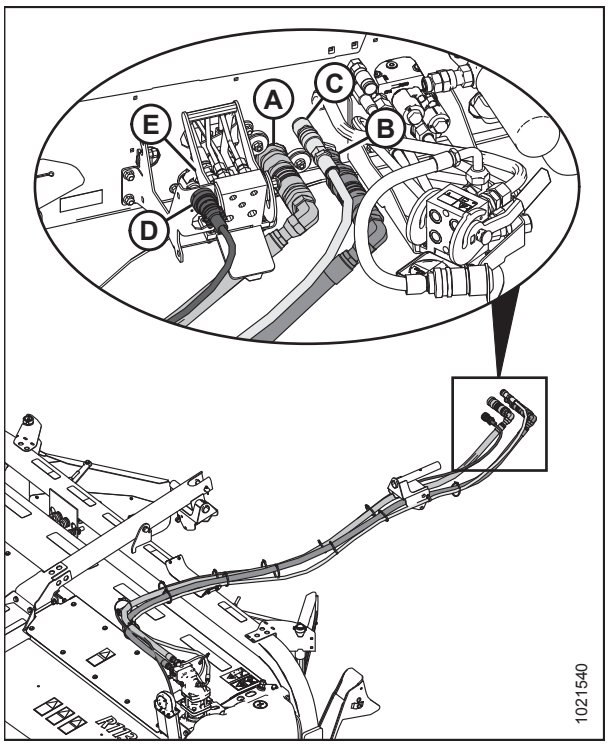


Figure 3.54: M1170 Hydraulic and Electrical Connections

Connecting R1 Series Hydraulics and Electrical: M155E4 Windrowers

DANGER

To avoid bodily injury or death from 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.

NOTE:

Hydraulic drive kit (A) (MD #B6272) is required for a R113 self-propelled disc header to operate correctly on a M155*E4* Self-Propelled Windrower. To order this kit, contact your MacDon Dealer.

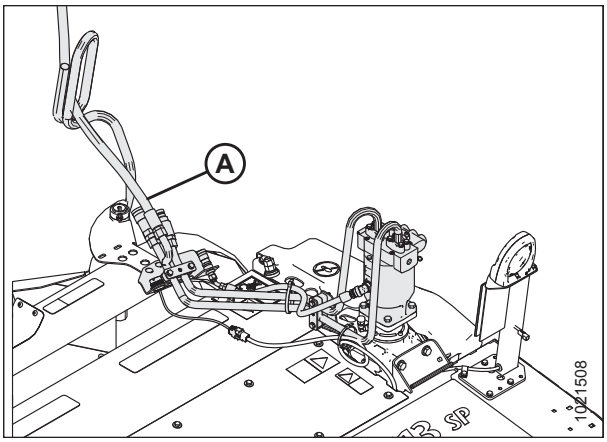


Figure 3.55: Hydraulic Drive Kit (MD #B6272)

1. Disengage and rotate lever (A) counterclockwise to FULLY UP position.
2. Remove the cap (B) securing the electrical connector to the frame.

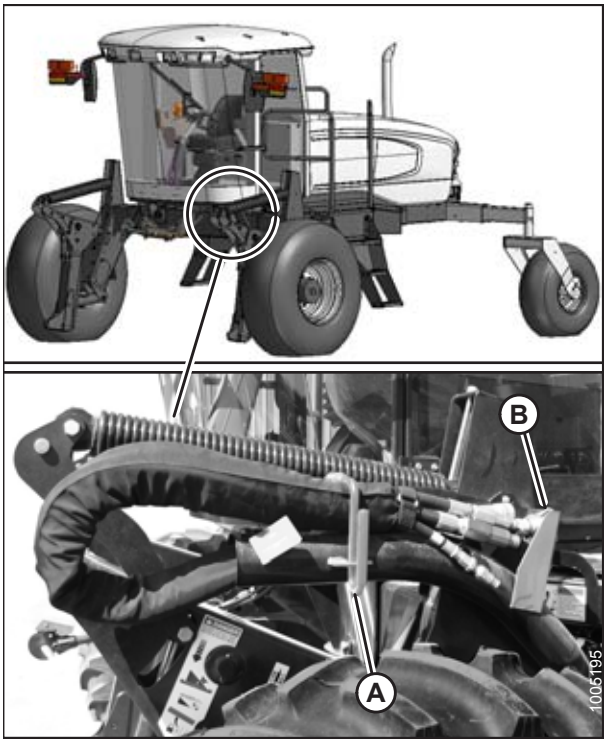


Figure 3.56: Hose Bundle

3. Move hose bundle (A) from the windrower and rest the bundle on the header.

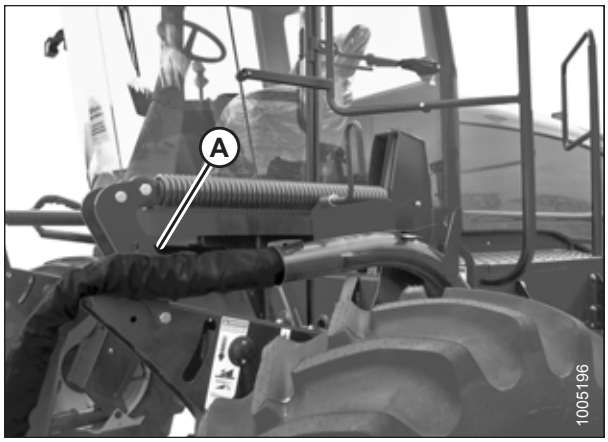


Figure 3.57: Hose Bundle

4. Position the hose support with lower bolt (A) in the forward hole as shown in Figure *3.58, page 46*. Loosen both bolts and adjust as required.

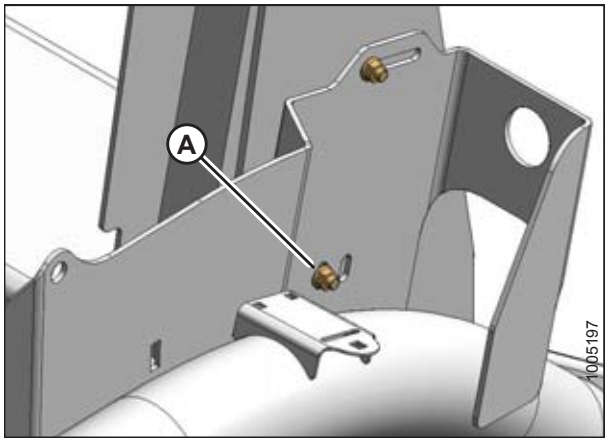


Figure 3.58: Hose Support

5. Install hose support (A) from kit with supplied hardware (B) onto header.

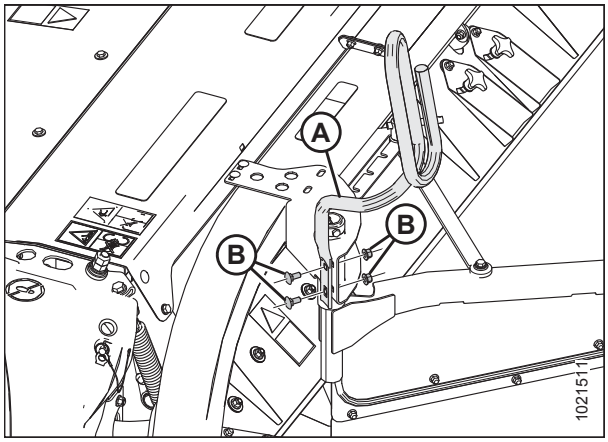


Figure 3.59: Hose Support

6. Move the windrower's left-side (cab-forward) platform (A) to the OPEN position. Refer to your windrower operator's manual for instructions.

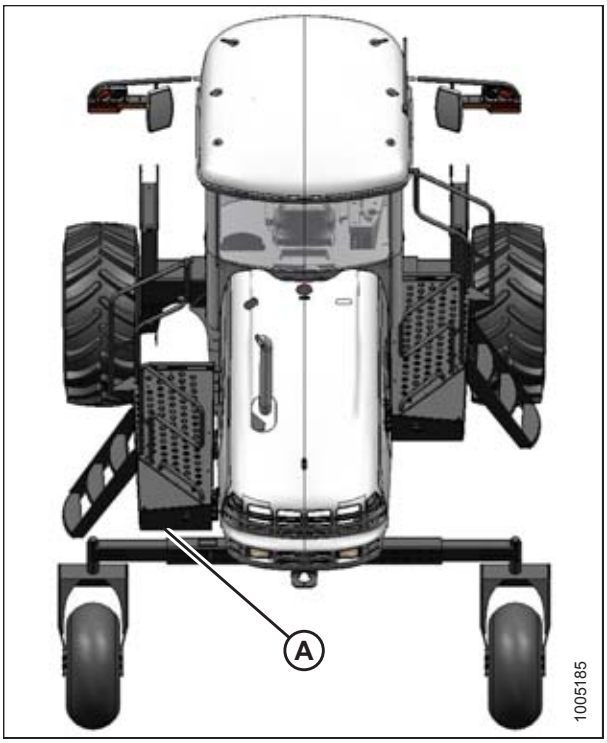


Figure 3.60: Windrower Left Platform in Open Position

7. Route the windrower hose bundle (A) through hose support (B) on the header.

   NOTE:

   Route hoses as straight as possible and avoid rub/wear points that could damage hydraulic hoses.

8. Route pressure hose (C) from the header through support (B) to the windrower.

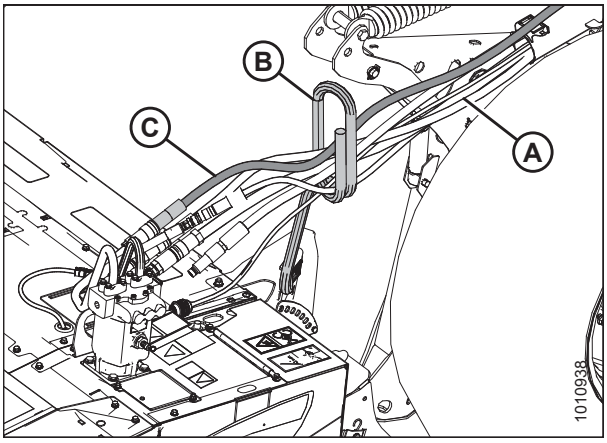


Figure 3.61: Hose Bundle

9. Remove protective plugs (A) from return line fitting (B) and pressure line fitting (C).

   IMPORTANT:

   Keep open lines and ports clean.

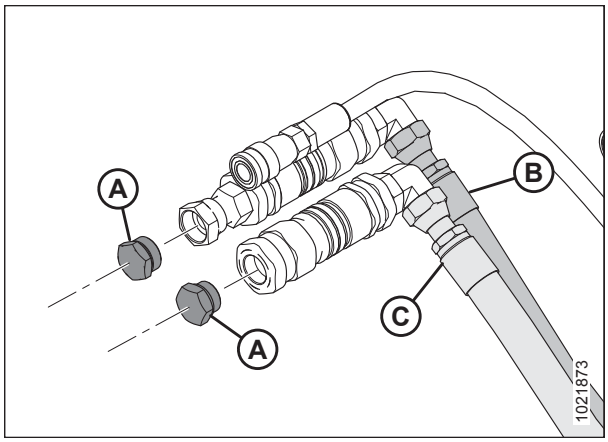


Figure 3.62: Protective Plugs

10. Connect the pressure hose (A) routed from the header to port M2 on the windrower's disc drive valve (middle block).

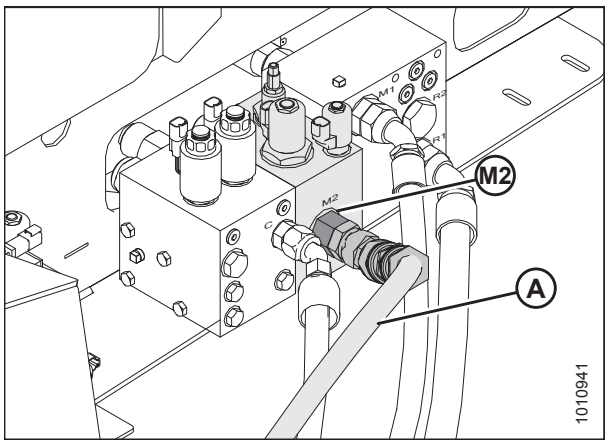


Figure 3.63: Hydraulic Connections

11. Remove caps and plugs from hoses on windrower and lines on header.
12. Connect the return hose (B) from port M1 on the windrower's drive manifold to the steel line attached to port (A) on the header motor.

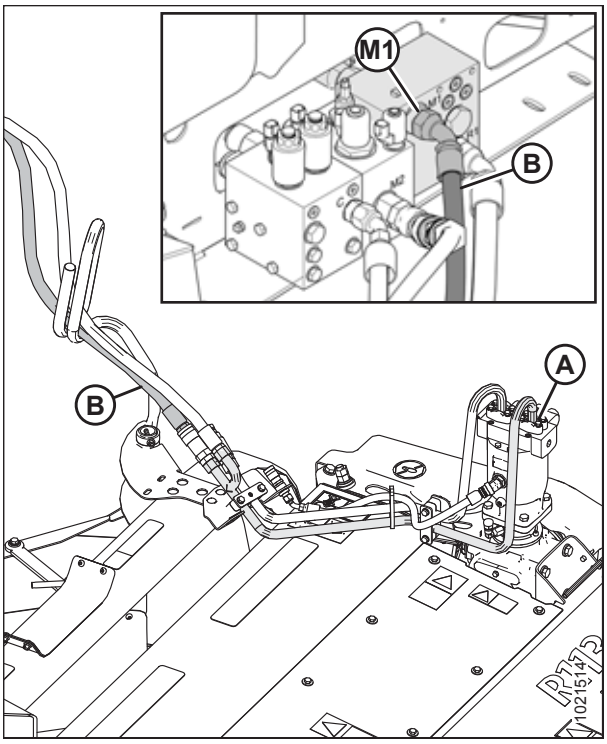


Figure 3.64: Hydraulic Connections

13. Connect the pressure hose (A) from the windrower's drive manifold port R1 to the steel line attached to port (B) on the header's motor.

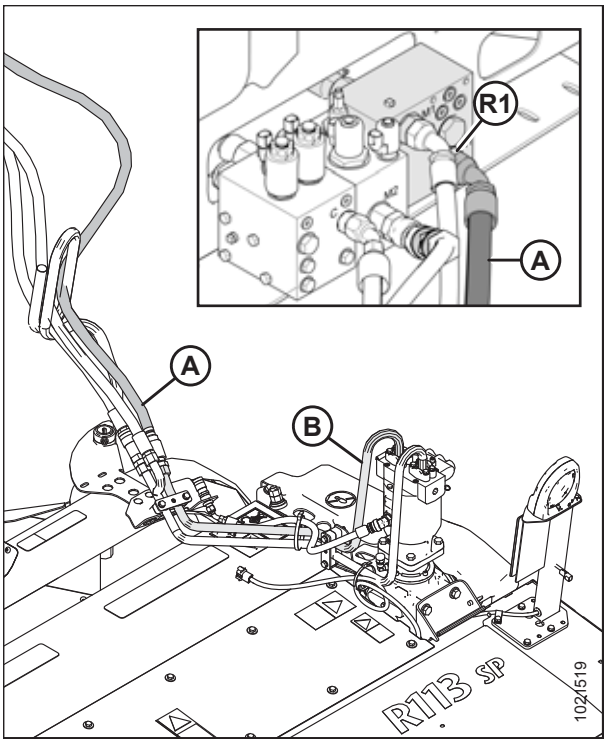


Figure 3.65: Hydraulic Connections

NOTE:

If the windrower is equipped with a reverser valve (A) for an auger header, route the return hose (B) from port R1 on the windrower's reverser valve to the steel line attached to port (C) on the header's motor.

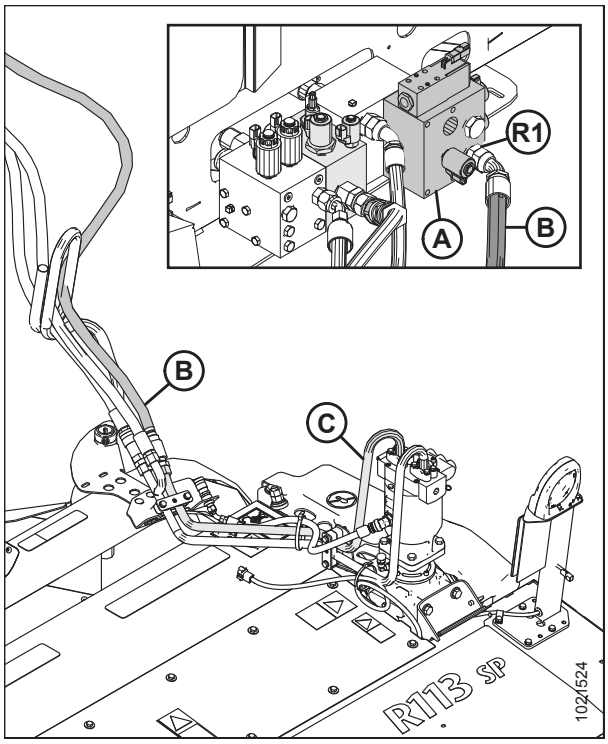


Figure 3.66: Windrower Hose Connections with Reverser

15. Connect the case drain hose (A) from the lift manifold port T3 to the fitting attached to motor port (D).

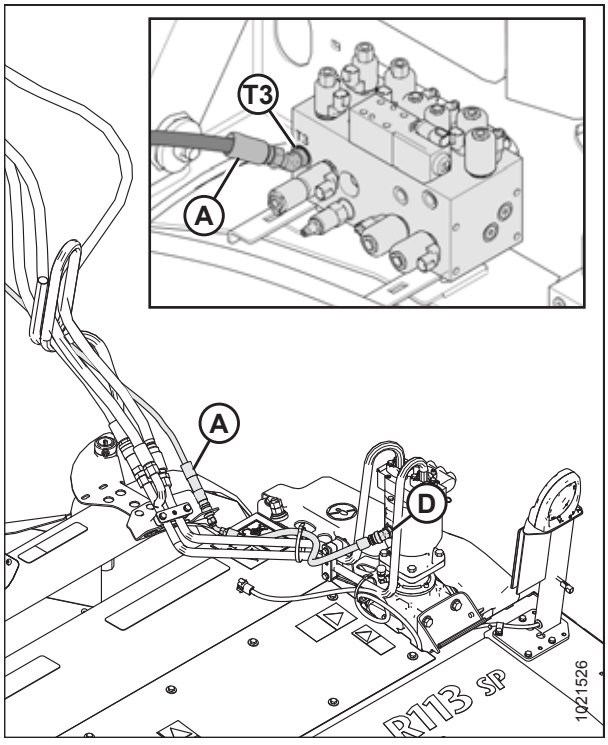


Figure 3.67: Hydraulic Connections

16. Connect the electrical harness (A) from windrower to the electrical connector (B) on the header.

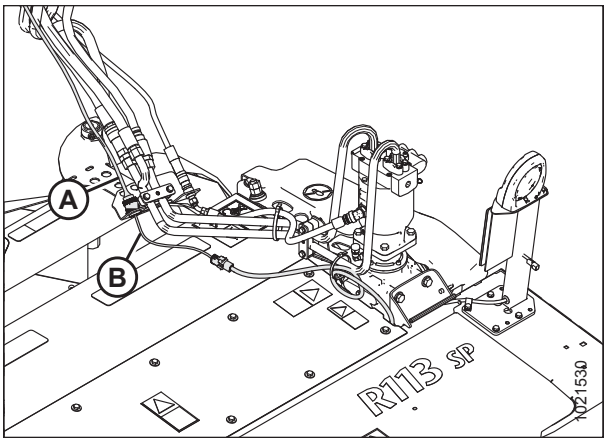


Figure 3.68: Electrical Connection

17. Lower and lock lever (A). Secure hose (B) with three cinch straps (C).

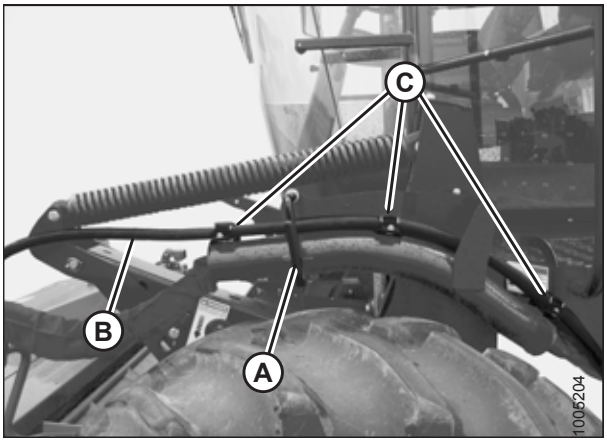


Figure 3.69: Hose Bundle

18. Move platform (A) to the CLOSED position.

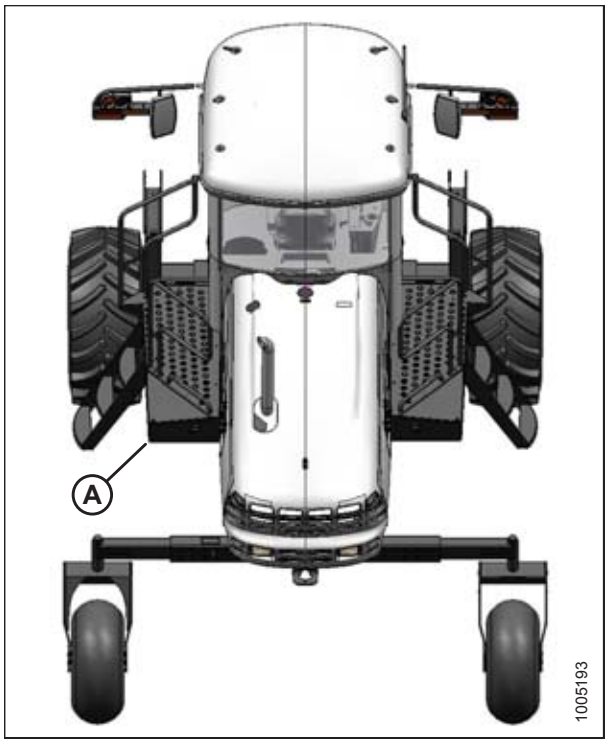


Figure 3.70: Top View of Windrower

3.6 Detaching the Header

3.6.1 Detaching R1 Series Header: M1170 Windrower

DANGER

To avoid bodily injury or death from 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.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the engine, and press switch (A) to raise the header to the maximum height.
2. Stop the engine and remove key from ignition.

Figure 3.71: Ground Speed Lever

3. Engage safety prop on lift cylinder as follows:
   a. Pull lever (A) and rotate toward header to release, and lower safety prop onto cylinder.
   b. Repeat for opposite lift cylinder.

   IMPORTANT:

   Ensure the safety props engage over the cylinder piston rods. If safety prop does not engage properly, raise header until prop fits over the rod.

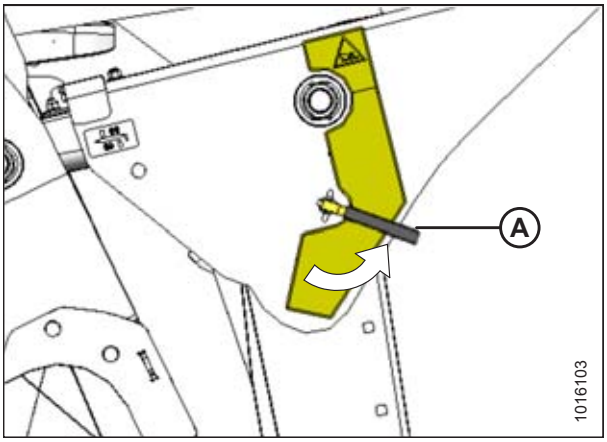


Figure 3.72: Cylinder Safety Prop

4. Open left-side platform. For instructions, refer to the windrower operator's manual.

5. Disconnect the following electrical harness and hydraulic hoses from the windrower:

   a. Disconnect the return hose from receptacle (A).
   b. Disconnect the pressure hose from receptacle (B).
   c. Disconnect the case drain hose from receptacle (C).
   d. Disconnect the electrical harness from receptacle (D).

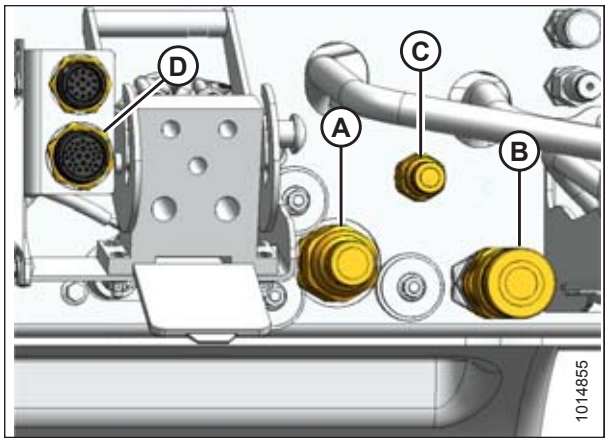


Figure 3.73: Header Drive Hydraulics

6. Remove hose support weldment (A) from the windrower and place in storage position on the header. Slide weldment support cylinder (B) into support on center-link (C) and secure with hardware (D).

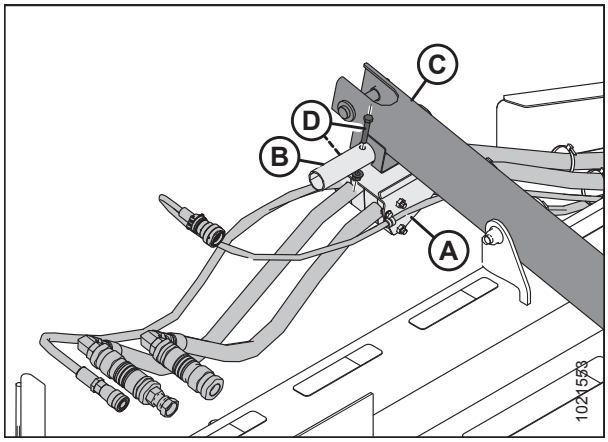


Figure 3.74: Hose Support Weldment, Storage Position

7. Store the hydraulic hoses (A) and electrical harness (B) disconnected from the windrower in Step *5, page 54* on the header's hydraulic storage plate (C).

   NOTE:

   Install caps and plugs on open lines to prevent buildup of dirt and debris while in storage.

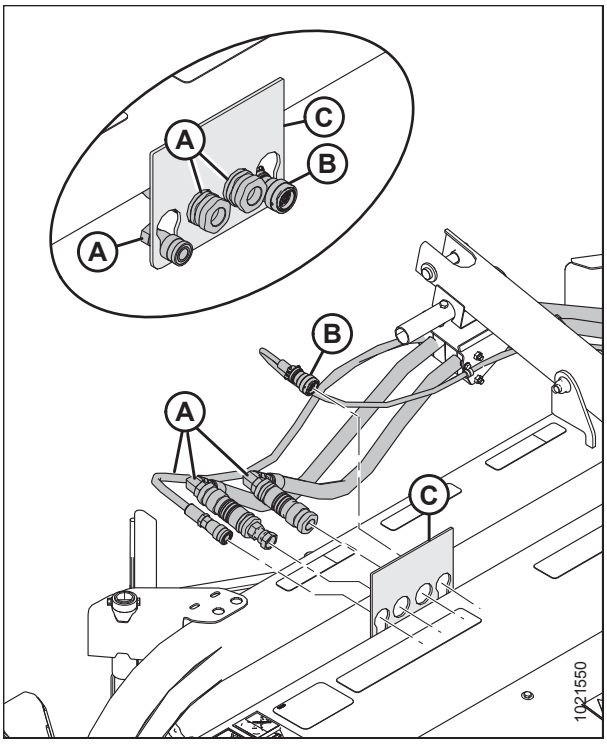


Figure 3.75: Hydraulic Storage Plate (Parts Removed for Clarity)

8. Remove hairpin from clevis pin (A). Remove clevis pin from header support (B) on both sides of header.

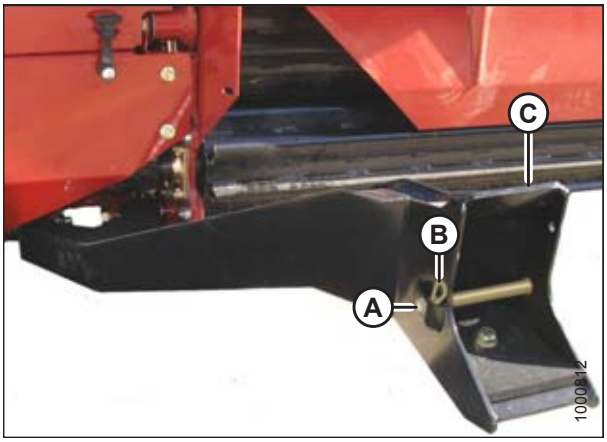


Figure 3.76: Header Supports

9. Engage safety prop on lift cylinder as follows:

   a. Pull lever (A) and rotate toward header to release, and lower safety prop onto cylinder.
   b. Repeat for opposite lift cylinder.

   IMPORTANT:

   Ensure the safety props engage over the cylinder piston rods. If safety prop does not engage properly, raise header until prop fits over the rod.

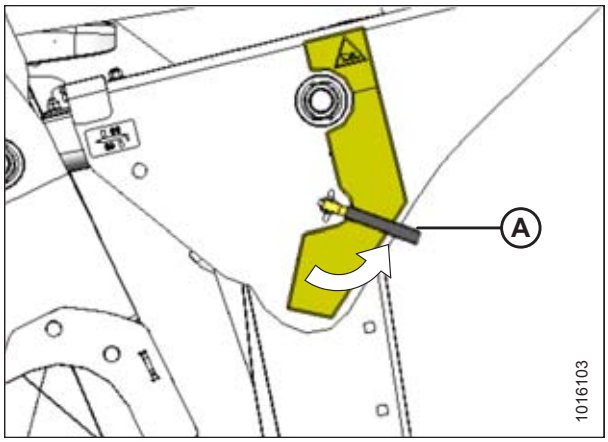


Figure 3.77: Cylinder Safety Prop

Windrowers with center-link self-alignment kit only:

10. Release the center-link latch (A) before returning to the cab.

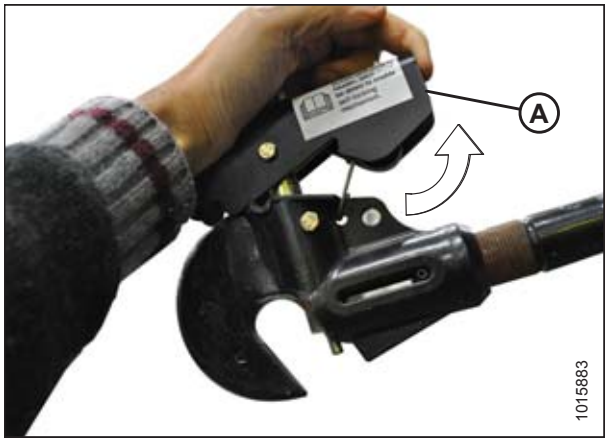


Figure 3.78: Center-Link

11. Disengage safety prop by turning lever (A) downwards until lever locks into the vertical position.
12. Repeat for the opposite side.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

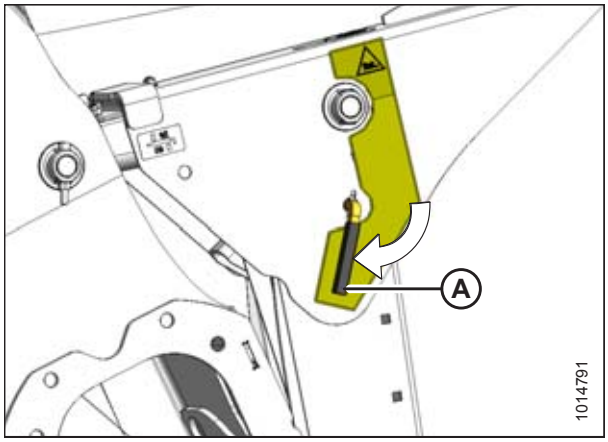


Figure 3.79: Safety Props

13. Start engine and remove header float when prompted by the Harvest Performance Tracker (HPT).

NOTE:

If not prompted by the HPT to remove float, remove float manually.

14. Lower the header to the ground.

Self-aligning center-link:

15. Use HEADER TILT cylinder switches (A) on GSL to release load on center-link cylinder.
16. Operate the link lift cylinder with the REEL UP switch (B) to disengage the center-link from the header.

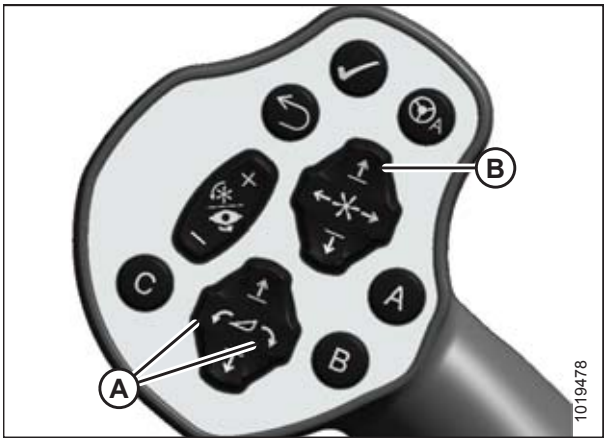


Figure 3.80: GSL

Non-self-aligning center-link:

17. Shut off the engine and remove the key.
18. Lift hook release (A) and lift hook (B) off header pin.

CAUTION

Check to be sure all bystanders have cleared the area.

19. Start the engine.

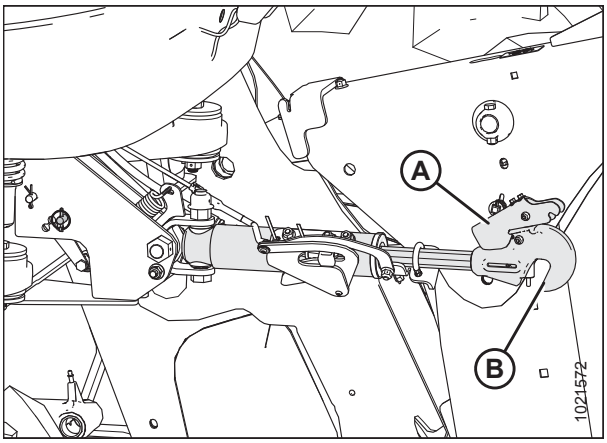


Figure 3.81: Hydraulic Center-Link

20. Back the windrower slowly away from header.
21. Reinstall clevis pin (A) through support (C) and secure with hairpin (B). Repeat for opposite side.

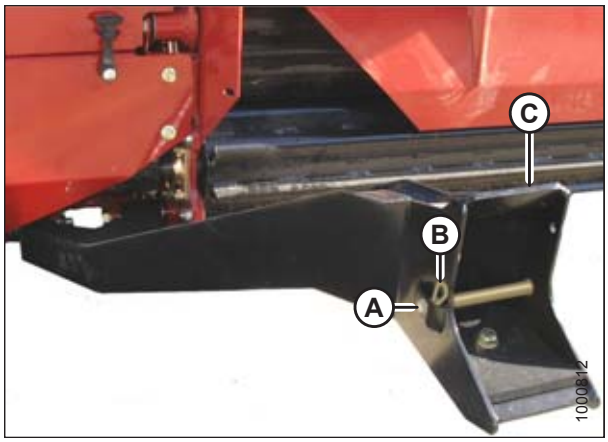


Figure 3.82: Header Support

3.6.2 Detaching R1 Series Header: M155*E4* Windrower

DANGER

To avoid bodily injury or death from 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. Lower the header to the ground. If the ground is soft, place blocks under the header.
2. Stop the engine and remove the key.
3. Move the left side (cab-forward) platform (A) to the open position.

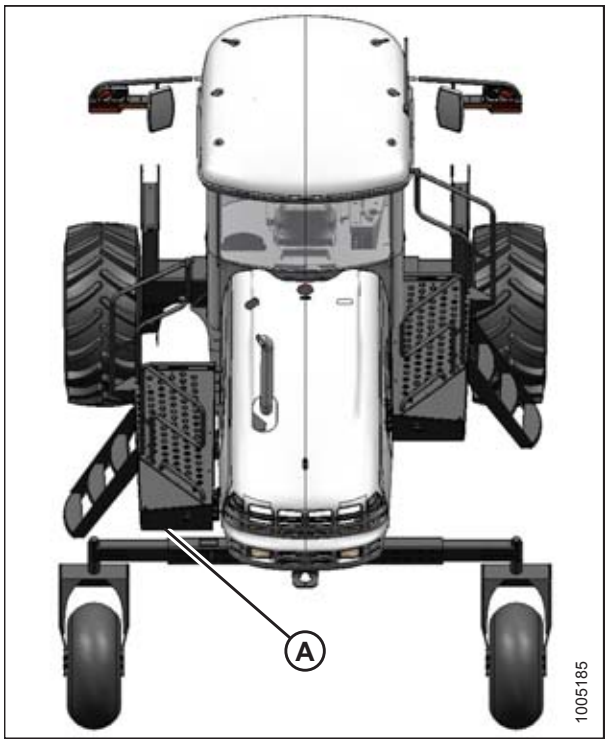


Figure 3.83: Windrower LH Platform

4. Disconnect hose (A) from port (M2) on the disc drive valve.

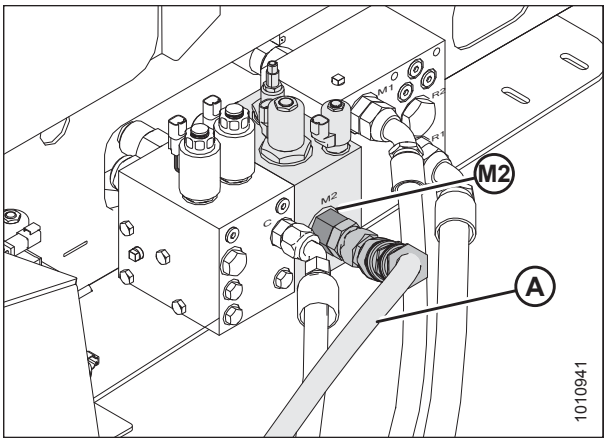


Figure 3.84: Hydraulic Connections

5. Raise lever (A) and undo the three cinch straps (C).
6. Move hose (B) to store on header.

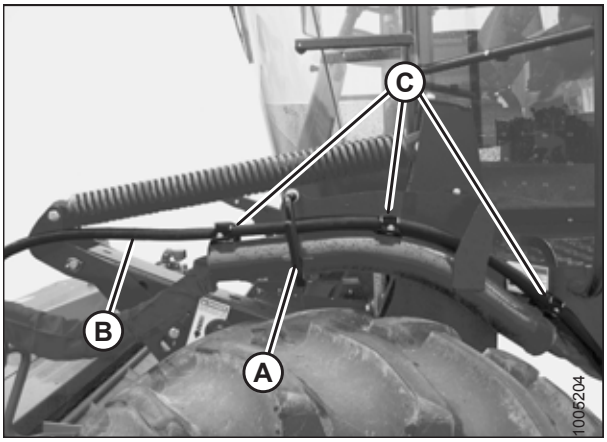


Figure 3.85: Hose Bundle

7. Disconnect the following hoses from the hydraulic motor:
   - Return hose (A)
   - Pressure hose (B)
   - Case drain hose (C)
8. Install caps on the connectors and hose ends (if equipped) to prevent buildup of dirt and debris.

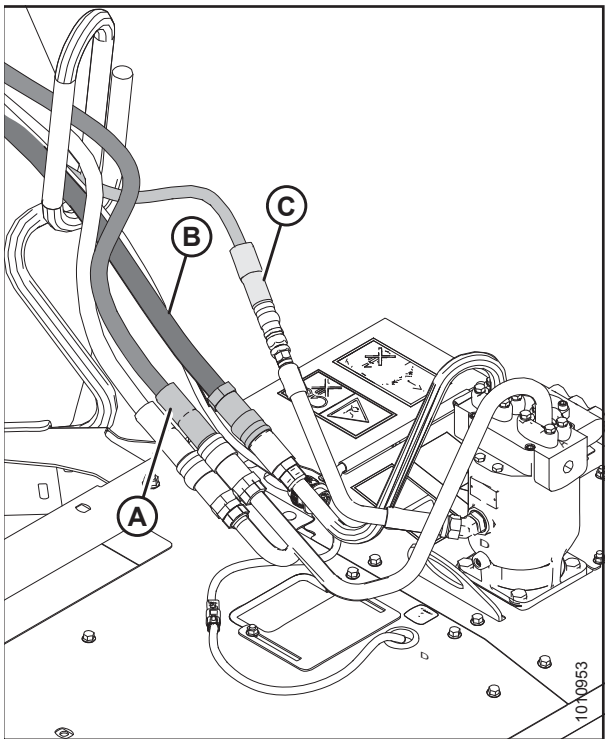


Figure 3.86: Hose Bundle

9. Disconnect the electrical connector (A) by turning the collar counterclockwise and pulling connector to disengage.

   NOTE:

   Hydraulic lines and hoses hidden on illustration to show the electrical connection.

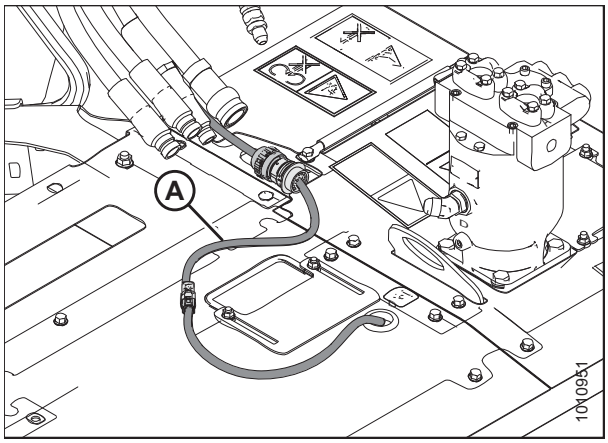


Figure 3.87: Electrical Connection

10. Move the hose bundle from header to the left-side (cab-forward) hose support (B).
11. Rotate lever (A) clockwise and push to engage bracket.
12. Route the electrical harness through the hose support (B) and attach cap to electrical connector (C).

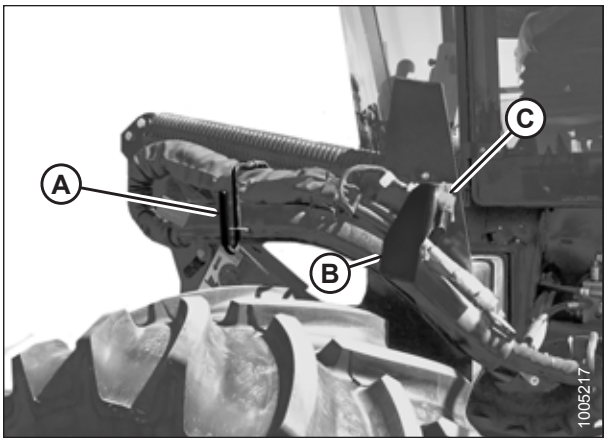


Figure 3.88: Hose Bundle

13. Move the windrower platform (A) to the CLOSED position.
14. Refer to the windrower operator's manual to mechanically detach the header from the windrower.

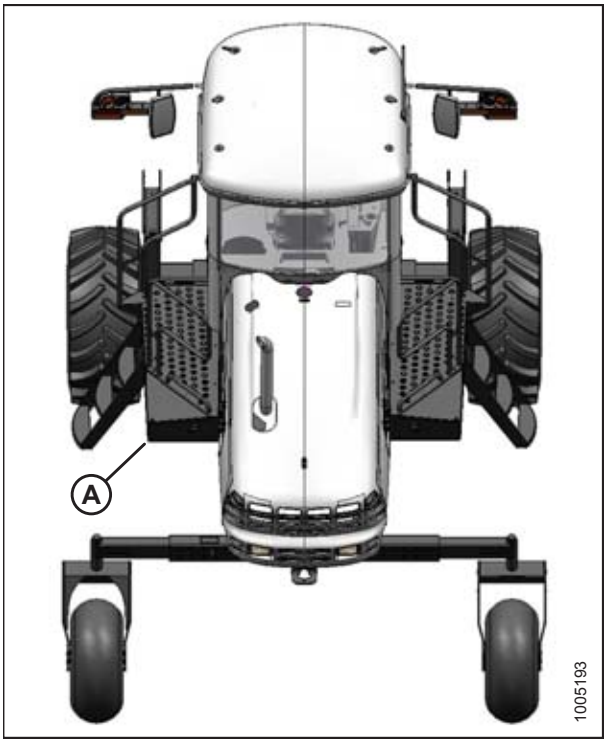


Figure 3.89: Windrower LH Platform

3.7 Driveshields

3.7.1 Opening Driveshields

CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown are for left driveshield—right driveshield is similar.

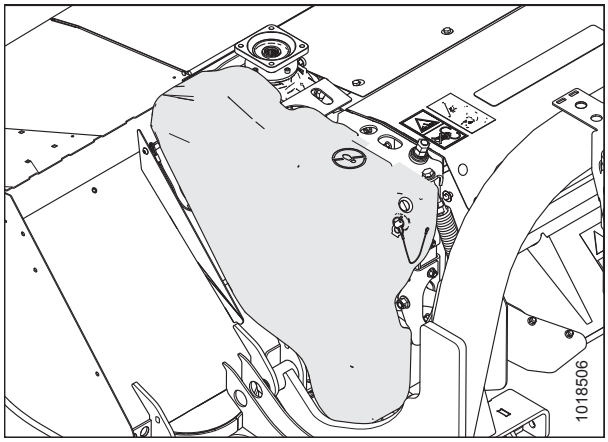


Figure 3.90: Left Driveshield

1. Remove lynch pin (A) and tool (B) from pin (C).

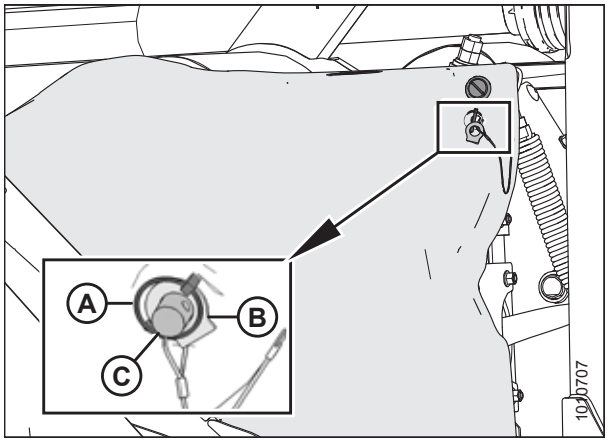


Figure 3.91: Left Driveshield

2. Insert flat end of tool (A) into latch (B) and turn it counterclockwise to unlock.

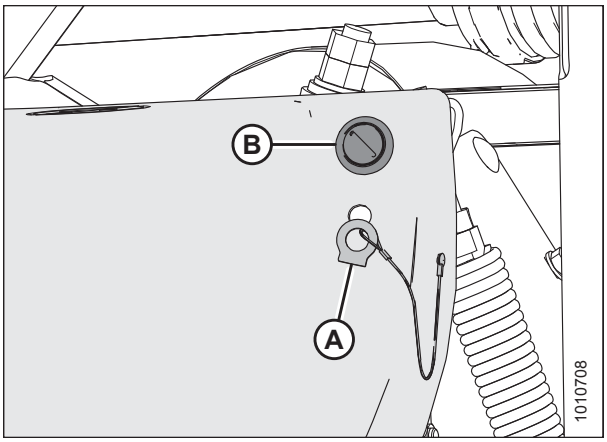


Figure 3.92: Driveshield Latch

3. Pull top of driveshield (A) away from header to open.

   NOTE:

   For improved access, lift driveshield off the pins at the base of the shield, and lay the shield on the header.

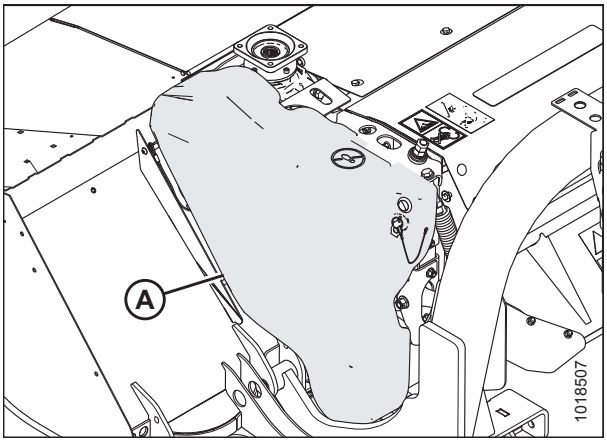


Figure 3.93: Left Driveshield

3.7.2 Closing Driveshields

⚠ CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown are for left driveshield—right driveshield is similar.

1. Position driveshield onto pins at base of driveshield (if necessary).
2. Push driveshield (A) to engage latch (B).
3. Check that driveshield is properly secured.

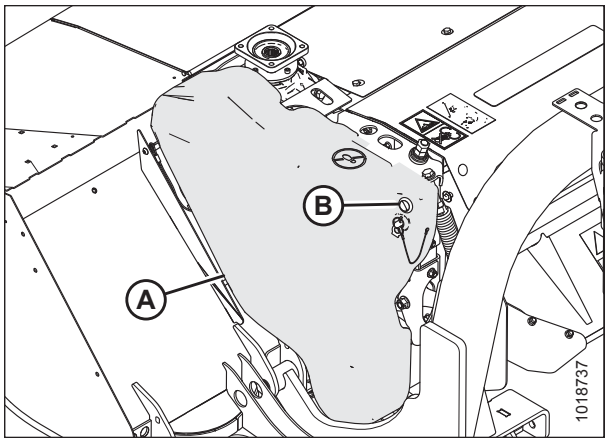


Figure 3.94: Left Driveshield

4. Replace tool (B) and lynch pin (A) on pin (C).

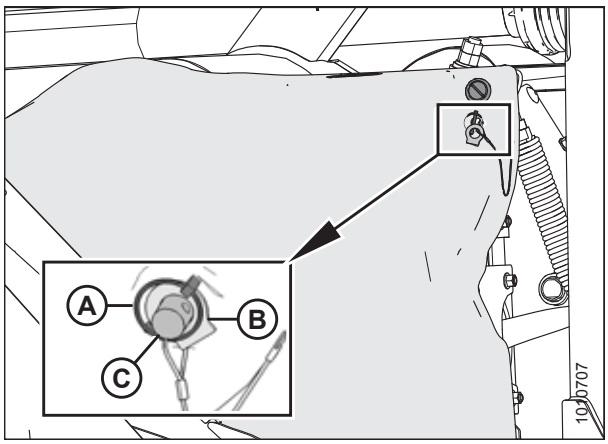


Figure 3.95: Left Driveshield

3.8 Cutterbar Doors

WARNING

Do NOT operate the machine without all the cutterbar doors down or without curtains installed and in good condition.

Two doors (A) with rubber curtains provide access to the cutterbar area.

Curtains (B) and (C) are attached to each front corner and at the center respectively. Always keep curtains lowered when operating the self-propelled disc header.

IMPORTANT:

Replace curtains if they become worn or damaged. Refer to *3.13 Curtains, page 77* or contact your Dealer for replacement instructions.

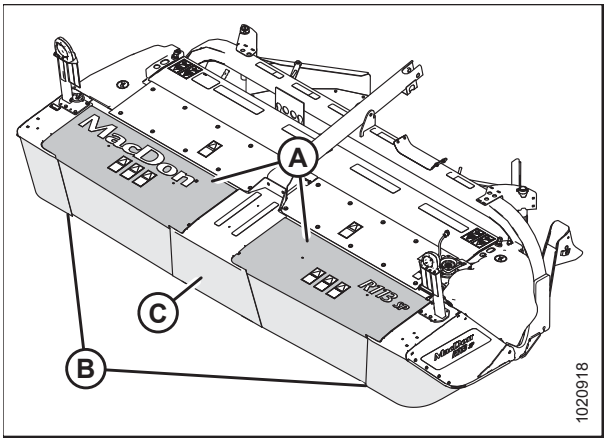


Figure 3.96: Cutterbar Doors and Curtains

3.8.1 Inspecting Cutterbar Doors

1. Ensure that door operates smoothly and lies flat when closed. Adjust if necessary.
2. Inspect hinge pin bolts (A) and tighten to 68.5 Nm (50.5 lbf·ft) if loose.
3. Check door for cracks and repair if required.
4. Check for exposed metal surfaces and surface rust. Repair and repaint if necessary.
5. Check shield/curtain bolts (B) and replace if missing, or tighten if loose.

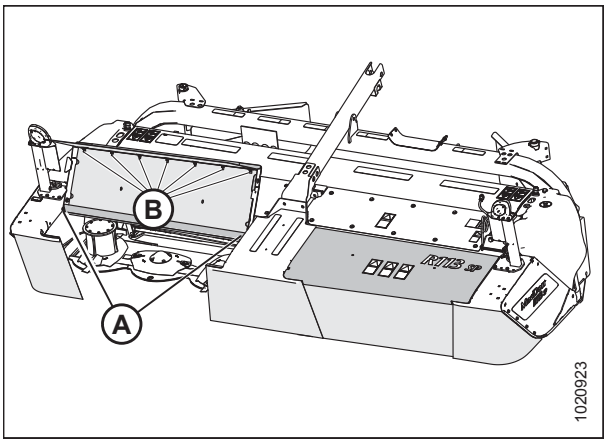


Figure 3.97: Cutterbar Door (Right Side Shown, Left Opposite)

3.8.2 Opening Cutterbar Doors

To open cutterbar doors on a self-propelled disc header with export latches, refer to *3.8.3 Opening Cutterbar Doors: Export Latches, page 66*.

1. Lift door (A) at front to open.

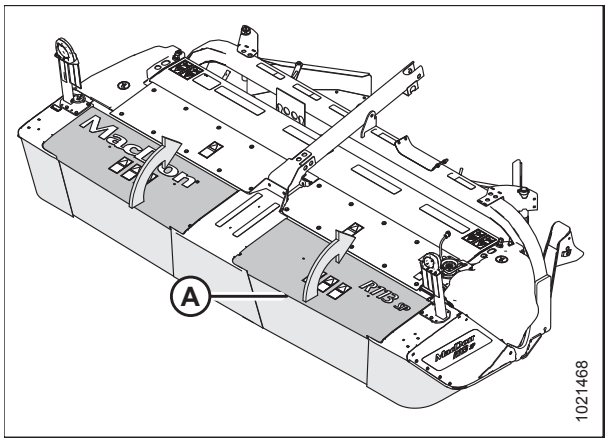


Figure 3.98: Cutterbar Doors

3.8.3 Opening Cutterbar Doors: Export Latches

Headers sold outside North America require a tool-operated latch on the cutterbar doors. Follow these steps to open cutterbar doors with export latches:

DANGER

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

1. Locate the latch access holes (A) for each door.

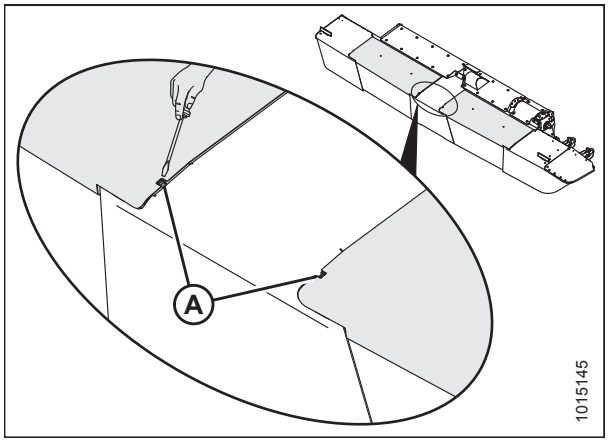


Figure 3.99: Cutterbar Door Latch Access Hole (Export Only)

2. Use a rod or screwdriver to press down on the latch (A) and release the cutterbar door.

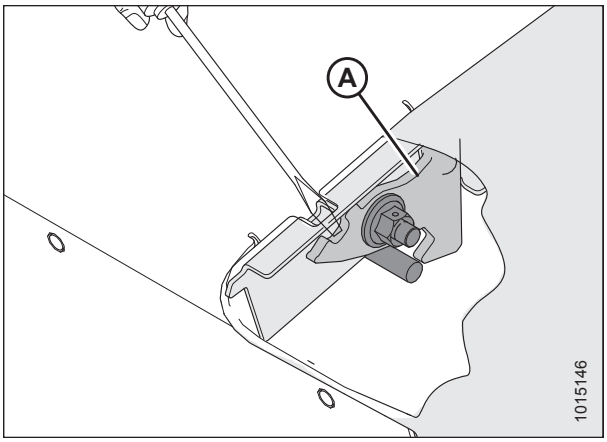


Figure 3.100: Cutterbar Door Latch (Cut Away View)

3. Lift up on door (A) while pressing down on latch.

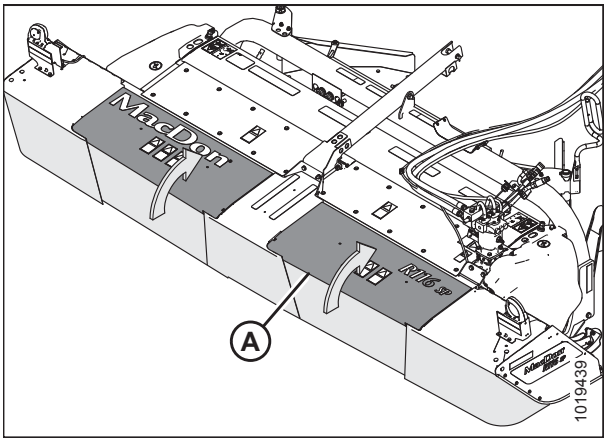


Figure 3.101: Left Cutterbar Door Open

3.8.4 Closing Cutterbar Doors

CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

1. Pull door (A) at top to close.
2. Ensure that curtains hang properly and completely enclose cutterbar area.

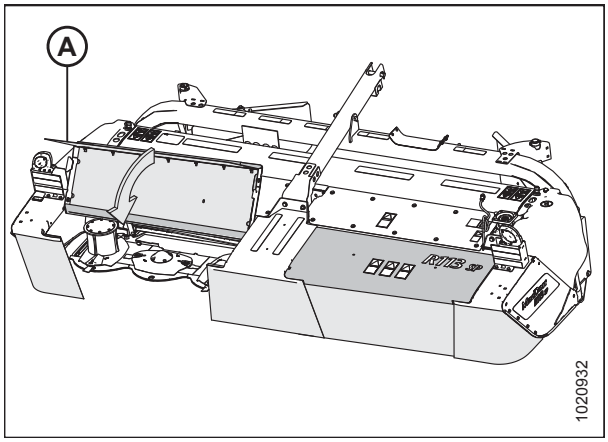


Figure 3.102: Cutterbar Doors

3.9 Cutterbar Deflectors

Cutterbar deflectors attach to the cutterbar just below the header's conditioner rolls. Deflectors provide improved feeding into the conditioner rolls and prevent heavy crop with long stems from feeding under the rolls during cutting. Cutterbar deflectors may not be well-suited for some environments, such as sandy conditions, and can be easily removed or installed in the field.

3.9.1 Removing Cutterbar Deflectors

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, stop engine, remove key, and engage header lift cylinder lock-out valves before going under machine for any reason.

1. Raise header fully, shut down tractor, and remove key from ignition.
2. Close lift cylinder safety props.
3. Clean debris from deflectors and deflector area.
4. Remove three bolts (B) securing deflector (A) to cutterbar using an 8 mm hex key and a 16 mm socket and remove deflector
5. Remove bolt (C) shared with skid shoe on outboard end of deflector.
6. Repeat for deflector on opposite side of header.
7. Store deflectors and hardware in a safe place.

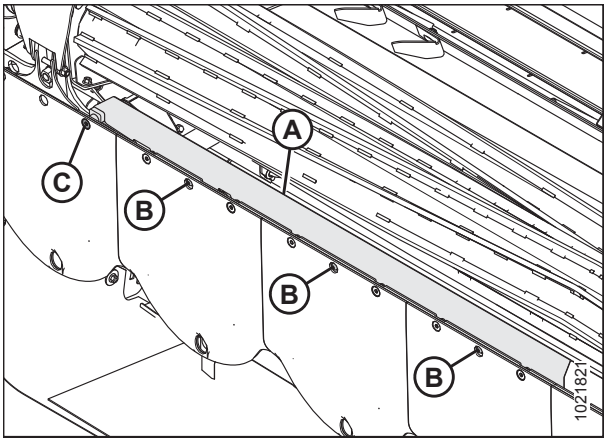


Figure 3.103: Left Cutterbar Deflector Viewed from Underside of Cutterbar

3.9.2 Installing Cutterbar Deflectors

DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, stop engine, remove key, and engage header lift cylinder lock-out valves before going under machine for any reason.

1. Raise header fully, shut down tractor, and remove key from ignition.
2. Close lift cylinder safety props.
3. Clean debris from ledge and the six mounting holes along aft edge of cutterbar.

4. Position left deflector (A) on top of ledge along the aft end of the cutterbar, and align existing fasteners and cutterbar plug with slots in deflector (A).
5. Install three button hex head socket M10 bolts (B) with lock nuts in the holes with the heads facing down.
6. Install bolt (C) shared with skid shoe on outboard end of deflector.

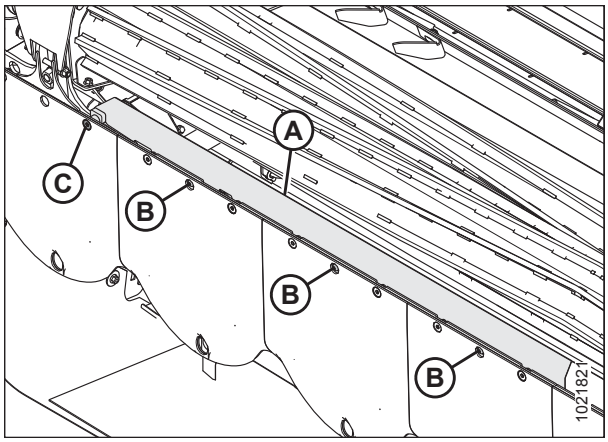


Figure 3.104: Left Cutterbar Deflector Viewed from Underside of Cutterbar

7. Position right deflector (A) on top of ledge along the outboard end of the cutterbar, and install button hex head socket M10 bolts (B) with lock nuts in the holes with the heads facing down.
8. Install bolt (C) shared with skid shoe on outboard end of deflector.
9. Align deflectors at position (B) and tighten bolts (C) to specified torque with a 16 mm socket and an 8 mm hex key.

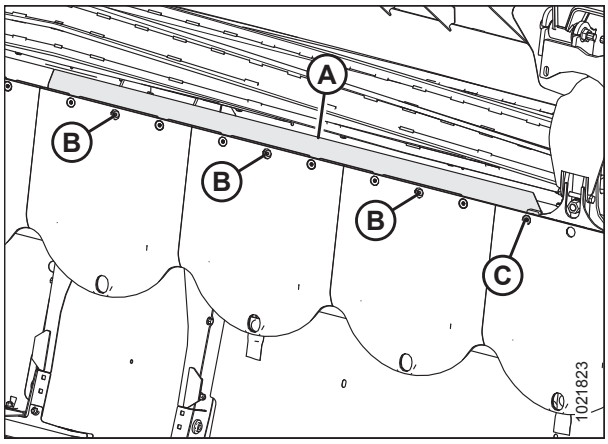


Figure 3.105: Right Cutterbar Deflector Viewed from Underside of Cutterbar

3.10 Cutting Height

Cutting height is determined by a combination of the cutterbar angle and skid shoe settings. Adjust cutting height for optimum cutting performance while preventing excessive build-up of mud and soil inside the self-propelled disc header that can lead to poor crop flow and increased wear on cutting components.

To choose an angle that maximizes performance for your crop and field conditions, refer to *3.11 Cutterbar Angle, page 72*.

- Lowering the skid shoes and decreasing self-propelled disc header angle increases the cutting height, resulting in longer stubble lengths that help material dry faster. This may be desirable in stony conditions to help reduce damage to cutting components.
- Raising the skid shoes and increasing self-propelled disc header angle decreases the cutting height, resulting in a shorter stubble height.

To minimize cutterbar damage, scooping soil, and soil build-up at the cutterbar in damp conditions, self-propelled disc header float should be set as light as possible without causing excessive bouncing.

NOTE:

When float setting is light, it may be necessary to reduce ground speed in order to prevent excessive bouncing and leaving a ragged cut.

3.10.1 Adjusting Cutting Height

DANGER

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

1. Raise self-propelled disc header fully, stop engine, and remove key.
2. Loosen bolts (C).
3. Remove bolts, nuts, and washers (D).
4. Raise or lower skid shoe.

   NOTE:

   Skid shoes have two adjustment settings: fully raised (A) and fully lowered (B).
5. Install bolts, nuts, and washers (D), and then tighten.
6. Tighten bolts (C).
7. Check self-propelled disc header float. Refer to windrower operator's manual.
8. Adjust cutterbar angle to desired working position using the header angle controls. If angle is not critical, set it to mid-position. Refer to *3.11 Cutterbar Angle, page 72*.

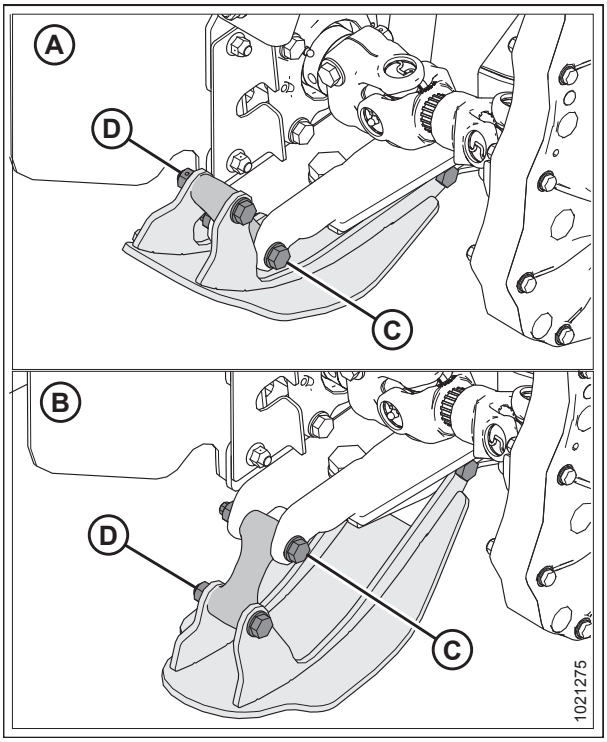


Figure 3.106: Skid Shoes

3.11 Cutterbar Angle

The cutterbar angle adjustment ranges from 0 to 8 degrees below horizontal. Choose an angle that maximizes performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions, whereas a steeper angle is required in down crops for better lifting action. Refer to your windrower operator's manual for instructions.

3.12 Cutterbar Lubrication

3.12.1 Checking and Adding Cutterbar Lubricant

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Park the self-propelled disc header on level ground.
2. Position self-propelled disc header so that the cutterbar is approximately level.
3. Shut down the self-propelled disc header, and remove key.
4. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

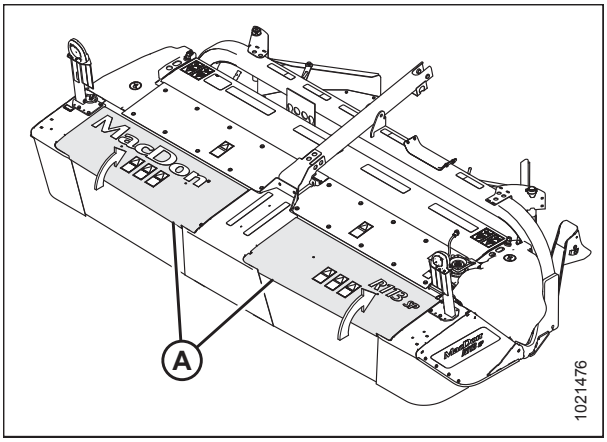


Figure 3.107: Cutterbar Doors

5. Use a spirit (bubble) level to ensure the cutterbar is level in both directions. Raise or lower self-propelled disc header accordingly.

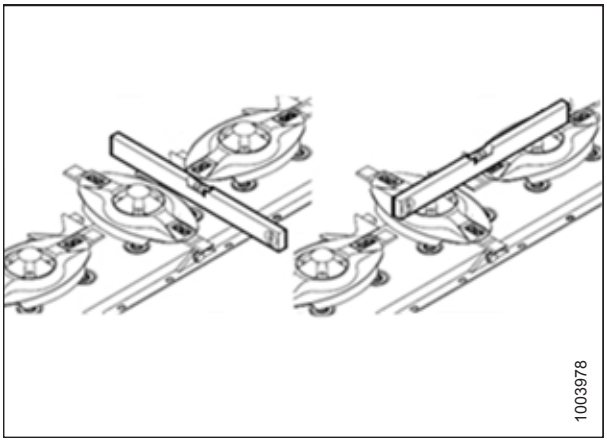


Figure 3.108: Spirit Level on Cutterbar

6. Remove oil level inspection plug (A) and O-ring (B) from cutterbar.

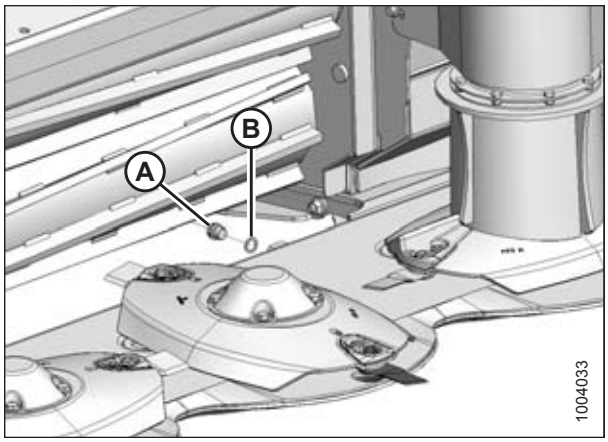


Figure 3.109: Cutterbar

7. Oil level must be up to the bore. If required, add lubricant as follows:

   a. Replace inspection plug removed in Step *6, page 74*.
   b. Start windrower engine, and raise header slightly.
   c. Lower header onto blocks so that left end is slightly higher than right end.

   NOTE:

   Refer to the inside back cover of this manual for lubricant specifications.

   IMPORTANT:

   Do **NOT** overfill the cutterbar. Overfilling can cause overheating and damage to, or failure of, cutterbar components.

   d. Remove breather (A) at left end, and add sufficient lubricant to required level.
   e. Replace breather (A), torque breather to 30 Nm (22 lbf·ft), and recheck oil level.

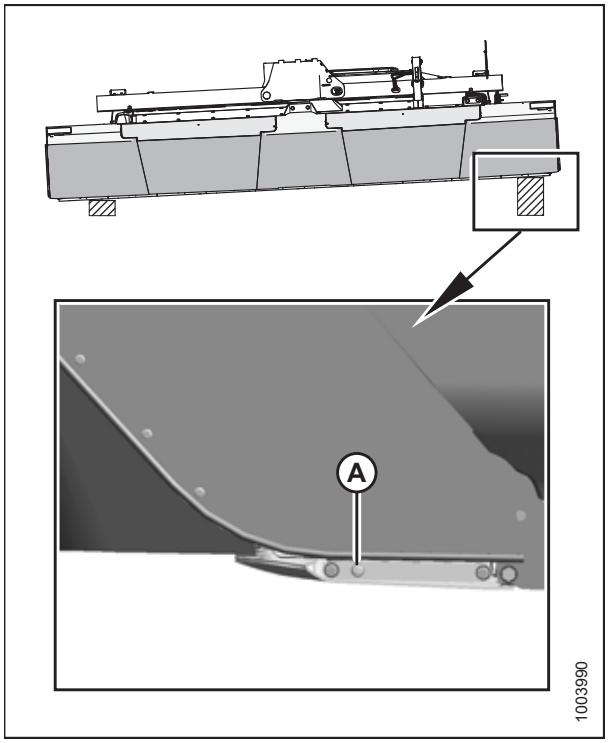


Figure 3.110: Adding Lubricant

8. Check O-ring (B) for breaks or cracks and replace if necessary.
9. Install plug (A) and O-ring (B). Tighten securely.

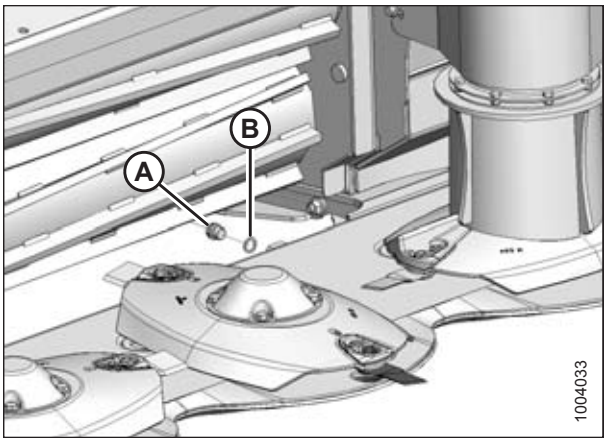


Figure 3.111: Cutterbar

3.12.2 Draining Cutterbar

DANGER

To avoid bodily injury or death from 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.

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Start engine and raise self-propelled disc header.
2. Place a block under each side of the self-propelled disc header so the right end (with the M18 cutterbar plug) is lower than the end with the M18 cutterbar breather.

   IMPORTANT:

   Always drain lubricant from the M18 cutterbar breather (A) on the right end of the header. Draining lubricant from the M18 cutterbar breather on the left end of the header may lead to breather contamination or failure.
3. Lower self-propelled disc header onto blocks, shut down engine, and remove key.
4. Place a 10 liter (10.5 qts [US]) capacity container under lower end of cutterbar, clean area around M18 cutterbar plug (A), and remove plug.

   IMPORTANT:

   Do **NOT** remove M10 hex head bolts (B) securing cutterbar end plate (C) to cutterbar or lubricant leaks could result.
5. Allow sufficient time for lubricant to drain, and install M18 cutterbar plug (A).

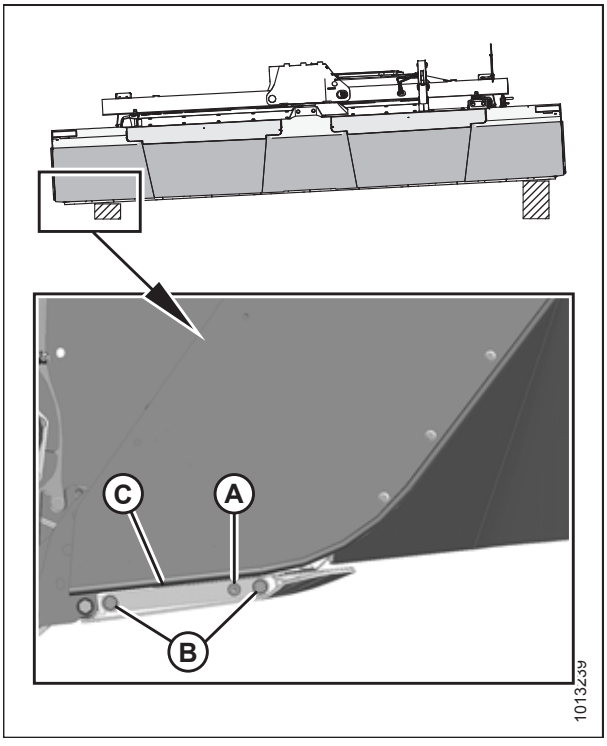


Figure 3.112: Right Side Shown – Left Side Similar

NOTE:

Do **NOT** flush the cutterbar.

6. Dispose of used lubricant safely.

3.12.3 Filling Cutterbar

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Remove M18 cutterbar breather (A) from the raised end of cutterbar and add the exact amount of lubricant specified for the cutterbar. Refer to the inside back cover of this manual for list of recommended fluids and lubricants.

   IMPORTANT:

   Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, or failure of cutterbar components.

   IMPORTANT:

   Do **NOT** remove M10 hex head bolts securing cutterbar end plate to cutterbar or lubricant leaks could result.

2. Install M18 cutterbar breather (A). Torque breather to 30 Nm (22 lbf·ft).
3. Start engine and raise self-propelled disc header.
4. Stop engine, remove key, and engage windrower lift cylinder safety props.
5. Remove blocks.
6. Check lubricant level. Refer to *3.12.1 Checking and Adding Cutterbar Lubricant, page 73*.

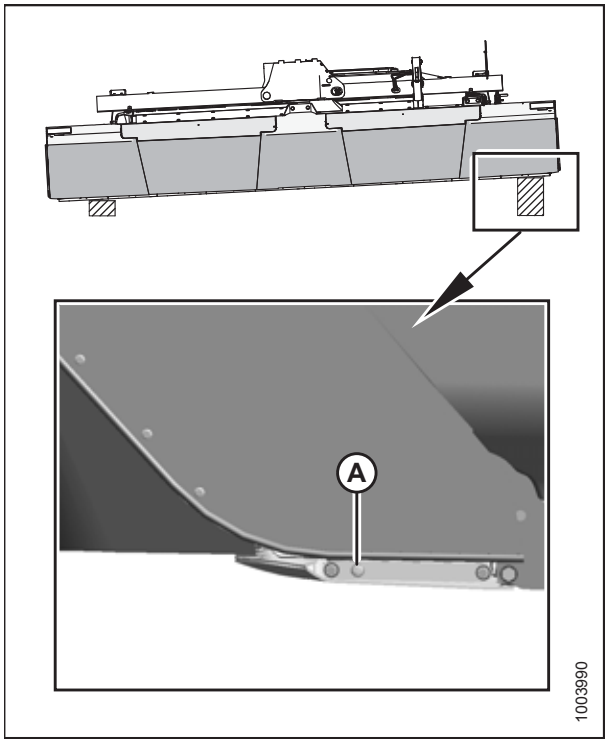


Figure 3.113: Left Side Shown – Right Side Similar

3.13 Curtains

Rubber curtains are installed at the following locations:

- Inboard curtain (A) attached to the center fixed cover.
- Door curtains (B) attached to each cutterbar door.
- Outboard curtains (C) attached to each front corner.

The curtains form a barrier that minimizes the risk of thrown objects being ejected from the cutterbar area. Always keep curtains down during operation.

Replace the curtains if they become worn or damaged.

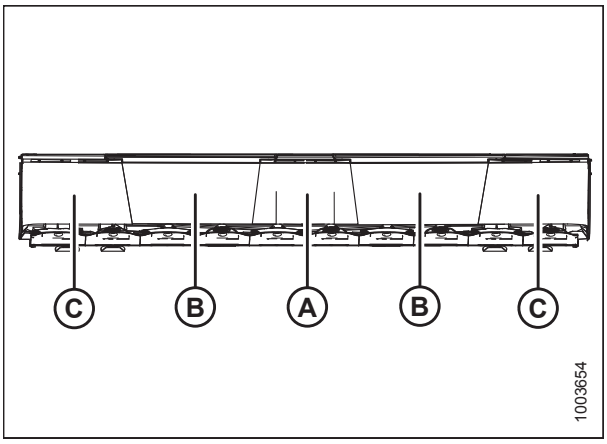


Figure 3.114: Cutterbar Curtains

3.13.1 Inspecting Curtains

The cutterbar curtains are very important as they reduce the potential for thrown objects. Always keep these curtains down when operating the self-propelled disc header.

WARNING

Do NOT operate the machine without all the cutterbar doors down or without curtains installed and in good condition.

CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

Check cutterbar curtains (A) for the following conditions:

- Rips and tears: Replace curtain.
- Cracking: While the curtain may look whole, this is an indicator that failure is imminent—replace curtain.
- Missing bolts: Replace missing hardware before operating.

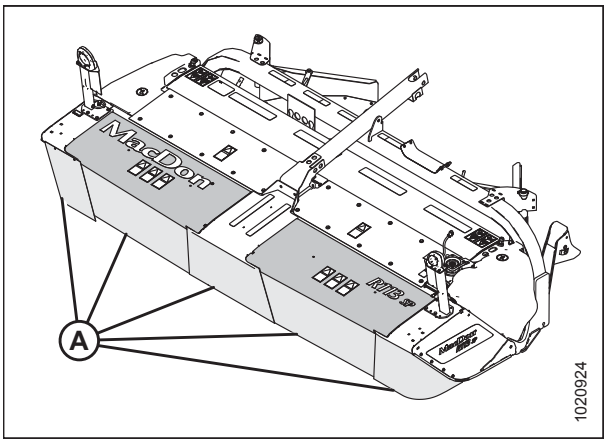


Figure 3.115: Cutterbar Curtains

3.13.2 Removing Cutterbar Door Curtains

The procedure for removing cutterbar door curtains is the same for both doors.

1. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

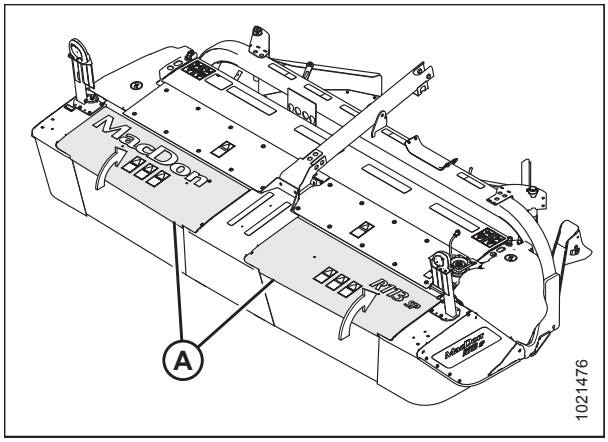


Figure 3.116: Cutterbar Doors

2. Remove seven nuts (A) from the bolt studs.
3. Remove aluminum liner (B).
4. Remove curtain (C).

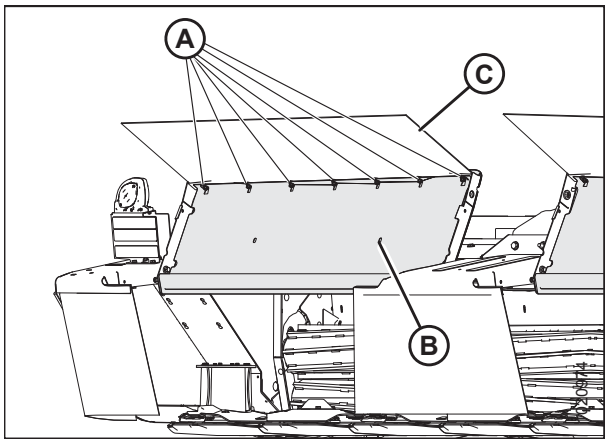


Figure 3.117: Nuts Securing Shield Panel and Curtain to Cutterbar Door

3.13.3 Installing Cutterbar Door Curtains

The procedure for installing cutterbar door curtains is the same for both doors.

1. Insert the cutterbar door stud bolts (B) into the precut holes on curtain (A).
2. Install seven large washers (C).
3. Install liner panel (D) against washers.
4. Install seven nuts (E) onto bolt studs and torque to 28 Nm (21 lbf·ft).

   IMPORTANT:

   To avoid damaging bolt studs, do not overtighten the nuts.
5. Close cutterbar doors. Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

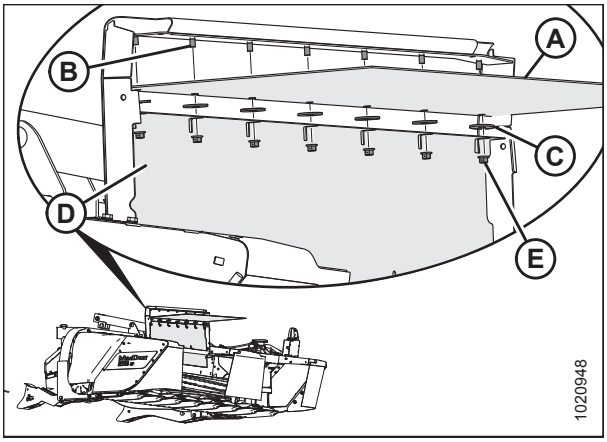


Figure 3.118: Curtain Installed onto Bolts

3.13.4 Removing Cutterbar Inboard Curtain

1. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

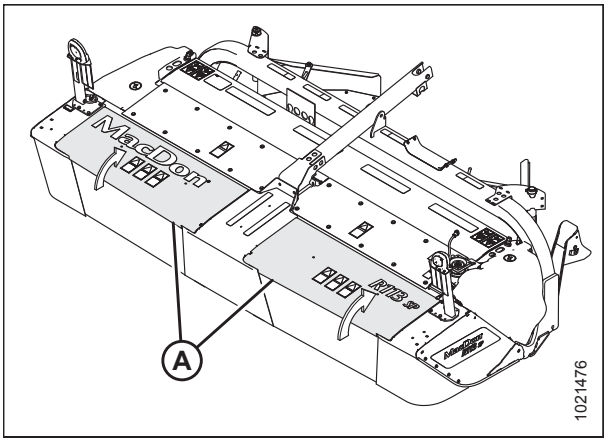


Figure 3.119: Cutterbar Doors

2. Remove two M10 carriage head bolts (A) and nuts securing curtain assembly (B) to the self-propelled disc header, and remove curtain assembly.

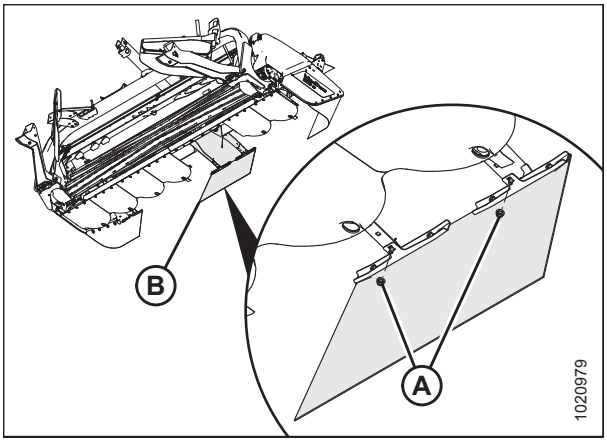


Figure 3.120: Inboard Curtain

3. Remove four nuts (A) from weld studs on center shield, remove two curtain brackets (B), and remove curtain.

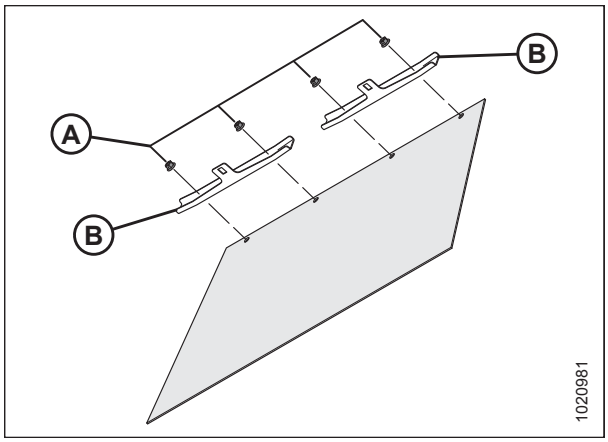


Figure 3.121: Inboard Curtain, Nuts, and Brackets

3.13.5 Installing Cutterbar Inboard Curtain

1. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

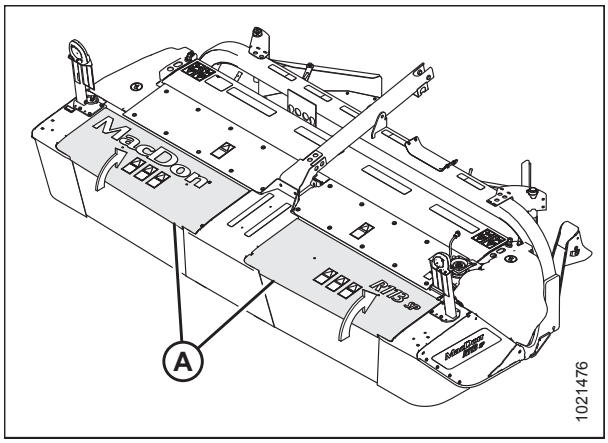


Figure 3.122: Cutterbar Doors

2. Install curtain onto weld studs on center shield, install two curtain brackets (B), and secure with four nuts (A).
3. Torque to 28 Nm (21 lbf·ft).

   IMPORTANT:

   To avoid damaging bolt studs, do not overtighten the nuts.

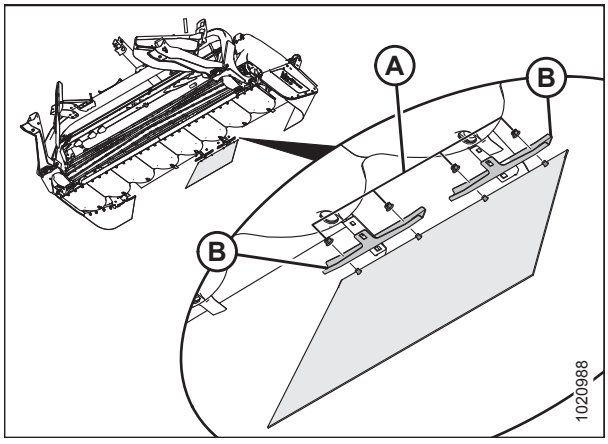


Figure 3.123: Inboard Curtain and Brackets

4. Secure two curtain brackets (A) to center shield using two M10 carriage head bolts (B) and nuts.
5. Torque bolts (A) to 39 Nm (29 lbf·ft).

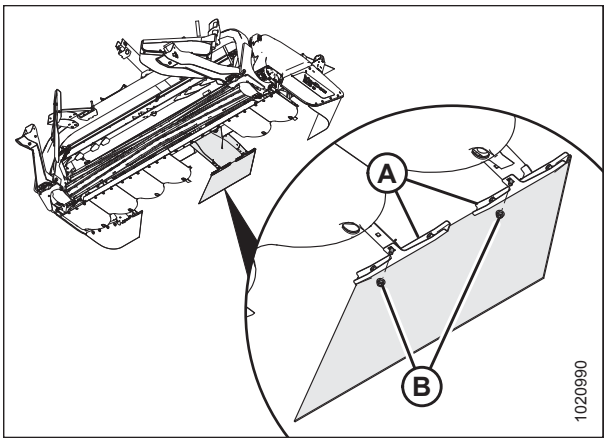


Figure 3.124: Inboard Curtain and Brackets

3.13.6 Removing Outboard Curtains

The procedure for removing outboard curtains is the same for both sides.

1. Open cutterbar door (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

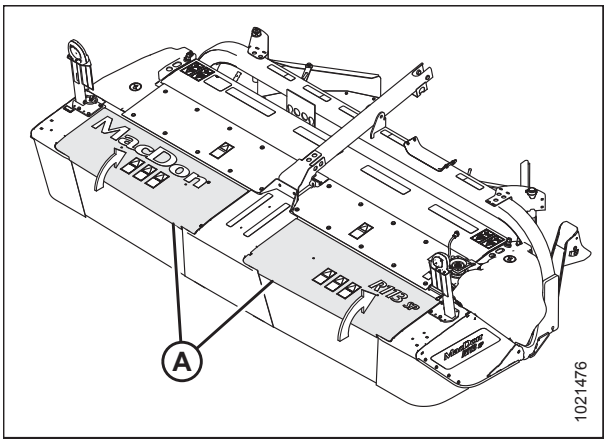


Figure 3.125: Cutterbar Doors

2. Remove four bolts, large washers, and nuts (A) securing outboard curtain (B) to endsheet.

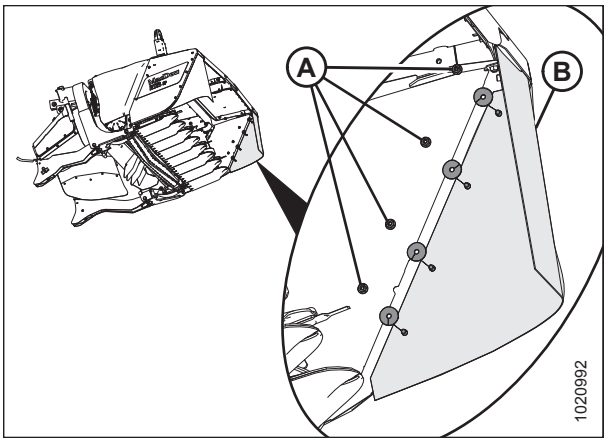


Figure 3.126: Left Side Endsheet

3. Remove two nuts (A) from bolt studs.
4. Remove nut (B) from carriage head bolt, slide out the bracket (C), and remove curtain (D).

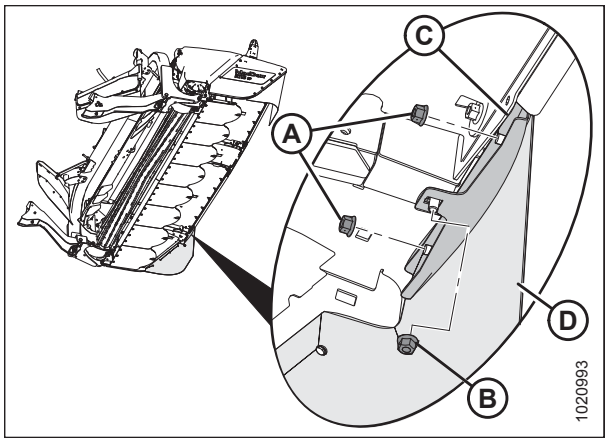


Figure 3.127: Outboard Curtain

3.13.7 Installing Outboard Curtains

The procedure for installing outboard curtains is the same for both sides.

1. Open cutterbar door (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

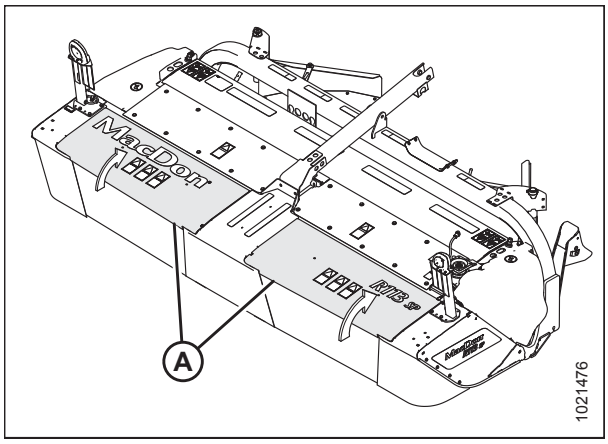


Figure 3.128: Cutterbar Doors

2. Install curtain (A) into bracket (B).
3. Install two nuts (D) and tighten.
4. Slide bracket (B) into position, and install the square neck carriage head bolt and flange nut (C).
5. Torque flange nut (C) to 39 Nm (29 lbf·ft).

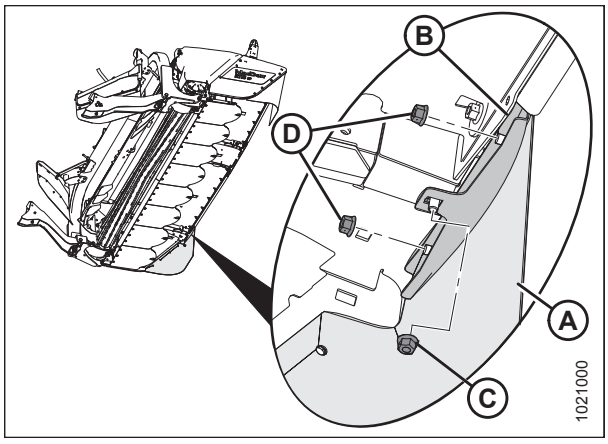


Figure 3.129: Outboard Curtain

6. Install four bolts, large washers, and nuts (A) to secure outboard curtain (B) to endsheet. Torque bolts to 39 Nm (29 lbf·ft).

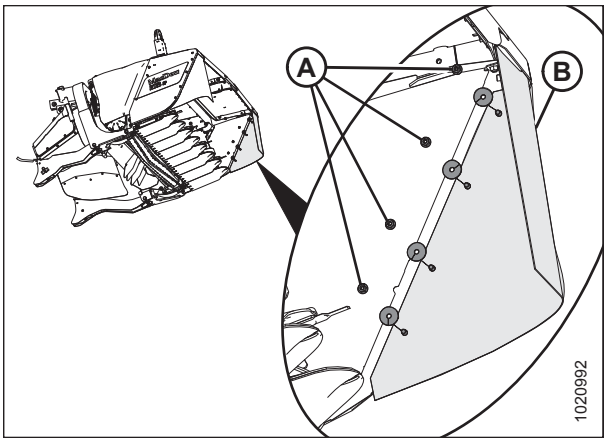


Figure 3.130: Left Side Endsheet

3.14 Roll Gap

The roll gap controls the degree to which crop is conditioned as it passes through the rolls. Roll gap is factory-set at 6 mm (1/4 in.) for steel rolls, and approximately 3 mm (1/8 in.) for polyurethane rolls.

Polyurethane rolls are better suited for crushing stems while providing reduced crimping and are recommended for alfalfa, clover, legumes and similar crops. Correct conditioning of crops is achieved when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set roll gap to produce these results.

Steel rolls with a larger gap (up to 25 mm [1 in.]) may be desirable for thick stemmed cane-type crops; however, too large a gap may cause feeding problems. Steel rolls are recommended for these types of situations.

Grass type crops may require less gap for proper feeding and conditioning.

IMPORTANT:

If using settings below the factory setting, visually inspect the roll gap.

3.14.1 Checking Roll Gap

DANGER

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

1. Lower self-propelled disc header fully.
2. Stop engine and remove key from ignition.
3. **Polyurethane Rolls:** Insert a feeler gauge through the inspection hole in the conditioner endsheet to check roll gap on polyurethane roll conditioners. Factory setting is 3 mm (1/8 in.). If adjustments are required, refer to *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85*.

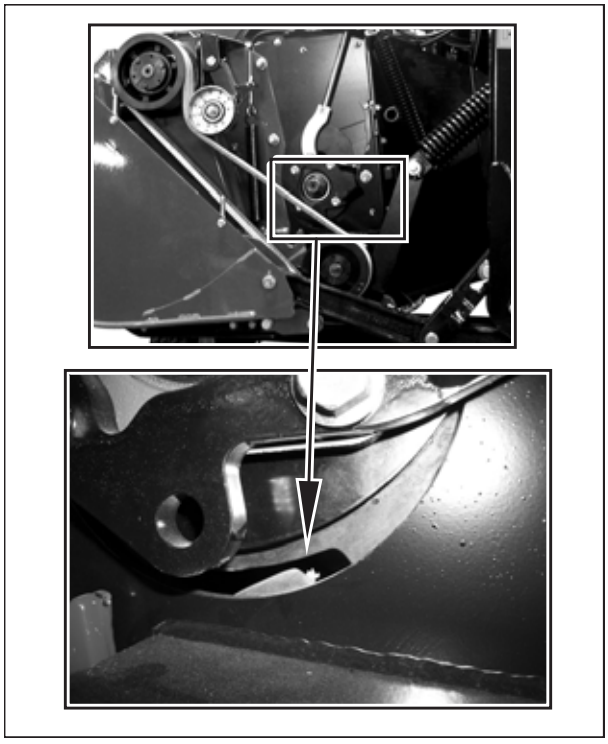


Figure 3.131: Polyurethane Roll Conditioner

4. **Steel Rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of roll gap but does **NOT** provide consistent roll gap measurements. Roll gap factory setting is 6 mm (1/4 in.). Refer to *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*.

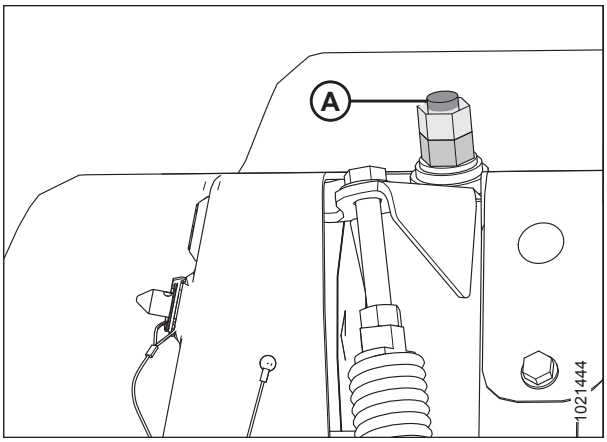


Figure 3.132: Roll Gap Adjustment

3.14.2 Adjusting Roll Gap: Polyurethane Rolls

Because polyurethane rolls operate at smaller gaps and the conditioning is less aggressive, the roll gap setting is more sensitive than on steel rolls. To return roll gap to the factory setting, follow the procedure below.

DANGER

To avoid bodily injury or death from 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. Lower self-propelled disc header fully.
2. Stop engine and remove key.
3. Loosen upper jam nut (A) on both sides of conditioner.
4. Turn lower nut (B) counterclockwise until upper roll rests on lower roll.
5. Turn lower nut (B) one full turn clockwise to raise the upper roll and achieve a 3 mm (1/8 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of header.
7. Rotate the rolls manually and use a feeler gauge at the ends of the rolls to check that the actual gap is no less than 2 mm (5/64 in.) and no more than 4 mm (5/32 in.).

   IMPORTANT:

   Make sure roll gap adjustment nuts are adjusted equally on both sides of the header to achieve a consistent gap across the rolls.

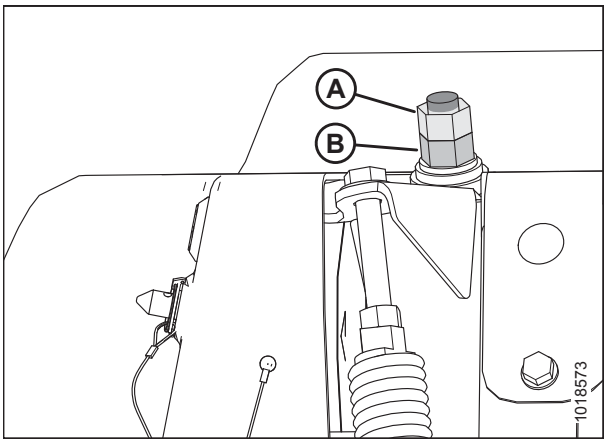


Figure 3.133: Roll Gap Adjustment

3.14.3 Adjusting Roll Gap: Steel Rolls

The length of thread extending above the jam nut on the adjustment rods can be used as an approximation of roll gap but does **NOT** provide consistent roll gap measurements. To ensure roll gap is at the factory setting, follow the procedure below.

DANGER

To avoid bodily injury or death from 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. Lower self-propelled disc header fully.
2. Stop engine and remove key.
3. Loosen jam nut (A) on both sides of conditioner.
4. Turn lower nut (B) counterclockwise until upper roll rests on lower roll. Ensure rolls intermesh.
5. Turn lower nut (B) two and a half full turns clockwise to raise upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of header.

   IMPORTANT:

   Make sure roll gap adjustment nuts are adjusted equally on both sides of the header to achieve a consistent gap across the rolls.
7. If further adjustment to roll gap is required:
   - Turn lower nut (B) clockwise to increase roll gap.
   - Turn lower nut (B) counterclockwise to decrease roll gap.

   NOTE:

   Make further adjustments to roll gap based on header performance and crop conditions.

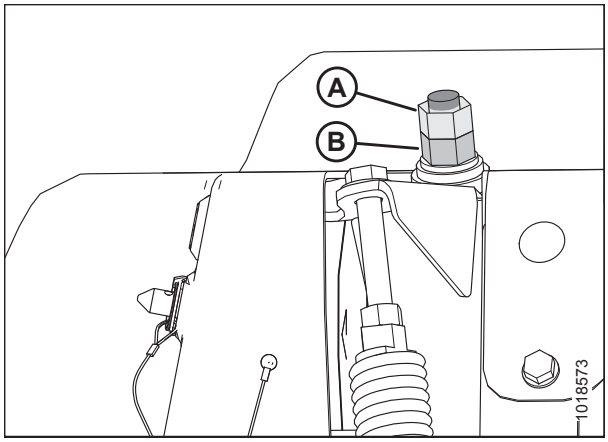


Figure 3.134: Roll Gap Adjustment

3.15 Roll Tension

Roll tension (the pressure holding the rolls together) is factory-set to maximum and is adjustable.

Heavy crops or tough forage can cause the rolls to separate; therefore, maximum roll tension is required to ensure that materials are sufficiently crimped.

To prevent over-conditioning of light alfalfa and short grasses, apply less roll tension.

3.15.1 Adjusting Roll Tension

Roll tension is factory-set to maximum position, and can be adjusted as follows:

DANGER

To avoid bodily injury or death from 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. Lower self-propelled disc header fully.
2. Stop engine, and remove key.
3. Loosen jam nut (A) on both sides of conditioner.
4. Turn the spring drawbolt (B) clockwise to tighten spring (C) and **INCREASE** roll tension.
5. Turn the spring drawbolt (B) counterclockwise to loosen spring (C) and **DECREASE** roll tension.
6. Measure the amount of exposed thread on the spring drawbolt (B) at each end of the conditioner. Measurement (D) should be 12–15 mm (1/2–9/16 in.) for both polyurethane and steel roll conditioners.

   IMPORTANT:

   Turn each bolt equally. Each turn of the bolt changes the roll tension by approximately 32 N (7.2 lbf).
7. Tighten jam nuts (A) on both sides.

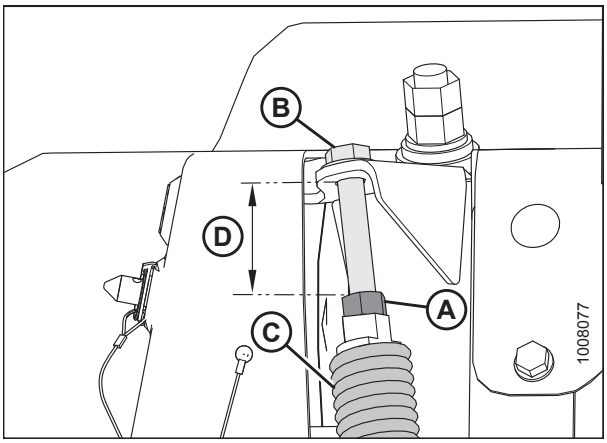


Figure 3.135: Left Side Shown – Right Side Opposite

3.16 Roll Timing

For proper conditioning, the rolls must be properly timed with the bar on one roll centered between two bars on the other roll. The factory setting should be suitable for most crop conditions.

IMPORTANT:

Roll timing is critical when the roll gap is decreased because conditioning is affected, and the bars may contact each other.

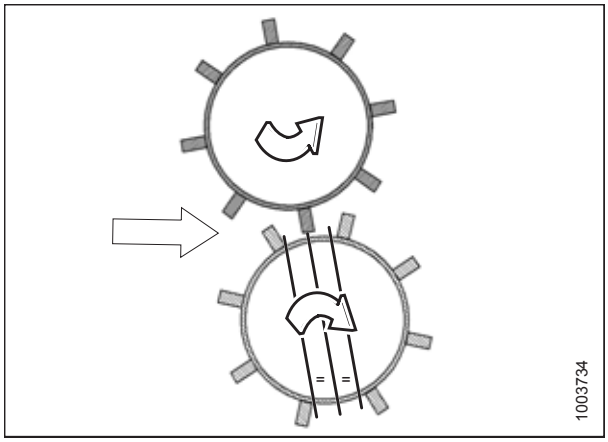


Figure 3.136: Properly Timed Rolls

3.16.1 Checking Roll Timing

Check roll timing if excessive noise is coming from the conditioner rolls.

DANGER

To avoid bodily injury or death from 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.

Roll timing is factory-set and should not require adjustment. However, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted. Refer to *3.16.2 Adjusting Roll Timing, page 88*.

3.16.2 Adjusting Roll Timing

1. Loosen four bolts (A) in slots of yoke plate (B) on upper roll universal shaft.

   NOTE:

   Only three of the four bolts are shown in the illustration.

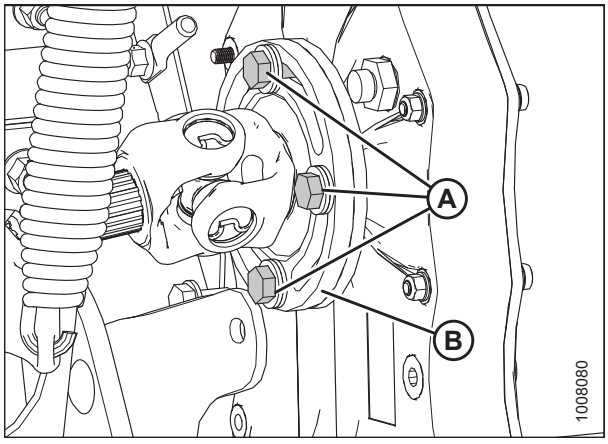


Figure 3.137: Conditioner Drive

NOTE:

When setting roll timing, ensure the grease fittings (F) on both drivelines face towards the rear simultaneously.

2. Secure bottom roll (A).
3. Manually rotate the upper roll (B) in a counterclockwise direction until it stops.
4. Make a mark (C) across the yoke (D) and gearbox flange (E).

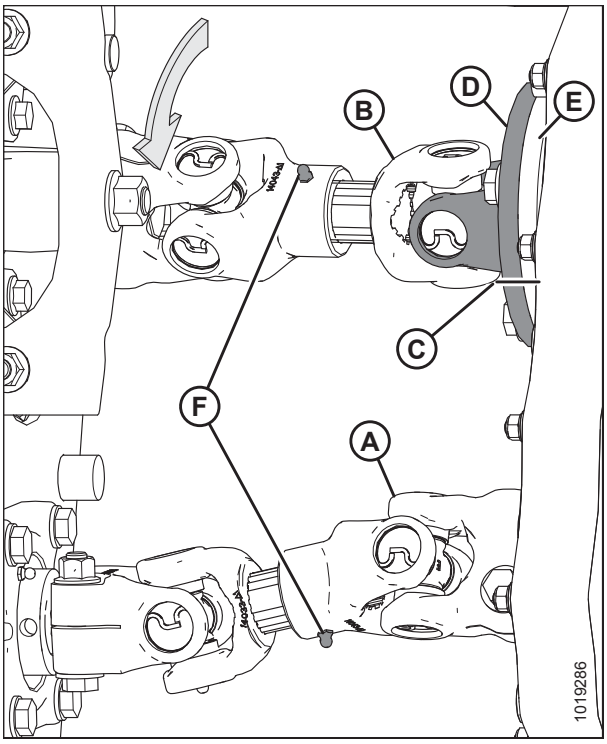


Figure 3.138: Conditioner Drive

5. Manually rotate upper roll (A) in a clockwise direction until it stops. Make a second mark (B) on the yoke flange, and align it with the mark on the gearbox flange.

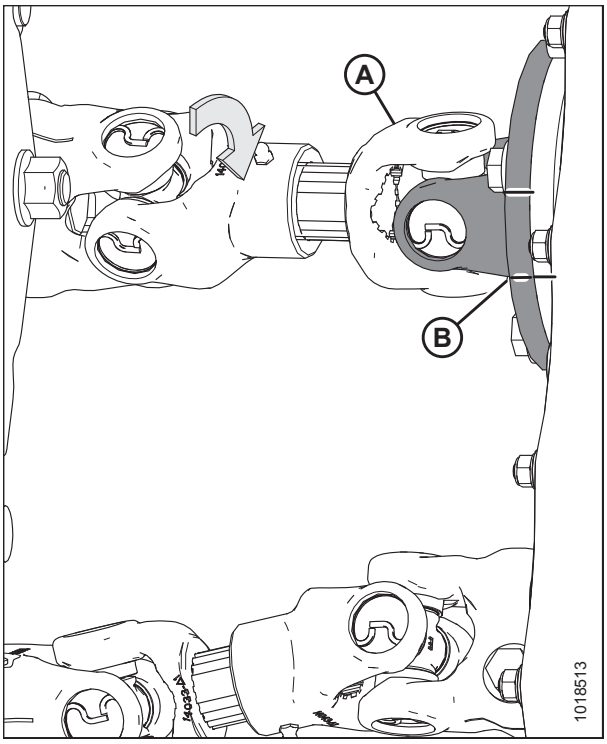


Figure 3.139: Conditioner Drive

6. Determine the center point (A) between the two marks on the yoke plate, and place a third mark.
7. Rotate the upper roll (B) in the counterclockwise direction until the bolt lines up with the third (center) mark.

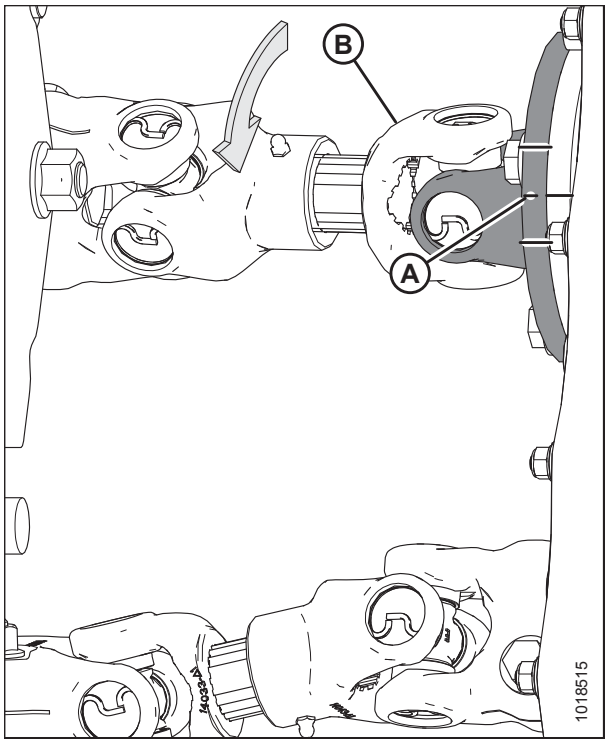


Figure 3.140: Conditioner Drive

8. Ensure threads on bolts (A) are clean and free of lubricant.
9. Apply Loctite® 242 (Blue), and tighten bolts (A) to secure the position. Torque to 95 Nm (70 lbf·ft).

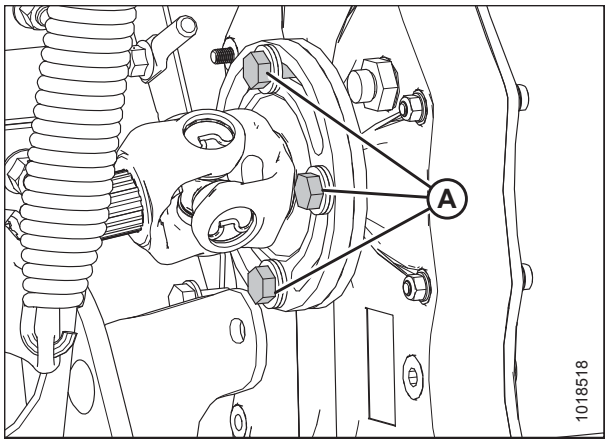


Figure 3.141: Conditioner Drive

3.17 Roll Conditioner

WARNING

Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.

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. A narrower windrow may be preferable for ease of pick-up and when drying is not critical (for example, when cutting for silage or green-feed).

The position of the forming shields controls the width and placement of the windrow. Deciding which forming shield position to use is based on the following factors:

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

3.17.1 Positioning Forming Shield Side Deflectors: Roll Conditioner

The position of the side deflectors controls the width and placement of the windrow. To ensure windrow placement is centered with respect to the carrier wheels, set both side deflectors to the same position.

DANGER

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

1. Loosen the locking handle (A).
2. Slide the adjuster bar (B) along adjuster plate (C) to the desired deflector position and engage the bar (B) into a notch in the adjuster plate.
3. Tighten locking handle (A).
4. Repeat for other side.

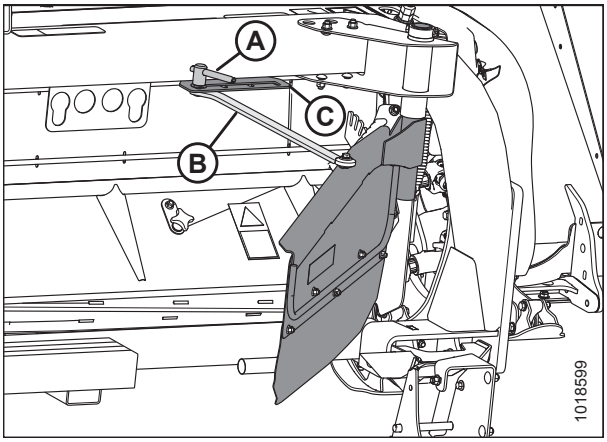


Figure 3.142: Forming Shield Side Deflector and Adjuster Bar

3.17.2 Positioning Forming Shield Rear Baffle: Roll Conditioner

DANGER

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

The rear baffle primarily determines the height of the windrow, but can also affect the width. It is located immediately behind and above the conditioning rolls and can be positioned to do the following:

- Direct the crop flow into the forming shield for narrow and moderate width windrows
- Direct crop downward to form a wide swath
- Assist with even material distribution across windrows by using adjustable crop fins mounted to the rear baffle

To position rear baffle, follow these steps:

1. Remove lynch pin (A) securing rear baffle adjustment lever (B) to bracket (C).
2. Pull rear baffle adjustment lever (B) in inboard direction to disengage from bracket (C).
3. Position rear baffle adjustment lever (B) as follows:
   - Move lever forward to **raise** baffle
   - Move lever backward to **lower** baffle
4. Release rear baffle adjustment lever (B) so that tab engages hole in bracket (C).
5. Secure baffle adjustment with lynch pin (A).

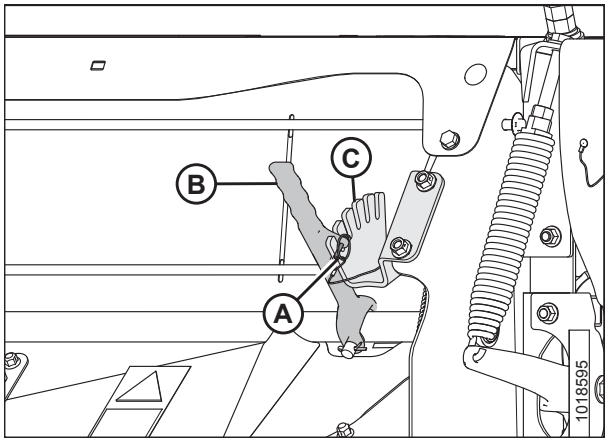


Figure 3.143: Right Side of Conditioner

3.18 Haying Tips

3.18.1 Curing

Curing crops quickly helps maintain the highest quality of crop material as 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.

3.18.2 Topsoil Moisture

Table 3.1 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, the general rule of wide and thin does not apply. A narrower windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level.
- If ground is wet due to irrigation, wait until soil moisture drops below 45%.
- If ground is wet due to frequent rains, cut hay when weather allows and let the forage 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.

3.18.3 Weather and Topography

- Cut as much hay as possible by midday when drying conditions are best.
- Fields sloping south get up to 100% more exposure to the sun’s heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields and chopping those facing north.
- When relative humidity is high, the evaporation rate is low and hay dries slowly.
- If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresh, less saturated air.
- Cut hay perpendicular to the direction of the prevailing winds if possible.

3.18.4 Windrow Characteristics

Producing windrows with the recommended characteristics will achieve the greatest results. Refer to *3 Operation, page 21* for instructions on adjusting the header.

Table 3.2 Recommended Windrow Characteristics

Characteristic	Advantage
High and fluffy	Enables airflow through 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

3.18.5 Driving on Windrow

Driving on previously cut windrows that will not be raked can lengthen drying time by a full day. If practical, set forming shields to produce a narrower windrow that the machine can straddle.

NOTE:

Driving on the windrow in high-yield crops may be unavoidable if a full width windrow is necessary.

3.18.6 Using Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces and enabling water to escape and evaporate faster. However, treated hay lying on wet ground will absorb ground moisture faster.

Before deciding to use a drying agent, carefully compare the relative costs and benefits for your area.

3.19 Transporting the Header

For information on transporting the header when attached to the windrower, refer to your windrower operator's manual.

IMPORTANT:

For cab-forward road travel the windrower must have the lighting and marking bundle installed (MD #B5412).

4 Maintenance and Servicing

The following instructions provide information about routine header service. Detailed maintenance and service information is contained in the technical manual that is available from your Dealer. A parts catalog is located in a plastic case at the right end of the header.

Log hours of operation and use the maintenance record provided (refer to *4.3.1 Maintenance Schedule/Record, page 101*) to keep track of your scheduled maintenance.

4.1 Preparing Machine for Servicing

CAUTION

To avoid personal injury, perform the following procedures before servicing self-propelled disc header or opening drive covers:

1. Lower the self-propelled disc header fully. If necessary to service in the raised position, always engage safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*
2. Disengage power take-off (PTO).
3. Stop engine and remove key.
4. Engage park brake.
5. Wait for all moving parts to stop.

4.2 Recommended Safety Procedures

- Park on level surface when possible. Follow all recommendations in your tractor operator's manual.
- Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.

Figure 4.1: Safety Around Equipment

- Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles, and heavy gloves.

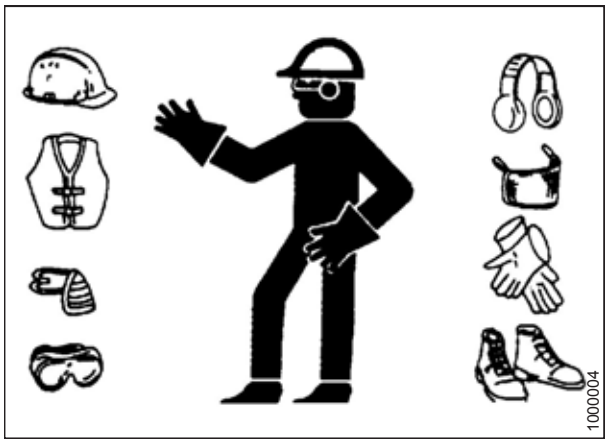


Figure 4.2: Safety Equipment

- Be aware that if more than one person is servicing the machine at the same time, rotating a driveline or other mechanically driven component by hand (for example, to access a lube fitting) will cause drive components in other areas (belts, pulleys, and discs) to move. Stay clear of driven components at all times.

Figure 4.3: Safety Around Equipment

- Be prepared if an accident should occur. Know where the first aid kits and fire extinguishers are located, and know how to use them.

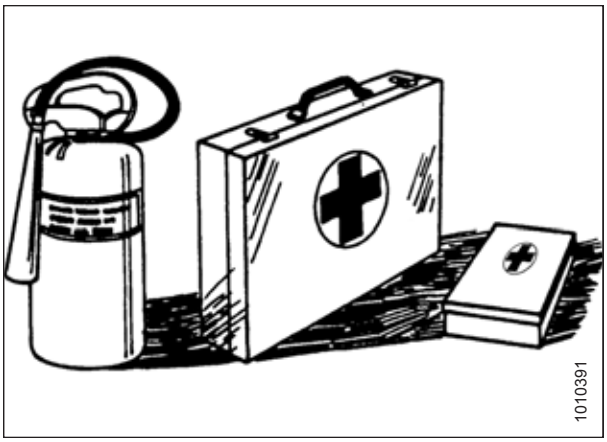


Figure 4.4: Safety Equipment

- Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.

Figure 4.5: Safety Around Equipment

- Use adequate light for the job at hand.
- Replace all shields removed or opened for service.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.
- Keep machinery clean. Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

4.3 Maintenance Requirements

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

Periodic maintenance requirements are organized according to service intervals.

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

Log hours of operation, use the maintenance record, and keep copies of your maintenance records. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

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 *4.2 Recommended Safety Procedures, page 98*.

4.3.1 Maintenance Schedule/Record

Keep a record of maintenance as evidence of a properly maintained machine. Daily maintenance records are not required to meet normal warranty conditions.

Action		✓ Check					♦ Lubricate					▲ Change				
✎	Hour meter reading															
✎	Service date															
✎	Serviced by															
First Use		Refer to *4.3.2 Break-In Inspections, page 103*.														
End of Season		Refer to *4.3.4 End-of-Season Servicing, page 104*.														
First 5 hours																
✓	Check for loose hardware. Refer to *7.1 Torque Specifications, page 191*.															
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 157*.															
First 10 hours, then daily																
✓	Check hydraulic hoses and lines. Refer to *Hydraulic Hoses and Lines, page 163*.															
✓	Check cutterbar discs. Refer to *Inspecting Cutterbar Discs, page 112*.															
✓	Check cutterbar discblades. Refer to *Inspecting Discblades, page 126*.															
✓	Check cutterbar drums. Refer to *Inspecting Drums, page 136*.															
First 25 hours																
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 157*.															
▲	Change conditioner roll timing gearbox oil. Refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.															
Every 25 hours																
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 157*.															
♦	Lube idler pivot. Refer to *4.4 Lubrication, page 105*.															
♦	Lube upper and lower driveline universal joints. Refer to *4.4 Lubrication, page 105*.															

Action	✓ Check	♦ Lubricate	▲ Change
♦	Lube roller conditioner bearings. Refer to *4.4 Lubrication, page 105*.		
♦	Lube conditioner roll driveline slip joints. Refer to *4.4 Lubrication, page 105*.		
First 50 hours			
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 157*.		
▲	Change cutterbar lubricant. Refer to *3.12 Cutterbar Lubrication, page 73*[3].		
▲	Change roll timing gearbox lubricant. Refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.		
▲	Change header drive gearbox lubricant. Refer to *4.6.1 Checking and Adding Lubricant, page 156*.		
Every 100 hours or annually			
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 157*.		
✓	Check roll timing gearbox lubricant. Refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.		
✓	Check header drive gearbox lubricant. Refer to *4.6.1 Checking and Adding Lubricant, page 156*.		
First 150 hours			
▲	Change cutterbar lubricant. Refer to *3.12 Cutterbar Lubrication, page 73*[3].		
▲	Change roll timing gearbox lubricant. Refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.		
▲	Change header drive gearbox lubricant. Refer to *4.6.1 Checking and Adding Lubricant, page 156*.		
Every 250 hours[4]			
▲	Change cutterbar lubricant. Refer to *3.12 Cutterbar Lubrication, page 73*[3].		

3. Use only the specified amount. Do **NOT** overfill
4. Begins after the first 150 hour service

Action		✓ Check			♦ Lubricate				▲ Change				
▲	Change roll timing gearbox lubricant. Refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.												
▲	Change header drive gearbox lubricant. Refer to *4.6.1 Checking and Adding Lubricant, page 156*.												

4.3.2 Break-In Inspections

Table 4.1 Break-In Inspection Schedule

Inspection Interval	Item	Refer to
1 Hour	Check for loose hardware and tighten to required torque	*7.1 Torque Specifications, page 191*
5 Hours	Check for loose hardware and tighten to required torque	*7.1 Torque Specifications, page 191*
	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 157*
25 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 157*
50 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 157*
	Check and change cutterbar lubricant	*3.12 Cutterbar Lubrication, page 73* Use only specified amount. Do **NOT** overfill.
	Check and change conditioner roll timing gearbox lubricant	*4.7.2 Roll Timing Gearbox (MD #221748), page 161*
	Check and change header drive gearbox lubricant	*Checking and Changing Roll Timing Gearbox Oil, page 161*
150 Hours	Check conditioner drive belt tension	*Inspecting Conditioner Drive Belt, page 157*
	Check and change cutterbar lubricant	*3.12 Cutterbar Lubrication, page 73* Use only specified amount. Do **NOT** overfill.
	Check and change conditioner roll timing gearbox lubricant	*4.7.2 Roll Timing Gearbox (MD #221748), page 161*
	Check and change header drive gearbox lubricant	*Checking and Changing Roll Timing Gearbox Oil, page 161*

4.3.3 Preseason Servicing

CAUTION

- **Review the operator's manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the self-propelled disc header and note hazard areas.**
- **Ensure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Make certain you understand and have practiced safe use of all controls. Know the capacity and the 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 procedures at the beginning of each operating season:

1. Lubricate machine completely. Refer to *4.4 Lubrication, page 105* and *3.12 Cutterbar Lubrication, page 73*.
2. Perform all annual maintenance. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

4.3.4 End-of-Season Servicing

CAUTION

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

CAUTION

Cover cutterbar to prevent injury from accidental contact.

Perform the following procedures at the end of each operating season:

1. Clean the self-propelled disc header thoroughly.
2. Store in a dry, protected place if possible. If stored outside, always cover self-propelled disc header with a waterproof canvas or other protective material.
3. Raise self-propelled disc header and engage lift cylinder safety props.
4. Repaint all worn or chipped painted surfaces to prevent rust.
5. Loosen drive belt.
6. Lubricate the self-propelled disc header thoroughly leaving excess grease on fittings to keep moisture out of bearings.
7. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
8. Oil cutterbar components to prevent rust.
9. Check for worn components and repair as necessary.
10. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at beginning of next season.
11. Replace or tighten any missing or loose hardware. Refer to *7.1 Torque Specifications, page 191*.
12. Remove divider rods (if equipped) to reduce space required for inside storage.

4.4 Lubrication

WARNING

To avoid personal injury, before servicing header or opening drive covers, refer to *4.1 Preparing Machine for Servicing, page 97*.

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

Log hours of operation and use the maintenance schedule provided to keep a record of scheduled maintenance. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

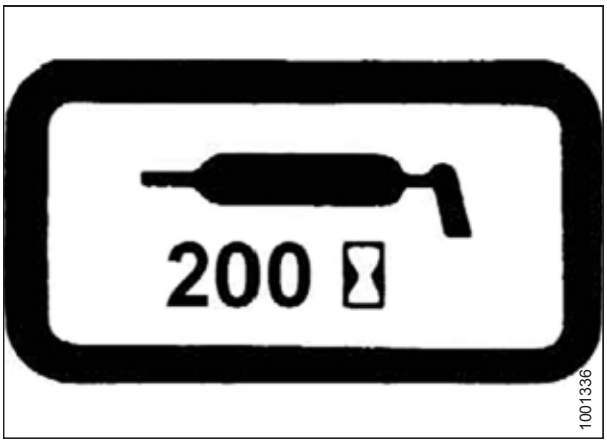


Figure 4.6: Grease Interval Decal

4.4.1 Greasing Procedure

Only use clean high pressure extreme pressure grease. Refer to this manual's inside back cover for a list of recommended fluids and lubricants.

CAUTION

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

1. Open driveshields at ends of self-propelled disc header to access greasing points. Refer to *3.7.1 Opening Driveshields, page 62*.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
4. Leave excess grease on fitting to keep out dirt.
5. Replace any loose or broken fittings immediately.
6. Remove and thoroughly clean any fitting that will not take grease and clean lubricant passageway. Replace fitting if necessary.

4.4.2 Service Intervals

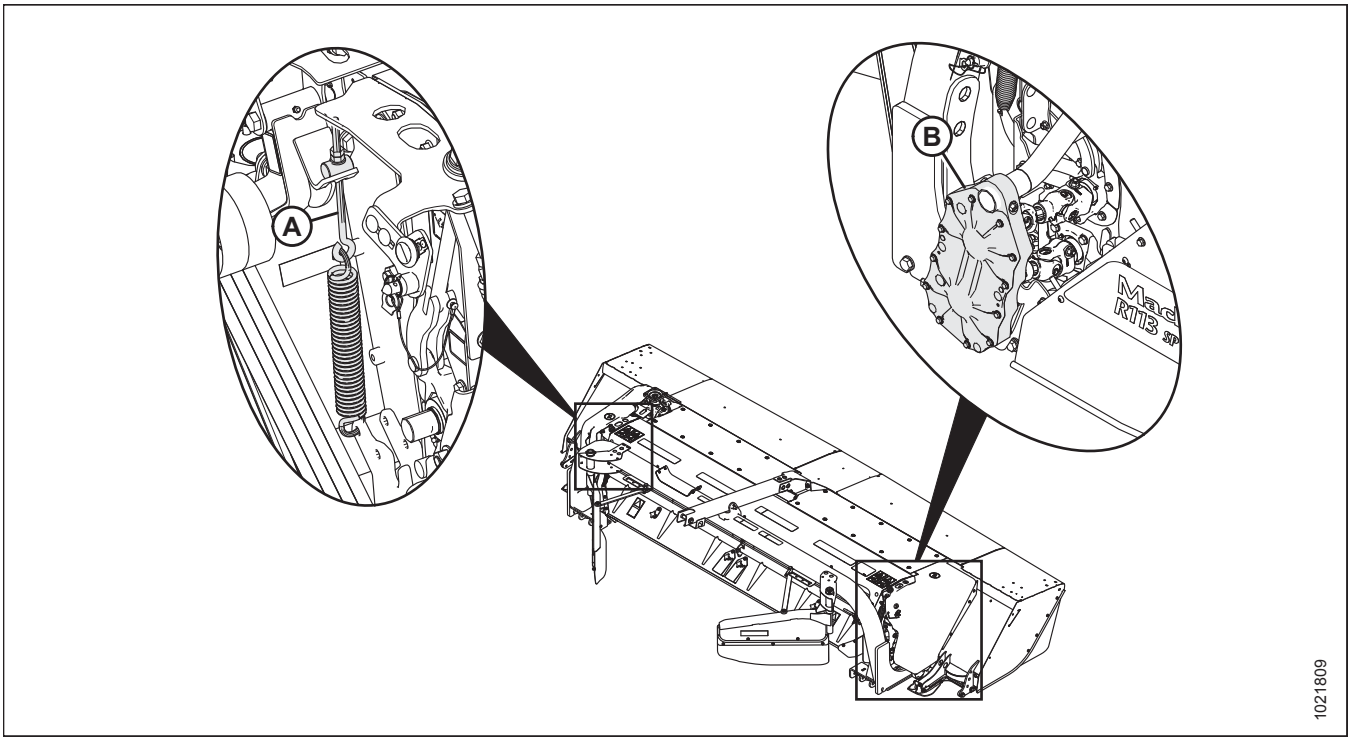
NOTE:

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

First 25 Hours

To check conditioner roll timing gearbox oil level, refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.

Figure 4.7: First 25 Hours

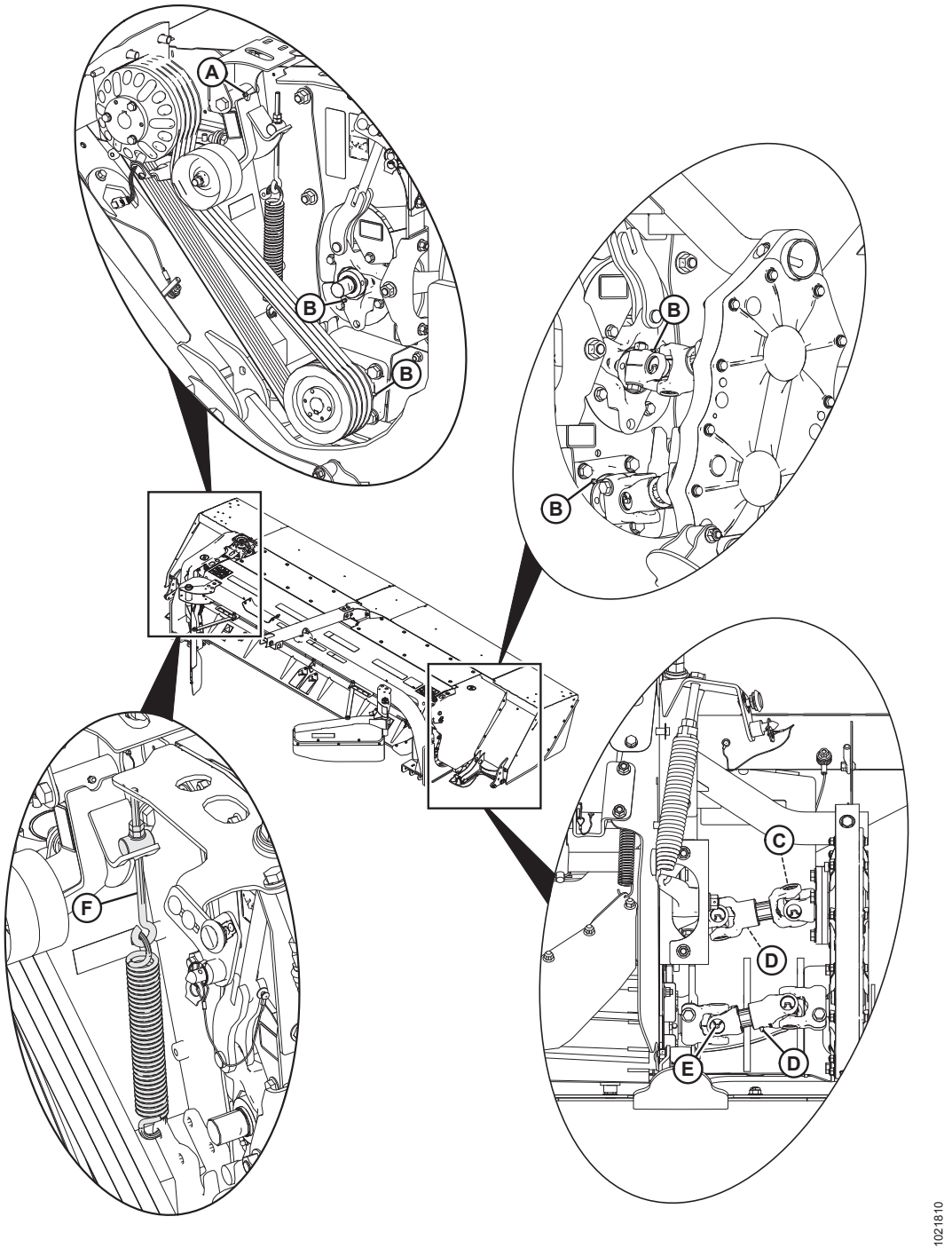


A – Conditioner Drive Belt Tensioner

B – Conditioner Roll Timing Gearbox

Every 25 Hours

Figure 4.8: Every 25 Hours



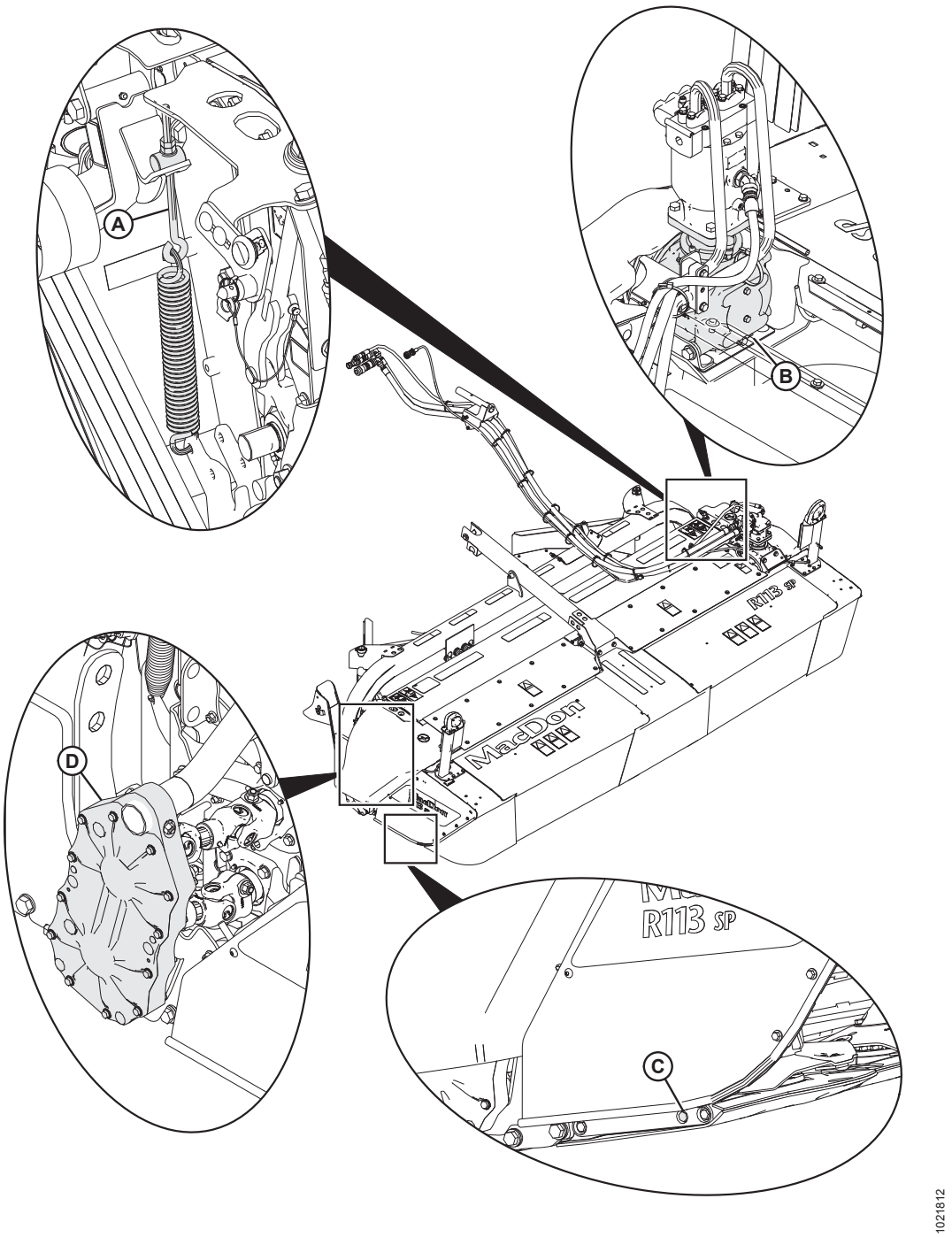
A - Idler Pivot
B - Bearing, Roller Conditioner (4 Places)
C - U-Joint, Upper Driveline (2 Places)
D - Slip Joints, Conditioner Drivelines [5]
E - U-Joint, Lower Driveline (2 Places)
F - Conditioner Drive Belt Tensioner

5. Use high temperature extreme pressure (EP2) performance with 10% max molybdenum disulphide (NLGI grade 2) lithium base

First 50 Hours

To change conditioner roll timing gearbox oil level, refer to *Checking and Changing Roll Timing Gearbox Oil, page 161*.

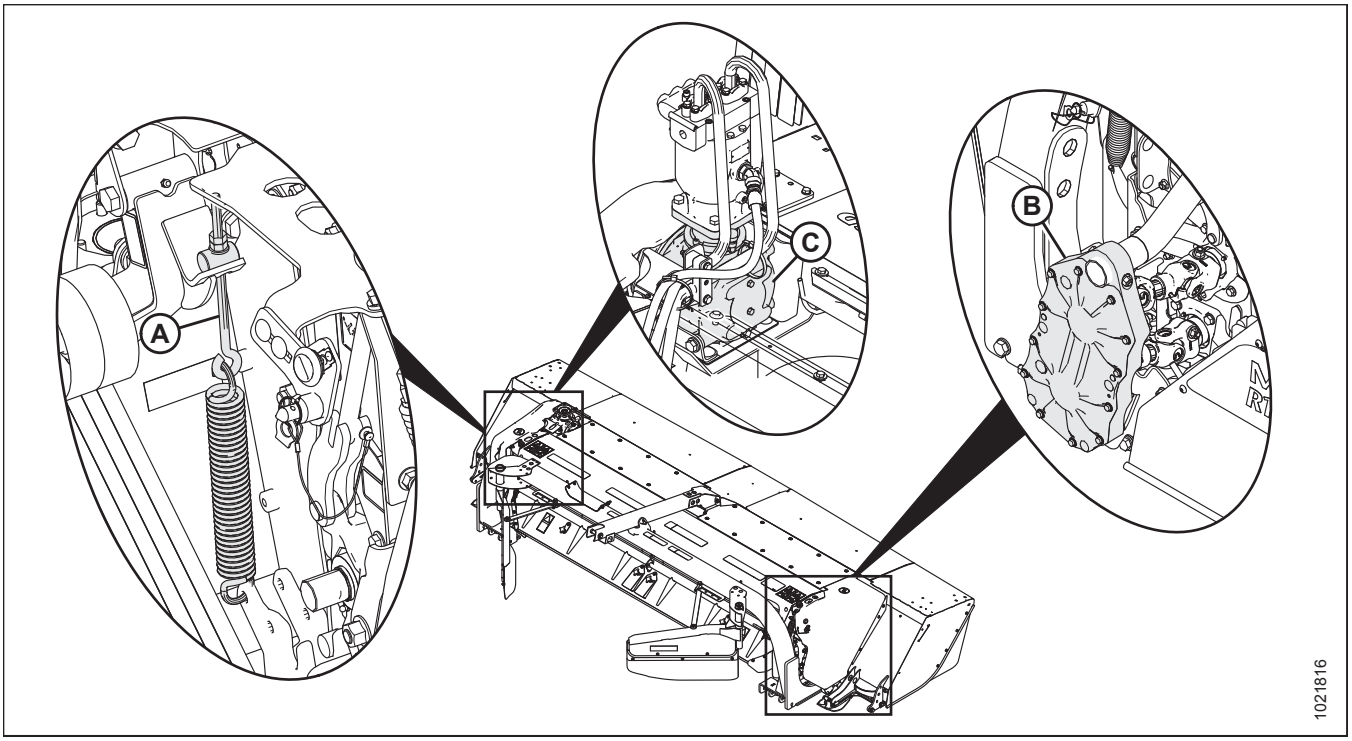
Figure 4.9: First 50 Hours



A – Conditioner Drive Belt Tensioner
B – Header Drive Gearbox
C – Cutterbar
D – Conditioner Roll Timing Gearbox

Every 100 Hours or Annually

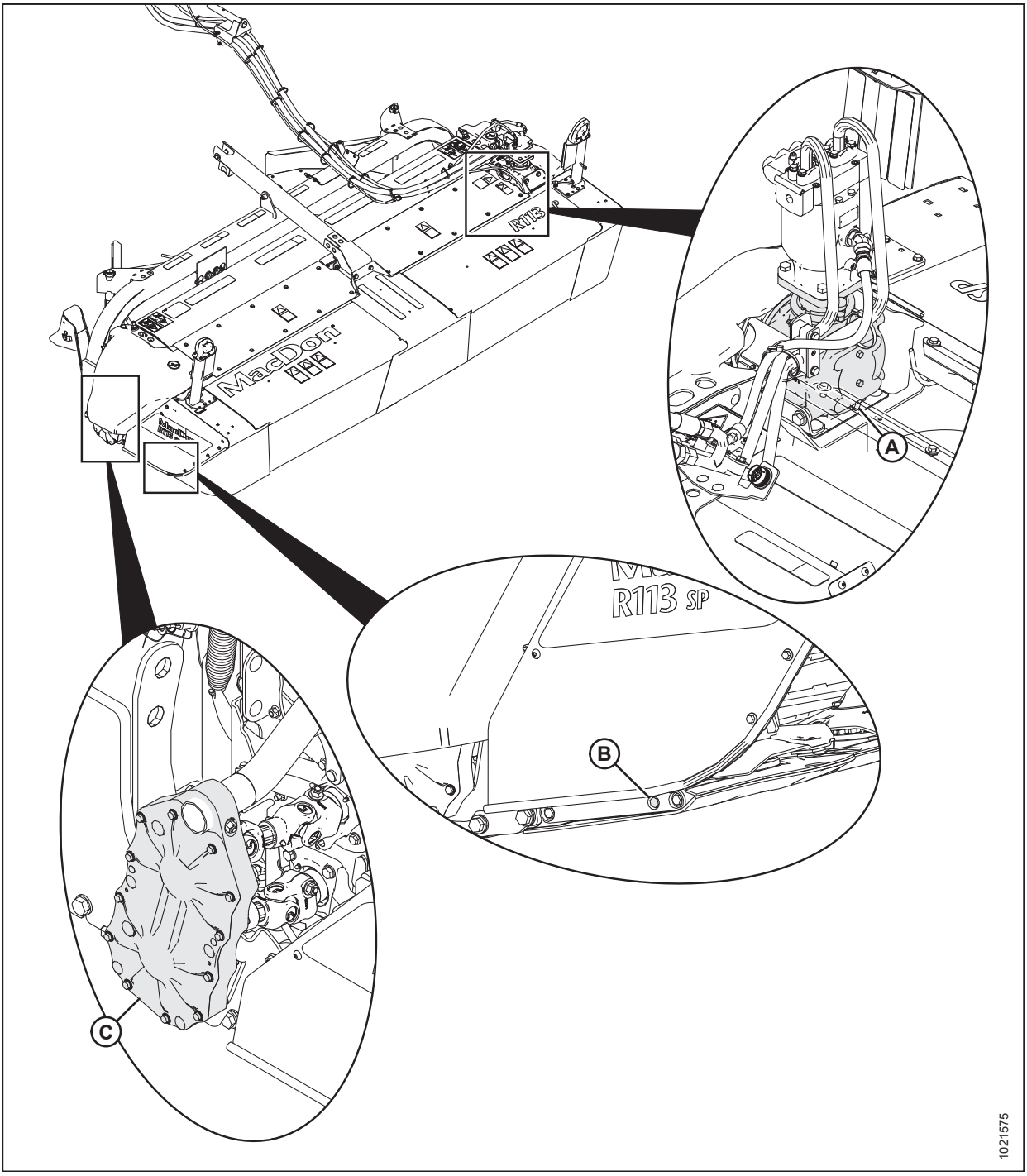
Figure 4.10: Every 100 Hours



A – Conditioner Drive Belt Tensioner
B – Conditioner Roll Timing Gearbox
C – Header Drive Gearbox

First 150 Hours

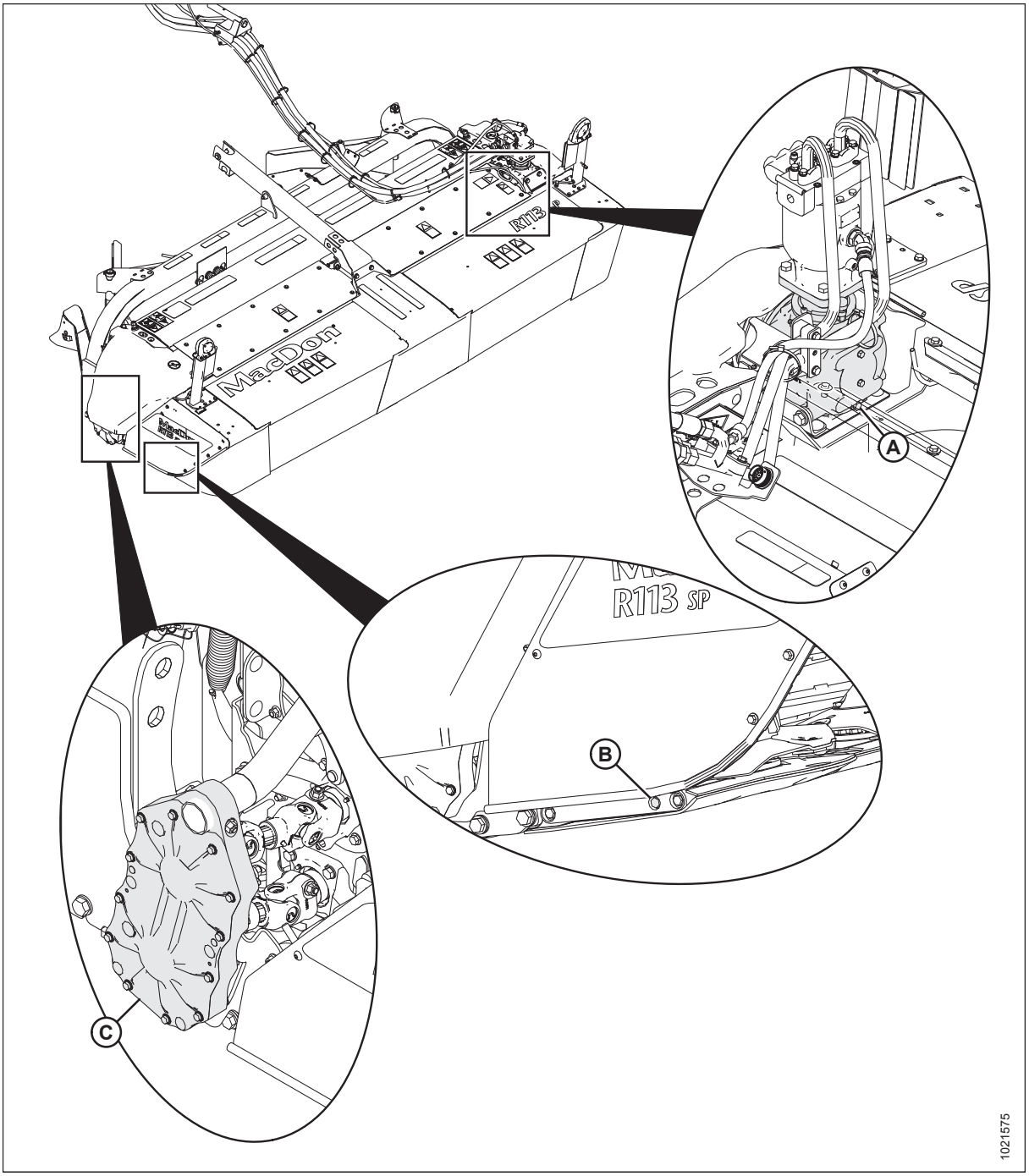
Figure 4.11: First 150 Hours



A – Header Drive Gearbox **B – Cutterbar** **C – Conditioner Roll Timing Gearbox**

Every 250 Hours

Figure 4.12: Every 250 Hours



A – Header Drive Gearbox **B – Cutterbar** **C – Conditioner Roll Timing Gearbox**

4.5 Cutterbar

The cutterbar does not require regular maintenance other than checking and changing the lubricant at regular intervals. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

IMPORTANT:

Check the lubricant level when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to checking.

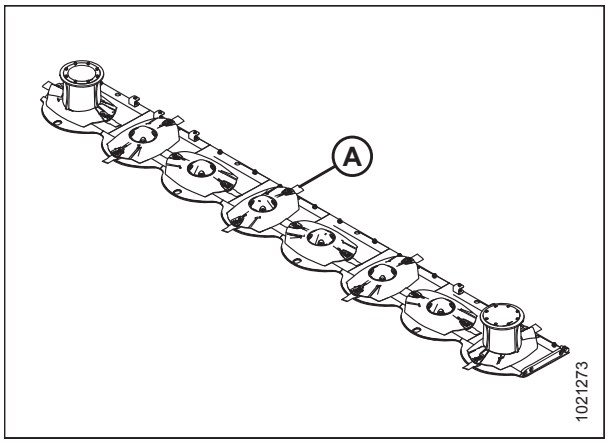


Figure 4.13: 13-Foot Cutterbar

A - 13-Foot Cutterbar

4.5.1 Cutterbar Discs

Perform daily inspections to ensure that cutterbar discs have not suffered damage from rocks, or experienced excessive wear from abrasive working conditions.

Cutterbar discs are interchangeable and can be moved to a spindle that rotates in the opposite direction as long as it is in usable condition and the blades are oriented to cut in the correct direction.

The cutterbar discs are **NOT** repairable and must be replaced if severely damaged or worn.

IMPORTANT:

If holes appear in a cutterbar disc, replace the disc immediately. Do **NOT** attempt to repair the cutterbar discs. Always use factory replacement parts.

Inspecting Cutterbar Discs

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

CAUTION

Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades immediately.

1. Ensure that the discblade fasteners (A) are securely attached to the cutterbar disc and that nut shields (B) are present and undamaged. Replace as required.
2. Check that the cutterbar disc bolts (C) are securely attached to the spindles. Tighten as required.
3. Inspect the cutterbar disc surface (D) for cracks, excessive wear, and disc distortion. Replace as required.
4. Inspect the cutterbar disc edges (E) for cracks, excessive wear, and edge distortion. Replace as required.

   NOTE:

   Cutterbar discs are **NOT** repairable and must be replaced if damaged.

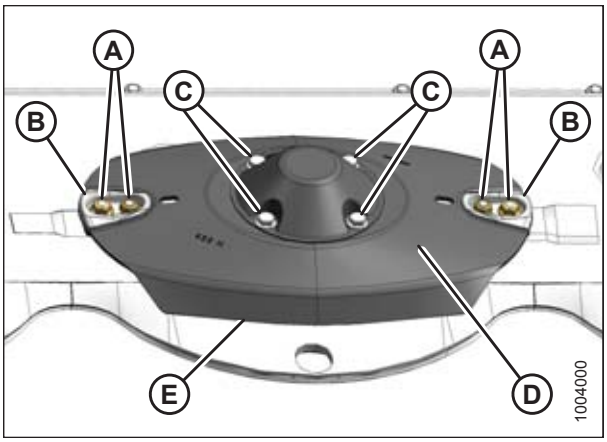


Figure 4.14: Cutterbar Disc

Removing Cutterbar Discs

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Raise self-propelled disc header fully, shut off engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.
3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

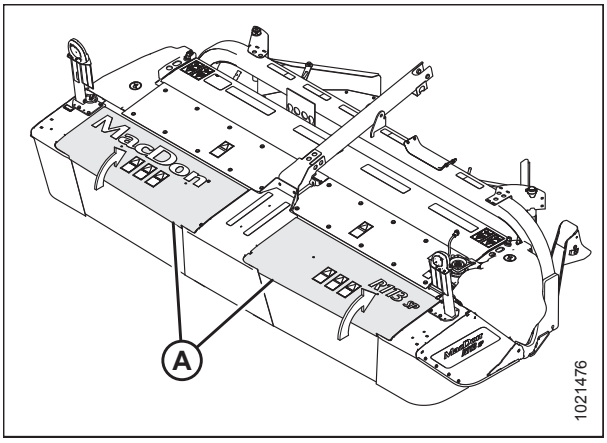


Figure 4.15: Cutterbar Doors

4. Place a pin (or equivalent) in the front hole of the rock guard (B) to prevent disc rotation while loosening bolts.
5. Remove four M12 bolts (A) and washers.

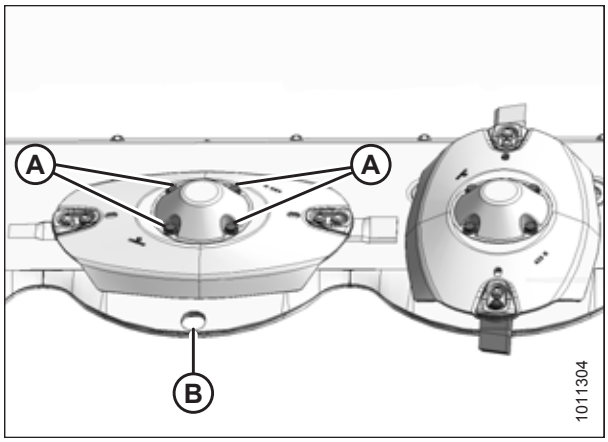


Figure 4.16: Cutterbar Disc Bolts

6. Remove cutterbar disc cap (A).
7. Remove cutterbar disc (B).

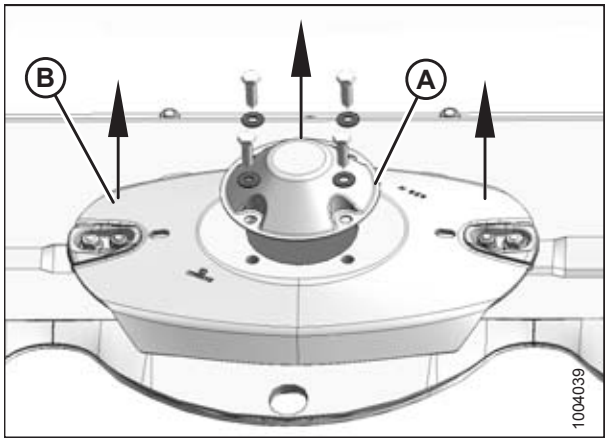


Figure 4.17: Cutterbar Disc and Cap

Installing Cutterbar Discs

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Install spacer plate (A) on spindle.

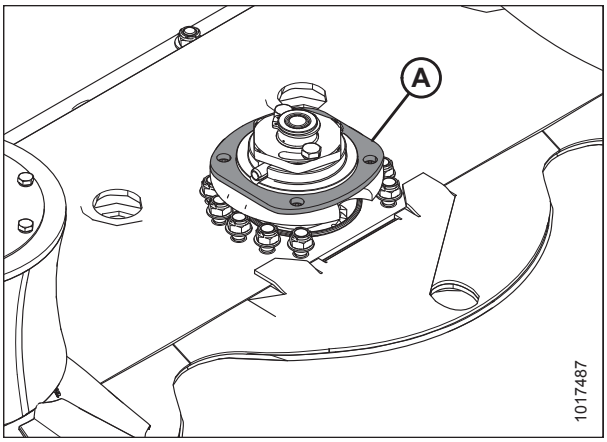


Figure 4.18: Cutterbar Disc and Cap

2. Place a pin (or equivalent) in the front hole of the rock guard (D) to prevent disc rotation while tightening bolts.
3. Position new disc (A) on spindle ensuring that it is positioned at a 90 degree angle in relation to the adjacent discs.
4. Install cutter disc cap (B), and secure assembly with four M12 bolts and washers (C). Torque bolts to 85 Nm (63 lbf·ft).

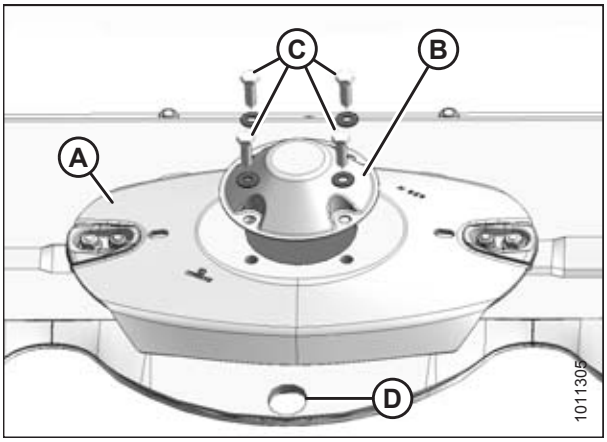


Figure 4.19: Cutterbar Disc and Cap

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

5. Remove pin (or equivalent) from front hole of rock guard.
6. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

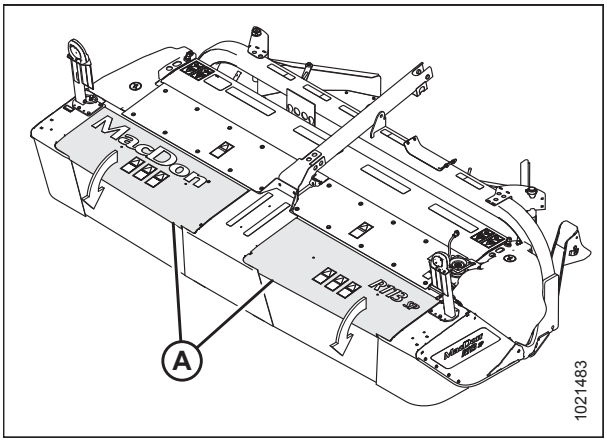


Figure 4.20: Cutterbar Doors

4.5.2 Cutterbar Spindles

Discs are factory-installed to produce three crop stream, but disc rotation patterns can be changed to suit crop conditions.

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin (A).

If the disc contacts a large object such as a stone or stump, the pin will shear and the disc will stop rotating and move upwards while remaining attached to the spindle with a snap ring (B).

Refer to *4.5.8 Cutterbar Spindle Shear Pin, page 149* to replace shear pin.

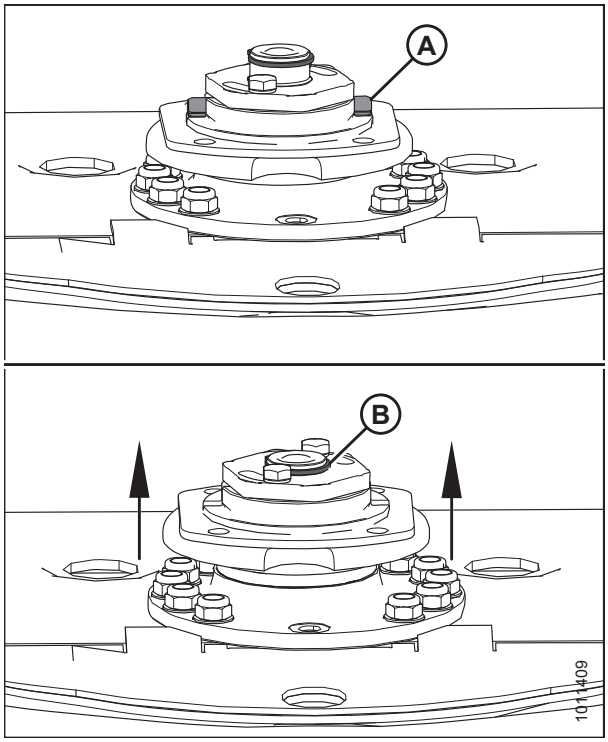


Figure 4.21: Cutterbar Spindles

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and a smooth top on the spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and machined grooves on the spindle gear shaft (B) and nut (C).
- If spindle position in cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (i.e., a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain rotation pattern can result in damage to spindle and/or cutterbar components.

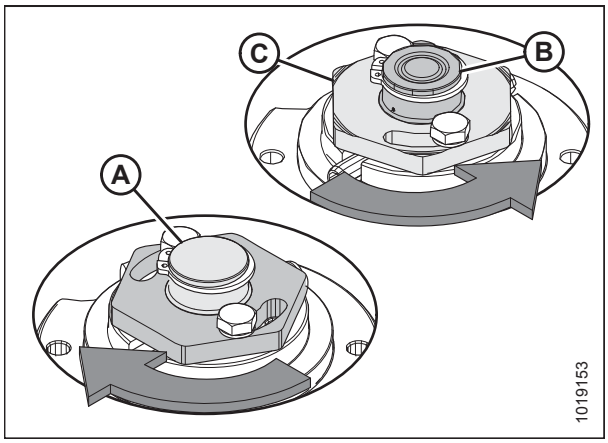


Figure 4.22: Cutterbar Spindles

Removing Cutterbar Spindles

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Park on a flat, level surface.
2. Lower self-propelled disc header fully, shut off engine, and remove key.

   NOTE:

   To prevent oil from spilling from the cutterbar when removing disc spindles, ensure self-propelled disc header is on a flat, level surface and is tilted all the way.

3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

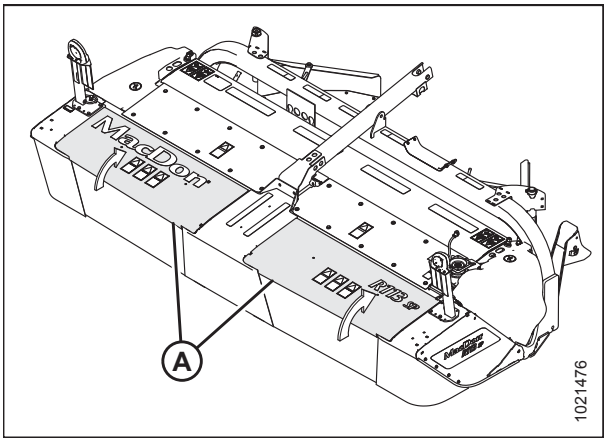


Figure 4.23: Cutterbar Doors

4. Place a pin (or equivalent) in the front hole of the rock guard (B) to prevent disc rotation while loosening bolts.
5. Remove four M12 bolts (A) and washers.

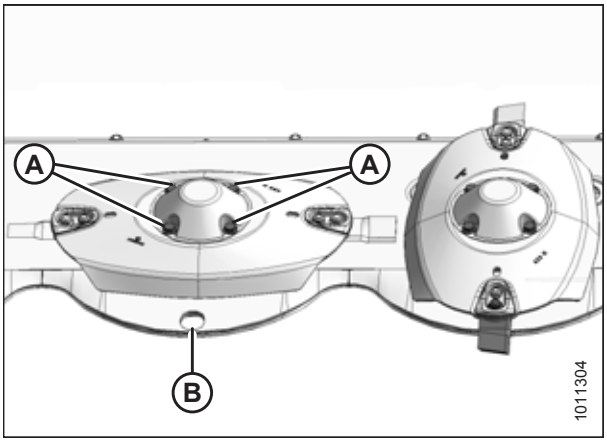


Figure 4.24: Cutterbar Disc Bolts

6. Remove cutterbar disc cap (A).
7. Remove cutterbar disc (B).

   IMPORTANT:

   Blades are rotation specific. It is necessary to switch entire disc when swapping spindles.

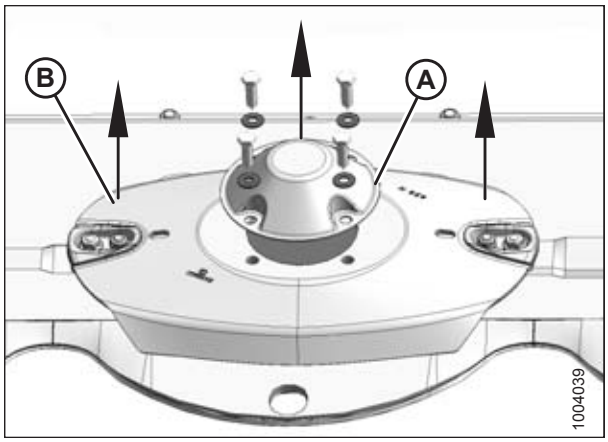


Figure 4.25: Cutterbar Disc and Cap

8. Remove spacer plate (A).

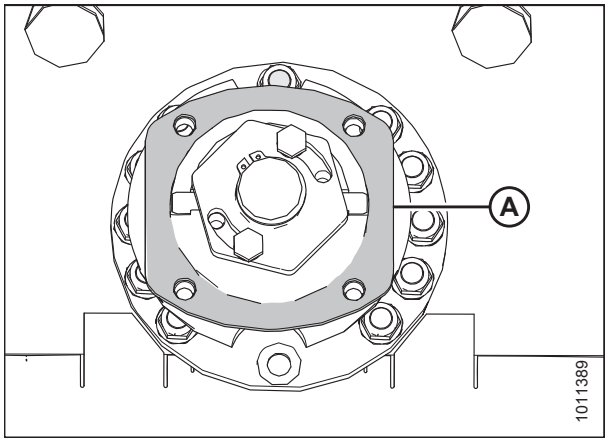


Figure 4.26: Spacer Plate

9. Rotate spindle hub (A) to access nuts, and remove eleven M12 lock nuts (B) and washers.

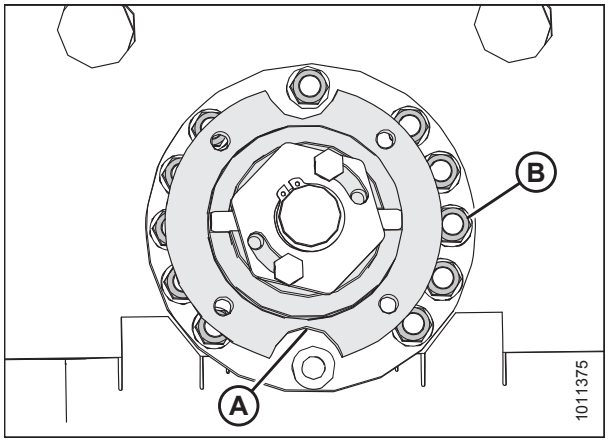


Figure 4.27: Left Spindle Hub and Hardware

10. Remove spindle (A) from cutterbar.

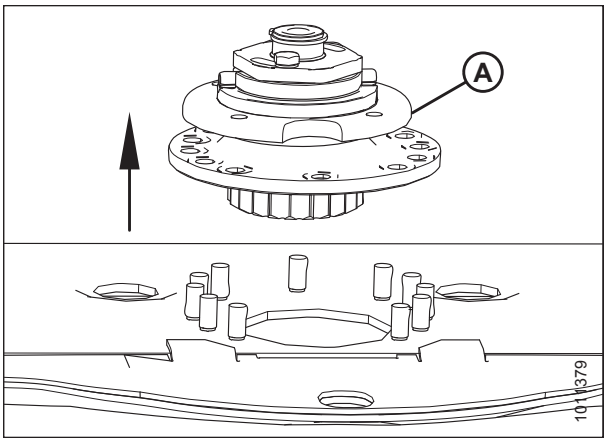
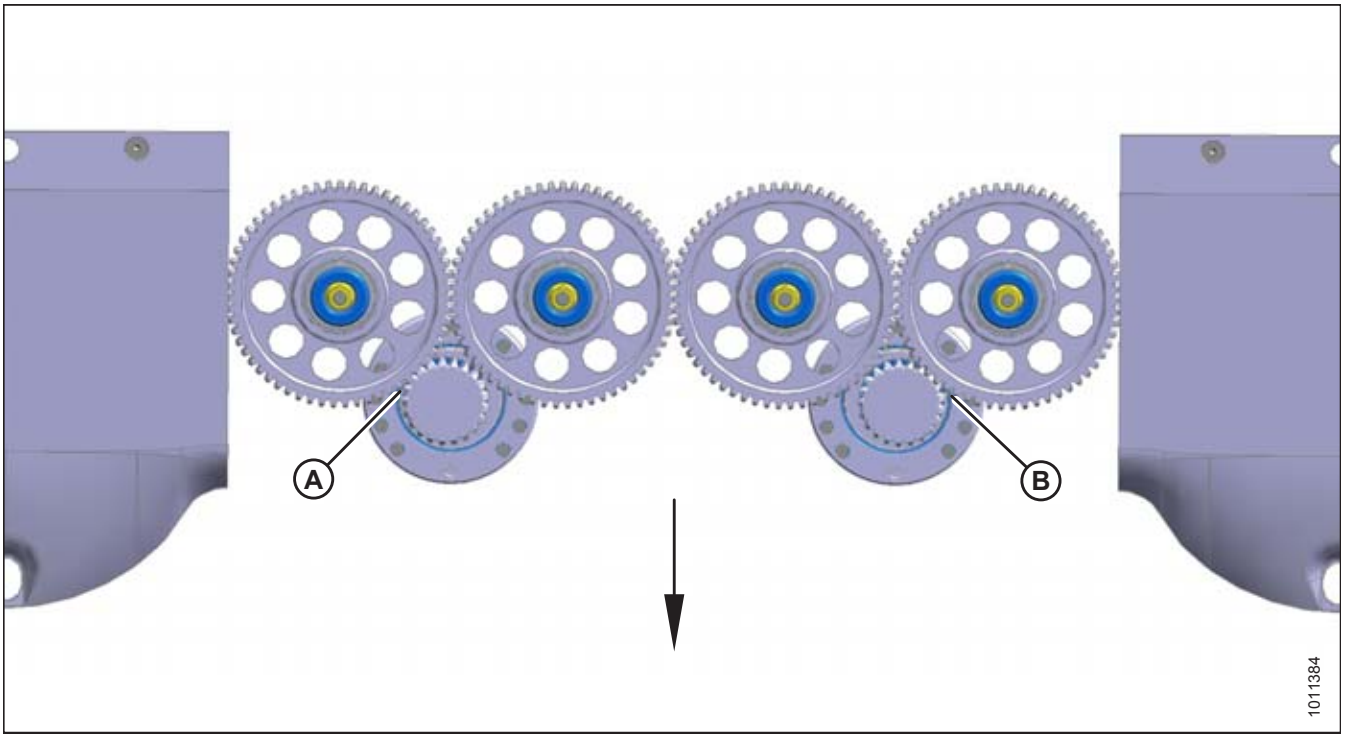


Figure 4.28: Left Spindle

Installing Cutterbar Spindles

Figure 4.29: Underside of Cutterbar Spindles Installed in Cutterbar



IMPORTANT:

Right discs (A) and left discs (B) are timed and must be at 90° when reinstalled. Misaligned discs could result in the following:

- Discblades of co-rotating discs hitting each other
- Discblades of diverging discs hitting adjacent discs

Check clearance before tightening spindle to the cutterbar. Turn disc by hand to ensure discblades do not contact each other or adjacent discs. If contact occurs, remove spindle, rotate 90°, and reinstall. Remove and reinstall spindles as many times as necessary to achieve proper alignment.

NOTE:

Right discs (A) and left discs (B) are slightly offset as shown depending on which idler gear the spindle is turning.

- Spindles that rotate clockwise have left-leading threading
- Spindles that rotate counterclockwise have right-leading threading

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Park on a flat, level surface.
2. Lower self-propelled disc header fully, shut off engine, and remove key.

   NOTE:

   To prevent oil from spilling from the cutterbar while installing disc spindles, ensure self-propelled disc header is on a flat, level surface and is tilted all the way back.

3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

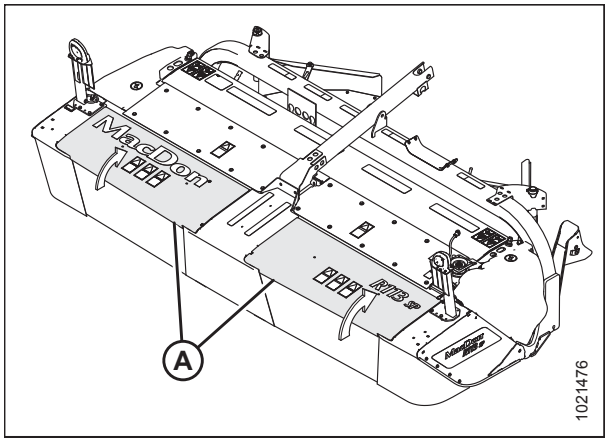


Figure 4.30: Cutterbar Doors

4. Determine suitable spindle rotation pattern for crop conditions. Refer to *4.5.2 Cutterbar Spindles, page 116*.

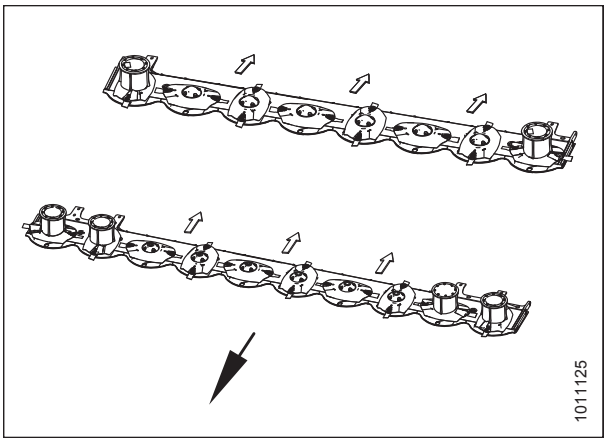


Figure 4.31: 13- and 16-Foot Cutterbars

5. Ensure that spindle O-ring (A) is properly seated, cleaned, and undamaged.

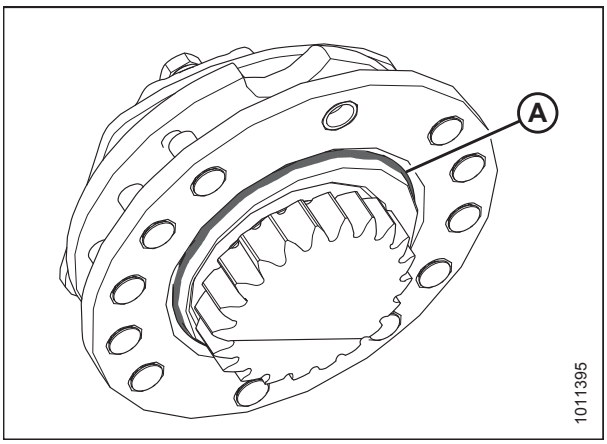


Figure 4.32: Left-Hand Spindle O-Ring

6. Insert spindle (A) into cutterbar.

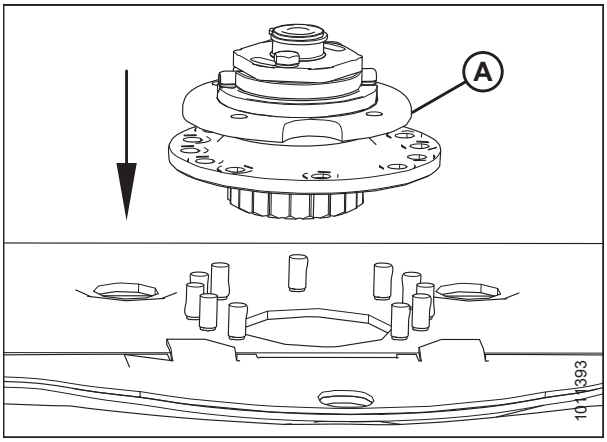


Figure 4.33: Left-Hand Spindle

7. Insert studs (A) into spindle as shown.

   NOTE:

   Plugs are factory-installed as shown in position (B), but may come loose over time. Ensure studs are inserted into proper location.

   IMPORTANT:

   Ensure clockwise spindles rotate clockwise and counterclockwise spindles (with machined grooves) rotate counterclockwise.

   IMPORTANT:

   The offset gear design makes it possible to install spindles having an opposite rotation to what is intended. This will prevent discs from spinning up after impact, resulting in cutterbar component damage.

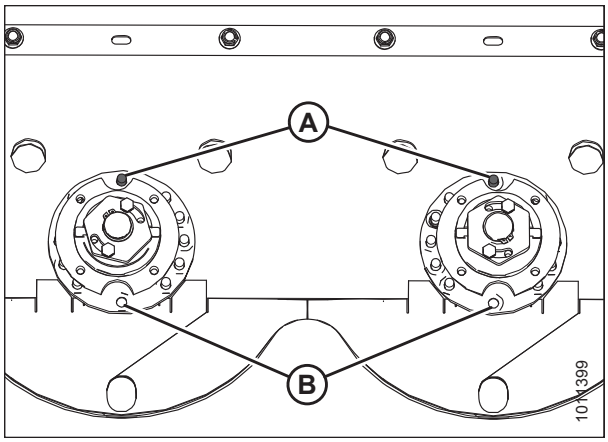


Figure 4.34: Spindle Orientation

8. Rotate spindle hub (A) to access studs, and install eleven M12 lock nuts (B) and washers.

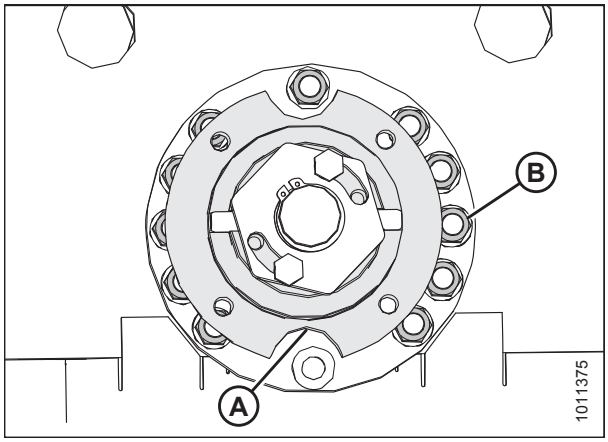


Figure 4.35: Left Side Spindle Hub and Hardware

9. Torque bolts to 50 Nm (37 lbf·ft) following the tightening pattern shown at right.

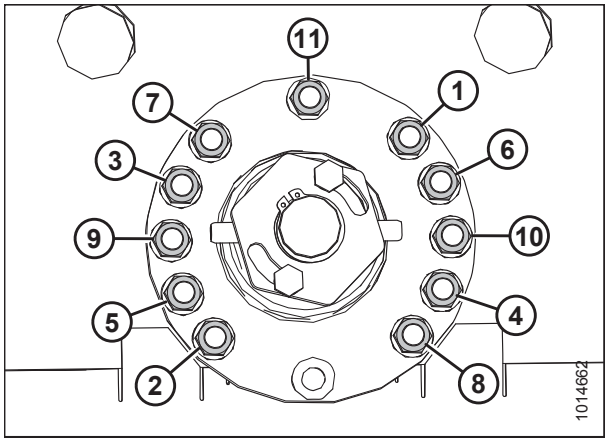


Figure 4.36: Tightening Pattern (Hub Removed for Clarity)

10. Install spacer plate (A).

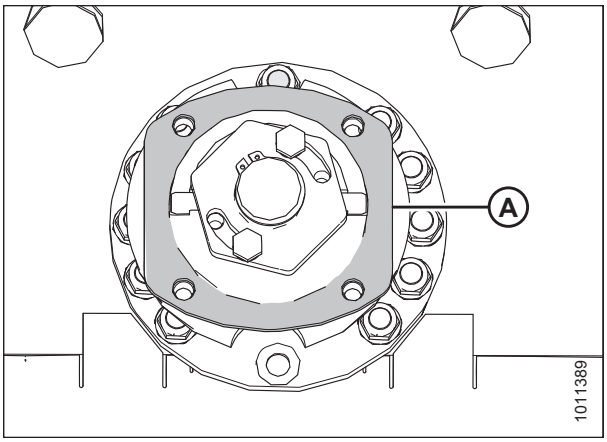


Figure 4.37: Spacer Plate

11. Place a pin (or equivalent) in the front hole of the rock guard (D) to prevent disc rotation while tightening bolts.

    IMPORTANT:

    Blades are rotation specific. It is necessary to switch entire disc when swapping spindles.

12. Position disc (A) on spindle ensuring that it is positioned at a 90° angle in relation to the adjacent discs.

    NOTE:

    Turn disc (A) by hand to ensure discblades do not contact each other or adjacent discs.

13. Install cutter disc cap (B) and secure assembly with four M12 bolts and washers (C). Torque bolts to 85 Nm (63 lbf·ft).

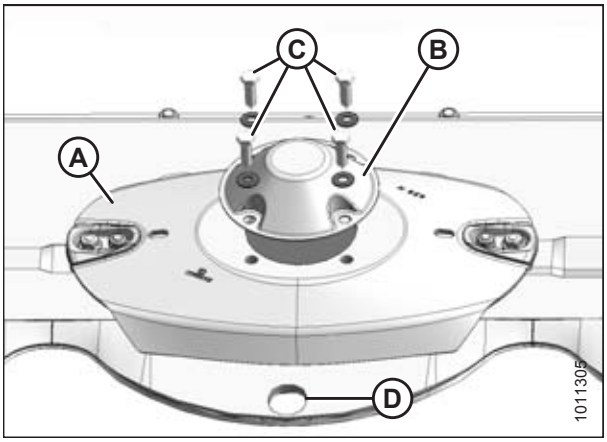


Figure 4.38: Cutterbar Disc and Cap

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

14. Remove pin (or equivalent) from front hole of rock guard.
15. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

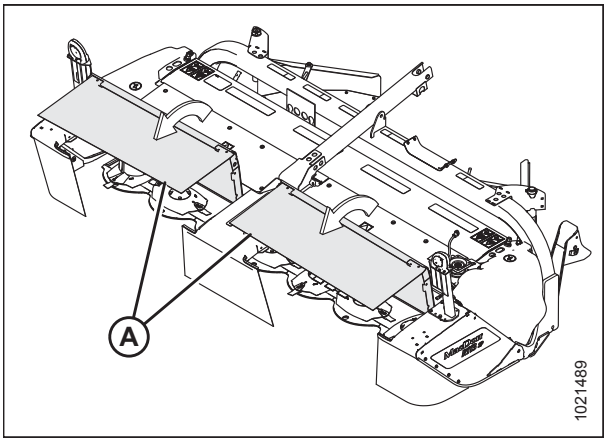


Figure 4.39: Cutterbar Doors in Closed Position

4.5.3 Cutterbar Crop Stream Configuration

Discs are factory-installed to produce three crop streams, but disc rotation pattern can be changed by substitution of spindle and corresponding disc to suit crop conditions. Each spindle and disc pair is designed to rotate in one direction and must be changed as sets when altering crop flows.

Reducing or increasing the number of crop streams will produce the following results:

- Reducing the number of crop streams will result in narrower windrows.
- Increasing the number of crop streams will result in smoother, wider windrows.

NOTE:

Increasing the number of crop streams will also increase the number of diverging disc pairs which may negatively affect cut quality in certain conditions.

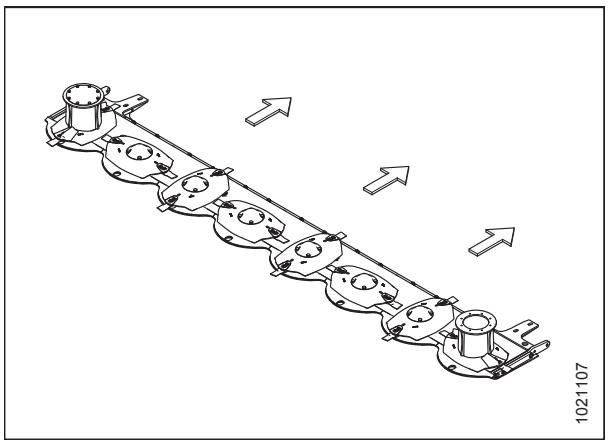


Figure 4.40: 13-Foot Cutterbar

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and a smooth top on the spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and machined grooves on the spindle gear shaft (B) and nut (C).
- If spindle position in cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (i.e., a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain rotation pattern can result in damage to spindle and/or cutterbar components.

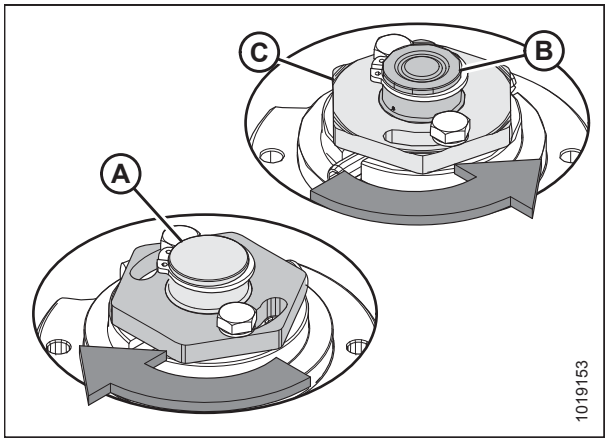
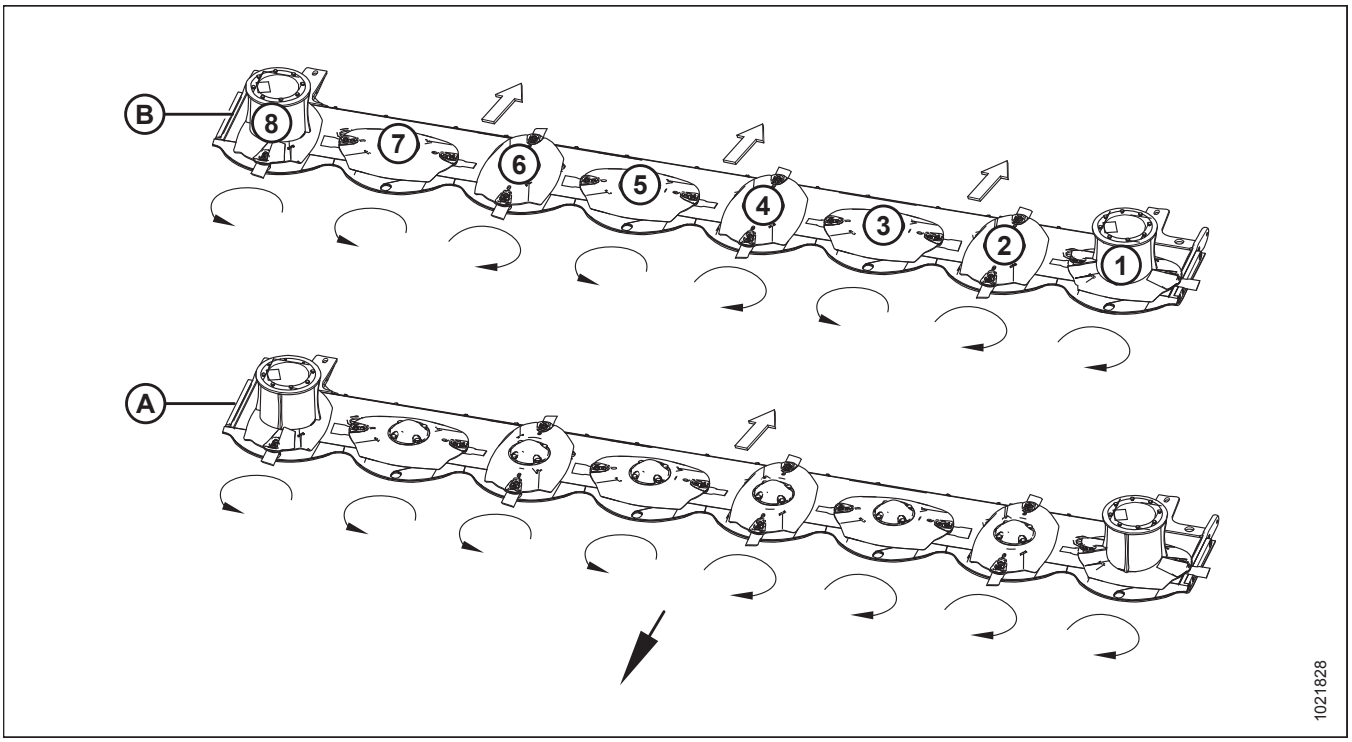


Figure 4.41: Cutterbar Spindles

Changing 13-Foot Cutterbar Crop Stream Configuration

Figure 4.42: 13-Foot (8 Disc) Spindle Rotation Pattern and Crop Streams



A - One Crop Stream

B - Three Crop Streams

NOTE:

Refer to *Removing Cutterbar Spindles, page 116* and *Installing Cutterbar Spindles, page 119*.

Change 13-foot (8 disc) spindle rotation from three crop streams (B) to one crop stream (A).

- Swap disc/spindle (3) with disc/spindle (6)

4.5.4 Discblades

Each disc has two blades (A) attached at opposite ends that are free to rotate horizontally on a specially designed shoulder bolt.

The blade (A) has two cutting edges and can be flipped over so that the blade does not need replacing as often.

The blades are **NOT** repairable and must be replaced if severely worn or damaged.

IMPORTANT:

Always use factory replacement parts.

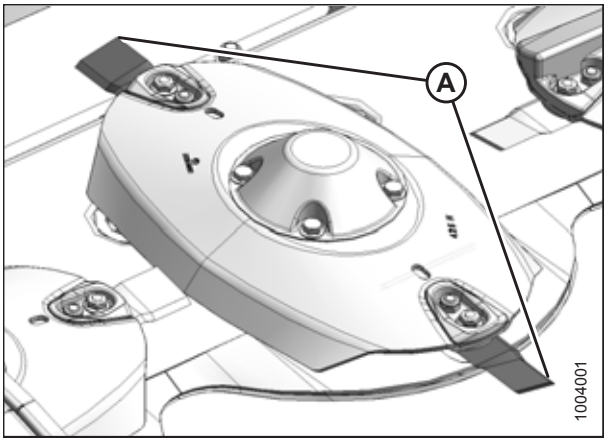


Figure 4.43: Discblades

Inspecting Discblades

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

CAUTION

Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades immediately.

CAUTION

Damaged or loose discblades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

1. Check daily that the discblades are securely attached to the disc.
2. Inspect blades for cracks, wear beyond safe operating limits (C), and distortion.
3. Replace blades immediately if any problems occur.

   IMPORTANT:

   Blades should be replaced in pairs, or the disc may become unbalanced and cause damage to the cutterbar.

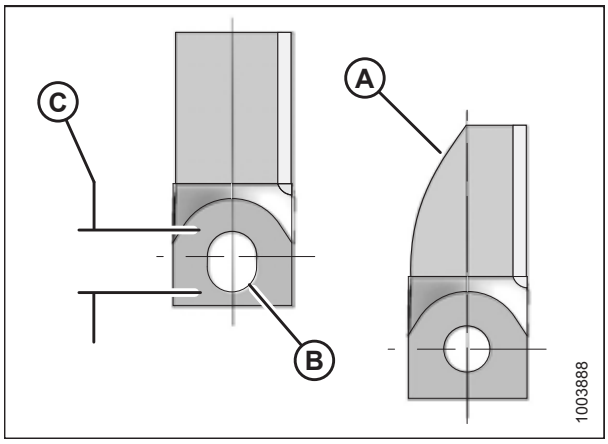


Figure 4.44: Discblades

A - Blade Wear to Center Line
B - Elongated Hole
C - Maximum Elongation 21 mm (13/16 in.)

IMPORTANT:

The discblades have cutting edges on both sides so the blades can be turned over and reused. The twist in each blade determines the cutting direction.

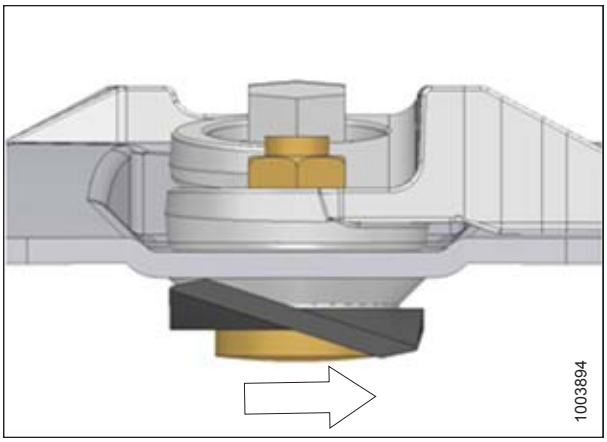


Figure 4.45: Counterclockwise Disc Rotation Direction

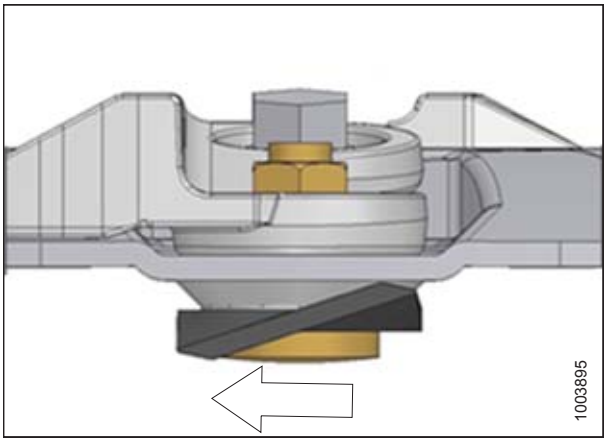


Figure 4.46: Clockwise Disc Rotation Direction

Inspecting Discblade Hardware

CAUTION

Damaged or loose discblades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

Inspect blade attachment hardware each time blades are changed.

1. Check and replace bolts under the following conditions:
   - Bolt has been removed and reinstalled five times.
   - Head (A) is worn flush with bearing surface of blade.
   - Diameter of bolt neck (B) has worn to 14.5 mm (9-1/16 in.) or less.
   - Bolt is cracked (C).
   - Bolt is visibly distorted (D).
   - Bolt shows evidence of interference (E) with adjacent parts.

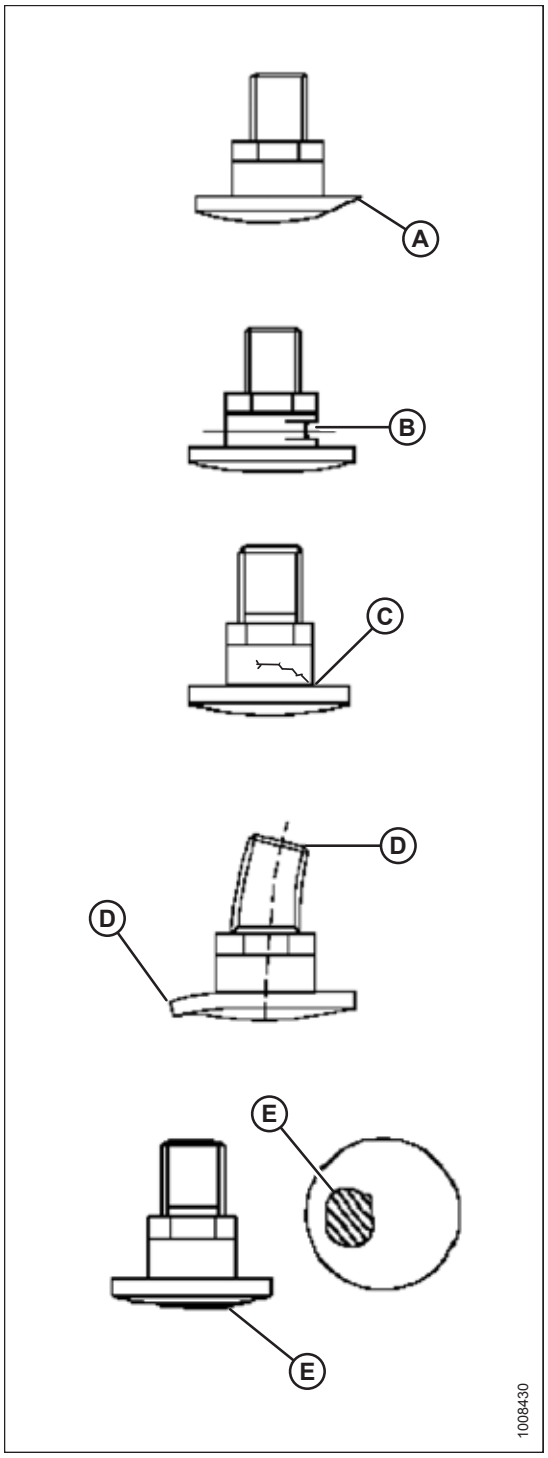


Figure 4.47: Discblade Bolts

2. Check and replace nuts under the following conditions:
   - Nut has been previously installed—nuts are one-time use only.
   - Nut shows signs of wear (A) that is more than half the original height (B).
   - Nut is cracked.

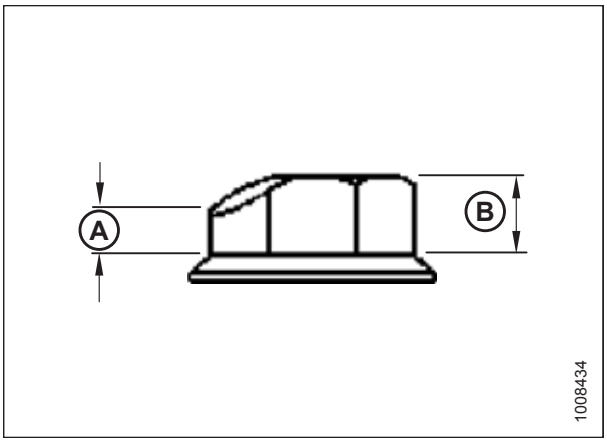


Figure 4.48: Discblade Nut

Removing Discblades

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Raise self-propelled disc header fully, shut off engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to windrower operator's manual.
3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

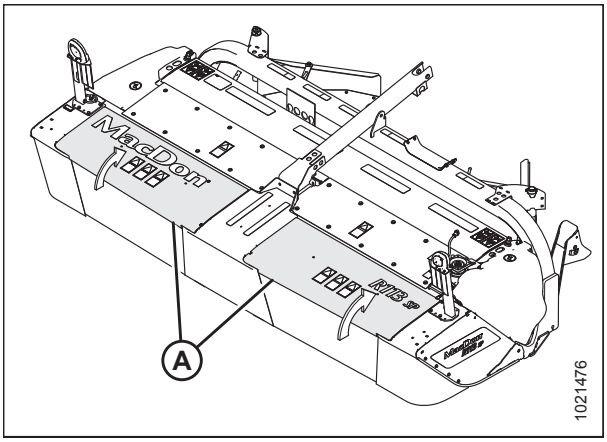


Figure 4.49: Cutterbar Doors

4. Rotate disc (A) so that blade (B) faces forward and lines up with hole (C) in rock guard.

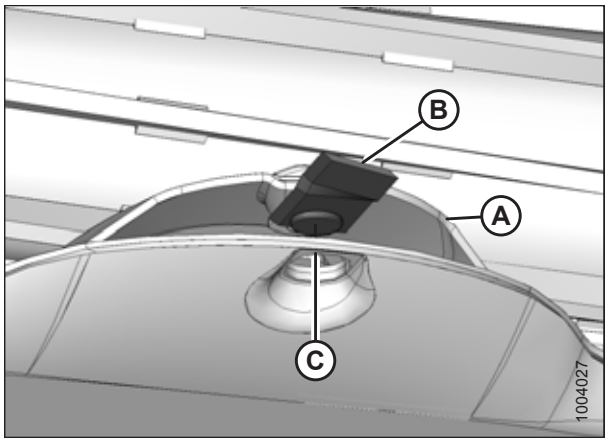


Figure 4.50: Discblade Aligned with Hole in Rock Guard

5. Place a pin (or equivalent) in the front hole of the rock guard to prevent disc rotation while loosening blade bolts.
6. Clean debris from blade attachment area.
7. Remove nut (A) and discard.

   IMPORTANT:

   Nuts are one-time-use only. When flipping or changing a blade, replace using a new nut only.
8. Remove shoulder bolt (B) and blade (C).

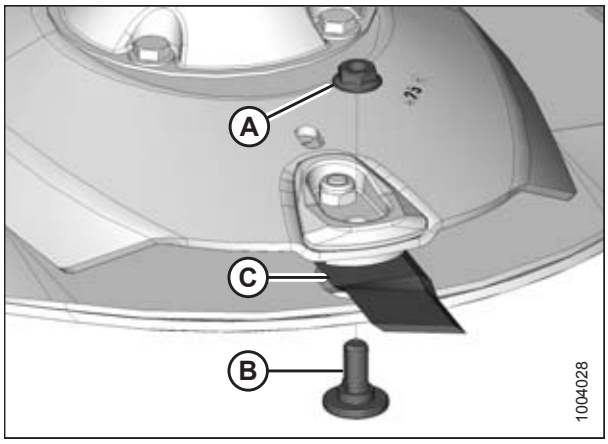


Figure 4.51: Nut, Shoulder Bolt, and Discblade

Installing Discblades

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

IMPORTANT:

If you are unsure which direction the spindles rotate, refer to *4.5.3 Cutterbar Crop Stream Configuration, page 124*.

1. Place a pin (or equivalent) in the front hole of the rock guard to prevent disc rotation while tightening blade bolts.
2. Install new or reversed blade (A) with shoulder bolt (B) onto disc (C).

   IMPORTANT:

   Nuts are one-time-use only. When flipping or changing a blade, replace using a **new** nut only.
3. Install new nut (D) and torque to 125 Nm (92 lbf·ft).

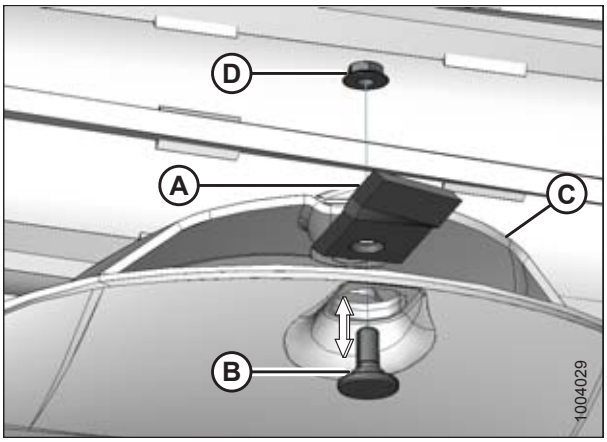


Figure 4.52: Nut, Shoulder Bolt, and Discblade

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

4. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

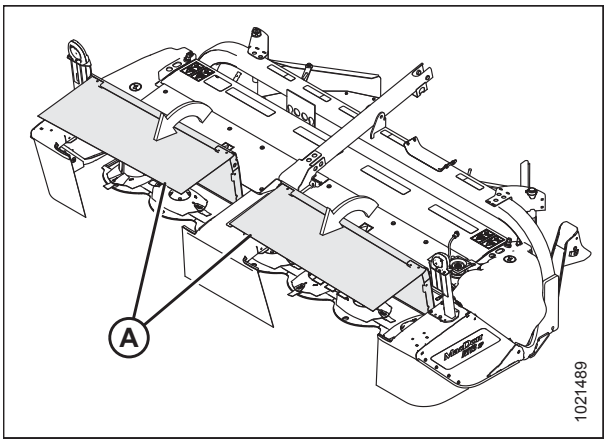


Figure 4.53: Cutterbar Doors

4.5.5 Accelerators

Accelerators (A) are mounted on each outboard disc and are designed to quickly move cut material off the disc and into the conditioner.

One pair of accelerators is installed at each outboard end of a 13-foot self-propelled disc header, whereas a 16-foot self-propelled disc header has two pairs at each end.

Periodically inspect accelerators for damage and loose or missing fasteners, and replace as necessary.

IMPORTANT:

Always replace accelerators in pairs to ensure proper disc balance.

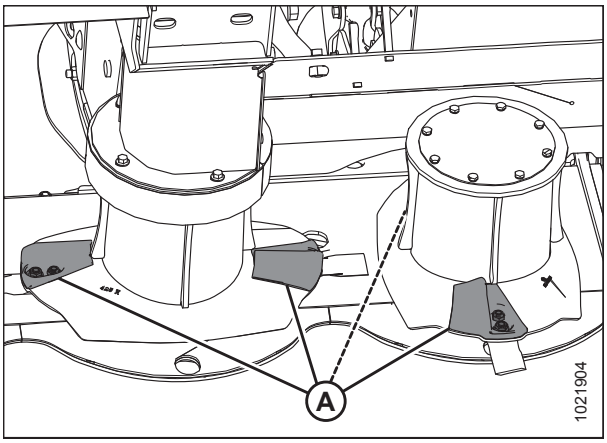


Figure 4.54: 16-Foot SP Disc Header

Inspecting Accelerators

DANGER

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

1. Raise self-propelled disc header fully, stop engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to windrower operator's manual.
3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

4. Inspect accelerators for damage and wear, and replace if worn to 50% or more of their original height or if they are no longer effectively moving crop.
5. Check for loose or missing fasteners; tighten or replace as necessary.

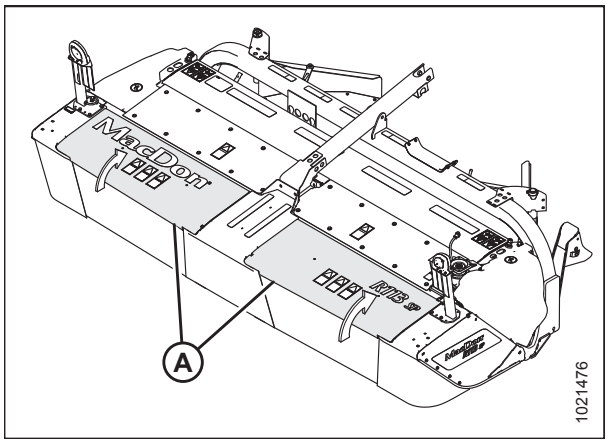


Figure 4.55: Cutterbar Doors

Removing Accelerators

DANGER

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

IMPORTANT:

Always replace accelerators in pairs to ensure proper disc balance.

1. Raise self-propelled disc header fully, shut off engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

3. Remove nut (A), flange bolt (B), and discblade (C) from disc. Discard nut.

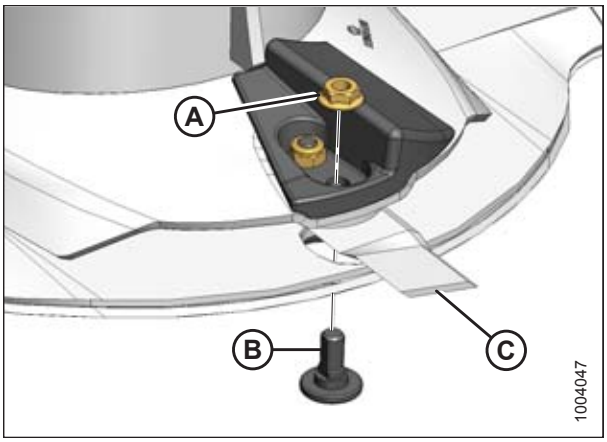


Figure 4.56: Discblade and Disc

4. Remove lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D).
5. Repeat the removal procedure for the second accelerator.

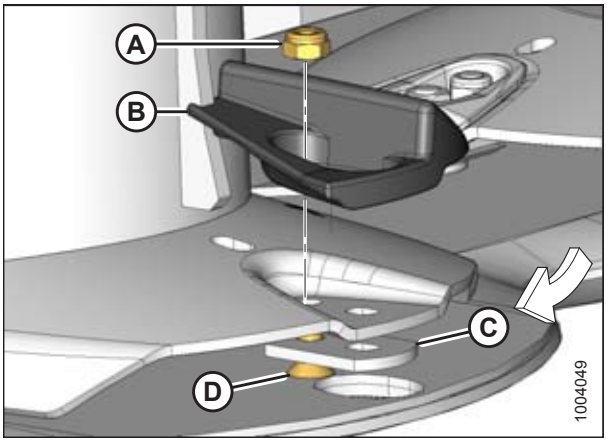


Figure 4.57: Accelerator and Hardware

Installing Accelerators

IMPORTANT:

Always replace accelerators in pairs to ensure proper disc balance.

1. Place a wooden block between two cutterbar discs to prevent disc rotation while tightening blade bolts.

   IMPORTANT:

   Accelerators can operate in a clockwise or counterclockwise direction. Verify the direction of the disc before installing accelerators.

2. Install lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D). Do **NOT** tighten at this time.

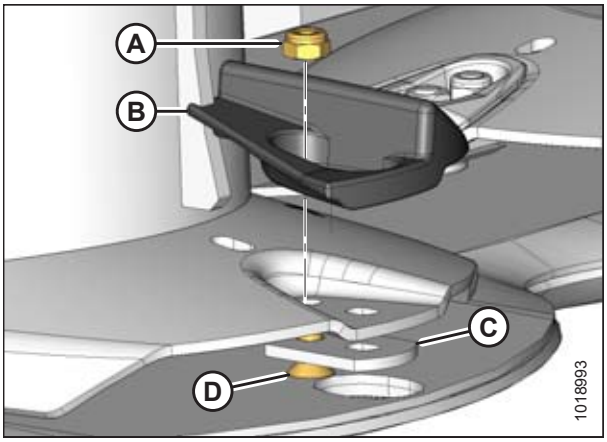


Figure 4.58: Accelerator and Hardware

⚠ CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

3. Install new nut (A), flange bolt (B), and discblade (C) onto disc.

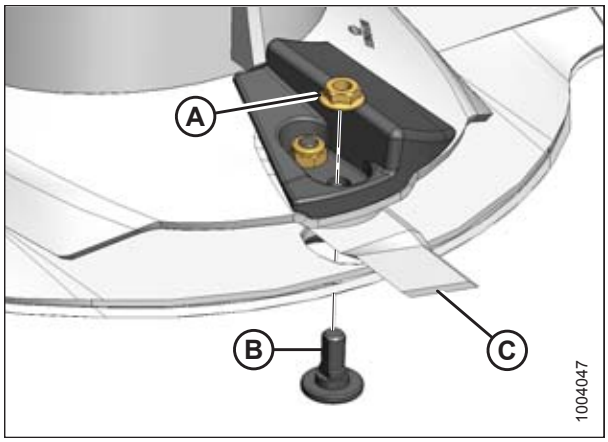


Figure 4.59: Discblade and Disc

4. Torque the inside nut (A) to 58 Nm (43 lbf·ft).
5. Torque the outside nut (B), closest to the blade, to 125 Nm (92 lbf·ft).
6. Repeat the installation procedure for the second accelerator.

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

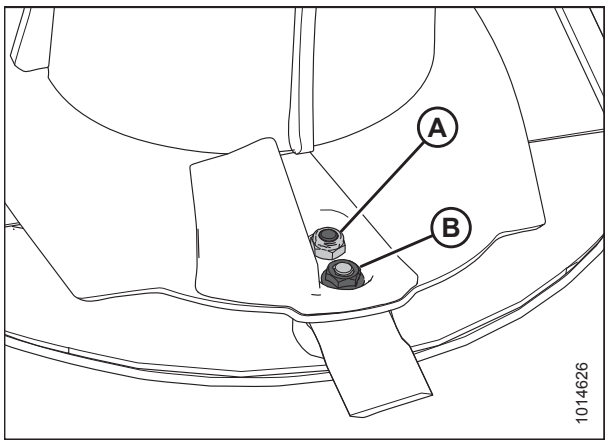


Figure 4.60: Discblade and Disc

7. Remove wooden block.
8. Close cutterbar doors. Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

4.5.6 Rock Guards

The machine is equipped with rock guards at each cutting disc location. Rock guards prevent the cutterbar from digging into the ground and protect the disc from coming in contact with stones and other debris.

Inspecting Rock Guards

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Raise self-propelled disc header fully, stop engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.
3. Inspect rock guards for wear, cracks, damage, or distortion. Replace if worn to 75% or more of their original thickness.
4. Check for loose or missing fasteners; tighten or replace fasteners as needed.

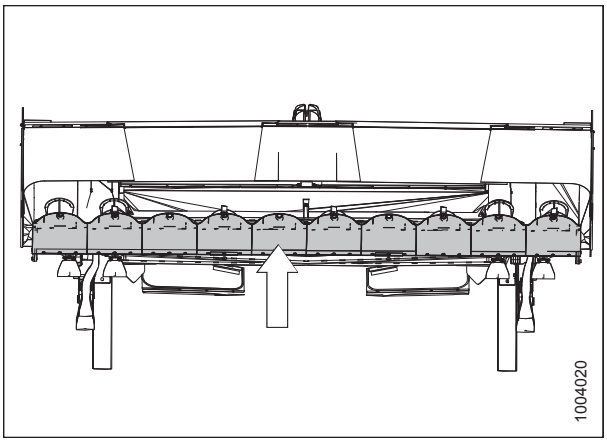


Figure 4.61: Rock Guards

Removing Rock Guards

1. Remove two hex head screws, washers, and lock nuts (A).

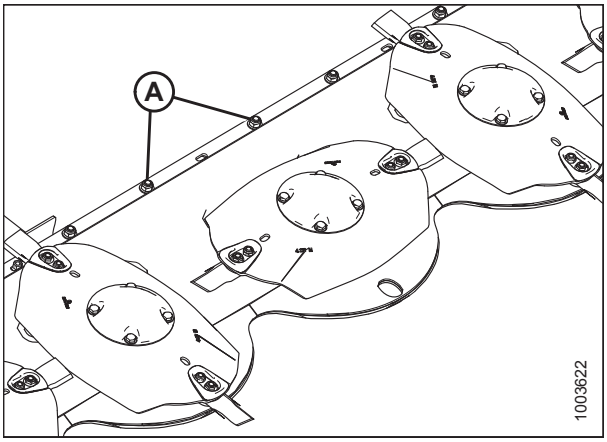


Figure 4.62: Rock Guard Hardware

2. Slide rock guard (A) forward in the direction of arrow (B) and remove.

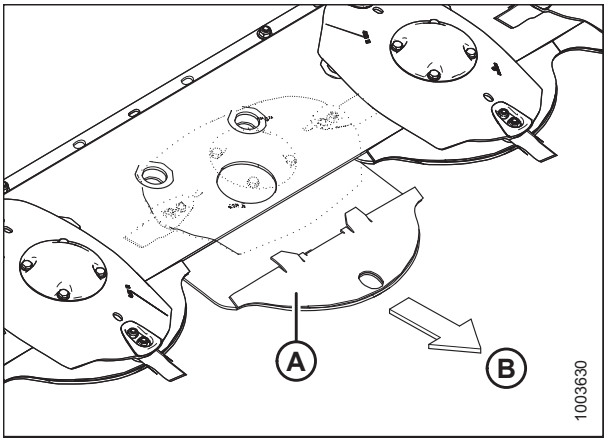


Figure 4.63: Rock Guard Removed from Cutterbar

Installing Rock Guards

1. Guide rock guard onto cutterbar until tabs (A) sit on top of the cutterbar while bottom back bolt holes line up.

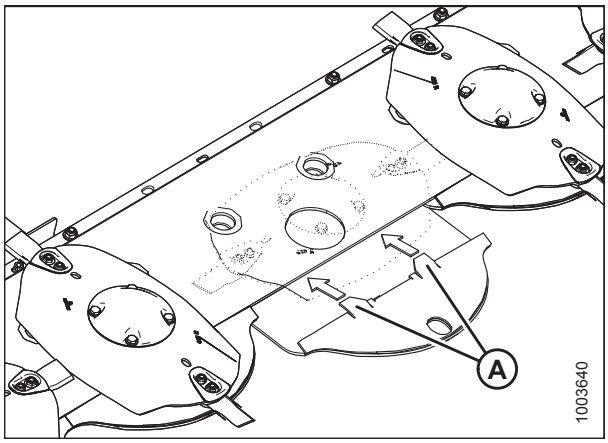


Figure 4.64: Rock Guard Installed on Cutterbar

2. Install two hex head screws, washers, and lock nuts (A). Torque to 68 Nm (50 lbf·ft).

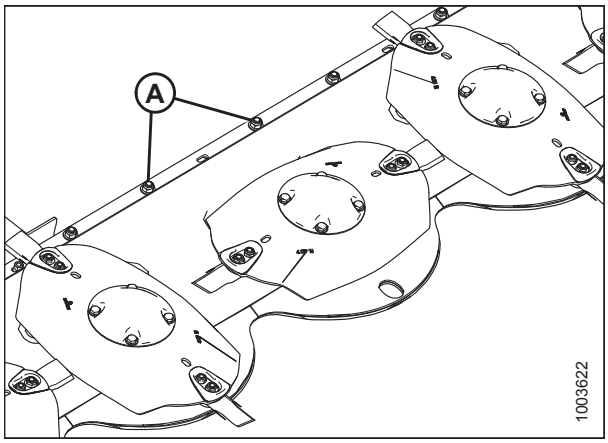


Figure 4.65: Rock Guard Hardware

4.5.7 Drums

Drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner. Drums are attached to the outboard discs at each end of the cutterbar.

Inspecting Drums

Inspect drums daily for signs of damage or wear.

DANGER

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

1. Lower self-propelled disc header fully, shut off engine, and remove key.

2. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

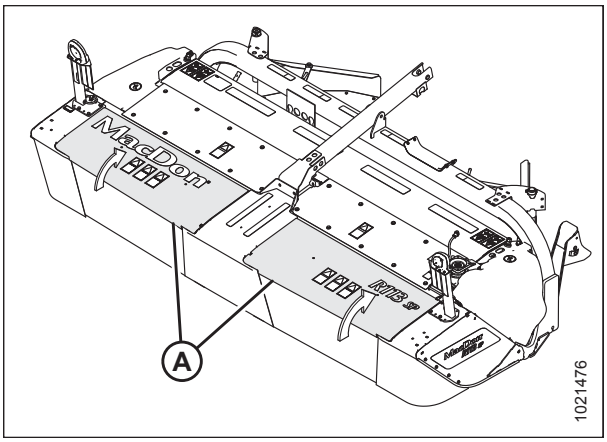


Figure 4.66: Cutterbar Doors

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

3. Inspect drums (A) and (B) for damage and wear, and replace if drums are worn at the center to 50% or more of their original thickness. Do **NOT** repair drums.
4. Examine drums for large dents. Replace dented drums to prevent an imbalance in the cutterbar.
5. Tighten or replace loose or missing fasteners.

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

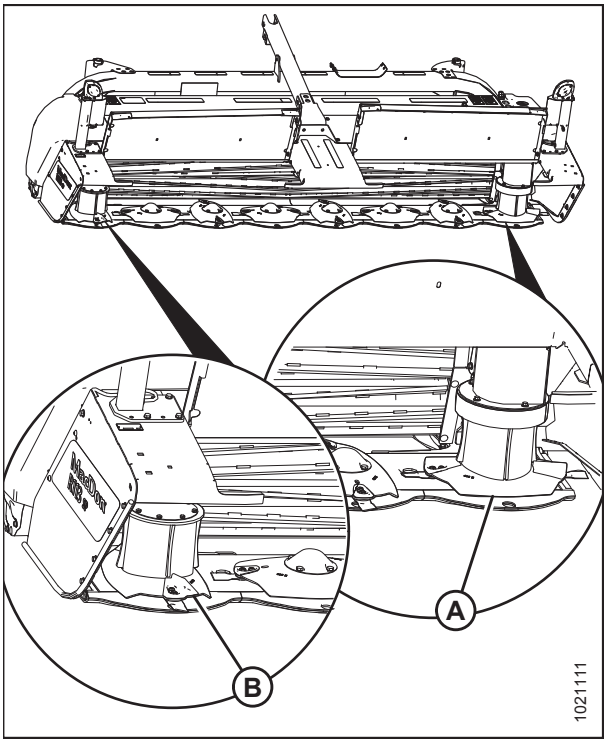


Figure 4.67: Drums

6. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

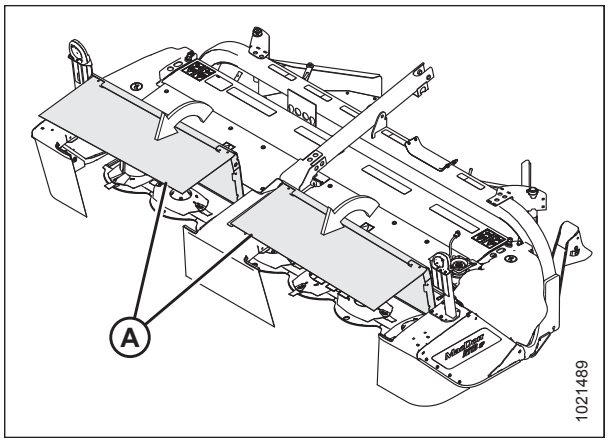


Figure 4.68: Cutterbar Doors in Closed Position

Removing Driven Drums and Driveline

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

NOTE:

Illustrations show left side drum and driveline—right side drum and driveline are similar.

1. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

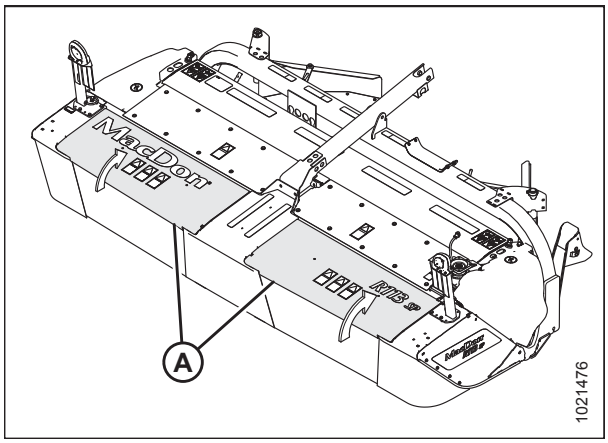


Figure 4.69: Cutterbar Doors

2. Remove four M10 hex flange head bolts (A) and remove vertical drive shield (B).

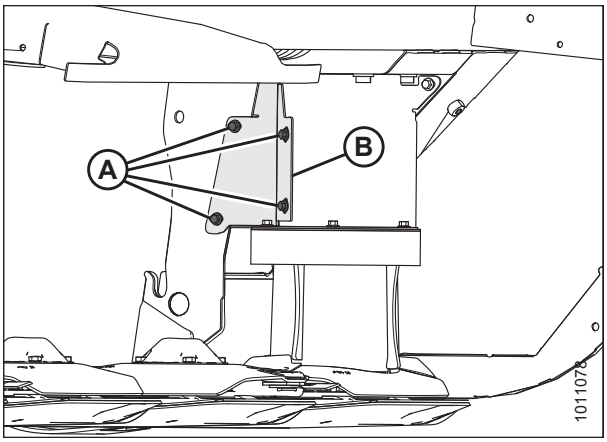


Figure 4.70: Vertical Drive Shield

3. Remove two M10 hex flange head bolts (A) and remove cover plate (B).

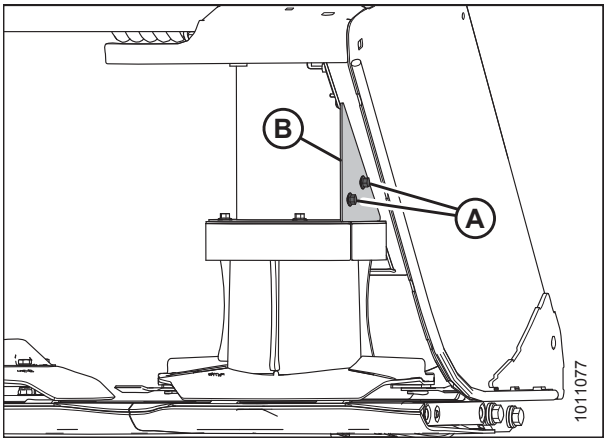


Figure 4.71: Cover Plate

4. Remove four M10 hex flange head bolts (A), and remove top plate (B) and drum top (C).

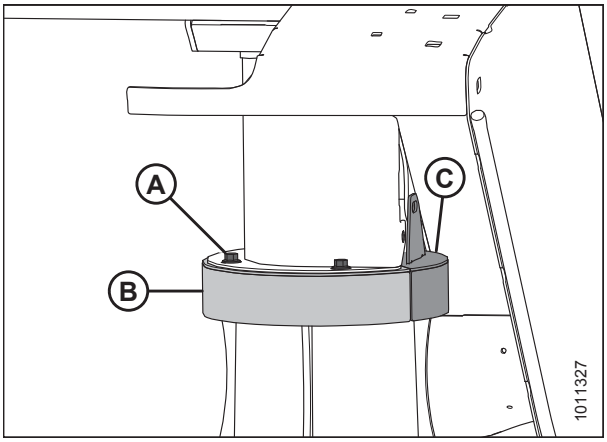


Figure 4.72: Top Plate and Drum Top

5. Remove one 20 mm M10 hex flange head bolt (A), two 16 mm M10 hex flange head bolts (B), and vertical shield (C).

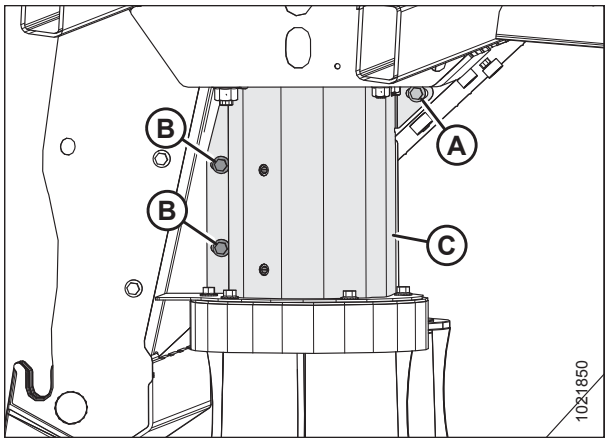


Figure 4.73: Vertical Shield

6. Remove eight M8 hex flange head bolts (A), and remove two drum shields (B).

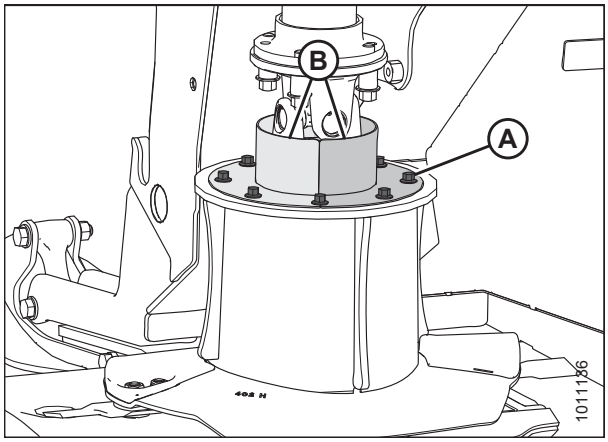


Figure 4.74: Drum Shields

7. Remove four M12 hex flange head bolts (A) and spacers securing driveline assembly (B) to hub drive (C).

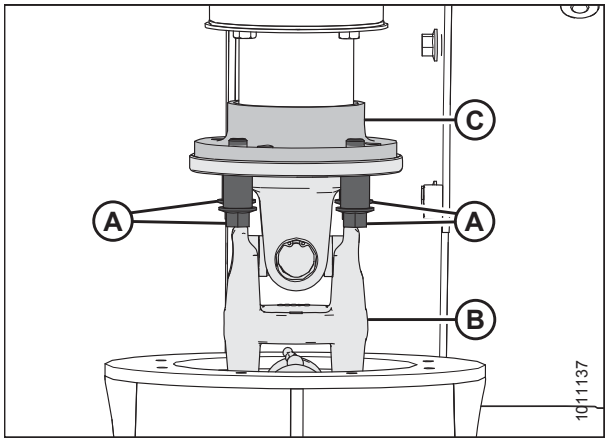


Figure 4.75: Driveline Hardware

8. Slide driveline (A) downwards, tilt to the side, and pull driveline up and out of drum.

   NOTE:

   For clarity, illustration shows cutaway view of drum and tube shield.

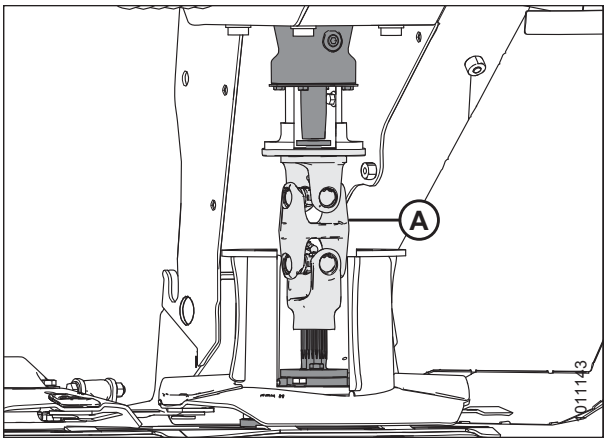


Figure 4.76: Vertical Driveline (Cutaway View Shown)

9. Look down into the drum, and use a 305 mm (12 in.) extension and 16 mm deep socket to remove the four M12 bolts (A) and washers holding the drum disc in place.
10. Remove drum disc assembly.

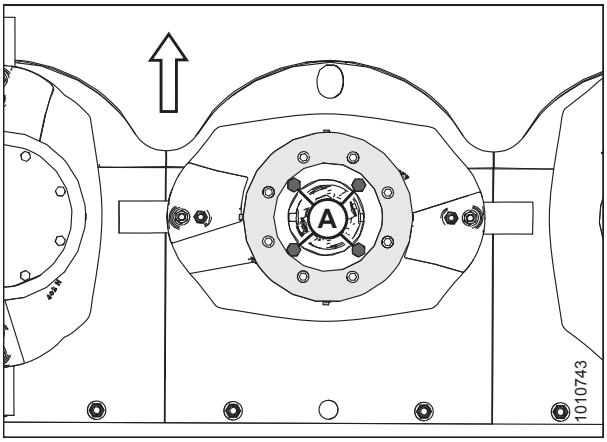


Figure 4.77: Driven Drum (Top View, Arrow Indicates Front of Machine)

Installing Driven Drums and Driveline

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

NOTE:

Illustrations show left side drum and driveline—right side drum and driveline are similar.

1. Position the drum disc assembly as shown.
2. Use a 305 mm (12 in.) extension and 16 mm deep socket to install the four M12 bolts (A) and washers that hold the drum disc in place. Torque to 85 Nm (63 lbf·ft).

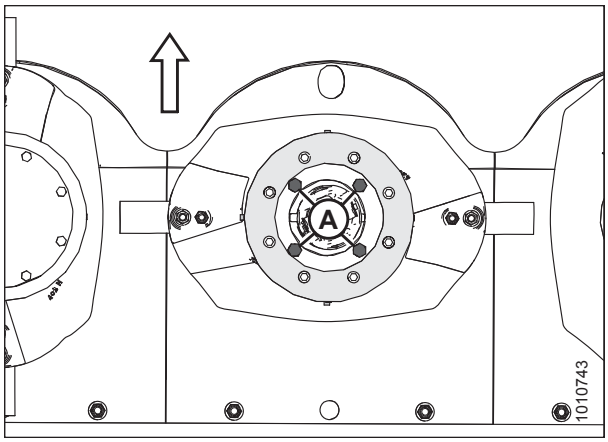


Figure 4.78: Drum Disc (Top View, Arrow Indicates Front of Machine)

3. Lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.

   NOTE:

   For clarity, illustration shows cutaway view of drum and tube shield.
4. Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).
5. Insert splined spindle end (A) into splined bore of driveline (B).

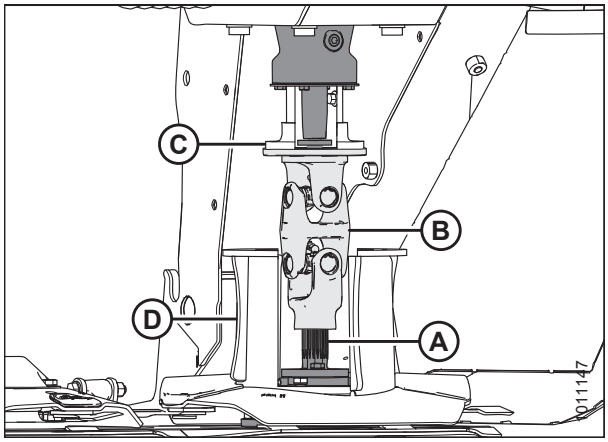


Figure 4.79: Vertical Driveline (Cutaway View Shown)

6. Place a bead of Loctite® 242 around threads, and install four M12 hex flange head bolts (A) and spacers to secure driveline assembly (B) to hub drive (C). Torque bolts to 95 Nm (70 lbf·ft).

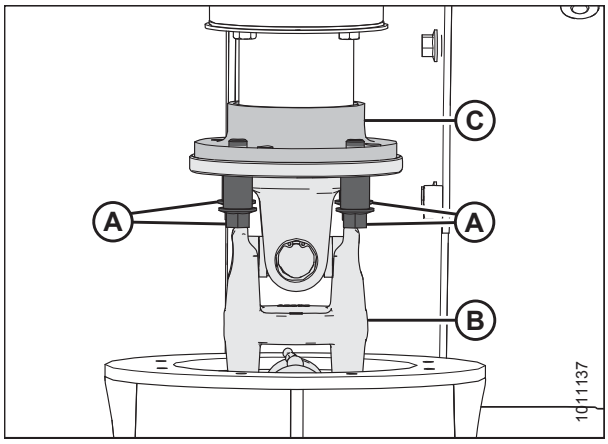


Figure 4.80: Driveline Hardware

7. Position two drum shields (B) as shown, and secure with eight M8 hex flange head bolts (A).

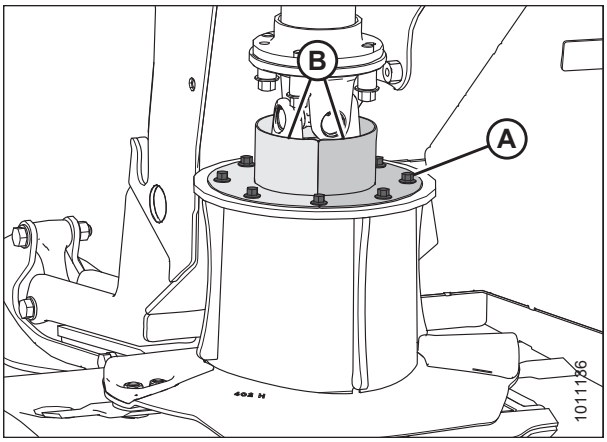


Figure 4.81: Drum Shields

8. Position vertical shield (A) as shown, and install one 20 mm M10 hex flange head bolt (B) and two 16 mm M10 hex flange head bolts (C).

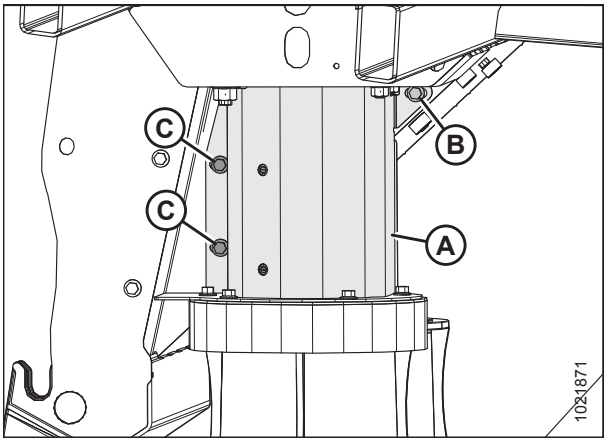


Figure 4.82: Vertical Shield

9. Position top plate (B) and drum top (C) onto drum as shown, and secure with four M10 hex flange head bolts (A).

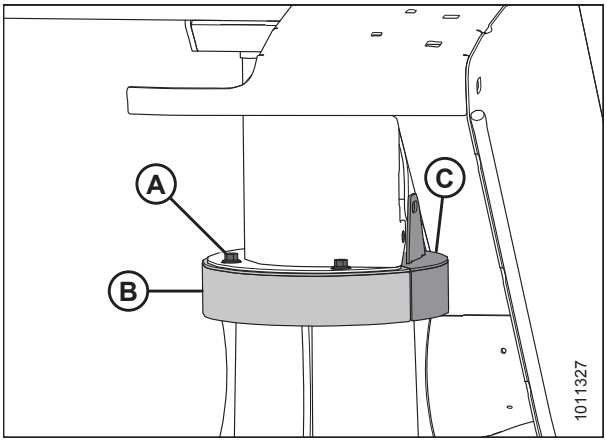


Figure 4.83: Top Plate and Drum Top

10. Install top M10 hex flange head bolt (B) through cover plate (A) and top plate (C).
11. Install lower M10 hex flange head bolt (D) through cover plate (A) and vertical shield (E).
12. Tighten bolts (B) and (D).

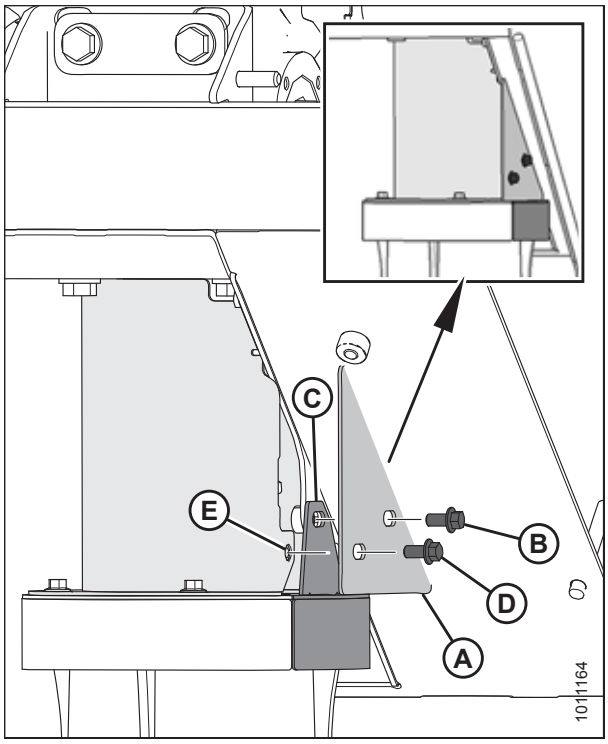


Figure 4.84: Cover Plate

13. Install vertical drive shield (B) using four M10 hex flange head bolts (A).

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

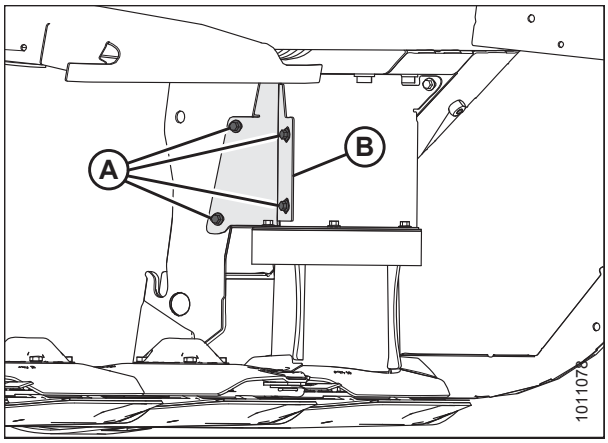


Figure 4.85: Vertical Drive Shield

14. Close cutterbar doors. Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

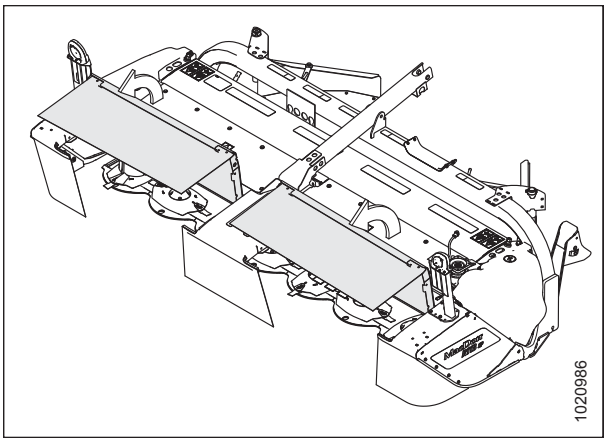


Figure 4.86: Cutterbar Doors in Closed Position

Removing Non-Driven Drums

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.

   NOTE:

   Arrows in the following illustrations point to the front of the machine.

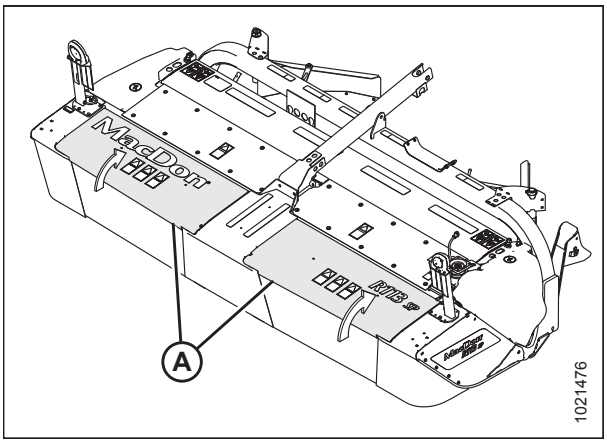


Figure 4.87: Cutterbar Doors

2. Place a wooden block between two cutterbar discs to prevent disc rotation while loosening blade bolts.
3. Remove eight M8 bolts (A) and washers securing the cover to the non-driven drum, and then remove the cover.

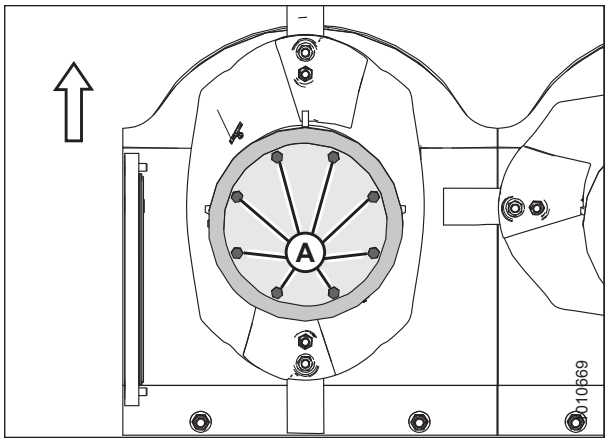


Figure 4.88: Non-Driven Drum Cover (Top View)

4. Remove the four M10 bolts (A) inside the drum using a 305 mm (12 in.) extension and 16 mm socket.
5. Remove wooden block.
6. Remove drum.

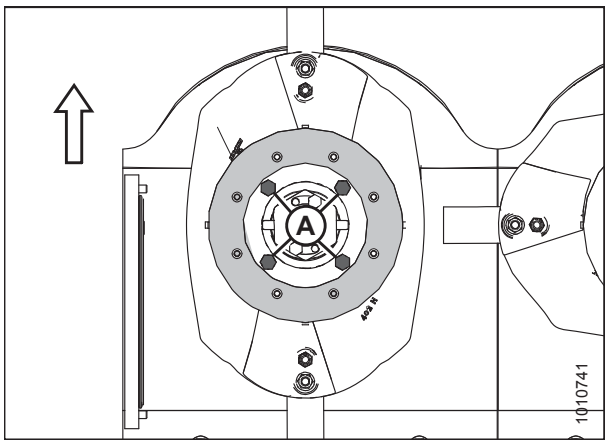


Figure 4.89: Non-Driven Drum (Top View)

Installing Non-Driven Drums

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Position each disc at a 90 degree angle relative to the neighboring discs.

   IMPORTANT:

   Discs are direction-specific. Ensure proper disc orientation.

   NOTE:

   Arrow in illustration points to the front of the machine.

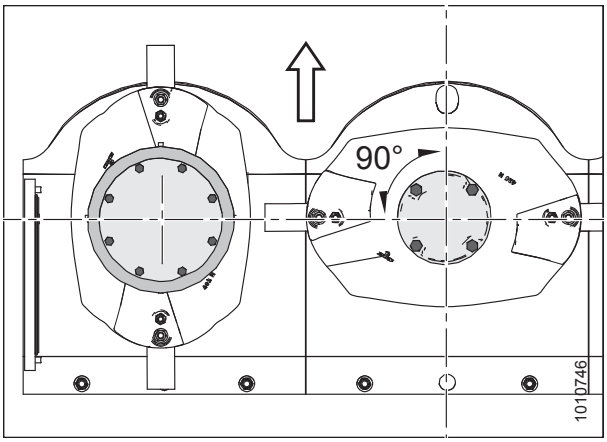


Figure 4.90: Cutterbar Discs (Top View)

2. Install spacer (A) on spindle.

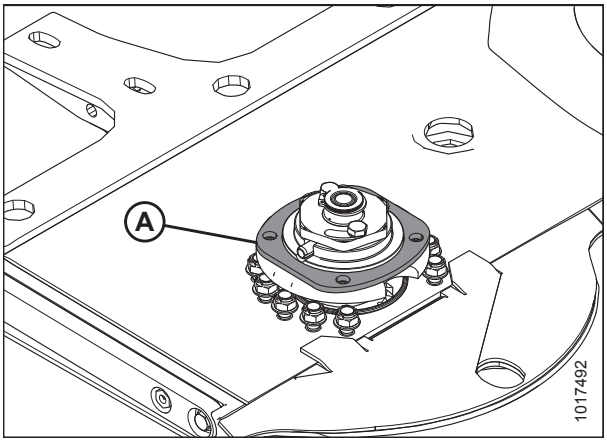


Figure 4.91: Non-Driven Spindle

3. Position the non-driven drum.

   NOTE:

   Arrow in illustration points to the front of the machine.

4. Use a 305 mm (12 in.) extension and 16 mm deep socket to install the four M10 bolts (A) and washers that hold the drum disc in place. Torque to 55 Nm (40 lbf·ft).

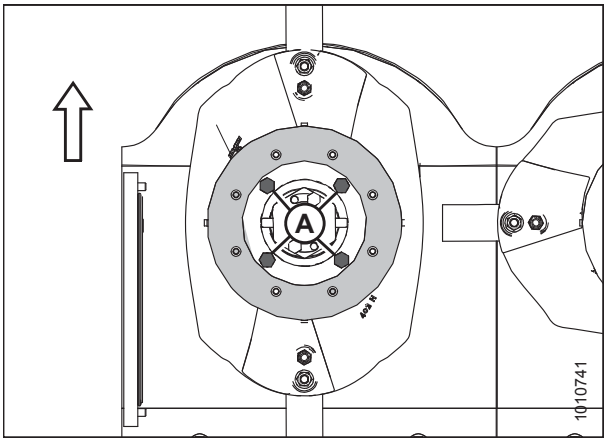


Figure 4.92: Non-Driven Drum (Top View)

5. Install eight M8 bolts (A) and washers to secure the cover to the non-driven drum, and torque to 28 Nm (20 lbf·ft).

   NOTE:

   Arrow in illustration points to the front of the machine.

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

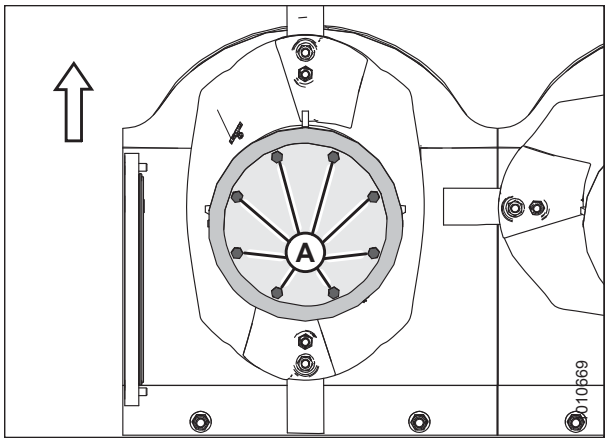


Figure 4.93: Non-Driven Drum Cover (Top View)

6. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

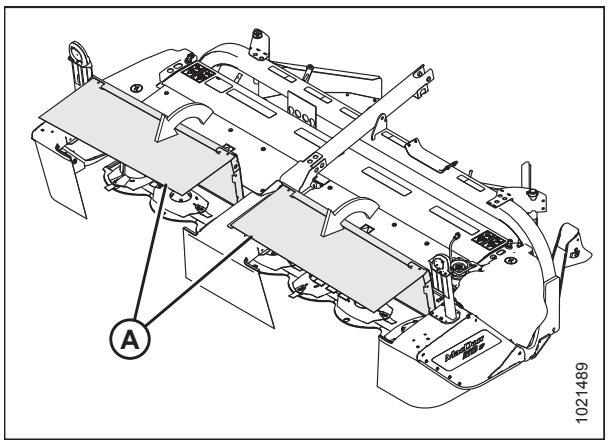


Figure 4.94: Cutterbar Doors in Closed Position

4.5.8 Cutterbar Spindle Shear Pin

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin (A).

If the disc contacts a large object such as a stone or stump, the pin will shear and the disc will stop rotating and move upwards while remaining attached to the spindle with a snap ring (B).

IMPORTANT:

- Ensure correct orientation of the shear pins during replacement.
- Spindles that rotate clockwise have left-leading threading.
- Spindles that rotate counterclockwise have right-leading threading.

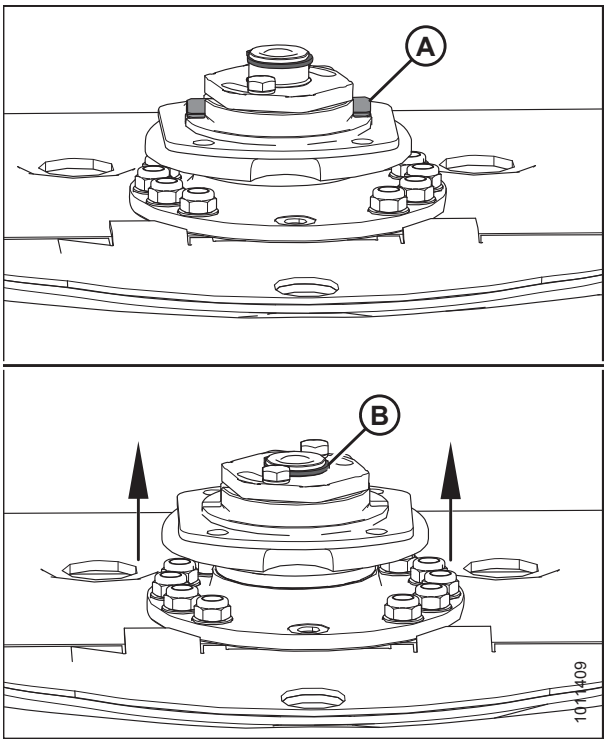


Figure 4.95: Cutterbar Spindles

Removing Cutterbar Spindle Shear Pin

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Raise self-propelled disc header fully, shut off engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.

3. Open cutterbar doors (A). Refer to *3.8.2 Opening Cutterbar Doors, page 65*.
4. Clean debris from work area.

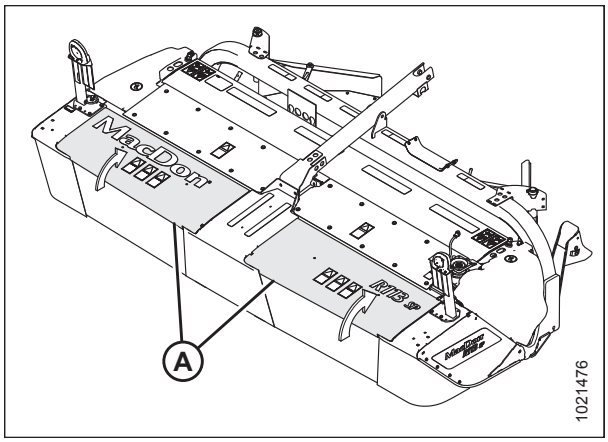


Figure 4.96: Cutterbar Doors

5. Remove cutterbar disc (A). Refer to *Removing Cutterbar Discs, page 113*.
6. Remove driven drum (B). Refer to *Removing Driven Drums and Driveline, page 138*.
7. Remove non-driven drum (C). Refer to *Removing Non-Driven Drums, page 145*.

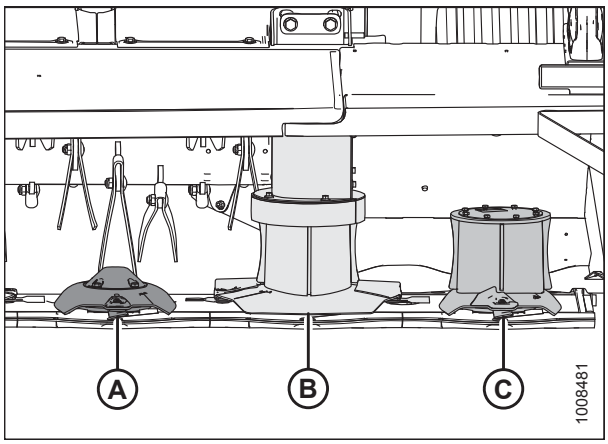


Figure 4.97: Cutterbar Disc Assemblies

8. Remove retaining ring (A).

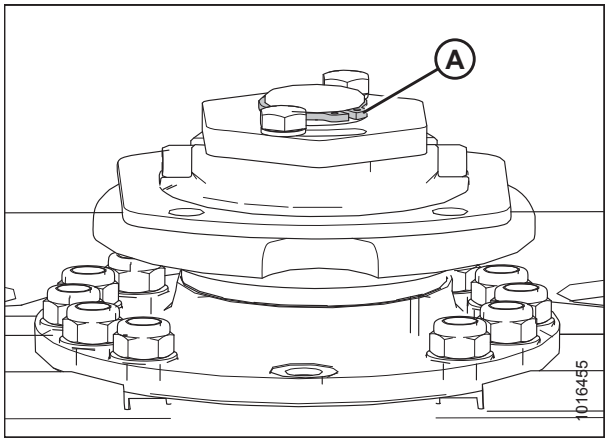


Figure 4.98: Cutterbar Spindle

9. Remove M12 bolt and remove safecut spindle-nut wrench (A) from left side shield plate.

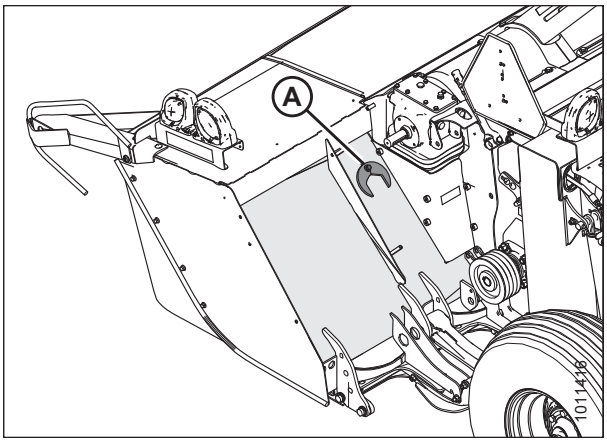


Figure 4.99: Safecut Spindle-Nut Wrench Location

10. Identify left or right markings on spindle nut.

    IMPORTANT:

    Distinguish between left and right markings as follows:

    - Left spindle nuts (A) have distinctive grooved bevels (C) on the corners—right spindle nuts (B) do not.
    - Left pinion shafts (D) have distinctive grooves on the face—right pinions (E) do not.

    IMPORTANT:

    Turn left nut counterclockwise to tighten, and turn right nut clockwise to tighten.

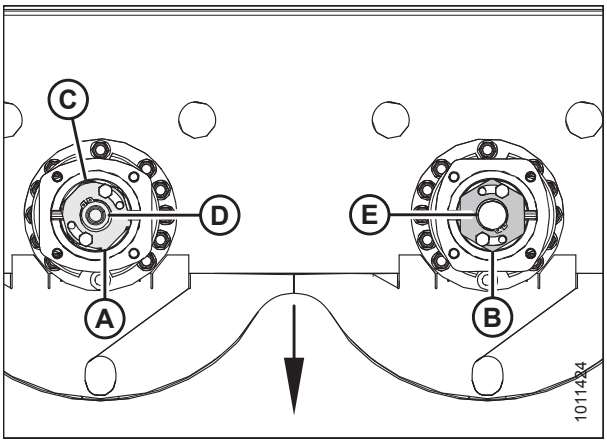


Figure 4.100: Left and Right Markings

11. Remove two M10 bolts and washers (A).

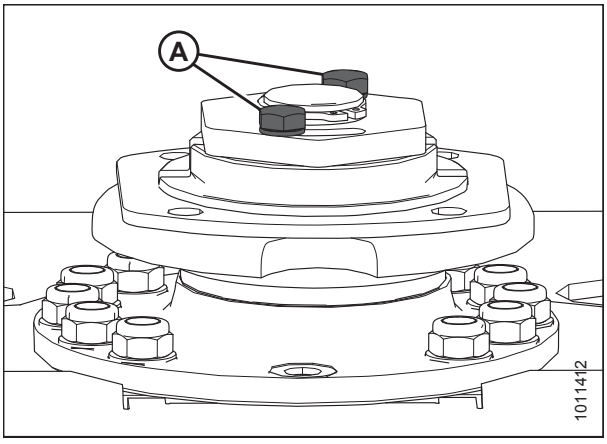


Figure 4.101: Cutterbar Spindle

12. Use the safecut spindle-nut wrench and remove nut (A).

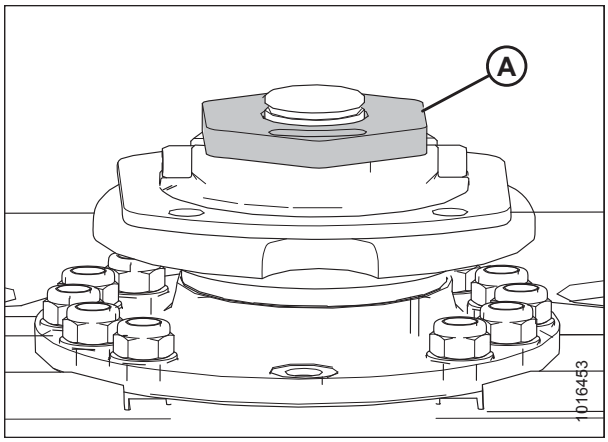


Figure 4.102: Cutterbar Spindle

13. Remove the hub (A).
14. Remove shear pins (B). Do **NOT** damage the pin bore on the pinion.

    NOTE:

    Check the nut and hub for damage. Replace if necessary.

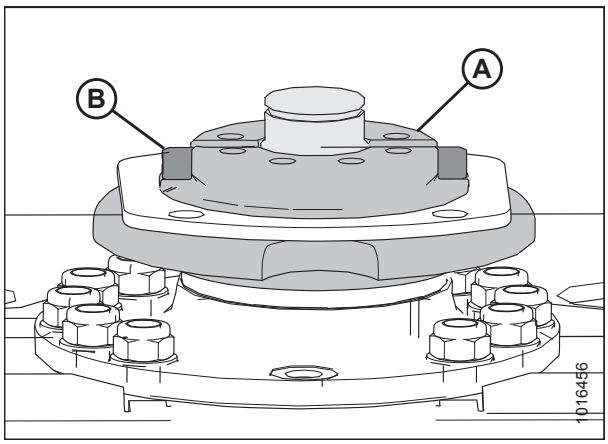


Figure 4.103: Cutterbar Spindle

Installing Cutterbar Spindle Shear Pin

DANGER

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

CAUTION

Discblades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with blades.

1. Fill the space above the bearing with grease.
2. Place the hub (A) on the spindle (C).
3. Install shear pins (B).

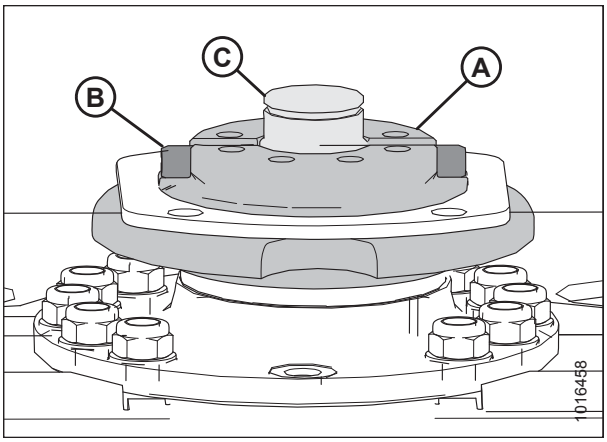


Figure 4.104: Cutterbar Spindle

4. Observe orientation of groove in shear pin (A).

   IMPORTANT:

   The correct shear pin orientation is critical. Both shear pin grooves (A) must be facing the same direction and parallel to the cutterbar.

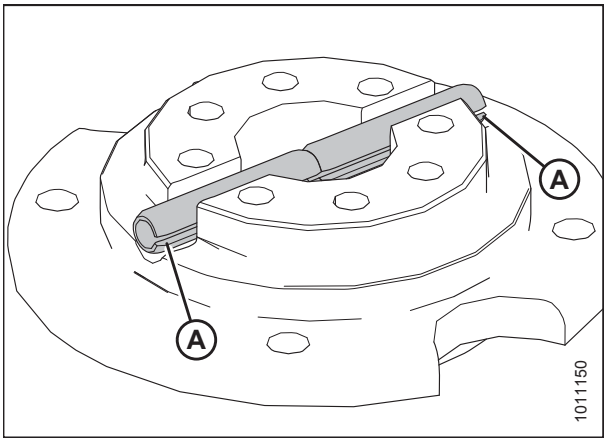


Figure 4.105: Shear Pin Orientation (Shaft Not Shown)

5. Install nut (A).

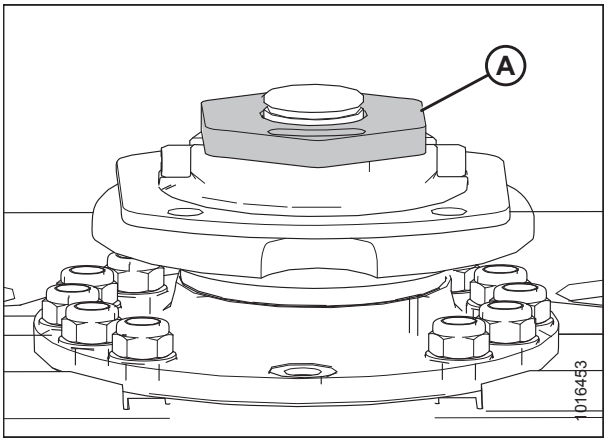


Figure 4.106: Cutterbar Spindle

6. Using the safecut spindle-nut wrench (B), torque spindle nut (C) to 300 Nm (221 lbf·ft).

   NOTE:

   Position the safecut spindle-nut wrench (B) 90 degrees (D) to the torque wrench (A).

7. Return safecut spindle-nut wrench to left side shield plate.

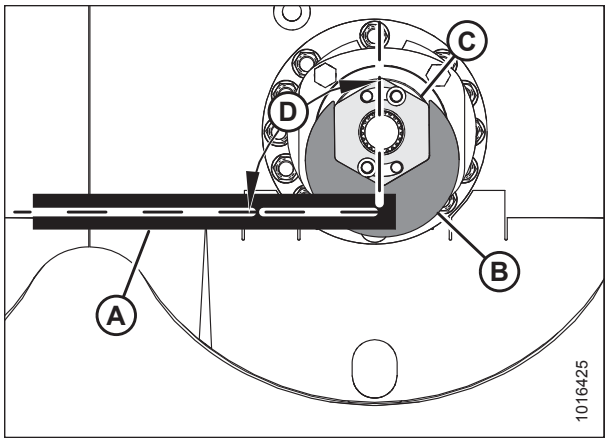


Figure 4.107: Spindle Nut

8. Inspect the threads of the two M10 bolts (A) and replace if damaged.
9. Install two M10 bolts (A) and washers. Torque to 55 Nm (40 lbf·ft).

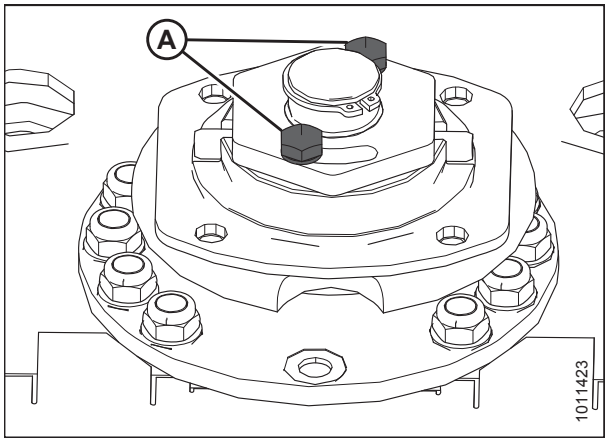


Figure 4.108: Cutterbar Spindle

10. Install retaining ring (A).

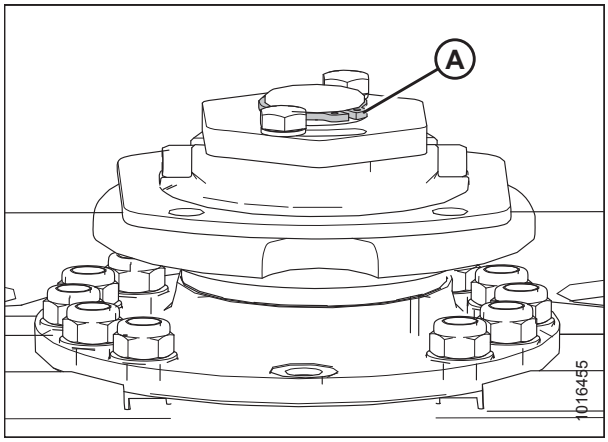


Figure 4.109: Cutterbar Spindle

11. Install cutterbar disc (A). Refer to *Installing Cutterbar Discs, page 114*.
12. Install driven drum (B). Refer to *Installing Driven Drums and Driveline, page 141*.
13. Install non-driven drum (C). Refer to *Installing Non-Driven Drums, page 146*.

WARNING

Ensure cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

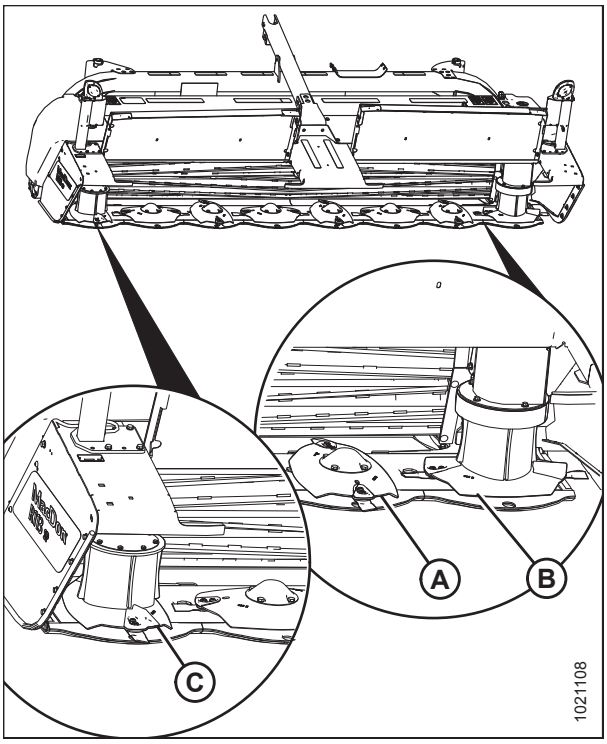


Figure 4.110: Cutterbar Disc Assemblies

14. Close cutterbar doors (A). Refer to *3.8.4 Closing Cutterbar Doors, page 68*.

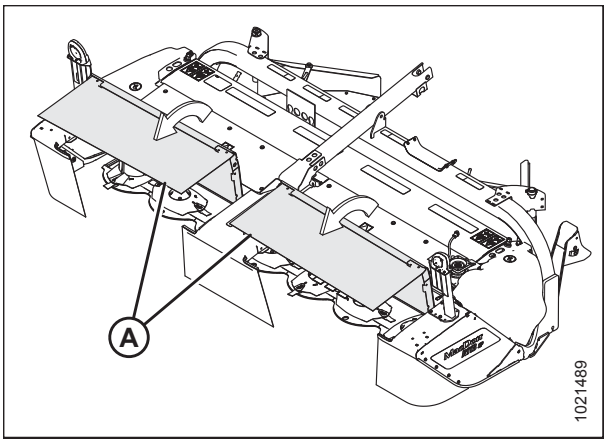


Figure 4.111: Cutterbar Doors in Closed Position

4.6 Header Drive 90-Degree Gearbox

The header drive gearbox (A), transfers power from the hydraulic motor. It is located inside the drive compartment at the left end of the self-propelled disc header.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. Refer to *4.3.1 Maintenance Schedule/Record, page 101*.

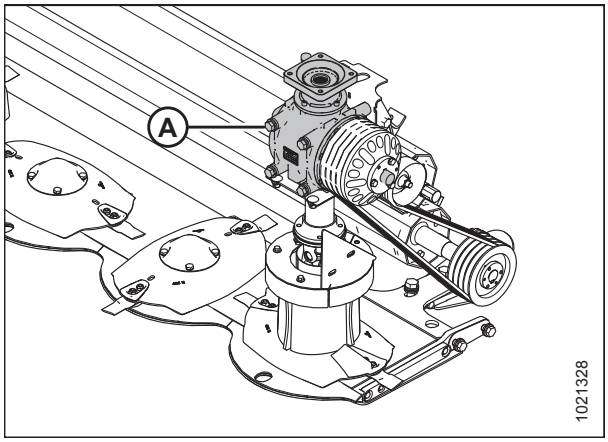


Figure 4.112: Header Drive Gearbox

4.6.1 Checking and Adding Lubricant

The self-propelled disc header 90-degree gearbox is located on the left side of the header.

DANGER

To avoid bodily injury or death from 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. Lower header until the top of the header is parallel with the ground. Turn engine off, and remove key.
2. Open left cutterbar door. For instructions refer to *3.8.2 Opening Cutterbar Doors, page 65*.
3. The gearbox is located inside the cutterbar area at the top right corner (looking into cutterbar area from front). Clean area around check plug (A).
4. Remove plug (A) with a 13 mm socket.
5. Ensure lubricant slightly runs out of hole (A).
6. If necessary, remove plug (B) and add lubricant to gearbox through hole (B) until lubricant runs out of hole (A). Refer to the inside back cover of this manual for lubricant information.
7. Reinstall plugs and tighten.
8. Close left cutterbar door. For instructions, refer to *3.8.4 Closing Cutterbar Doors, page 68*.

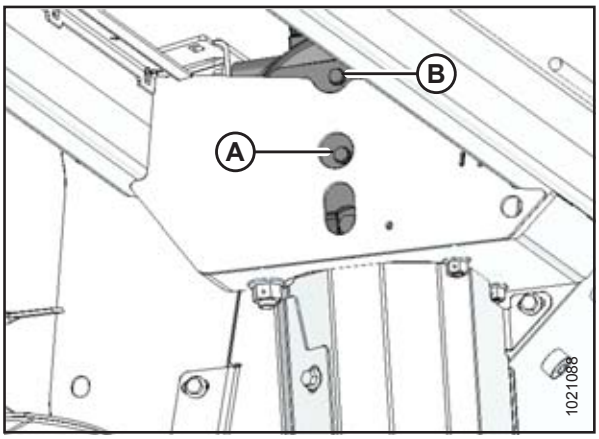


Figure 4.113: 90-Degree Drive Gearbox

4.7 Conditioners

4.7.1 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner. The tension is factory-set and should not require adjustment.

Inspecting Conditioner Drive Belt

Check the belt tension and inspect for damage or wear every 100 hours or annually (preferably before the start of the cutting season).

DANGER

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

1. Lower self-propelled disc header fully, turn off engine, and remove key.
2. Open the left side driveshield (A). Refer to *3.7.1 Opening Driveshields, page 62*.

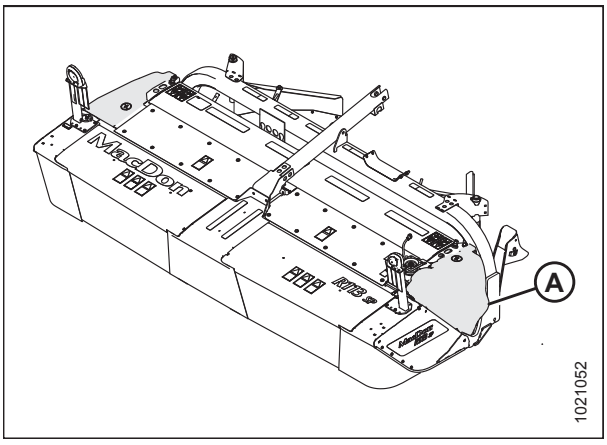


Figure 4.114: Left Side Driveshield

3. Inspect drive belt (A) and replace if damaged or cracked.
4. Check that jam nut (B) and adjuster nut (C) are tight.

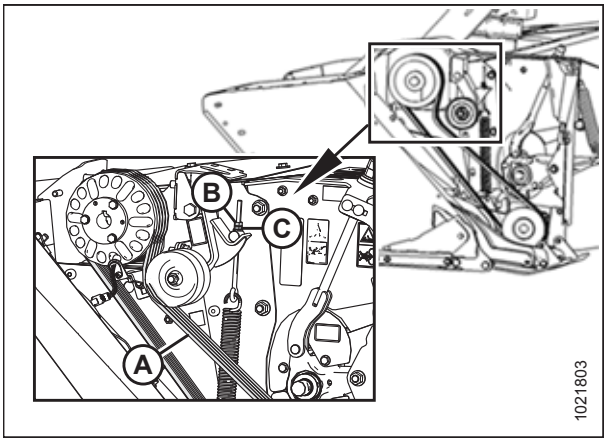


Figure 4.115: Conditioner Drive

5. Measure the length of belt tensioner spring (A) and ensure spring length (B) is 366 mm (14-3/8 in.) in accordance with spring tension decal (C). If spring length requires adjustment, refer to *Installing Conditioner Drive Belt, page 159*.
6. Close driveshield. Refer to *3.7.2 Closing Driveshields, page 63*.

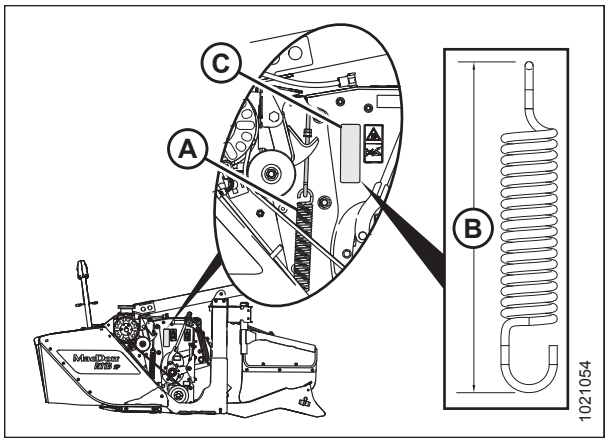


Figure 4.116: Belt Tension Spring

Removing Conditioner Drive Belt

DANGER

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

1. Lower header fully, turn off engine, and remove key.
2. Remove the left driveshield. Refer to *3.7.1 Opening Driveshields, page 62*.
3. Disconnect wire harness (A) from speed sensor (B).

   NOTE:

   The speed sensor orientation should be factory-set for either the M1170 or M155*E4* windrower and does not require manual adjustment.

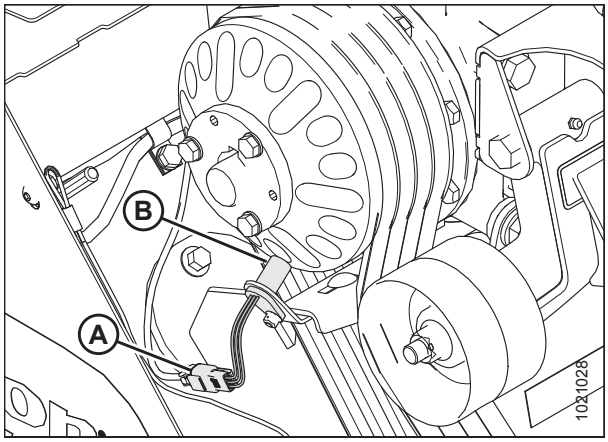


Figure 4.117: Speed Sensor

4. Turn jam nut (A) counterclockwise to unlock tension adjustment.
5. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully collapse tensioner spring (C), and release the tension from conditioner drive belt (D).
6. Remove drive belt (D).

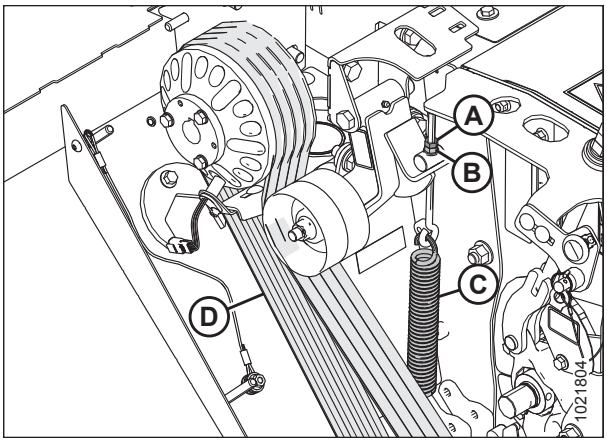


Figure 4.118: Conditioner Drive

Installing Conditioner Drive Belt

DANGER

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

1. Lower self-propelled disc header fully, turn off engine, and remove key.
2. Install drive belt (A) onto driven pulley (C) first, and then onto drive pulley (B) ensuring that the belt is in the pulley grooves.

   NOTE:

   If necessary, loosen jam nut and adjuster nut to relieve spring tension.

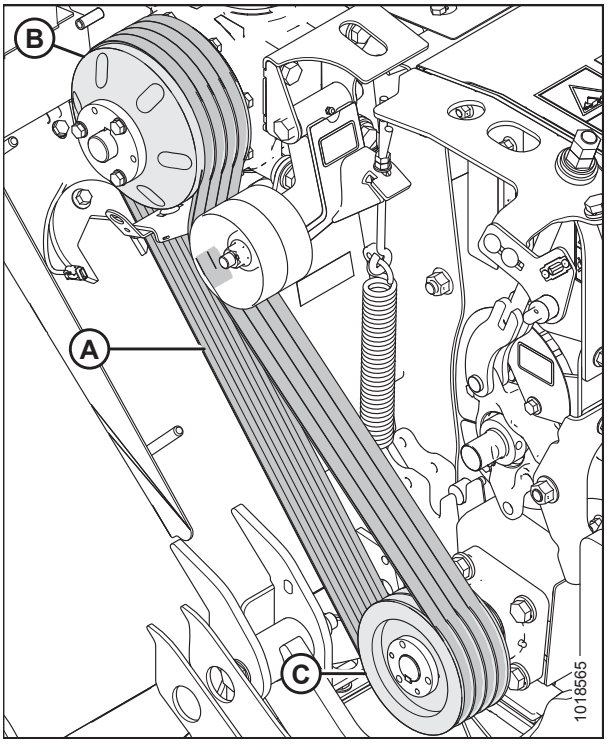


Figure 4.119: Conditioner Drive

3. Measure the length of tensioner spring (C); dimension (D) should be set to 366 mm (14-3/8 in.).
4. Loosen nut (A).
5. To adjust the spring tension, turn adjuster nut (B) clockwise to increase spring length (tension) or turn adjuster nut (B) counterclockwise to decrease spring length (relax).
6. Once correct spring measurement has been achieved, hold adjuster nut (B) and tighten jam nut (A) against it.

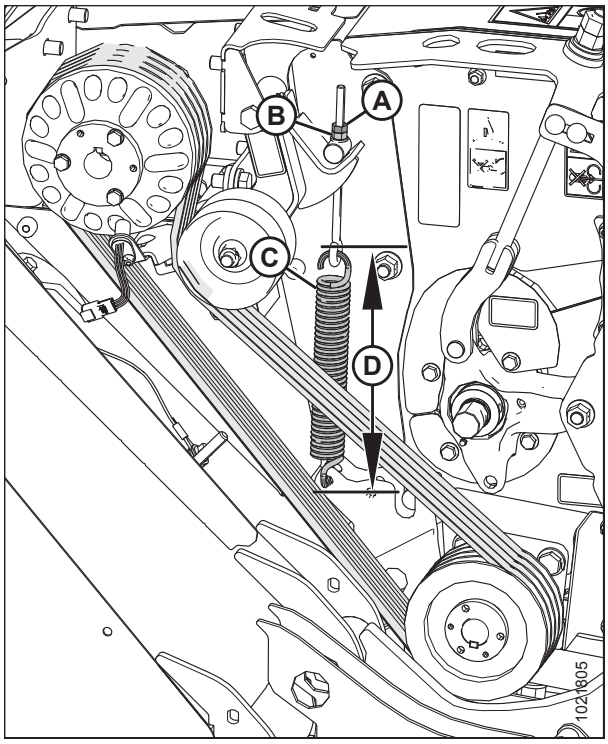


Figure 4.120: Conditioner Drive

7. Reconnect the speed sensor (B) to wiring harness (A).

   NOTE:

   The speed sensor orientation should be factory-set for either the M1170 or M155*E4* windrower and does not require manual adjustment.
8. Close left driveshield. Refer to *3.7.2 Closing Driveshields, page 63*.

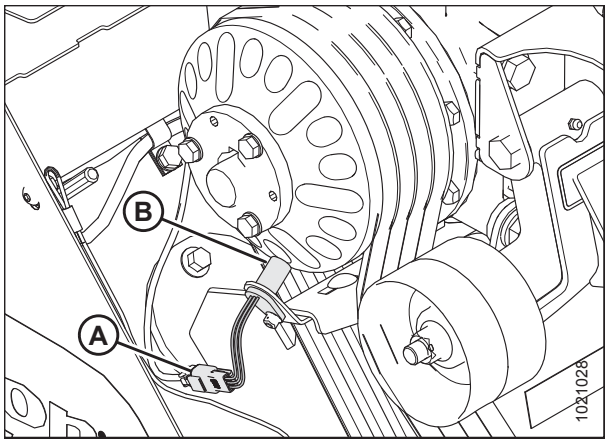


Figure 4.121: Speed Sensor

4.7.2 Roll Timing Gearbox (MD #221748)

The roll timing gearbox, located inside the drive compartment at the right side of the self-propelled disc header, transfers power from the gearbox-driven lower roll to the upper roll.

The gearbox (A) does not require routine maintenance or service other than checking and changing the oil.

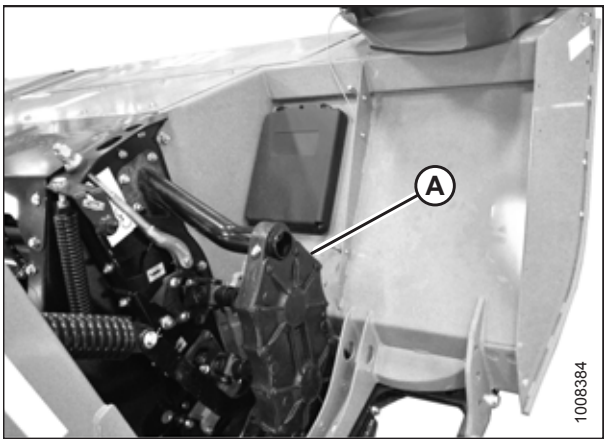


Figure 4.122: Roll Timing Gearbox

Checking and Changing Roll Timing Gearbox Oil

Change oil after the first 50 hours of operation. Perform subsequent oil changes every 100 hours or annually (preferably before the start of the cutting season).

DANGER

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

IMPORTANT:

Check the gearbox oil level when the oil is warm. If the oil is cold, idle the machine for approximately 10 minutes prior to checking.

1. Lower self-propelled disc header fully, turn off engine, and remove key.
2. Remove the right driveshield (A). Refer to *Removing Driveshields, page 165*.

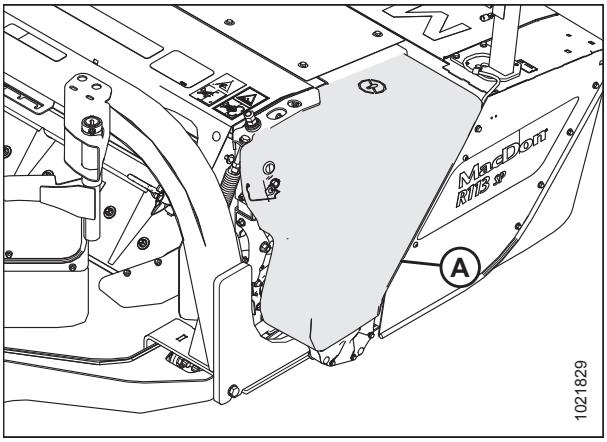


Figure 4.123: Right Driveshield

Checking Conditioner Gearbox Oil Level

3. Clean around oil level plug (A) on inboard side of gearbox.
4. Remove oil level plug (A), and check that oil level is even with the hole.
5. Top up oil level with SAE 85W-140 gear oil if necessary.
6. Replace oil level plug (A) and tighten.

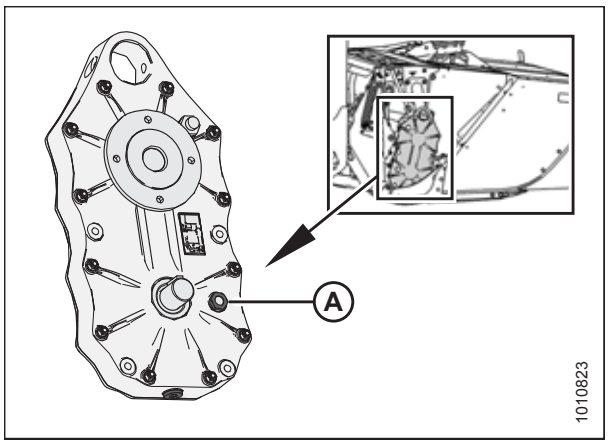


Figure 4.124: Oil Level Plug

Changing Conditioner Gearbox Oil

WARNING

To avoid bodily injury or death from unexpected start-up or fall of raised machine: stop engine, remove key, and engage lift cylinder lock-out valves before going under machine.

7. Raise self-propelled disc header to provide sufficient access to oil drain plug (A), shut off engine, and remove key.
8. Engage the windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.
9. Clean around oil drain plug (A) on bottom of gearbox and around oil level plug (B) on inboard side of gearbox.
10. Place a 1 liter (1.05 qts [US]) container underneath conditioner gearbox.
11. Remove oil drain plug (A) using a hex key.
12. Allow sufficient time for oil to drain, replace oil drain plug (A), and tighten.
13. Remove oil level plug (B) and fill with SAE 85W-140 gear oil until the oil level is even with the bore hole.
14. Replace oil level plug (B) and tighten.
15. Properly dispose of oil.

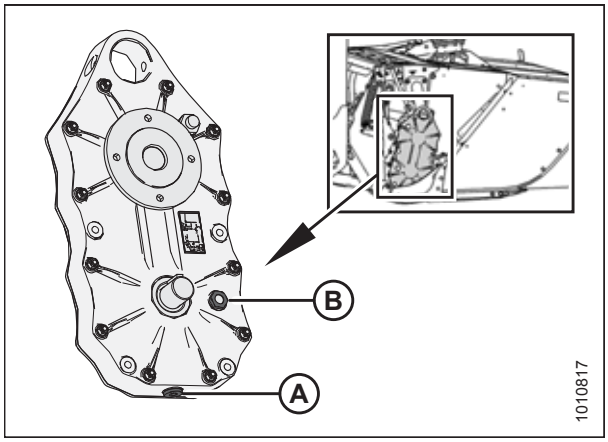


Figure 4.125: Oil Level and Drain Plug

4.7.3 Hydraulics

Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure.**
- **If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.**

Figure 4.126: Hydraulic Pressure Hazard

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

IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Allowing dust, dirt, water, or foreign material to enter the system is the major cause of hydraulic system damage. Do **NOT** attempt to service hydraulic systems in the field. Precision fits require a perfectly clean connection during overhaul.

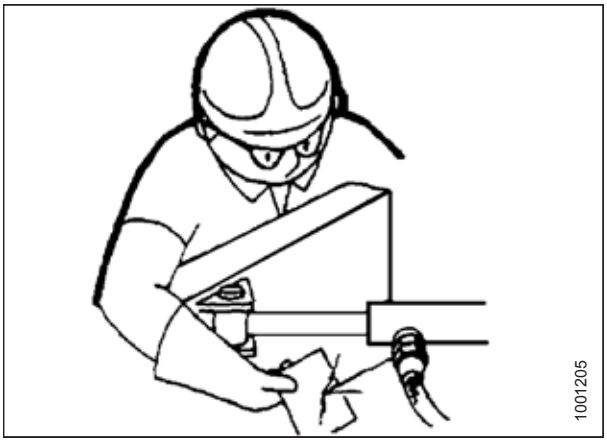


Figure 4.127: Testing for Hydraulic Leaks

4.7.4 Electrical System

Maintaining Electrical System

- Use electrical tape and cable ties as required to prevent wires from dragging or rubbing.
- Keep lights clean and replace defective bulbs.

Servicing Amber Hazard/Signal Lights

Replacing Amber Hazard/Signal Bulb

1. Remove two Phillips screws (A) from fixture, and remove the plastic lens.
2. Replace bulb, and reinstall plastic lens and screws. Bulb—Trade #1157.

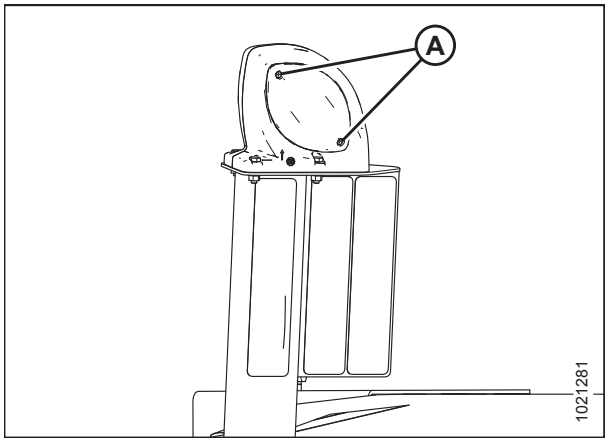


Figure 4.128: Plastic Lens and Screws

Replacing Amber Hazard/Signal Light Fixture

1. Remove four nuts (A) (only 3 shown) securing light to bracket and remove light. Disconnect light from electrical harness.
2. Connect new light to the electrical harness
3. Install four nuts (A) and tighten.

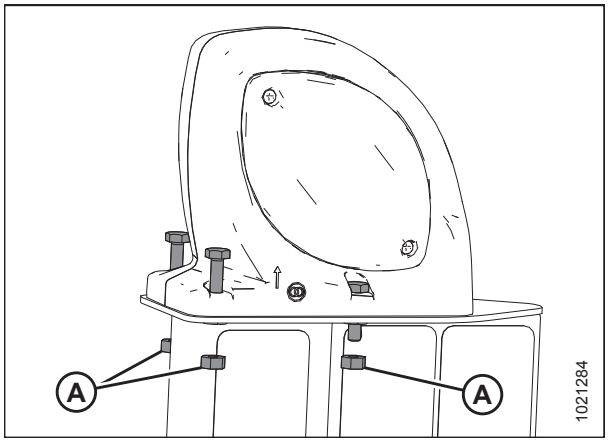


Figure 4.129: Amber Hazard Light

4.7.5 Driveshields

Removing Driveshields

CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown are for left side driveshield (A). Right side driveshield is similar.

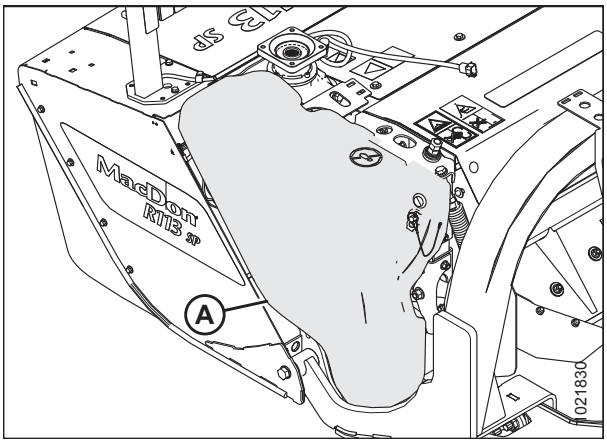


Figure 4.130: Left Driveshield

1. Remove lynch pin (A) and tool (B) from pin (C).

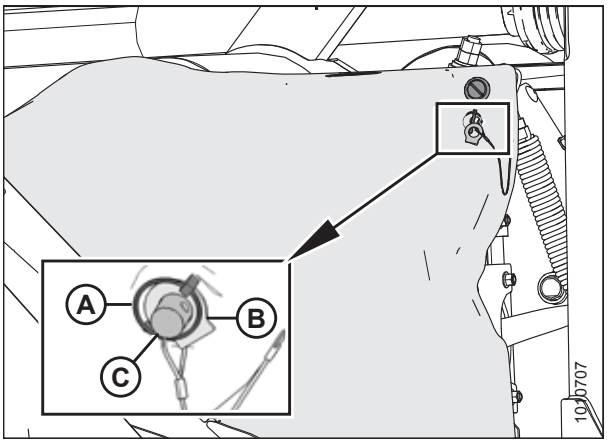


Figure 4.131: Tool to Unlock Driveshield

2. Insert flat end of tool (A) into latch (B) and turn it counterclockwise to unlock.

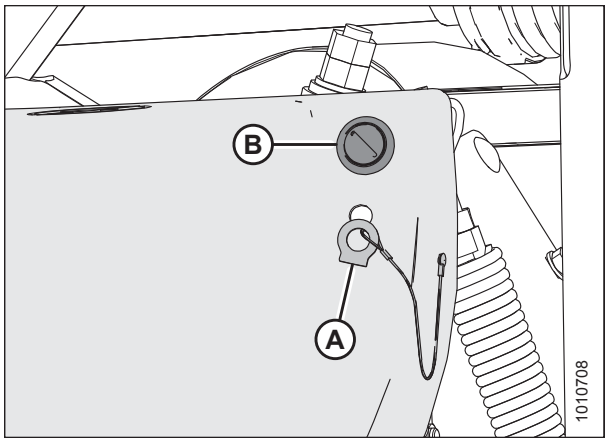


Figure 4.132: Tool to Unlock Driveshield and Latch

3. Pull top of driveshield (A) away from header conditioner and lift off the pins at the base of the shield to remove.

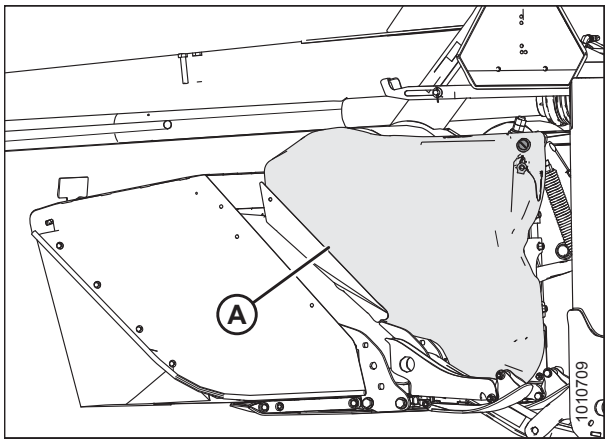


Figure 4.133: Driveshield

Installing Driveshields

CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown are for left side driveshield—right side driveshield is similar.

1. Position driveshield (A) onto pins (B) at base of driveshield.
2. Push driveshield to engage latch (C).
3. Check that driveshield (A) is properly secured.

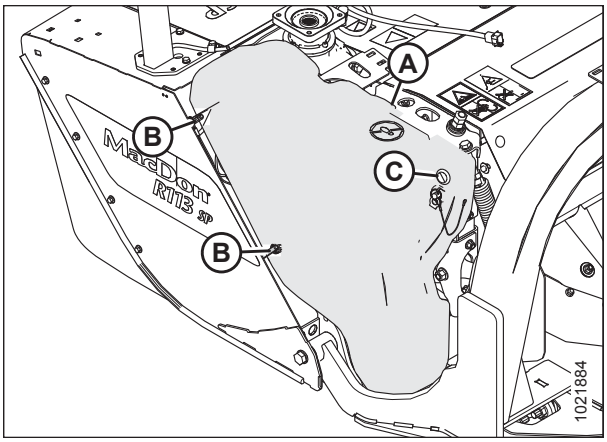


Figure 4.134: Driveshield and Latch

4. Replace tool (B) and lynch pin (A) on pin (C).

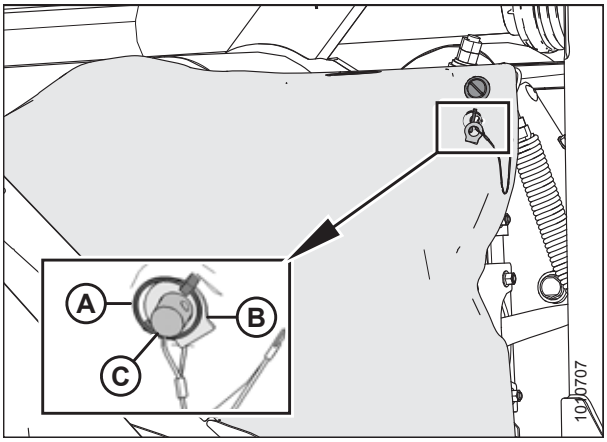


Figure 4.135: Tool to Unlock Driveshield

Replacing Driveshield Latch

CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown are for left side driveshield—right side driveshield is similar.

1. Remove driveshield (A). Refer to *Removing Driveshields, page 165*.

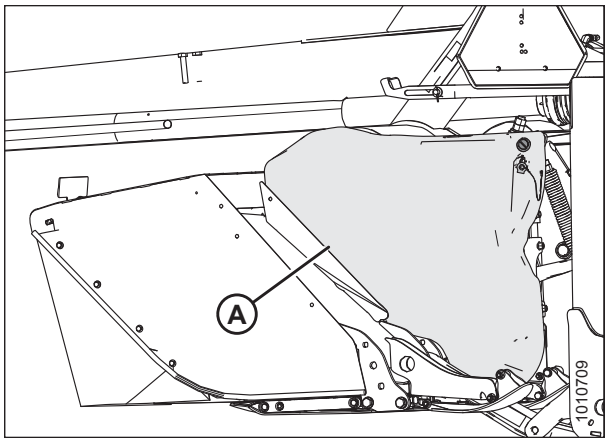


Figure 4.136: Driveshield

2. Remove hex nut (A) and flat washer securing latch to backside of driveshield, replace latch if worn or damaged, and reinstall nut and washer.

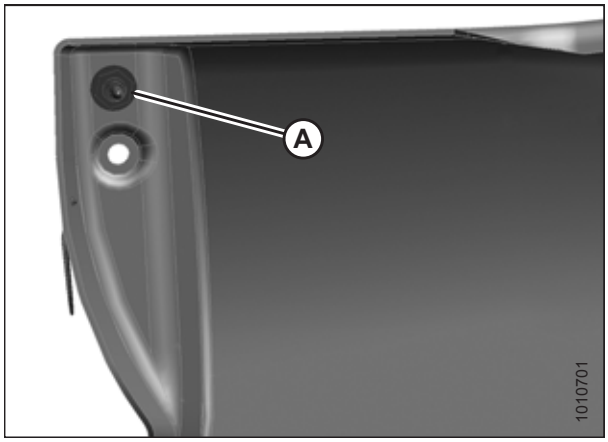


Figure 4.137: Backside of Driveshield

3. Remove two carriage bolts (A), replace stud and clip assembly (B) if worn or damaged, and reinstall carriage bolts.
4. Install driveshield. Refer to *Installing Driveshields, page 166*.

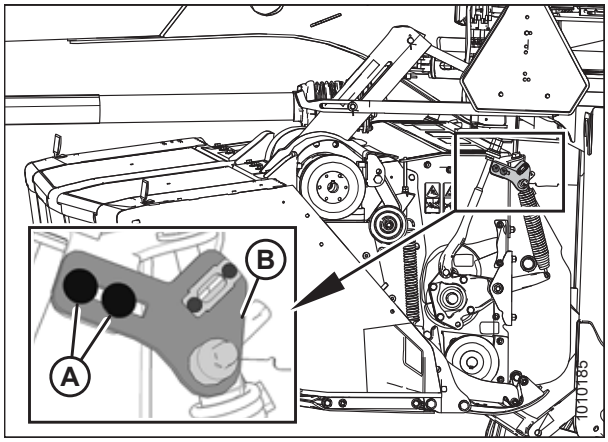


Figure 4.138: Stud and Clip Assembly

4.7.6 Conditioners

Roll Conditioner

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. Both steel and polyurethane conditioner rolls are available. Refer to *5.1 Options and Attachments, page 181* for ordering information.

Inspecting Roll Conditioner

DANGER

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

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Lower self-propelled disc header fully, stop engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to *3.3 Engaging and Disengaging Header Safety Props, page 24*.
3. Remove left and right driveshields (A). Refer to *3.7.1 Opening Driveshields, page 62*.

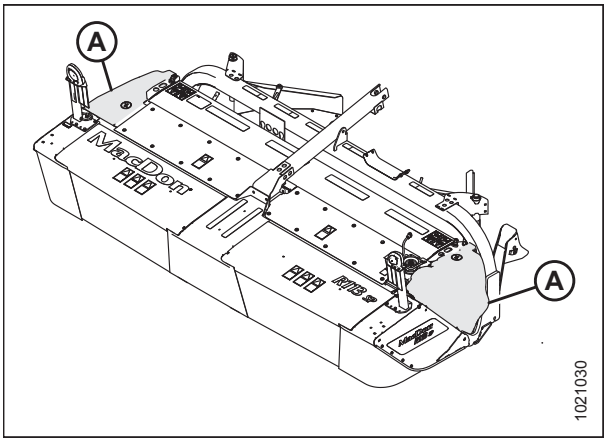


Figure 4.139: Driveshields

4. Inspect left side roll conditioner bearing (A) for signs of wear or damage.

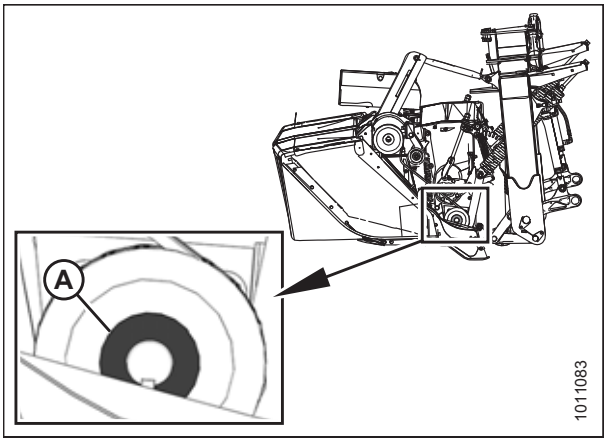


Figure 4.140: Left Side Roll Conditioner Bearing

5. Inspect right side roll conditioner U-joints (A) for signs of wear or damage.

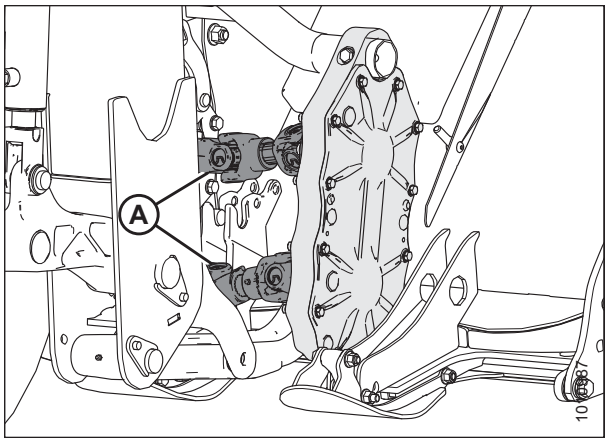


Figure 4.141: Right Side Roll Conditioner U-Joints

6. Inspect right side roll timing gearbox bearings (A) for signs of wear or damage.

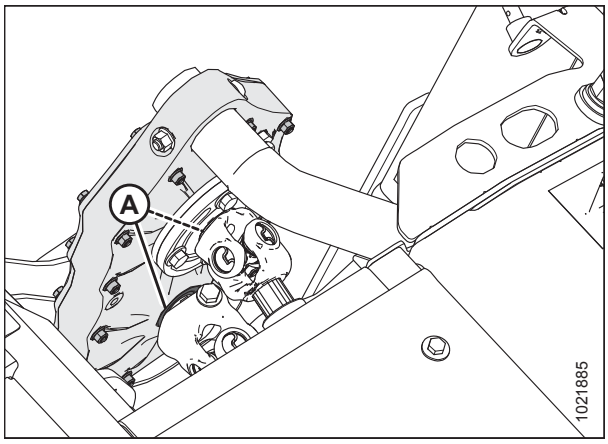


Figure 4.142: Right Side Roll Timing Gearbox Bearings

4.7.7 Changing the Conditioner

The R113 self-propelled disc header can be operated either with no conditioner, with a polyurethane roll conditioner, or with a steel roll conditioner. If the header is not conditioner equipped, a shield must be installed.

Follow these instructions to change conditioners.

NOTE:

These instructions apply to all conditioners. Exceptions are identified where applicable.

Removing the Conditioner

This procedure is applicable when the header is not attached to the windrower. If necessary, detach the header from the windrower before proceeding.

1. Open the driveshields. Refer to *3.7.1 Opening Driveshields, page 62*.
2. Remove the conditioner drive belt. Refer to *Removing Conditioner Drive Belt, page 158*.

3. **M1170:** Move hose bundle (A) clear of frame and lay on header.

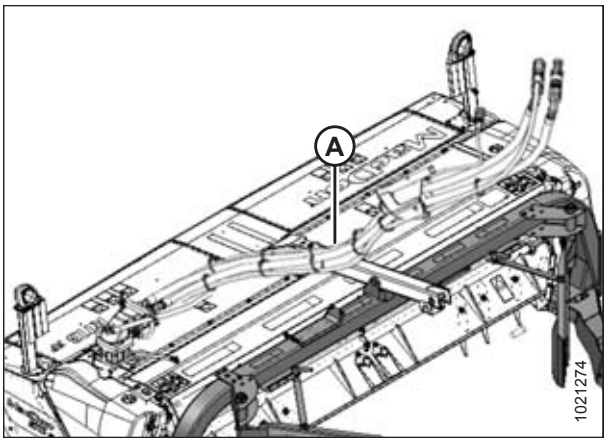


Figure 4.143: M1170 Hose Bundle

4. **M155*E4:*** Remove two bolts (A) attaching hose bracket (B) to header frame. Place hose bundle and bracket onto header. Do **NOT** disconnect hoses from motor.

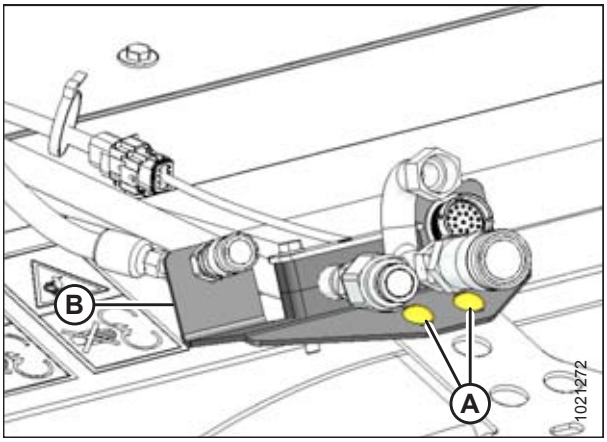


Figure 4.144: M155*E4* Hoses

5. Attach a spreader bar (A) to a forklift or equivalent, and attach chains to lugs (B) on conditioner (C). Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

CAUTION

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast while detaching the conditioner from the self-propelled disc header.

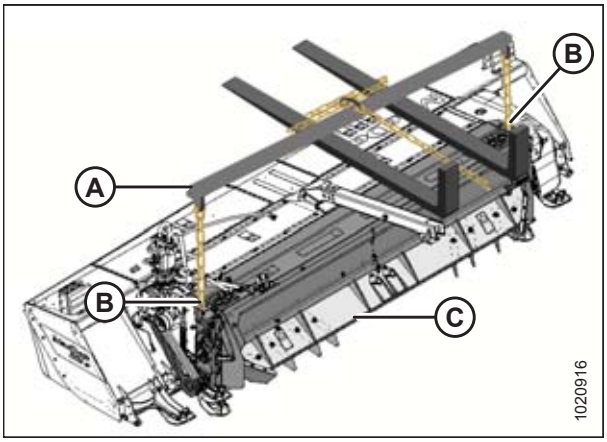


Figure 4.145: Spreader Bar

6. To protect the finish on the frame, wrap packing foam (A) (or equivalent) around frame at approximate shown locations.
7. Position forks (B) under the packing foam on the frame as shown at right. Raise forks and lift frame slightly. The forks should not directly contact the frame.
8. To secure frame to forks, wrap chain (C) around end of forks and attach to forklift.

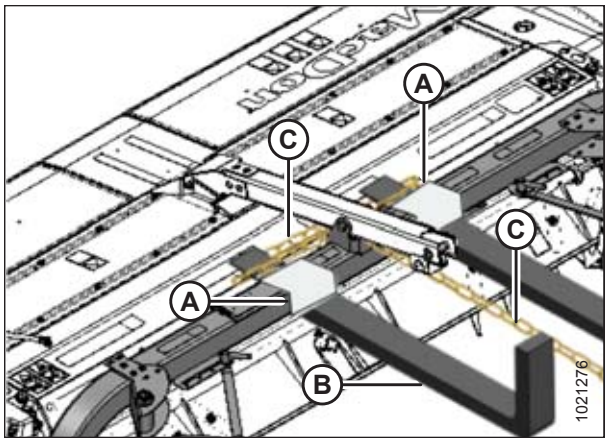


Figure 4.146: Supporting Frame

9. Remove nut (A), securing bolt (B) and washer (C), and washer shims (D) from the center-link support attaching header to frame (E). If necessary, adjust height of forks lifting the frame. Retain hardware for reinstallation.

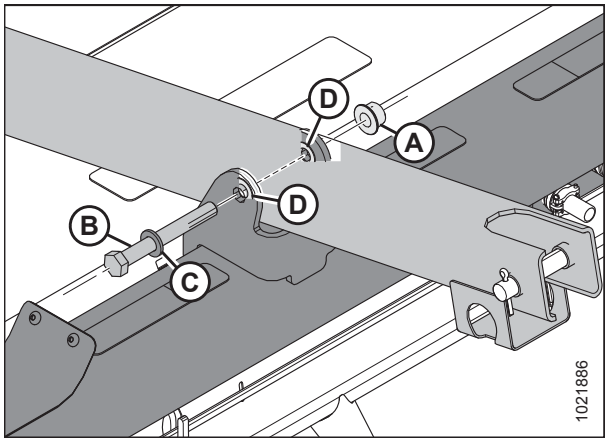


Figure 4.147: Frame (Center-Link Support)

10. Remove nut (B).
11. Remove bolt (A) from frame (C). If necessary, adjust the height of forks lifting the frame to provide more room and better access to bolt (A). Repeat at opposite side of frame. Retain hardware for reinstallation.

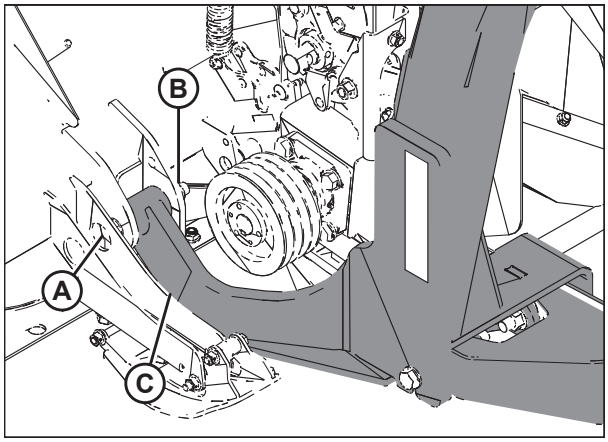


Figure 4.148: Frame (Left Side Shown)

12. Loosen two M16 hex head bolts (A) at each side of conditioner that secure it to header.

DANGER

To prevent the conditioner from falling backward, ensure lifting chains are secure and tight. Failure to do so may result in death or serious injury.

13. Adjust the height of forks lifting the frame and raise the conditioner slightly. Remove the loosened bolts (A). Retain hardware for reinstallation.

CAUTION

Stand clear when detaching the conditioner.

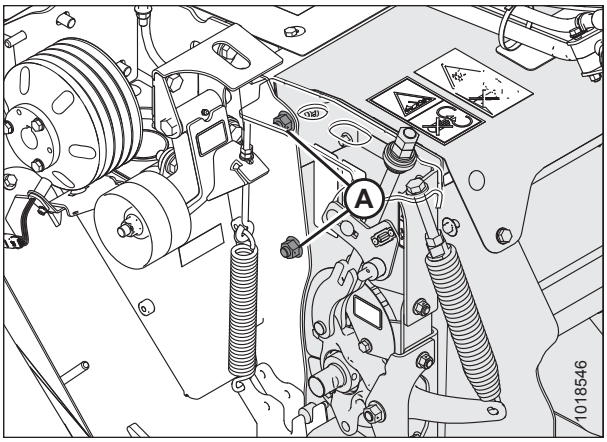


Figure 4.149: Left Side of Conditioner – Right Side Similar

14. Using the forklift, lift conditioner (A) off header (B), and move frame away from work area, set on ground, and remove chain securing frame to forks.

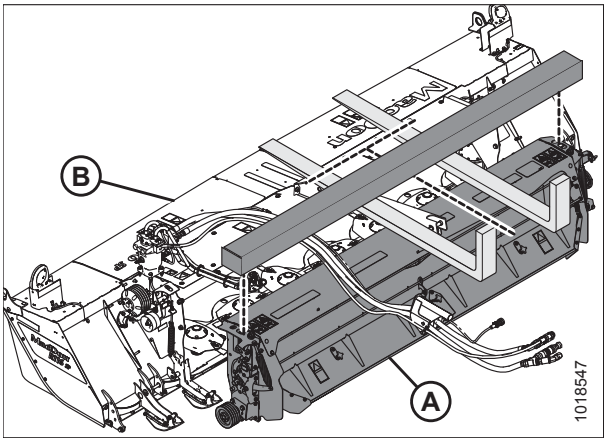


Figure 4.150: Conditioner Lift

Installing the Conditioner

CAUTION

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast while detaching the conditioner from the self-propelled disc header.

1. Attach a spreader bar (A) to a forklift (or equivalent) and attach chains to lugs (B) on conditioner. Use a chain rated for overhead lifting with a minimum working load of 1135 kg. (2500 lb.).
2. Lift conditioner (C) and align it with the header opening.

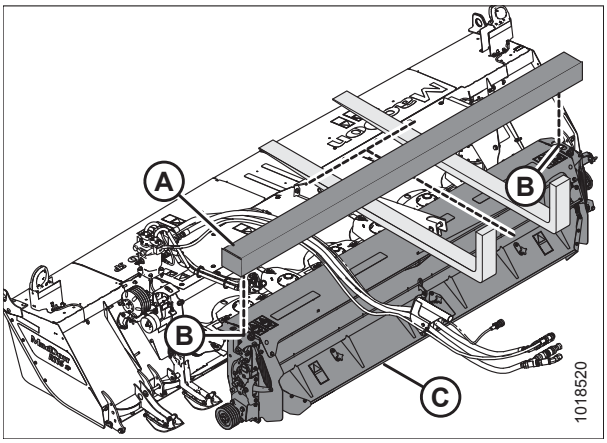


Figure 4.151: Conditioner Lift

3. Carefully align pin (B) at each end of conditioner (A) with lug (C) on header. Lower the conditioner (A), so that pins (B) engage lugs (C) on header

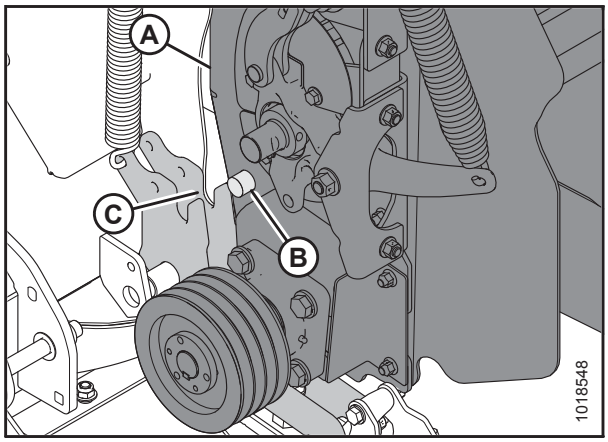


Figure 4.152: Installing Conditioner

4. Align mounting holes and install four M16 x 40 hex head bolts (A) with heads facing inboard (two per side). Secure with M16 center lock flanged nuts and torque to 170 Nm (126 lbf·ft).
5. Remove lifting chains from conditioner and move lifting device clear of work area.
6. If necessary, install conditioner drive components. Refer to *Installing Conditioner Drive, page 176*.

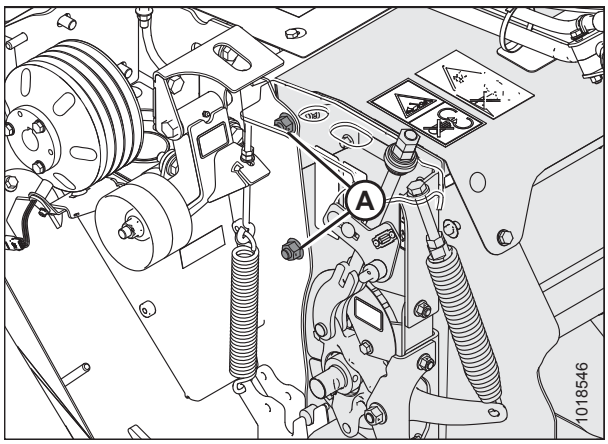


Figure 4.153: Left Side of Conditioner – Right Side Similar

7. Position forks (B) under frame as shown ensuring packing foam (A) (or equivalent) is between forks and frame. Raise forks to lift frame slightly. Ensure forks do not contact frame.
8. To secure frame to forks, wrap chain (C) around end of forks and attach to forklift.
9. Pick up frame and position it against header as shown.

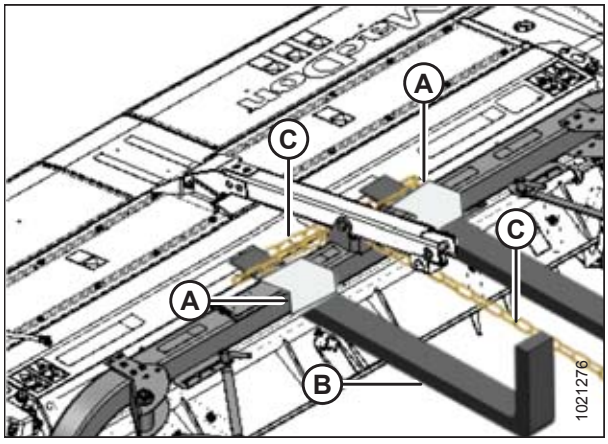


Figure 4.154: Installing Frame

10. Slowly move forward until the lift arm (C) is lined up with the mounting holes in the frame (A) and (B).

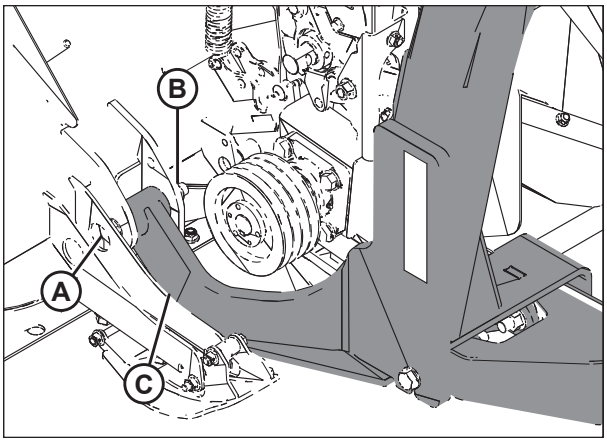


Figure 4.155: Frame (Left Side Shown)

11. Install only bolt (A) through the frame (B) and bushing (D) in the lift arm. Repeat for opposite side.
12. Check the gap (C) between the inner steel sleeve (D) of the bushing and the frame (B). If there is a gap, washers (1.2 mm thick) (MD #5113) will need to be installed to minimize the gap on both sides of the bushing.
13. Remove bolt (A).

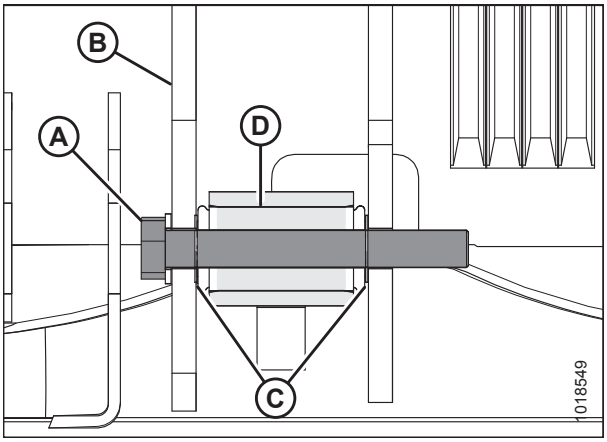


Figure 4.156: Frame Attachment (Left Side Shown)

14. Install washer (A) onto bolt (B) and apply anti-seize compound to bolt shank only. Do **NOT** apply to threads.
15. Install bolt (B) with washers (C) as determined in Step *12, page 175*.
16. Install three washers (D) and nut (E) onto bolt. Torque to 332–346 Nm (245–255 lbf·ft).
17. Repeat steps *12, page 175* to *16, page 175* for opposite side.

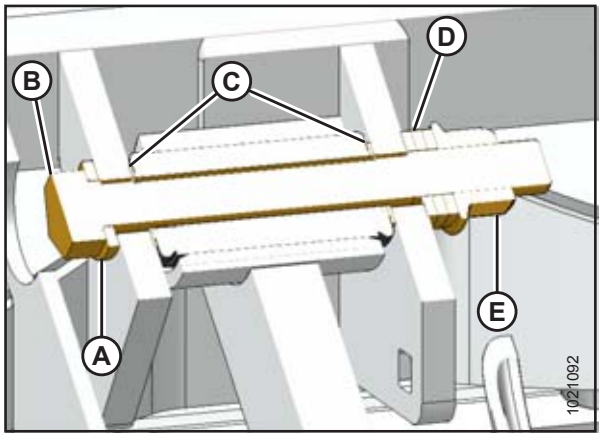


Figure 4.157: Frame Attachment (Left Side Shown)

18. With flat washer shim (A) on either side of the center-link support, install securing bolt (B) and washer (C) through the conditioner center-link support bracket and center-link support.
19. Install nut (D) and torque to 332–346 Nm (245–255 lbf·ft).
20. Remove chain securing frame to forks, and back forklift away from work area.

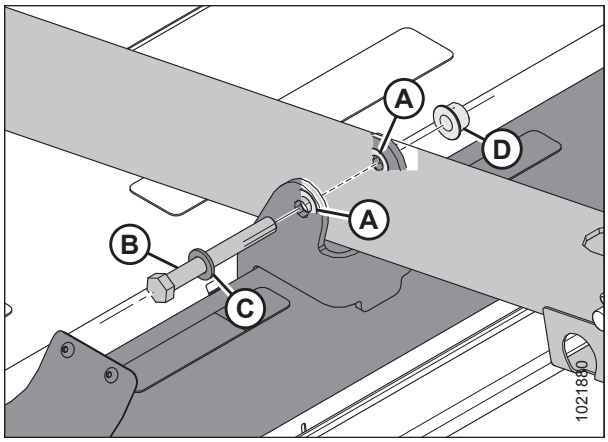


Figure 4.158: Frame (Center Support)

21. Position hose bundle and hose support (B) onto adapter and secure with bolts (A) and nuts.
22. Install the conditioner drive belt. Refer to *Installing Conditioner Drive Belt, page 159*.
23. Close the driveshields. Refer to *3.7.2 Closing Driveshields, page 63*.

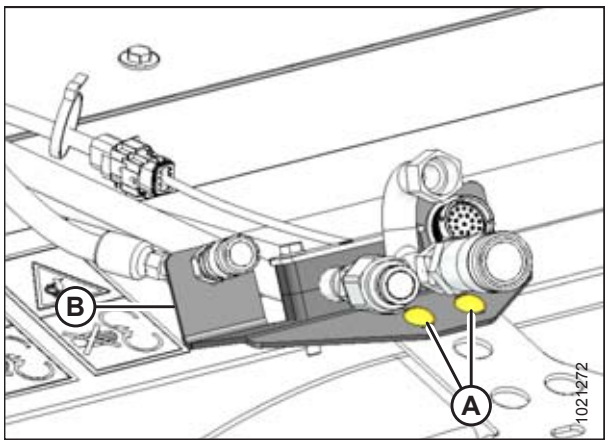


Figure 4.159: Hose Support

Installing Conditioner Drive

This procedure describes the installation of conditioner drive components on a machine that was originally supplied with no conditioner. The procedure is similar for machines that will have a conditioner installed.

If a conditioner is to be installed on the self-propelled disc header, refer to *Installing the Conditioner, page 173* and *Installing Conditioner Drive Belt, page 159*.

1. Remove drive cover (A) from left side of header by removing securing hex head bolt (B), flat washer (C) and nut (D) and sliding cover off pins (E).

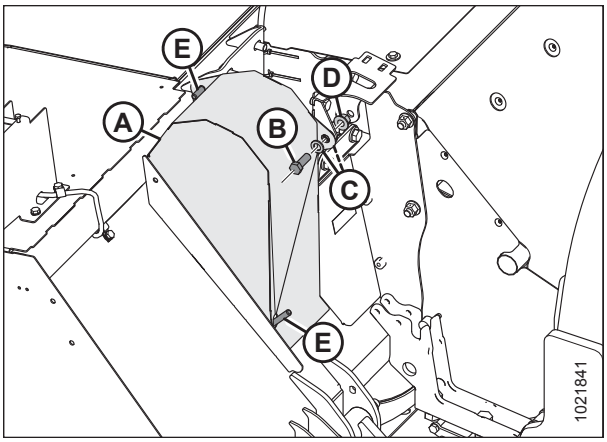


Figure 4.160: Drive Cover

2. Position tensioner assembly (A) as shown, and secure with M16 x 120 bolt (B) and nut (C). Torque nut (C) to 47–54 Nm (35–40 ft·lbf).

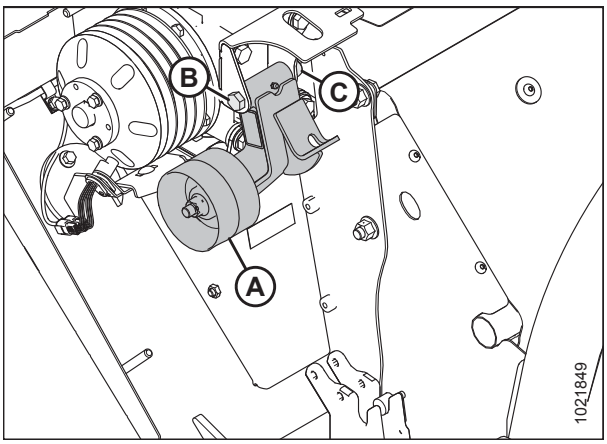


Figure 4.161: Tensioner

3. Install spring (A) into forward hole (B) in frame.
4. Install eyebolt (C) onto spring (A) and tensioner (D). Secure eyebolt (C) to tensioner (D) with hardened washer (E), and two M10 nuts (F), and straight pin (G).

   NOTE:

   Install conditioner drive belt after reattaching header to adapter.

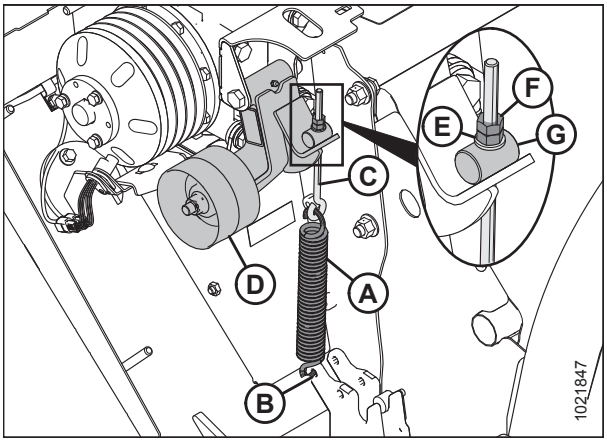


Figure 4.162: Tensioner

4.7.8 Shield (No Conditioner)

Removing Shield (No Conditioner)

Follow these steps to remove the shielding installed on a disc header configured without a conditioner:

1. Disconnect and remove the header from the windrower. On both ends of the header, remove four M16 hex head bolts (A), nuts, and flat washers securing the shield (B) to the panel on header (C).

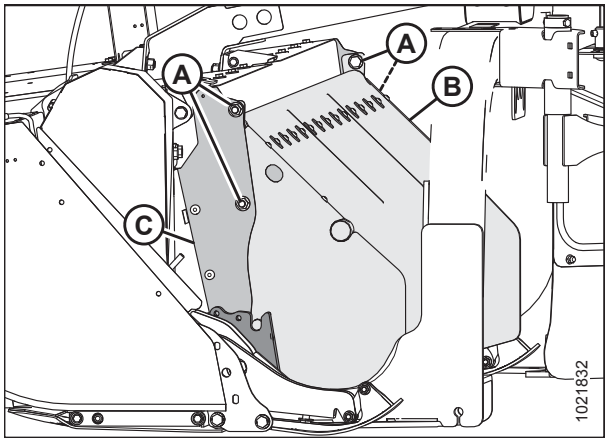


Figure 4.163: Header Side View (Left Side Shown, Right Opposite)

2. Lift the shield (A) until pins (B) disengage from slots in support (C) and shield on panel (D).

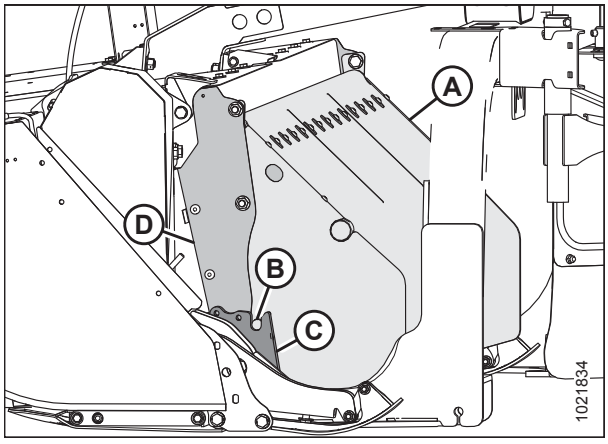


Figure 4.164: Header Side View (Left Side Shown, Right Opposite)

Installing Shield (No Conditioner)

Follow these steps to install the shielding on a self-propelled disc header configured without a conditioner:

1. Position shielding (A) until pins (B) engage the slots in cutterbar support (C) and bolt holes (D) align with panel (E).

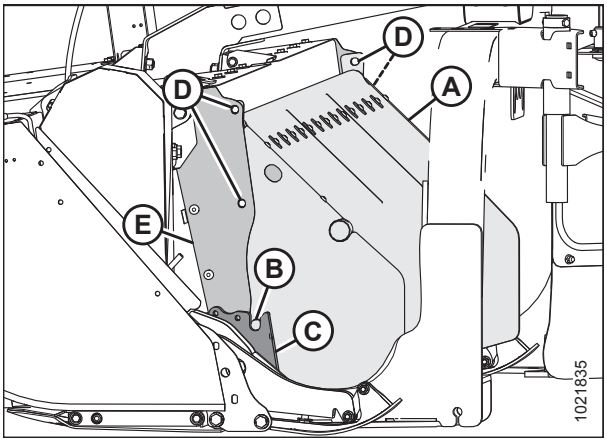


Figure 4.165: Header Left Side

2. Install four M16 hex head bolts (A), nuts, and flat washers to secure shield (B) to the panel (C). Ensure bolt heads face inboard.

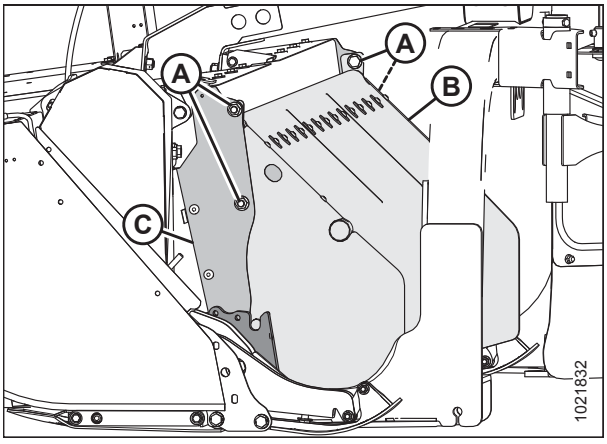


Figure 4.166: Header Left Side

5 Optional Kits

The following kits are available through your MacDon Dealer. The Dealer will require the bundle number for pricing and availability.

5.1 Options and Attachments

5.1.1 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the self-propelled disc header for clean crop dividing and cutterbar entry in tall crops. The kit includes left and right dividers and attachment hardware.

MD #B5800

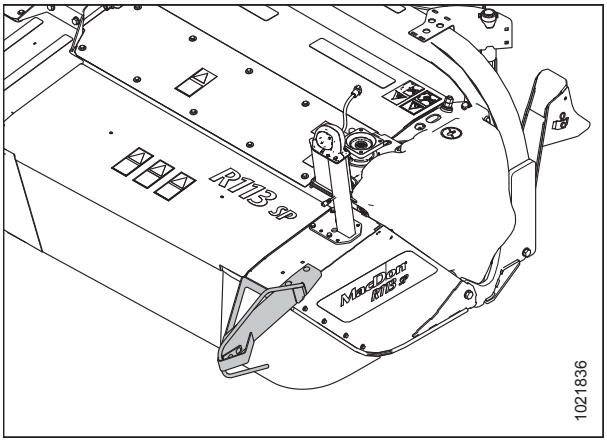


Figure 5.1: Left Side Tall Crop Divider

5.1.2 No Roll Conditioner Kit

The R113 self-propelled disc header can be operated without a roll conditioner installed. Kit includes required rear windrow shielding and curtain for operating header without a roll conditioner.

MD #B5818

5.1.3 Polyurethane Roll Conditioner Kit

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. A polyurethane roll conditioner is better suited for crushing stems while providing reduced crimping and is recommended for alfalfa, clover, legumes, and similar crops. The kit includes the conditioner and installation hardware.

MD #B5754

5.1.4 Steel Roll Conditioner Kit

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. Steel rolls with a larger gap (up to 25 mm [1 in.]) may be desirable for thick stemmed cane-type crops; however, too large a gap may cause feeding problems. Steel rolls are recommended for these types of situations. The kit includes the conditioner and installation hardware.

MD #B5755

6 Troubleshooting

6.1 Performance Problems

Symptom	Problem	Solution	Refer to
Cutterbar plugging	Dull, bent, or badly worn discblades	Replace discblades.	• *Removing Discblades, page 129* • *Installing Discblades, page 130*
	Build-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	• *3.10 Cutting Height, page 71* • Refer to windrower operator's manual
	Conditioner drive belt slipping	Adjust conditioner drive belt tension.	*4.7.1 Conditioner Drive Belt, page 157*
Ragged or uneven cutting of crop	Header angle too flat for guards to pick up down crop	Increase header angle.	*3.10 Cutting Height, page 71*
	Downed crop	Adjust header angle to cut closer to ground.	
	Header float too light, causing bouncing	Adjust to heavier float setting.	Refer to windrower operator's manual
	Excessive ground speed	Reduce ground speed.	—
Strips of uncut crop left on field	Dull, bent, or badly worn discblades	Replace discblades.	• *Removing Discblades, page 129* • *Installing Discblades, page 130*
	Build-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	• *3.10 Cutting Height, page 71* • Refer to windrower operator's manual
	Excessive header speed	Reduce header disc speed.	—
	Foreign object on cutterbar	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	*4.5.1 Cutterbar Discs, page 112*
	Disc not turning	Replace spindle key.	*Installing Cutterbar Spindles, page 119*

Symptom	Problem	Solution	Refer to
Strips of uncut crop left on field (continued)	Ground speed too slow	Increase ground speed.	—
Conditioner rolls plugging	Ground speed too fast	Reduce ground speed.	—
	Roll gap too large for proper feeding	Decrease roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
	Roll gap too small in thick-stemmed cane-type crops	Increase roll gap.	
	Swath baffle set too low	Raise swath baffle.	*3.17 Roll Conditioner, page 91*
	Roll speed too low	Increase disc speed.	—
	Foreign object between rolls	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	*4.5.1 Cutterbar Discs, page 112*
	Cutting height too low	Decrease header angle to raise cutting height.	*3.10 Cutting Height, page 71*
	Backing into windrow	Raise header before backing up.	—
	Rolls improperly timed	Adjust roll timing.	*3.16.2 Adjusting Roll Timing, page 88*
Uneven formation and bunching of windrow	Rear deflector bypassing or dragging crop	Adjust rear deflector for proper crop control.	*3.17.2 Positioning Forming Shield Rear Baffle: Roll Conditioner, page 92*
	Forming shields improperly adjusted	Adjust roll conditioner forming shields.	• *3.17.1 Positioning Forming Shield Side Deflectors: Roll Conditioner, page 91* • *3.17.2 Positioning Forming Shield Rear Baffle: Roll Conditioner, page 92*
	Roll gap too large	Adjust roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
	Conditioner rolls running too slow	Maintain rated header speed.	Refer to windrower operator's manual

Symptom	Problem	Solution	Refer to
Uneven windrow formation in light crop	Uneven feeding	Reduce header speed.	Refer to windrower operator's manual
Plugging behind end hourglass deflectors	Ground speed too slow	Increase ground speed.	—
Not cutting short enough in down crop	Ground speed too fast	Reduce ground speed.	—
	Broken, bent, or dull blades	Replace blades or turn blades over.	• *Removing Discblades, page 129* • *Installing Discblades, page 130*
	Cutting height too high	Adjust header angle steeper to lower cutting height if field conditions allow.	*3.10 Cutting Height, page 71*
Material being pulled out by roots when cutting. Tall crop leaning into machine	Crop in conditioner rolls before crop is cut	Increase roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
Damaged leaves and broken stems	Insufficient roll gap		
	Roll timing off	Check roll timing and adjust if necessary.	• *3.16.1 Checking Roll Timing, page 88* • *3.16.2 Adjusting Roll Timing, page 88*
Cutting height varies from one side to the other	Float not properly balanced	Adjust header float.	Refer to windrower operator's manual
Slow crop drying	Crop is bunched in windrow	Adjust forming shields/ baffle.	• *3.17.1 Positioning Forming Shield Side Deflectors: Roll Conditioner, page 91* • *3.17.2 Positioning Forming Shield Rear Baffle: Roll Conditioner, page 92*
	Rolls not crimping crop sufficiently	Decrease roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*

Symptom	Problem	Solution	Refer to
Excessive drying or bleaching of crop	Excessive crimping	Increase roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
	Crop is spread too wide in windrow	Adjust forming shields.	• *3.17.1 Positioning Forming Shield Side Deflectors: Roll Conditioner, page 91* • *3.17.2 Positioning Forming Shield Rear Baffle: Roll Conditioner, page 92*
Poorly formed or bunchy windrows	Forming shields not properly positioned		

6.2 Mechanical Problems

Symptom	Problem	Solution	Refer to
Excessive noises	Bent discblade	Replace blade.	• *Removing Discblades, page 129* • *Installing Discblades, page 130*
	Conditioner roll timing off	Check roll timing and adjust if necessary.	• *3.16.1 Checking Roll Timing, page 88* • *3.16.2 Adjusting Roll Timing, page 88*
	Bent drum deflector	Replace drum.	*4.5.7 Drums, page 136*
	Conditioner roll gap too small	Check gap and adjust if necessary.	• *3.14.1 Checking Roll Gap, page 84* • *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
Excessive vibration or noise in header	Mud deposits on conditioner rolls	Clean rolls.	—
	Conditioner rolls contacting each other	Increase roll gap.	• *3.14.2 Adjusting Roll Gap: Polyurethane Rolls, page 85* • *3.14.3 Adjusting Roll Gap: Steel Rolls, page 86*
		Check roll timing.	*3.16.1 Checking Roll Timing, page 88*
Excessive heat in cutterbar	Incorrect level of lubricant in cutterbar—either too little or too much	Drain lubricant and refill with specified amount.	*3.12.2 Draining Cutterbar, page 75*
Frequent blade damage	Mud on cutterbar	Remove mud from cutterbar. Do **NOT** allow mud to dry on cutterbar.	—
	Spindle bearing failure	Replace spindle bearing.	• *Removing Cutterbar Spindles, page 116* • *Installing Cutterbar Spindles, page 119*

Symptom	Problem	Solution	Refer to
Frequent blade damage (continued)	Material wrapped around spindle	Remove disc and remove material.	• *Removing Discblades, page 129* • *Installing Discblades, page 130*
	Cutting too low in rocky field conditions	Decrease header angle: increase flotation.	*3.10 Cutting Height, page 71* and refer to windrower operator's manual
	Header float set too heavy	Increase flotation.	Refer to windrower operator's manual
	Ground speed too high in rocky field conditions. At high ground speed, header tends to dig rocks from ground instead of floating over them	Reduce ground speed.	—
	Discblades incorrectly mounted	Check all blade mounting hardware and ensure blades are free to move.	*Inspecting Discblades, page 126*
Excessive wear of cutting components	Header angle too steep	Reduce header angle.	*3.10 Cutting Height, page 71*
	Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—
	Mud on cutterbar	Remove mud from cutterbar. Do **NOT** allow mud to dry on cutterbar.	
Machine pulling to one side	Header dragging on one end and pulling to that side	Adjust header flotation on both ends.	Refer to windrower operator's manual
Breakage of conditioner roll timing belt	Belt not in proper groove in pulley	Move belt to proper groove.	*4.7.1 Conditioner Drive Belt, page 157*
	Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	*Inspecting Conditioner Drive Belt, page 157*
	Belt pulleys and idlers misaligned	Align pulleys and idler.	See MacDon Dealer
Conditioner roll does not rotate	Faulty drive belt	Check drive belt pulleys.	*Inspecting Conditioner Drive Belt, page 157*
Disc does not turn when engaging header	Hoses not connected	Connect hoses.	*3.5 Attaching Header to Windrower, page 28*
	Poor electrical connection at pump solenoid	Check connection at windrower.	Refer to windrower operator's manual

Symptom	Problem	Solution	Refer to
Cutterbar discs do not turn when engaging header	Faulty header drive 90-degree gearbox	Check gearbox.	• *4.6 Header Drive 90-Degree Gearbox, page 156* • *4.6.1 Checking and Adding Lubricant, page 156*
Header slows when going uphill	Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	Refer to windrower operator's manual
Header runs while unloaded, but slows or stops when starting to cut	Defective hydraulic motor	Repair/replace hydraulic motor.	See MacDon Dealer
	Defective hydraulic pump in windrower	Repair/replace pump.	
	Defective relief valve in windrower	Repair/replace relief valve.	
	Cold oil in hydraulic drive system	Reduce ground speed until oil reaches operating temperature.	—

7 Reference

7.1 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

Jam Nuts

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by f=0.65.

Self-Tapping Screws

Standard torque is to be used (not to be used on critical or structurally important joints).

7.1.1 Metric Bolt Specifications

Table 7.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.4	1.6	*13	*14
3.5-0.6	2.2	2.5	*20	*22
4-0.7	3.3	3.7	*29	*32
5-0.8	6.7	7.4	*59	*66
6-1.0	11.4	12.6	*101	*112
8-1.25	28	30	20	23
10-1.5	55	60	40	45
12-1.75	95	105	70	78
14-2.0	152	168	113	124
16-2.0	236	261	175	193
20-2.5	460	509	341	377
24-3.0	796	879	589	651

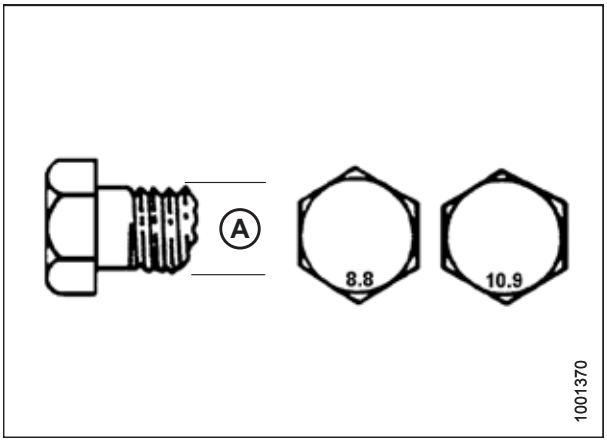


Figure 7.1: Bolt Grades

Table 7.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5	314	347	233	257
24-3.0	543	600	402	444

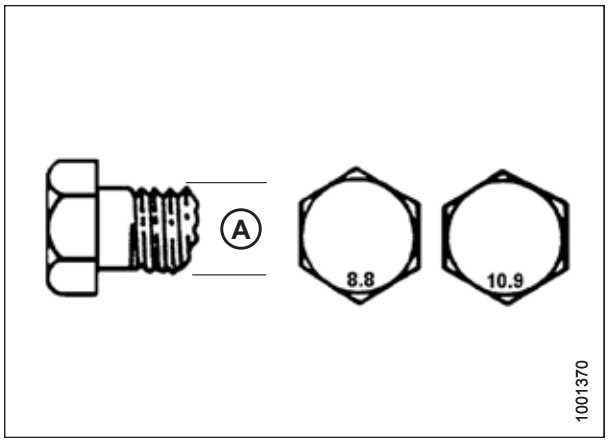


Figure 7.2: Bolt Grades

Table 7.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.8	2	*18	*19
3.5-0.6	2.8	3.1	*27	*30
4-0.7	4.2	4.6	*41	*45
5-0.8	8.4	9.3	*82	*91
6-1.0	14.3	15.8	*140	*154
8-1.25	38	42	28	31
10-1.5	75	83	56	62
12-1.75	132	145	97	108
14-2.0	210	232	156	172
16-2.0	326	360	242	267
20-2.5	637	704	472	521
24-3.0	1101	1217	815	901

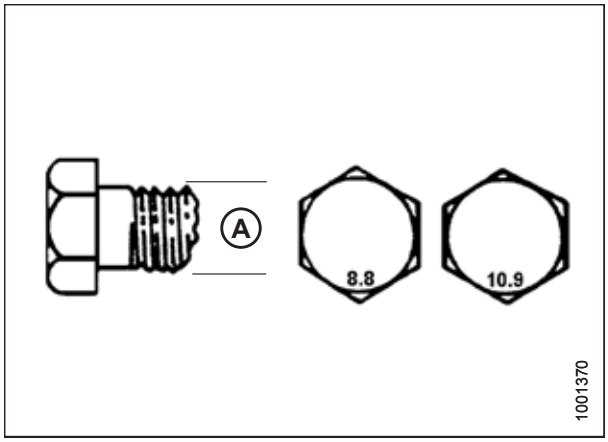


Figure 7.3: Bolt Grades

Table 7.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1.3	1.5	*12	*13
3.5-0.6	2.1	2.3	*19	*21
4-0.7	3.1	3.4	*28	*31
5-0.8	6.3	7	*56	*62
6-1.0	10.7	11.8	*95	*105
8-1.25	26	29	19	21
10-1.5	51	57	38	42
12-1.75	90	99	66	73
14-2.0	143	158	106	117
16-2.0	222	246	165	182
20-2.5	434	480	322	356
24-3.0	750	829	556	614

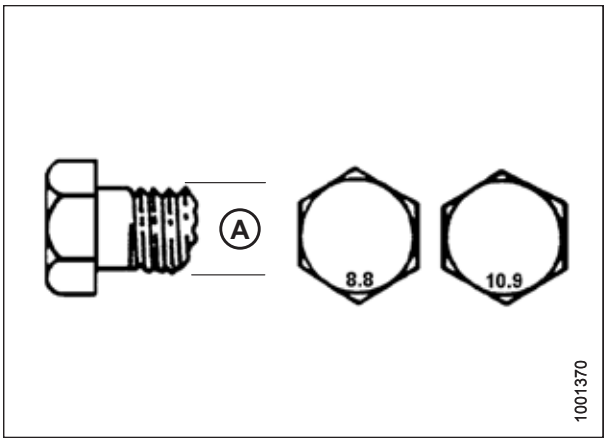


Figure 7.4: Bolt Grades

7.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 7.5 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	Nm	lbf·ft	Nm	lbf·ft
M3	–	–	–	1
M4	–	–	4	2.6
M5	–	–	8	5.5
M6	9	6	12	9
M8	20	14	28	20
M10	40	28	55	40
M12	70	52	100	73
M14	–	–	–	–
M16	–	–	–	–

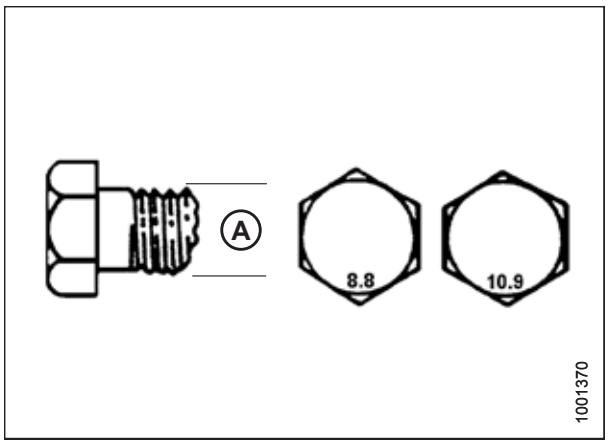


Figure 7.5: Bolt Grades

7.1.3 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

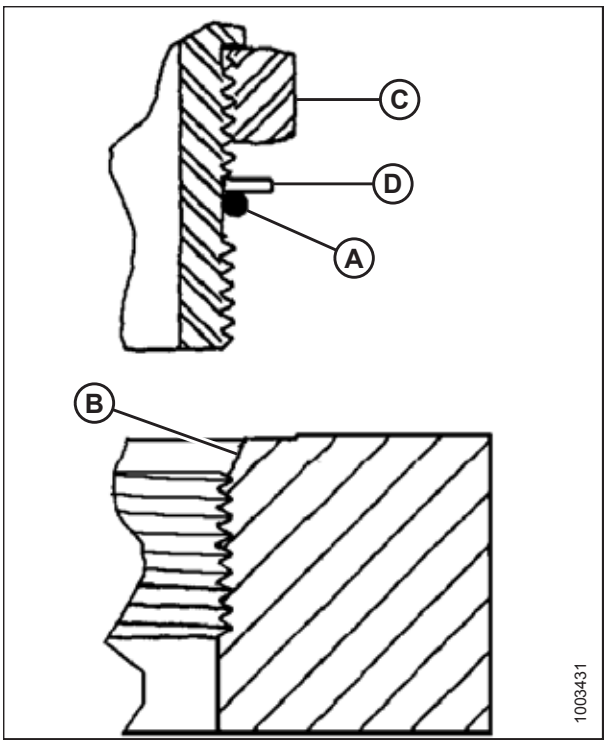


Figure 7.6: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).
8. Check final condition of fitting.

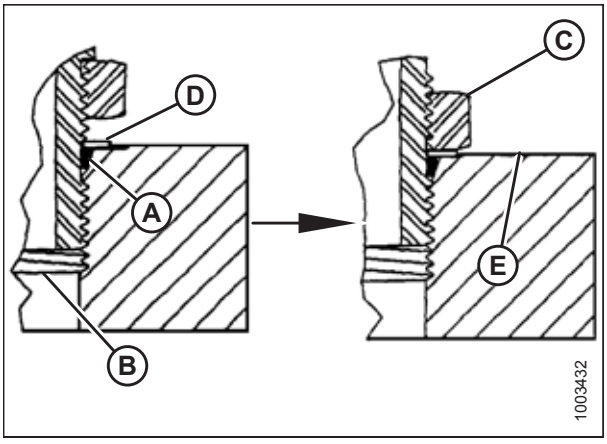


Figure 7.7: Hydraulic Fitting

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value[6]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1-1/16–12	120–132	88–97
-14	1-3/8–12	153–168	113–124
-16	1-5/16–12	176–193	130–142
-20	1-5/8–12	221–243	163–179
-24	1-7/8–12	270–298	199–220
-32	2-1/2–12	332–365	245–269

6. Torque values shown are based on lubricated connections as in reassembly.

7.1.4 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to values in Table *7.7, page 197*.
6. Check final condition of fitting.

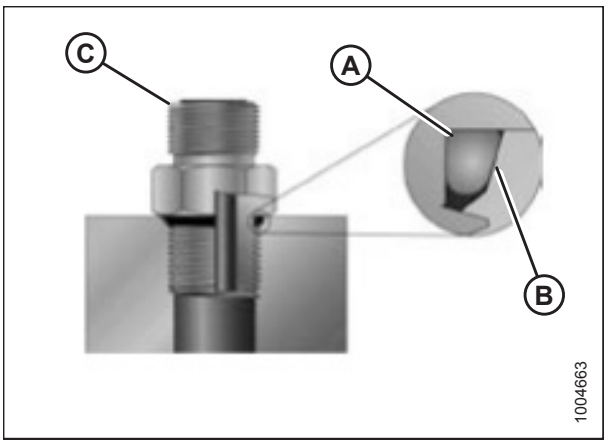


Figure 7.8: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value[7]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1-1/16–12	120–132	88–97
-14	1-3/8–12	153–168	113–124
-16	1-5/16–12	176–193	130–142
-20	1-5/8–12	221–243	163–179
-24	1-7/8–12	270–298	199–220
-32	2-1/2–12	332–365	245–269

7. Torque values shown are based on lubricated connections as in reassembly.

7.1.5 O-Ring Face Seal (ORFS) Hydraulic Fittings

1. Check components to ensure that sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.

Figure 7.9: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table *7.8, page 198*.

   NOTE:

   If applicable, hold hex on fitting body (E) to prevent rotation of fitting body and hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Check final condition of fitting.

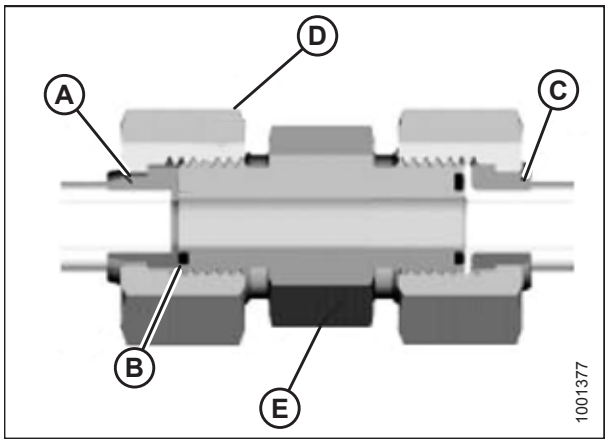


Figure 7.10: Hydraulic Fitting

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[8]	
			Nm	lbf·ft
-3	Note[9]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[9]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1-3/16	3/4	115–127	85–94

8. Torque values and angles shown are based on lubricated connection as in reassembly.
9. O-ring face seal type end not defined for this tube size.

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[10]	
			Nm	lbf·ft
-14	Note[9]	7/8	–	–
-16	1-7/16	1	150–165	111–122
-20	1-11/16	1-1/4	205–226	151–167
-24	1–2	1-1/2	315–347	232–256
-32	2-1/2	2	510–561	376–414

7.1.6 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table *7.9, page 199*. Make sure that tube end of a shaped connector (typically 45º or 90º) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

   NOTE:

   Overtorque failure of fittings may not be evident until fittings are disassembled.

Table 7.9 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended T.F.F.T.	Recommended F.F.F.T.
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

10. Torque values and angles shown are based on lubricated connection as in reassembly.

7.2 Conversion Chart

Table 7.10 Conversion Chart

Quantity	SI Units (Metric)		Factor	Inch-Pound Units	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectares	ha	x 2.4710 =	acres	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newtons	N	x 0.2248 =	pounds force	lbf
Length	millimeters	mm	x 0.0394 =	inch	in.
	meters	m	x 3.2808 =	foot	ft.
Power	kilowatts	kW	x 1.341 =	horsepower	hp
Pressure	kilopascals	kPa	x 0.145 =	pounds per square inch	psi
	megapascals	MPa	x 145.038 =		
	bar (Non-SI)	bar	x 14.5038		
Torque	Newton meters	Nm	x 0.7376 =	pound feet or foot pounds	lbf·ft
	Newton meters	Nm	x 8.8507 =	pound inches or inch pounds	lbf·in
Temperature	Celsius	˚C	(C˚ x 1.8) + 32 =	degrees Fahrenheit	˚F
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
	meters per second	m/s	x 3.2808 =	feet per second	ft/s
	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liters	L	x 0.2642 =	US gallons	US gal
	milliliters	ml	x 0.0338 =	ounces	oz.
	cubic centimeters	cm^3 or cc	x 0.061 =	cubic inches	$in.^3$
Weight	kilograms	kg	x 2.2046 =	pounds	lb.

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Recommended Lubricants

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

- Use clean containers to handle all lubricants.
- Store lubricants in an area protected from dust, moisture, and other contaminants.

IMPORTANT:

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of cutterbar components.

Lubricant	Specification	Description	Use	Capacities
Grease	SAE Multipurpose	High temperature extreme pressure (EP) performance with 1% maximum molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
		High temperature extreme pressure (EP) performance with 10% maximum molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
Gear Lubricant	SAE 80W-90	High thermal and oxidation stability API service class GL-5	Cutterbar	8 liters (8.5 qts [US])
	SAE 85W-140	Gear lubricant API service class GL-5	Conditioner roll timing gearbox	0.7 liters (0.75 qts [US])
	SAE 80W-140	Fully synthetic oil API GL-5 minimum, SAE J2360 preferred	Header drive 90-degree gearbox	1.85 liters (1.95 qts [US])

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