MacDon

A30-D and A40-D Pull-Type Mower Conditioners and Self-Propelled Auger Headers

Operator's Manual

169970 Revision A

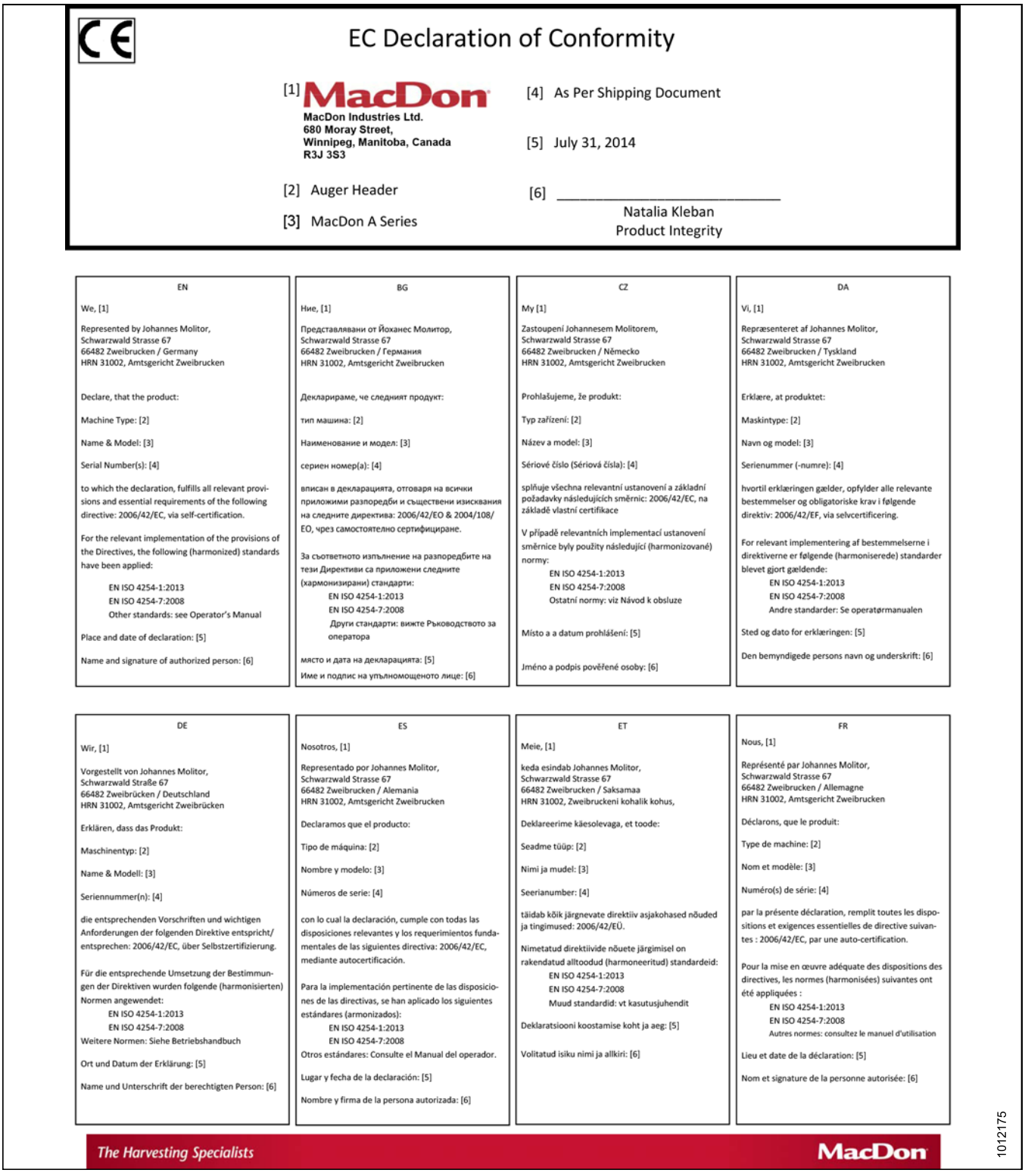
Original Instruction

The harvesting specialists.

MacDon A40-D Self-Propelled Auger Header and A30-D Pull-Type Mower Conditioner

Published: January, 2015

EC Declaration of Conformity



EC Declaration of Conformity

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

[2] Auger Header

[3] MacDon A Series

[4] As Per Shipping Document

[5] July 31, 2014

[6] _____
Natalia Kleban
Product Integrity

EN

We, [1]

Represented by Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Germany
HRN 31002, Amtsgericht Zweibrucken

Declare, that the product:

Machine Type: [2]

Name & Model: [3]

Serial Number(s): [4]

to which the declaration, fulfills all relevant provisions and essential requirements of the following directive: 2006/42/EC, via self-certification.

For the relevant implementation of the provisions of the Directives, the following (harmonized) standards have been applied:

EN ISO 4254-1:2013
EN ISO 4254-7:2008
Other standards: see Operator's Manual

Place and date of declaration: [5]

Name and signature of authorized person: [6]

BG

Ние, [1]

Представлявани от Йоханес Молитор,
Schwarzwald Strasse 67
66482 Zweibrucken / Германия
HRN 31002, Amtsgericht Zweibrucken

Декларираме, че следният продукт:

тип машина: [2]

Наименование и модел: [3]

сериен номер(а): [4]

вписан в декларацията, отговаря на всички приложими разпоредби и съществени изисквания на следните директива: 2006/42/ЕО & 2004/108/ЕО, чрез самостоятелно сертифициране.

За съответното изпълнение на разпоредбите на тези Директиви са приложени следните (хармонизирани) стандарти:
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Други стандарти: вижте Ръководството за оператора

място и дата на декларацията: [5]

Име и подпис на упълномощеното лице: [6]

CZ

My [1]

Zastoupení Johannesem Molitorem,
Schwarzwald Strasse 67
66482 Zweibrucken / Německo
HRN 31002, Amtsgericht Zweibrucken

Prohlašujeme, že produkt:

Typ zařízení: [2]

Název a model: [3]

Sériové číslo (Sériová čísla): [4]

splňuje všechna relevantní ustanovení a základní požadavky následujících směrnic: 2006/42/EC, na základě vlastní certifikace

V případě relevantních implementací ustanovení směrnice byly použity následující (harmonizované) normy:
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Ostatní normy: viz Návod k obsluze

Místo a a datum prohlášení: [5]

Jméno a podpis pověřené osoby: [6]

DA

Vi, [1]

Repræsenteret af Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Tyskland
HRN 31002, Amtsgericht Zweibrucken

Erklære, at produktet:

Maskintype: [2]

Navn og model: [3]

Serienummer (-numre): [4]

hvortil erklæringen gælder, opfylder alle relevante bestemmelser og obligatoriske krav i følgende direktiv: 2006/42/EF, via selvcertificering.

For relevant implementering af bestemmelserne i direktiverne er følgende (harmoniserede) standarder blevet gjort gældende:
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Andre standarder: Se operatørmanualen

Sted og dato for erklæringen: [5]

Den bemyndigede persons navn og underskrift: [6]

DE

Wir, [1]

Vorgestellt von Johannes Molitor,
Schwarzwald Straße 67
66482 Zweibrücken / Deutschland
HRN 31002, Amtsgericht Zweibrücken

Erklären, dass das Produkt:

Maschinentyp: [2]

Name & Modell: [3]

Seriennummer(n): [4]

die entsprechenden Vorschriften und wichtigen Anforderungen der folgenden Direktive entspricht/entsprechen: 2006/42/EC, über Selbstzertifizierung.

Für die entsprechende Umsetzung der Bestimmungen der Direktiven wurden folgende (harmonisierten) Normen angewendet:
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Weitere Normen: Siehe Betriebshandbuch

Ort und Datum der Erklärung: [5]

Name und Unterschrift der berechtigten Person: [6]

ES

Nosotros, [1]

Representado por Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Alemania
HRN 31002, Amtsgericht Zweibrucken

Declaramos que el producto:

Tipo de máquina: [2]

Nombre y modelo: [3]

Números de serie: [4]

con lo cual la declaración, cumple con todas las disposiciones relevantes y los requerimientos fundamentales de las siguientes directiva: 2006/42/EC, mediante autocertificación.

Para la implementación pertinente de las disposiciones de las directivas, se han aplicado los siguientes estándares (armonizados):
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Otros estándares: Consulte el Manual del operador.

Lugar y fecha de la declaración: [5]

Nombre y firma de la persona autorizada: [6]

ET

Meie, [1]

keda esindab Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Saksamaa
HRN 31002, Zweibruckeni kohalik kohus,

Deklareerime käesolevaga, et toode:

Seadme tüüp: [2]

Nimi ja mudel: [3]

Seerianumber: [4]

täidab kõik järgnevate direktiiv asjakohased nõuded ja tingimused: 2006/42/EÜ.

Nimetatud direktiivide nõuete järgimisel on rakendatud alltoodud (harmoneeritud) standardeid:
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Muud standardid: vt kasutusjuhendit

Deklaratsiooni koostamise koht ja aeg: [5]

Volitatud isiku nimi ja allkiri: [6]

FR

Nous, [1]

Représenté par Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Allemagne
HRN 31002, Amtsgericht Zweibrucken

Déclarons, que le produit:

Type de machine: [2]

Nom et modèle: [3]

Numéro(s) de série: [4]

par la présente déclaration, remplit toutes les dispositions et exigences essentielles de directive suivantes : 2006/42/EC, par une auto-certification.

Pour la mise en œuvre adéquate des dispositions des directives, les normes (harmonisées) suivantes ont été appliquées :
EN ISO 4254-1:2013
EN ISO 4254-7:2008
Autres normes: consultez le manuel d'utilisation

Lieu et date de la déclaration: [5]

Nom et signature de la personne autorisée: [6]

The Harvesting Specialists MacDon

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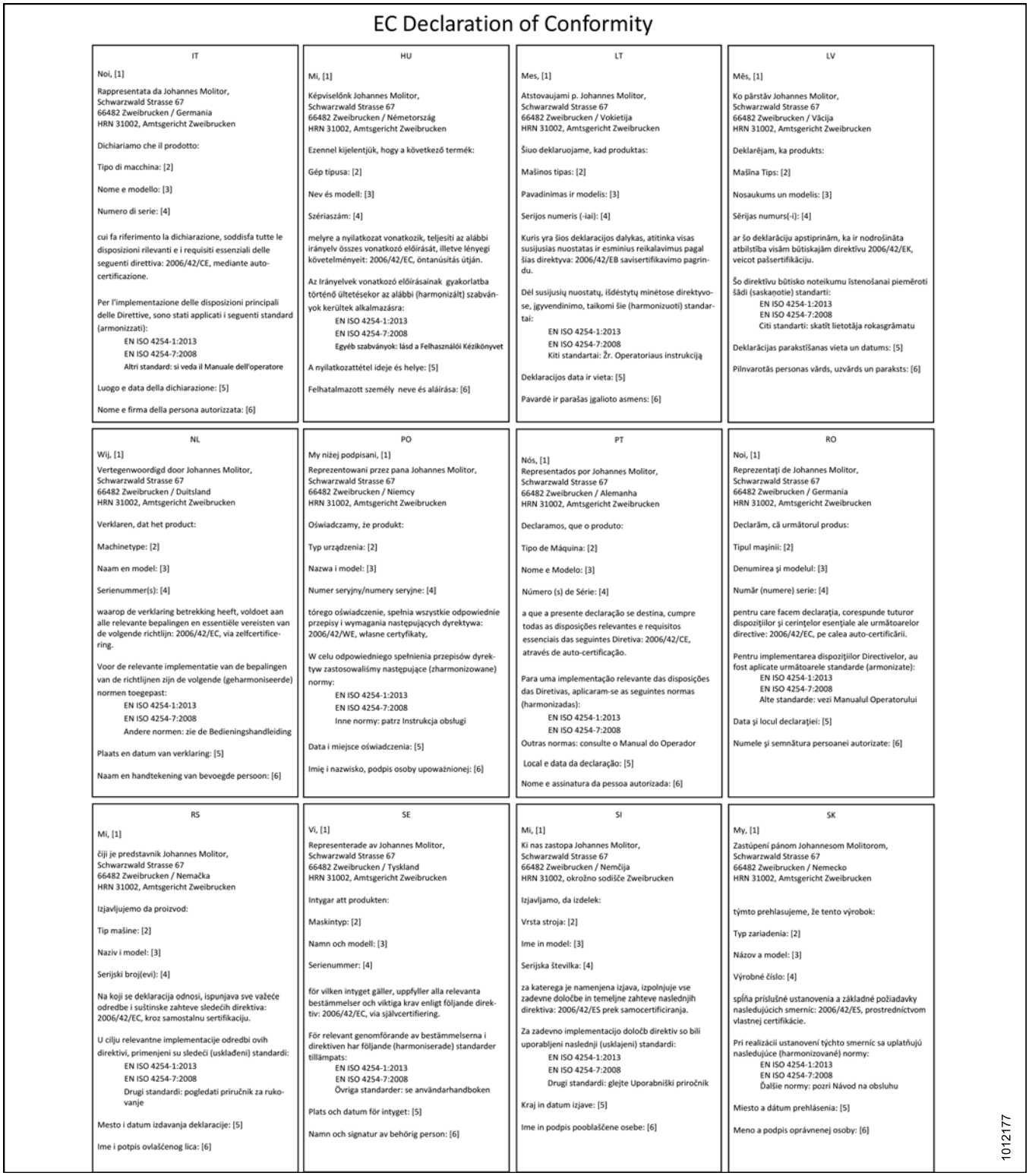
Figure 1: EC Declaration of Conformity Page 1



EC Declaration of Conformity

IT

Noi, [1]

Rappresentata da Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Germania
HRN 31002, Amtsgericht Zweibrucken

Dichiariamo che il prodotto:

Tipo di macchina: [2]

Nome e modello: [3]

Numero di serie: [4]

cui fa riferimento la dichiarazione, soddisfa tutte le disposizioni rilevanti e i requisiti essenziali delle seguenti direttiva: 2006/42/CE, mediante auto-certificazione.

Per l'implementazione delle disposizioni principali delle Direttive, sono stati applicati i seguenti standard (armonizzati):

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Altri standard: si veda il Manuale dell'operatore

Luogo e data della dichiarazione: [5]

Nome e firma della persona autorizzata: [6]

HU

Mi, [1]

Képviselőnk Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Németország
HRN 31002, Amtsgericht Zweibrucken

Ezennel kijelentjük, hogy a következő termék:

Gép típusa: [2]

Nev és modell: [3]

Szériaszám: [4]

melyre a nyilatkozat vonatkozik, teljesíti az alábbi irányelv összes vonatkozó előírását, illetve lényegi követelményeit: 2006/42/EC, öntanúsítás útján.

Az Irányelvek vonatkozó előírásainak gyakorlatba történő ültetésekor az alábbi (harmonizált) szabványok kerültek alkalmazásra:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Egyéb szabványok: lásd a Felhasználói Kézikönyvet

A nyilatkozattétel ideje és helye: [5]

Felhatalmazott személy neve és aláírása: [6]

LT

Mes, [1]

Atstovaujami p. Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Vokietija
HRN 31002, Amtsgericht Zweibrucken

Šiuo deklaruojame, kad produktas:

Mašinos tipas: [2]

Pavadinimas ir modelis: [3]

Serijos numeris (-iai): [4]

Kuris yra šios deklaracijos dalykas, atitinka visas susijusias nuostatas ir esminius reikalavimus pagal šias direktyva: 2006/42/EB savisertifikavimo pagrindu.

Dėl susijusių nuostatų, išdėstytų minėtose direktyvose, įgyvendinimo, taikomi šie (harmonizuoti) standartai:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Kiti standartai: Žr. Operatoriaus instrukciją

Deklaracijos data ir vieta: [5]

Pavardė ir parašas įgalioto asmens: [6]

LV

Mēs, [1]

Ko pārstāv Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Vācija
HRN 31002, Amtsgericht Zweibrucken

Deklarējam, ka produkts:

Mašīna Tips: [2]

Nosaukums un modelis: [3]

Sērijas numurs(-i): [4]

ar šo deklarāciju apstiprinām, ka ir nodrošināta atbilstība visām būtiskajām direktīvu 2006/42/EK, veicot pašsertifikāciju.

Šo direktīvu būtisko noteikumu īstenošanai pieņēroti šādi (saskaņotie) standarti:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Citi standarti: skatīt lietotāja rokasgrāmatu

Deklarācijas parakstīšanas vieta un datums: [5]

Pilnvarotās personas vārds, uzvārds un paraksts: [6]

NL

Wij, [1]

Vertegenwoordigd door Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Duitsland
HRN 31002, Amtsgericht Zweibrucken

Verklaren, dat het product:

Machinetype: [2]

Naam en model: [3]

Serienummer(s): [4]

waarop de verklaring betrekking heeft, voldoet aan alle relevante bepalingen en essentiële vereisten van de volgende richtlijn: 2006/42/EC, via zelfcertificering.

Voor de relevante implementatie van de bepalingen van de richtlijnen zijn de volgende (geharmoniseerde) normen toegepast:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Andere normen: zie de Bedieningshandleiding

Plaats en datum van verklaring: [5]

Naam en handtekening van bevoegde persoon: [6]

PO

My niżej podpisani, [1]

Reprezentowani przez pana Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Niemcy
HRN 31002, Amtsgericht Zweibrucken

Oświadczamy, że produkt:

Typ urządzenia: [2]

Nazwa i model: [3]

Numer seryjny/numery seryjne: [4]

tórego oświadczenie, spełnia wszystkie odpowiednie przepisy i wymagania następujących dyrektywa: 2006/42/WE, własne certyfikaty,

W celu odpowiedniego spełnienia przepisów dyrektyw zastosowaliśmy następujące (zharmonizowane) normy:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Inne normy: patrz Instrukcja obsługi

Data i miejsce oświadczenia: [5]

Imię i nazwisko, podpis osoby upoważnionej: [6]

PT

Nós, [1]
Representados por Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Alemanha
HRN 31002, Amtsgericht Zweibrucken

Declaramos, que o produto:

Tipo de Máquina: [2]

Nome e Modelo: [3]

Número (s) de Série: [4]

a que a presente declaração se destina, cumpre todas as disposições relevantes e requisitos essenciais das seguintes Diretiva: 2006/42/CE, através de auto-certificação.

Para uma implementação relevante das disposições das Diretivas, aplicaram-se as seguintes normas (harmonizadas):

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008

Outras normas: consulte o Manual do Operador

Local e data da declaração: [5]

Nome e assinatura da pessoa autorizada: [6]

RO

Noi, [1]

Reprezentați de Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Germania
HRN 31002, Amtsgericht Zweibrucken

Declarăm, că următorul produs:

Tipul mașinii: [2]

Denumirea și modelul: [3]

Număr (numere) serie: [4]

pentru care facem declarația, corespunde tuturor dispozițiilor și cerințelor esențiale ale următoarelor directive: 2006/42/EC, pe calea auto-certificării.

Pentru implementarea dispozițiilor Directivelor, au fost aplicate următoarele standarde (armonizate):

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Alte standarde: vezi Manualul Operatorului

Data și locul declarației: [5]

Numele și semnătura persoanei autorizate: [6]

RS

Mi, [1]

čiji je predstavnik Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Nemačka
HRN 31002, Amtsgericht Zweibrucken

Izjavljujemo da proizvod:

Tip mašine: [2]

Naziv i model: [3]

Serijski broj(evi): [4]

Na koji se deklaracija odnosi, ispunjava sve važeće odredbe i suštinske zahteve sledećih direktiva: 2006/42/EC, kroz samostalnu sertifikaciju.

U cilju relevantne implementacije odredbi ovih direktivi, primenjeni su sledeći (usklađeni) standardi:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Drugi standardi: pogledati priručnik za rukovanje

Mesto i datum izdavanja deklaracije: [5]

Ime i potpis ovlašćenog lica: [6]

SE

Vi, [1]

Representerade av Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Tyskland
HRN 31002, Amtsgericht Zweibrucken

Intygar att produkten:

Maskintyp: [2]

Namn och modell: [3]

Serienummer: [4]

för vilken intyget gäller, uppfyller alla relevanta bestämmelser och viktiga krav enligt följande direktiv: 2006/42/EC, via självcertifiering.

För relevant genomförande av bestämmelserna i direktiven har följande (harmoniserade) standarder tillämpats:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Övriga standarder: se användarhandboken

Plats och datum för intyget: [5]

Namn och signatur av behörig person: [6]

SI

Mi, [1]

Ki nas zastopa Johannes Molitor,
Schwarzwald Strasse 67
66482 Zweibrucken / Nemčija
HRN 31002, okrožno sodišče Zweibrucken

Izjavljamo, da izdelek:

Vrsta stroja: [2]

Ime in model: [3]

Serijska številka: [4]

za katerega je namenjena izjava, izpolnjuje vse zadevne določbe in temeljne zahteve naslednjih direktiva: 2006/42/ES prek samocertificiranja.

Za zadevno implementacijo določb direktiv so bili uporabljeni naslednji (usklajeni) standardi:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Drugi standardi: glejte Uporabniški priročnik

Kraj in datum izjave: [5]

Ime in podpis pooblaščene osebe: [6]

SK

My, [1]

Zastúpení pánom Johannesom Molitorom,
Schwarzwald Strasse 67
66482 Zweibrucken / Nemecko
HRN 31002, Amtsgericht Zweibrucken

týmto prehlasujeme, že tento výrobok:

Typ zariadenia: [2]

Názov a model: [3]

Výrobné číslo: [4]

spĺňa príslušné ustanovenia a základné požiadavky nasledujúcich smerníc: 2006/42/ES, prostredníctvom vlastnej certifikácie.

Pri realizácii ustanovení týchto smerníc sa uplatňujú nasledujúce (harmonizované) normy:

- EN ISO 4254-1:2013
- EN ISO 4254-7:2008
- Ďalšie normy: pozri Návod na obsluhu

Miesto a dátum prehlásenia: [5]

Meno a podpis oprávnenej osoby: [6]

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Figure 2: EC Declaration of Conformity Page 2

Introduction

This Operator's Manual describes the operating and maintenance procedures for MacDon model A30-D Pull-Type Mower Conditioners and A40-D Self-Propelled Auger Headers, including a Grass Seed version.

These auger headers are designed to cut, condition, and lay windrows in a wide variety of grasses and hay crops. The double-knife feature expands the operational envelope, especially in heavier crops.

Model	Description	Configuration	Knife	Size (ft.)	Features
A30-D	Auger header with conditioner	Pull-Type	Double	14, 16, and 18	Mechanical drive
A40-D	Auger header with conditioner	Self-Propelled only	Double	14, 16, and 18	Separate hydraulic auger, knife, and reel drives, grass seed option

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

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

CAREFULLY READ THE INFORMATION PROVIDED IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE OR MAINTAIN AN A30-D MOWER CONDITIONER OR AN A40-D AUGER HEADER.

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

NOTE:
A Russian translation of this manual (MD #169339) can be ordered from MacDon, downloaded from the MacDon Dealer Portal (*https://portal.macdon.com*) (login required), or downloaded from the MacDon international website (*http://www.macdon.com/world*).

Model and Serial Number

Record the model number, serial number, and model year of the header and the articulated power turn (APT) in the space below. The header serial number plate is located on the top of the left-hand end frame (A).

Header Model Number: _____

Header Serial Number: _____

Year: _____

(If 2015, indicate early-build or later-build unit: _____)

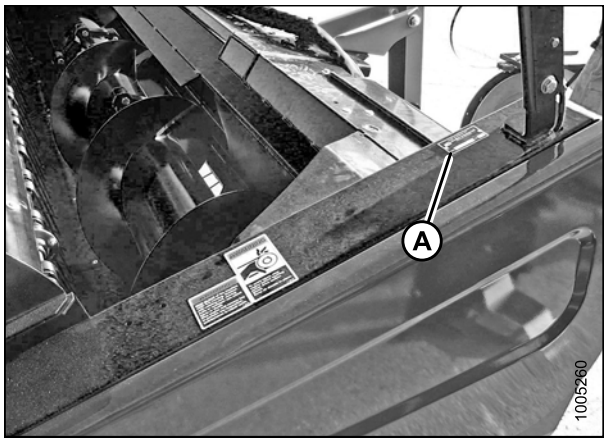


Figure 3: Header Serial Number Plate Location

NOTE:
Early-build 2015 model A40-D SP windrower headers have a round reel motor (as do 2014 and earlier model year units). Later-build 2015 models have a square-shaped reel motor. For a visual, refer to *2.2.2 A40-D, page 27*.

APT Serial Number (Pull-Type):

_____

The APT Serial Number plate is located at the top aft end of the APT (A).

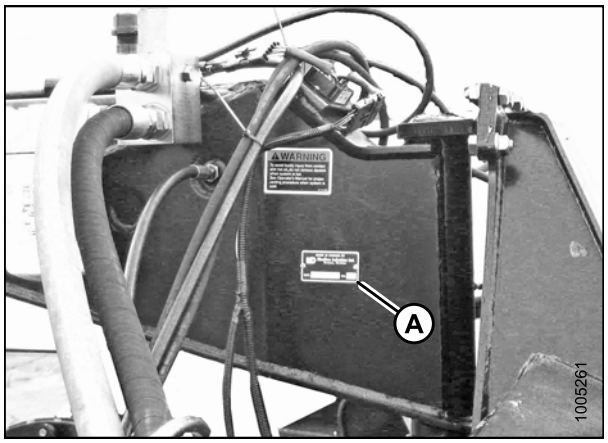


Figure 4: APT Serial Number Plate Location

PTO Speed:

- 540 rpm [____]
- 1000 rpm [____]

List of Revisions

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

Summary of Change	Location
Revised EC Declaration of Conformity	*EC Declaration of Conformity, page i*
Updated Introduction page to confirm that all A30-D models are equipped with mechanical drive (standard); that all manuals are accessible from the MacDon public and dealer websites, and added Part Number for Russian-language version of this publication.	*Introduction, page iii*
Updated product specifications.	*2.3 Product Specifications, page 29*
Updated safety sign (decal) location sections	*1 Safety, page 1*
Updated Preparing Mower Conditioner for Transport section for safety sign locations for Pull-Type Transport Lock Pin MD #171298.	
Changed amber light orientation when transporting A40-D header with a windrower.	*4.3 Transporting A40-D Header with Windrower, page 133*
Organized Operating Procedures into one section for the A30-D Pull-Type Mower Conditioner, and one section for the A40-D SP Windrower Header.	*3 Operation: A30-D Pull-Type Mower Conditioner, page 33* *4 Operation: A40-D Self-Propelled Mower Conditioner, page 101*
Updated Recommended Operating Settings Table.	*3.8 Recommended Operating Settings, page 81*
Grouped settings that affect operating performance into a new section called Operating Variables.	*3.7 Operating Variables for A30-D, page 56*, or *4.5 Operating Variables for A40-D, page 135*

Summary of Change	Location
Added illustrations and procedure for routing hoses for early-build 2015, 2014 and earlier A40-D units. These units have a round-shaped reel motor.	*4.1.6 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D for use on M100, M105 and M205 Windrowers Only), page 122*
Added illustrations and procedure for routing hoses later-build 2015 units. These units have a square-shaped reel motor.	*4.1.7 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only), page 124*
Changed procedure for re-routing the reverser valve jumper hose when converting from a draper header (with conditioner) to auger header for use with M150, M155, or M200 windrowers only.	*4.1.5 Configuring Reverser Valve Jumper Hose, page 121*,
Updated illustrations and procedure for routing hoses at the reel motor.	*Removing Hydraulic Reel – A40-D 2014 and Earlier* *Removing Hydraulic Reel – A40-D 2015 and Forward* *Installing Hydraulic Reel – A40-D 2014 and Prior* *Installing Hydraulic Reel – A40-D 2015 and Later*
A30-D reel speed should be set to match ground speed or about 10% faster.	*3.7.3 Setting Reel Speed, page 58*
A40-D reel speed settings were changed for M155,M150 to 15–85 rpm, and for M100, M105, M200 and M205 to 50–85 rpm.	*4.5.3 Adjusting Reel Speed, page 136*
Roll gap determines how much the crop is conditioned. When and why to reduce or increase roll gap.	*3.7.11 Adjusting Conditioner Roll Gap, page 74*
Changed skid shoes to new standard configuration for A30-D and A40-D models.	A30-D: *3.7.6 Setting Cutting Height, page 69* A40-D: *4.5.8 Setting Cutting Height, page 144*
Changed header float references to float. Added more detail regarding setting float for your field and crop conditions.	Throughout the publication

Summary of Change	Location
Revised Replacing Guard section for pointed guards.	*Replacing Guards, page 212*
A40-D Grass Seed Special section expanded, 7-bat reel is standard, and new tee-fitting and coupler added on reel case drain hose for later-build 2015 units.	*4.8 Grass Seed Special A40-D, page 155*
All references to articulating power tongue (APT) changed to articulated power turn (APT)	Throughout the publication

1 Safety

1.1 Safety Alert Symbols

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

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 the protective clothing and personal safety devices that **COULD** be necessary for the job at hand. Don't take chances. 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
- 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.

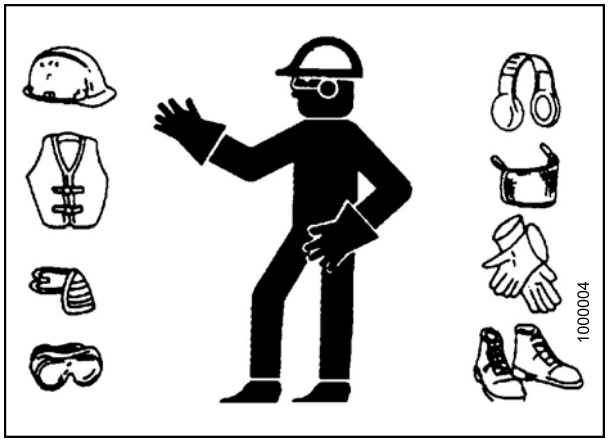


Figure 1.2: Safety Equipment

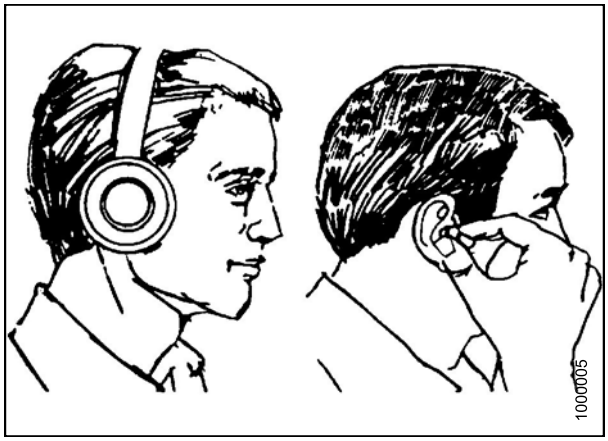


Figure 1.3: Safety Equipment

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

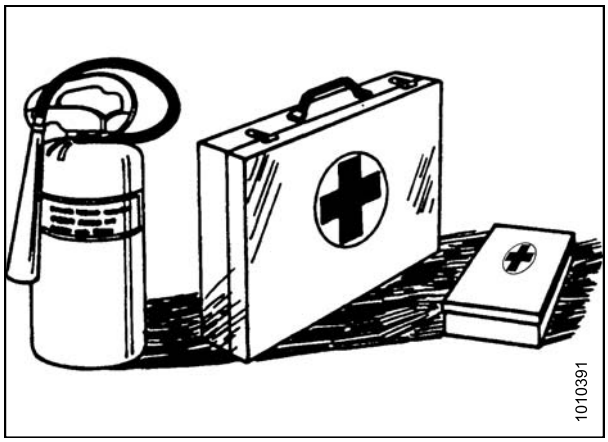


Figure 1.4: Safety Equipment

- 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 the shaft and can telescope freely.
- Use only service and repair parts made or approved by the 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 the engine is running.
- Do **NOT** modify the machine. Non-authorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- Stop the engine and remove the key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

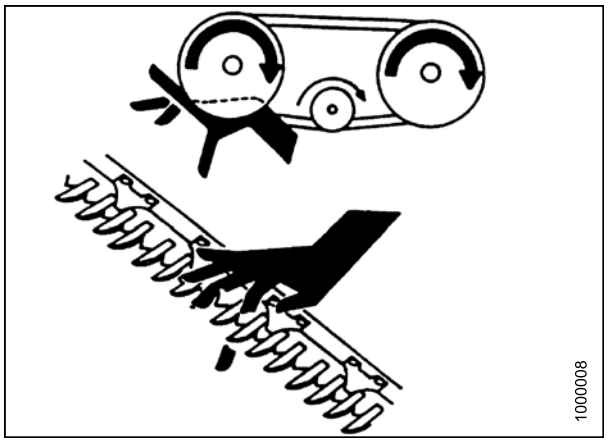


Figure 1.6: Safety Around Equipment

- 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.
- Keep work area well lit.
- Keep machinery clean. Straw and chaff, on a hot engine, are 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 the machine:

- Review the operator's manual and all safety items before operation and/or maintenance of the 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 the job at hand
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Make sure all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance and repairs or when making any adjustments.
- Install transport lock or place safety stands under the frame before working under the .
- If more than one person is servicing the machine at the 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 knife) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

Figure 1.8: Safety Around Equipment

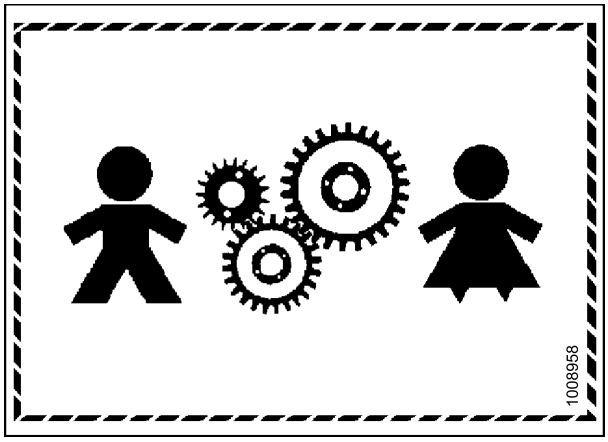


Figure 1.9: Equipment NOT Safe for Children

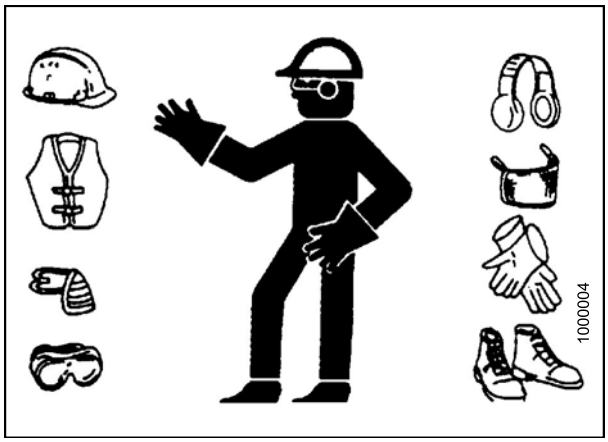


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

- Always place all hydraulic controls in Neutral before dismounting.
- Make sure that all components in the hydraulic system are kept clean and in good condition.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do **NOT** attempt any makeshift repairs to the 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 a hazardous and unsafe condition.

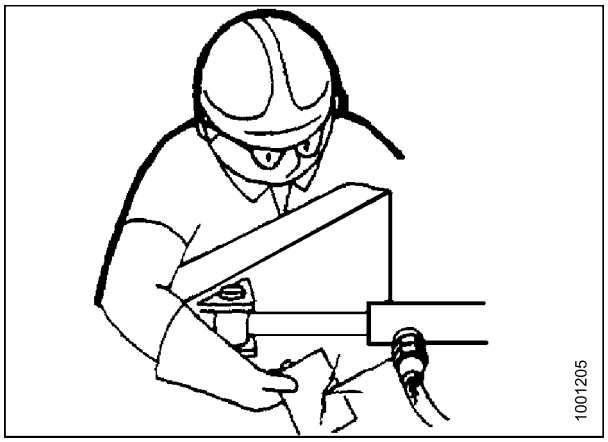


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. 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 that steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.

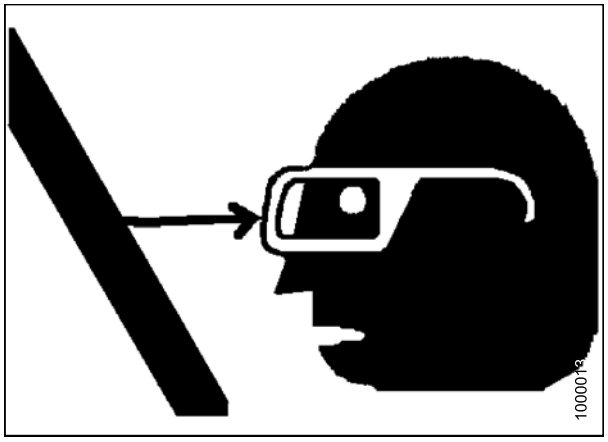


Figure 1.13: Safety Around Equipment

1.6 Tire Safety

- Follow proper procedures when mounting a tire on a wheel or rim. Failure to do so can produce an explosion that may result in serious injury or death.

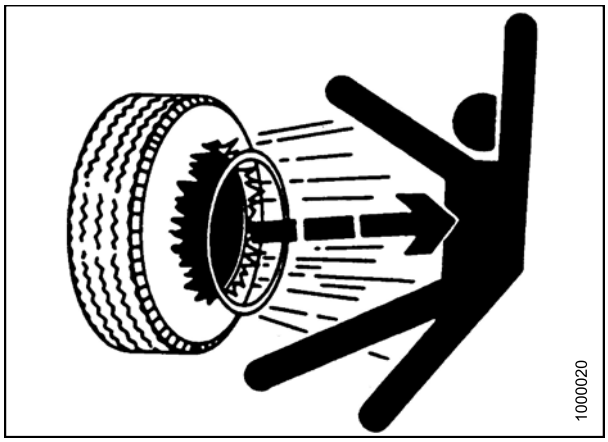


Figure 1.14: Overinflated Tire

- Do **NOT** attempt to mount a tire unless you have the proper training and equipment.
- Have a qualified tire dealer or repair service perform required tire maintenance.

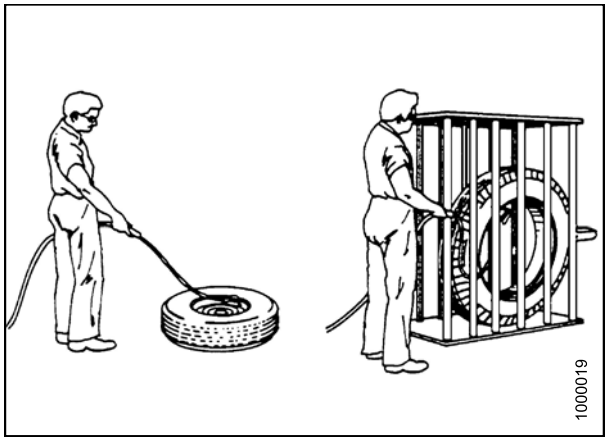


Figure 1.15: Safely Filling a Tire with Air

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 the repair part also bears the current safety sign.
- Safety signs are available from your Dealer Parts Department.

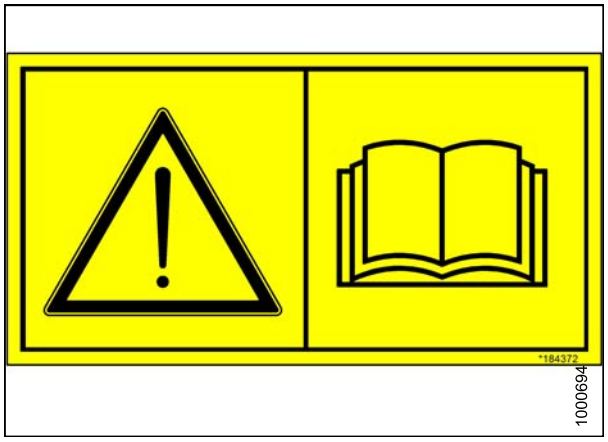


Figure 1.16: Operator's Manual Decal

1.7.1 Installing Safety Decals

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

1.8 Safety Sign Locations: Pull Type

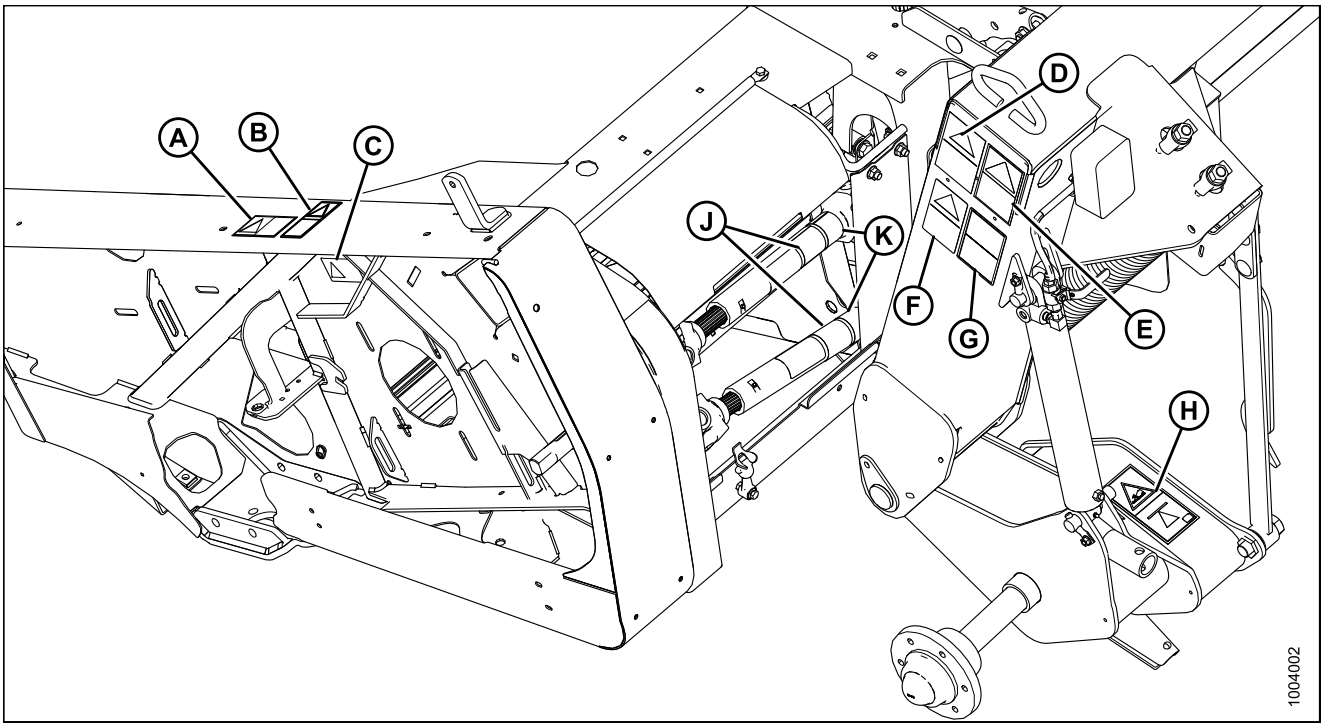


Figure 1.17: Left Side

A - MD #174632
B - MD #184422
C - MD #166452
D - MD #113482
E - MD #194464
F - MD #174436
G - MD #171287
H - MD #171279
J - MD #36651
K - MD #194521

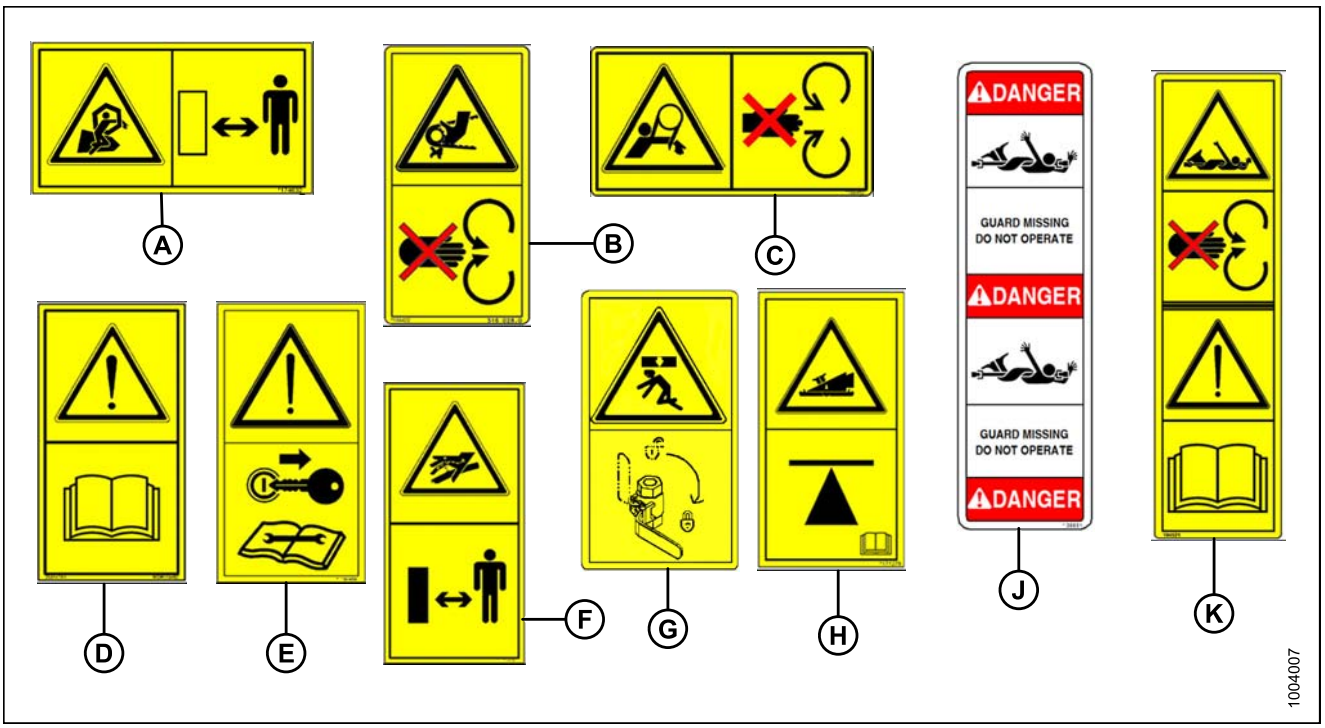


Figure 1.18: Decals on Left Side

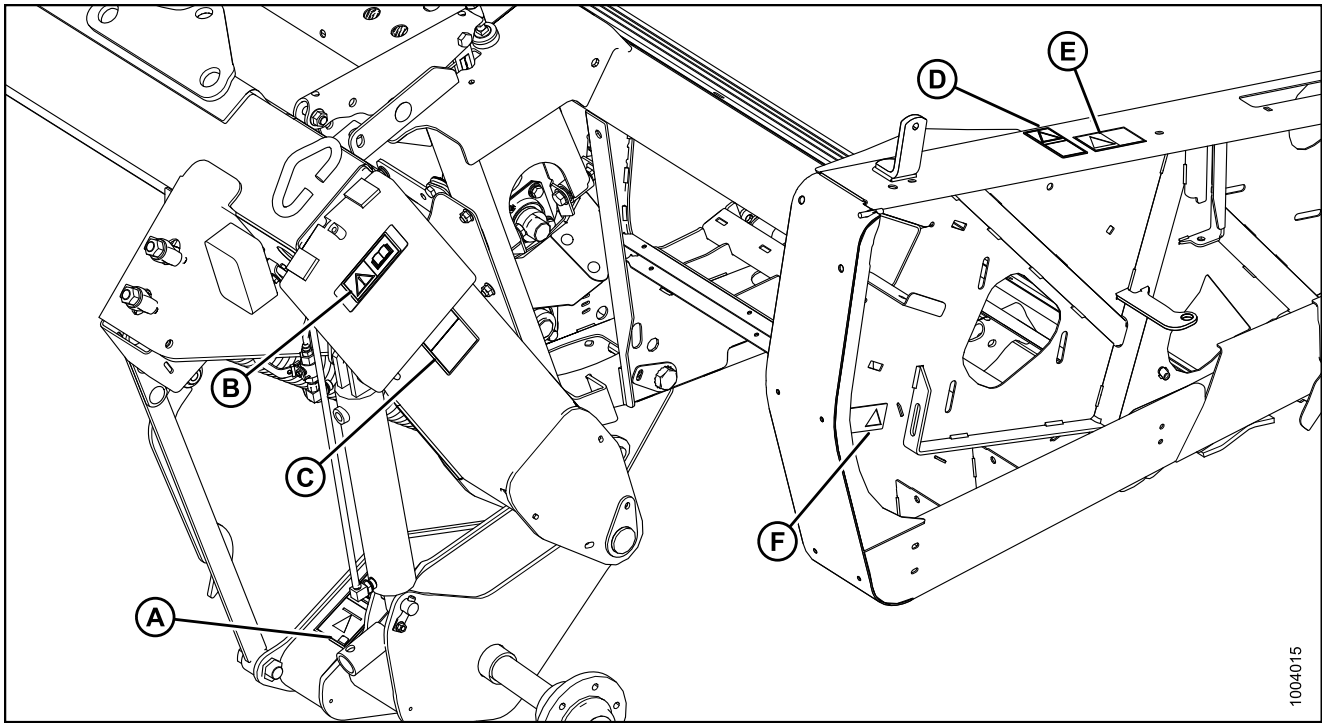


Figure 1.19: Right Side

A - MD #171279
B - MD #184372
C - MD #171287
D - MD #184422
E - MD #174632
F - MD #166452

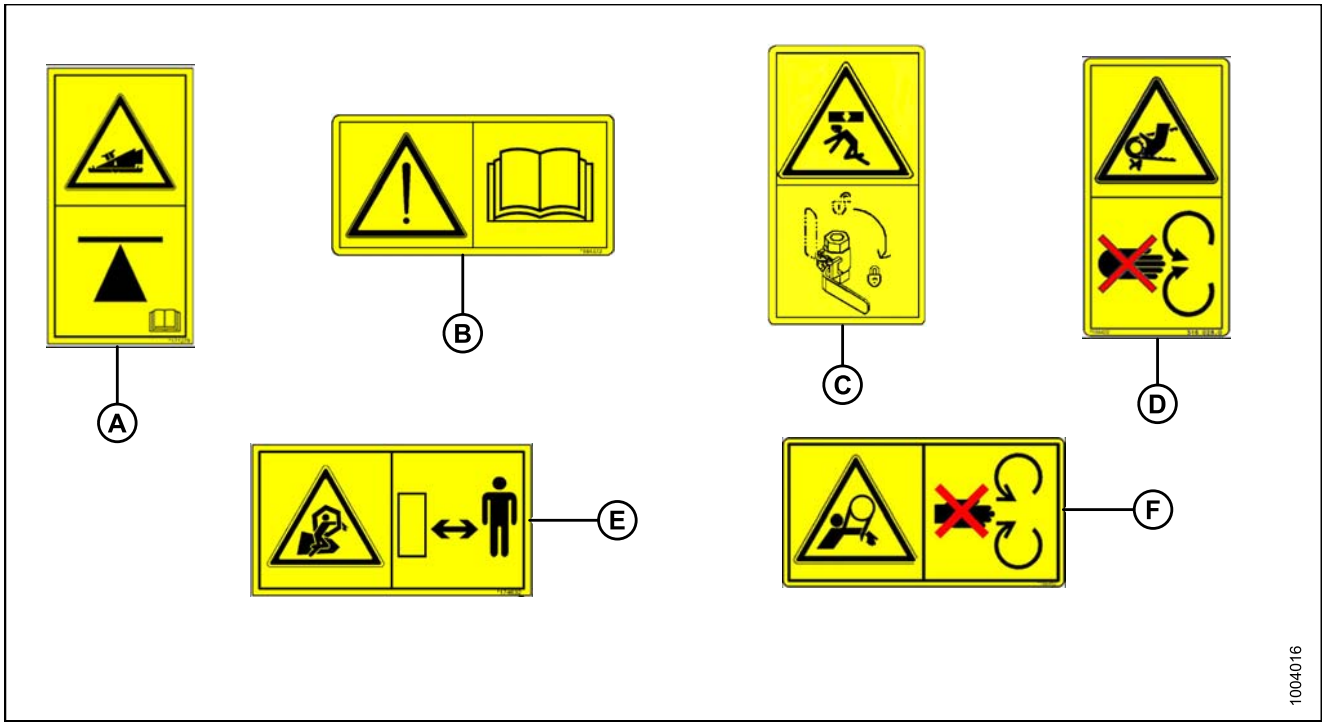


Figure 1.20: Decals on Right Side

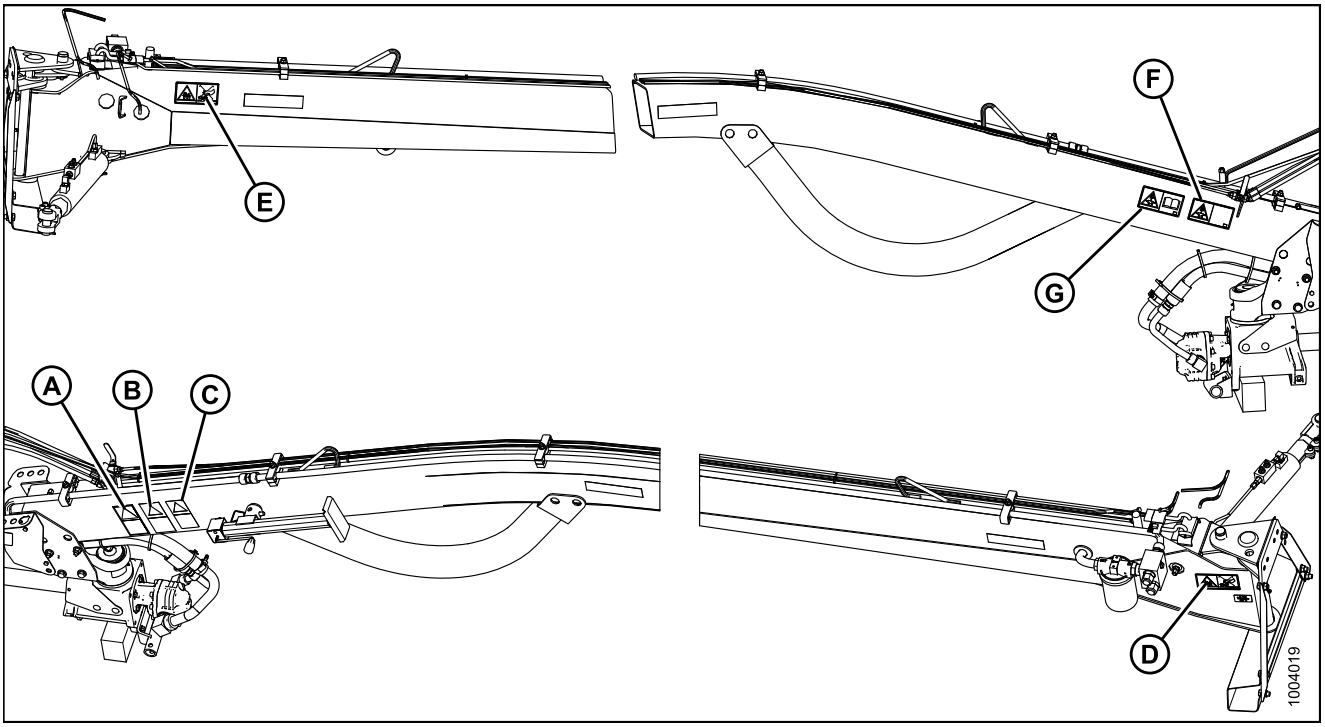


Figure 1.21: Hitch

A - MD #194464
B - MD #113482
C - MD #174436
D - MD #171281
E - MD #171281
F - MD #171286
G - MD #171298

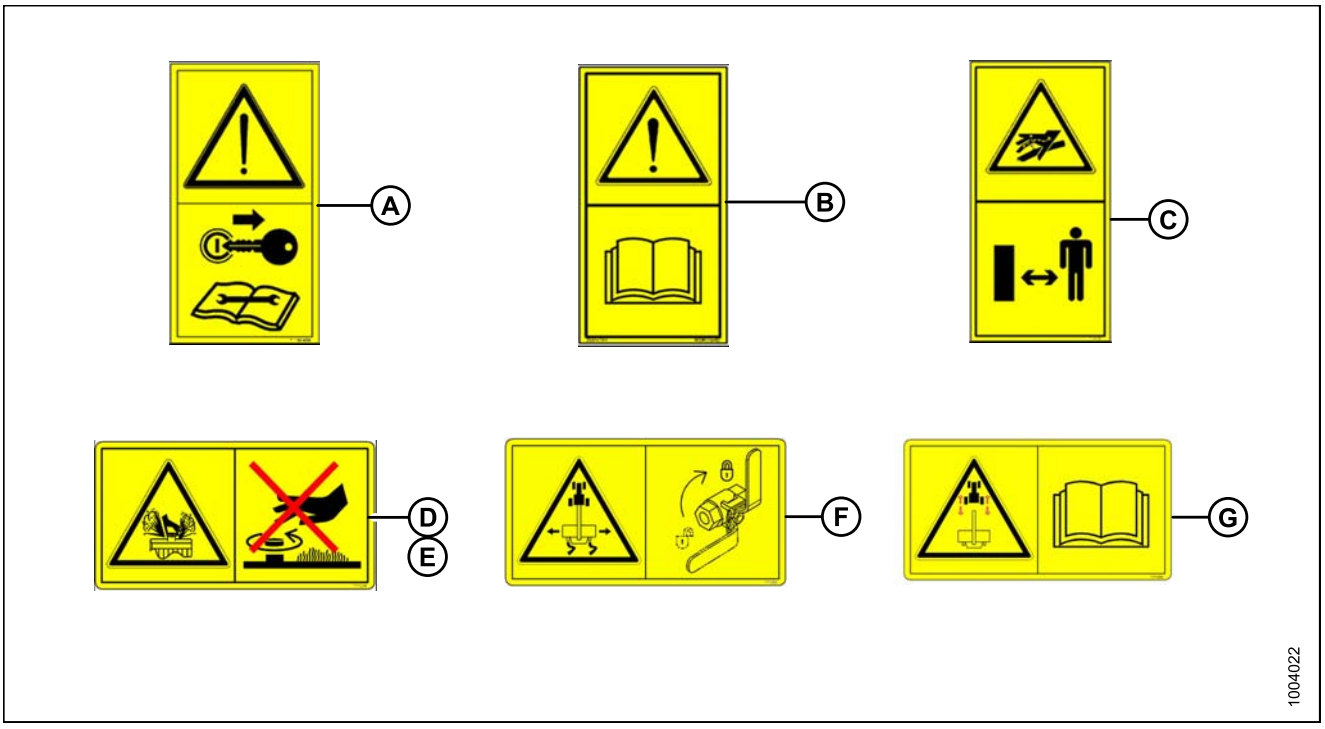


Figure 1.22: Decals on Hitch

1.9 Safety Sign Locations: Self-Propelled

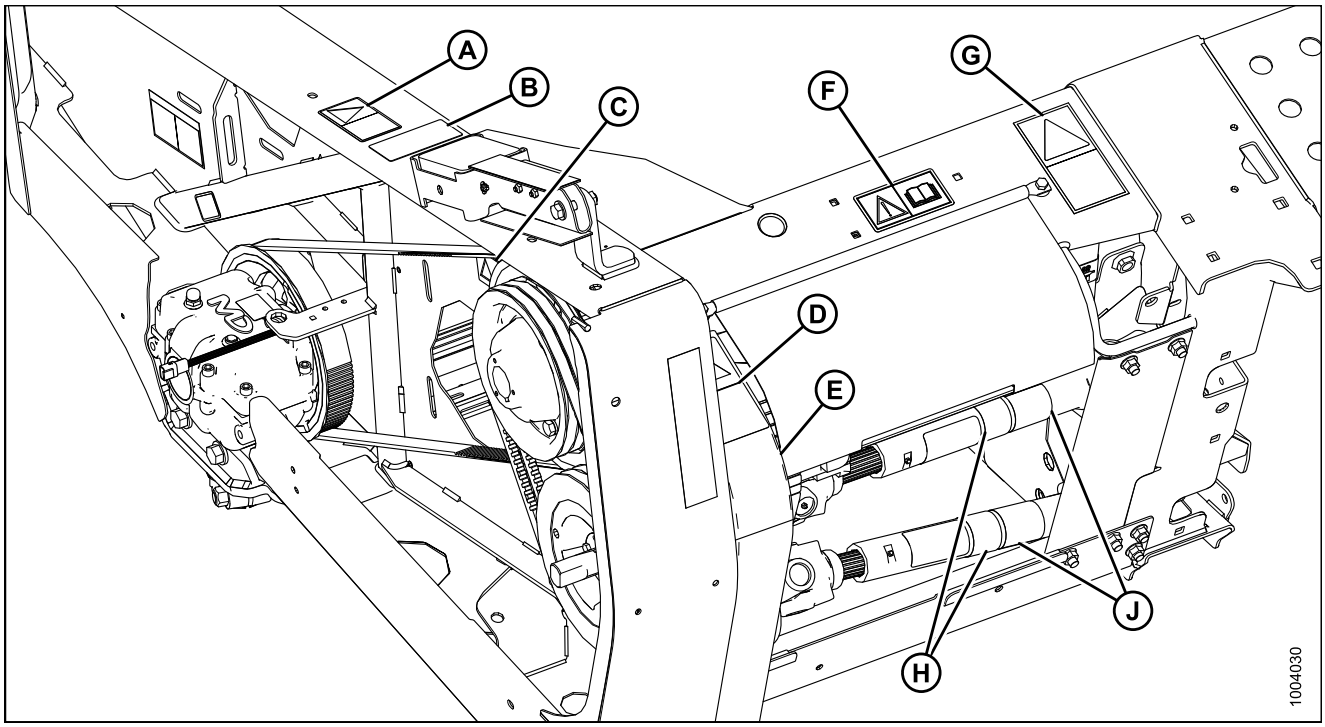


Figure 1.23: Left Side Locations

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

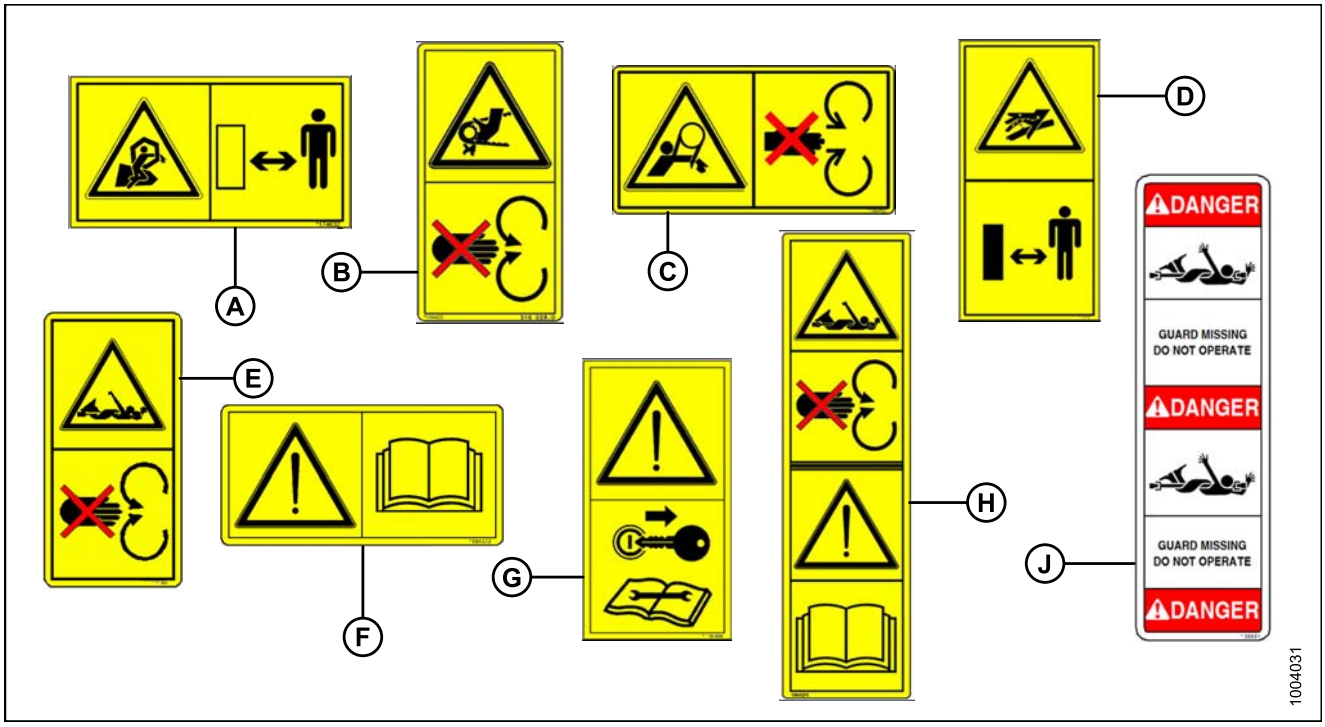


Figure 1.24: Left Side Decals

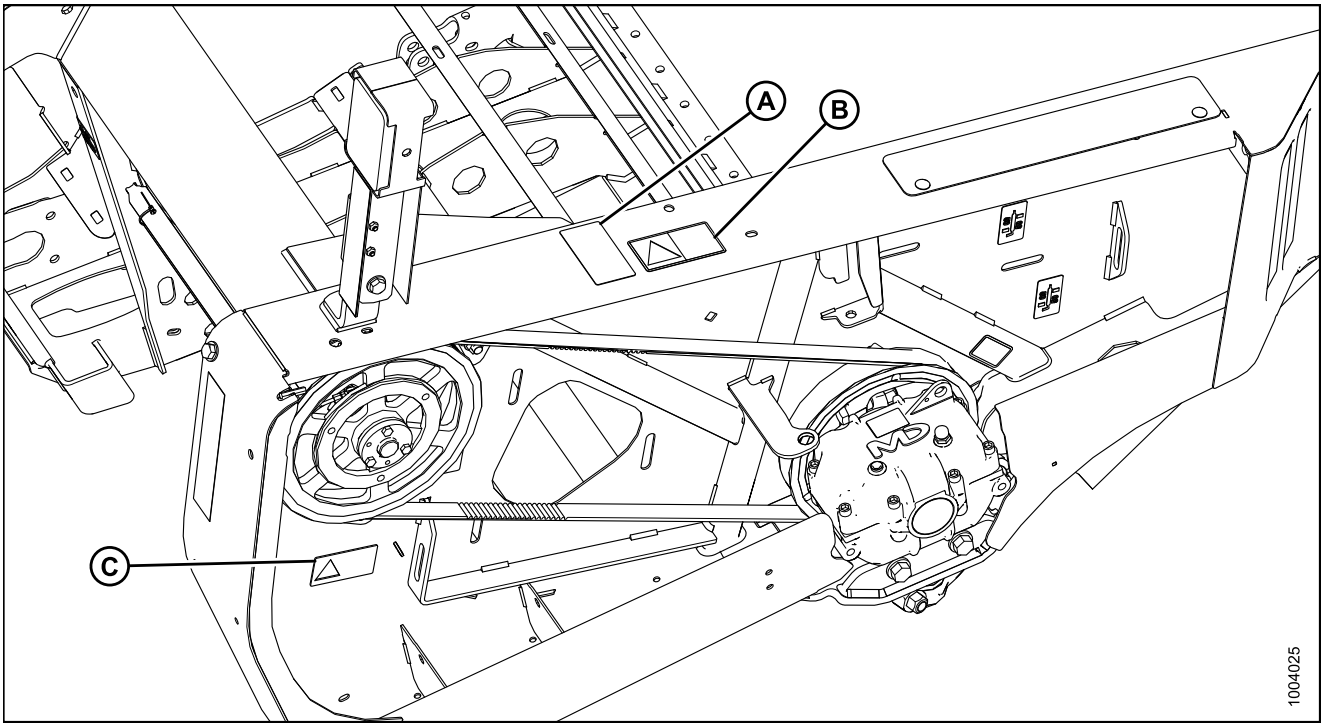


Figure 1.25: Right Side Locations

A - MD #184422 **B - MD #174632** **C - MD #166452**

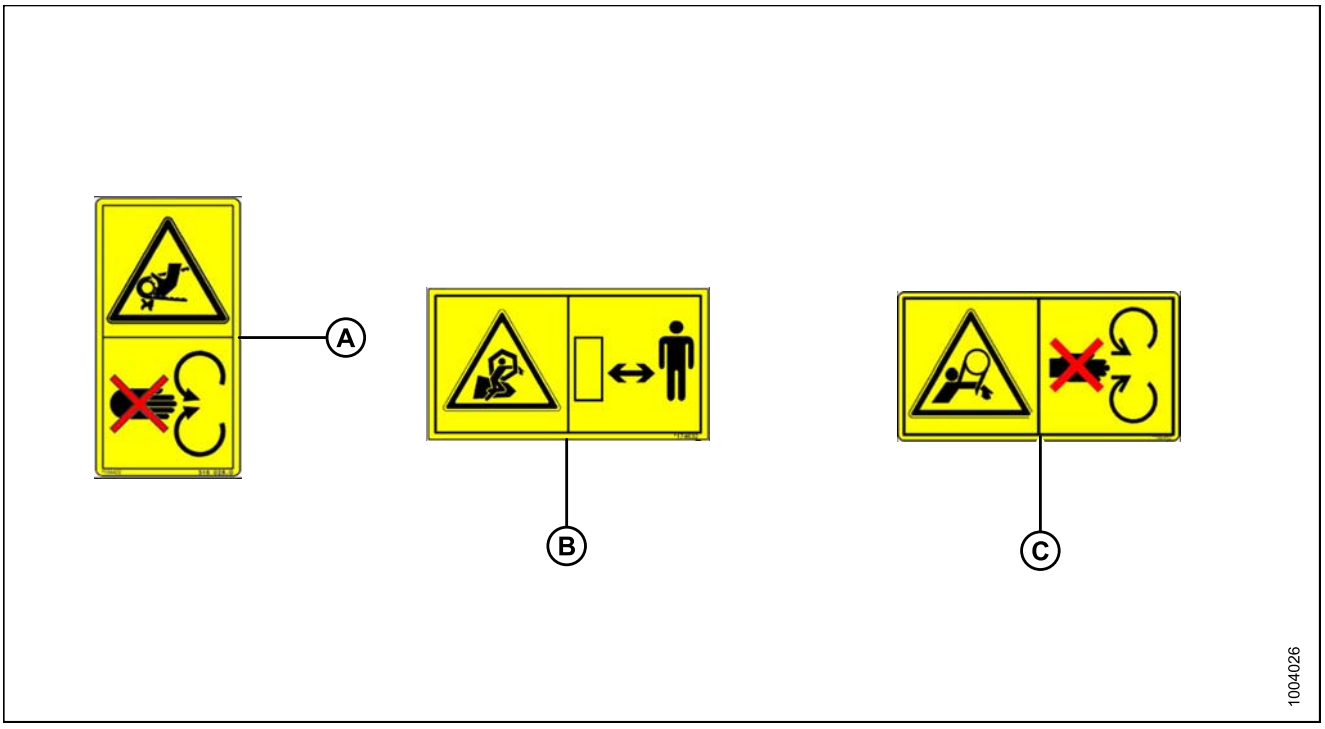


Figure 1.26: Right Side Decals

1.10 Understanding Safety Signs

MD #36651

Rotating driveline

DANGER

- Rotating driveline contact can cause death—**keep away**!

Do not operate without:

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

Figure 1.27: MD #36651

MD #113482

General hazard pertaining to machine operation and servicing

CAUTION

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

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

Figure 1.28: MD #113482

MD #166452

Pinch point hazard

WARNING

- To avoid injury, stop the engine and remove the key before opening engine hood.

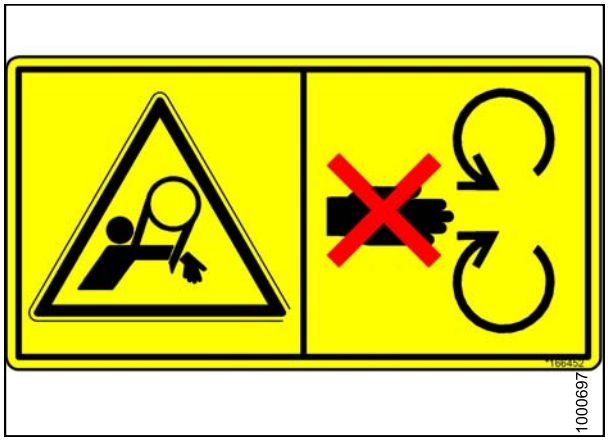


Figure 1.29: MD #166452

MD #166466

High pressure oil hazard

WARNING

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

Figure 1.30: MD #166466

MD #171279

Crushing hazard

DANGER

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Rest header on ground or engage hydraulic lock-out valves before going under unit.

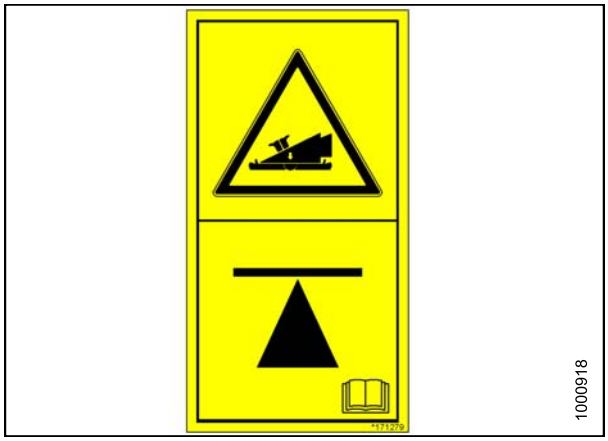


Figure 1.31: MD #171279

MD #171281

Hot fluid under pressure

CAUTION

- Coolant is under pressure and may be hot. Never remove radiator cap when engine is hot.

Figure 1.32: MD #171281

MD #171286

Lock pull-type hydraulic for transport

WARNING

- Charge cylinder with oil before towing.
- Rotate valve handle to lock in transport position.
- Maximum towing speed 20 mph (32 km/h).
- Failure to comply could result in death or serious injury.

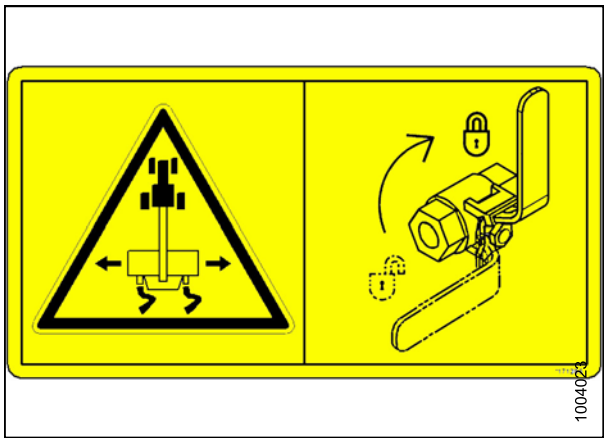


Figure 1.33: MD #171286

MD #171287

Install lock panel

WARNING

- Rotate valve handle to lock before going under unit.
- Failure to comply could result in death or serious injury.

Figure 1.34: MD #171287

MD #171288

Entanglement hazard

CAUTION

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

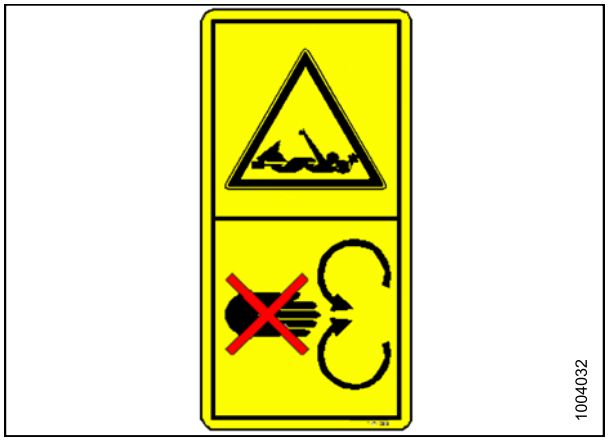


Figure 1.35: MD #171288

MD #171298

Pull-type transport lock pin

WARNING

- Transport lock pin must be in place before transport.
- Failure to comply could result in death or serious injury.

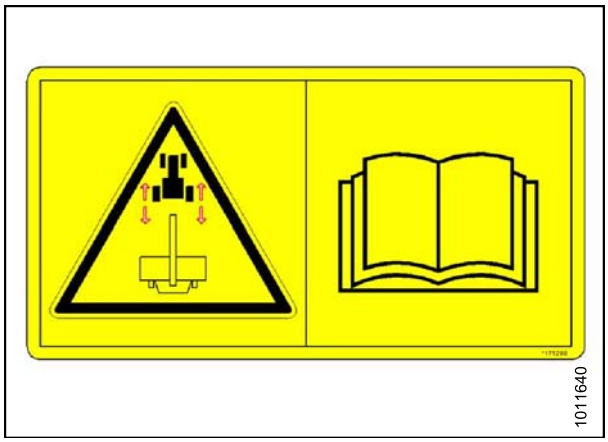


Figure 1.36: MD #171298

MD #174436

High pressure oil hazard

WARNING

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

Figure 1.37: MD #174436

MD #174632

Reel entanglement hazard

CAUTION

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

Figure 1.38: MD #174632

MD #184372

General hazard pertaining to machine operation and servicing

CAUTION

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

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

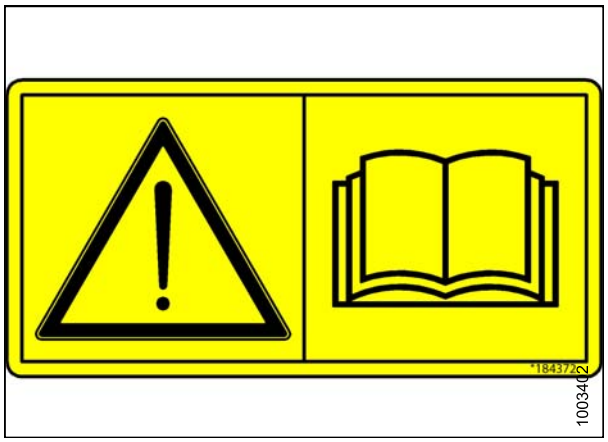


Figure 1.39: MD #184372

MD #184422

Keep shields in place hazard

WARNING

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

Figure 1.40: MD #184422

MD #194464

Shut down for service

WARNING

- Remove key from ignition.
- Read tractor and mower manufacturer's manuals for inspection and maintenance instructions.
- Read the windrower and header manuals for inspection and maintenance instructions.

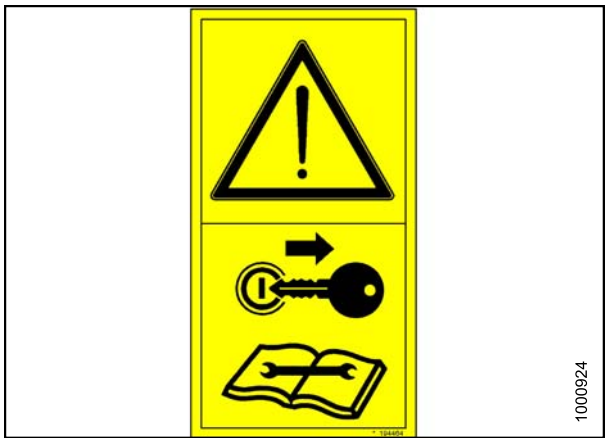


Figure 1.41: MD #194464

MD #194521

Auger entanglement hazard

CAUTION

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

General hazard pertaining to machine operation and servicing

CAUTION

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

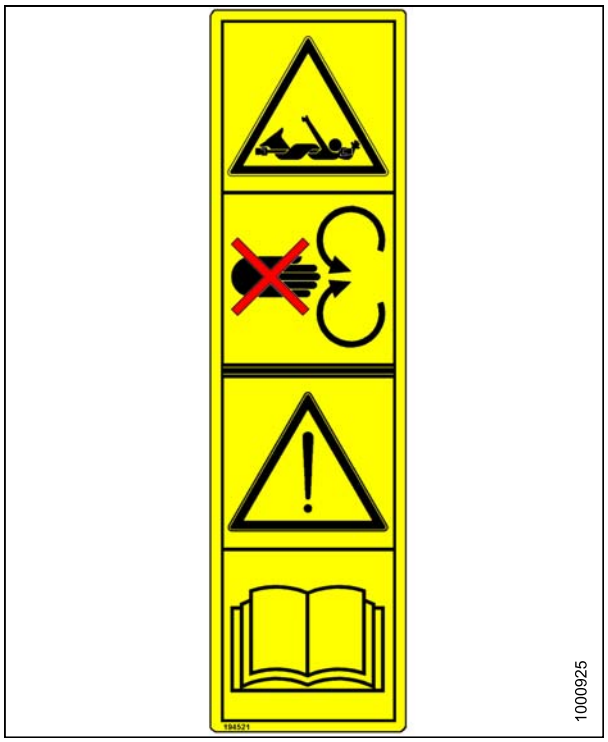


Figure 1.42: MD #194521

1.11 Owner/Operator Responsibilities

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the header/mower conditioner. Contact your Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety signs on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the header/mower conditioner, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all Operators annually.**
- **Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **Safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**
- **Ensure that tractor is properly equipped to safely operate mower conditioner. This may include adding ballast according to the tractor operator's manual requirements for attachments of this size and mass.**

1.12 Operational Safety

CAUTION

- **Follow all safety and operational instructions given in your operator's manual. If you do not have a tractor/windrower manual, get one from your Dealer and read it thoroughly.**
- **Never attempt to start tractor/windrower engine or operate the machine, except from the operator's seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Do not allow riders on tractor/windrower or mower conditioner.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Avoid travelling over loose fill, rocks, ditches or holes.**
- **Drive slowly through gates and doorways.**
- **If cutting ditch banks, use extreme caution. If the header/mower conditioner hits an obstruction, front of the tractor will usually swerve towards the ditch.**
- **When working on inclines, travel uphill or downhill when possible. Be sure to keep tractor transmission in gear when travelling downhill.**
- **Never attempt to get on or off a moving tractor/windrower.**
- **Do not get off the tractor/windrower while the machine is in operation.**
- **Stop tractor/windrower engine, and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Operate only in daylight or good artificial light.**

CAUTION

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

- **Engage tractor/windrower brake.**
- **Disengage PTO.**
- **Turn engine OFF, and remove key.**
- **Wait for all movement to stop**
- **Dismount and engage cylinder stops before inspecting raised machine.**

2 Reference

2.1 Definitions

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

Term	Definition
A-Series header	MacDon auger header
API	American Petroleum Institute
APT	Articulated Power Turn
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with the Operator and cab facing in the direction of travel
CDM	Cab display module on a self-propelled windrower
Center-link	A hydraulic cylinder link between the header and the machine to which it is attached: It is used to change header angle
CGVW	Combined vehicle gross weight
DK	Double knife
DKD	Double-knife drive
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose
FFFT	Flats from finger tight
GSL	Ground speed lever
GSS	Grass Seed Special
GVW	Gross vehicle weight
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower
Hex key	A hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive)
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed the standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
N-DETENT	The slot opposite the NEUTRAL position on operator’s console

Term	Definition
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
PTO	Power take-off
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the 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 in one of the mating parts
SK	Single knife
SKD	Single-knife drive
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
Tractor	Agricultural type tractor
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lbs (3400 kg)
Timed knife drive	Synchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor
Tension	Axial load placed on a bolt or screw, usually measured in pounds (lb) or Newtons (N)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in foot-pounds (ft·lbf) or Newton-meters (N·m)
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the bolt or screw
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism
Windrower	Power unit of a self-propelled header

2.2 Model Identification

This chapter is designed to help you identify the various MacDon A-Series auger header models.

2.2.1 A30-D

The A30-D is a double-knife header with a mechanically-driven auger and reel that can be used on a carrier frame, and pulled by a tractor or can be used on an M-Series Self-Propelled Windrower.

NOTE:
Additional parts are required when installing header onto a self-propelled windrower.

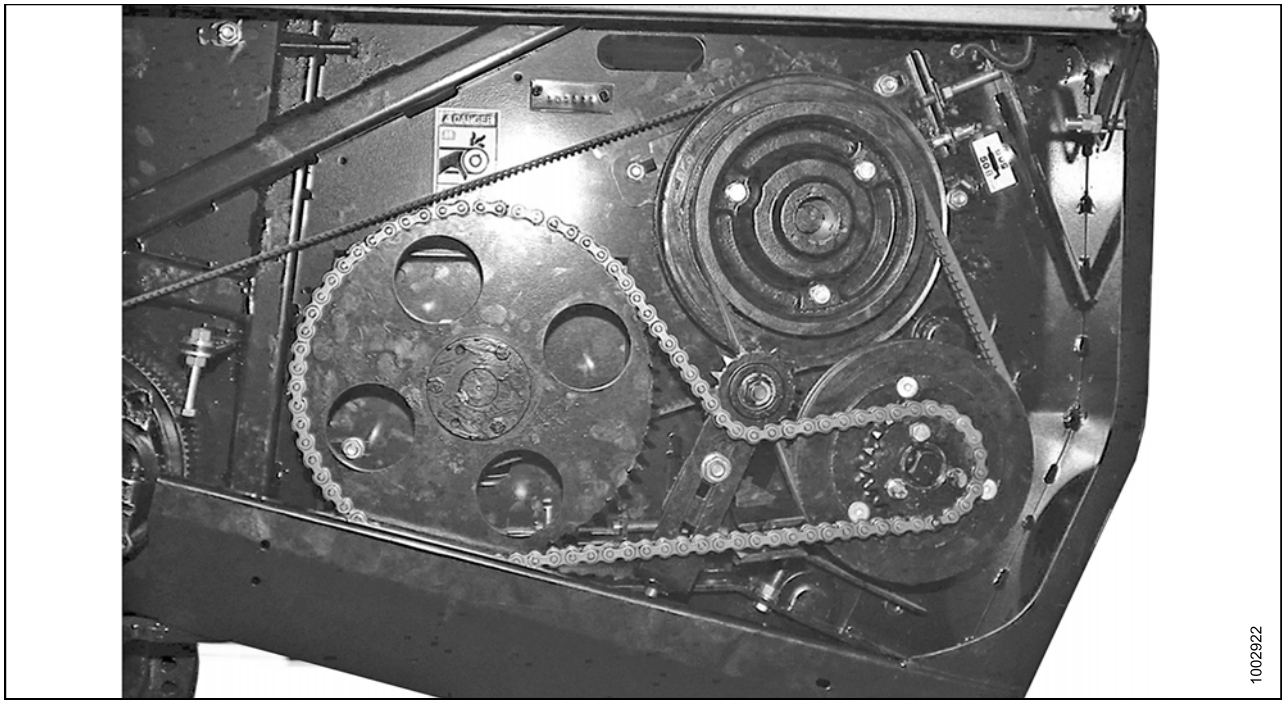


Figure 2.1: A30-D Left Side

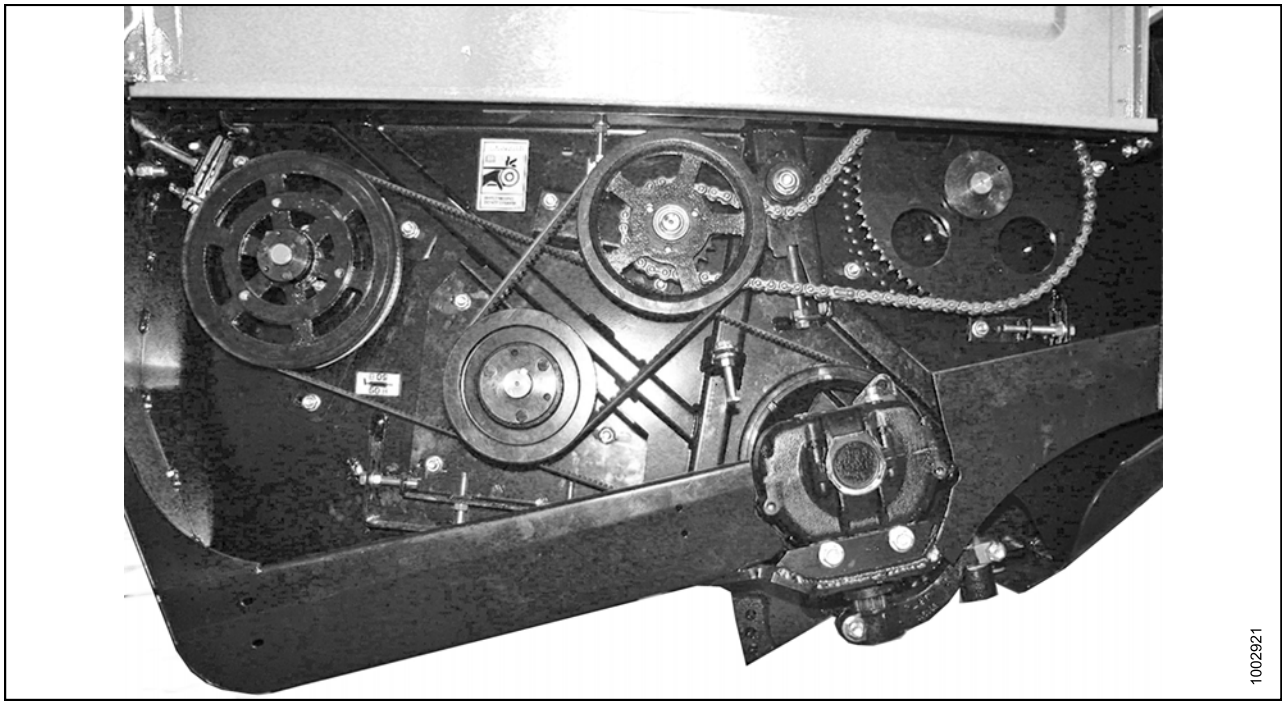


Figure 2.2: A30-D Right Side

2.2.2 A40-D

The A40-D is a double-knife header using a hydraulically-driven auger, reel and cutterbar that can be used only on an M-Series self-propelled windrower. For the 2015 model year, there are two types based on whether the reel motor is square or round.

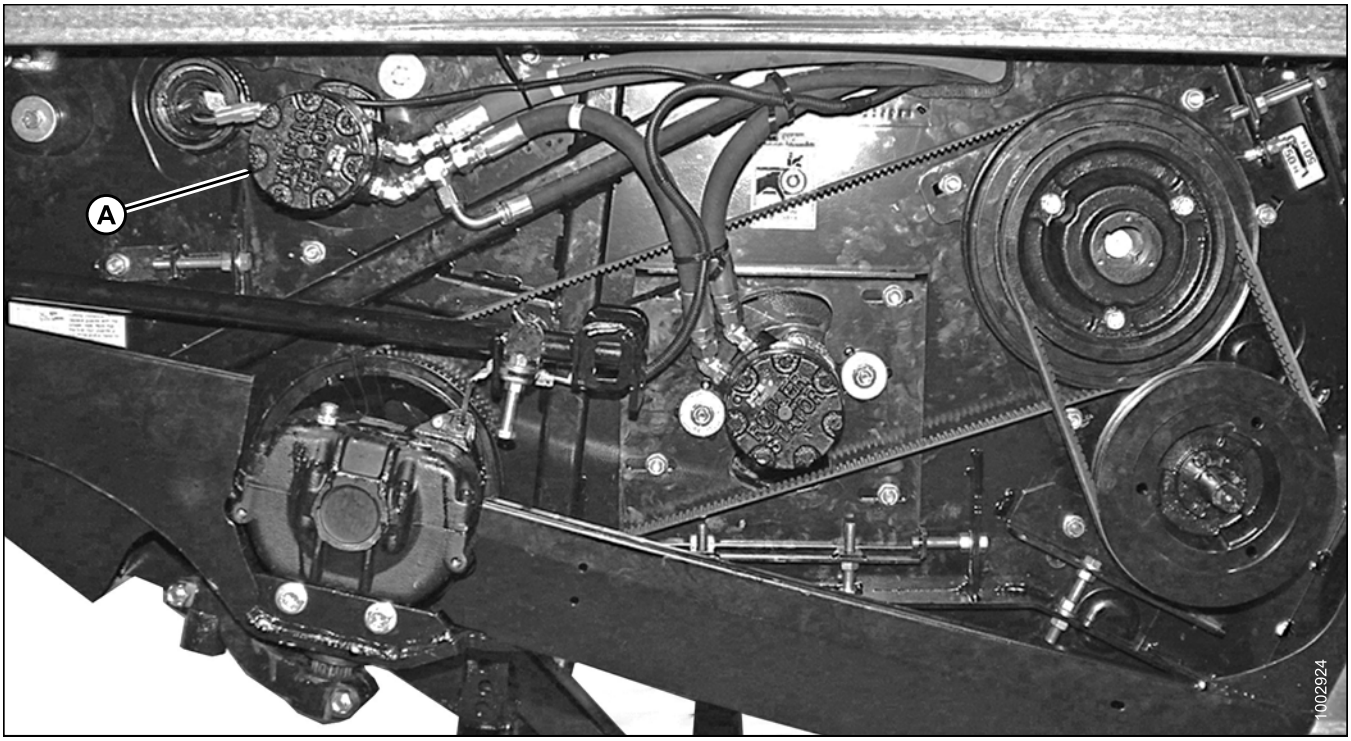


Figure 2.3: A40-D Left Side (Early-Build 2015, 2014 and Earlier) (Round Reel Motor)

A - For 2015 A40-D SP Windrower Headers, a round-shaped reel motor indicates that this is an early-build 2015 unit.

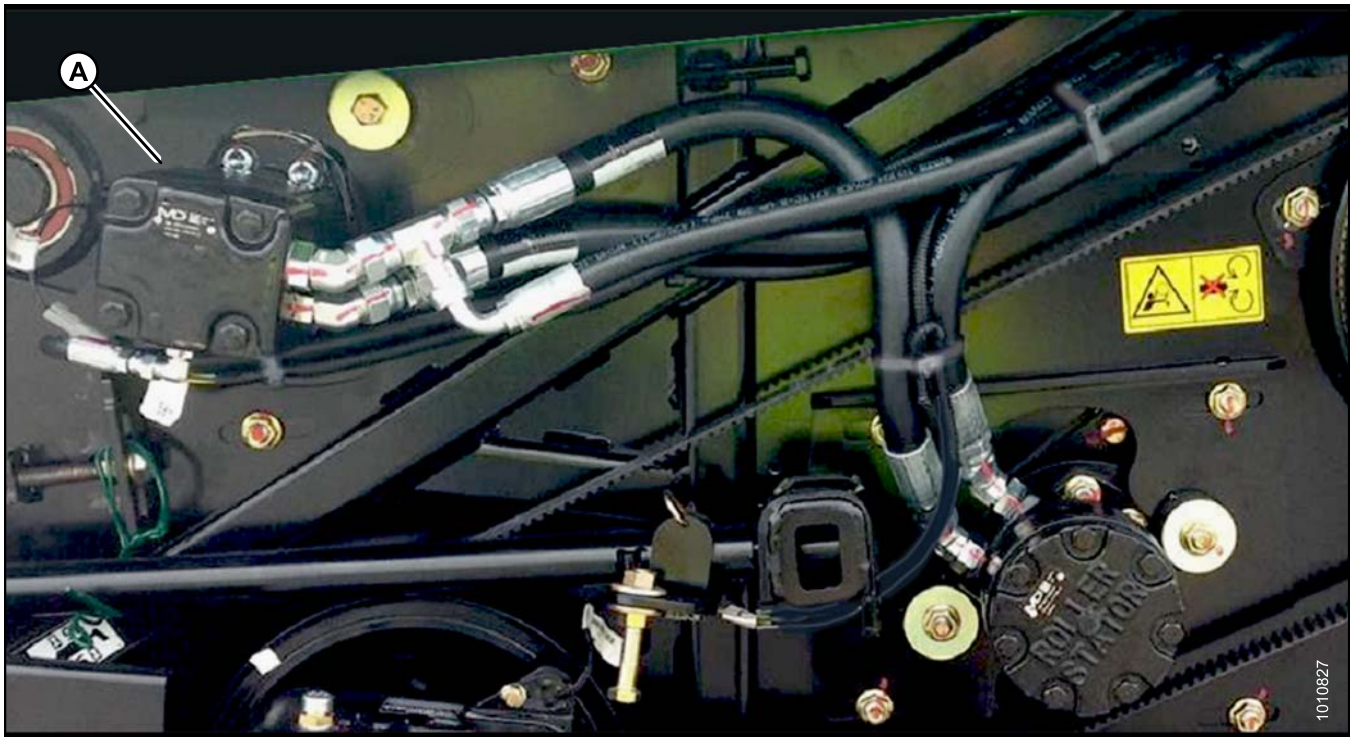


Figure 2.4: A40-D Left Side (Later-Build 2015) (Square Reel Motor)

A - For 2015 A40-D SP Windrower Headers, a square-shaped reel motor indicates that this is an later-build 2015 unit.

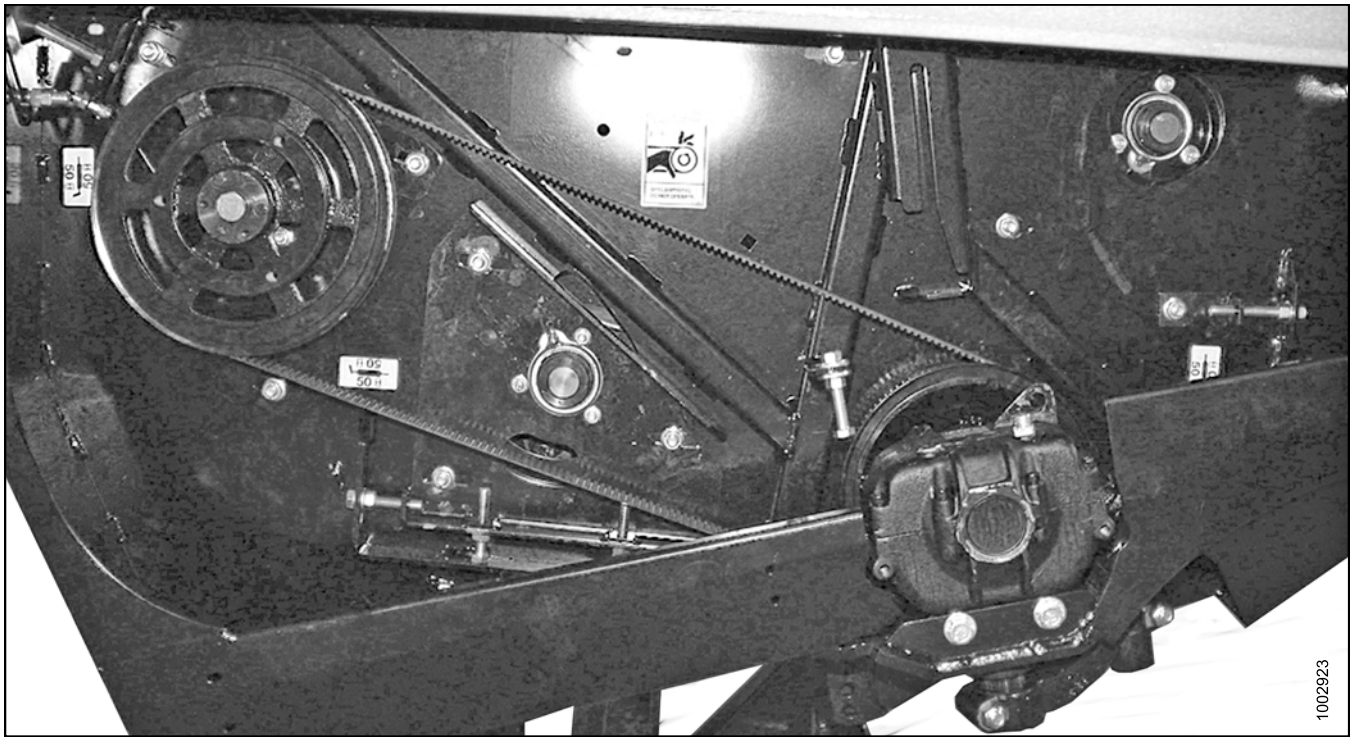


Figure 2.5: A40-D Right Side (All Years)

2.3 Product Specifications

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

Specifications			A30-D Pull-Type	A40-D Self-Propelled
CUTTERBAR				
Effective cutting width	14-foot header		14 ft–9 in. (4496 mm)	
	16-foot header		16 ft–3 in. (4953 mm)	
	18-foot header		N/A	17 ft–9 in. (5410 mm)
Double-knife drive: hydraulic motor to two “B” belts/timing belts to enclosed heavy duty (MD) knife drive boxes			Standard	
Knife stroke			3 in. (76 mm)	
Knife speed (strokes per minute)	Factory	No load	1983	1450–1900
		Load	1912	
	Switching Pulleys	No load	1749	
		Load	1687	
Double heat-treated forged pointed guards			Standard	
Bolted over-serrated knife sections – 9 serrations per inch				
Center overlap			1/8 in. (3 mm)	
Cutterbar Lift Range (measured at guard tip)	Below ground		4 in. (100 mm)	5-3/4 in. (150 mm)
	Above ground		21 in. (533 mm)	35-3/8 in. (900 mm)
Guard Angle (cutterbar on ground)			8 to 16 degrees	7 to 17-1/2 degrees
Replaceable, abrasion-resistant cutterbar wear plates			Standard	
Inner skid shoes, adjustable set of two (can be relocated to outboard location)			Optional	Standard
Outer skid shoes or gauge rollers			Standard	Optional
Outer gauge rollers			Optional	
AUGER				
Diameter	Overall		20 in. (508 mm)	
	Tube O.D.		10 in. (254 mm)	
Undershot, center feed			Standard	
Flighting	Width		5 in. (127 mm)	
	Thickness		1/4 in. (6 mm)	
Pitch			23-1/4 in. (590 mm)	
Rubber feed fingers			Standard	

Specifications			A30-D Pull-Type	A40-D Self-Propelled
Stripper bars (three per side)			Standard	
Auger drive	Mechanical, two “B” belts to No. 60H roller chain		Standard	N/A
	Hydraulic, 15.9 cu in. (261 cc) per rev direct mounted motor		N/A	Standard
Auger speed	Pull-type Factory 22T sprocket	No load	271 rpm	N/A
		Load	261 rpm	
	Pull-type Optional 19T sprocket	No load	234 rpm	
		Load	225 rpm	
	SP windrower		N/A	230–320 rpm
Replaceable high density polyethylene auger pans: two-piece design			Standard	
Rock drop tines at discharge opening with discharge angle adjustment				
Delivery opening width			95-11/16 in. (2430 mm)	
REEL				
Oval closed section bats with end caps. **NOTE:** A40-D Grass Seed Special model has standard 7-bat reel			5 bats optional 6 bat	6 bats optional 7 bat
Steel fingers			1/4 in. (6 mm) diameter	
Reel radius (to finger tip)			22 in. (540 mm)	
Single piece tine bar with replaceable polyethylene bearings			Standard	N/A
Sectioned tine bar with regreasable ball bearings			N/A	Standard
Drive	Mechanical, two “B” belts from auger to 60H roller chain		Standard	N/A
	Hydraulic motor: 14.2 cu in. (232 cc) /rev to enclosed gearbox		N/A	Standard
Reel speed	Pull-type: 22T factory sprocket @ 271 auger rpm	No load	74 rpm	N/A
		Load	72 rpm	
	Pull-type: 19T optional sprocket @ 271 auger rpm	No load	64 rpm	
		Load	62 rpm	
	Pull-type: 19T optional sprocket @ 234 auger rpm	No load	55 rpm	
		Load	53 rpm	
	M100/M105/M205 SP hydraulic variable		N/A	50–85 rpm
	M150/M155/M200 SP hydraulic variable		N/A	15–85 rpm
HAY CONDITIONER				
Roll-type			Intermeshing steel bars	
Roll size	Length		102 in. (2590 mm)	
	Overall		9-3/16 in. (233 mm)	
	Tube		6-5/8 in. (168 mm)	

Specifications			A30-D Pull-Type	A40-D Self-Propelled
Drive: 44 cc. hydraulic piston motor to enclosed gearbox			Standard	
Roll speed	Pull-type carrier	No Load	766 rpm	N/A
		Load	736 rpm	
	SP windrower		N/A	601–810 rpm
PLUG PREVENTION/UNPLUGGING				
Pull Type	Rolls open as header is lifted		Standard	N/A
	Rolls open 4-1/4 in. (108 mm) tip to tube during operation		Standard	N/A
Self-Propelled	Reverse hydraulic flow to three motors (reverses knife, auger, reel, and conditioner)		N/A	Optional
SWATH FORMING SHIELD				
Swath width range			36 in. (915 mm) to 100 in. (2540 mm)	
Header-mounted adjustable baffle			N/A	Standard
Attachment			Carrier	Windrower
Adjustable side deflectors			Standard	
FRAME AND STRUCTURE				
Two amber transport lights			Standard	
Header width			Nominal cut width plus 18-7/8 in. (480 mm)	
Header attachment			Carrier	Windrower
Spare knife storage			Frame tube	Lean bar
Tool and parts storage compartment			Standard	N/A
HEADER HYDRAULICS CONNECTION				
Direct coupled hoses			Standard	N/A
Hydraulic quick couplers			N/A	Standard
ATTACHMENTS AND ACCESSORIES				
Header reversing wrench and guard straightening tool			Standard	
Double Windrow Attachment (DWA) M150/M155/M200/M205 windrowers			N/A	Optional
CARRIER FRAME AND HITCH (Continued on next page)				

Specifications		A30-D Pull-Type	A40-D Self-Propelled
Tractor 1000 rpm PTO	3:1 ratio gearbox to 2.01 cu in. gear pump	Standard	N/A
Hitch	Drawbar adapter with transport safety chain	Standard	
	3 point hitch adapter (quick hitch compatible)	Optional	
	Transport lockout valve for steering cylinder	Standard	
	Heavy duty jack	Standard	
Header lift and steering		Hydraulic	
Header angle adjustment		Mechanical	
Hydraulic header angle kit, double-acting cylinder and indicator (three remotes required)		Optional	
Transport lights: two red complete with seven pole connector		Standard	
SMV decal			
Wheels	Size	31 x 13.5 x 15 NHS terra tires	
	Tread width	150 in. (3810 mm)	
Transport length		320 in. (8130 mm)	
Transport width	14-foot header	192 in. (4877 mm)	
	16-foot header	210 in. (5334 mm)	
Transport height		86 in. (2185 mm)	
Tractor requirements	14-foot header	75 hp (56 kw)	
	16-foot header	90 hp (68 kw)	
	Hydraulic capacity	2000 psi (13,714 kPa)	

3 Operation: A30-D Pull-Type Mower Conditioner

This chapter will describe the operating procedures of the A30-D Pull-Type Mower Conditioner.

3.1 Preparing Tractor for Mower Conditioner

3.1.1 Tractor Requirements

Header Width feet	Minimum Power HP (kW)	Minimum Drawbar Capacity lbf (N)	Minimum Hydraulics psi (MPa)
14	90 (68)	1400 (6227)	2000 (13.7)
16	110 (83)	1450 (6449)	
18	130 (98)	1500 (6672)	

NOTE:
Tractor must be equipped with a seven-terminal outlet to supply power to the mower conditioner's warning lights.

3.1.2 Adjusting Drawbar

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Adjust tractor drawbar to meet ASAE Standard specifications as listed below:

Dimension	1000 rpm Power Take-Off (PTO)	
	1.37 inch diameter	1.75 inch. diameter
'X'	16 in. (406 mm)	20 in. (508 mm)
'Y'	6–12 in. (152–305 mm) 8 in. (203 mm) recommended	
'Z'	13–17 in. (330–432 mm) 16 in. (406 mm) recommended	

IMPORTANT:
Improper drawbar length can cause vibration and premature pump gearbox failure.

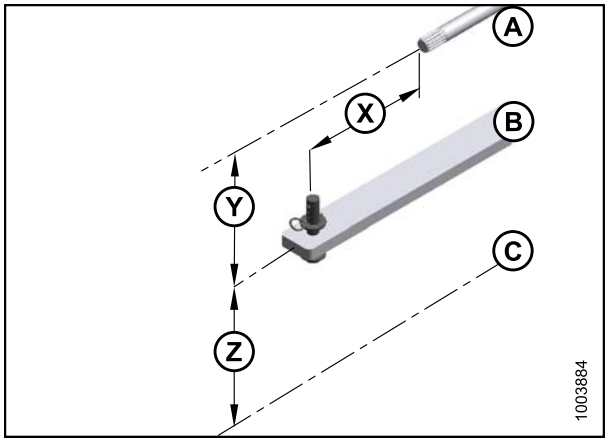


Figure 3.1: Drawbar Adjustment

A - PTO **B - Tractor Drawbar** **C - Ground**

3.1.3 Setting Up Drawbar Hitch

To set up the drawbar hitch, follow these steps:

1. Secure tractor drawbar so the hitch-pin hole is directly below the driveline.
2. Loosen bolts (A) on extension assembly (B), and slide onto drawbar.
3. Install pin (A) through drawbar and extension from underside, and secure with hairpin.
4. Gradually tighten four bolts to 265 ft·lbf (359 N·m).

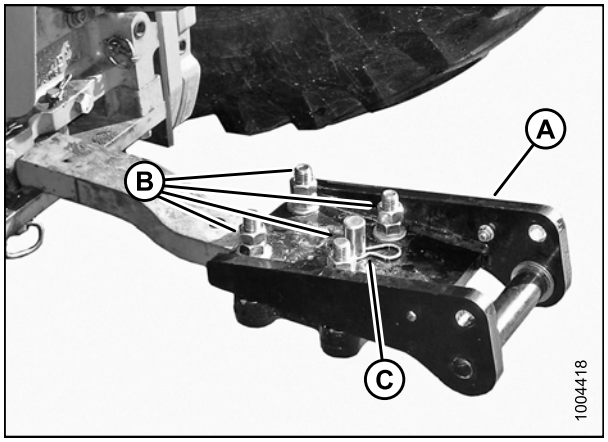


Figure 3.2: Drawbar Hitch

5. Attach the swivel articulated power turn (APT) member (A) with pin (B) onto the APT.

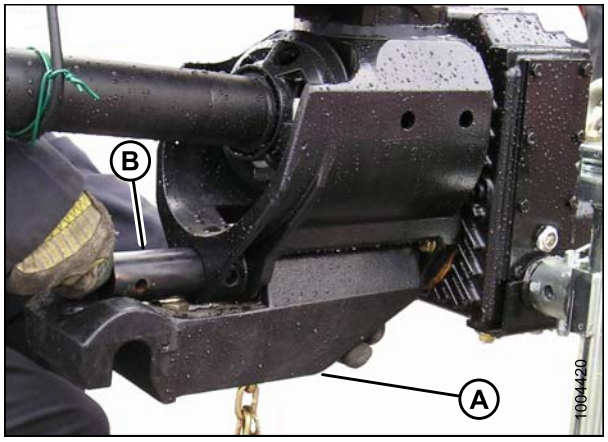


Figure 3.3: APT

6. Secure pin with clevis pin (A), washers, and cotter pin.

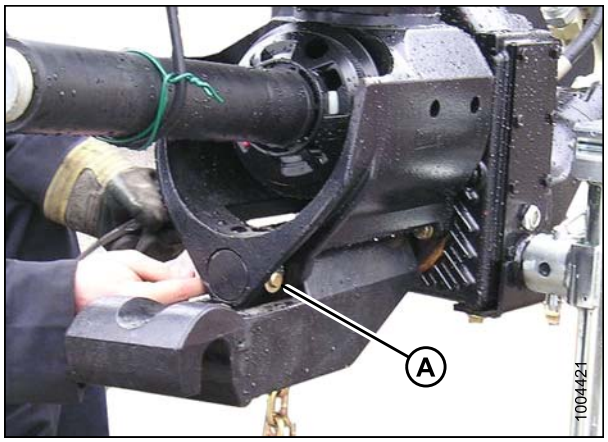


Figure 3.4: APT

7. Assemble power take-off (PTO) driveline male half (A) onto PTO shaft (B) on APT. Push male half so that PTO shaft is at its fully compressed length.
8. Place PTO shaft in hook (C).

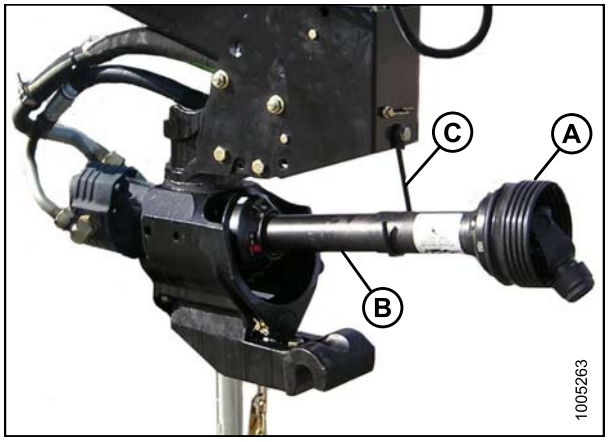


Figure 3.5: PTO to APT

3.1.4 Installing Three-Point Hitch Yoke (Cat. II, III, or IIIN)

To set up the three-point hitch, follow these steps:

1. Attach the three-point hitch adapter (A) to the articulated power turn (APT) with pin (B). The installation is similar to that described in *3.1.3 Setting Up Drawbar Hitch, page 34*.
2. Secure pin (B) with clevis pin (C), washers, and cotter pin.

   NOTE:
   The arms on the adapter (A) can be set up to suit Category II and IIIN, or Category III tractor hitch arms:

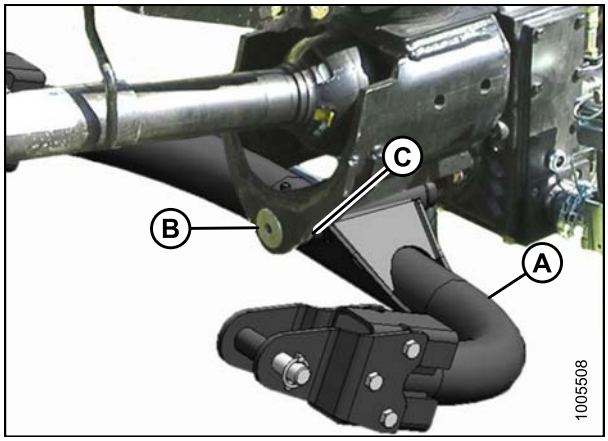


Figure 3.6: Three Point Hitch

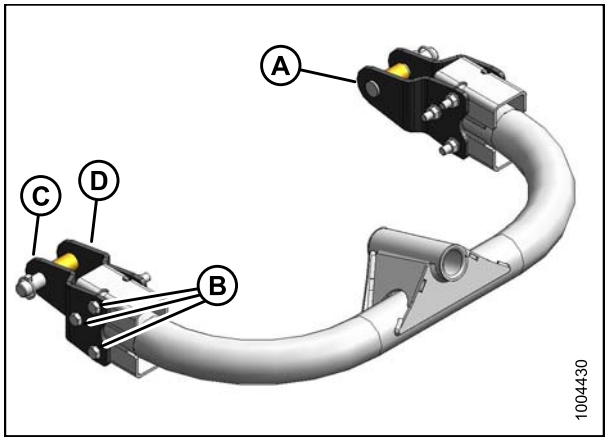


Figure 3.7: Category II or IIIN

3. Set up the adapter arms:
   a. Remove pins (A).
   b. Remove bolts (B) (three per side).
   c. Flip outer plate (C) and inner plate (D) on each arm.

      IMPORTANT:
      The inner plate (D) has a smaller joggle than the outer plate (C). Always maintain the proper locations.

   d. Reinstall bolts (B).
   e. Replace pins (A).

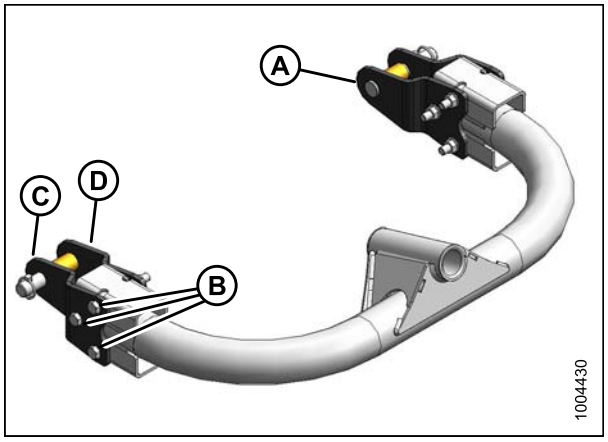


Figure 3.8: Category III

NOTE:
Bushings (A) on pins can be removed to suit hole size in tractor hitch arms.

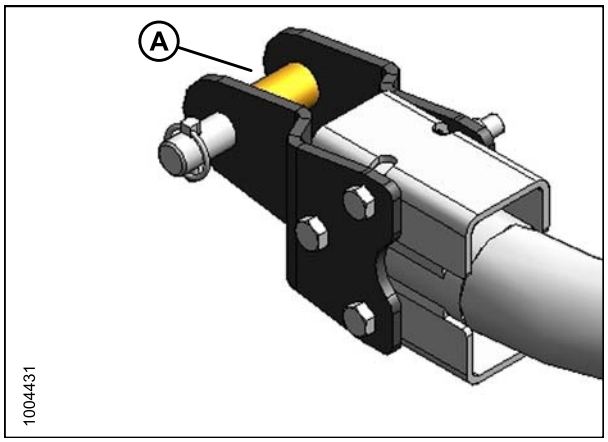


Figure 3.9: Adaptor Arm Bushings

4. Assemble power take-off (PTO) driveline male half (A) onto PTO shaft (B) on APT. Push male half so that PTO shaft is at its fully compressed length.
5. Position PTO shaft in hook (C).

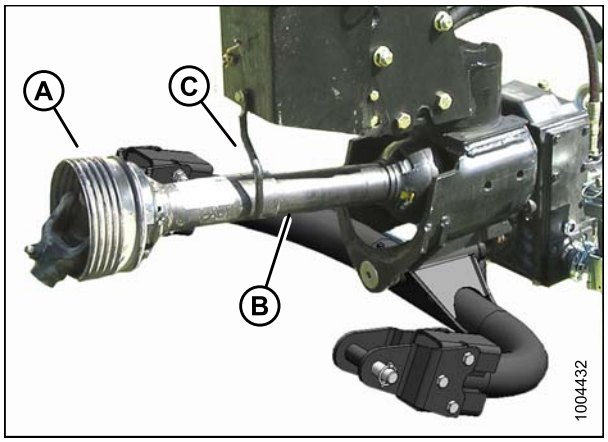


Figure 3.10: PTO and APT

3.2 Attaching Mower Conditioner to Tractor

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

CAUTION

Never attach mower conditioner to tractor rear axle or three-point hitch arms.

3.2.1 Attaching Drawbar

1. Remove pin (A).

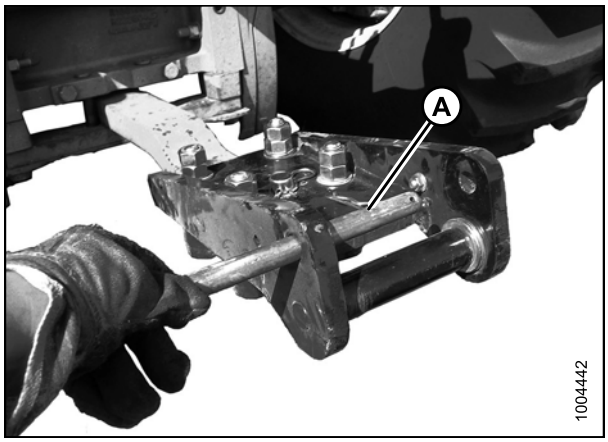


Figure 3.11: Tractor Drawbar Extension

2. Position tractor to align drawbar extension (B) with arm (C) on mower conditioner.
3. Lower jack (D) to engage arm (C) on drawbar extension (B).
4. Install hitch-pin (A), and secure with hairpin.

   IMPORTANT:
   If the tractor has a three-point hitch, lower the lower links as low as possible to prevent damage to the APT.

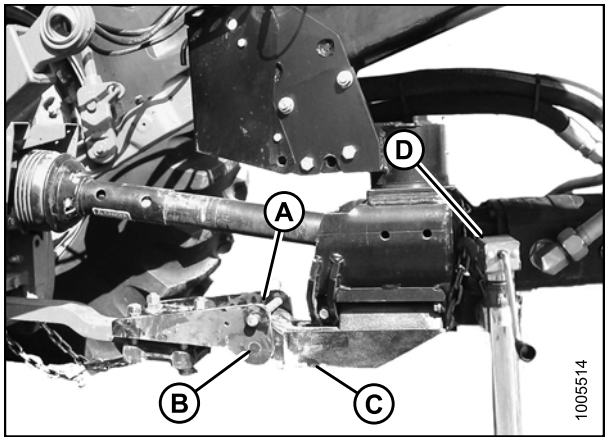


Figure 3.12: Tractor Drawbar Extension Connected to APT Arm

5. Attach driveline (A) to tractor power take-off (PTO) shaft as follows:
6. Position driveline onto tractor PTO shaft (B).
7. Pull back collar on driveshaft, and push driveshaft until it locks. Release collar.
8. Route safety chain from mower conditioner through chain support (C), around drawbar support, and lock the hook (D) on chain.

   IMPORTANT:
   Adjust chain length to remove all slack except what is needed for turns.

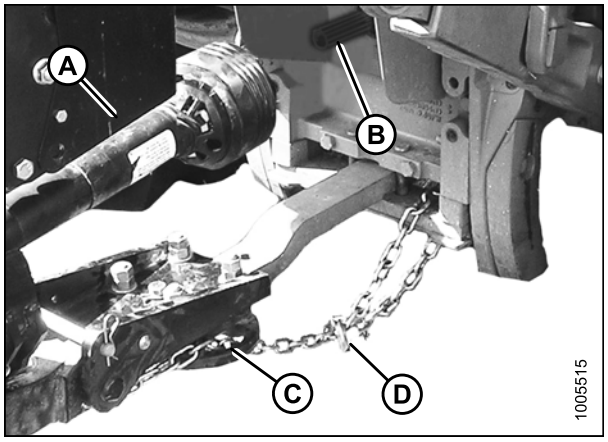


Figure 3.13: Driveline Attached to Tractor PTO Shaft

9. Raise jack (A), pull pin (B), and move jack to storage position on side of APT.
10. Secure jack with pin (B).

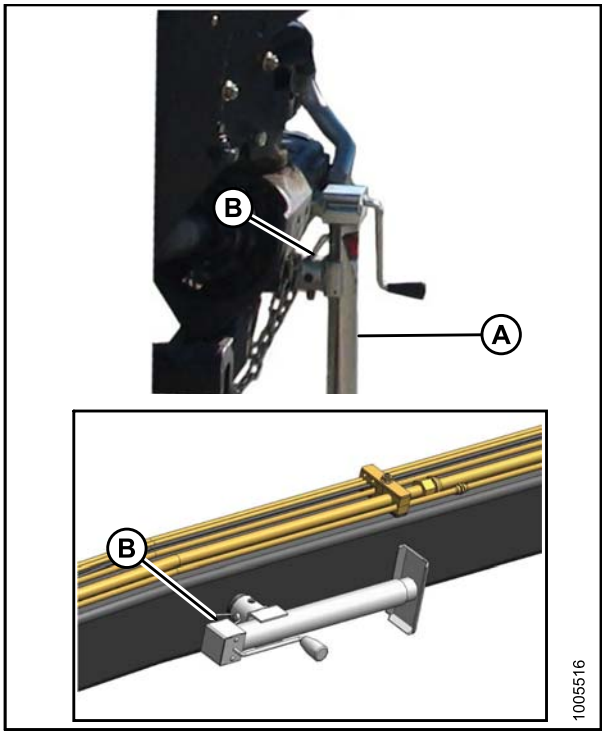


Figure 3.14: Jack in Working Position and in Storage Position

11. Proceed to *3.2.3 Connecting Hydraulics, page 41*.

3.2.2 Attaching Three-Point Hitch (Cat. II, III, or IIIN)

⚠ CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Position tractor, and align tractor hitch arms (A) with hitch adapter (B).
2. Shut off tractor, and remove key.
3. Remove pins (C) from hitch adapter, and use the jack to adjust the height of the articulated power turn (APT) so that pins (C) can be reinstalled.

   NOTE:
   If tractor is equipped with a quick hitch system, pins (C) do not need to be removed.

4. Secure pins (C) with lynch pins.
5. Install anti-sway bars on tractor hitch to stabilize lateral movement of hitch arms (A). Refer to your tractor operator's manual for instructions.
6. Check distance **'X'** between tractor power take-off (PTO) shaft (A) and implement input shaft (B) (without the front half of the driveline attached). The measurement must **NOT** exceed the dimensions listed below.

Driveline Shaft Size	Distance
1.375 in. (34 mm)	27 in. (685 mm)
1.75 in. (43 mm)	31 in. (790 mm)

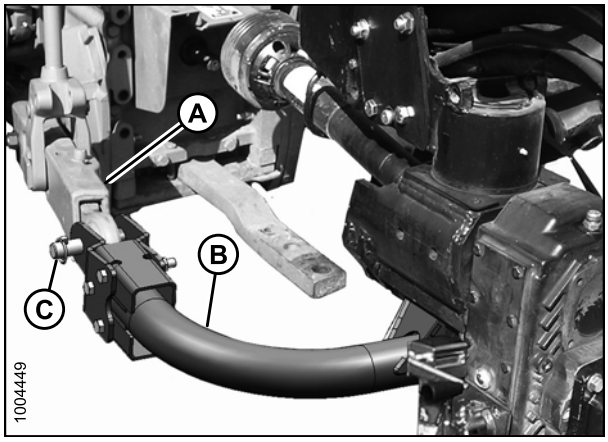


Figure 3.15: Hitch Attached to Tractor

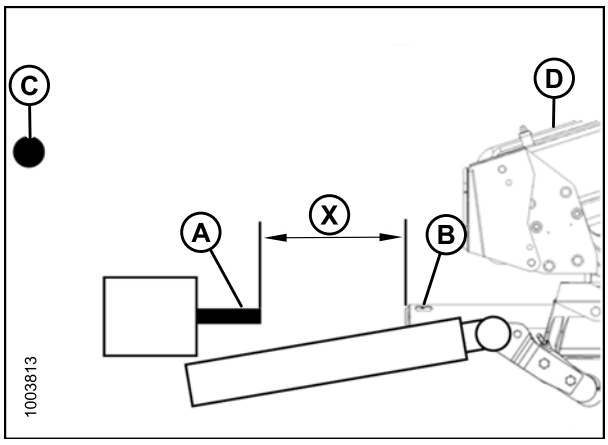


Figure 3.16: Distance between PTO Shaft and Implement Input Shaft

A - Tractor PTO
B - Implement Input Shaft
C - Tractor Axle
D - APT

7. Position driveshaft (A) onto tractor PTO shaft. Driveline should be approximately level.

   IMPORTANT:
   Front half of driveline (A) for three-point hitch is longer than the driveline for draw-bar hitch. Ensure proper length driveline is used.

8. Pull back collar on driveshaft, and push driveshaft until it locks. Release collar.
9. Rotate driveline storage hook (B) to upward position.

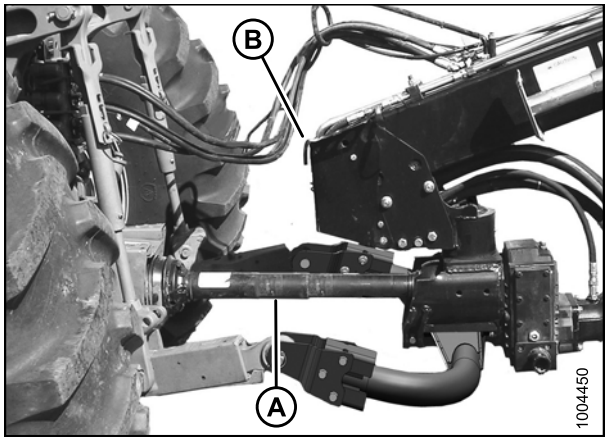


Figure 3.17: Driveshaft and Hitch Attached to Tractor

10. Raise jack (A), pull pin (B), and move jack to storage position on side of APT. Secure jack with pin (B).

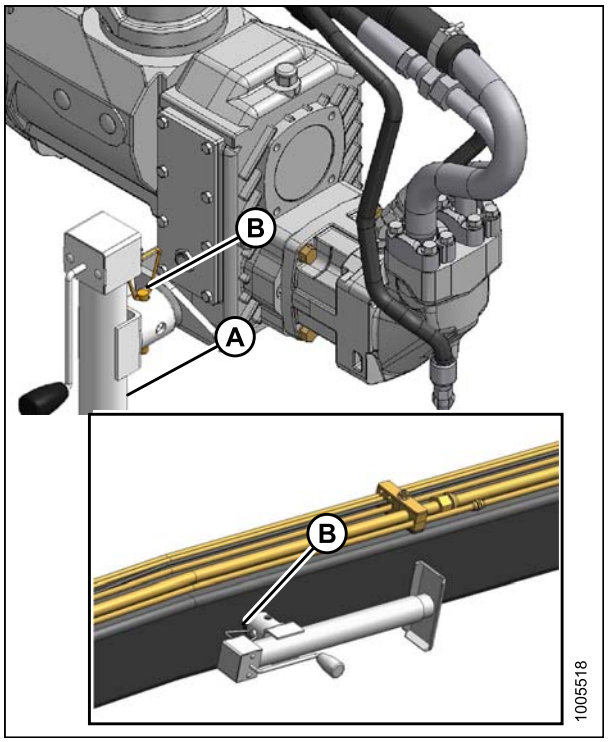


Figure 3.18: Jack in Working Position and in Storage Position

3.2.3 Connecting Hydraulics

WARNING

Do not use remote hydraulic system pressures over 3000 psi (20,684 kPa). Check your tractor operator's manual for remote system pressure.

System	Hose	Tractor Hydraulics
Steering	A (2 Hoses)	Control 1
Lift	B (1 Hose)	Control 2
Header Tilt	C (2 Hoses)	Control 3

NOTE: Arrows cut into plate indicate system for hoses. LIFT ↑ (up arrow) STEERING ↔ (double-headed arrow).

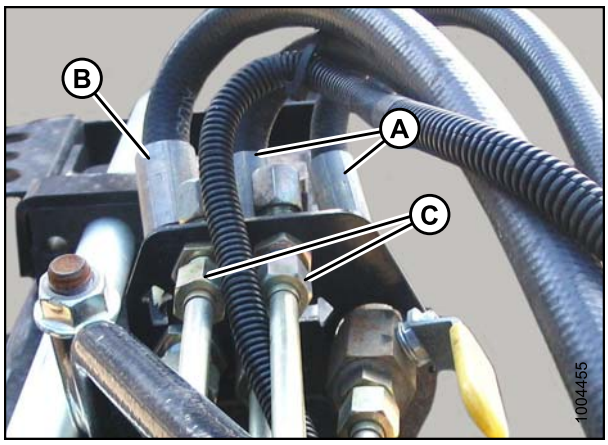


Figure 3.19: Quick Disconnect Couplers

1. Ensure hoses are routed through guide (A) to provide proper hose arc as shown.

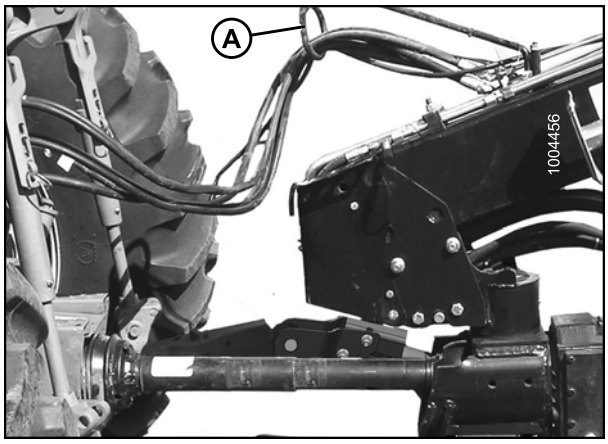


Figure 3.20: Hose Routing

2. Connect two steering cylinder hoses (A) as follows:

Control Lever Position	Cylinder Movement	Mower Conditioner Direction
Forward	Extend	Right
Backward	Retract	Left

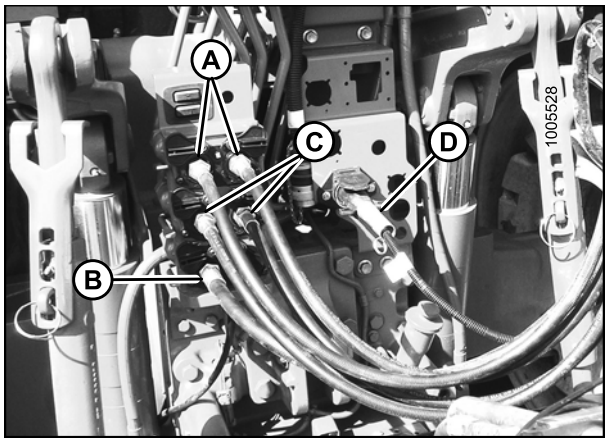


Figure 3.21: Steering Cylinder Hose Connections

3. Connect one lift cylinder hose (B) as follows:

Control Lever Position	Cylinder Movement	Header Movement
Forward	Retract	Lower
Backward	Extend	Raise

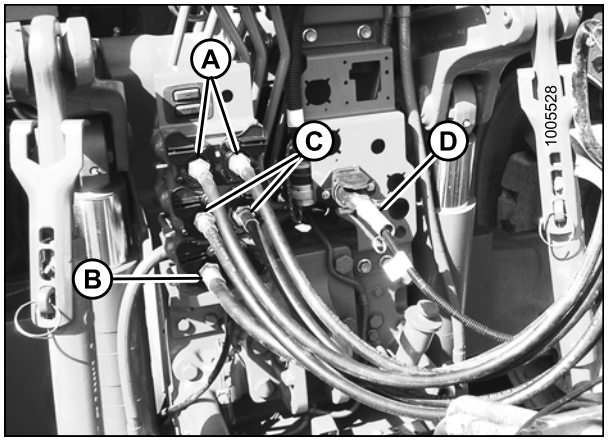


Figure 3.22: Steering Cylinder Hose Connections

4. Connect two header tilt cylinder hoses (C) as follows (not required with mechanical center-link):

Control Lever Position	Cylinder Movement	Header Movement
Forward	Retract	Lower
Backward	Extend	Raise

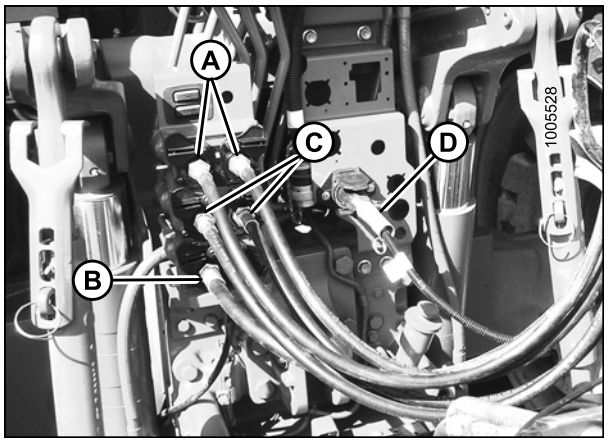


Figure 3.23: Header Tilt Cylinder Hose Connections

5. Connect the mower conditioner wiring harness connector (D) to tractor. Connector is designed to fit tractors equipped with a round seven-pin receptacle (SAE J560).

IMPORTANT:
Older model tractors will have Pin #4 (A) energized as an accessory circuit. The mower conditioner uses this pin position (B) for brake lights. Check that Pin #4 in the tractor receptacle is NOT constantly energized. Consult your tractor operator's manual, and then, if required, remove the appropriate fuse.

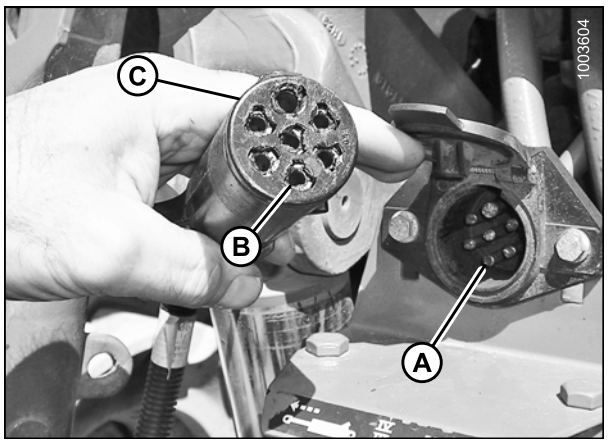


Figure 3.24: Harness Connectors

3.3 Detaching Mower Conditioner from Tractor

This topic applies only to pull-type mower conditioners.

CAUTION

To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key. To maintain stability, always lower the machine completely. Block mower conditioner wheels before detaching from tractor.

3.3.1 Unhooking Drawbar

1. Park machine on flat level surface with hitch at an angle to tractor drawbar (to facilitate pump detachment).
2. Lower header onto blocks or leave header raised. If leaving in raised position, engage lift cylinder lock-out valves.
3. Move remote cylinder control valve lever back and forth to relieve stored hydraulic pressure.
4. Disconnect hydraulic hoses and electrical harness. Store hose ends in holes at front of articulated power turn (APT) as shown.

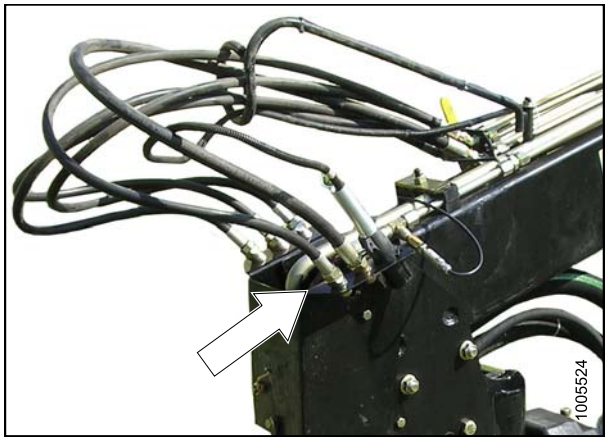


Figure 3.25: Hydraulic Hoses and Electrical Harness

5. Remove pin (A).

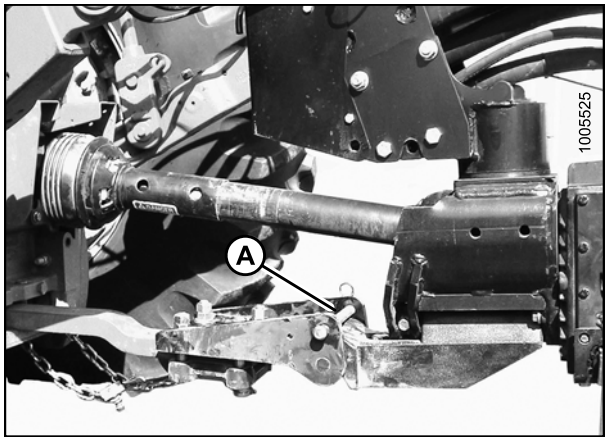


Figure 3.26: Hitch Pin

6. Rotate hook (A) to the lower position.

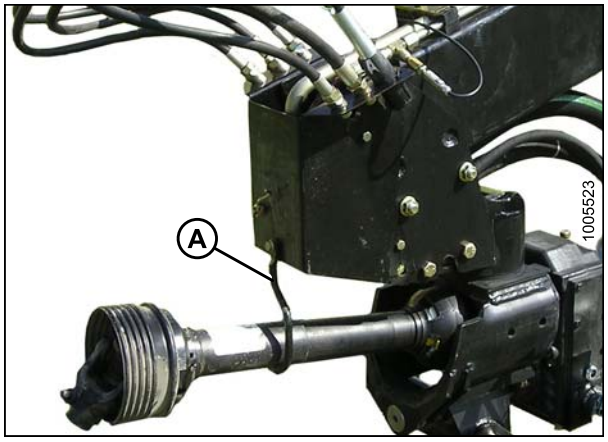


Figure 3.27: PTO Hook

7. Pull back collar on driveline (A), slide coupler off tractor power take-off (PTO) shaft, and position driveline in hook.

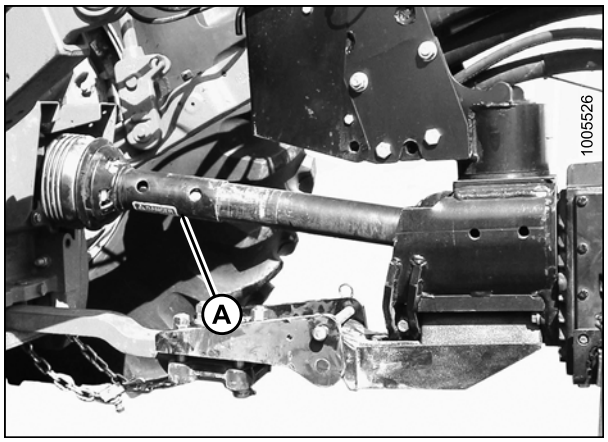


Figure 3.28: PTO

8. Pull pin (B) securing jack (A), and move to working position at front of APT. Secure jack with pin (B).
9. Lower jack to take weight off tractor drawbar.

NOTE:
If ground is soft, place a block under the jack.

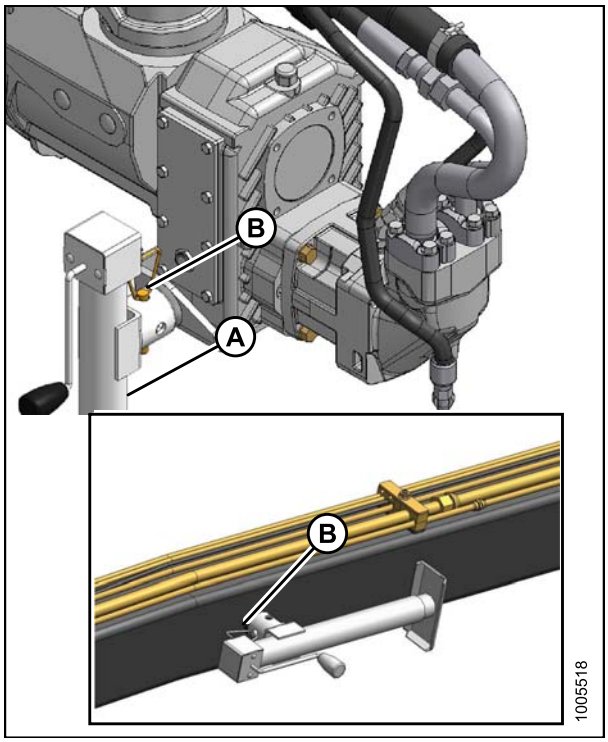


Figure 3.29: APT and Jacking

10. Remove chain lock (A), and unhook safety chain from tractor. Wrap chain around APT for storage.
11. Lower jack to raise APT clear of drawbar.
12. Slowly drive tractor away from mower conditioner.

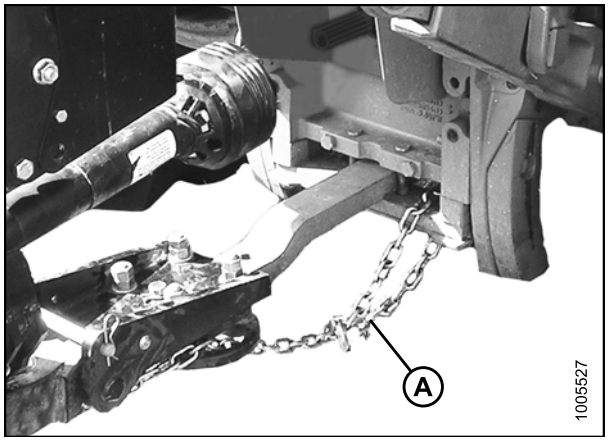


Figure 3.30: Hitch Safety Chain

13. Replace hitch pin (A), and secure with hairpin.

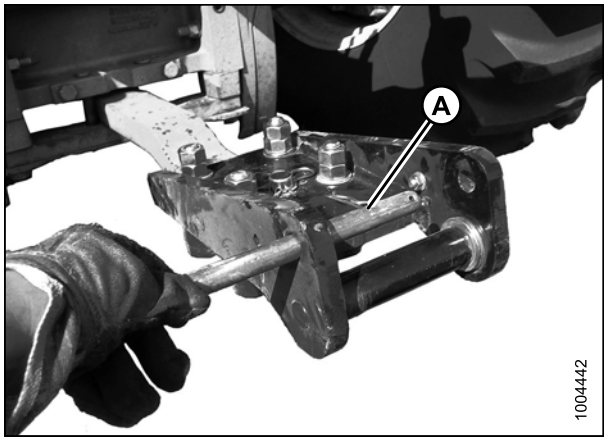


Figure 3.31: Hitch Pin with Hairpin

3.3.2 Unhooking Three-Point Hitch

1. Park machine on flat level surface.
2. Lower header onto blocks, or leave header raised. If leaving in raised position, engage lift cylinder lock-out valves.

CAUTION

To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key. To maintain stability, always lower the machine completely. Block mower conditioner wheels before detaching from tractor.

3. Shut off engine, and remove key.
4. Move remote cylinder control valve lever back and forth to relieve stored hydraulic pressure.
5. Disconnect hydraulic hoses and electrical harness. Store hose ends in holes at front of articulated power turn (APT) as shown.

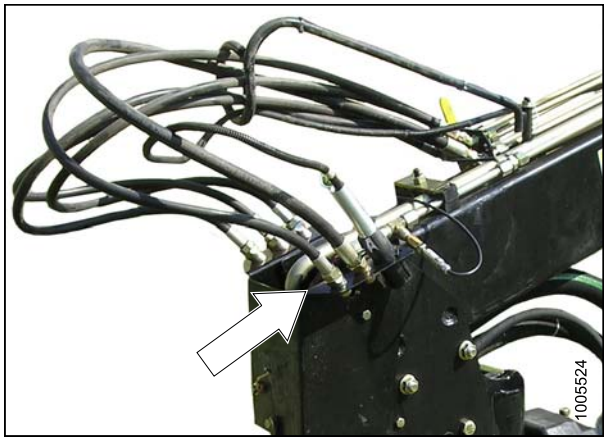


Figure 3.32: Hydraulic Hoses and Electrical Harness

6. Pull pin (A) securing jack (B) at storage location, and remove jack.

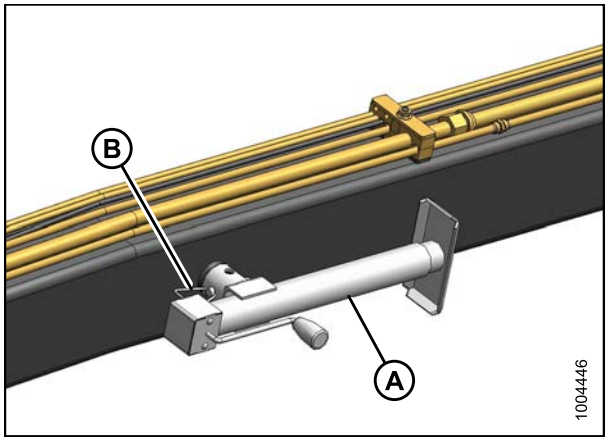


Figure 3.33: APT Jack

7. Install at working position at front of APT. Secure jack with pin (A).

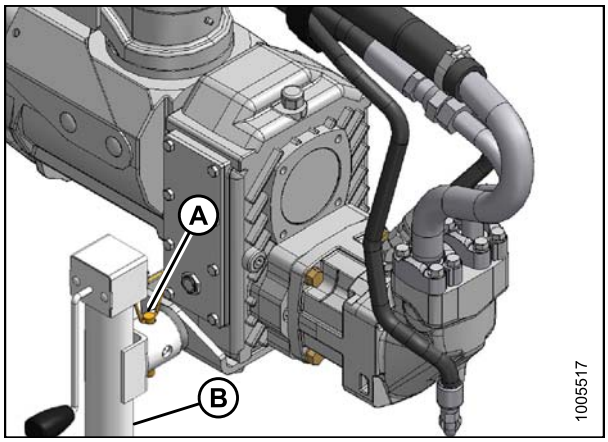


Figure 3.34: APT Jack

8. Pull back collar on driveline (A), and slide coupler off tractor power take-off (PTO) shaft.
9. Rotate hook (B) to lower position, and place driveline in hook.
10. Lower jack to raise APT, and take weight off hitch arms.

    NOTE:
    If tractor is equipped with a quick hitch system, pins (C) do not need to be removed.

11. Remove lynch pins (C), and swing hitch arms (D) clear of APT.
12. Slowly drive tractor away from mower conditioner.

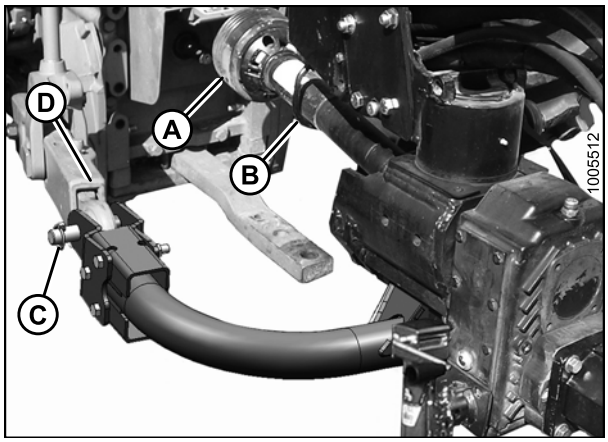


Figure 3.35: APT and PTO

3.4 Engaging the Power Take-Off (PTO)

DANGER

Be sure all bystanders are clear of the machine before engaging the PTO. Never leave tractor seat with the PTO engaged.

1. Engage PTO slowly, just before the mower conditioner is moved up to the standing crop.
2. Be sure tractor PTO is running at correct rpm before starting to cut (540 or 1000 rpm, as equipped).
3. Disengage PTO when not operating the mower conditioner.

3.5 Lift Cylinder Lock-Outs

1. Raise machine to maximum height by activating remote cylinder control valve in tractor.

   IMPORTANT:
   Hoses should be connected so that moving control lever (A) backward raises the header.

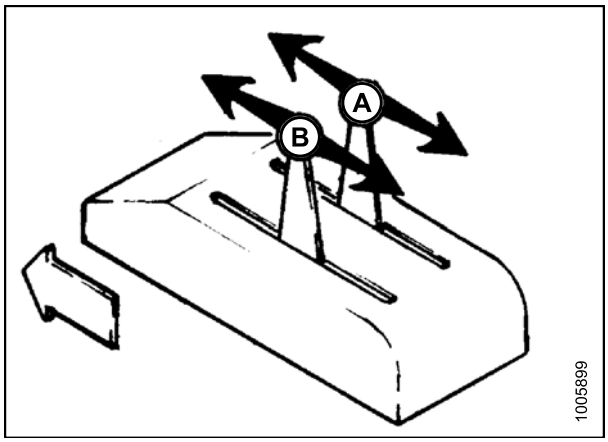


Figure 3.36: Tractor Controls

A - Lever to Lower/Raise Header
B - Lever to Steer Right/Left

2. Close lock-out valve on each lift cylinder by turning the handle to the horizontal position (A).
3. To return to normal operation, turn handle on the lock-out valves to the vertical position (B).

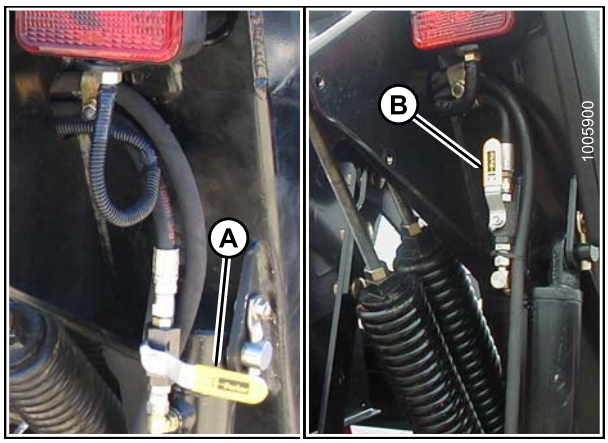


Figure 3.37

A - Closed Operation - Handle in Horizontal Position
B - Normal Operation - Handle in Vertical Position

3.6 Steering the Pull-Type Mower Conditioner

Steering is controlled by the tractor's remote hydraulic system. This steering system allows the mower conditioner to follow directly behind the tractor, make a full cut to either side, or any position in-between.

IMPORTANT:
Hoses should be connected so that moving the tractor control lever (A) FORWARD steers the machine to the RIGHT, and moving lever (A) BACKWARD steers the machine LEFT.

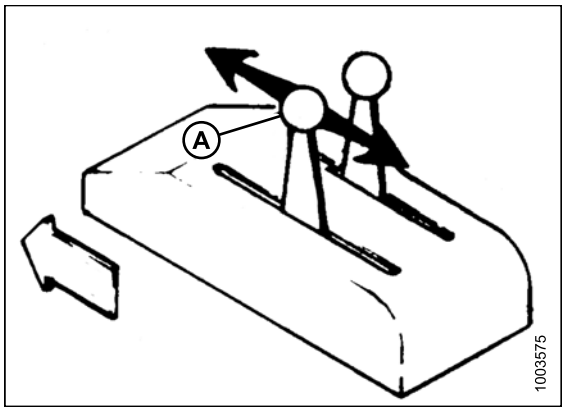


Figure 3.38: Tractor Steering Lever

A - Moving Forward Steers Right
Moving Backward Steers Left

IMPORTANT:
To allow articulated power turn (APT) to swing, the valve on the APT must be in the working or open position (handle in line with APT), and the temporary transport lock pin must be in the storage location.

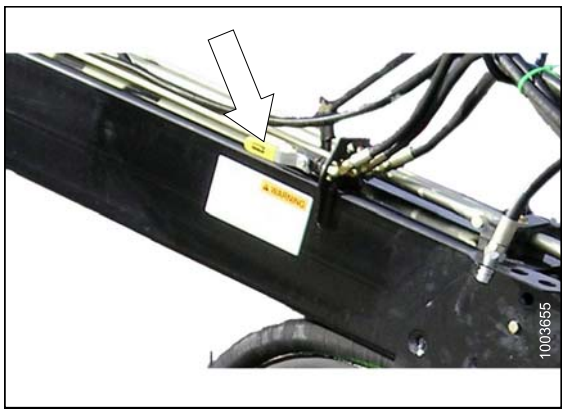


Figure 3.39: Open APT Valve

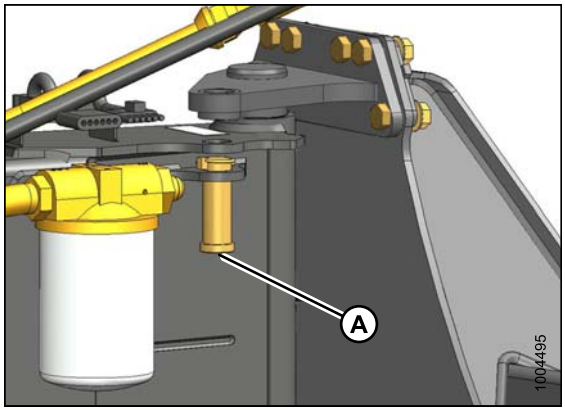


Figure 3.40: Temporary Transport Lock Pin in Storage Location

3.6.1 Right-Side Operation

Move steering lever FORWARD to achieve desired position of mower conditioner on RIGHT side of tractor.

To adjust tracking of mower conditioner during right side operation, the steering cylinder clevis can be re-positioned.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

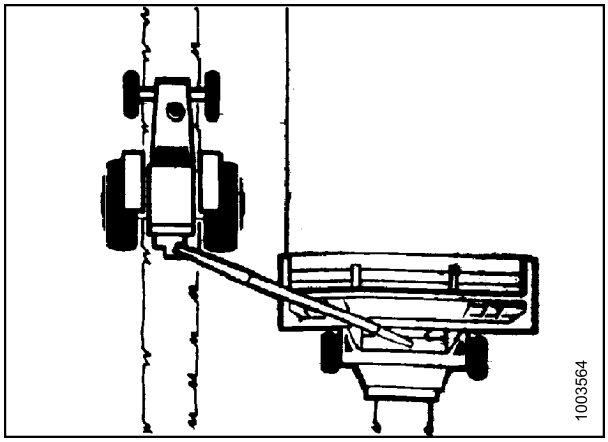


Figure 3.41: Right-Side Operation

To reposition the steering cylinder clevis, follow these steps:

1. Shut down tractor, and remove key.
2. Loosen clamping bolt (A) on clevis (B).
3. Using a wrench on the stroke control (A), rotate cylinder rod so that clevis moves away from or closer to the cylinder. **Each turn of the rod changes the tracking by approximately 2 in. (50 mm).**

Desired Track	Cylinder Extension	Clevis Position
Further RIGHT	Increase	Clevis (C) Further From Cylinder
Further LEFT	Decrease	Clevis (C) Closer To Cylinder

4. Tighten clamping bolt to 65 ft·lbf (90 N·m).
5. Recheck torque on clamping bolt after 1 hour, and every 100 hours thereafter.

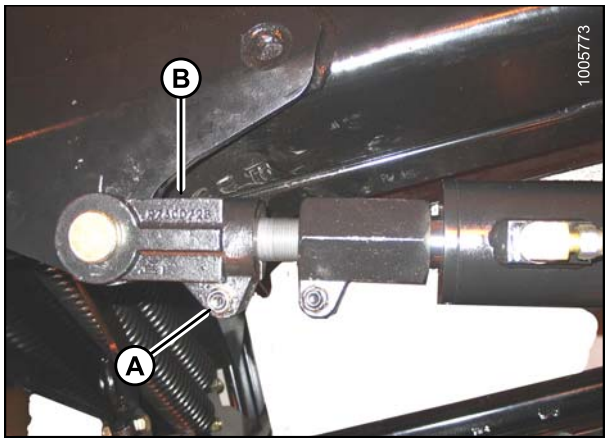


Figure 3.42: Steering Cylinder Clevis

3.6.2 Left-Side Operation

Move steering lever backward to achieve desired position of mower conditioner on left-hand side of tractor.

To adjust tracking of mower conditioner during left-hand side operation, the steering cylinder stroke control can be repositioned.

IMPORTANT:
The adjustment for right-side operation must be done PRIOR to adjustment for left-side operation.

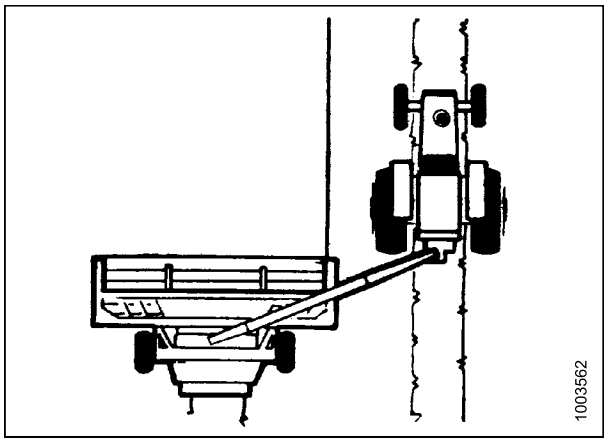


Figure 3.43: Left-Side Operation

To reposition the steering stroke control, follow these steps:

1. Loosen clamping bolt (A) on stroke control (B), and rotate stroke control to desired position.

   NOTE:
   Each turn of the stroke control changes tracking by approximately 2 in. (50 mm).

Desired Track	Cylinder Stroke	Stroke Control Position
Further LEFT	Decrease	Rotate Stroke Control (B) Away From Clevis.
Further RIGHT	Increase	Rotate Stroke Control (B) Towards Clevis.

2. Tighten clamping bolt to 65 ft·lbf (90 N·m).
3. Recheck torque on clamping bolt after 1 hour, and every 100 hours thereafter.

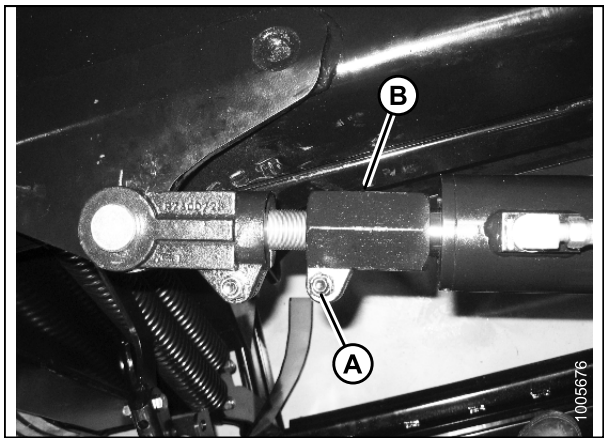


Figure 3.44: Steering Stroke Control

3.6.3 Avoiding Obstacles

Move steering lever as required to avoid obstacles.

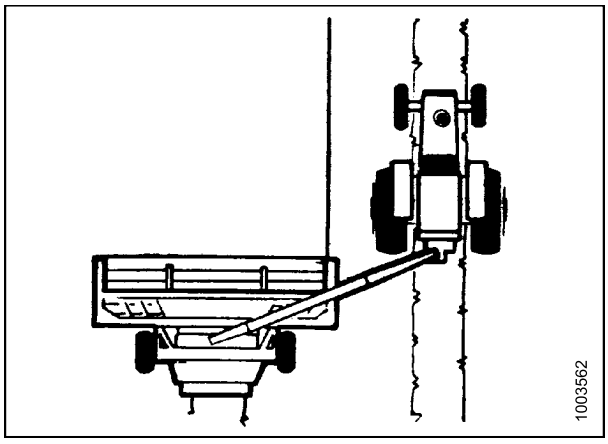


Figure 3.45: Avoiding Obstacles

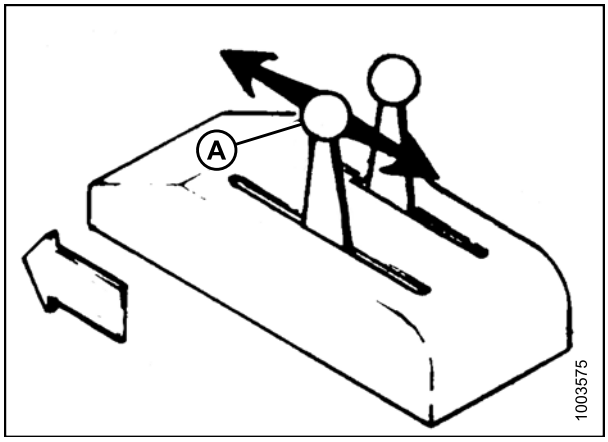


Figure 3.46: Tractor Steering Lever

A - Moving Lever Forward Steers Right
A - Moving Lever Backward Steers Left

3.6.4 Turning Square Corners

The following procedure is intended only as a guide to developing a turning procedure for the tractor being used. Specific distances are not given due to the variances in tractor manoeuvrability.

1. As tractor approaches the corner, guide tractor sharply away from the crop. Steer the mower conditioner to maintain a straight cut ahead, as the tractor moves away from the crop.
2. As soon as the knife cuts past where the new corner will be, raise the header sufficiently for skid shoes to clear the ground, then steer the mower conditioner to the extreme direction away from the uncut crop.
3. As the tractor passes the corner, steer it sharply back towards the uncut crop, taking care that the inside tractor tire does not contact the mower conditioner's articulated power turn (APT).
4. Guide the tractor to straddle the last cut windrow. As the mower conditioner finishes turning, steer it back towards the uncut crop, align the header with the crop edge, and lower header to cutting height.

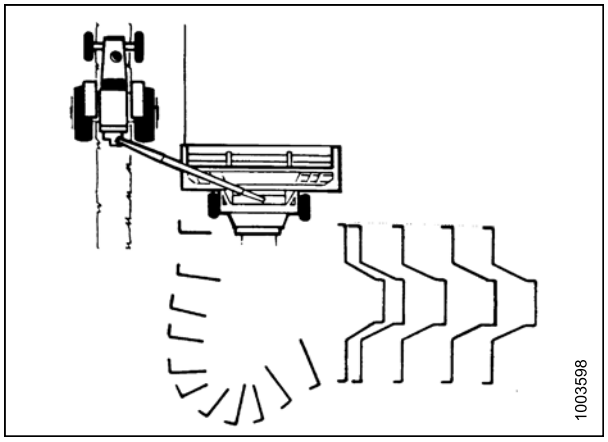


Figure 3.47: Square Corners

3.6.5 Turning 180 Degrees

NOTE:
When cutting back and forth on one side of the field, approximately 50 ft. (15 m) is required at each end of the field to make a 180 degree turnaround.

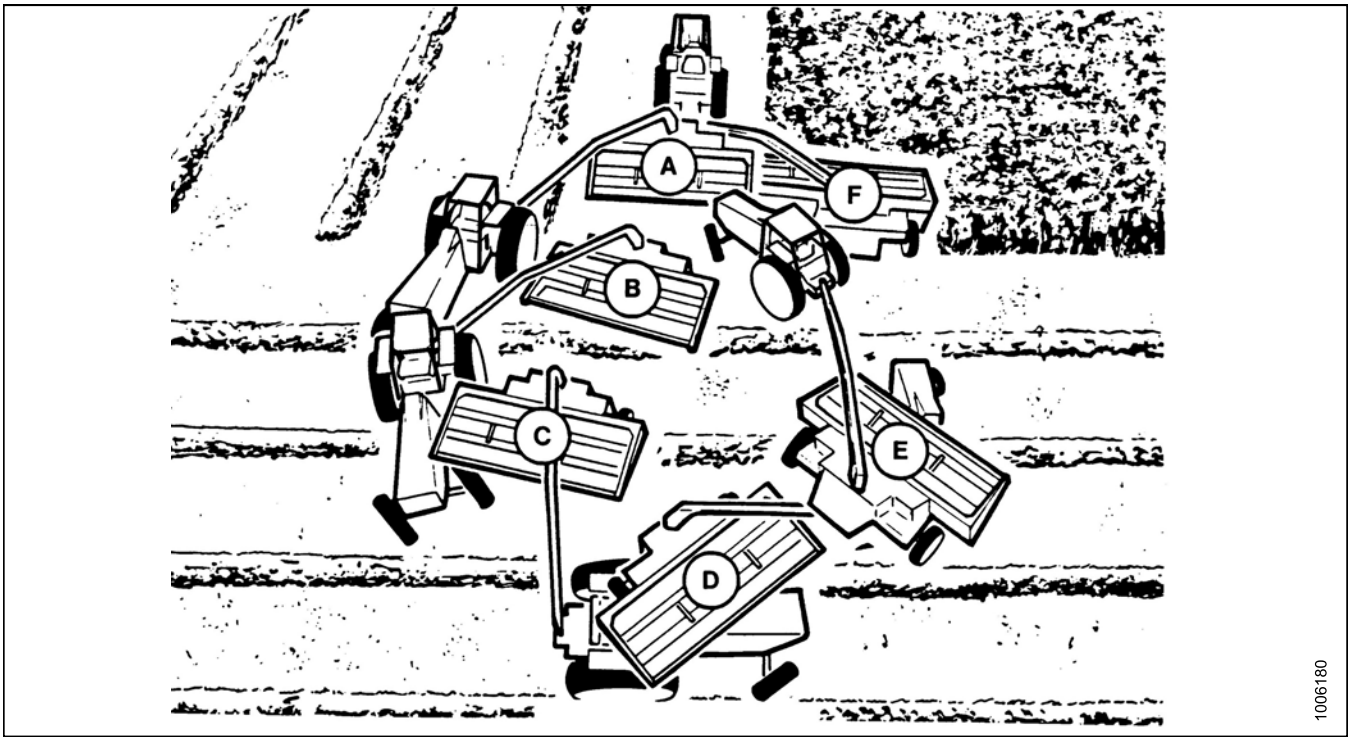


Figure 3.48: 180 Degree Turn

Refer to illustration above, and proceed as follows:

1. Beginning at position (A), steer the tractor away from the uncut crop, and steer the mower conditioner straight ahead until cutting through the end.
2. As soon as the knife cuts through, raise header to lift the skid shoes clear of the ground, and steer mower conditioner to the extreme direction away from the uncut crop.

   NOTE:
   For ease of operation, both levers can be activated with one hand, and held until steering cylinder completes its stroke.

3. At position (B), start turning tractor back towards the uncut crop.

   IMPORTANT:
   When turning, take care that inside tractor tire does NOT contact the articulated power turn (APT) of the mower conditioner.

4. In positions (C) and (D), continue turning towards the uncut crop, (with the mower conditioner steered towards the outside of the turning circle), being aware of APT-to-tire clearance.
5. At position (E), the tractor completes the circle, and front wheels are turned to straddle the last cut windrow. At this point, steer the mower conditioner to line up with the edge of the uncut crop.
6. At position (F), lower header to cutting height, and begin a new cut through the field.

3.7 Operating Variables for A30-D

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

Correct operation reduces crop loss and allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

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

Table 3.1 Header/Mower Conditioner Adjustments

Variable	Refer to
Lean Bar Position	*3.7.1 Setting Lean Bar, page 57*
Auger Speed	*3.7.2 Setting Auger Speed, page 57*
Reel Speed	*3.7.3 Setting Reel Speed, page 58*
Auger Position	*3.7.4 Setting Auger Position, page 59*
Reel Position	*3.7.5 Setting Reel Position, page 64*
Tine Aggressiveness Adjustment	*3.7.7 Setting Tine Aggressiveness, page 70*
Cutting Height	*3.7.6 Setting Cutting Height, page 69*
Header Angle	*3.7.8 Setting Header Angle, page 71*
Header Float	*3.7.9 Setting Float, page 72*
Feed Pan / Rock Drop Tine Position	*3.7.10 Setting Feed Pan and Rock Drop Tine Position, page 73*
Roll Gap/Timing/Alignment	*3.7.11 Adjusting Conditioner Roll Gap, page 74*, *8.12.12 Checking/Adjusting Roll Alignment, page 287*, and *8.12.13 Adjusting Conditioner Roll Timing, page 289*
Roll Tension	*3.7.12 Adjusting Conditioner Roll Tension, page 76*
Forming Shields	*3.7.13 Positioning the Forming Shields, page 76*
Tall Crop Dividers	*6.1 Adjusting Tall Crop Dividers, page 161*
Ground Speed	*5 Selecting Ground Speed, page 159*

3.7.1 Setting Lean Bar

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

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

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

In crops over 5 ft. (1.52 m), an optional tall crop divider kit (MD #B4690) is available that includes lean bar extensions to raise the lean bar. See also *6.1 Adjusting Tall Crop Dividers, page 161*.

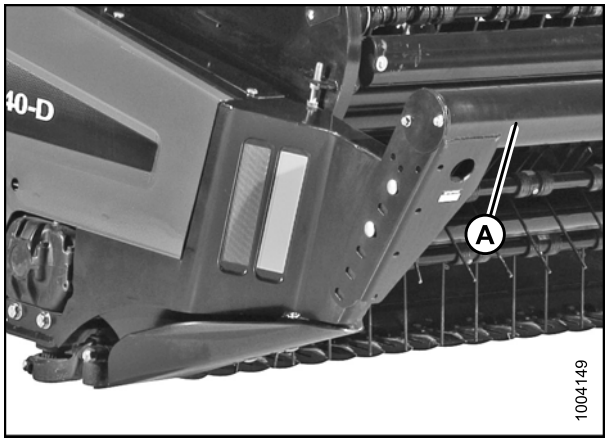


Figure 3.49: Lean Bar

3.7.2 Setting Auger Speed

Optional drive sprockets provide different auger speed ranges.

- Increase auger speed at high ground speed, or in heavy crop conditions.
- Decrease auger speed at low ground speed or in light crop conditions.

NOTE:
Adjusting auger speed can change your windrow shape:

- Higher auger speeds place more crop in the center of the windrow.
- Lower auger speeds place more crop at the edges of the windrow.

A30-D auger speed is fixed to the engine rpm. An optional 19-tooth drive sprocket provides lower auger speeds.

Refer to *2.3 Product Specifications, page 29* for available auger speeds at rated tractor rpm.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Change auger drive sprockets as follows:

1. Remove auger drive chain (A). Refer to *Removing Auger Drive Chain, page 238*.
2. Remove three bolts (B) attaching sprocket to pulley, and remove sprocket.
3. Attach applicable sprocket to pulley with three bolts, and torque to 75 ft·lbf (102 N·m).
4. Replace auger drive chain (A). Refer to *Installing Auger Drive Chain, page 238*.

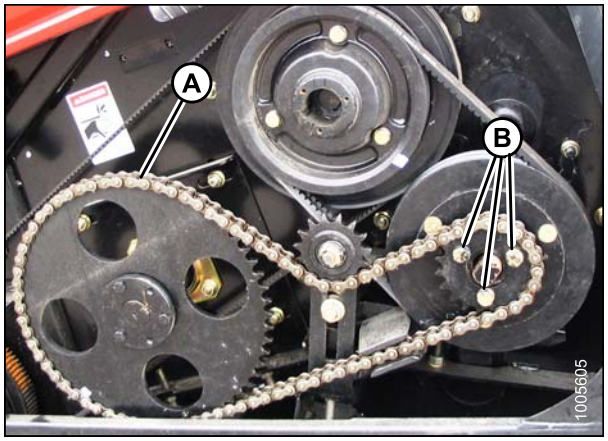


Figure 3.50: Auger Drive

3.7.3 Setting Reel Speed

Reel speed should be set to match ground speed, or about 10% faster. Optional drive sprockets provide different reel speed ranges.

The A30-D reel speed is fixed to the engine rpm and auger speed. An optional 19-tooth drive sprocket provides lower reel speeds if necessary.

Refer to *2.3 Product Specifications, page 29* for available reel speeds at rated tractor rpm.

Change auger drive sprockets, as follows:

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove reel drive belt (A) and reel drive chain (B) from drive sprocket. Refer to the following sections:
   - *Removing Reel Drive Chain, page 235*
   - *Removing Reel Drive Belt, page 236*
2. Remove snap ring (C) from pulley (D), and remove pulley.
3. Remove three bolts attaching sprocket to pulley, and remove sprocket.
4. Attach applicable sprocket to pulley with three bolts, and torque to 75 ft·lbf (102 N·m).
5. Replace pulley, and install snap ring.
6. Replace reel drive chain and belt. Refer to the following sections:
   - *Installing Reel Drive Chain, page 235*
   - *Installing Reel Drive Belt, page 237*

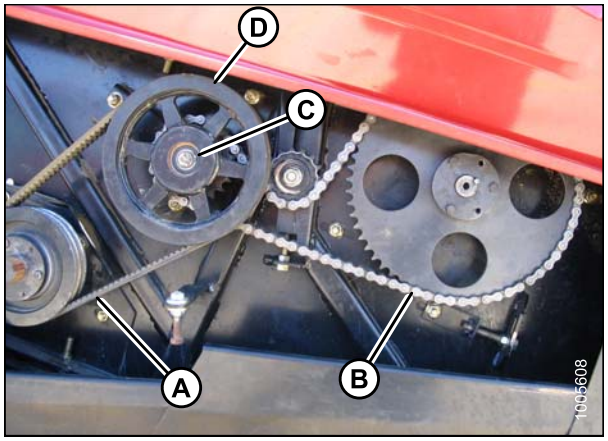


Figure 3.51: Reel Drive Chain and Belt

3.7.4 Setting Auger Position

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

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

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

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

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

- *Setting Auger Fore-Aft Position, page 59*
- *Setting Auger Vertical Position, page 62*
- A40-D: *Adjusting Auger Fore-Aft Position, page 137*
- A40-D: *Adjusting Vertical Position, page 138*

NOTE:
In heavier crops it may be necessary to remove the front stripper bar for smoother crop flow across the auger. Refer to *8.11.3 Stripper Bar, page 264*.

NOTE:
The auger should clear the stripper bars on the auger pan by approximately 1/32–5/32 in. (1–4 mm). Shimming the stripper bars may be required. Refer to *8.11.3 Stripper Bar, page 264*.

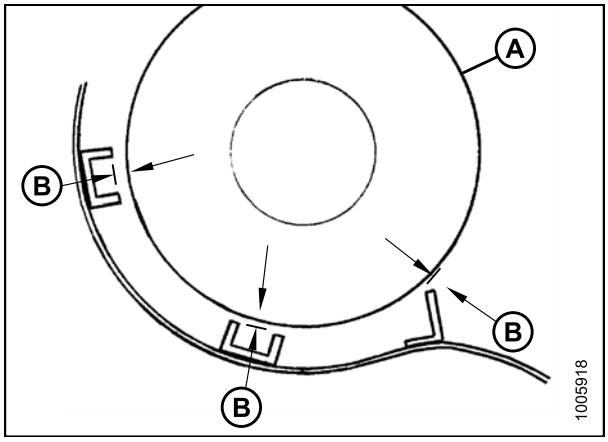


Figure 3.52: Clearance between Auger and Stripper Bars on the Auger Pan

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

Setting Auger Fore-Aft Position

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Open left-hand endshield.
2. Loosen auger drive chain (A) as follows:
   a. Loosen nut (B) on idler sprocket support.
   b. Turn adjuster bolt (C) to loosen chain (A).

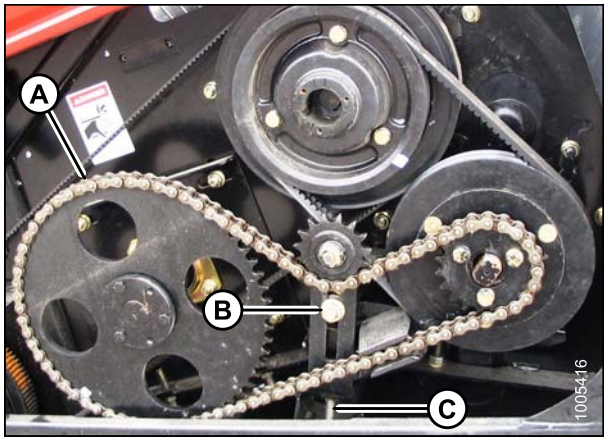


Figure 3.53

3. Loosen four nuts (A).
4. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt (B) to adjust auger fore-aft position.
5. Tighten jam nut and four nuts (A).

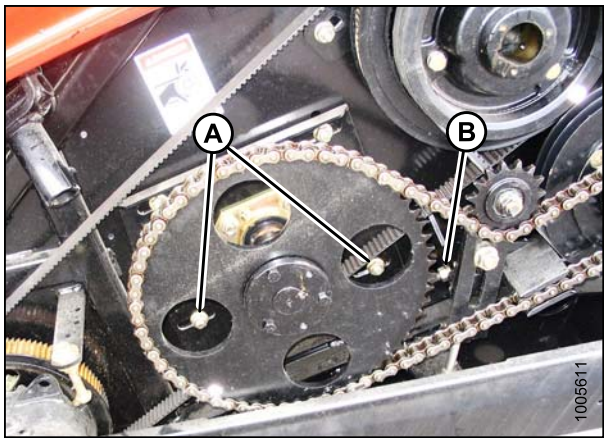


Figure 3.54

6. Tighten auger drive chain (A) as follows:
   a. Turn adjuster bolt (C) to achieve 1/4 in. (6 mm) slack at mid-span of chain (A).
   b. Tighten nut (B) on idler sprocket support.
   c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.

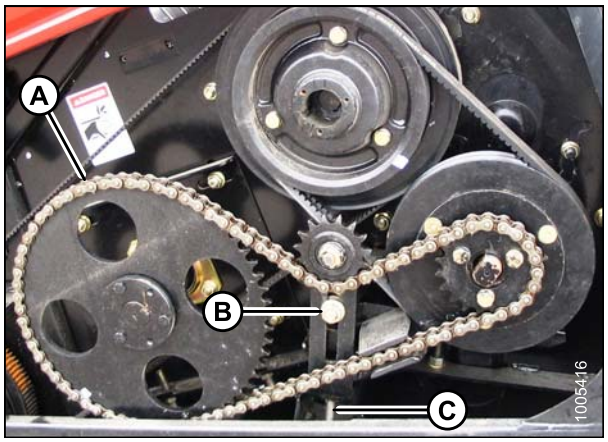


Figure 3.55

7. Open right-hand endshield.
8. Loosen reel drive belts (A) as follows:
   a. Loosen nuts (C).
   b. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt (B) to loosen reel drive belts.

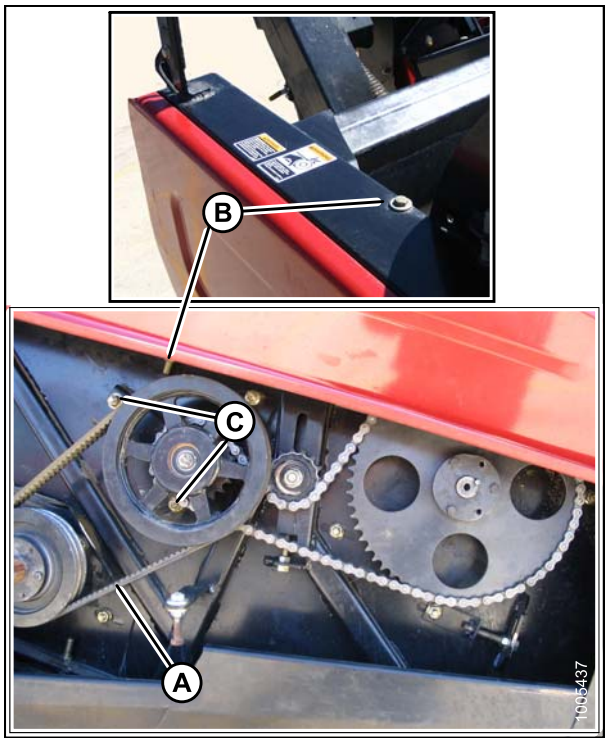


Figure 3.56

9. Loosen nuts (A).
10. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt (B) to adjust auger fore-aft position.
11. Tighten nuts (A) and jam nut.

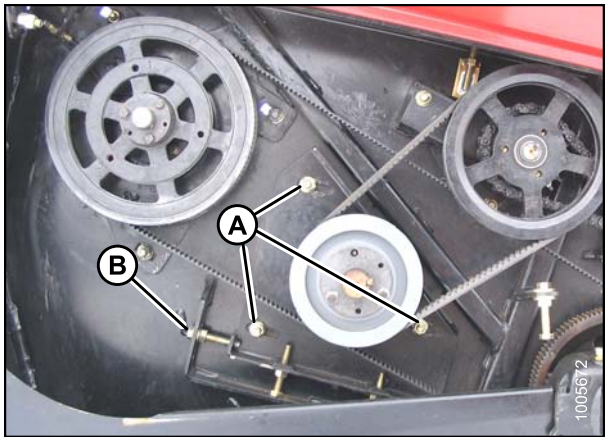


Figure 3.57

12. Check reel drive chain tension. Total chain slack at (A) should be 1/4 in. (6 mm). If necessary, adjust chain slack as follows:
    a. Loosen bolt (B) on sprocket and jam nut on adjuster bolt (C).
    b. Turn adjuster bolt (C) to move idler sprocket downward until chain slack is achieved as above.
    c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.
    d. Tighten jam nut at (C) and nut (B) on sprocket. Recheck tension.
13. Close shields before engaging header.

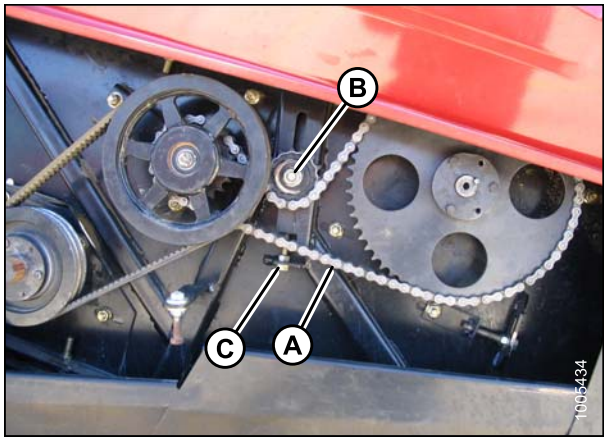


Figure 3.58

Setting Auger Vertical Position

⚠ CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Open left-hand endshield.
2. Loosen auger drive chain (A) as follows:
    a. Loosen nut (B) on idler sprocket support.
    b. Turn adjuster bolt (C) to loosen chain (A).

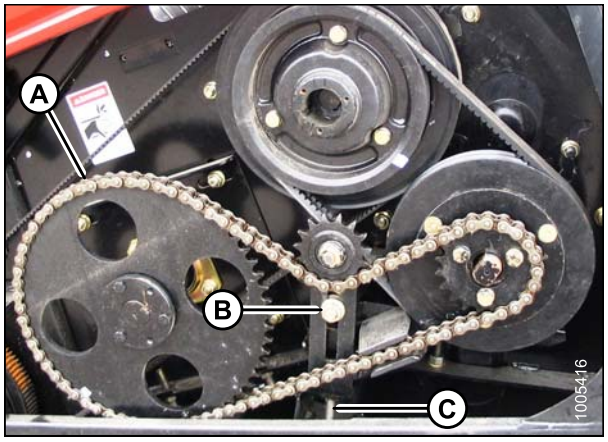


Figure 3.59

3. Loosen four nuts (A).
4. Loosen jam nut on the two adjuster bolts (B), and turn the two adjuster bolts (B) to adjust auger vertical position.
5. Tighten jam nut and four nuts (A).

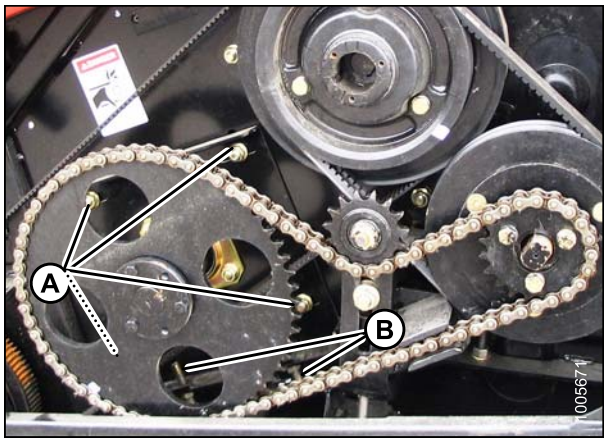


Figure 3.60

6. Tighten auger drive chain (A) as follows:
   a. Turn adjuster bolt (C) to achieve 1/4 in. (6 mm) slack at mid-span of chain (A).
   b. Tighten nut (B) on idler sprocket support.
   c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.

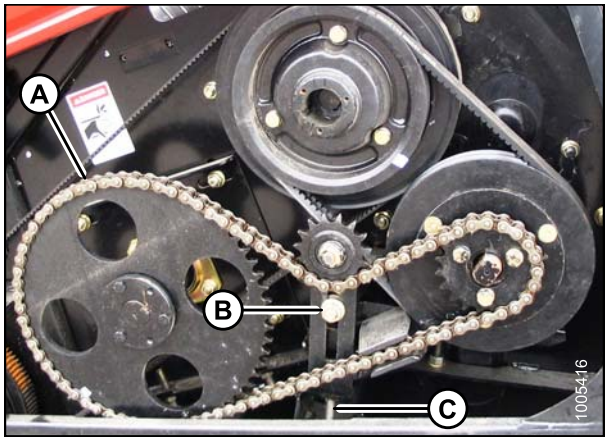


Figure 3.61

7. Open right-hand endshield.
8. Loosen reel drive belts (A) as follows:
   a. Loosen nuts (C).
   b. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt (B) to loosen reel drive belts (A).

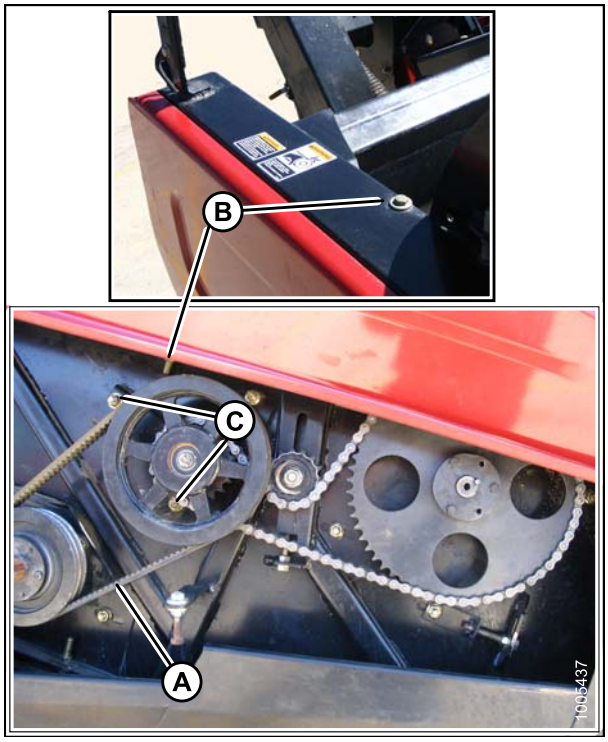


Figure 3.62

9. Loosen nuts (A).
10. Loosen jam nuts on adjuster bolts (B), and turn adjuster bolts (B) to adjust auger vertical position.
11. Tighten nuts (A) and jam nuts.

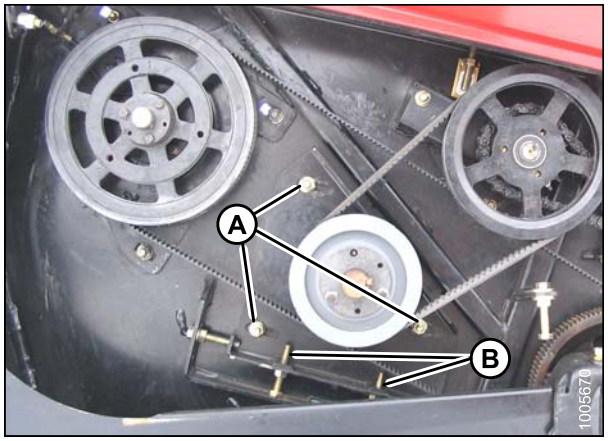


Figure 3.63

12. Check reel drive chain tension. Total chain slack at (A) should be 1/4 in. (6 mm). If necessary, adjust as follows:
    a. Loosen bolt (B) on sprocket and jam nut on adjuster bolt (C).
    b. Turn adjuster bolt (C) to move idler sprocket downward until chain slack is achieved as above.
    c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.
    d. Tighten jam nut at (C) and nut (B) on sprocket. Recheck tension.
13. Close shields before engaging header.

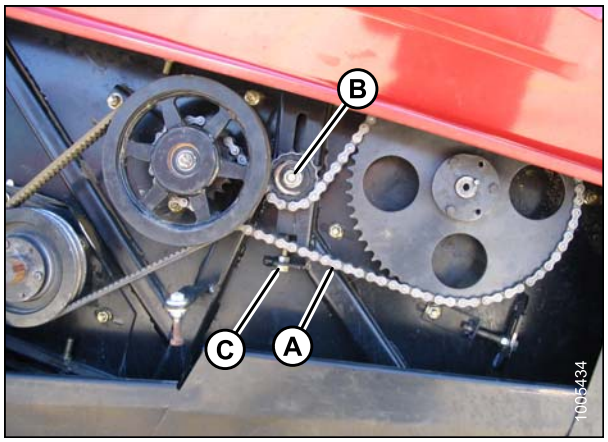


Figure 3.64

3.7.5 Setting Reel Position

Reel position has been found to be a critical factor in achieving good results in adverse conditions. Reel position is factory-set for average straight standing crop. It can be adjusted both vertically and horizontally (fore-aft) for different crop conditions.

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

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

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

- *Setting Reel Fore-Aft Position, page 65*
- *Setting Reel Vertical Position, page 66*

Setting Reel Fore-Aft Position

NOTE:
The reel must be adjusted equally on both sides.

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Open left-hand endshield.
2. Loosen four nuts (A).
3. Loosen jam nut on adjuster bolt (B), and turn bolt (B) to adjust fore-aft position.
4. Tighten jam nut, and four nuts (A).

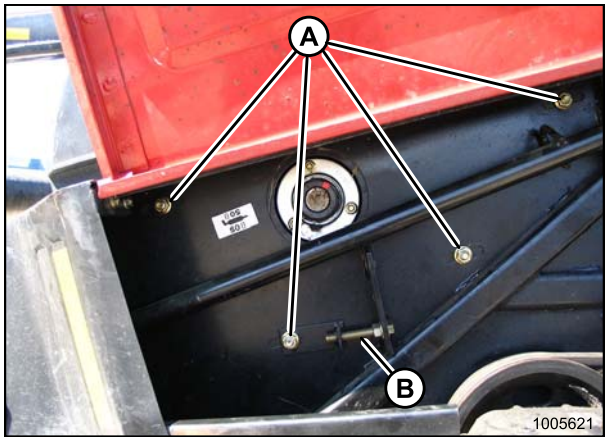


Figure 3.65

5. Open right-hand endshield.
6. Loosen the reel drive chain (A) as follows:
   a. Loosen nut (B) on sprocket.
   b. Loosen jam nut on adjuster bolt (C), and turn adjuster bolt (C) to loosen chain.

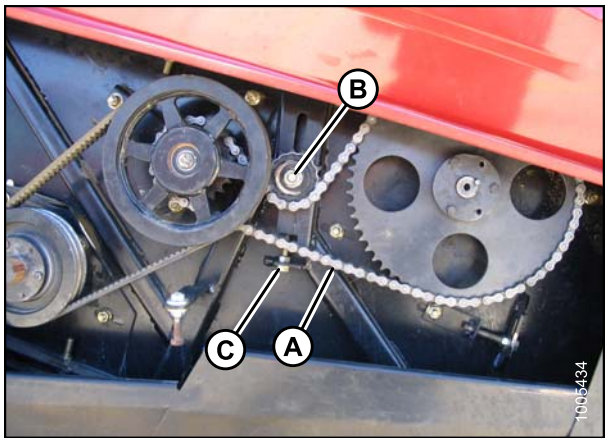


Figure 3.66

7. Loosen four nuts (A).
8. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt to adjust reel fore-aft position.
9. Tighten jam nut, and four nuts (A).

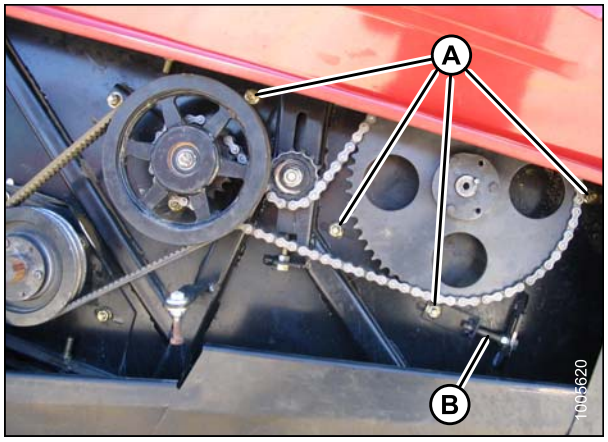


Figure 3.67

10. Tighten reel drive chain (A) as follows:
    a. Turn adjuster bolt (C) to tighten chain until total chain slack at (A) is 1/4 in. (6 mm).
    b. Tighten jam nut at (C) and nut (B), and recheck tension.
11. Close shields before engaging the header.

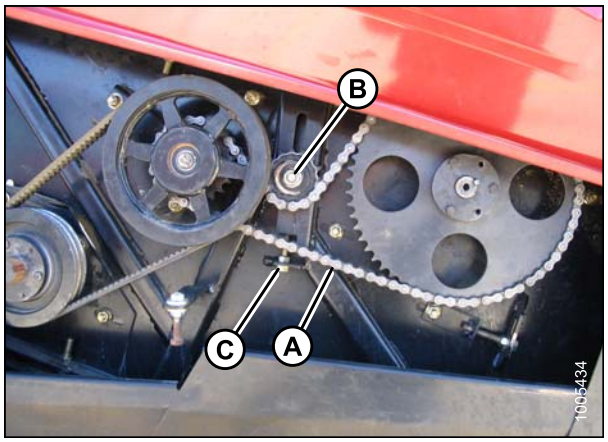


Figure 3.68

Setting Reel Vertical Position

The reel vertical position can be adjusted to provide the proper clearance between the reel tines and the cutterbar. Refer to Auger Vertical Position for more information. Refer to *Adjusting Vertical Position, page 138* for more information.

⚠ CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Open left-hand endshield.
2. Loosen four nuts (A).

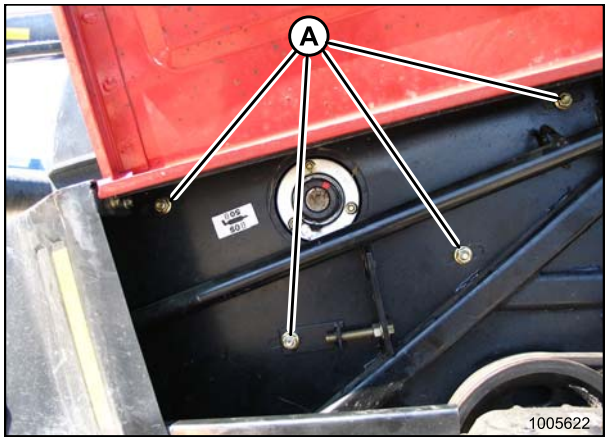


Figure 3.69

3. Loosen jam nuts on adjuster bolts (A), and turn bolts (A) to raise or lower reel.

   NOTE:
   Adjustment at forward adjuster bolt should be 0.47 in. (12 mm) lower than at rear adjuster bolt.

4. Tighten jam nuts and nuts.

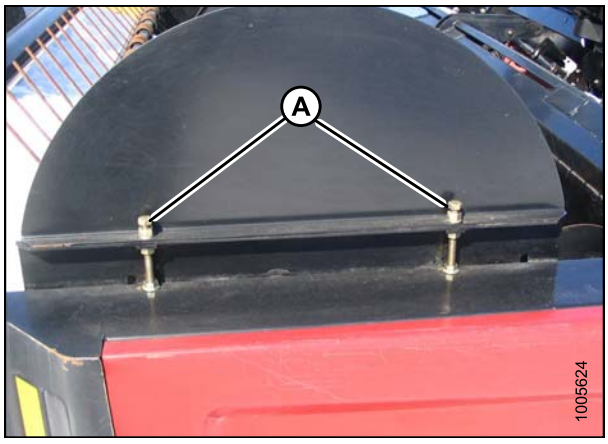


Figure 3.70

5. Open right-hand endshield.
6. Loosen reel drive chain (A) as follows:
   a. Loosen nut (B) on sprocket.
   b. Loosen jam nut on adjuster bolt (C), and turn adjuster bolt (C) to loosen chain.

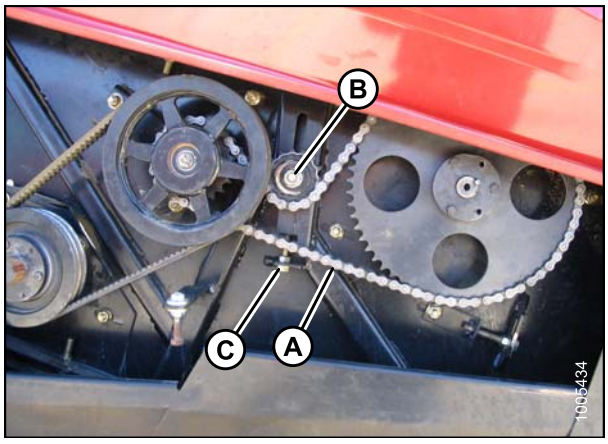


Figure 3.71

7. Loosen four nuts (A).

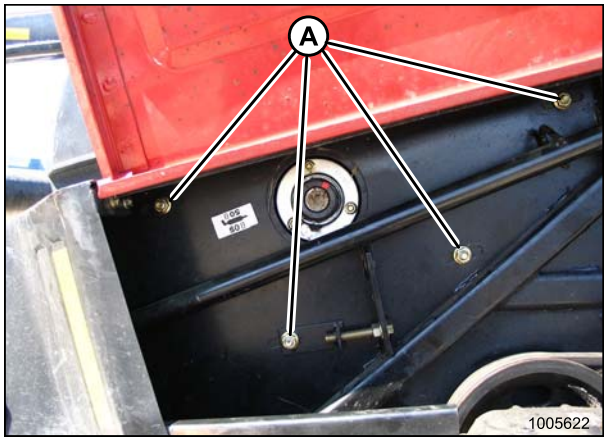


Figure 3.72

8. Loosen jam nuts on adjuster bolts (A), and turn adjuster bolts to raise or lower reel.

   NOTE:
   Adjustment at forward adjuster bolt should be 0.47 in. (12 mm) lower than at rear adjuster bolt.

9. Tighten jam nuts and four nuts.

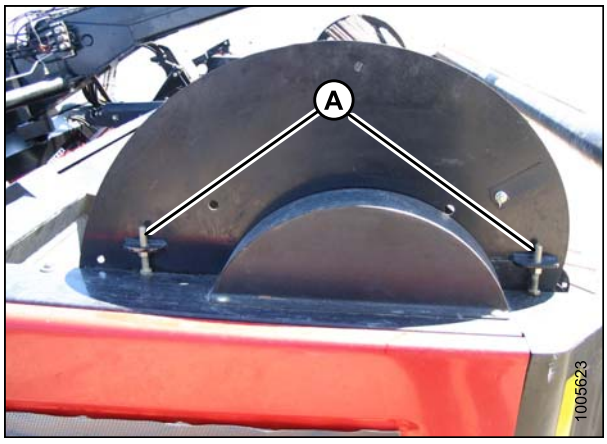


Figure 3.73

10. Tighten reel drive chain (A) as follows:
    a. Turn adjuster bolt (C) to tighten chain until total chain slack at (A) is 1/4 in. (6 mm).
    b. Tighten jam nut at (C) and nut (B) and re-check tension.
11. Close shields before engaging header.
12. Check that reel rotates freely.

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

13. Check that reel is evenly adjusted.

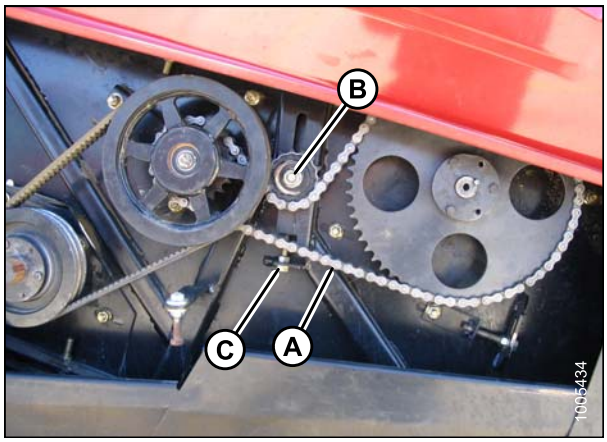


Figure 3.74

Checking Reel Tine to Header Pan Clearance

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

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

   NOTE:
   If there are a few reel tines that are touching the pan while the rest are at the correct height, trim the longer tines to match the rest. Be sure to adjust both sides of the reel. For self-propelled windrower headers, ensure that tines do **NOT** contact plastic header pan.

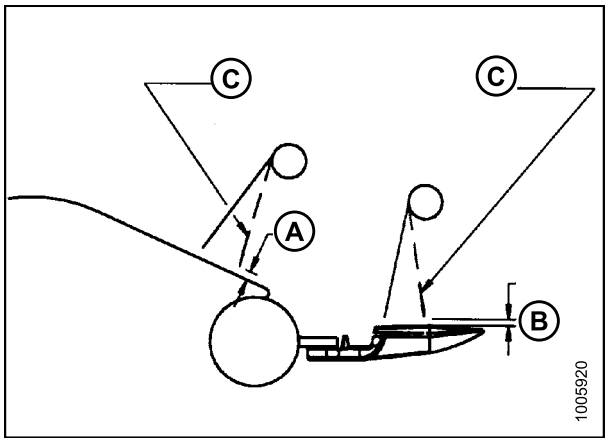


Figure 3.75: Reel Tine Clearance

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

3.7.6 Setting Cutting Height

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

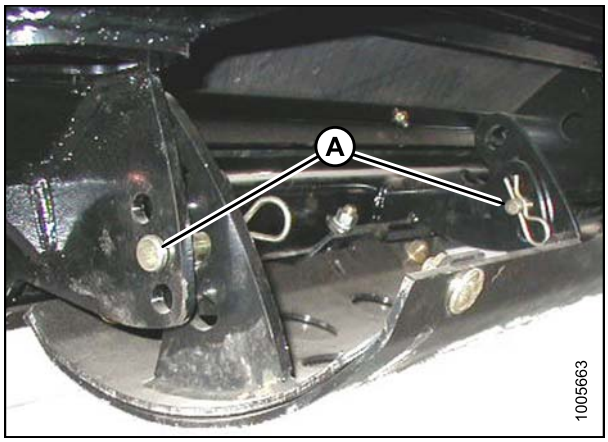


Figure 3.76: Skid Shoe

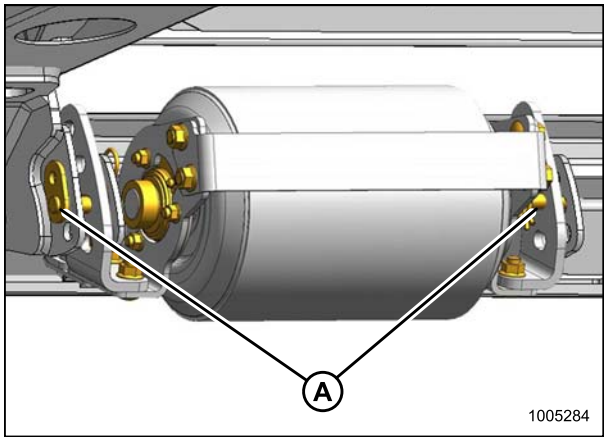


Figure 3.77: Gauge Roller

5. Check that skid shoes or gauge rollers are adjusted to the same position.
6. Check header float, and adjust if required:
   - Refer to *3.7.9 Setting Float, page 72*

NOTE:
For PULL-TYPE units, the two outboard skid shoes are standard equipment.

3.7.7 Setting Tine Aggressiveness

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Open right-hand endshield.
2. At right side of reel (cam end) **ONLY**, loosen four nuts (A).

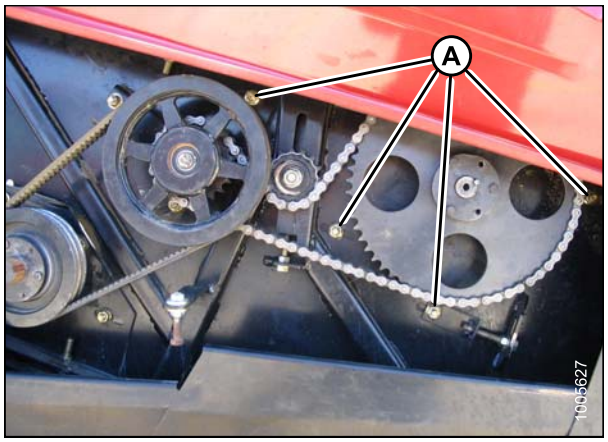


Figure 3.78: A30-D

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

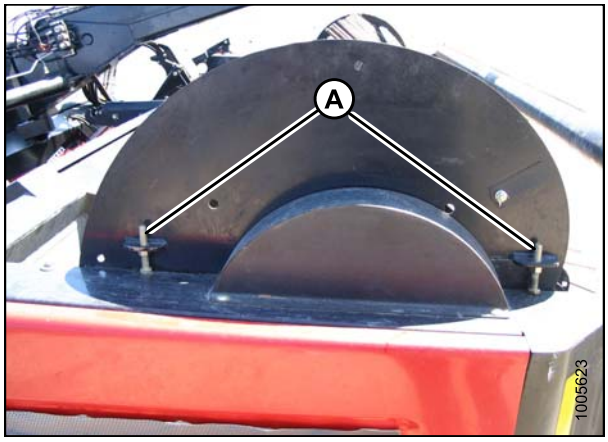


Figure 3.79: A30-D

4. Tighten nuts (A), and jam nuts on bolts.
5. Check that chain and/or belt have **NOT** become over-tight. Adjust to recommended tension if required. Refer to the following:
   - *Checking/Adjusting Reel Drive Chain Tension, page 234*
   - *Checking/Adjusting Reel Drive Belt Tension, page 235*.
6. Check reel tine to header pan clearance to ensure that there is no contact between reel tines and the header pan. Refer to *Checking Reel Tine to Header Pan Clearance, page 69*.

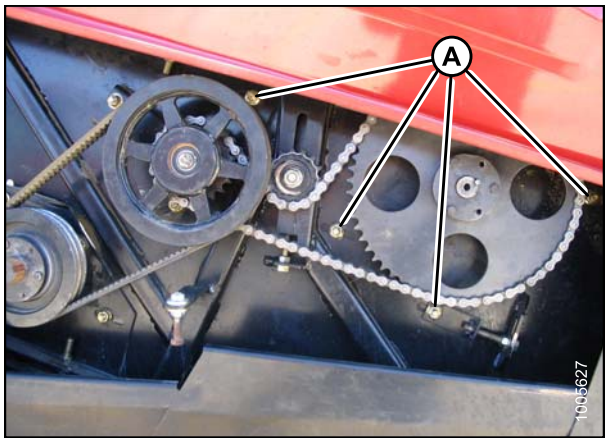


Figure 3.80: A30-D

3.7.8 Setting Header Angle

Header (or guard) angle can be varied from 8–16 degrees below horizontal. Choose an angle that maximizes performance for your crop and field conditions.

A flatter angle provides better clearance in stony conditions while a steeper angle is required in down crops for better lifting action.

Mechanically Adjusting Header Angle

Mechanical adjustment is standard on the A30-D header.

1. Lower header so that cutter bar is resting on the ground.
2. Loosen nut (A).
3. **To decrease (flatten) header angle,** rotate the turnbuckle sleeve (B) so that the turnbuckle decreases in length.
4. **To increase (steepen) header angle,** rotate the turnbuckle sleeve (B) so that the turnbuckle increases in length.
5. Snug up nut (A), but do **NOT** over-tighten. A slight tap with a small hammer is sufficient.
6. Check cutting height, and adjust if required. Refer to *3.7.6 Setting Cutting Height, page 69*.
7. Check header float, and adjust if required. Refer to *3.7.9 Setting Float, page 72*.

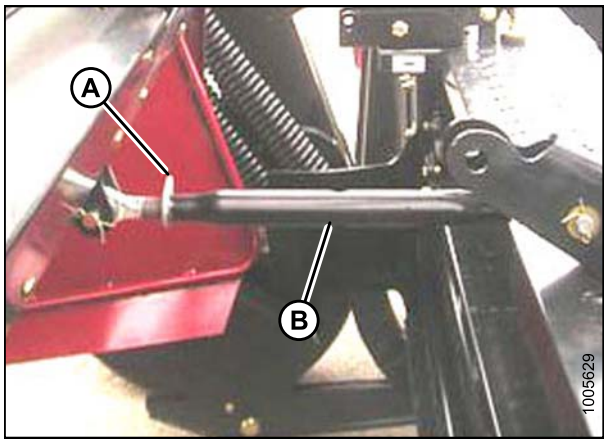


Figure 3.81

Hydraulically Adjusting Header Angle

Hydraulic adjustment is optional on the A30-D header. With the hydraulic option installed, header angle can be adjusted from the tractor, without shutting down the mower conditioner.

1. **To decrease (flatten) header angle,** operate tractor hydraulic control so that cylinder retracts, decreasing the number of holes in the gauge (A) that are exposed.
2. **To increase (steepen) header angle,** operate tractor hydraulic control so that cylinder extends, increasing the number of holes in the gauge that are exposed.

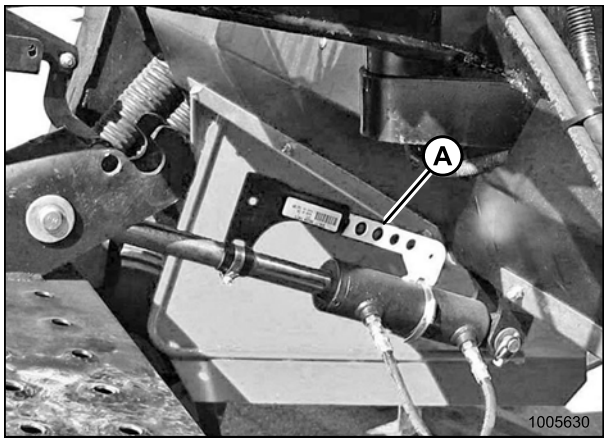


Figure 3.82

3.7.9 Setting Float

Float should be set for your field and crop conditions. Float should be light enough to float over obstacles such as mole hills or gopher mounds, but heavy enough so that mower conditioner comes back easily to its former cutting height, and does not skip over crop.

IMPORTANT:
Float setting (or lifting force) must be equal on both ends of the mower conditioner. Left-hand and right-hand ends require different spring lengths to achieve equal float at both ends.

IMPORTANT:
Because mower conditioner weight transfers to outside tire whenever mower conditioner is swung from one side to the other, tires must be fully inflated (30 psi [207 kPa]) to minimize effects on float.

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

1. Position mower conditioner directly behind tractor, and raise mower conditioner fully.
2. Stop engine, remove key, and engage lift cylinder lock-outs.
3. Back jam nuts (A) away from spring.
4. **To increase float,** turn adjuster bolts (B) clockwise (further into spring).
5. **To decrease float,** turn adjuster bolts (B) counterclockwise.

   NOTE:
   Springs must be adjusted in pairs.
6. Tighten jam nuts (A) against spring inserts to secure the setting.
7. Lower header, and check header float at each end.

   NOTE:
   Other operating variable adjustments may affect float setting. Check the float, and readjust if necessary after adjusting reel position, cutting height, or header angle.

   NOTE:
   If using a tractor with drawbar height different than 16 in. (406 mm) float will be affected. Adjust as required.

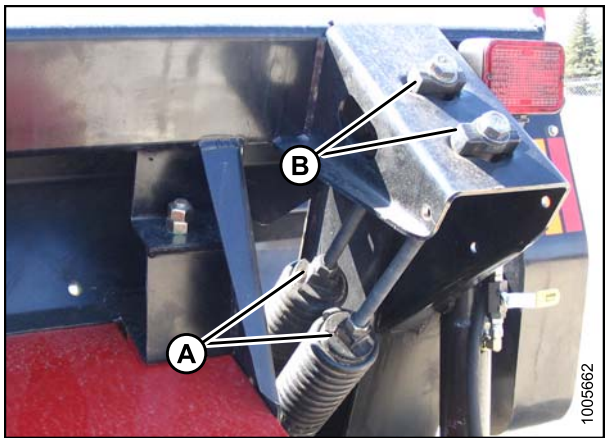


Figure 3.83

3.7.10 Setting Feed Pan and Rock Drop Tine Position

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

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

WARNING

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

1. Raise header fully, and engage header lift cylinder stops.
2. Stop engine, and remove key.

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

Crop Condition	Light	Normal	Heavy
Slot	Upper	Center	Lower

4. Tighten hardware on both sides.
5. Disengage header lift cylinder stops.

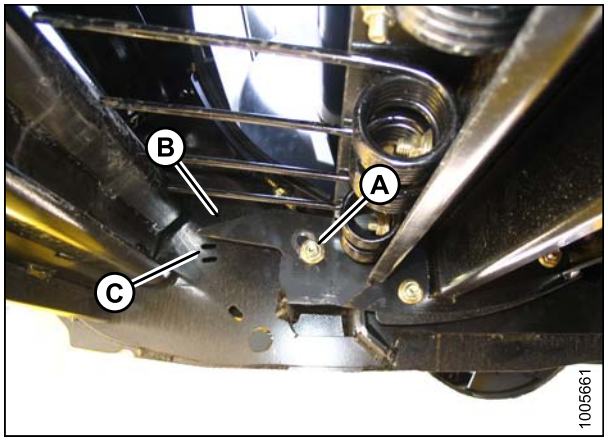


Figure 3.84

A - Nut **B - Pointer** **C - Slots**

3.7.11 Adjusting Conditioner Roll Gap

The roll gap determines the amount of conditioning:

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

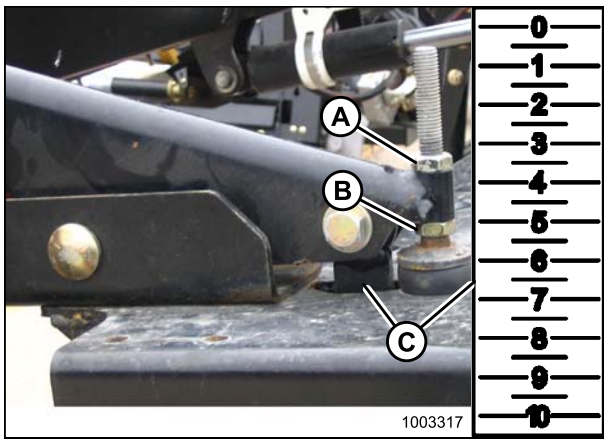


Figure 3.85: Pull-Type

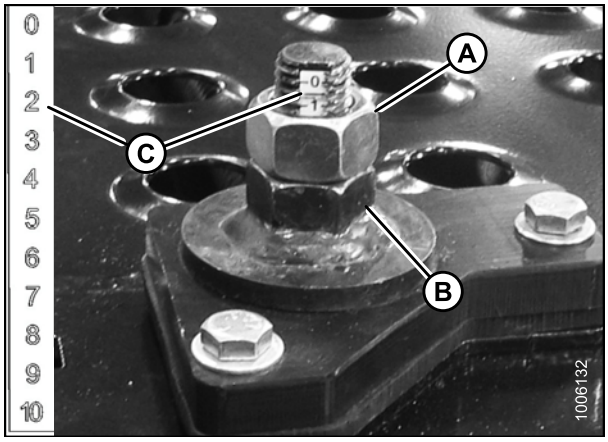


Figure 3.86: Self-Propelled

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

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

   - Conditioning is affected
   - The bars may contact each other

7. Check roll timing and alignment when reducing roll gap. Refer to:

   - *8.12.13 Adjusting Conditioner Roll Timing, page 289*
   - *8.12.12 Checking/Adjusting Roll Alignment, page 287*

8. Close cover (B), and tighten bolt (A).

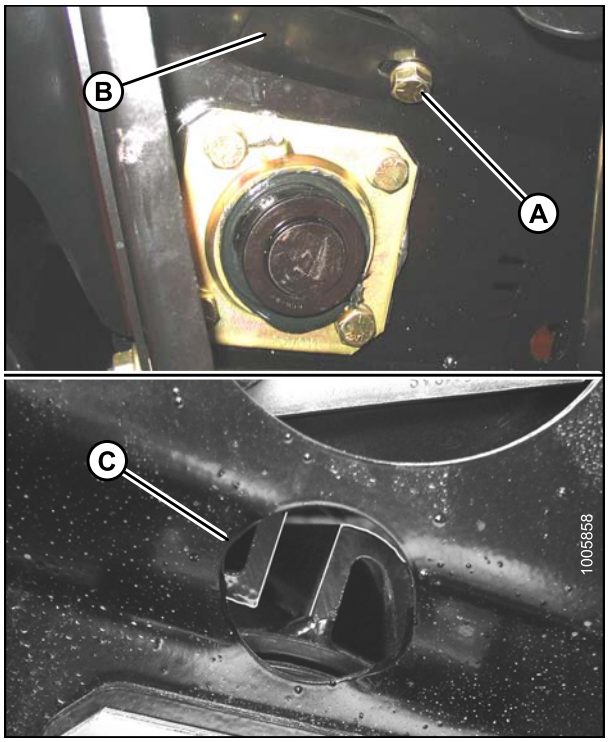


Figure 3.87

3.7.12 Adjusting Conditioner Roll Tension

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

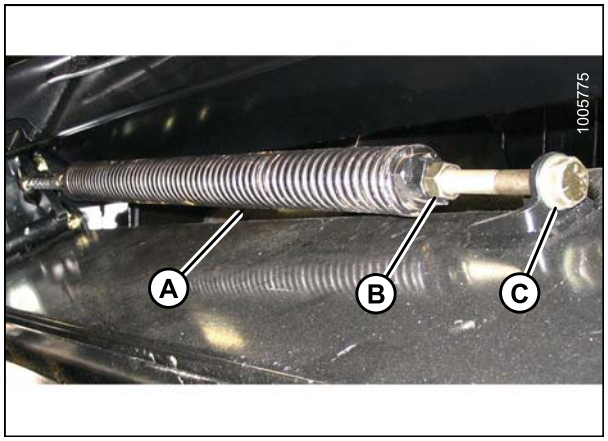


Figure 3.88

3.7.13 Positioning the Forming Shields

WARNING

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

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

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

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to *7 Haying, page 165* for more information.

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

Positioning Side Deflectors

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

1. For **SELF-PROPELLED units**, set forming shield side deflectors to desired width by re-positioning adjuster bars as follows:
   a. Remove lynch pin (A).
   b. Move adjuster bar (B) to another hole.
   c. Reinstall lynch pin (A).

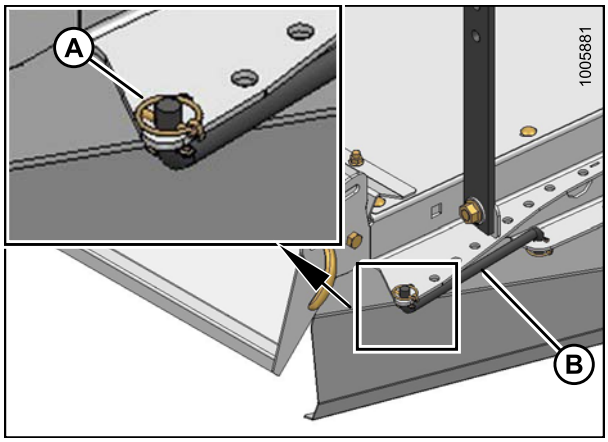


Figure 3.89: Self-Propelled

2. For **PULL-TYPE units**, set forming shield side deflectors to desired width by re-positioning adjuster bar.
   a. Remove hairpin and clevis pin (A).
   b. Move adjuster bar (B) to another hole.
   c. Reinstall clevis pin (A) and hairpin.

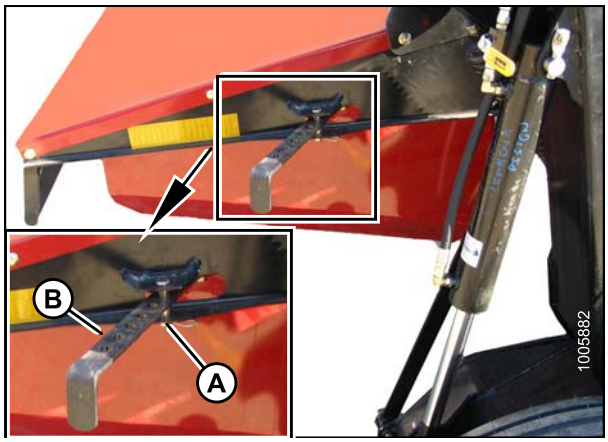


Figure 3.90: Pull-Type

3. For **SELF-PROPELLED units**, if forming shield attachment is too tight or too loose, tighten or loosen nut (A) as required.

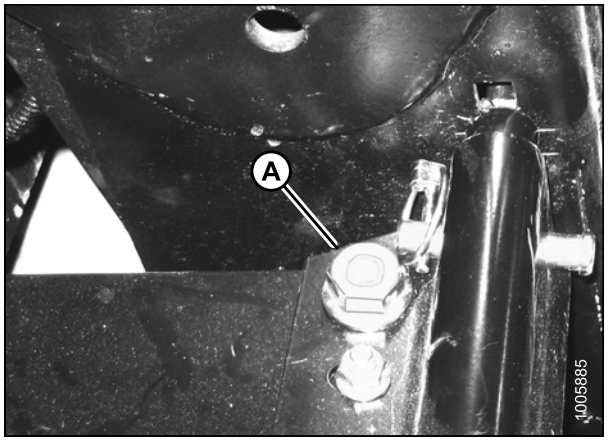


Figure 3.91: Self-Propelled

4. For **PULL-TYPE units**, if forming shield attachment is too tight or too loose, back off top nut at (A), and adjust lower nut at (B) as required. Then, holding lower nut with a wrench, tighten top nut securely against lower nut.

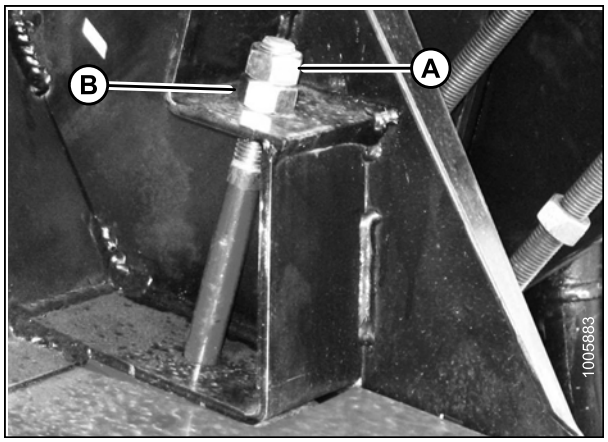


Figure 3.92: Pull-Type

Positioning Rear Deflector (Fluffer Shield)

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

⚠ CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

⚠ CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

   NOTE:
   For even windrow formation, be sure the deflector is **NOT** twisted.

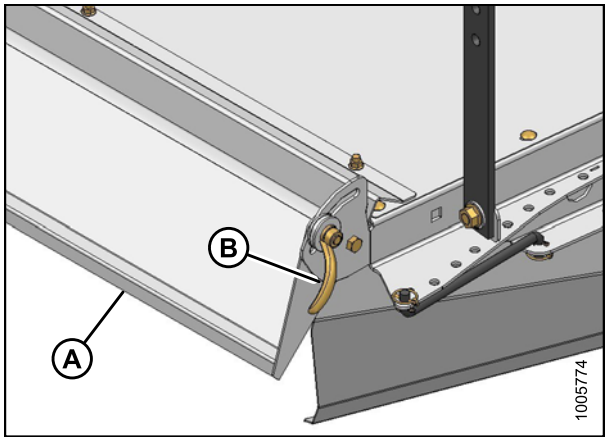


Figure 3.93: A40-D

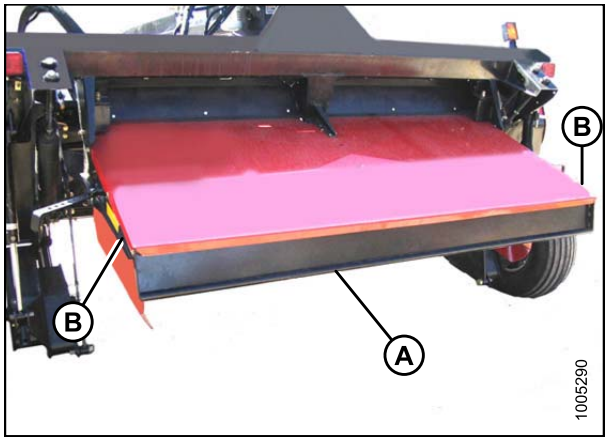


Figure 3.94: A30-D

3.8 Recommended Operating Settings

These settings are intended as a starting point. Operators should fine-tune to crop and field conditions. Also, refer to the A-Series Auger Header Quick Card (MD #147588) that was included in your shipment.

The settings chart continues on the next page.

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

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

3.9 Transporting the A30-D Mower Conditioner

This section describes the methods and procedures to transport the A30-D mower conditioner. Refer to *4.3 Transporting A40-D Header with Windrower, page 133*.

3.9.1 Towing A30-D Mower Conditioner

Preparing A30-D for Transport

Charge the steering circuit as follows:

1. Connect two articulated power turn (APT) steering cylinder hoses to a tractor hydraulic circuit.
2. Steer header completely to the left, then right. Repeat three or four times.
3. Steer mower conditioner so that it is centered behind the towing vehicle.
4. Close the lock-out valve (A) on the APT.

Figure 3.95: Steering Lock-Out Valve

5. Raise header fully, and engage both header lift cylinder lock-out valves (A).

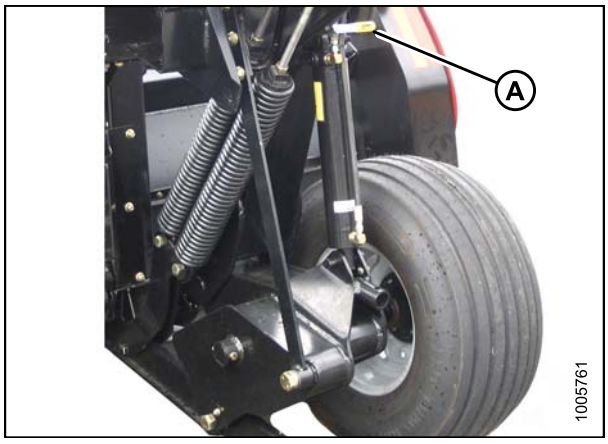


Figure 3.96: Lift Cylinder Lock-Out Valve

WARNING

- **Do NOT tow unless the steering cylinder is fully charged. If steering cylinder is not fully charged, loss of control can result in injury or death.**
- **Do NOT tow unless the transport lock pin is in place.**

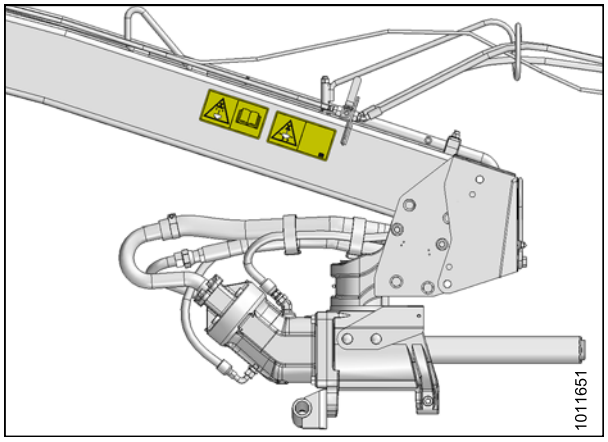


Figure 3.97: Transport Safety Decals

6. Install the transport pin as follows.
7. Remove pin from storage at aft end of APT.

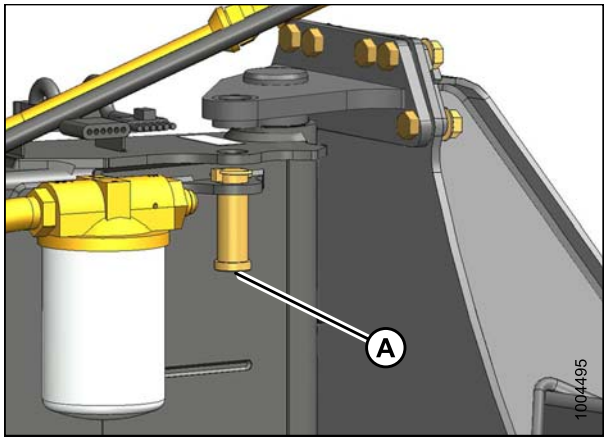


Figure 3.98: Transport Lock Pin

8. Line up holes in APT and frame, and install transport lock pin (A) as shown.
9. Secure with lynch pin (B).

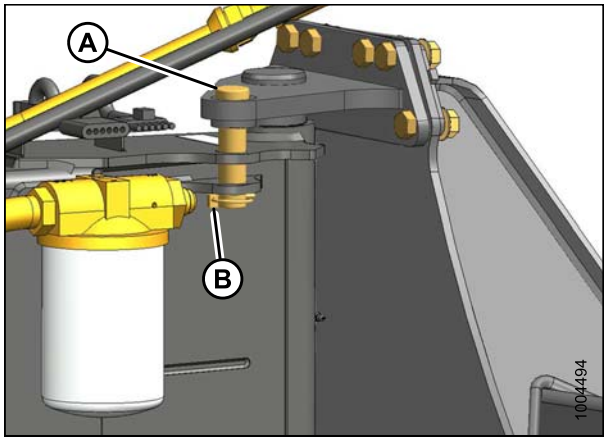


Figure 3.99: Transport Lock Pin

10. Check that jack is properly attached in storage position on APT and secured with pin (B).
11. Keep slow-moving vehicle (SMV) sign, reflectors, and lights clean and visible at rear of mower conditioner.
12. Ensure tires are properly inflated.
13. For towing procedures, refer to one of the following depending on your equipment:
    - *Towing A30-D with a Tractor, page 85*
    - *Towing A30-D with a Truck, page 86*

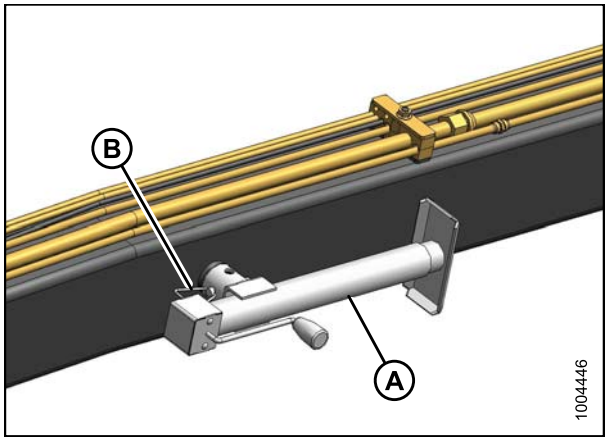


Figure 3.100: APT Jack

Towing A30-D with a Tractor

This procedure assumes that you have already prepared the mower conditioner for transport. If not, see *Preparing A30-D for Transport, page 83*.

To tow the mower conditioner with a tractor, follow these steps:

1. Hook up mower conditioner to tractor. For details on attaching the mower conditioner to the tractor, refer to *3.2 Attaching Mower Conditioner to Tractor, page 37*.

   NOTE:
   The hydraulic hoses do **NOT** need to be attached to the tractor for towing. Ensure they are securely stored on the articulated power turn (APT).

   NOTE:
   The power take-off (PTO) does not need to be attached for towing purposes. If not attached, lower hook (A), store driveline on hook, and remove forward half (B) of driveline. Store forward half in cab for transport.

2. Ensure that APT safety chain is properly attached to towing vehicle. Provide only enough slack in chain to permit turning.
3. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
4. Do **NOT** exceed 20 mph (32 km/h).

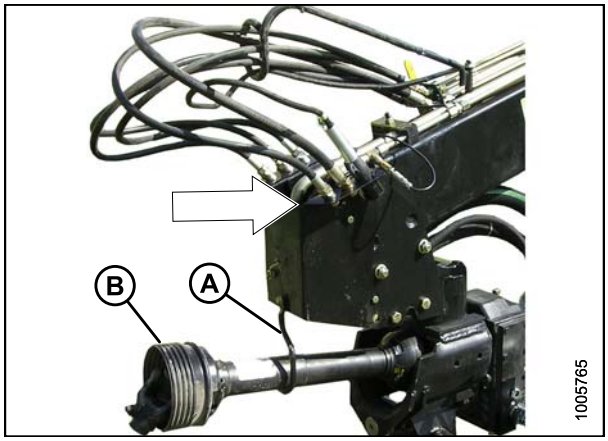


Figure 3.101

Towing A30-D with a Truck

CAUTION

Do not tow with a vehicle weighing less than 7500 lb (3400 kg). Ensure that the capacity of the towing vehicle is sufficient to maintain control.

This procedure assumes that you have already prepared the mower conditioner for transport. If not, see *Preparing A30-D for Transport, page 83*.

To tow the mower conditioner with a truck, follow these steps:

1. Store hydraulic hoses on the articulated power turn (APT) as shown.
2. Lower hook (A), and place driveline in hook.
3. Remove the forward half (B) of driveline, and store in truck for transport.

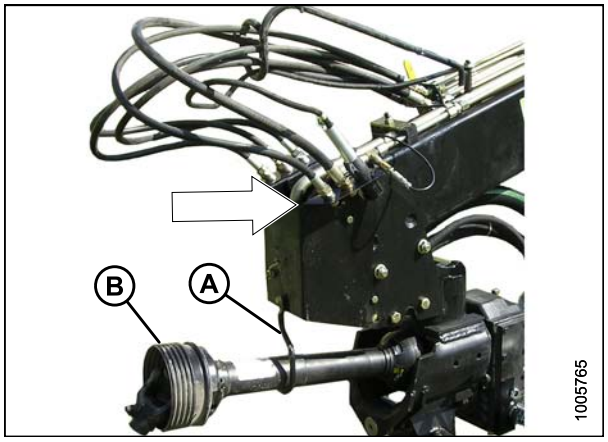


Figure 3.102

4. Position towing adapter (A) on APT, and secure with pins (B).
5. Attach mower conditioner to truck.
6. Remove jack from working position, and store on APT. Secure with pin.

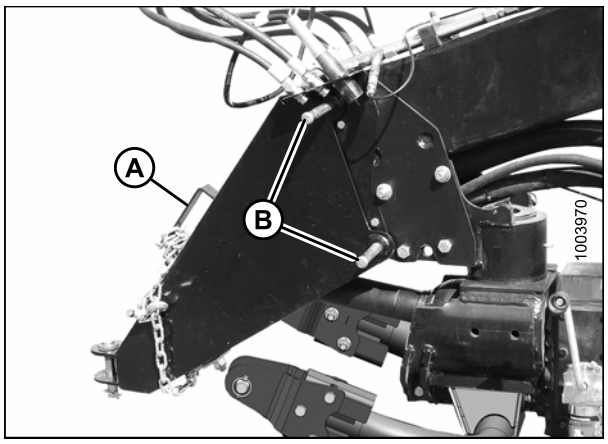


Figure 3.103

7. Wrap safety chain around APT, and attach to truck frame (A).
8. Connect electrical harness (B).
9. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
10. Do **NOT** exceed 20 mph (32 km/h).

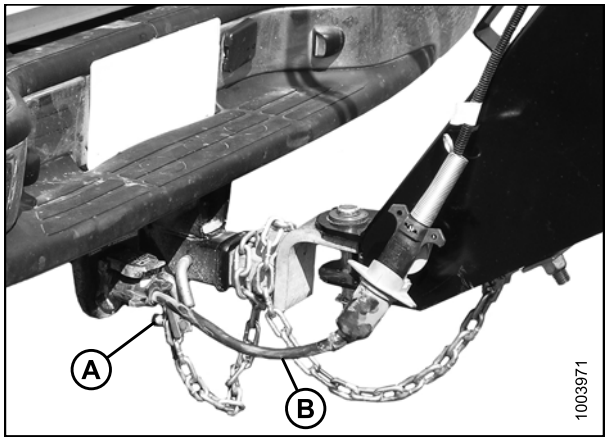


Figure 3.104

3.9.2 Transporting A30-D on a Flatbed Trailer

To transport the mower conditioner on a flatbed trailer, proceed as follows:

CAUTION

Use the following procedures when transporting the mower conditioner on a flatbed trailer.

Loading Mower Conditioner on Flatbed Trailer

1. Lower mower conditioner to the ground, and move the cylinder lock-out valve handle to the horizontal position at both lift cylinders.

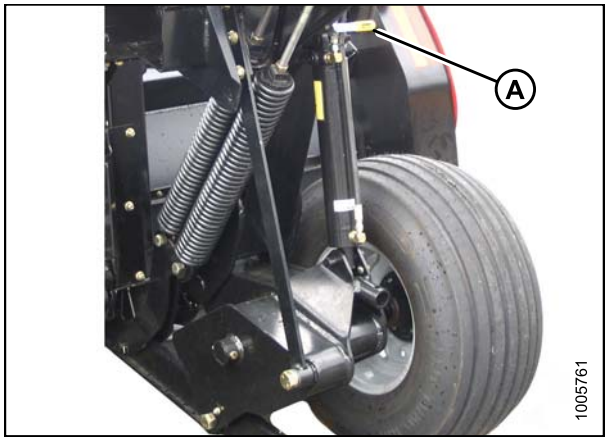


Figure 3.105: Cylinder Lock-Out Valve Handle

2. Retract header angle control link to minimum.
3. Unhook mower conditioner from tractor. Refer to *3.3.1 Unhooking Drawbar, page 43*.
4. Tie hoses to articulated power turn (APT).

5. Remove tall crop dividers (if equipped) as follows:
   a. Remove U-bolt (A) and bolts (B) securing crop divider (C) to lean bar, and remove crop divider.
   b. Repeat for crop divider at opposite end.

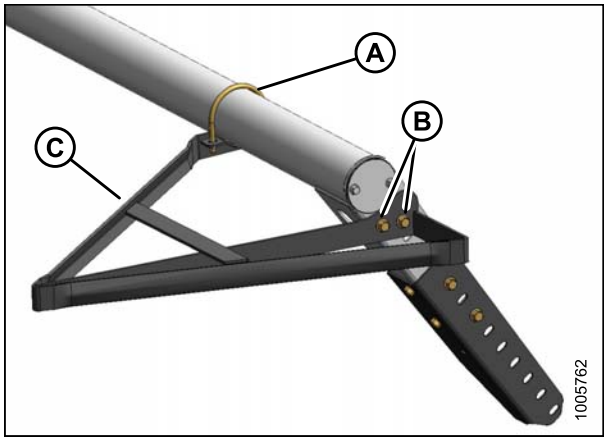


Figure 3.106: Tall Crop Divider

6. To remove complete forming shield group, remove pins (A).
7. Disassemble adjuster bars (B) from side deflectors (C). Note orientation of hardware.

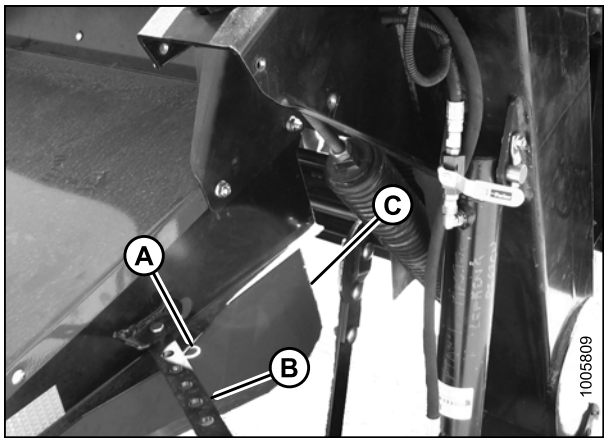


Figure 3.107: Forming Shield Group

8. Remove nuts (A), and drop side deflectors from frame (B).

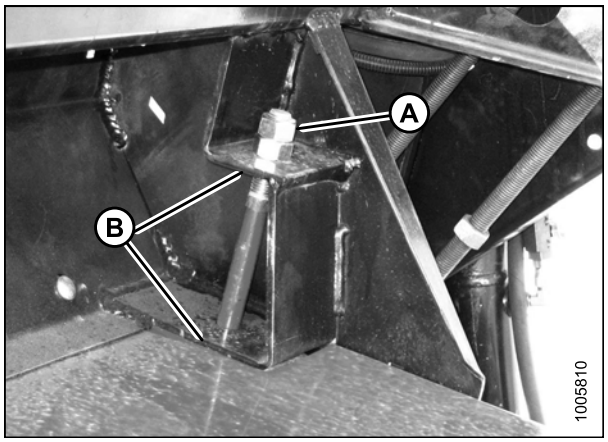


Figure 3.108: Side Deflectors

9. Remove ten bolts (A) attaching forming shield cover to frame.

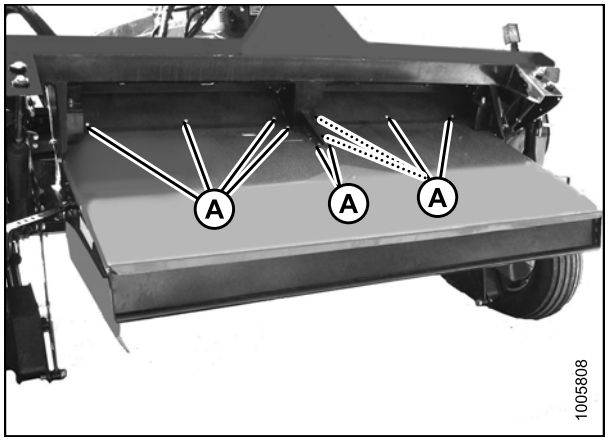


Figure 3.109: Bolts

10. Remove two bolts (A), and lower rear of forming shield to ground.
11. Remove two bolts (B), and detach forming shield from frame.

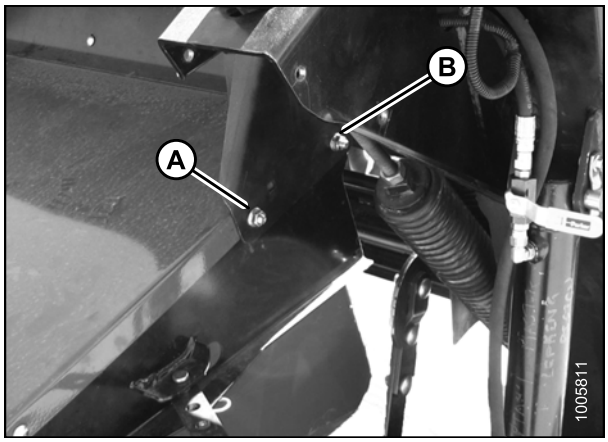


Figure 3.110: Bolts

12. Remove pin at rod end of APT steering cylinder, and move cylinder away from frame. Reinsert pin in clevis.

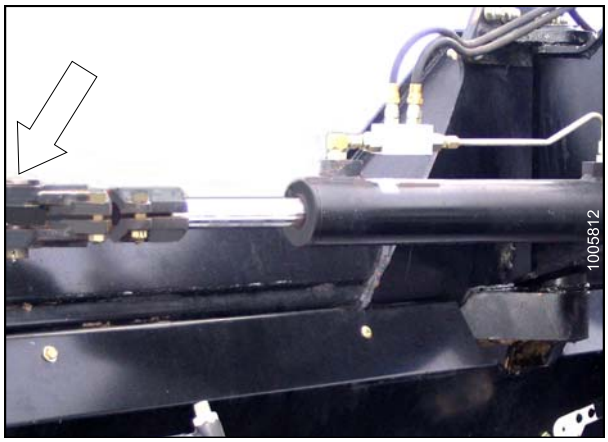


Figure 3.111: Pin at Rod End

13. Ensure temporary transport lock pin (A) is in storage location.

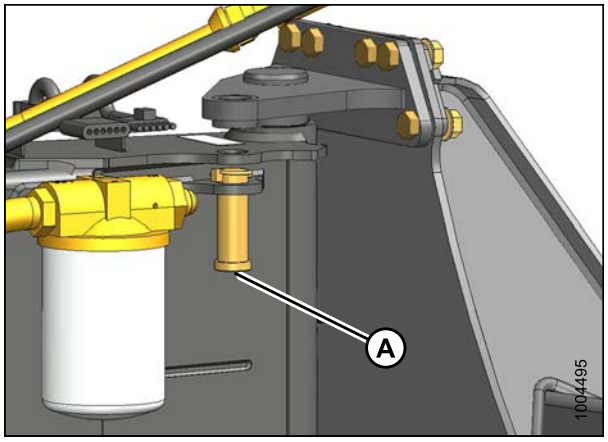


Figure 3.112: Temporary Transport Lock Pin

14. Swing APT to the left as far as possible without damaging hydraulic lines.

WARNING

To avoid tipping over, the header must be resting on the ground prior to swinging the APT.

IMPORTANT:
The APT must NOT widen the shipping package.

Figure 3.113: APT

15. Secure APT to frame hook to prevent movement. Use cardboard or suitable material under the tie to protect paint.

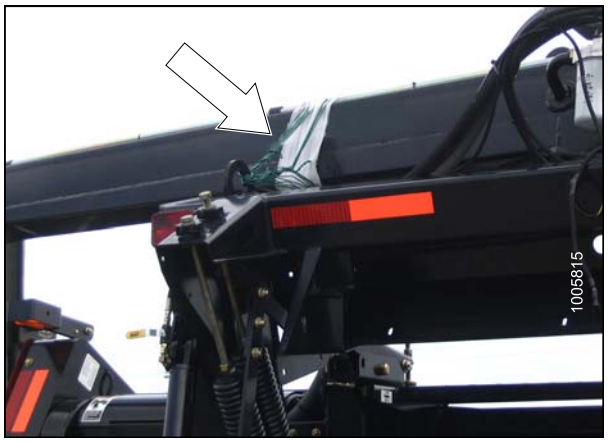


Figure 3.114: Frame Hook

16. Secure the steering cylinder to the frame with wire. Wrap tie around clevis, and use cardboard or suitable material under the tie to protect paint on the frame.

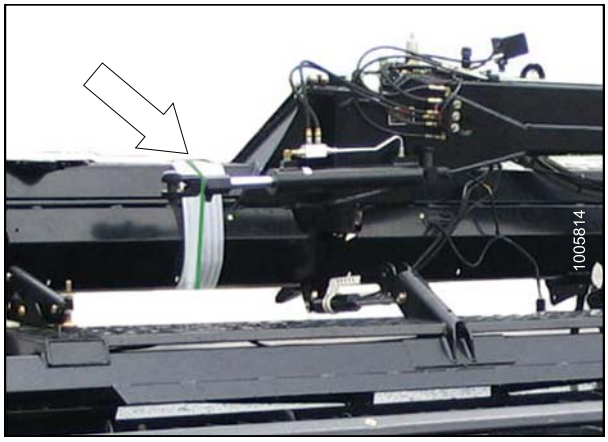


Figure 3.115: Wire

CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping or machine damage.

Requirements – Lifting Vehicle:

- Minimum Lifting Capacity: 8500 lb (3865 kg)
- Minimum Lifting Height: 15 ft (4.5 m)

Requirements – Chain:

- Type: Overhead Lifting Quality (1/2 in)
- Minimum Working Load: 5000 lb (2270 kg)

17. Attach a chain to each frame hook (A) and a chain to each end of the lean bar at (B). Chain **MUST** pass through hole at end of lean bar.
18. Position forklift from either front or back of mower conditioner, and lift slightly off the ground.

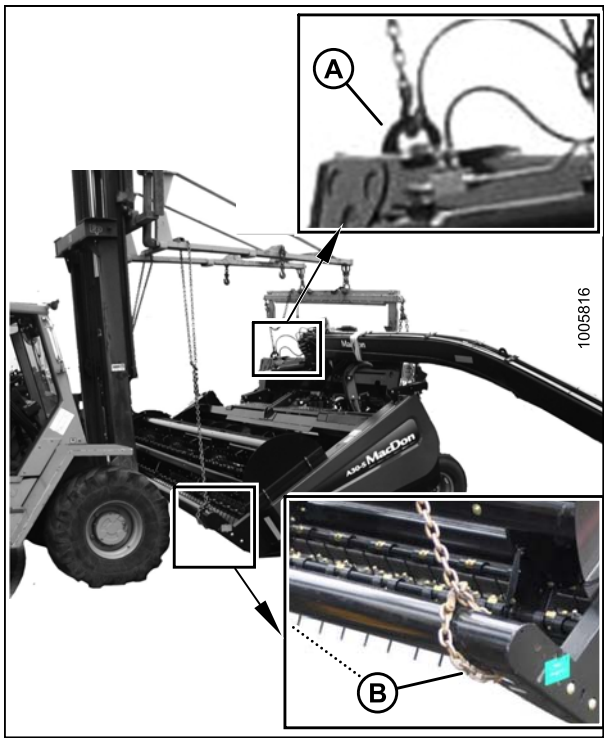


Figure 3.116: Chain Attachment

19. Remove the wheels by removing bolt (A), and pulling wheel/axle assembly from frame.

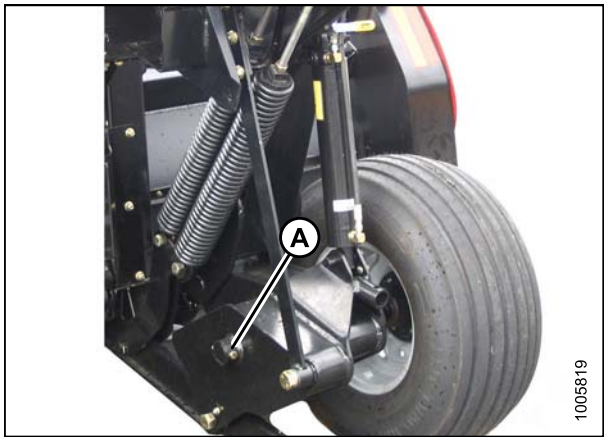


Figure 3.117: Wheel Bolt Removal

20. Lift mower conditioner, and back the flatbed trailer under the unit. The mower conditioner can be positioned with the APT towards the front or rear of the flatbed.

Figure 3.118: Flatbed Positioning

21. Lower mower conditioner onto flatbed, so that its weight rests on the frame and sloped edge of header end panels, or cutterbar as shown.

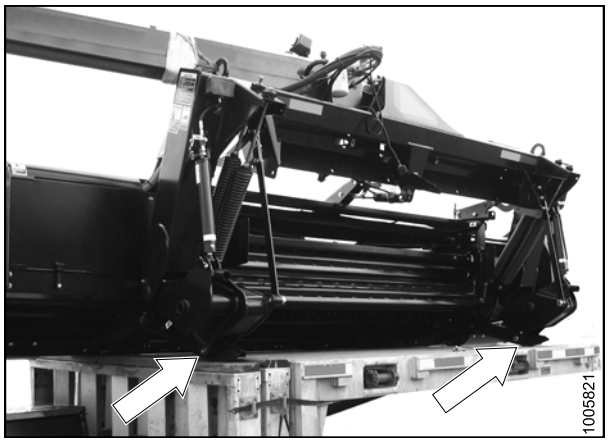


Figure 3.119: Flatbed

22. Remove four bolts (A), and remove the lean bar to minimize load width. Secure lean bar to the flatbed.

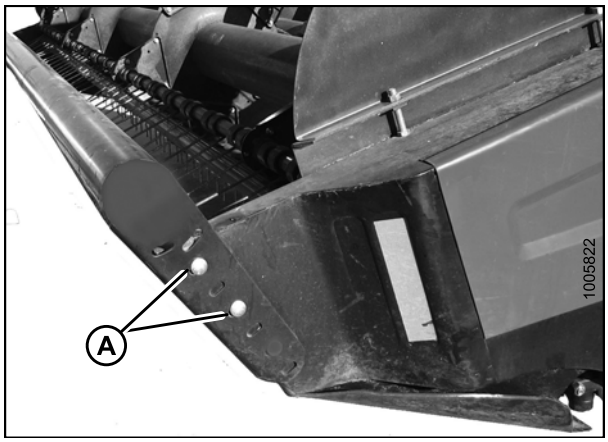


Figure 3.120: Lean Bar Bolt Removal

23. Tie the unit and the end of the APT down securely.

Unloading Mower Conditioner from Flatbed Trailer

1. Remove tie downs.

2. Install lean bar onto mower conditioner with four bolts (A).

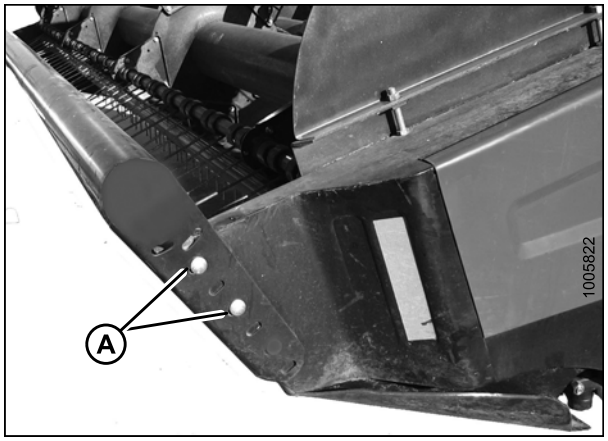


Figure 3.121

3. Attach a chain to each frame hook (A), and a chain to each end of the lean bar at (B). Chain **MUST** pass through hole at end of lean bar.

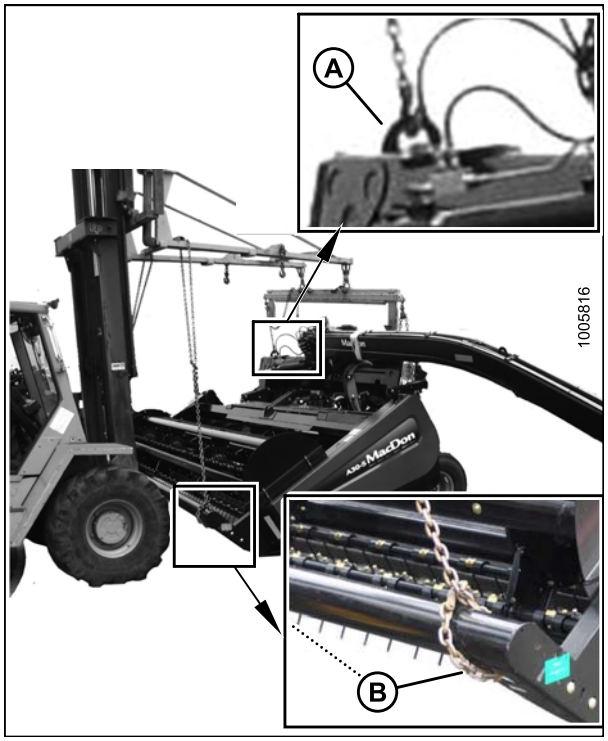


Figure 3.122

CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping or machine damage.

Requirements – Lifting Vehicle:

- Minimum Lifting Capacity: 8500 lb (3865 kg)
- Minimum Lifting Height: 15 ft (4.5 m)

Requirements – Chain:

- Type: Overhead Lifting Quality (1/2 in)
- Minimum Working Load: 5000 lb (2270 kg)

4. Position forklift from either front or back of mower conditioner, lift slightly off the flatbed, and move flatbed from beneath mower conditioner.
5. Lower mower conditioner, and install wheel/axle assemblies onto mower conditioner. Secure axle to frame with bolt (A), and tighten to required torque.
6. Lower mower conditioner to ground, and remove lifting chains.

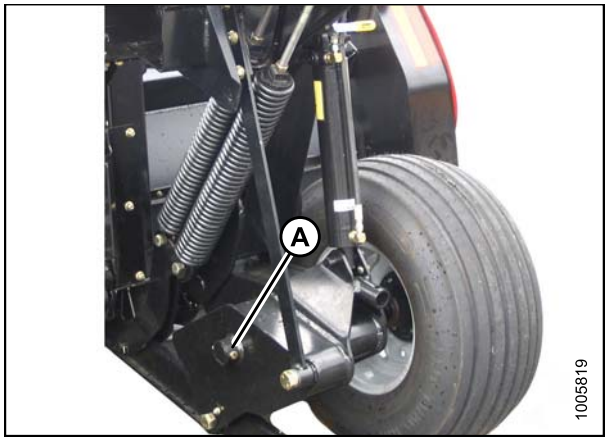


Figure 3.123

7. Remove tie securing steering cylinder to frame.

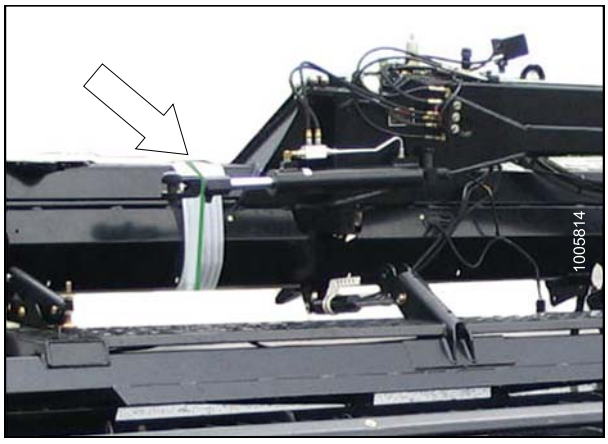


Figure 3.124

8. Remove tie securing articulated power turn (APT) to frame.

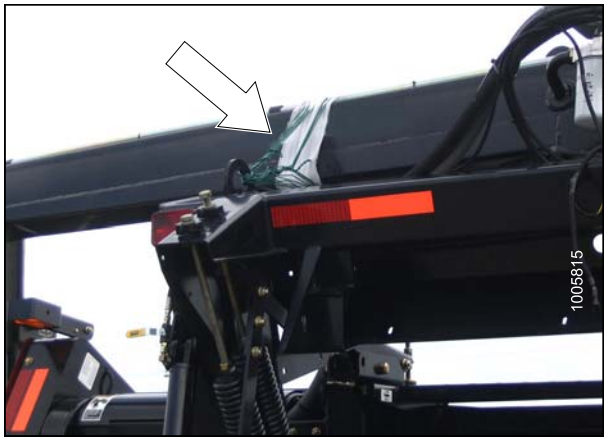


Figure 3.125

9. Swing APT to working position.

Figure 3.126

10. Attach steering cylinder rod end to frame.

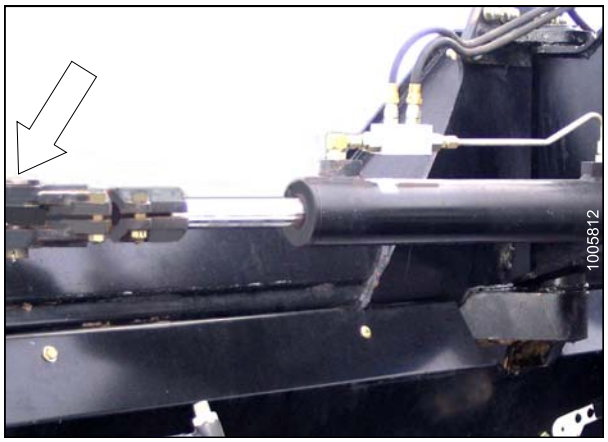


Figure 3.127

11. Attach forming shield to frame using two bolts (B).
12. Lift lower rear of forming shield off ground, and then install two bolts (A).

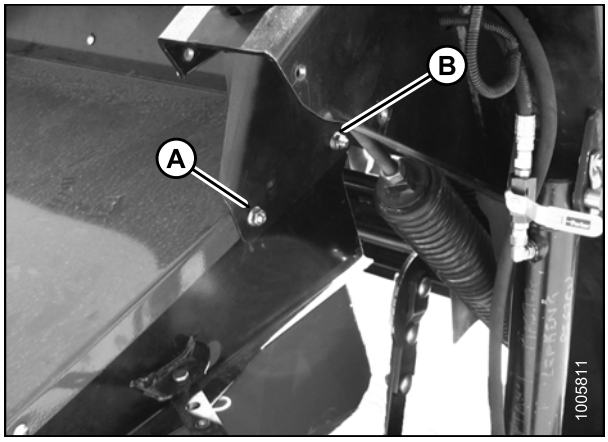


Figure 3.128

13. Use ten bolts (A) to attach forming shield cover to frame.

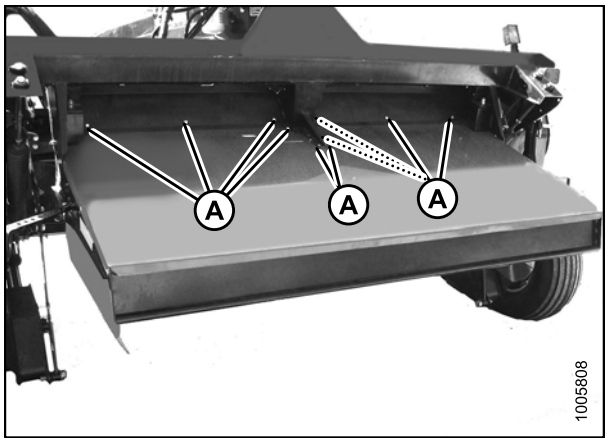


Figure 3.129

14. Attach side deflectors to frame (B) with nuts (A).

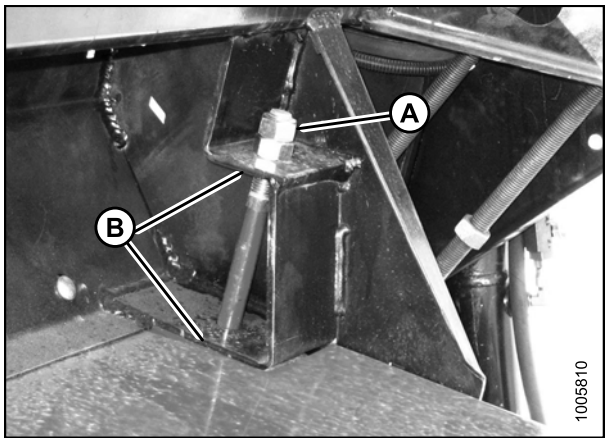


Figure 3.130

15. Attach adjuster bars (B) to side deflectors (C).
16. Insert pins (A).

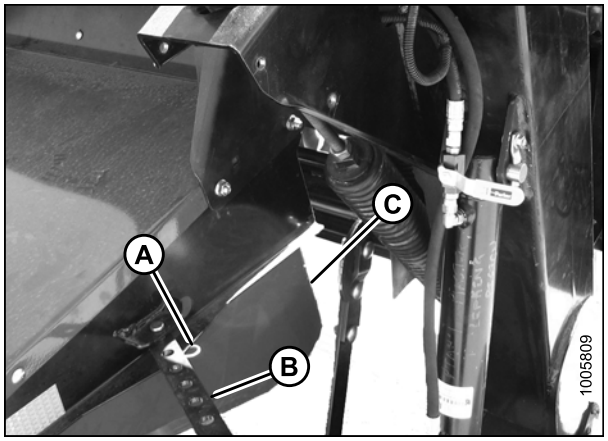


Figure 3.131

17. Move lift cylinder lock out valve handles to vertical position.

Figure 3.132

3.10 Unplugging Conditioner and Knife: Pull-Type

WARNING

Stop tractor engine, and remove key before removing plugged material from mower conditioner. A child or even a pet could engage the drive.

1. Stop forward movement of the tractor, and stop the power take-off (PTO).
2. Raise the machine, and slowly engage the PTO.

   NOTE:
   Raising the mower conditioner automatically raises the top roll to ease plug removal.
3. If plug does not clear, with machine still raised, shut off engine, remove key, and lock tractor brakes.
4. Engage lift cylinder lock-out valves.

   ## WARNING

   Wear heavy gloves when working around or handling knife.

5. Clean off cutterbar and area under reel by hand.

Figure 3.133

6. Retrieve wrench from storage inside the left-hand drive compartment.
7. Use wrench on left-hand end of primary driveshaft to turn rolls forward until plug clears.
8. Return wrench to storage location, and secure in place with pin.

   ## WARNING

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

   NOTE:
   If plugging persists, refer to *9 Troubleshooting, page 297*.

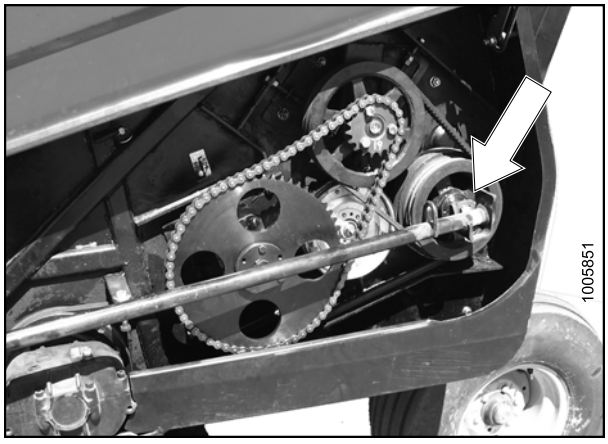


Figure 3.134

4 Operation: A40-D Self-Propelled Mower Conditioner

This chapter will describe the operating procedures of the A40-D SP Mower Conditioner.

4.1 Attaching A40-D Header to SP Windrower

Refer to your windrower operator's manual for procedures for mechanically attaching the auger header to the self-propelled windrower and for modifications if required to the windrower hydraulic connections.

Refer to the following procedures for electrical and hydraulic connections. Header drive hydraulic hoses and electrical harness are located on the left-hand cab-forward side of the windrower.

IMPORTANT:
For M150, M155, M155*E4*, and M200 windrowers with Reverser kit **MD #B4656** installed, hose plumbing to the reverser valve must be changed if switching between a D-Series draper header with a conditioner and an A40-D auger header to prevent draper header reel damage and improper operation. Refer to *4.1.5 Configuring Reverser Valve Jumper Hose, page 121* and if necessary to instruction MD #169213 (Reverser Kit Installation Instructions), available from our Dealer-only site (*https://portal.macdon.com*) (login required).

NOTE:
Header reel motor hose routing must be properly configured before attaching the header to a windrower. The header is factory-configured for M150, M155, and M200 windrowers. For M100, M105, or M205 windrowers, refer to:

- *4.1.1 Attaching to M100 or M105, page 101*
- *4.1.4 Attaching to M205, page 116*

.

4.1.1 Attaching to M100 or M105

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

Figure 4.1: Header Drive Hoses

1. Disengage rubber latch (A) and open driveline shield (B).

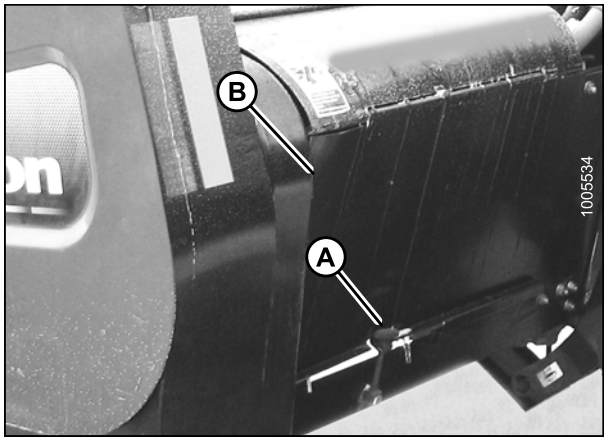


Figure 4.2: Driveline Shield

2. Remove the cap (A) from electrical connector and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

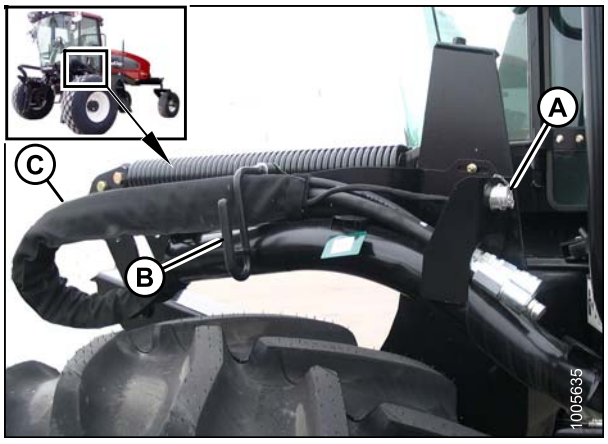


Figure 4.3: Support Bracket and Hose Bundle

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

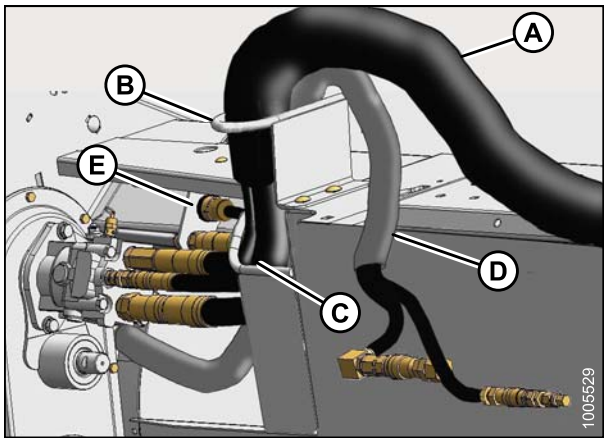


Figure 4.4: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

NOTE:
At (C), later-built 2015 will have a “tee” going to case drain on square reel motor only.

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

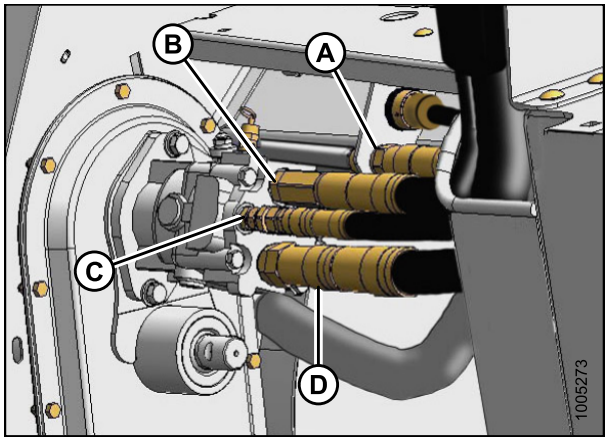


Figure 4.5: Early-build 2015, 2014 and Earllier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

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

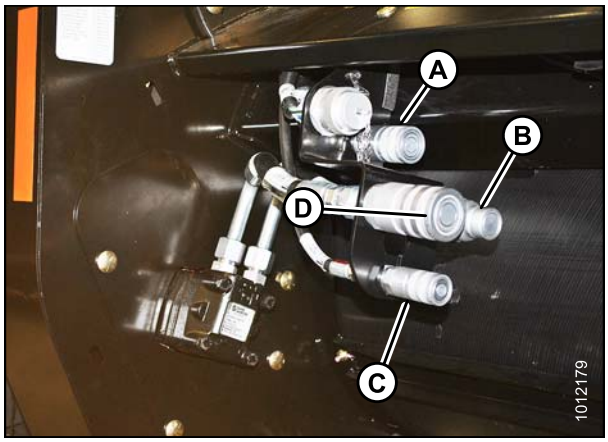


Figure 4.6: 2015 Grass Seed Header Hose Connectors

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

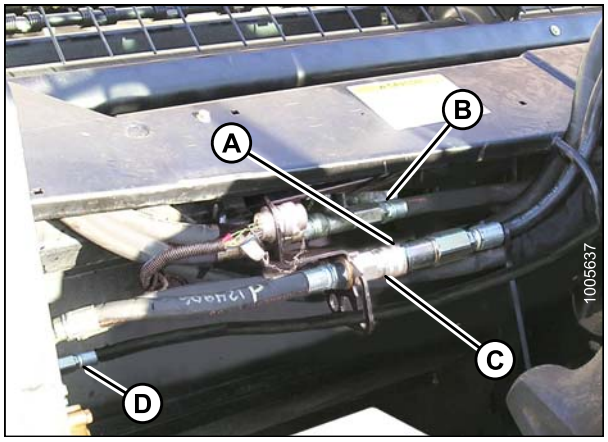


Figure 4.7: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

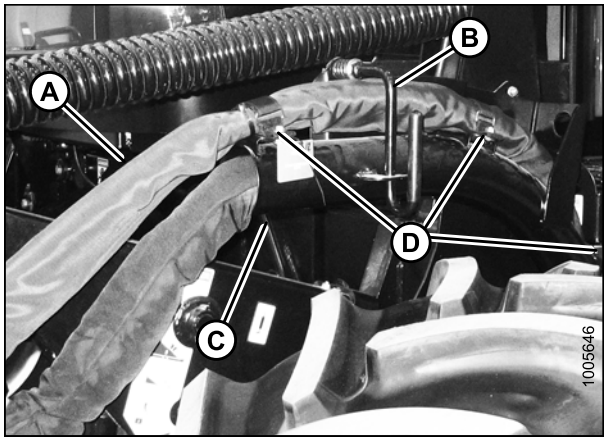


Figure 4.8: Auger Return and Reel Pressure Hose Bundle

13. If valve blocks are **NOT** configured as shown, install required fittings as described in the A40-D Auger Self-Propelled Windrower Header Unloading and Assembly Instructions (MD #169957) that were supplied with your A40-D Auger Header.

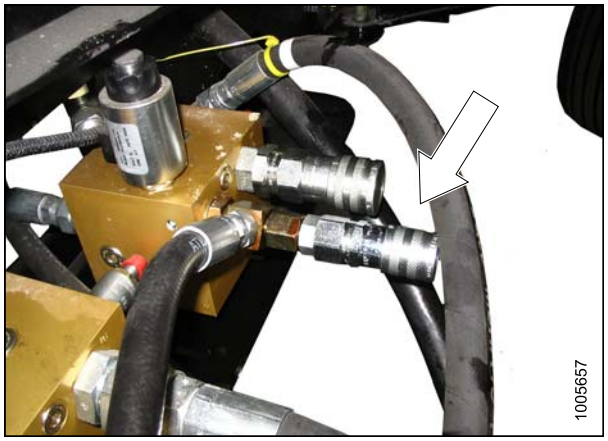


Figure 4.9: Valve Block Configuration

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

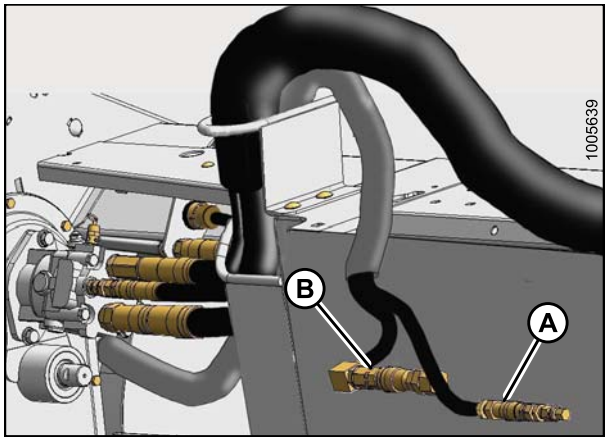


Figure 4.10: Auger/Reel Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

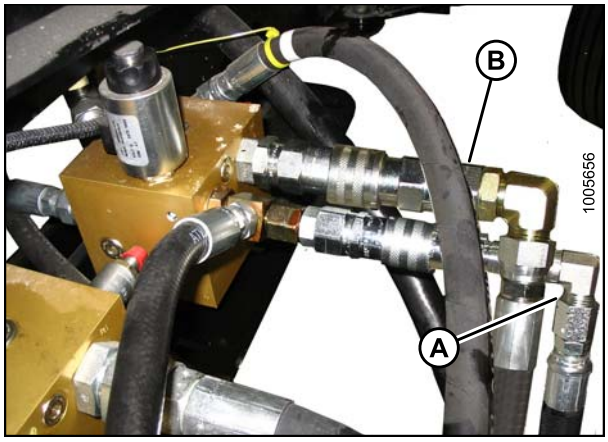


Figure 4.11: Auger/Reel Pressure and Auger/Reel Return Valve Block Receptacles

15. Open header left driveshield and check hose routing at the reel motor.

    NOTE:
    Reel drive motor may not be exactly as shown. Later-Build 2015 A40-D units have a square reel motor; Early-Build 2014 A40-D (and 2014 and earlier units) have a round reel motor. The image at the right shows a square reel motor and so is a later-build model.

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

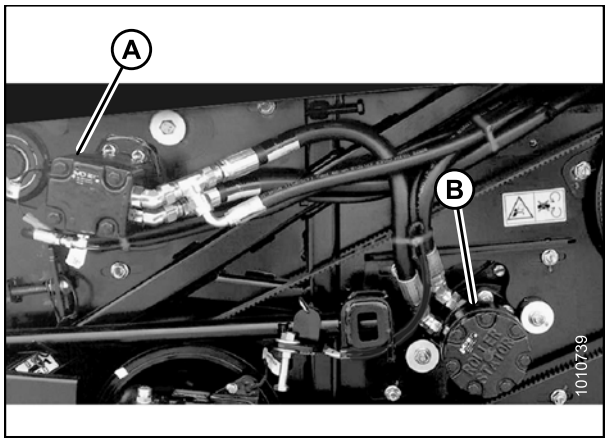


Figure 4.12: Factory Routing M150, M155, and M200 – Later-Build 2015 shown

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

16. For procedure to change hose routing for M100 or M105 Windrowers, refer to the section based on the year of manufacture:

    - Later- build 2015: *4.1.7 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only), page 124*,

    or

    - Early-build 2015, 2014 and earlier: *4.1.6 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D for use on M100, M105 and M205 Windrowers Only), page 122*.

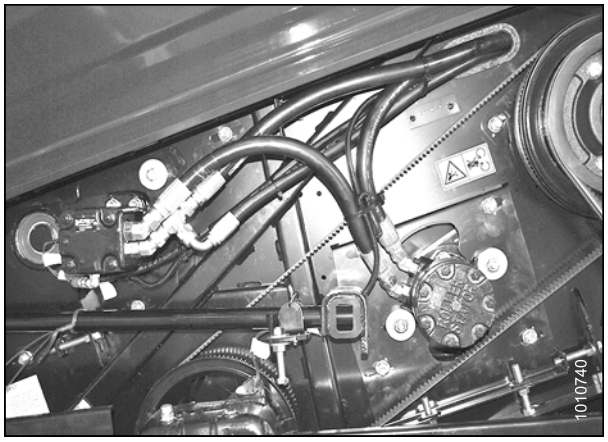


Figure 4.13: Modified Routing M100, M105, and M205 – Later Build 2015 shown

4.1.2 Attaching to M150 or M155

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

M150 and M155 self-propelled windrowers are factory-equipped with four header drive hoses on the left-hand side.

Figure 4.14: Header Drive Hoses

1. Disengage rubber latch (A) and open driveline shield (B).

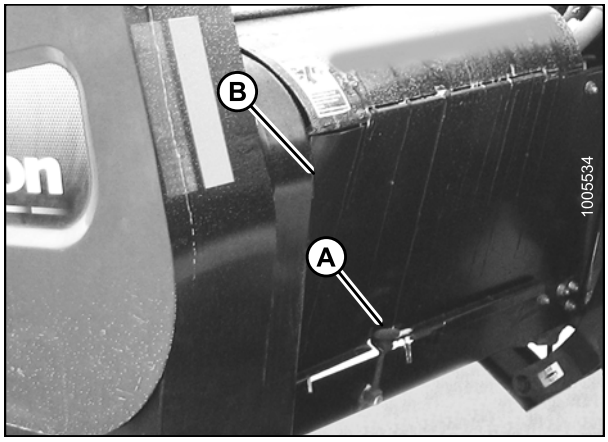


Figure 4.15: Driveline Shield

2. Remove the cap (A) from electrical connector and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

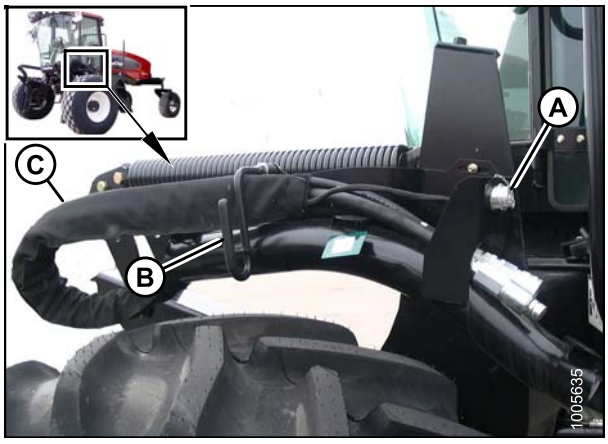


Figure 4.16: Support Bracket and Hose Bundle

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

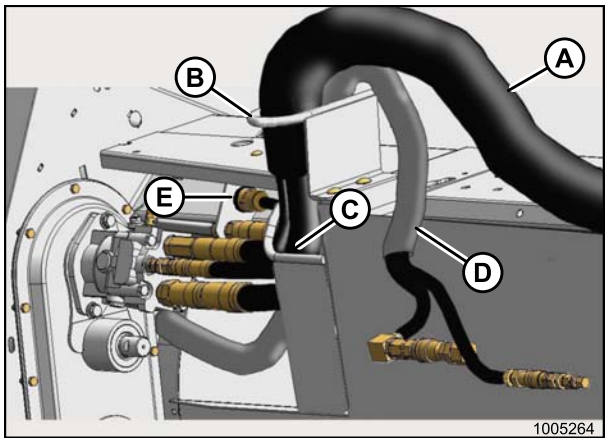


Figure 4.17: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

NOTE:
At (C), later-built 2015 will have a “tee” going to case drain on square reel motor only.

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

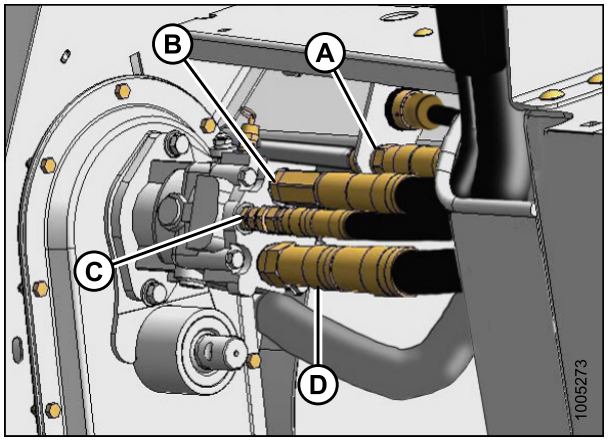


Figure 4.18: Early-Build 2015. 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

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

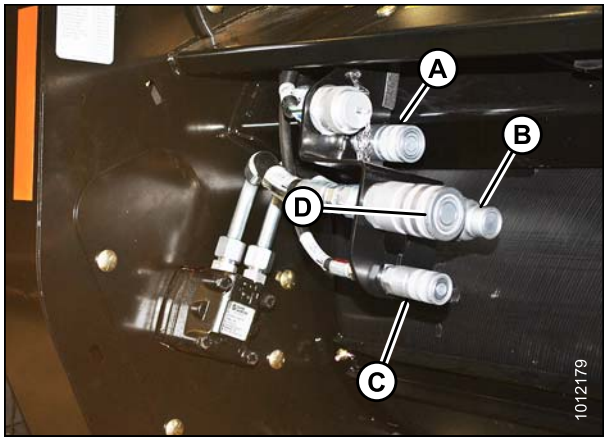


Figure 4.19: 2015 Grass Seed Header Hose Connectors

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

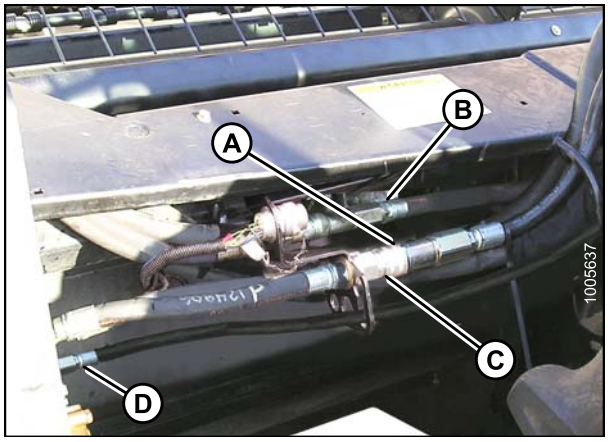


Figure 4.20: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D) and lower lever (B).

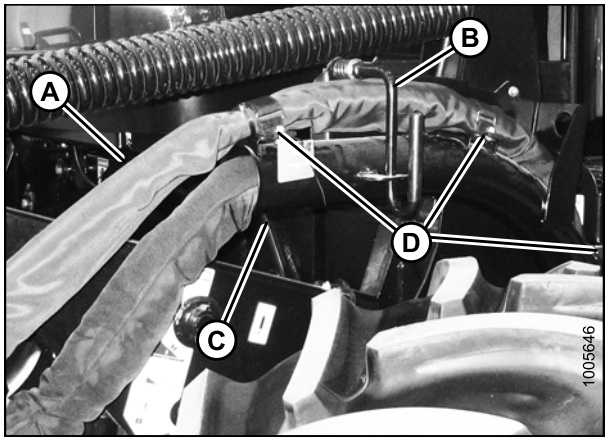


Figure 4.21: Auger Return and Reel Pressure Hose Bundle

13. If valve blocks are **NOT** configured as shown at right, install required fittings as described in the A40-D Auger Self-Propelled Windrower Header Unloading and Assembly Instructions (MD # 169957), which were supplied with your A40-D Auger Header.

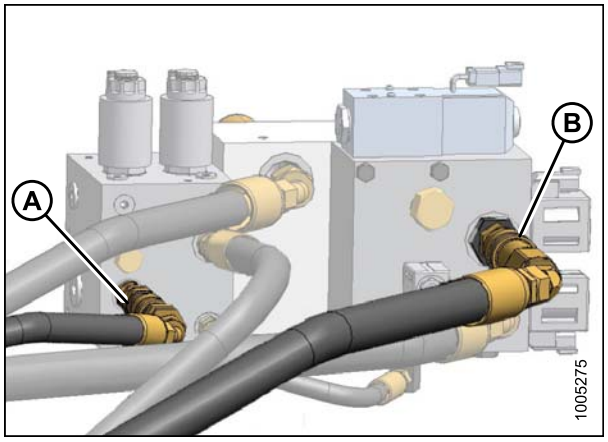


Figure 4.22: M150/M155 With Reverser Valve

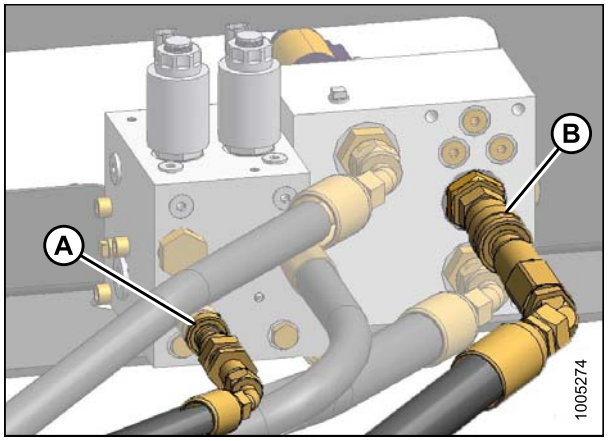


Figure 4.23: M150/M155 Without Reverser Valve

14. Push auger pressure (A) at port R2 and auger/reel return (B) hose couplers onto mating receptacles on knife valve block port R2 until collar on receptacle snaps into lock position.
15. Proceed to *4.1.5 Configuring Reverser Valve Jumper Hose, page 121*.

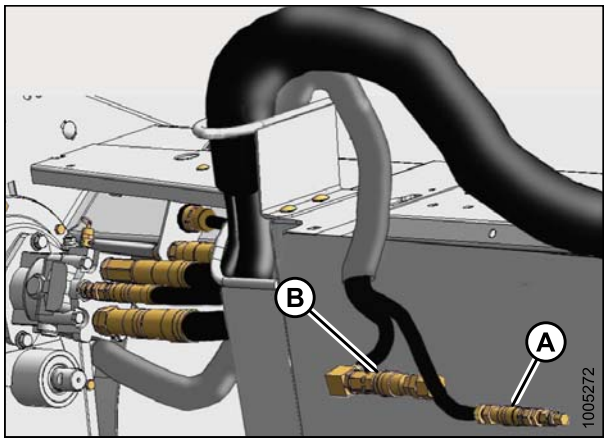


Figure 4.24: Auger Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

4.1.3 Attaching to M200

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

The M200 Windrower requires four drive hoses to run an A40-D Auger Header.

Figure 4.25: Drive Hoses

If only three drive hoses are present, before following the procedure below, configure the M200 to run an A40-D Auger Header by installing kit MD #B4651. The kit includes an additional hose, hardware, and installation instructions.

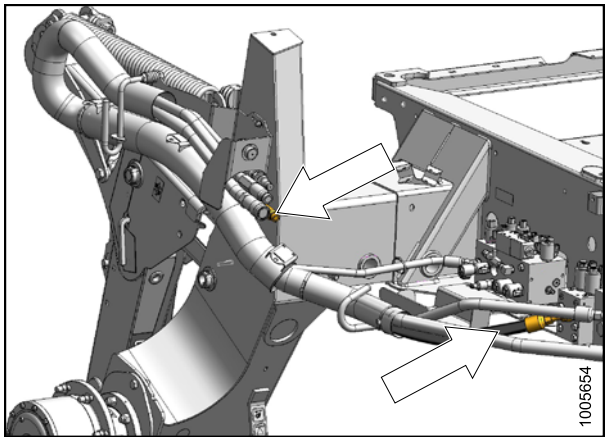


Figure 4.26: Kit MD #B4651

1. Disengage rubber latch (A), and open driveline shield (B).

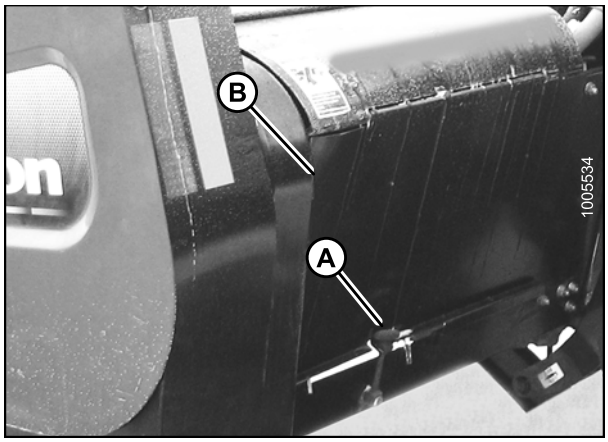


Figure 4.27: Driveline Shield

2. Remove cap (A) from electrical connector, and remove connector from support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).

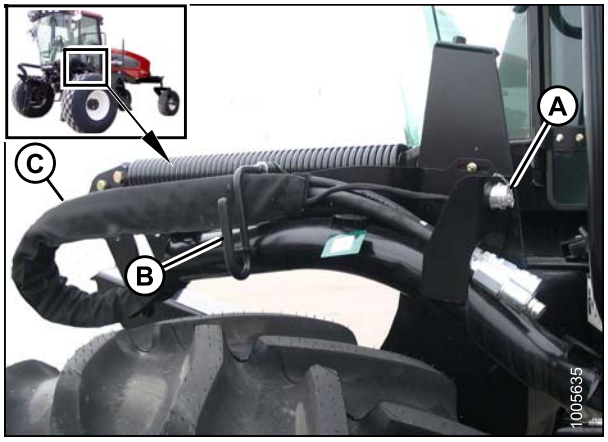


Figure 4.28: Support Bracket and Hose Bundle

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

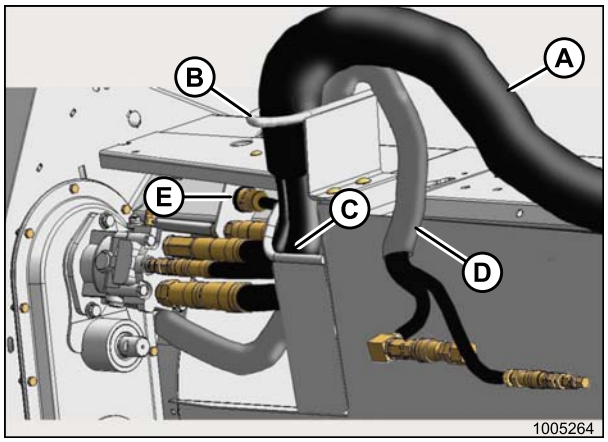


Figure 4.29: Hose and Electrical Bundle – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

NOTE:
At (C), later-build 2015 units will have a “tee” going to case drain on square reel motor only.

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

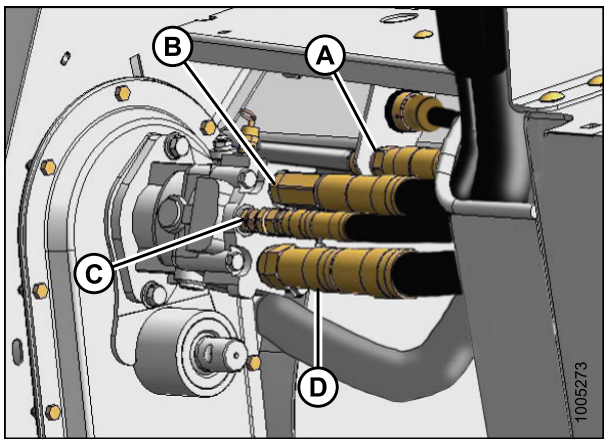


Figure 4.30: Early-Build 2015. 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

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

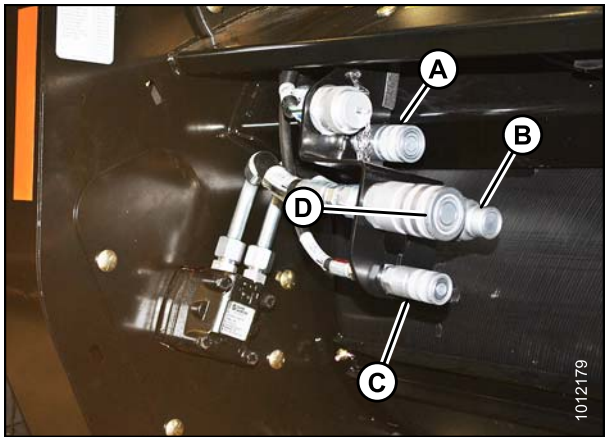


Figure 4.31: 2015 Grass Seed Header Hose Connectors

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

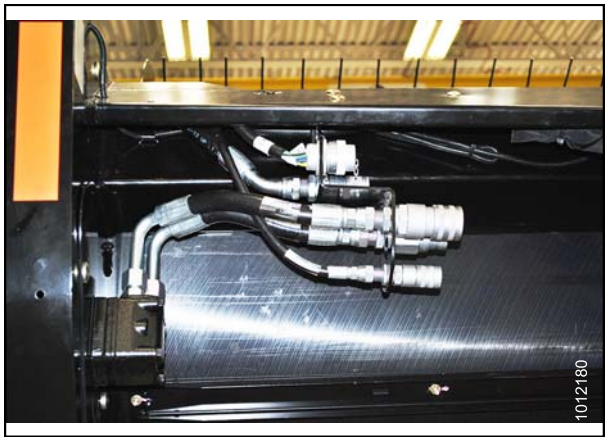


Figure 4.32: 2015 Grass Seed Header Hose Connectors Side View

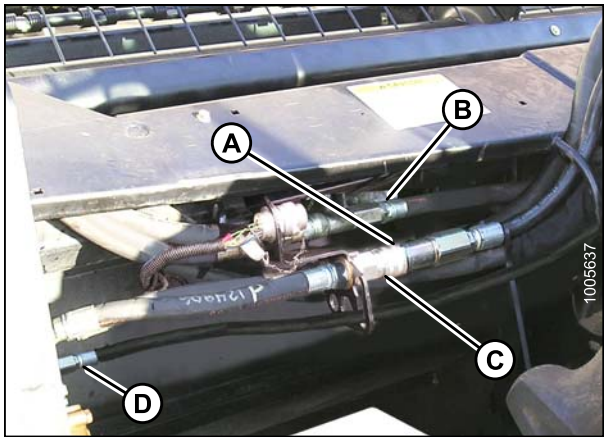


Figure 4.33: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in This Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D) and lower lever (B).

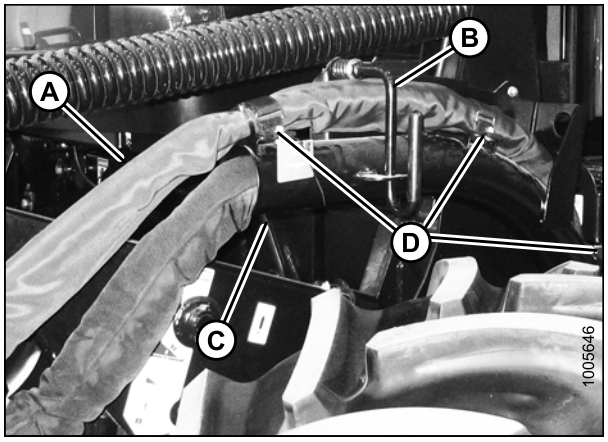


Figure 4.34: Auger Return and Reel Pressure Hose Bundle

13. If valve blocks are **NOT** configured as shown above, install required fittings as described in the A40-D Auger Self-Propelled Windrower Header Unloading and Assembly Instructions (MD #169957), which were supplied with your A40-D Auger Header.

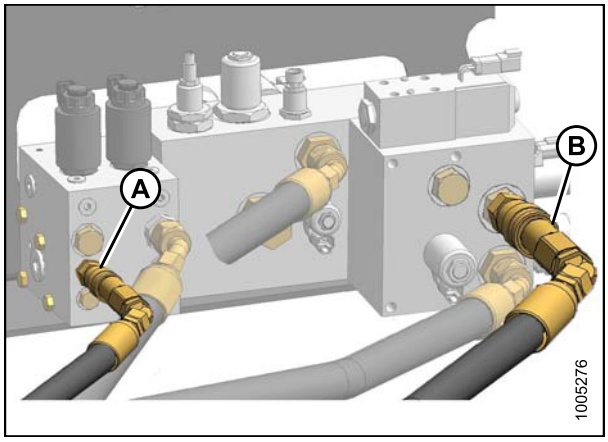


Figure 4.35: M200 With Reverser Valve

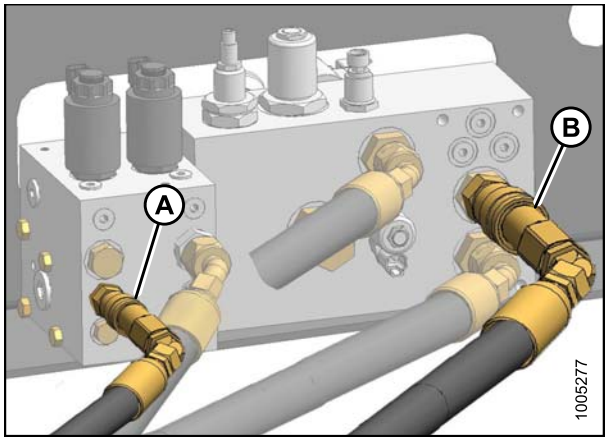


Figure 4.36: M200 Without Reverser Valve

14. Push auger pressure (A) and auger/reel return (B) hose couplers onto mating receptacles on valve block until collar on receptacle snaps into lock position.
15. Proceed to *4.1.5 Configuring Reverser Valve Jumper Hose, page 121*.

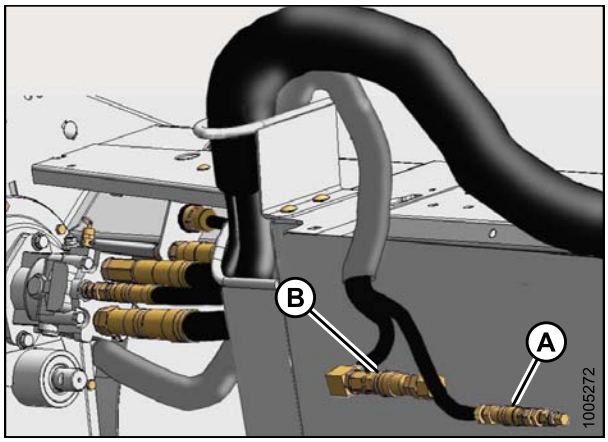


Figure 4.37: Auger Pressure and Auger/Reel Return Hose Couplers – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

4.1.4 Attaching to M205

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

The M205 windrower must be equipped with an auger drive basic kit and a completion kit as shown at right. If necessary, obtain the following kits from your MacDon Dealer and install them in accordance with the instructions supplied with the kits.

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

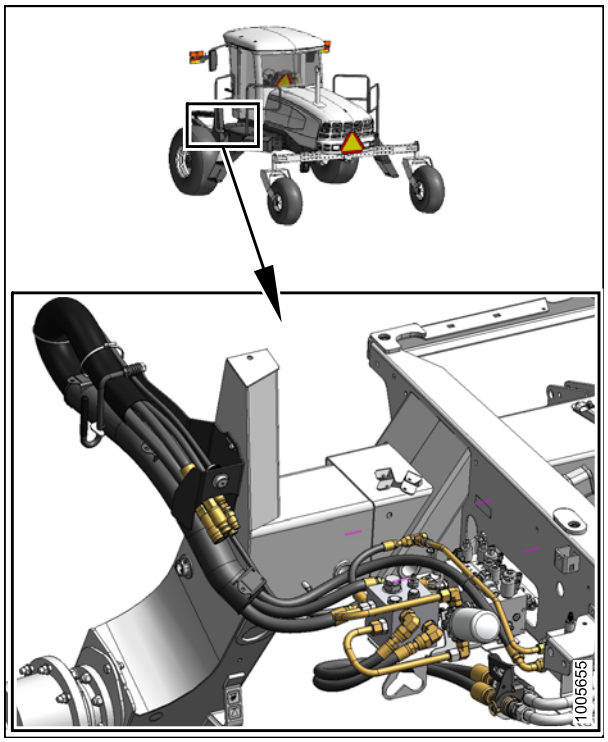


Figure 4.38: Auger Drive Basic Kit and Completion Kit Installed

1. Disengage rubber latch (A), and open driveline shield (B).

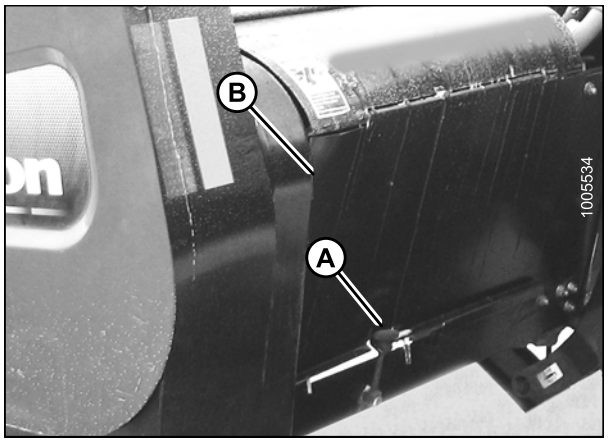


Figure 4.39: Driveline Shield

1. Reverser kit is optional and not required, although most A40-D headers have a Reverser kit (MD #B5492) ordered for the windrower. Check with the your Dealer, and install prior to hook-up if required.

2. Remove cap (A) from the electrical connector and remove the connector from the support bracket.
3. Disengage and rotate lever (B) counterclockwise to fully up position to release the hose bundle (C).
4. Move hose/electrical bundle (C) to header.

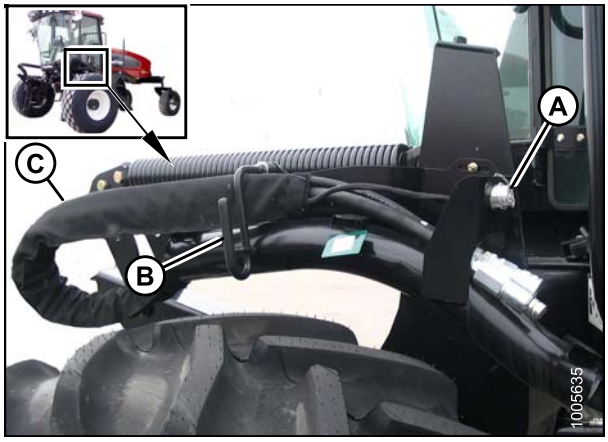


Figure 4.40: Support Bracket and Hose Bundle

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

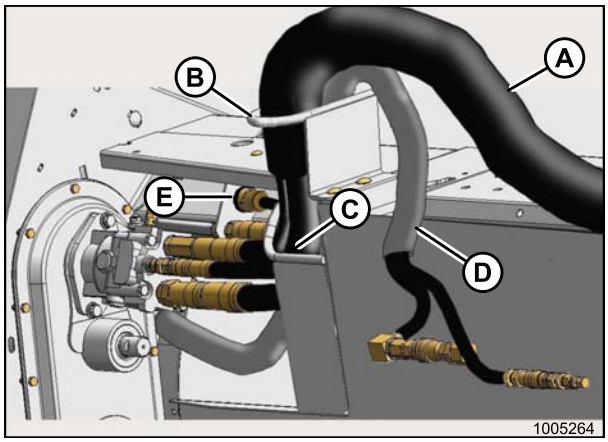


Figure 4.41: Hose and Electrical Bundle – 14-ft. and 16-Ft. Header Shown (18-Ft. Similar)

NOTE:
At (C), later-build 2015 units will have a “tee” going to case drain on square reel motor only.

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

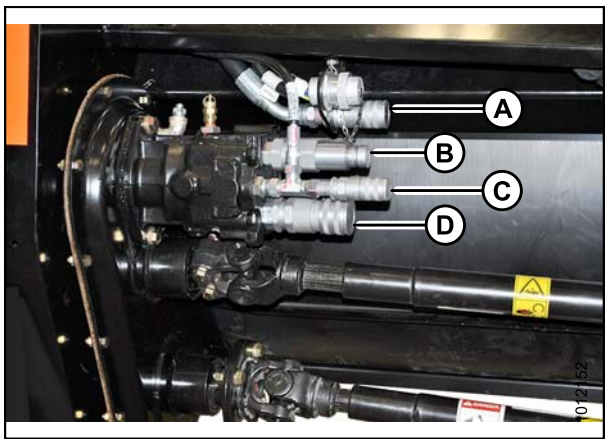


Figure 4.42: Early-Build 2015, 2014 and Earlier Standard Header – 14-Ft. and 16-Ft. Header Shown (18-Ft. Similar)

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

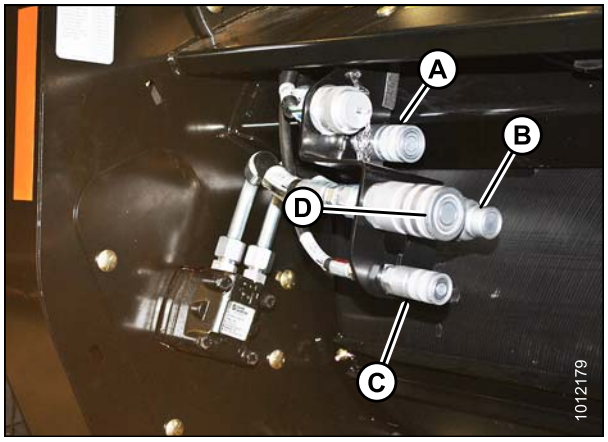


Figure 4.43: 2015 Grass Seed Header Hose Connectors

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

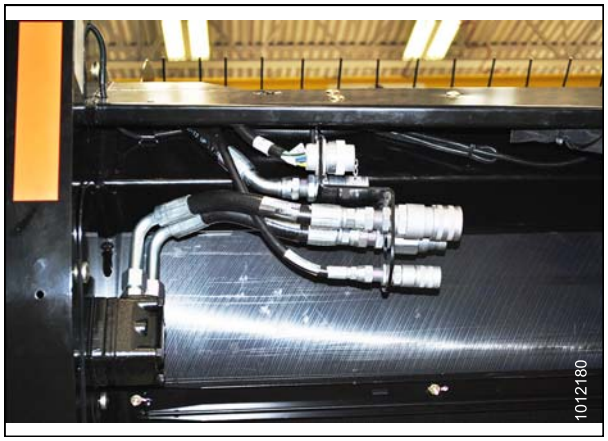


Figure 4.44: 2015 Grass Seed Header Hose Connectors Side View

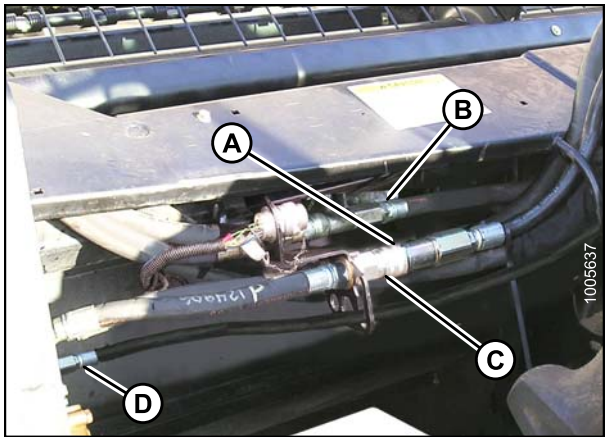


Figure 4.45: 2014 and Earlier Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this Image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

11. Route auger return and reel pressure hose bundle (A) from header to windrower, and position bundle above existing hose support (C) as shown.
12. Secure with three straps (D), and lower lever (B).

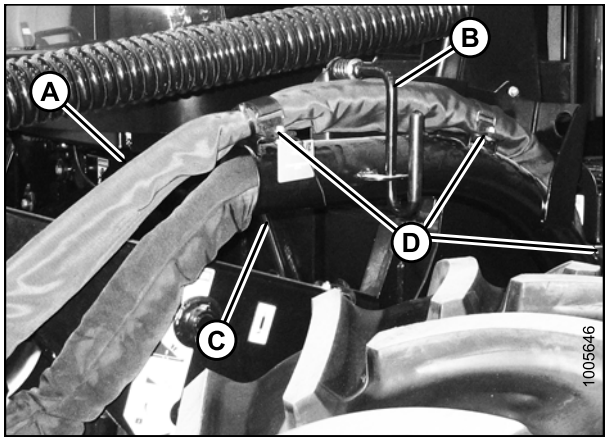


Figure 4.46: Auger Return and Reel Pressure Hose Bundle

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

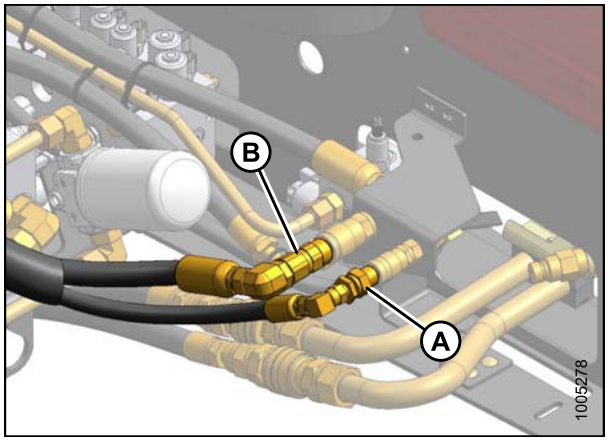


Figure 4.47: Auger/Reel Pressure and Auger/Reel Return Hose Couplers

14. Check hose routing at the reel motor. The hose routing depends on which windrower model the header is being attached to. The header is factory-configured for M150, M155, and M200 Windrowers.

    NOTE:
    Reel drive motor may not be exactly as shown.

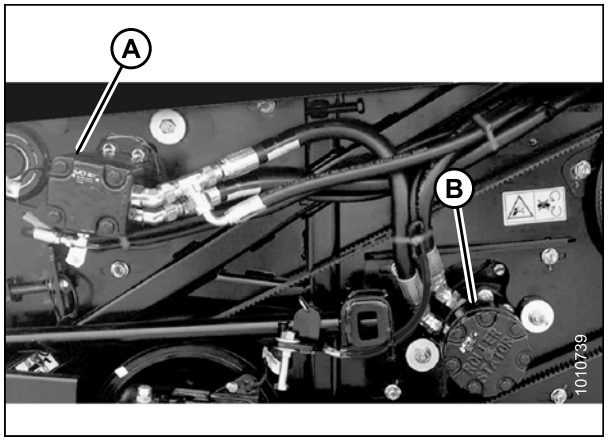


Figure 4.48: Later-build 2015 Factory Routing M150, M155, and M200

15. For the procedure to change hose routing for M205 windrowers, refer to the section based on the year of manufacture:

    - Later-build 2015: *4.1.7 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only), page 124*

    or

    - Early-build 2015, 2014 and earlier: *4.1.6 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D for use on M100, M105 and M205 Windrowers Only), page 122*

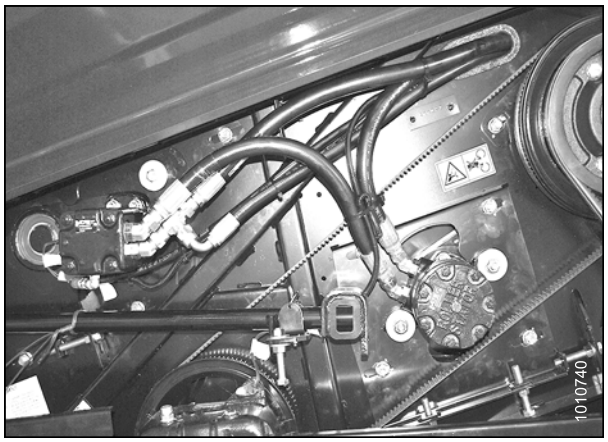


Figure 4.49: Modified Routing M100, M105, and M205

4.1.5 Configuring Reverser Valve Jumper Hose

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

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

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

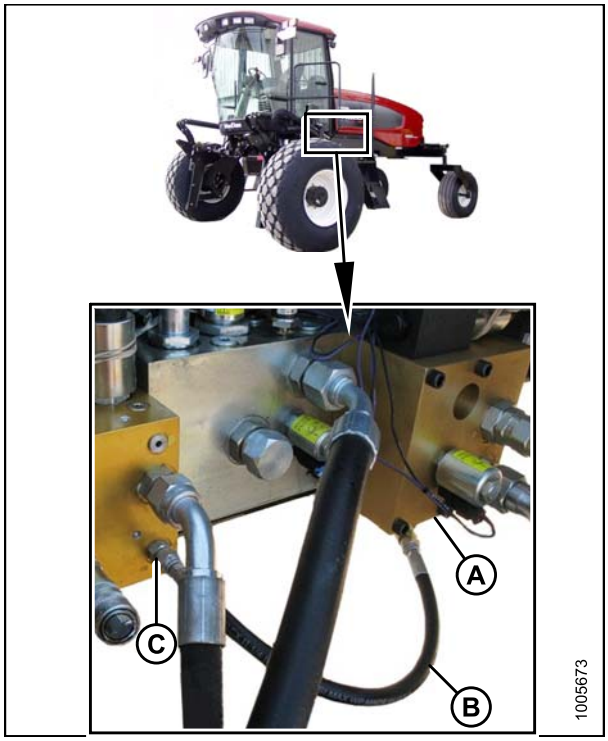


Figure 4.50: A40-D Hose (B) Position (M200 Shown; M150 and M155 Similar)

To reroute jumper hose from A30-D or Draper Header position to A40-D position, follow these steps:

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

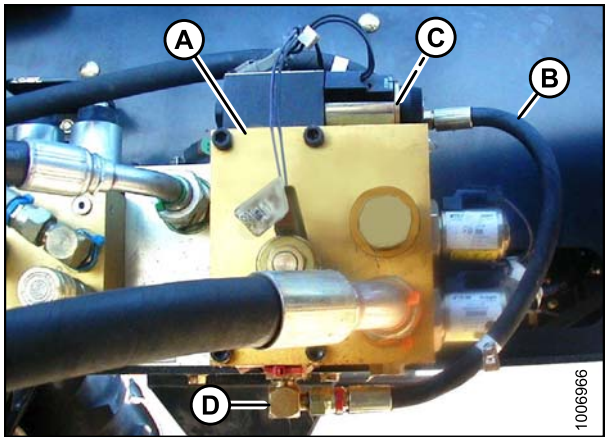


Figure 4.51: A30-D or Draper Header Hose Position (M150 Shown; M200 and M155 Similar)

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

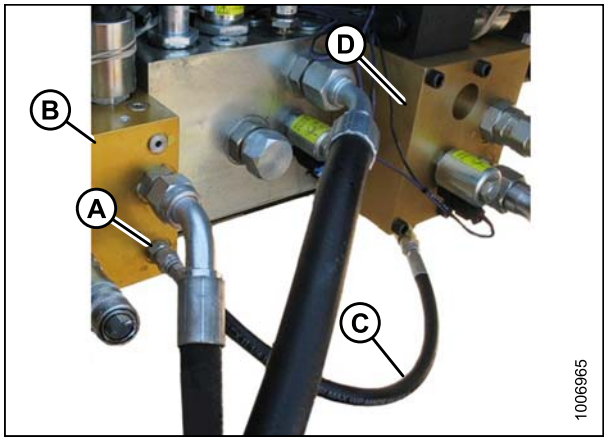


Figure 4.52

4.1.6 Hydraulic Drive Hose Routing (Early-Build 2015, 2014 and Earlier A40-D for use on M100, M105 and M205 Windrowers Only)

The A40-D Auger Header drive hose routing depends on the windrower model to which the header is being attached. To determine whether your 2015 A40-D is an early-build or later-build 2015 unit, refer to the **IMPORTANT** note below.

1. Press screwdriver against latch in opening (A) and lift to open header left-hand driveshield. Shield will latch at (B) to stay open.
2. Check hose routing at the reel motor. The header is factory-configured for M150, M155, and M200 Windrowers as shown in Figure *4.55: Early-Build 2015, 2014 and earlier Factory Configuration (M150, M155, and M200), page 123*.

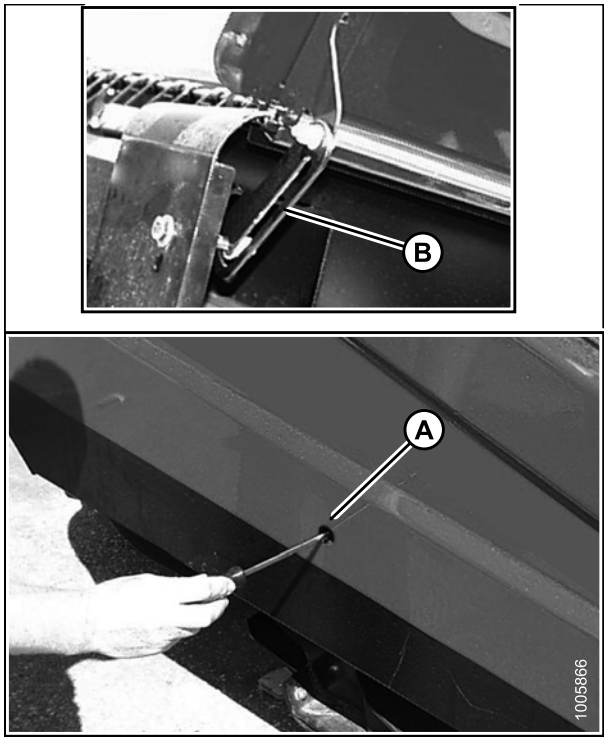


Figure 4.53: LH Driveshield

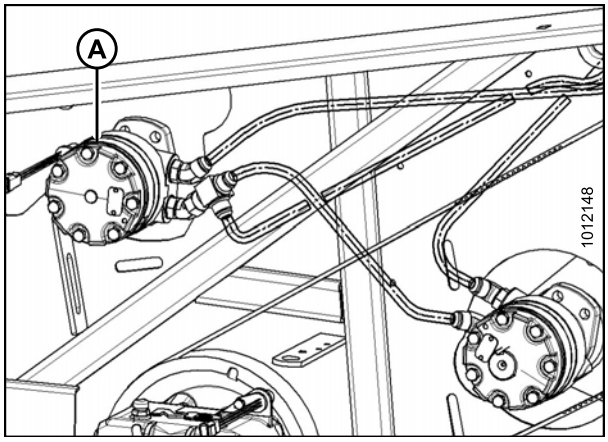


Figure 4.54: Round Reel Motor (A) Indicates Early-Build 2015, 2014 or Earlier A40-D Unit

To route hoses on early-build 2015, 2014 and earlier A40-D headers for use on M100, M105, and M205 windrowers, proceed as follows.

3. Disconnect hoses as follows:
   a. Disconnect hose (A) at tee (C).
   b. Disconnect hose (B) at reel motor upper port.
   c. Disconnect tee (C) at reel motor lower port.
4. Reconnect hoses as follows:
   a. Relocate tee (C) to reel motor upper port.
   b. Connect hose (B) to tee (C).
   c. Connect hose (A) to reel motor lower port.

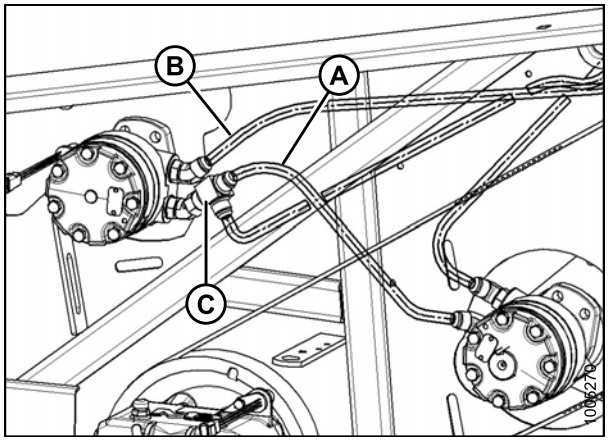


Figure 4.55: Early-Build 2015, 2014 and earlier Factory Configuration (M150, M155, and M200)

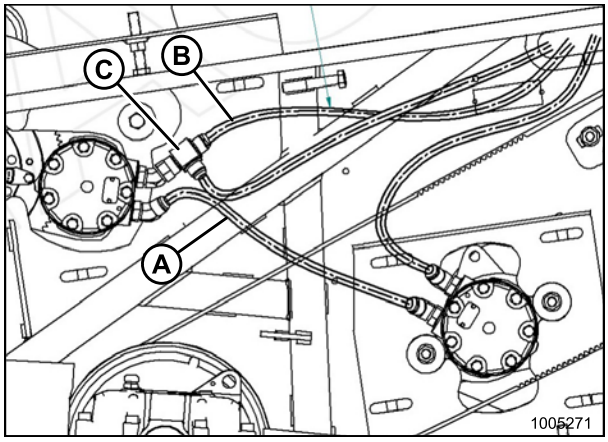


Figure 4.56: Adjusted Configuration (M100, M105, and M205)

5. Close driveline shield before engaging header.

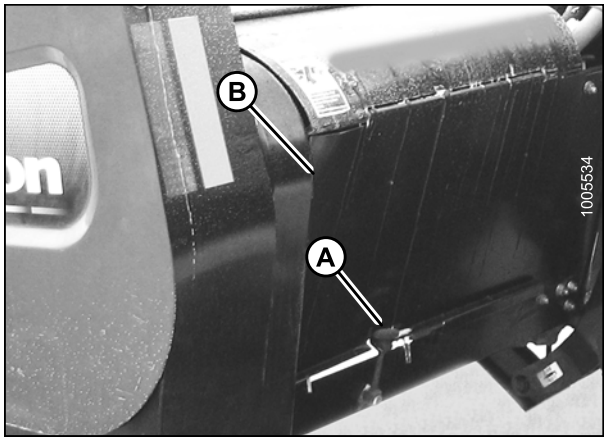


Figure 4.57: Driveline Shield

4.1.7 Hydraulic Drive Hose Routing (Later-Build 2015 A40-D Units Only)

The A40-D Auger Header hydraulic drive hose routing depends on the windrower model to which the header is being attached. To determine whether your 2015 A40-D is an early-build or later-build 2015 unit, refer to the **IMPORTANT** note below.

The header is factory-configured for M150, M155, and M200 SP Windrowers as shown in Figure *4.63: Factory Configuration (M150, M155, and M200), page 126*. To route hoses for M100, M105, and M205 Windrowers, proceed as follows.

1. Press screwdriver against latch in opening (A) and lift to open header left-hand driveshield. Shield will latch at (B) to stay open.

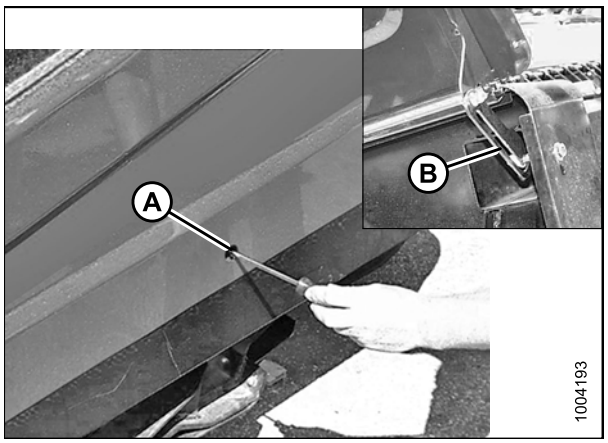


Figure 4.58: LH Driveshield

2. Disengage rubber latch (A), and open driveline shield (B).

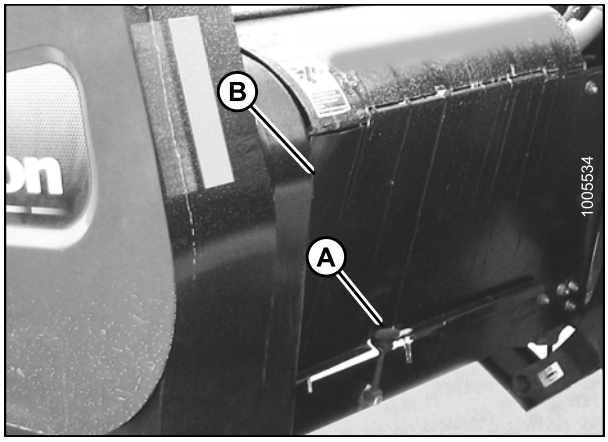


Figure 4.59: Driveline Shield

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

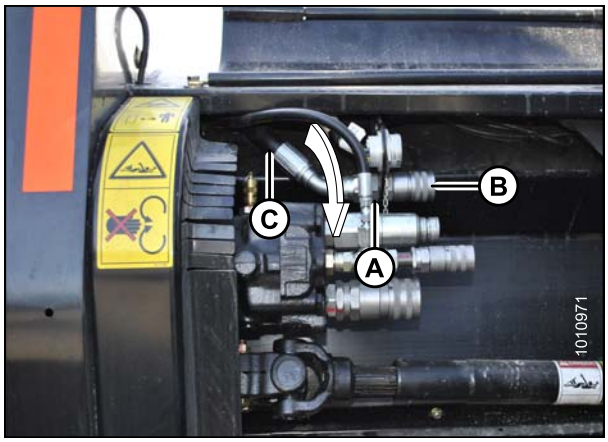


Figure 4.60: Auger and Reel Pressure Coupler and Hose – 14-Ft. and 16-Ft. Header Shown

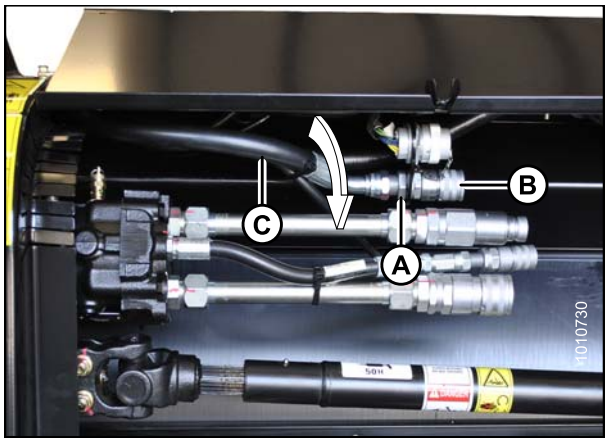


Figure 4.61: Auger and Reel Pressure Coupler and Hose – 18-Ft. Header Shown

IMPORTANT:
If you have a 2015 A40-D SP windrower header, confirm whether you have an early-build or a later-build 2015 unit. Look at the reel motor (A). If it is **square**, then it is a later-build 2015 model and this procedure should be used.

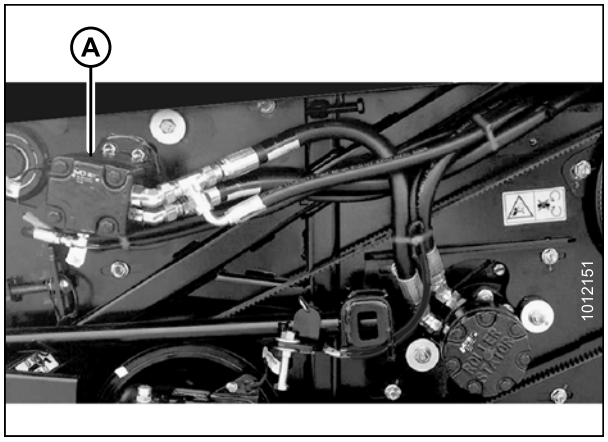


Figure 4.62: Square Reel Motor (A) Indicates Later-Build 2015 A40-D

4. Disconnect hoses as follows:
   a. Disconnect hose (A) at tee (B).
   b. Disconnect tee (B) at reel motor upper port.
   c. Disconnect hose (C) at reel motor lower port.
5. Cut cable ties (D) at locations shown in illustration.
6. Reconnect hoses as follows:
   a. Reroute hose (E) behind hose (A) and (F) to hose (C) and connect tee (B) to lower port fitting.
   b. Reroute hose (C) above hose (E) and (F) and connect hose (C) to tee (B). Tighten hose (C).
   c. Loosen 45 degree fittings at both ports. This allows room for wrenches when tightening tee (B) to lower port.
   d. Connect hose (A) to upper port fitting as shown and check orientation of 45 degree fitting.

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

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

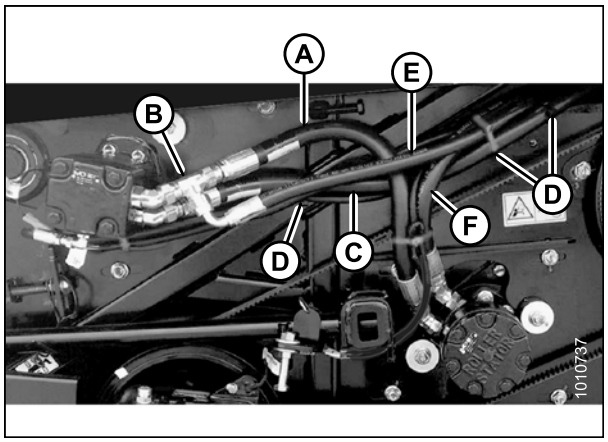


Figure 4.63: Factory Configuration (M150, M155, and M200)

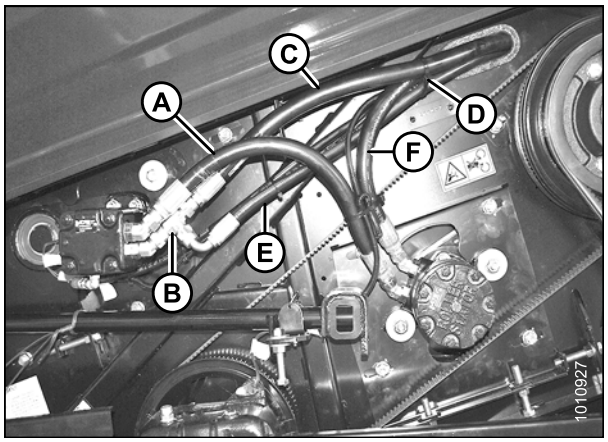


Figure 4.64: Adjusted Configuration (M100, M105, and M205)

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

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

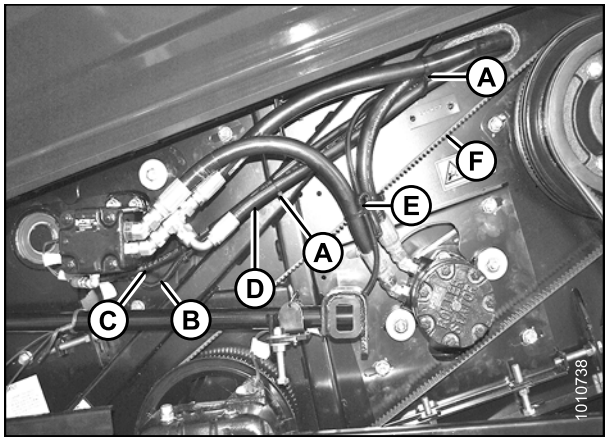


Figure 4.65: Adjusted Configuration (M100, M105, and M205)

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

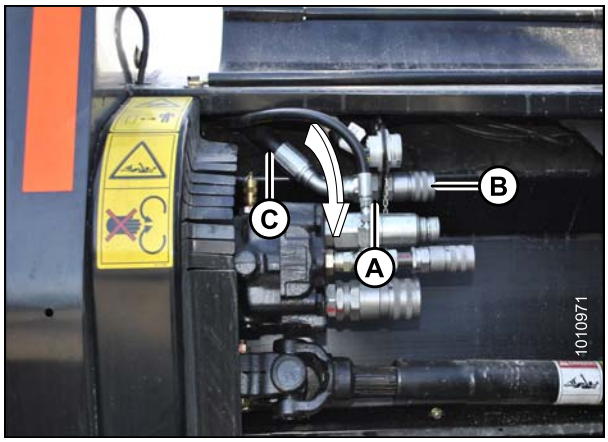


Figure 4.66: Auger and Reel Pressure Coupler and Hose – 14-Ft. and 16-Ft. Header Shown

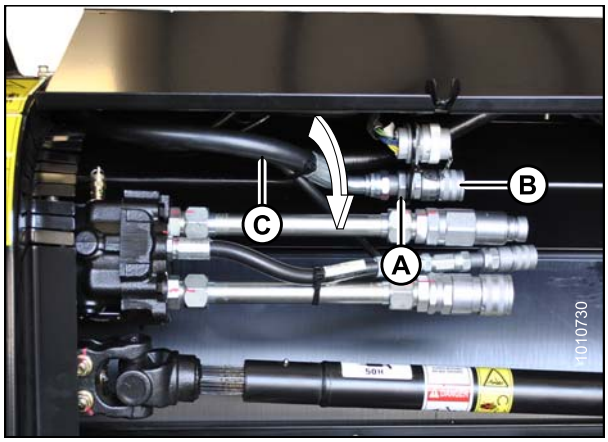


Figure 4.67: Auger and Reel Pressure Coupler and Hose – 18-Ft. Header Shown

9. Close driveline shield (B) and engage rubber latch (A).
10. Close driveshield before engaging header.

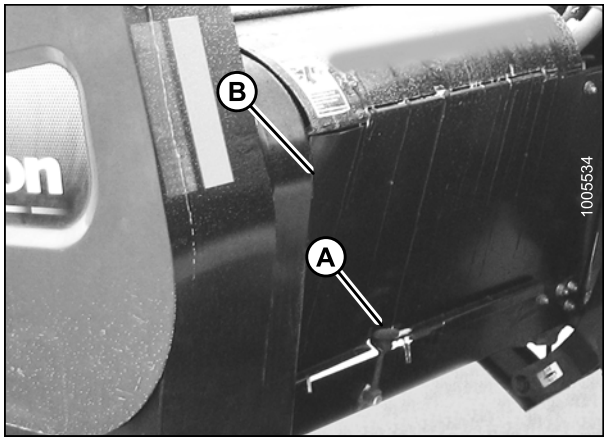


Figure 4.68: Driveline Shield

4.2 Detaching A40-D Header from Windrower

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Move left-hand cab-forward platform to rear of windrower.
2. Disconnect the two hydraulic hoses (A) and (B) from windrower valve(s).

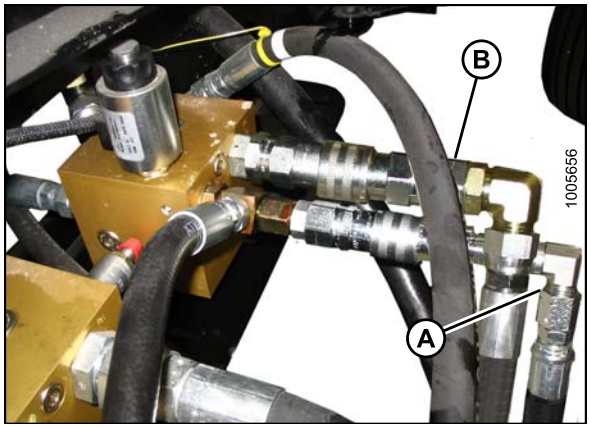


Figure 4.69: M100, M105

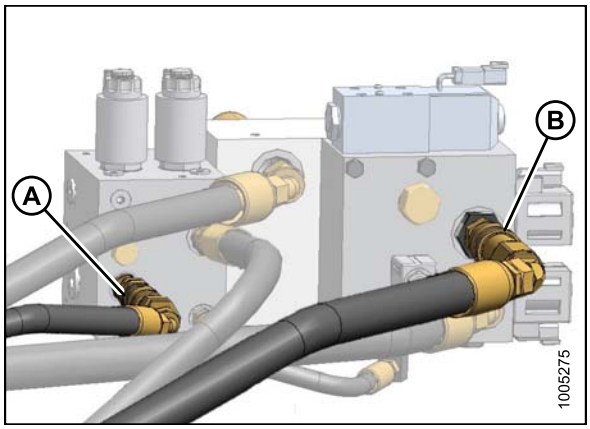


Figure 4.70: M150 with Reverser Valve (M155 Similar)

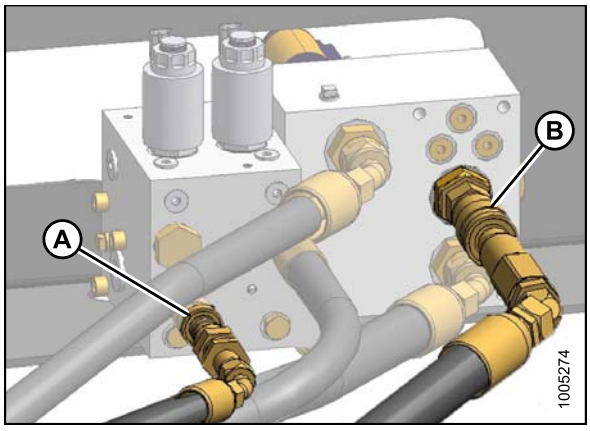


Figure 4.71: M150 without Reverser Valve (M155 Similar)

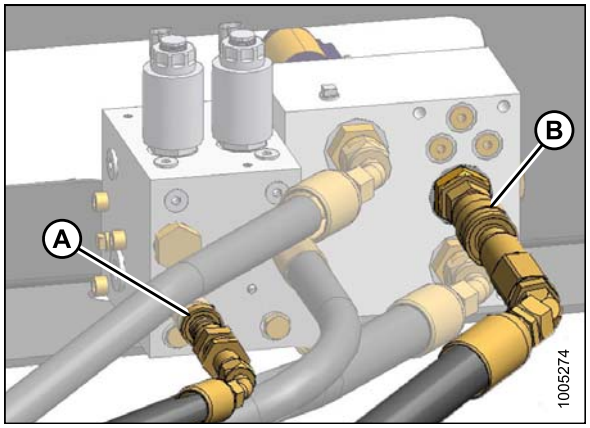


Figure 4.72: M150 without Reverser Valve (M155 Similar)

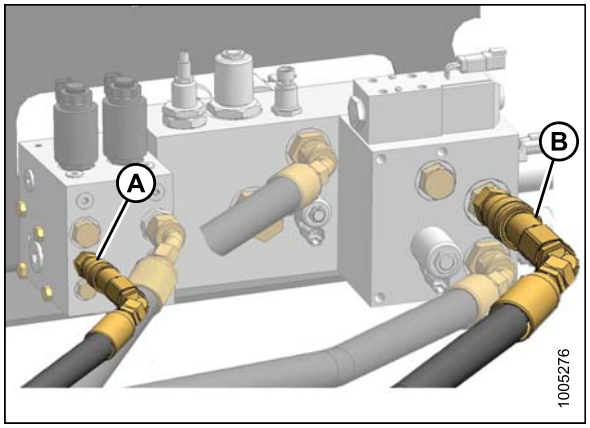


Figure 4.73: M200 with Reverser Valve

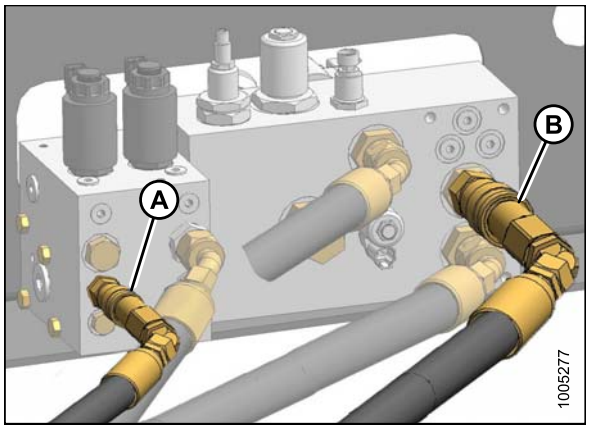


Figure 4.74: M200 without Reverser Valve

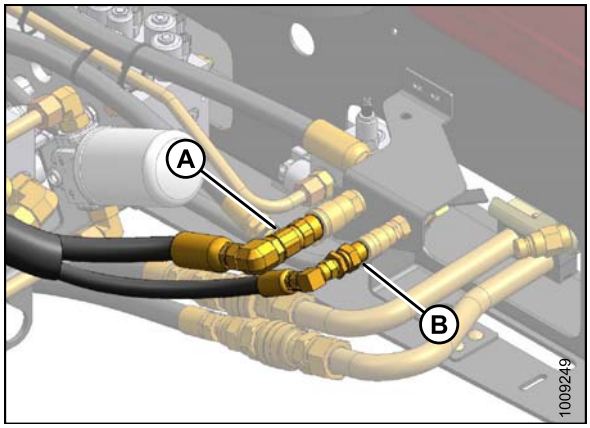


Figure 4.75: M205

3. Raise lever (B), and undo adjustable straps (D).
4. Move hose bundle (A) to store on header walkway.

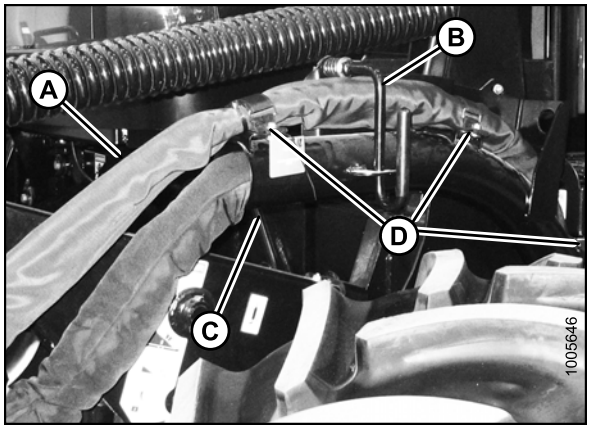


Figure 4.76: Hose Bundle

A - Auger Return and Reel Pressure Hose Bundle
B - Lever
D - Three Straps

5. Install caps on connectors and hose ends (if equipped).
6. At the header, disconnect electrical connector by turning collar counterclockwise, and pulling connector to disengage.
7. Disconnect hoses from hydraulic motor, auger, and reel pressure hose.

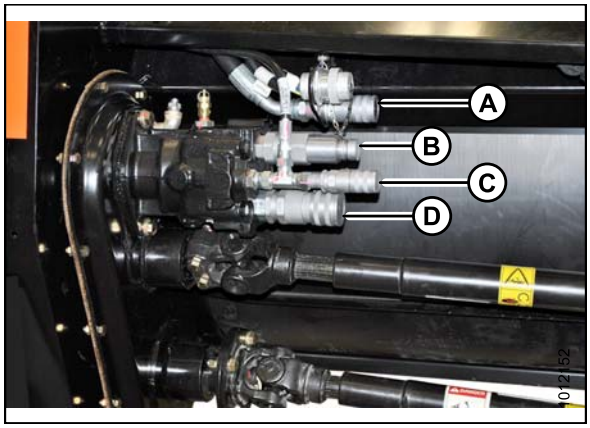


Figure 4.77: Standard Header

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

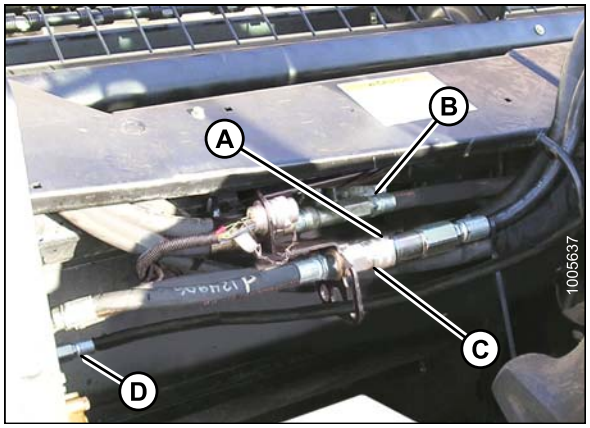


Figure 4.78: Grass Seed Header

A - Knife Return (Male Fitting at Header) (Hidden in this image)
B - Auger and Reel Pressure
C - Knife Pressure (Female Fitting at Header)
D - Case Drain

8. Move hose bundle (A) from header, and position on windrower left-hand side with hose ends in support (B) and under lever (C).
9. Rotate lever (C) clockwise, and push to engage bracket.
10. Position electrical harness through support (B), and attach cap to electrical connector.
11. Close driveline shield, and move windrower platform to closed position.
12. Check to ensure hoses and electrical harness clear tire.
13. Detach header from windrower. Refer to your windrower operator's manual for procedures for mechanically detaching the header from the windrower.

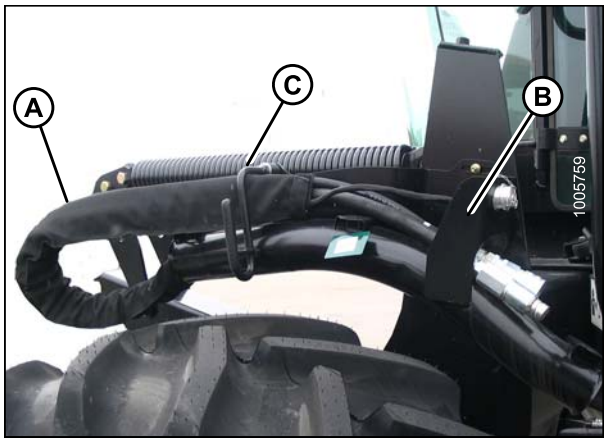


Figure 4.79: Hose Bundle Storage

4.3 Transporting A40-D Header with Windrower

Refer to your windrower operator's manual for information about transporting headers when attached to a windrower. The orientation of the reflectors on the hazard light fixtures is dependent on the direction of travel for Dual Direction® windrowers.

The amber reflectors **MUST** always face the direction of travel (C), and are changed as follows:

1. Lower header to the ground, shut off engine and remove key from ignition.
2. Remove bolts (A) from reflector assembly (B), and remove assembly from light fixture. Retrieve spacers (nuts).

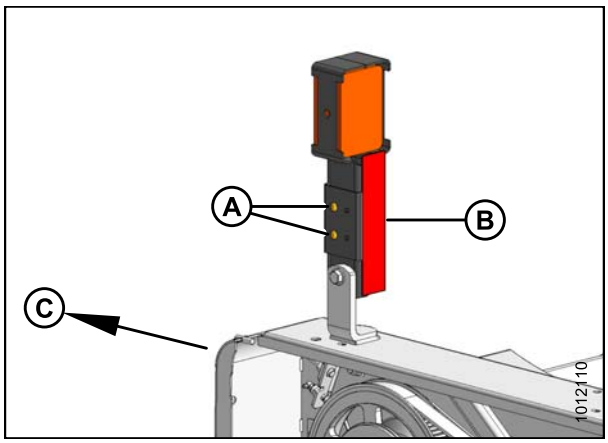


Figure 4.80: Engine-Forward Mode

3. Flip reflector assembly (B), and reinstall ensuring amber side is facing direction of travel (C).

   NOTE:
   Ensure reflector assembly is installed as shown. Otherwise it will interfere with the driveshield in the open position.
4. Secure with bolts (A), spacers, and nuts.
5. Repeat above steps for other light.

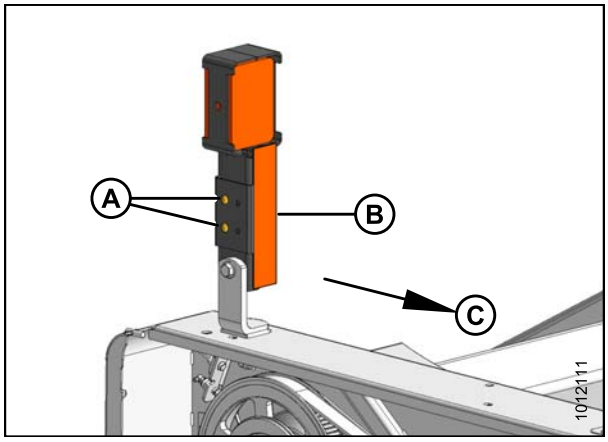


Figure 4.81: Cab-Forward Mode

4.4 Lift Cylinder Lock-Outs: Self-Propelled

Refer to your windrower operator’s manual for details on the lift cylinder locks.

4.5 Operating Variables for A40-D

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

Correct operation reduces crop loss and allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

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

Table 4.1 Header/Mower Conditioner Adjustments

Variable	Refer to
Lean Bar Position	*3.7.1 Setting Lean Bar, page 57*
Auger Speed	*4.5.2 Adjusting Auger Speed, page 136*
Reel Speed	*4.5.3 Adjusting Reel Speed, page 136*
Auger Position	*4.5.4 Setting Auger Position, page 136*
Reel Position	*4.5.5 Setting Reel Position, page 139*
Tine Aggressiveness Adjustment	*4.5.6 Setting Tine Aggressiveness, page 142*
Cutting Height	*4.5.8 Setting Cutting Height, page 144*
Header Angle	*4.5.7 Adjusting Header Angle of A40-D, page 144*
Header Float	*4.5.9 Checking/Adjusting Float, page 145*
Feed Pan / Rock Drop Tine Position	*3.7.10 Setting Feed Pan and Rock Drop Tine Position, page 73*
Roll Gap/Timing/Alignment	*3.7.11 Adjusting Conditioner Roll Gap, page 74*, *8.12.12 Checking/Adjusting Roll Alignment, page 287*, and *8.12.13 Adjusting Conditioner Roll Timing, page 289*
Roll Tension	*3.7.12 Adjusting Conditioner Roll Tension, page 76*
Forming Shields	*3.7.13 Positioning the Forming Shields, page 76*
Tall Crop Dividers	*6.1 Adjusting Tall Crop Dividers, page 161*
Ground Speed	*5 Selecting Ground Speed, page 159*

4.5.1 Setting Lean Bar

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

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

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

In crops over 5 ft. (1.52 m), an optional tall crop divider kit (MD #B4690) is available that includes lean bar extensions to raise the lean bar. See also *6.1 Adjusting Tall Crop Dividers, page 161*.

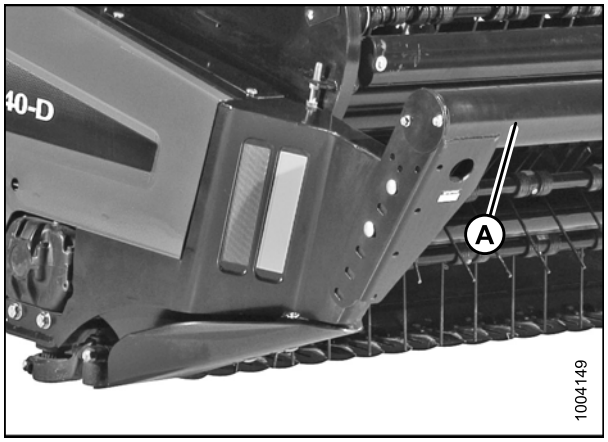


Figure 4.82: Lean Bar

4.5.2 Adjusting Auger Speed

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

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

4.5.3 Adjusting Reel Speed

The A40-D auger header features a hydraulic direct drive reel with operating speed range of 15 to 85 rpm (M150 and M155), 50 to 85 rpm (M100, M105, M200, M205), and is controlled from the Operator's station on the self-propelled windrower.

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

4.5.4 Setting Auger Position

⚠ CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

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

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

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

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

- *Setting Auger Fore-Aft Position, page 59*
- *Setting Auger Vertical Position, page 62*
- A40-D: *Adjusting Auger Fore-Aft Position, page 137*
- A40-D: *Adjusting Vertical Position, page 138*

NOTE:
In heavier crops it may be necessary to remove the front stripper bar for smoother crop flow across the auger. Refer to *8.11.3 Stripper Bar, page 264*.

NOTE:
The auger should clear the stripper bars on the auger pan by approximately 1/32–5/32 in. (1–4 mm). Shimming the stripper bars may be required. Refer to *8.11.3 Stripper Bar, page 264*.

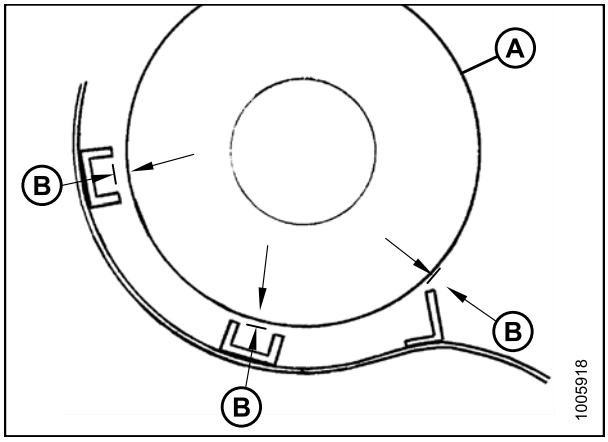


Figure 4.83: Clearance between Auger and Stripper Bars on the Auger Pan

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

Adjusting Auger Fore-Aft Position

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Open left-hand endshield.
2. Loosen four nuts (A).
3. Loosen jam nut on adjuster bolt (B), and turn bolt (B) to adjust auger fore-aft position.
4. Tighten jam nut.
5. Tighten nuts (A).

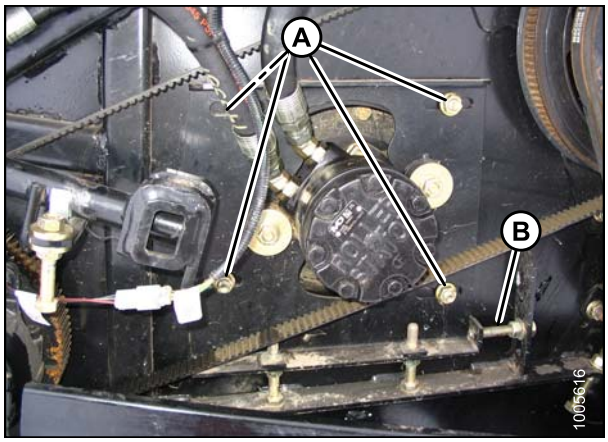


Figure 4.84

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

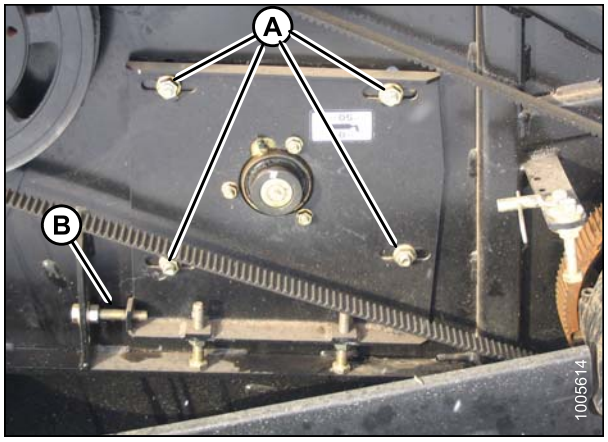


Figure 4.85

Adjusting Vertical Position

⚠ CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Open left-hand endshield
2. Loosen four nuts (A).
3. Loosen jam nuts on adjuster bolt (B), and turn bolt (B) to adjust auger vertical position.
4. Tighten jam nuts.
5. Tighten nuts (A).
6. Open right-hand endshield.

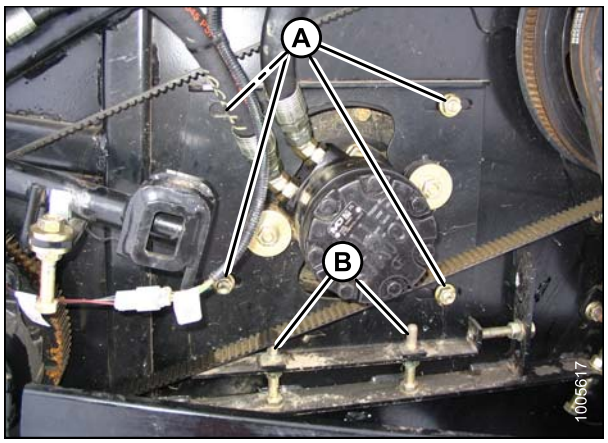


Figure 4.86

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

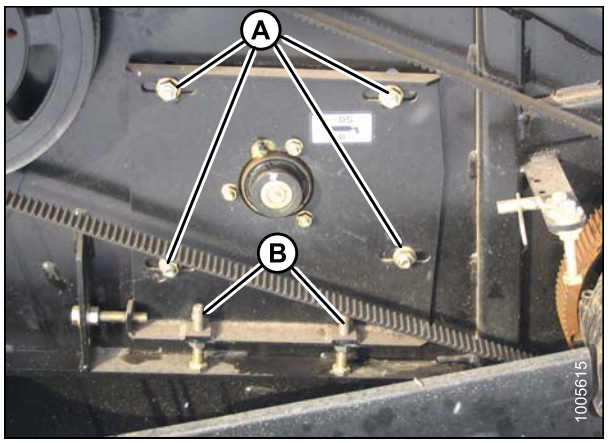


Figure 4.87

4.5.5 Setting Reel Position

Reel position has been found to be a critical factor in achieving good results in adverse conditions. Reel position is factory-set for average straight standing crop. It can be adjusted both vertically and horizontally (fore-aft) for different crop conditions.

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

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

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

- *Adjusting Reel Fore-Aft Position, page 139*
- *Adjusting Reel Vertical Position, page 140*

Adjusting Reel Fore-Aft Position

NOTE:
The reel must be adjusted equally on both sides.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Open left-hand endshield.
2. Loosen four nuts (A).
3. Loosen jam nut on adjuster bolt (B), and turn bolt (B) to adjust reel fore-aft position.
4. Tighten jam nut.
5. Tighten nuts (A).

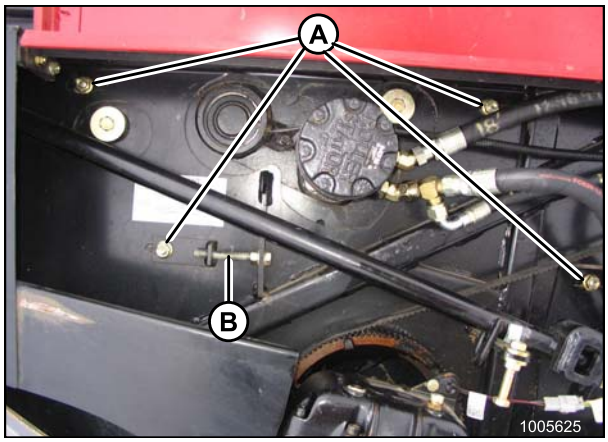


Figure 4.88

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

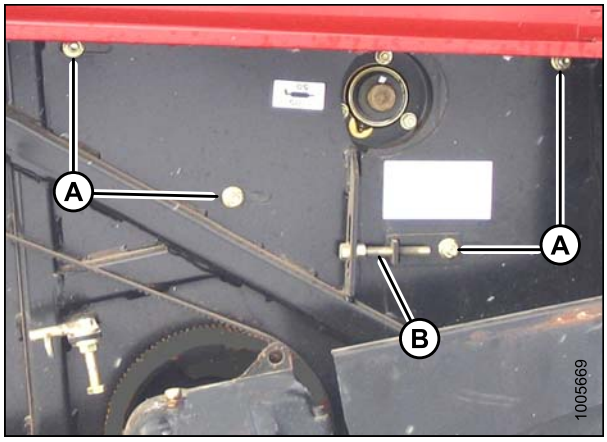


Figure 4.89

Adjusting Reel Vertical Position

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Open left-hand endshield.
2. Loosen four nuts (A).

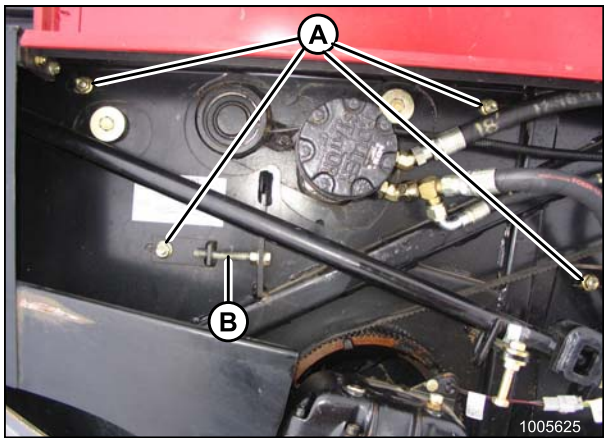


Figure 4.90

3. Loosen jam nuts on adjuster bolts (A), and turn bolts (A) to raise or lower reel.

   NOTE:
   Adjustment at forward adjuster bolt should be 0.47 in. (12 mm) lower than at rear adjuster bolt.

4. Tighten jam nuts (A).

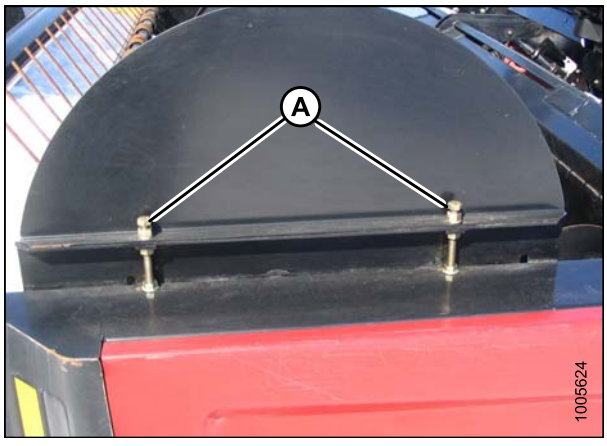


Figure 4.91

5. Tighten nuts (A).

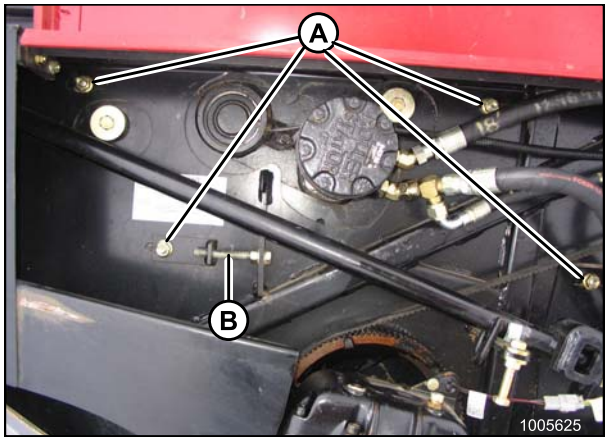


Figure 4.92

6. Open right-hand endshield.
7. Loosen four nuts (A).

Figure 4.93

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

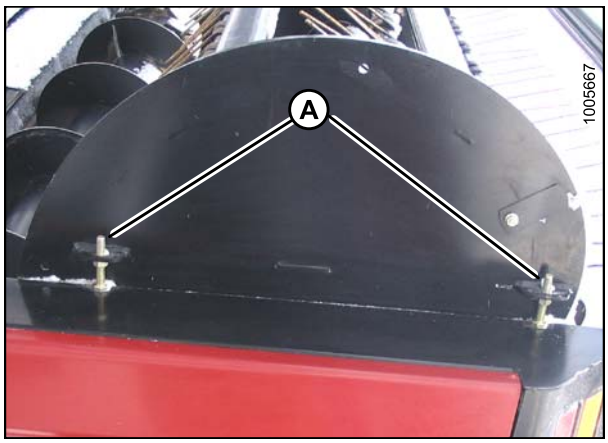


Figure 4.94

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

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

13. Check that reel is evenly adjusted.

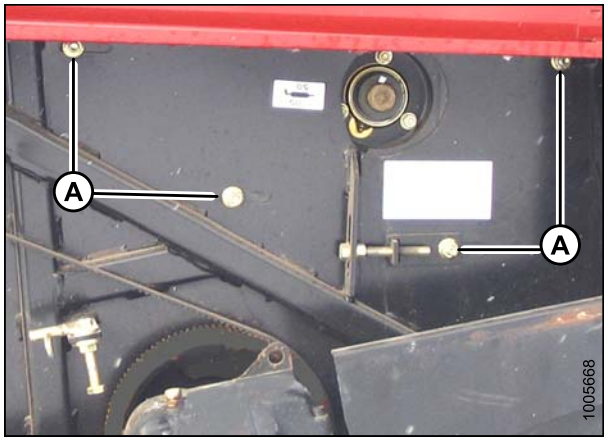


Figure 4.95

Checking Reel Tine to Header Pan Clearance

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

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

   NOTE:
   If there are a few reel tines that are touching the pan while the rest are at the correct height, trim the longer tines to match the rest. Be sure to adjust both sides of the reel. For self-propelled windrower headers, ensure that tines do **NOT** contact plastic header pan.

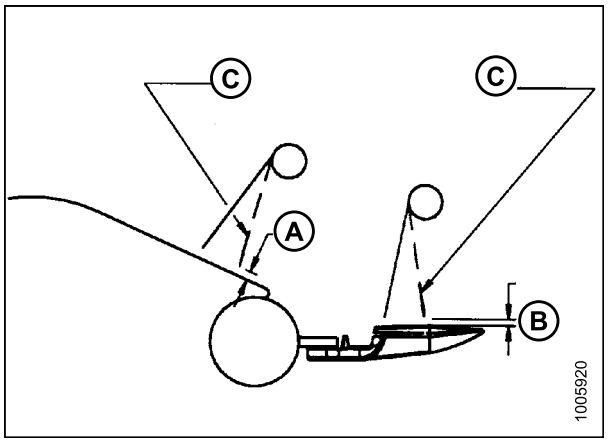


Figure 4.96: Reel Tine Clearance

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

4.5.6 Setting Tine Aggressiveness

⚠ CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

1. Open right-hand endshield.
2. At right side of reel (cam end) **ONLY**, loosen four nuts (A).

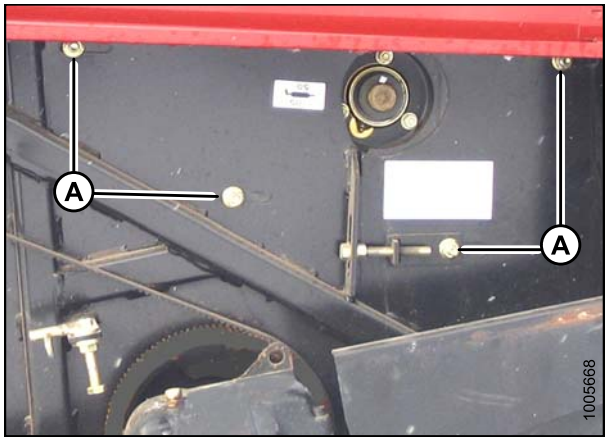


Figure 4.97: A40-D

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

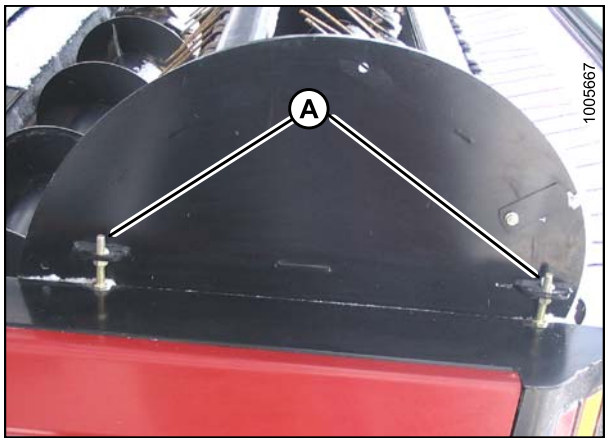


Figure 4.98: A40-D

4. Tighten nuts (A), and jam nuts on bolts.
5. Check that chain and/or belt have **NOT** become over-tight. Adjust to recommended tension if required. Refer to the following:
   - *Checking/Adjusting Reel Drive Belt Tension, page 235*.
6. Check reel tine to header pan clearance to ensure that there is no contact between reel tines and the header pan. Refer to *Checking Reel Tine to Header Pan Clearance, page 142*.

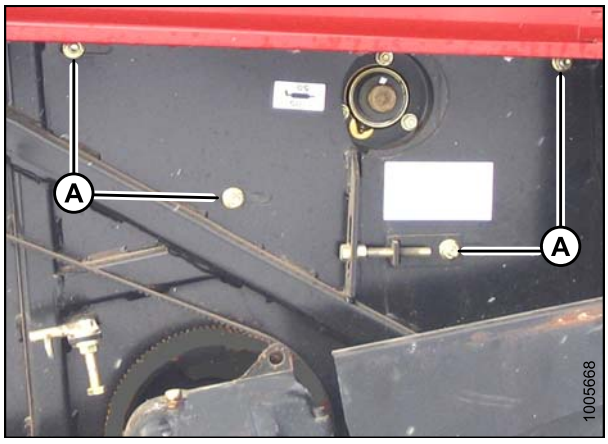


Figure 4.99: A40-D

4.5.7 Adjusting Header Angle of A40-D

Header angle can be hydraulically adjusted from the cab using hydraulic cylinder (A), without shutting down the windrower.

To adjust angle, refer to your windrower operator's manual.

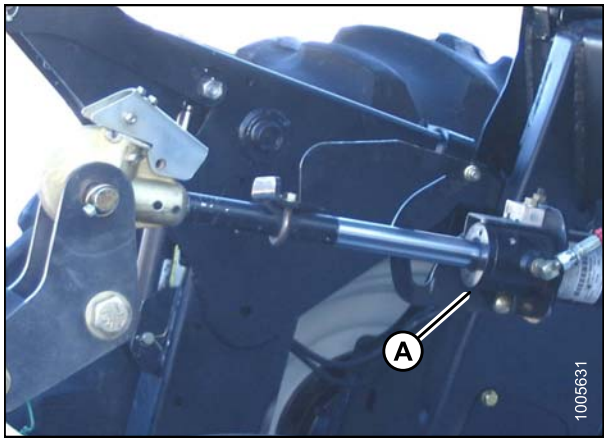


Figure 4.100

4.5.8 Setting Cutting Height

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

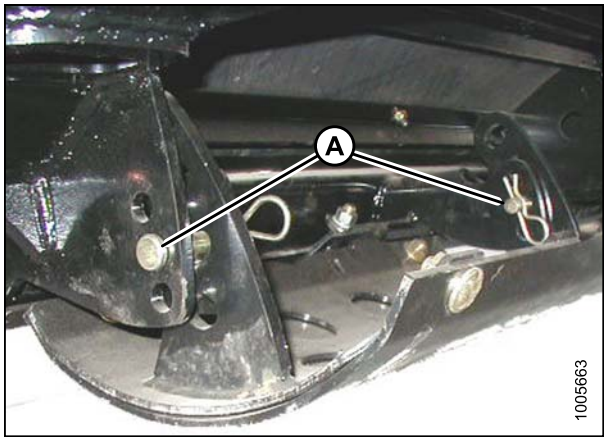


Figure 4.101: Skid Shoe

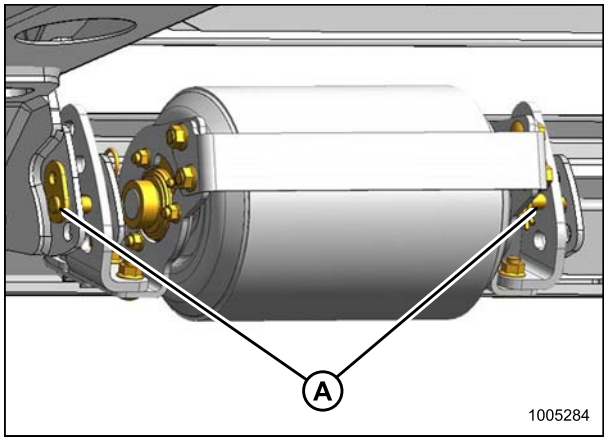


Figure 4.102: Gauge Roller

5. Check that skid shoes or gauge rollers are adjusted to the same position.

6. Check header float, and adjust if required:
   - Refer to *4.5.9 Checking/Adjusting Float, page 145*

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

4.5.9 Checking/Adjusting Float

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

To adjust the float, follow these steps:

1. Check float by grasping the lean bar and lifting. Lifting force should be 75–85 lbf (335–380 N) and should be approximately the same at both ends.
2. If necessary, perform the following steps to adjust the float:
   a. Raise header fully, shut down engine, and remove key.
   b. Turn drawbolt (A) clockwise to increase float (makes header lighter) or counterclockwise to decrease float (makes header heavier).
   c. Recheck the float.

Figure 4.103: Drawbolt – Top of Windrower Wheel Leg Member Shown

4.5.10 Adjusting Conditioner Roll Gap

The roll gap determines the amount of conditioning:

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

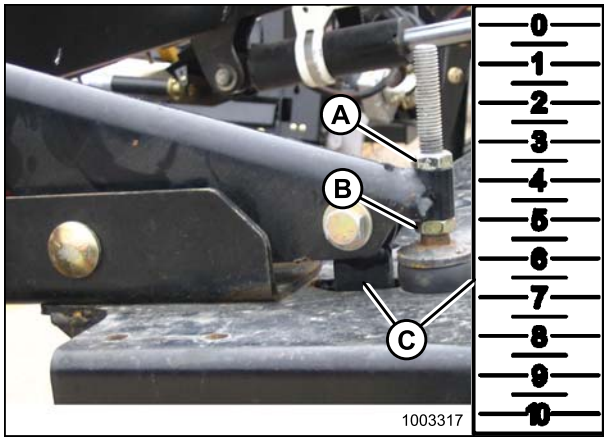


Figure 4.104: Pull-Type

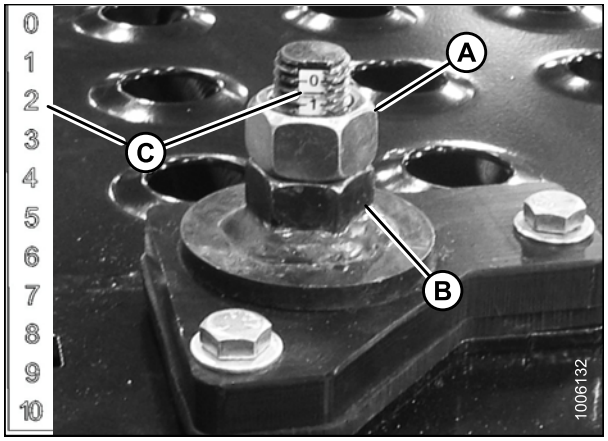


Figure 4.105: Self-Propelled

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

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

   - Conditioning is affected
   - The bars may contact each other

7. Check roll timing and alignment when reducing roll gap. Refer to:

   - *8.12.13 Adjusting Conditioner Roll Timing, page 289*
   - *8.12.12 Checking/Adjusting Roll Alignment, page 287*

8. Close cover (B), and tighten bolt (A).

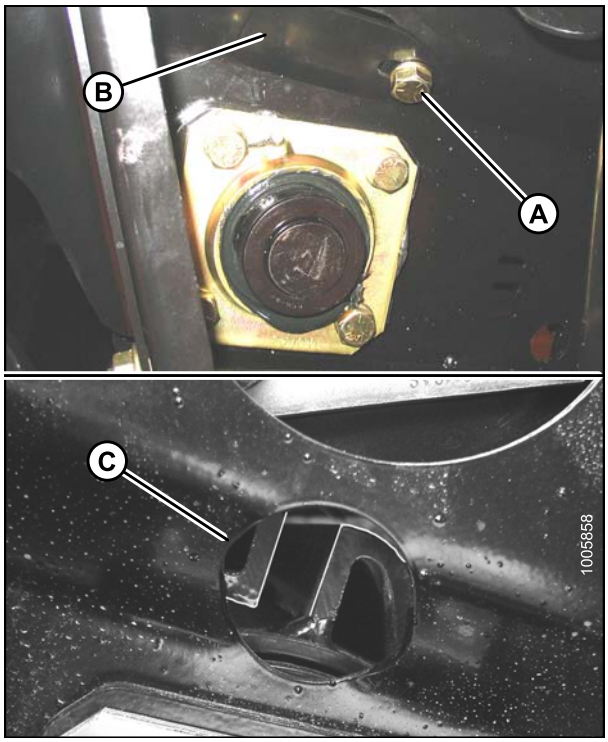


Figure 4.106

4.5.11 Adjusting Conditioner Roll Tension

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

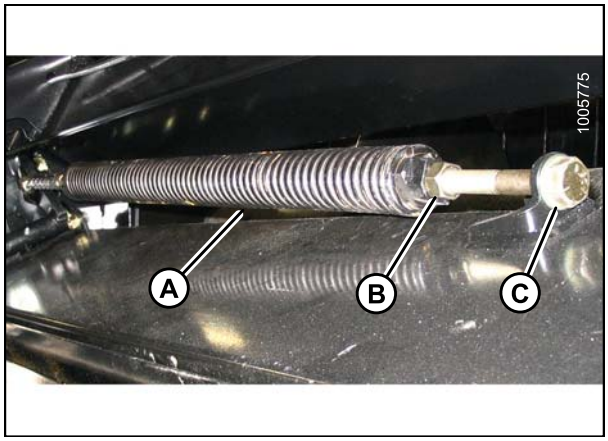


Figure 4.107

4.5.12 Positioning the Forming Shields

WARNING

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

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

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

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to *7 Haying, page 165* for more information.

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

Positioning Side Deflectors

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

1. For **SELF-PROPELLED units**, set forming shield side deflectors to desired width by re-positioning adjuster bars as follows:
   a. Remove lynch pin (A).
   b. Move adjuster bar (B) to another hole.
   c. Reinstall lynch pin (A).

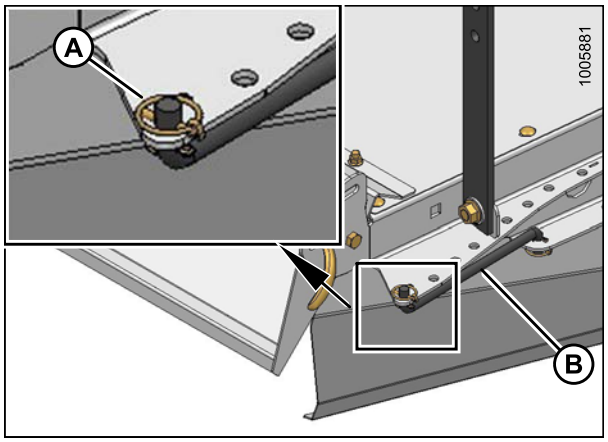


Figure 4.108: Self-Propelled

2. For **PULL-TYPE units**, set forming shield side deflectors to desired width by re-positioning adjuster bar.
   a. Remove hairpin and clevis pin (A).
   b. Move adjuster bar (B) to another hole.
   c. Reinstall clevis pin (A) and hairpin.

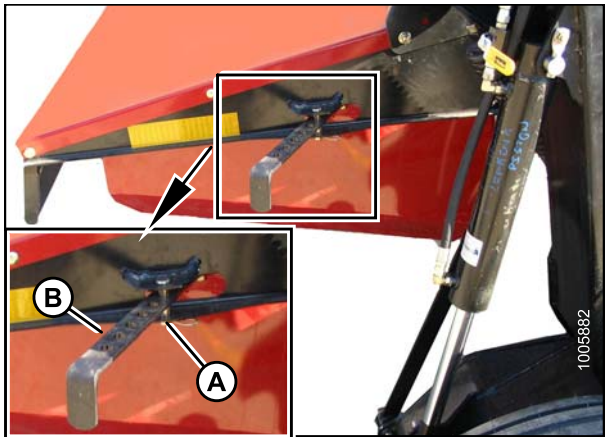


Figure 4.109: Pull-Type

3. For **SELF-PROPELLED units**, if forming shield attachment is too tight or too loose, tighten or loosen nut (A) as required.

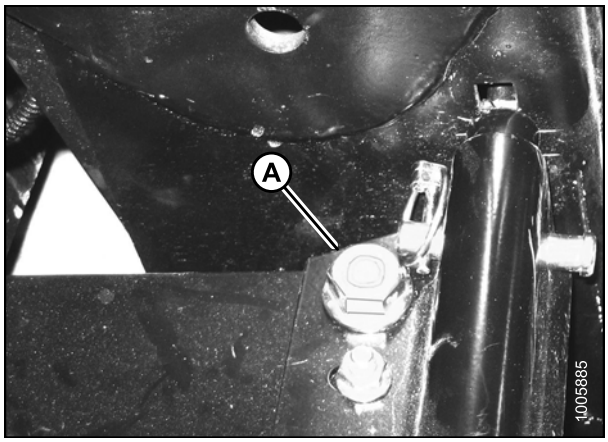


Figure 4.110: Self-Propelled

4. For **PULL-TYPE units**, if forming shield attachment is too tight or too loose, back off top nut at (A), and adjust lower nut at (B) as required. Then, holding lower nut with a wrench, tighten top nut securely against lower nut.

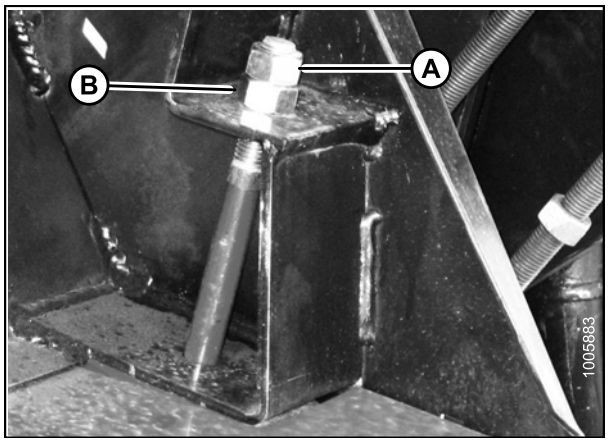


Figure 4.111: Pull-Type

Positioning Rear Deflector (Fluffer Shield)

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

CAUTION

For PULL-TYPE units: To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

CAUTION

For SELF-PROPELLED units: To prevent accidental movement of windrower, return ground speed lever (GSL) to N-DETENT, center steering wheel to lock, shut off engine, and remove key.

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

   NOTE:
   For even windrow formation, be sure the deflector is **NOT** twisted.

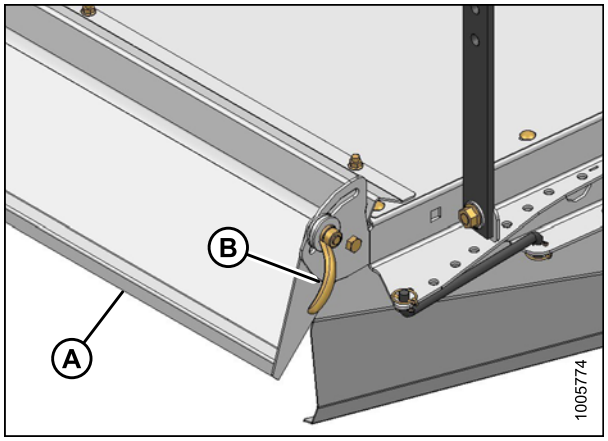


Figure 4.112: A40-D

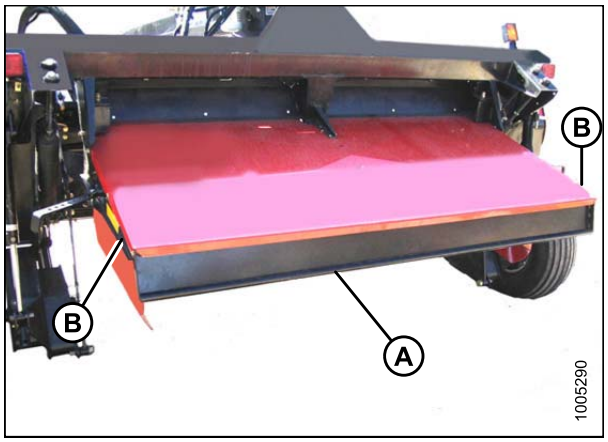


Figure 4.113: A30-D

4.6 Recommended Operating Settings

These settings are intended as a starting point. Operators should fine-tune to crop and field conditions. Also, refer to the A-Series Auger Header Quick Card (MD #147588) that was included in your shipment.

The settings chart continues on the next page.

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

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

4.7 Unplugging Conditioner and Knife: Self-Propelled

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop forward movement of windrower, and shut down header.
2. Lift cutterbar about 12 in. (300 mm).
3. Back up about 3 feet (1 metre) while slowly engaging the header.
4. If plug does not clear; raise machine, apply windrower brake, shut off engine, and remove key.
5. Engage lift cylinder lock-outs.

   ## WARNING

   Wear heavy gloves when working around or handling knife.

6. Clean off cutterbar by hand.

   NOTE:
   If knife plugging persists, refer to *9 Troubleshooting, page 297*.

4.8 Grass Seed Special A40-D

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

4.8.1 Stub Guards and Hold-Downs

The cutterbar is equipped with stub guards for effective cutting in tough grass crops. Refer to *8.7.7 Guards, page 210* for maintenance of these components.

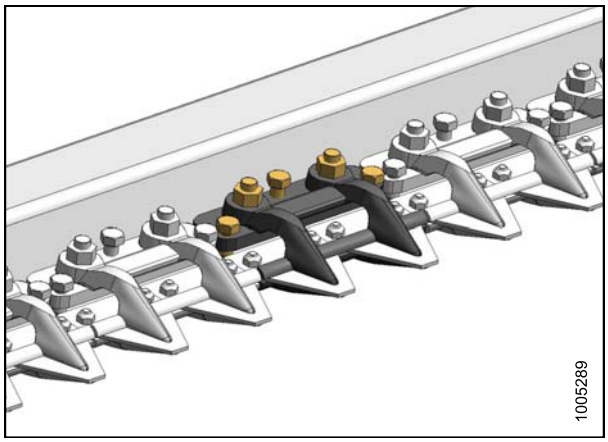


Figure 4.114

4.8.2 Special Auger Design for Grass Seed Special A40-D

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

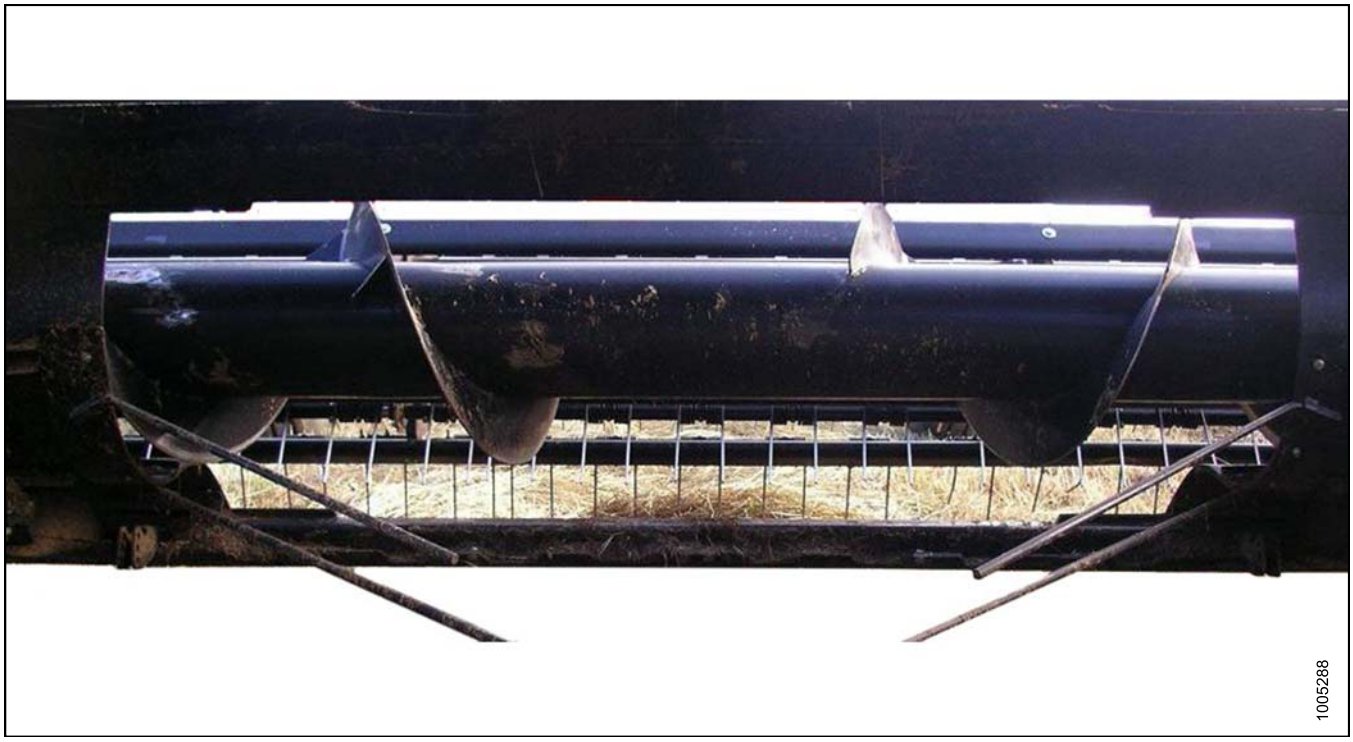


Figure 4.115

4.8.3 Seven-Bat Reel

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

Figure 4.116

4.8.4 Auger Pan Extensions

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

Adjusting Pan Extensions: Grass Seed Special

The grass seed header auger pan extensions are factory-installed for the widest delivery. Adjust as follows:

1. Remove two bolts (A) and loosen bolt (B).

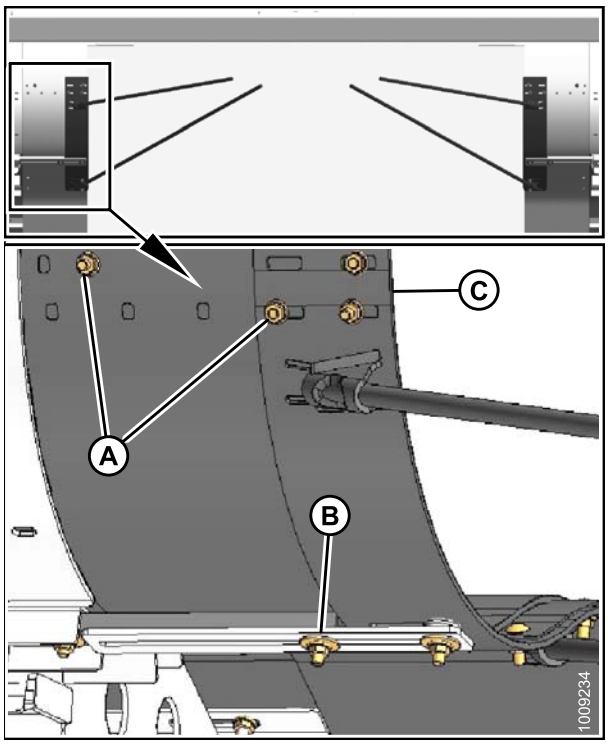


Figure 4.117: Pan Extension – Wide Setting

2. Slide pan extensions (C) and swath forming rods inboard to desired position and align holes.
3. Reinstall two bolts (A). Tighten bolts (A) and (B).
4. Repeat for opposite pan extension.

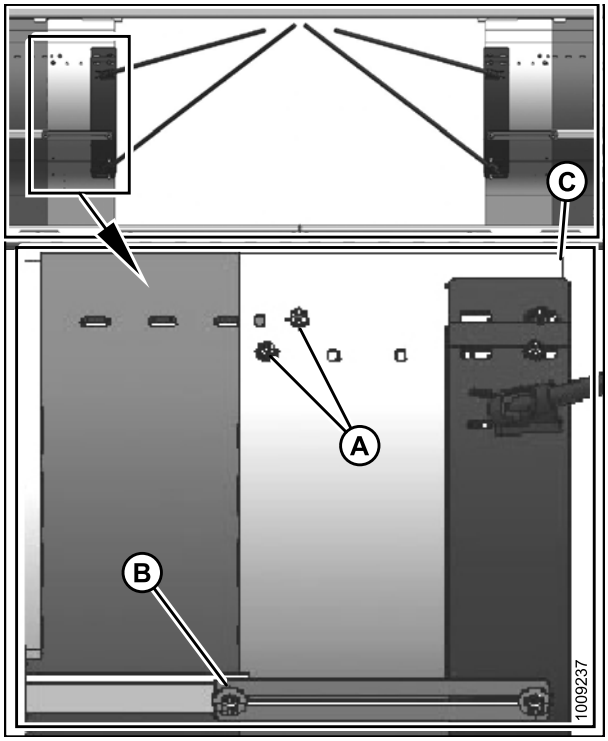


Figure 4.118: Pan Extension – Narrow Setting

4.8.5 Windrow Forming Rods

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

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

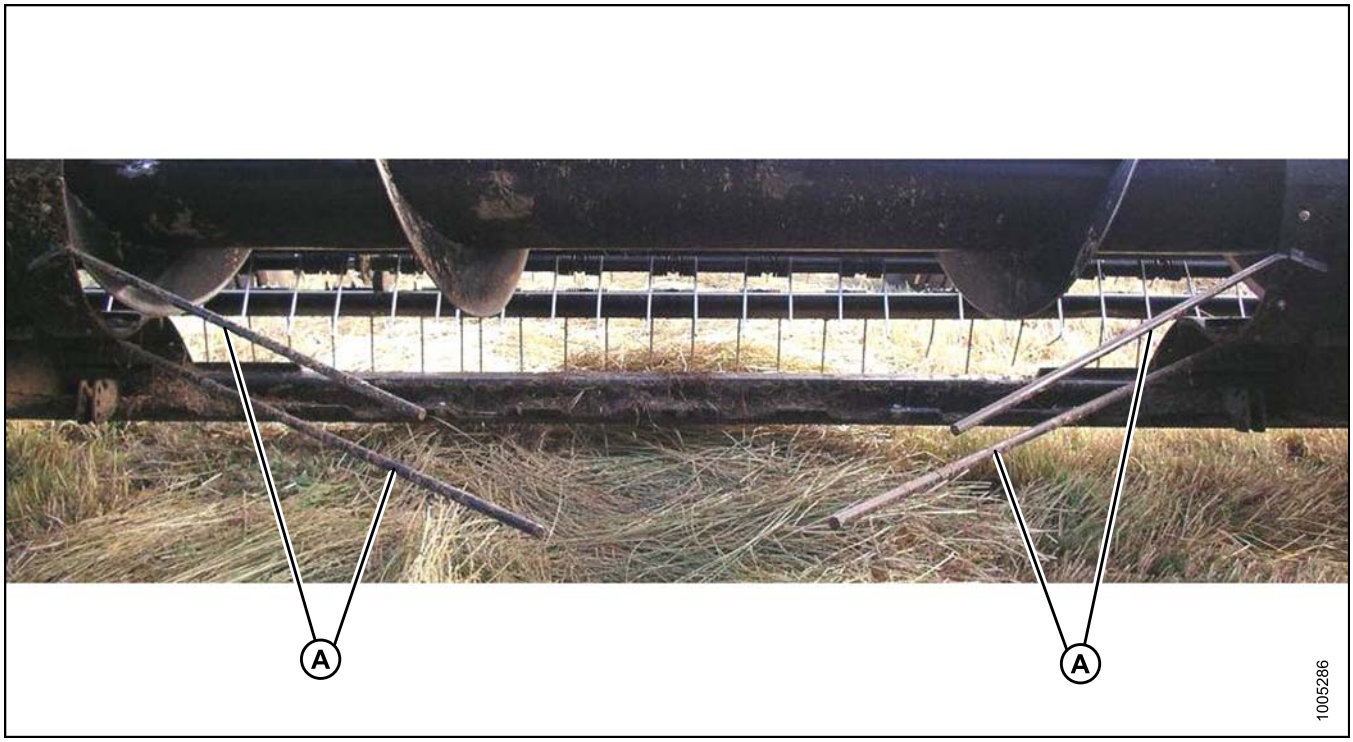


Figure 4.119

5 Selecting Ground Speed

CAUTION

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

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

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

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

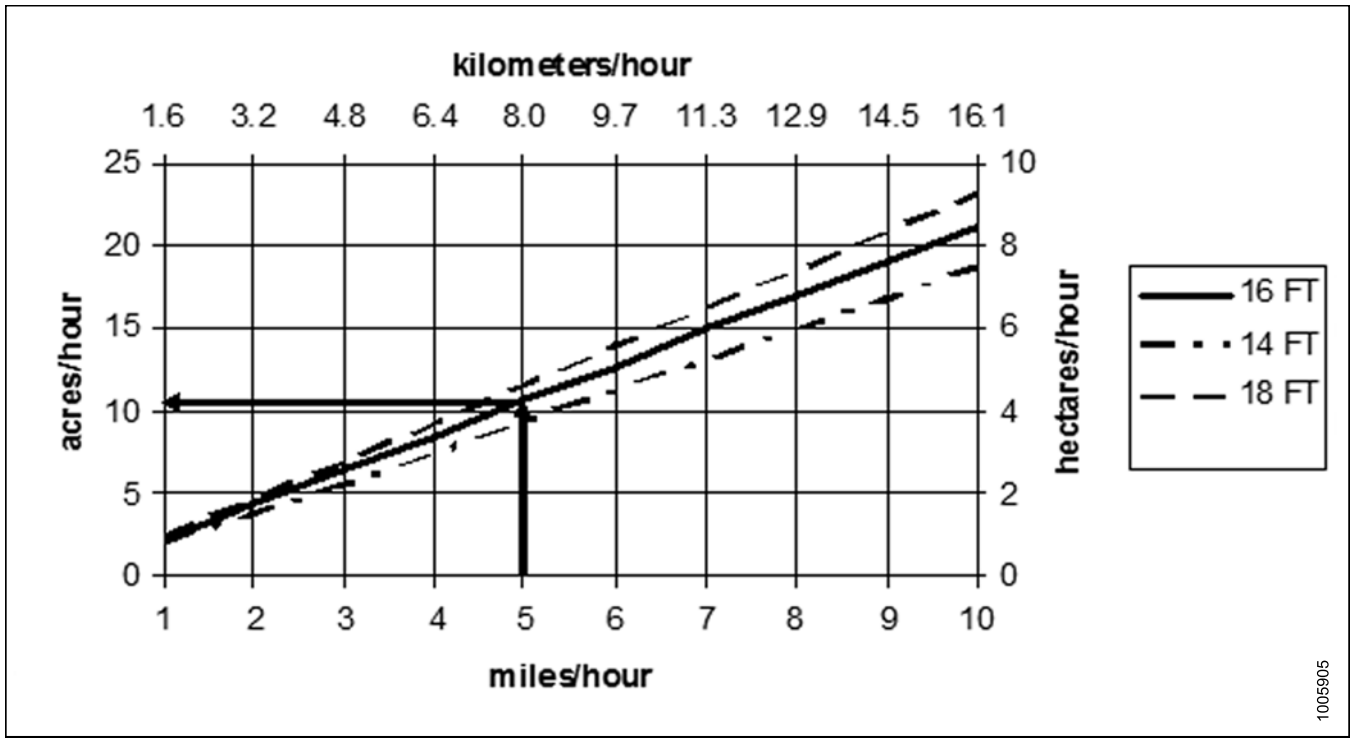


Figure 5.1: Ground Speed and Area Cut

6 Tall Crop Dividers

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

6.1 Adjusting Tall Crop Dividers

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

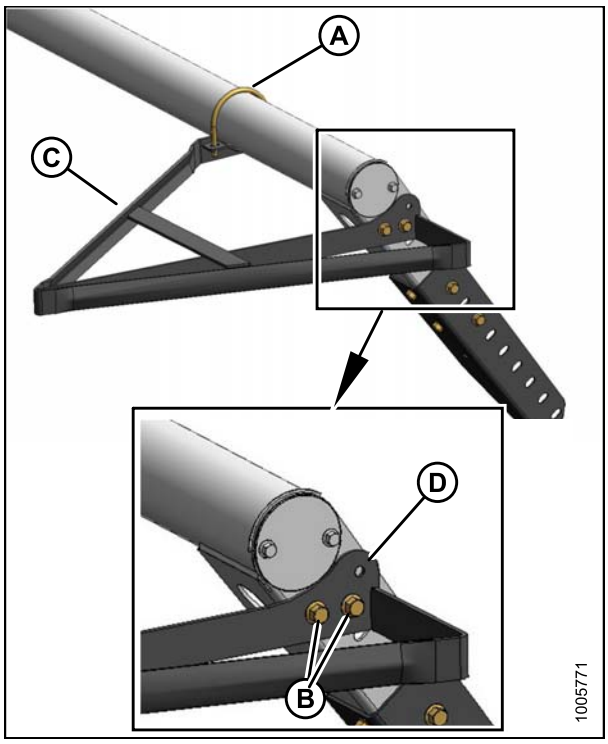


Figure 6.1

6.2 Removing Tall Crop Dividers

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

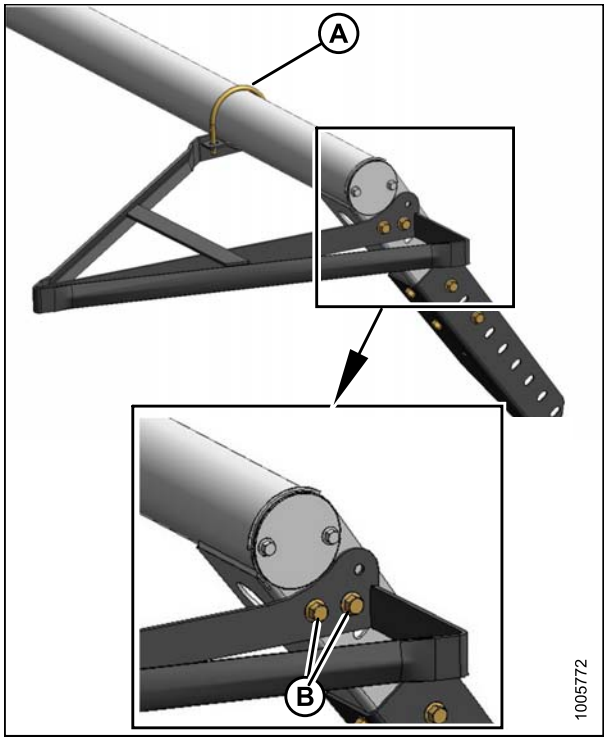


Figure 6.2

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

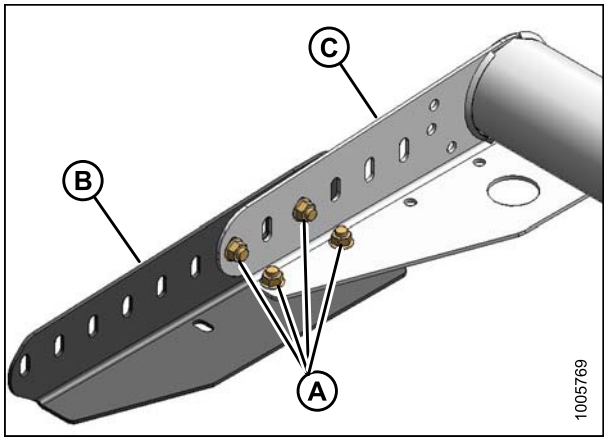


Figure 6.3

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

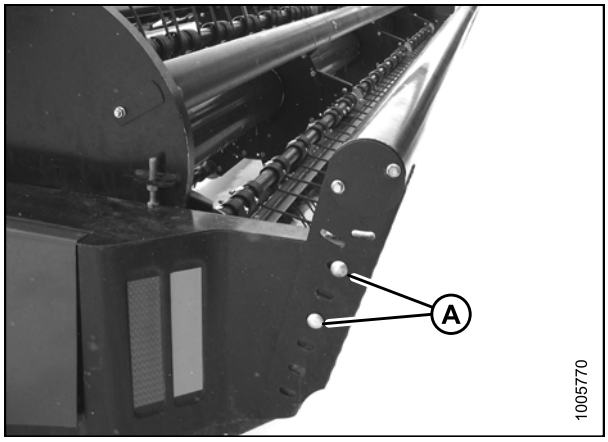


Figure 6.4

7 Haying

7.1 Haying Tips

7.1.1 Curing

Curing crops quickly helps maintain the highest quality because for each day that hay lies on the ground, 5% of the protein is lost.

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

7.1.2 Topsoil Moisture

Table 7.1 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 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.

7.1.3 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.

7.1.4 Windrow Characteristics

Producing windrows with the recommended characteristics will achieve the greatest results. Refer to *3.7 Operating Variables for A30-D, page 56* for instructions on adjusting the mower conditionerheader.

Table 7.2 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

7.1.5 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.

7.1.6 Raking and Tedding

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

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

7.1.7 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.

8 Maintenance and Servicing

The following instructions are provided to assist you in the use of the header/mower conditioner. Detailed maintenance, service, and parts information are contained in the technical manual and parts catalog that are available from your Dealer.

8.1 Preparing for Servicing

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers:

- **Fully lower the header. If necessary to service in the raised position, always engage lift cylinder stops.**
- **Disengage power take-off (PTO) (pull-type mower conditioners only).**
- **Place all controls in NEUTRAL or PARK.**
- **Stop engine and remove key.**
- **Wait for all moving parts to stop.**

8.2 Driveshields

To open left- and right-hand driveshields on header, press a screwdriver against latch in opening (A).

CAUTION

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

1. To close driveshields:
   a. Push shield slightly farther open.
   b. Move lock (B) out of the engagement slot.
   c. Lower shield by hand.
   d. Release about 12 in. (300 mm) from fully closed position.
   e. Shield will self-latch.

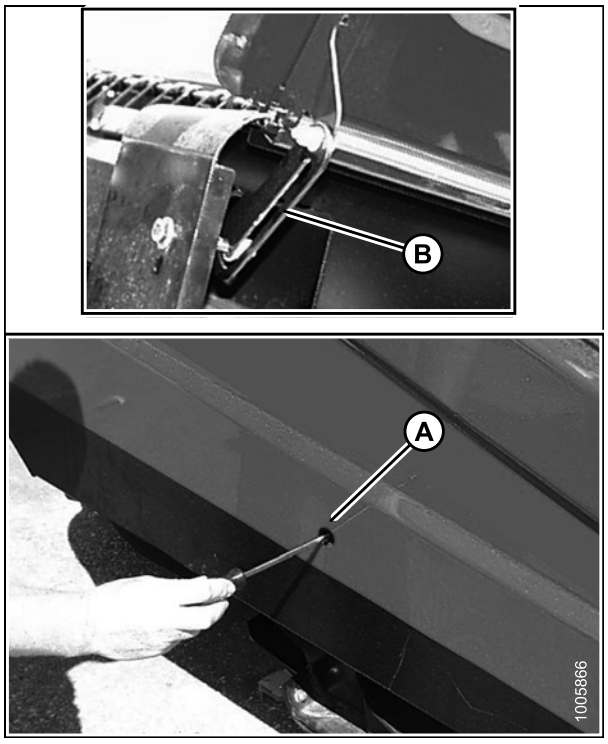


Figure 8.1: Screwdriver Against Latch

2. To open driveline shield:
   a. Disengage rubber latch (A).
   b. Open shield (B).
3. To close driveline shield:
   a. Lower shield (B).
   b. Engage rubber latch (A).

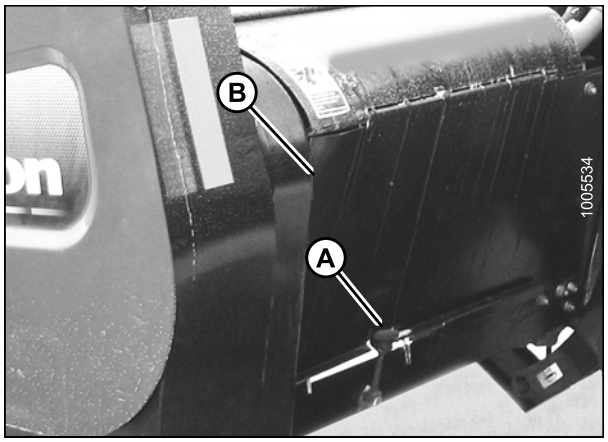


Figure 8.2: Driveline Shield

8.3 Maintenance Specifications

8.3.1 Recommended Fluids and Lubricants

Your machine can operate at top efficiency **ONLY** if clean lubricants are used.

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

Lubricant	Specification	Description	Use	Capacities
Grease	SAE Multi-Purpose	High temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2). Lithium base.	As required unless otherwise specified	—
		High temperature extreme pressure (EP) performance with 10% max molybdenum disulphide (NLGI Grade 2). Lithium base.	Driveline slip-joints	
Gear lubricant	SAE 85W-140	API service class GL-5	Knife drive box	2.3 quarts (2.2 liters)
			Conditioner drive gearbox	1.06 quarts (1 liter)
Hydraulic oil	SAE 15W-40	Compliant with SAE specs for API class SJ And CH-4 engine oil.	Steering, lift, and header drive systems reservoir	33 gal US (126 liters)

8.3.2 Recommended Torques

Torque Specifications

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

- Tighten all bolts to the torque values specified in the charts (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade of bolt.
- Use the 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.

SAE Bolt Torque Specifications

Torque values shown in the following tables are valid for non-greased, or non-oiled threads and heads; therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

Table 8.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*106	*117	11.9	13.2
5/16-18	*218	*241	24.6	27.1
3/8-16	32	36	44	48
7/16-14	52	57	70	77
1/2-13	79	87	106	118
9/16-12	114	126	153	170
5/8-11	157	173	212	234
3/4-10	281	311	380	420
7/8-9	449	496	606	669
1-8	611	676	825	912

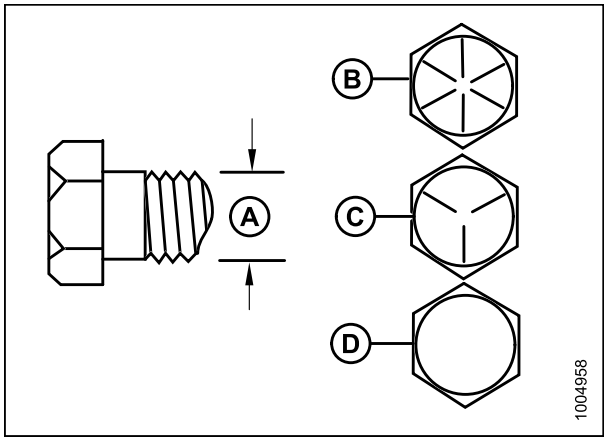


Figure 8.3: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*72	*80	8.1	9
5/16-18	*149	*164	16.7	18.5
3/8-16	22	24	30	33
7/16-14	35	39	48	53
1/2-13	54	59	73	80
9/16-12	77	86	105	116
5/8-11	107	118	144	160
3/4-10	192	212	259	286
7/8-9	306	338	413	456
1-8	459	507	619	684

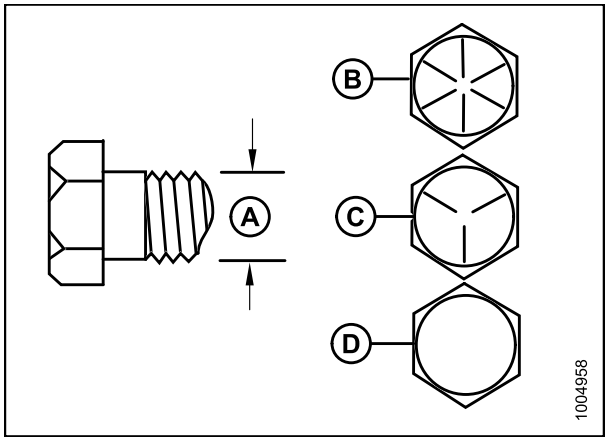


Figure 8.4: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	18	19	24	26
3/8-16	31	34	42	46
7/16-14	50	55	67	74
1/2-13	76	84	102	113
9/16-12	109	121	148	163
5/8-11	151	167	204	225
3/4-10	268	296	362	400
7/8-9	432	477	583	644
1-8	647	716	874	966

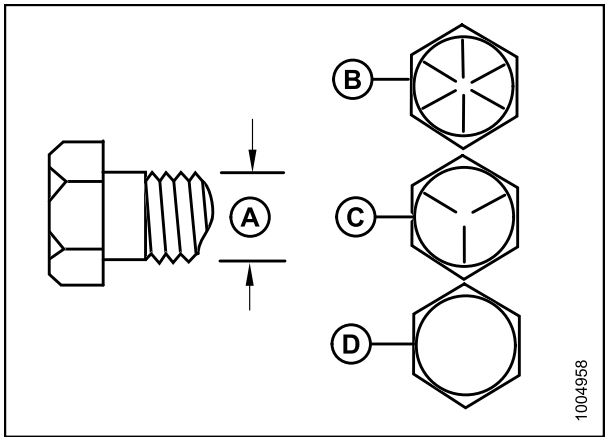


Figure 8.5: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 8.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	26	28	35	38
3/8-16	46	50	61	68
7/16-14	73	81	98	109
1/2-13	111	123	150	166
9/16-12	160	177	217	239
5/8-11	221	345	299	330
3/4-10	393	435	531	587
7/8-9	633	700	855	945
1-8	863	954	1165	1288

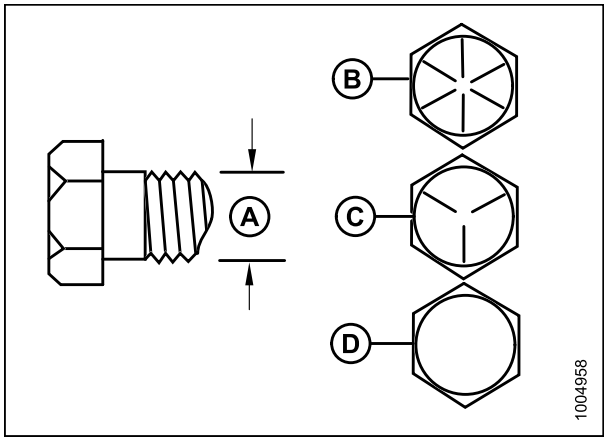


Figure 8.6: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Metric Bolt Specifications

Table 8.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

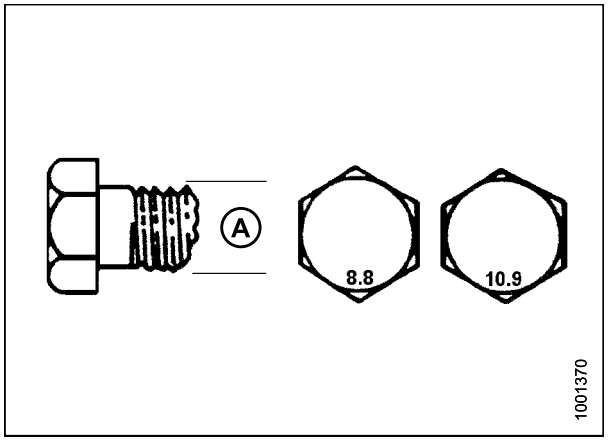


Figure 8.7: Bolt Grades

Table 8.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

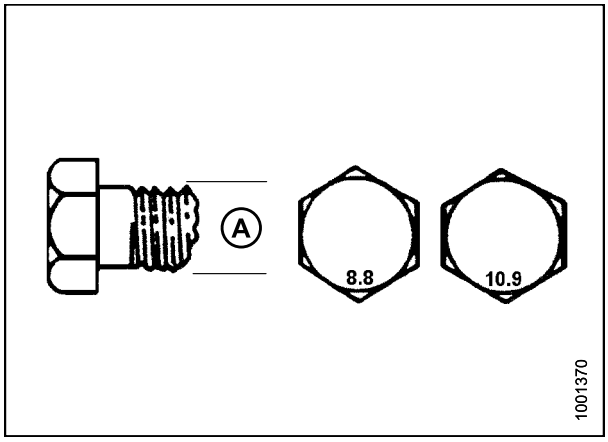


Figure 8.8: Bolt Grades

Table 8.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

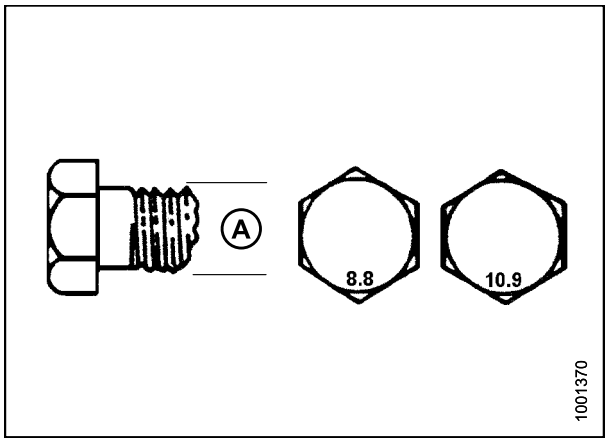


Figure 8.9: Bolt Grades

Table 8.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

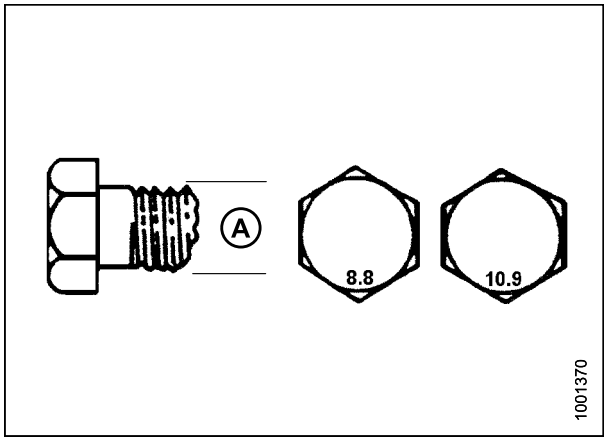


Figure 8.10: Bolt Grades

Metric Bolt Specifications Bolting into Cast Aluminum

Table 8.9 Metric Bolt Bolting into Cast Aluminum

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

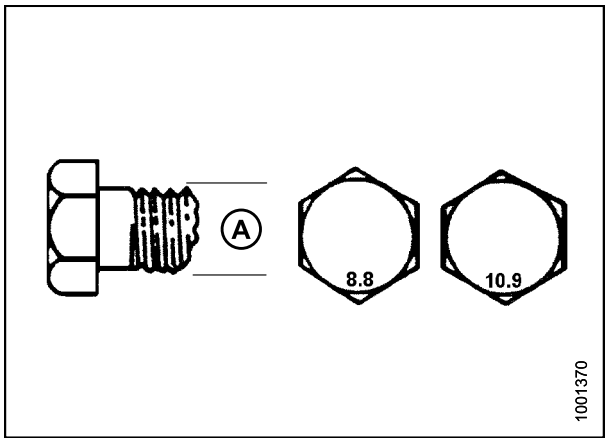


Figure 8.11: Bolt Grades

Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D), and thread nut (E) onto fitting without lubrication until contact has been made between the flared surfaces.
3. Torque the fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value shown in Table *8.10 Flare-Type Hydraulic Tube Fittings, page 176*.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on the fitting body (D), and tighten nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

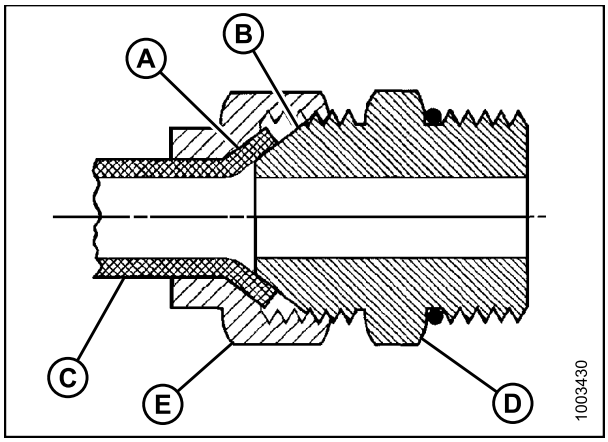


Figure 8.12: Hydraulic Fitting

Table 8.10 Flare-Type Hydraulic Tube Fittings

SAE No.	Tube Size O.D.(in.)	Thread Size (in.)	Nut Size Across Flats (in.)	Torque Value[2]		Flats from Finger Tight (FFFT)	
				ft·lbf	N·m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/8	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	3/4	1/8

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

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

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

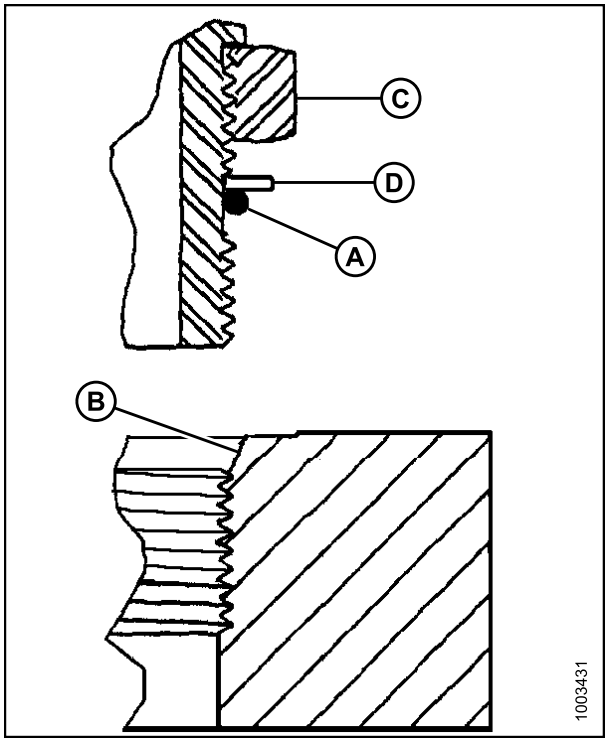


Figure 8.13: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact the 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 the other on lock nut (C).
8. Check the final condition of the fitting.

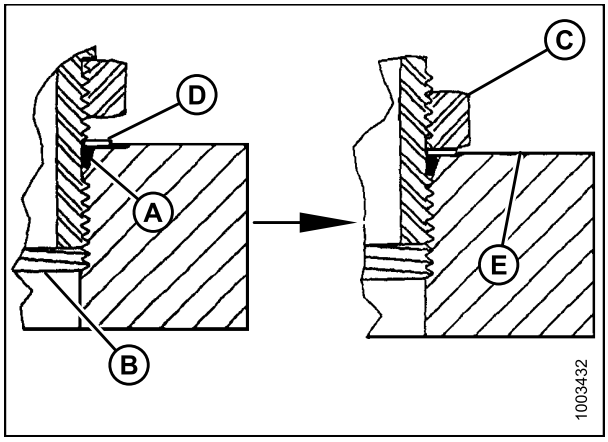


Figure 8.14: Hydraulic Fitting

Table 8.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

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

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 the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to the values in Table *8.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable), page 179*.
6. Check the final condition of the fitting.

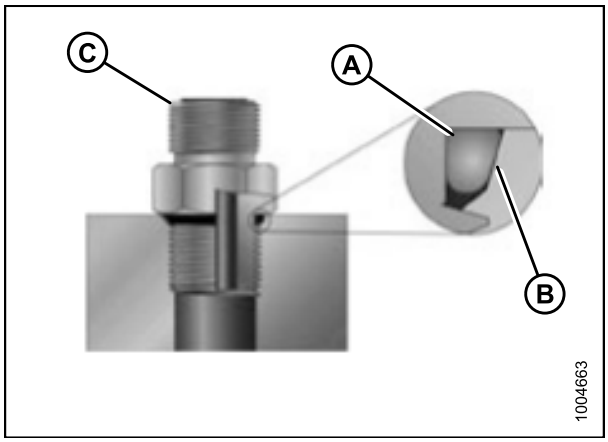


Figure 8.15: Hydraulic Fitting

Table 8.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

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

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

O-Ring Face Seal (ORFS) Hydraulic Fittings

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

Figure 8.16: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the 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 the values in Table *8.13 O-Ring Face Seal (ORFS) Hydraulic Fittings, page 181*.

   NOTE:
   If applicable, hold the hex on the fitting body (E) to prevent rotation of fitting body and hose when tightening the fitting nut (D).

6. Use three wrenches when assembling unions or joining two hoses together.
7. Check the final condition of the fitting.

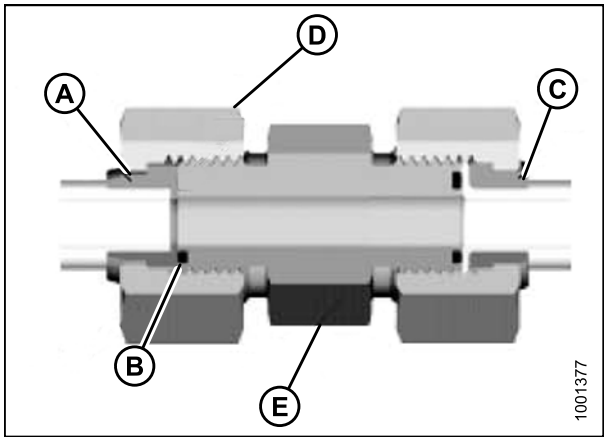


Figure 8.17: Hydraulic Fitting

Table 8.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[5]	
		ft·lbf (*in·lbf)	N·m
-3	Note[6]	–	–
-4	9/16–18	18–21	25–28
-5	Note[6]	–	–
-6	11/16–16	29–32	40–44
-8	13/16–16	41–45	55–61
-10	1–14	59–65	80–88
-12	1-3/16–12	85–94	115–127
-14	Note[6]	–	–
-16	1-7/16–12	111–122	150–165
-20	1-11/16–12	151–167	205–226
-24	2–12	232–256	315–347
-32	2-1/2–12	376–414	510–561

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

8.3.3 Conversion Chart

Table 8.14 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	Acres	acres	x 0.4047 =	Hectares	ha
Flow	US gallons per minute	gpm	x 3.7854 =	Liters per minute	L/min
Force	Pounds force	lbf	x 4.4482 =	Newtons	N
Length	Inch	in.	x 25.4 =	Millimeters	mm
	Foot	ft.	x 0.305 =	Meters	m
Power	Horsepower	hp	x 0.7457 =	Kilowatts	kW
Pressure	Pounds per square inch	psi	x 6.8948 =	Kilopascals	kPa
			x .00689 =	Megapascals	MPa
			÷ 14.5038 =	Bar (Non-SI)	bar
Torque	Pound feet or foot pounds	ft·lbf	x 1.3558 =	Newton meters	N·m
	Pound inches or inch pounds	in·lbf	x 0.1129 =	Newton meters	N·m
Temperature	Degrees Fahrenheit	˚F	(˚F-32) x 0.56 =	Celsius	˚C
Velocity	Feet per minute	ft/min	x 0.3048 =	Meters per minute	m/min
	Feet per second	ft/s	x 0.3048 =	Meters per second	m/s
	Miles per hour	mph	x 1.6063 =	Kilometres per hour	km/h
Volume	US gallons	US gal	x 3.7854 =	Liters	L
	Ounces	oz.	x 29.5735 =	Milliliters	ml
	Cubic inches	$in.^3$	x 16.3871 =	Cubic centimeters	cm^3 or cc
Weight	Pounds	lbs	x 0.4536 =	Kilograms	kg

8.4 Maintenance Requirements

Periodic maintenance requirements are organized according to service intervals.

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

When servicing the machine, refer to the specific headings in this section and use only fluids and lubricants specified in *8.3.1 Recommended Fluids and Lubricants, page 169*.

Log hours of operation, use the maintenance record, and keep copies of your maintenance records (depending on your equipment, refer to:

- *8.4.1 Maintenance Schedule/Record: Pull-Type, page 184*
- *8.4.2 Maintenance Schedule/Record: Self-Propelled, page 186*

If a service interval specifies more than one timeframe, e.g., "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT:
Recommended intervals are for average conditions. Service the machine more often if operating under adverse conditions (severe dust, extra heavy loads, etc.).

CAUTION

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

8.4.1 Maintenance Schedule/Record: Pull-Type

Pull-Type Mower Conditioner																
MAINTENANCE RECORD	**ACTION:**	**✓ - Check**					**♦ - Lubricate**					**▲ - Change**				
	Hour Meter Reading															
	Date															
	Serviced By															
FIRST USE		Refer to *8.4.3 Break-In Inspection: Pull-Type, page 188*														
100 HOURS OR ANNUALLY																
▲	Hydraulic Oil Filter - First 100 Hours Only															
✓	Conditioner Drive Gearbox Lubricant Level															
✓	Wheel Bolt Torque															
♦	Wheel Hub Bearings															
✓	Knife Drive Box Bolt Torque															
✓	Knife Drive Box Lubricant Level															
END OF SEASON		Refer to *8.4.6 Storage, page 189*														
10 HOURS OR DAILY																
♦	Auger Drive Chain [7]															
✓	Hydraulic Hoses and Lines[7]															
✓	Hydraulic Oil Level[7]															
♦	Reel Drive Chain[7]															
♦	Sections, Guards, and Hold-Downs[7]															
✓	Knife Assembly[7]															
✓	Knife Drive Box Bolt Torque - First 10 Hours Only[7]															
25 HOURS																
♦	Knifehead															

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

Pull-Type Mower Conditioner																
MAINTENANCE RECORD	ACTION:	✓ - Check					♦ - Lubricate					▲ - Change				
50 HOURS																
♦	Auger Drive and Jackshaft Bearings															
♦	Frame-to-Header Pivot															
♦	Gauge Roller Bearings															
♦	Lower Float Link Bushings															
♦	Main Driveshaft Bearings															
♦	Reel Shaft Bearings															
▲	Conditioner Gearbox Oil - First 50 Hours Only															
♦	Conditioner Drivelines															
♦	Roll Pivots															
♦	Knife Drive Cross-Shaft															
♦	Spring Pivots															
✓	Tire Pressure															
♦	Articulated Power Turn (APT) Pivot															
▲	Knife Drive Box Oil - First 50 Hours Only															
250 HOURS																
▲	Hydraulic Oil Filter															
500 HOURS OR 3 YEARS																
▲	Hydraulic Oil															
1000 HOURS OR 3 YEARS																
▲	Conditioner Drive Gearbox Lubricant															
▲	Knife Drive Box Lubricant															

8.4.2 Maintenance Schedule/Record: Self-Propelled

Self-Propelled Windrower Header																
MAINTENANCE RECORD	ACTION:	✓ - Check					♦ - Lubricate					▲ - Change				
	Hour Meter Reading															
	Date															
	Serviced By															
BREAK-IN		Refer to *8.4.4 Break-In Inspection: Self-Propelled, page 188*.														
100 HOURS OR ANNUALLY																
✓	Conditioner Drive Gearbox Lubricant Level															
✓	Knife Drive Box Bolt Torque															
✓	Knife Drive Box Lubricant Level															
END OF SEASON		Refer to *8.4.6 Storage, page 189*.														
10 HOURS OR DAILY																
✓	Hydraulic Hoses and Lines[8]															
♦	Sections, Guards, and Hold-downs[8]															
✓	Knife Assembly[8]															
✓	Knife Drive Box Bolt Torque - First 10 Hours Only															
25 HOURS																
♦	Knifehead															
50 HOURS																
♦	Auger Shaft Bearings															
♦	Gauge Roller Bearings															
♦	Main Driveshaft Bearings															
♦	Tine Bar Bearings															
♦	Reel Shaft Bearings															
▲	Conditioner Gearbox Oil - First 50 Hours Only															
♦	Conditioner Universal Shafts															

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

Self-Propelled Windrower Header																	
MAINTENANCE RECORD	ACTION:	✓ - Check					♦ - Lubricate					▲ - Change					
50 HOURS (continued)																	
♦	Roll Pivots																
♦	Conditioner Shaft Bearings																
♦	Knife Drive Cross-Shaft																
▲	Knife Drive Box Oil - First 50 Hours Only																
1000 HOURS OR 3 YEARS																	
▲	Conditioner Drive Gearbox Lubricant																
▲	Knife Drive Box Lubricant																

8.4.3 Break-In Inspection: Pull-Type

Hours	Item	Check	Reference
1	Wheel Bolts	Torque	120 ft·lbf (160 N·m) *8.13.1 Checking Wheel Bolts, page 290*
	Steering Cylinder Clevis and Stroke Control		52 ft·lbf (72 N·m)
5, 25, 50	Reel Drive Belt	Tension	*Checking/Adjusting Reel Drive Belt Tension, page 235*
	Knife Drive Belt		*8.8.1 Knife Drive – A30-D, page 227*
5	Hardware	Torque	*8.3.2 Recommended Torques, page 169*
10	Auger Drive Chain	Tension / Lubricate	*Checking/Adjusting Auger Drive Chain Tension, page 237*
	Reel Drive Chain		*Checking/Adjusting Reel Drive Chain Tension, page 234*
	Knife Drive Box Mounting Bolts	Torque	200 ft·lbf (270 N·m) *8.7.9 Knife Drive Box, page 218*

8.4.4 Break-In Inspection: Self-Propelled

Hours	Item	Check	Reference
5	Hardware	Torque	*8.3.2 Recommended Torques, page 169*
5, 25, and 50	Knife Drive Belt	Tension	*8.8.1 Knife Drive – A30-D, page 227* *8.9.1 Knife Drive – A40-D, page 239*
10	Knife Drive Box Mounting Bolts	Torque	*Mounting Bolts, page 219*

Replace or tighten any missing or loose hardware. Refer to *8.3.2 Recommended Torques, page 169*.

8.4.5 Preseason Checks

CAUTION

- **Review the operator's manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the mower conditioner and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

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

1. Adjust tension on drive belts. Refer to the following sections:
   - *8.7 Cutterbar, page 206*
   - *8.8.2 Reel Drive – A30-D, page 234*
   - *8.8.3 Auger, page 237*
2. Lubricate chains and adjust tensions. Refer to the following sections:
   - *8.5.3 Oiling, page 200*
   - *8.5.2 Lubrication Points, page 192*
   - *Checking/Adjusting Reel Drive Chain Tension, page 234*
   - *Checking/Adjusting Auger Drive Chain Tension, page 237*
3. Check tire pressure, and adjust as required. Refer to *8.13.4 Inflating Tire, page 291*.
4. Perform all annual maintenance. Refer to:
   - *8.4.1 Maintenance Schedule/Record: Pull-Type, page 184*
   - *8.4.2 Maintenance Schedule/Record: Self-Propelled, page 186*

8.4.6 Storage

Do the following at the end of each operating season.

CAUTION

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

CAUTION

Cover cutterbar and knife guards to prevent injury from accidental contact.

1. Clean the header/mower conditioner thoroughly.
2. Store in a dry, protected place if possible. If stored outside, always cover mower conditioner with a waterproof canvas or other protective material.
3. Raise header, and engage lift cylinder lock-outs.
4. If possible, block up the header to take weight off tires.

5. Re-paint all worn or chipped painted surfaces to prevent rust.
6. Loosen drive belts.
7. Lubricate header/mower conditioner thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods and sliding surfaces of components. Oil knife components to prevent rust.
8. Check for worn components, and repair.
9. Check for broken components and order replacement from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
10. Replace or tighten any missing or loose hardware. Refer to *8.3.2 Recommended Torques, page 169*.
11. Remove divider rods (if equipped) to reduce space required for inside storage.

8.5 Lubrication

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

CAUTION

Refer to *8.3.1 Recommended Fluids and Lubricants, page 169* for recommended greases.

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to:

- *8.4.1 Maintenance Schedule/Record: Pull-Type, page 184*
- *8.4.2 Maintenance Schedule/Record: Self-Propelled, page 186*

.

8.5.1 Greasing Procedure

WARNING

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

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

Use the recommended lubricants specified in this manual. Refer to *8.3.1 Recommended Fluids and Lubricants, page 169*.

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

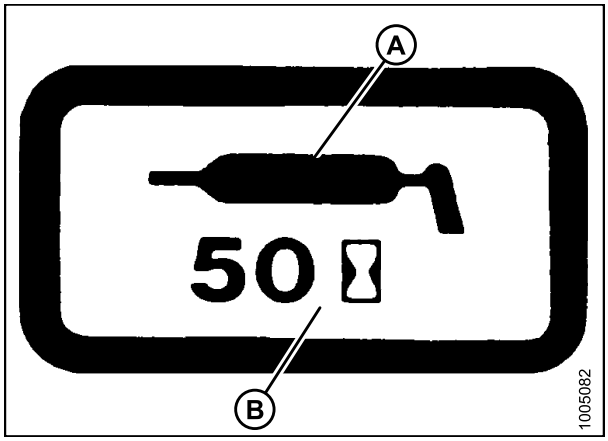


Figure 8.18: Grease Interval Decal

8.5.2 Lubrication Points

Lubrication requirements depend on the model of header/mower conditioner that is being serviced. Refer to lubrication points for your specific model:

Lubrication Points: A30-D Mower Conditioners

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

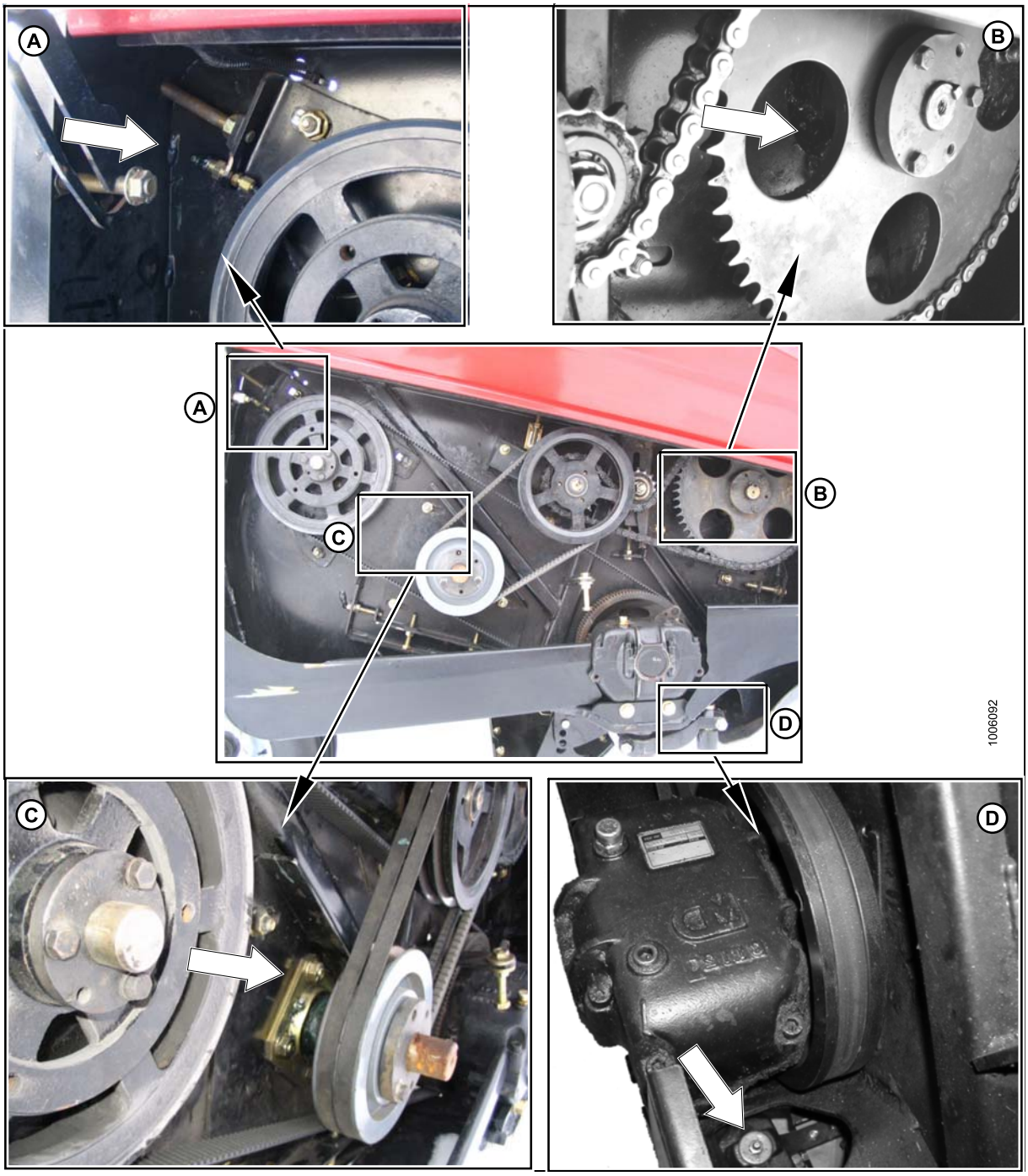


Figure 8.19: A30-D Mower Conditioner Right Side

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

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

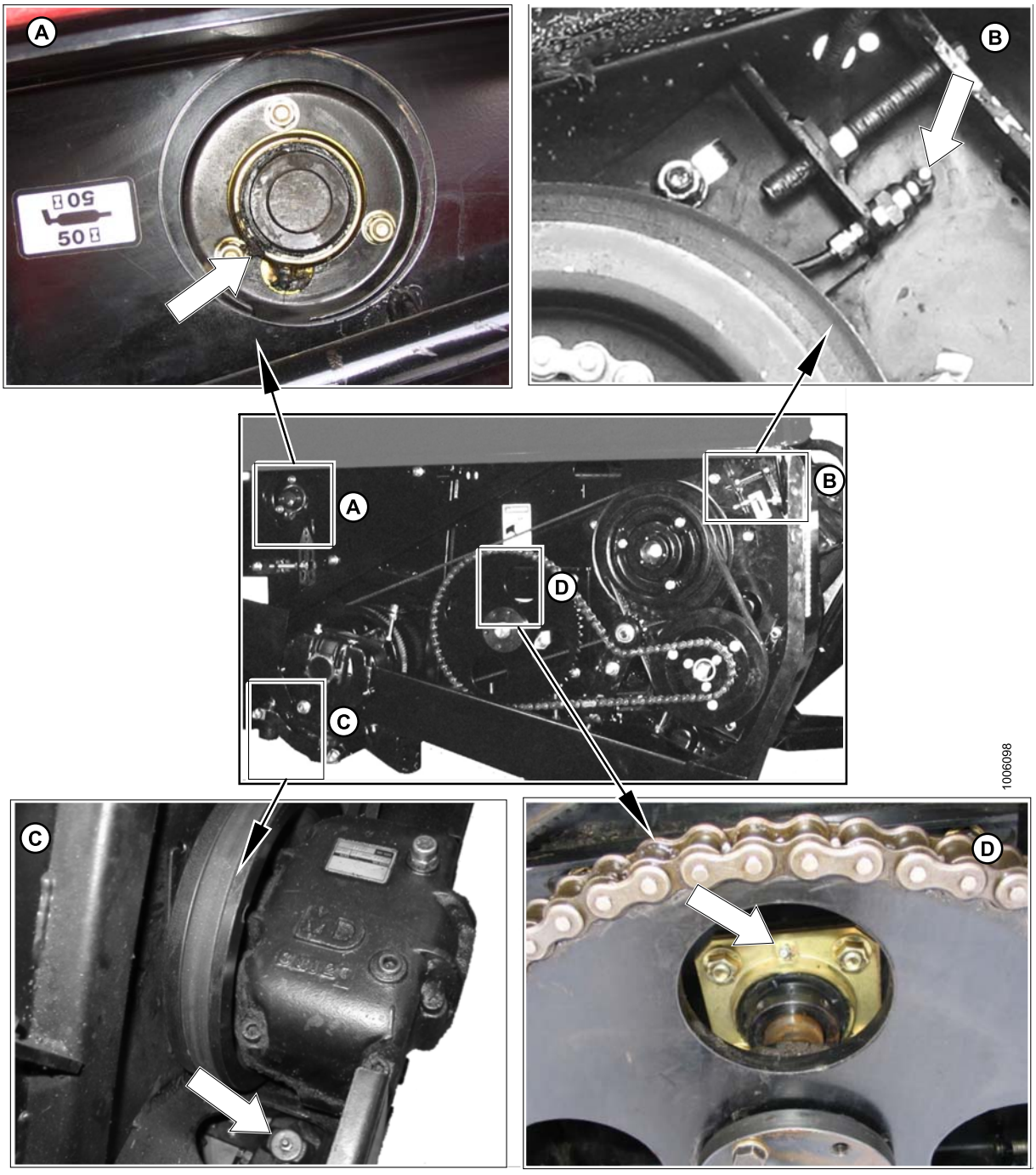


Figure 8.20: A30-D Mower ConditionerLeft Side

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

Lubrication Points: A40-D SP Windrower Headers

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

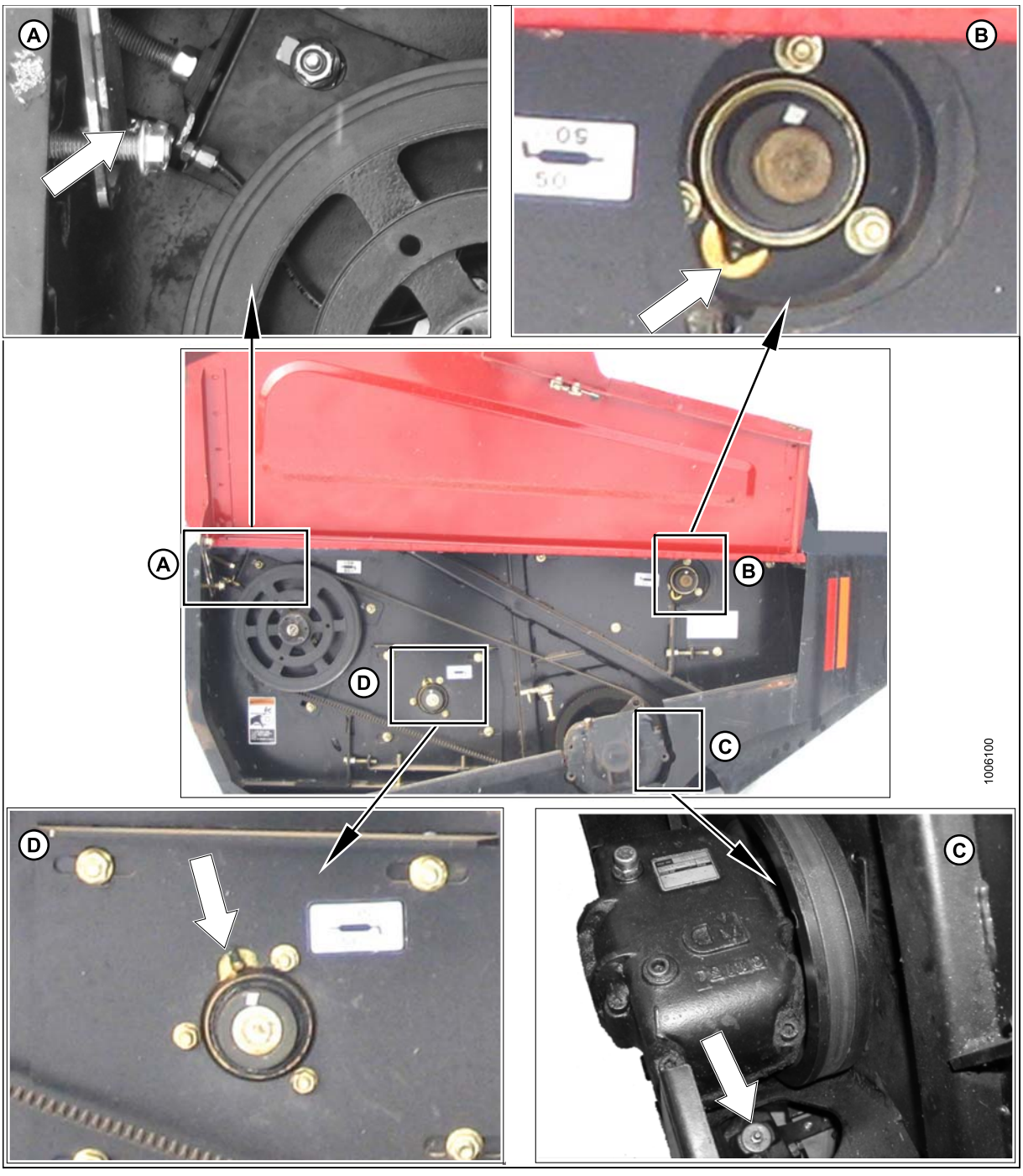


Figure 8.21: A40-D Header Right Side

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

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

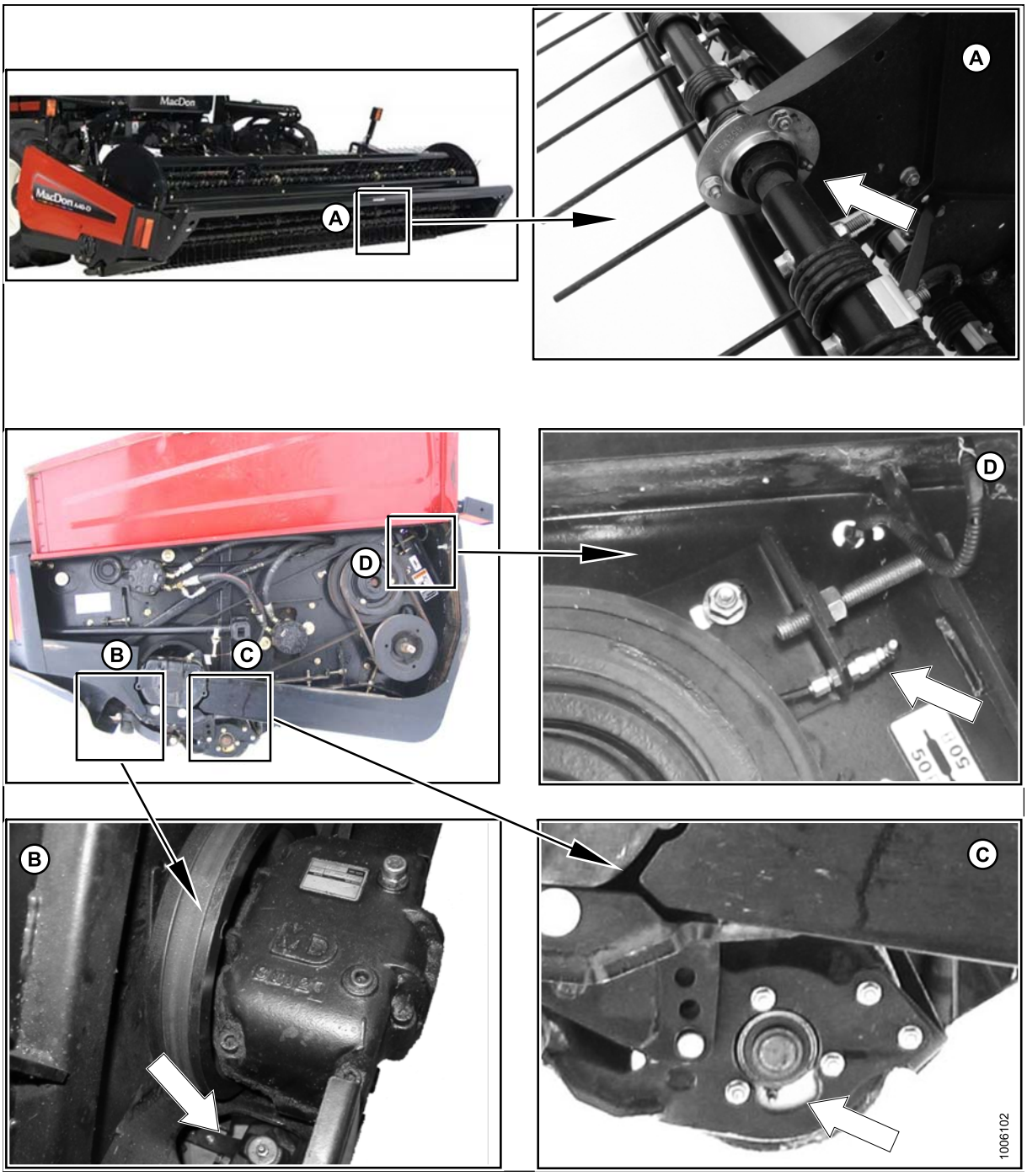


Figure 8.22: A40-D Header Left Side

A - Tine Bar Bearing (4 PLCS each tine bar) (50 hours)
B - Knifehead Bearing (1 PLC) (25 hours)
C - Gauge Roller Bearings (2 PLCS) both sides - if installed (50 hours)
D - Knife Drive Bearing (1 PLC) (50 hours)

Lubrication Points: Hay Conditioner

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

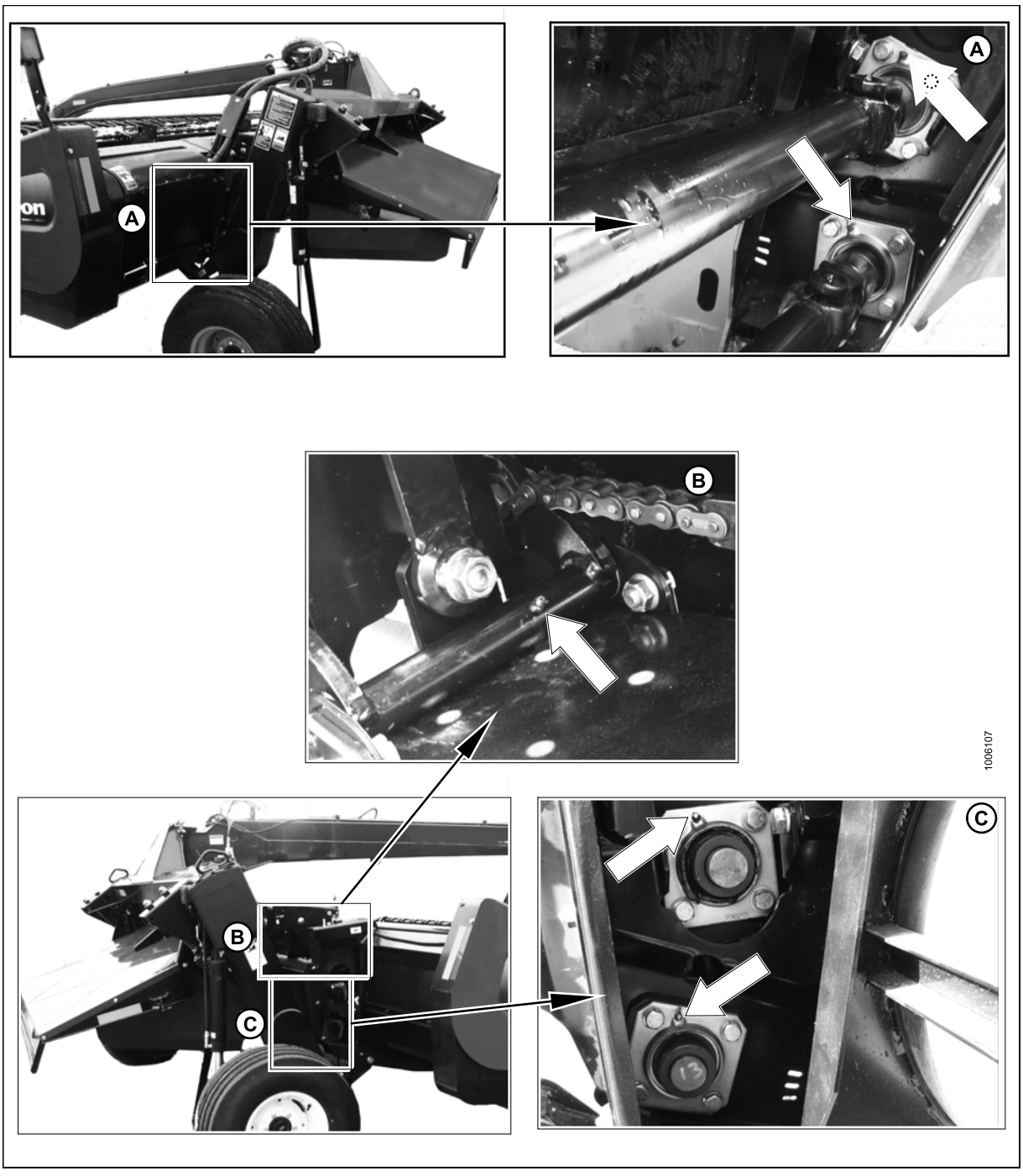


Figure 8.23: Hay Conditioner

A - Roll Shaft Bearings (2 PLCS) (50 hours)
B - Roll Pivot (1 PLC - Both sides) (50 hours)
C - Roll Shaft Bearings (2 PLCS) (50 hours)

Lubrication Points: Drivelines

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

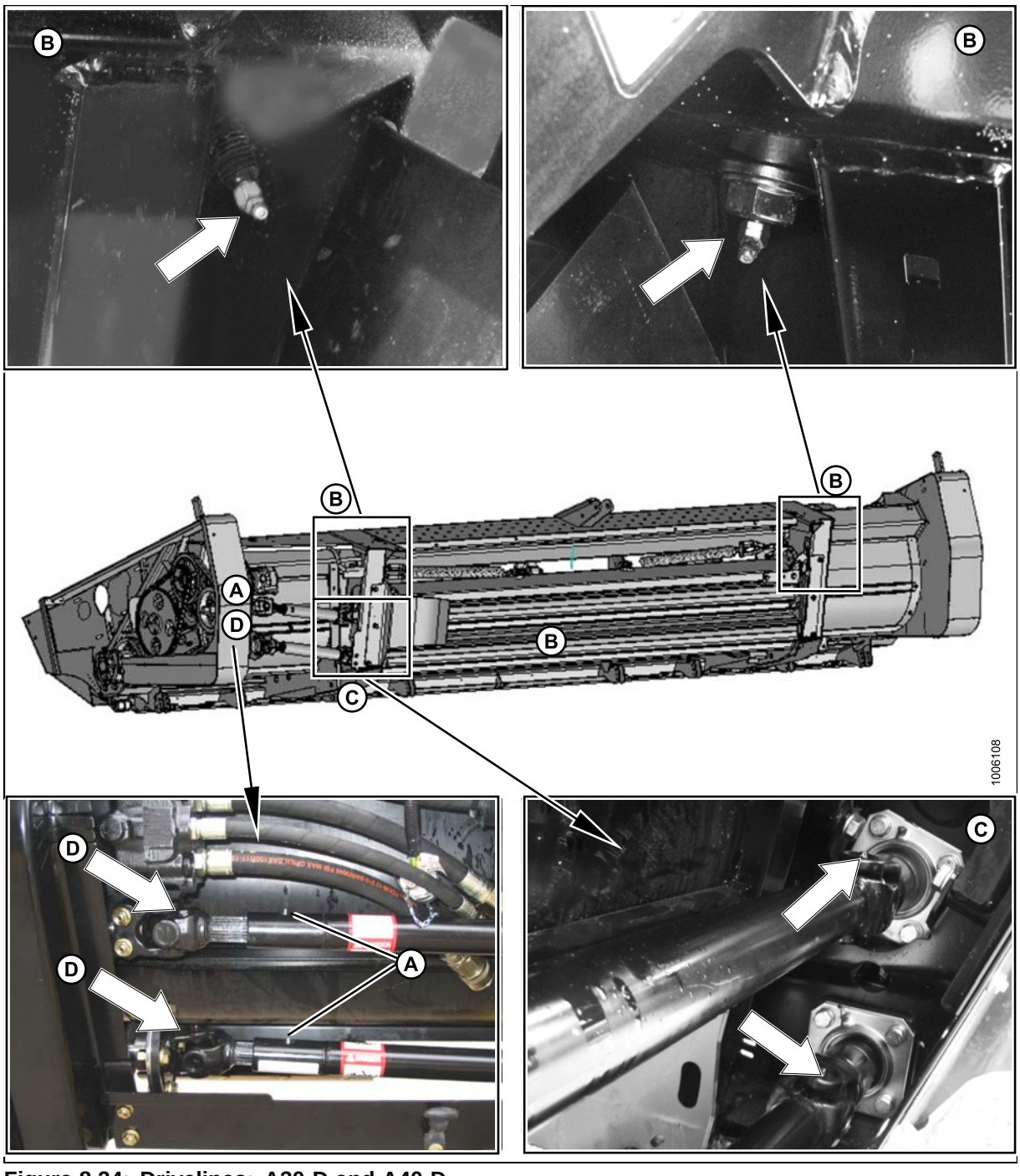


Figure 8.24: Drivelines: A30-D and A40-D

A - Driveline Shafts (2 PLCS) (50 hours) - NOTE: 10% moly grease is recommended for driveline shaft slip joints ONLY.
B - Cross Shafts (2 PLCS) (50 hours) **C - Driveline Universals (2 PLCS) (50 hours)** **D - Driveline Universals (2 PLCS) (50 hours)**

Lubrication Points: Pull-Type Carrier Frame

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

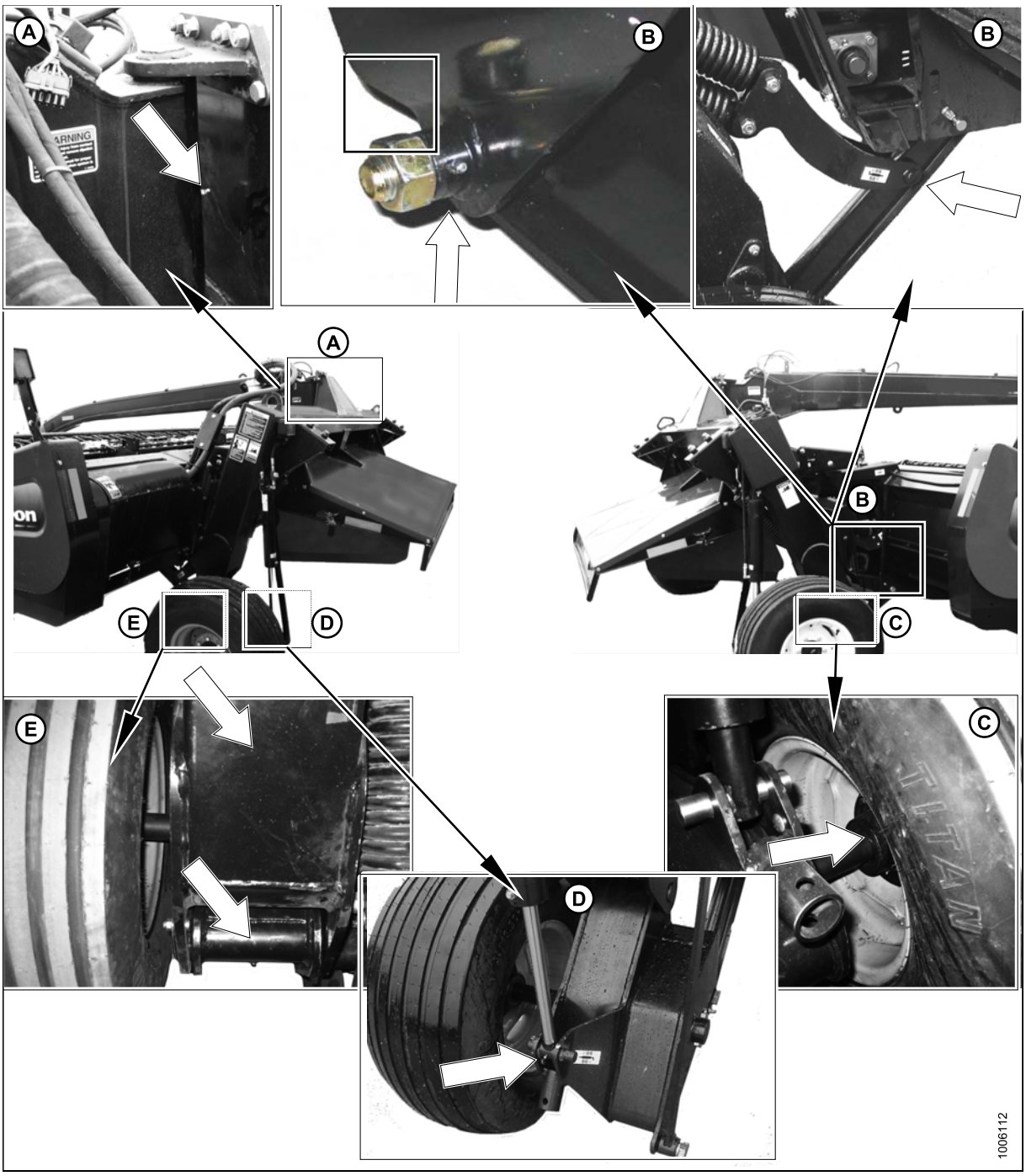


Figure 8.25: Pull-Type Carrier Frame

A - Tongue Pivot (1 PLC) (50 hours)
B - Lift Linkage (2 PLCS) - both sides (50 hours)
C - Wheel Bearings (1 PLC) - both sides
D - Lift Cylinder (1 PLC) (50 hours)
E - Frame/Header Pivot (1 PLC) - both sides (50 hours)

8.5.3 Oiling

Refer to the following illustration to identify the various locations that require lubrication. See *8.3.1 Recommended Fluids and Lubricants, page 169* for proper oil. Use SAE 30 oil.

Apply oil to upper edge of lower spans when oiling chains. Check oil level with top of knife drive box horizontal.

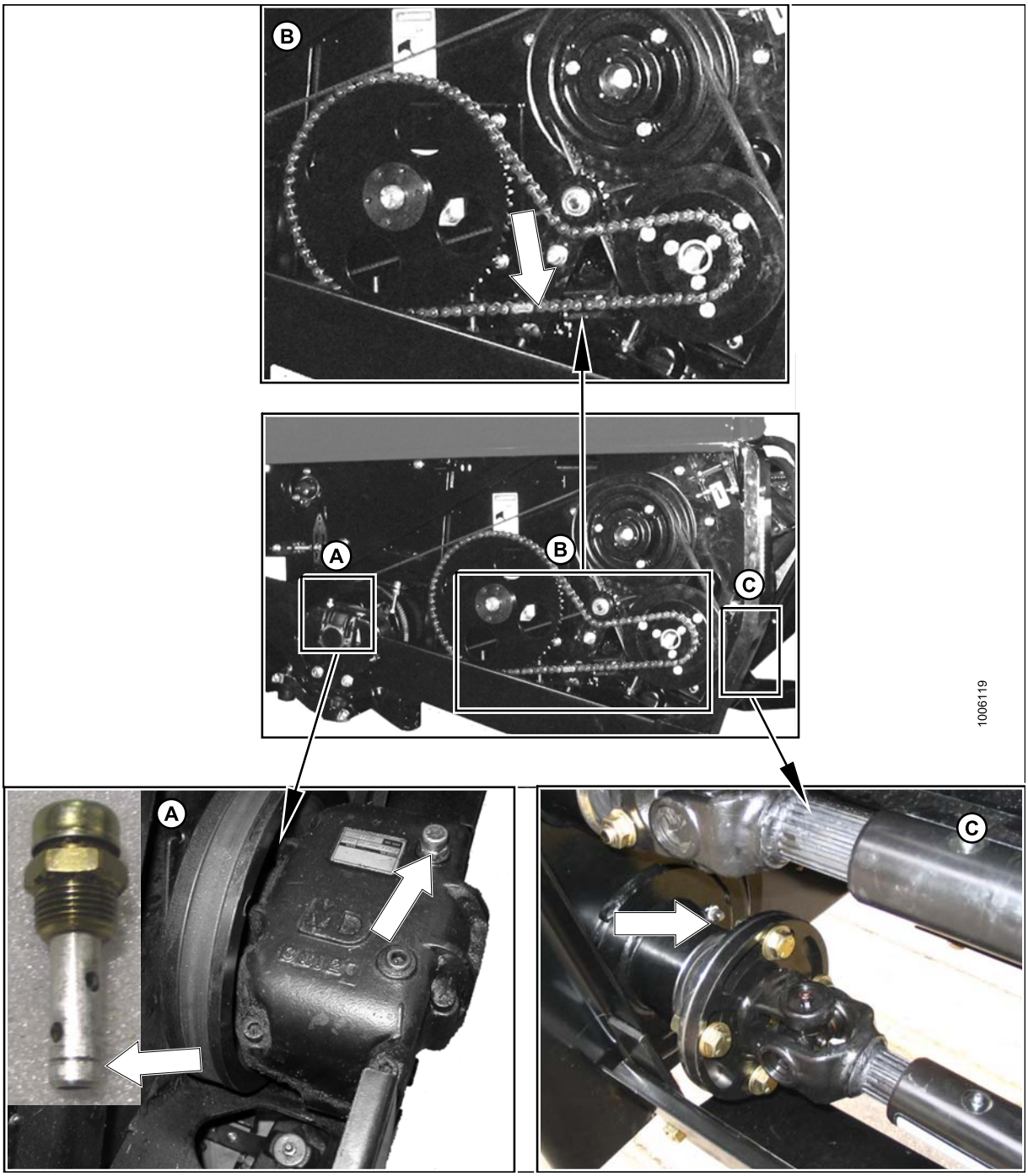


Figure 8.26: A30-D Mower Conditioner, Left-Hand Side – SAE 30 Oil

A - Knife Drive Box (A30-D / A40-D (2 PLCS) (100 hours) NOTE: Check oil level with top of knife drive box horizontal.
B - Auger Drive Chain (1 PLC) (10 hours) **C - Check Roll Gearbox (1 PLC) (100 hours)**

8.5.4 Installing Sealed Bearings

Follow these steps to install sealed bearings:

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

   NOTE:
   The locking cam is only on one side of the bearing.

3. Install (but do **NOT** tighten) the flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch.

   NOTE:
   The collar should be locked in the same direction the shaft rotates. Tighten the setscrew in the collar.

5. Tighten the flangette bolts.
6. Loosen the flangette bolts on the mating bearing one turn and retighten. This will allow the bearing to line up.

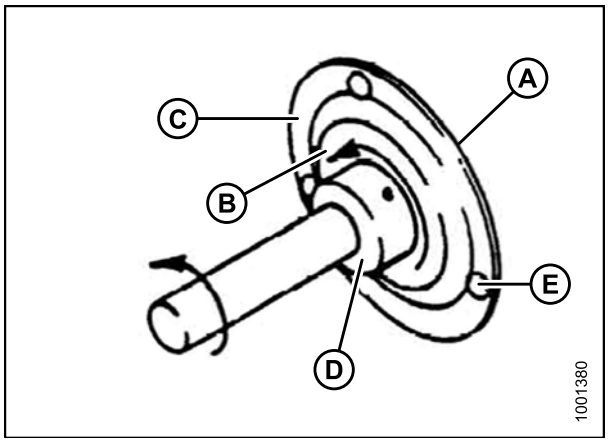


Figure 8.27: Sealed Bearing

8.6 Hydraulics

This chapter covers hydraulic information and testing for pull-type mower conditioners. For information about self-propelled headers, contact your Dealer.

8.6.1 Servicing A40-D Hydraulics

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

8.6.2 Servicing A30-D Hydraulics

The pull-type mower conditioner is hydraulically-powered using the following systems:

- A self-contained hydraulic system to operate the header functions.
- The tractor remote system to operate the header lift cylinders and steering.

WARNING

Do not use remote hydraulic system pressures over 3000 psi (20,684 kPa). Check your tractor operator's manual for remote system pressure.

Checking Hydraulic Oil Level

Check oil level daily (before start-up) at the sight gauge on the left side of the articulated power turn (APT).

The oil level should be at or near the FULL mark on the gauge when top surface of APT is level, and oil is cold.

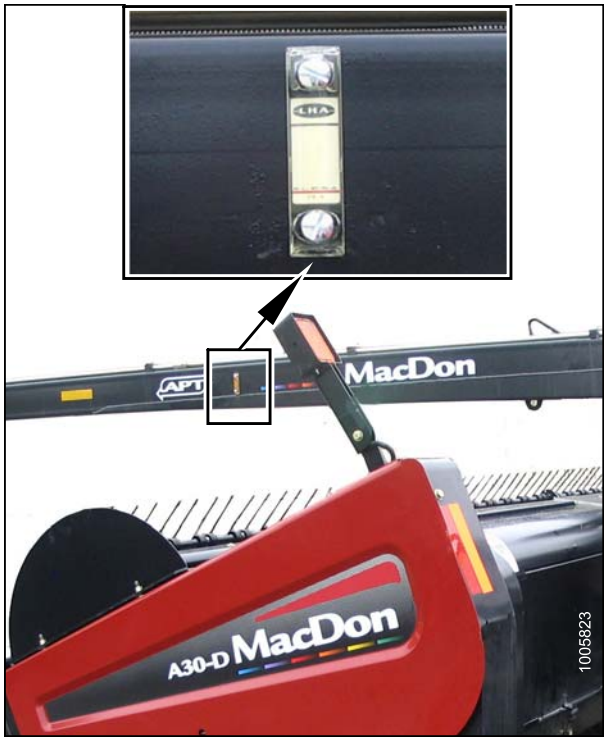


Figure 8.28

Adding Hydraulic Oil

1. Slowly unscrew filler cap (A) from filler tube.
2. Add SAE 15W40 oil until level is between ADD and FULL marks on sight gauge.
3. Replace filler cap.

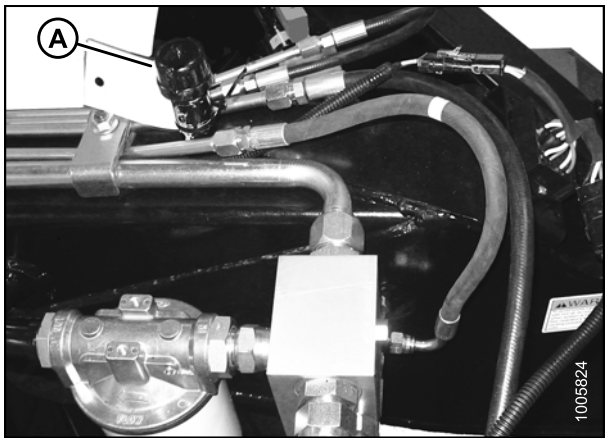


Figure 8.29

Changing Hydraulic Oil

NOTE:
Change hydraulic oil every 500 hours, or 3 years.

NOTE:
A drain pan with a capacity of 35 US gallons (130 liters) will be required.

NOTE:
Mower conditioner must be disconnected from tractor. Refer to *3.3 Detaching Mower Conditioner from Tractor, page 43*.

1. Remove filler cap (A) at aft end of articulated power turn (APT).

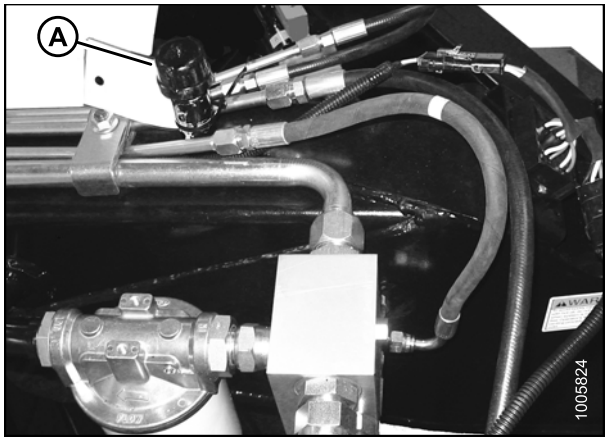


Figure 8.30

2. Disconnect pump suction hose (A) from pump, and drain into container.
3. Reconnect pump suction hose to pump.

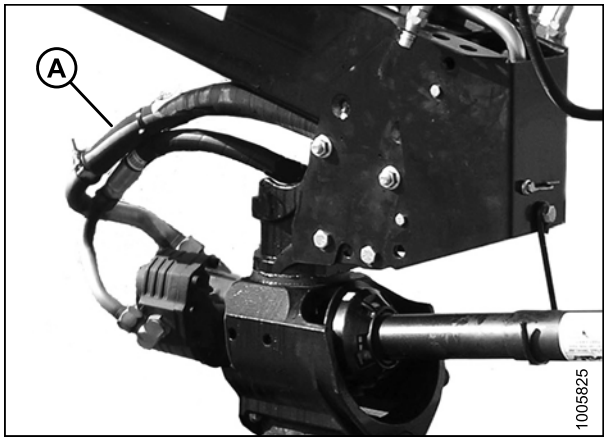


Figure 8.31

4. Fill reservoir to recommended level with SAE 15W30 oil. Capacity is 33 US gallons (126 liters).

Changing Hydraulic Oil Filter

NOTE:
Change hydraulic oil filter after the first 100 hours operation, and every 250 hours thereafter.

1. Clean around filter head (A).
2. Remove filter (B), and clean gasket surface of the filter head.
3. Apply a thin film of clean oil to the gasket on the new filter.
4. Install new filter. Turn filter onto the mount until the gasket contacts the filter head. Tighten the filter an additional 1/2 to 3/4 turn by hand.

   IMPORTANT:
   Do NOT use a filter wrench to install the filter. Over-tightening can damage gasket and filter.

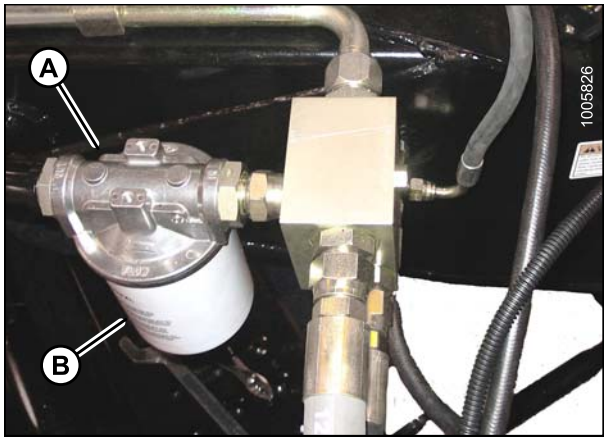


Figure 8.32

Checking Pressure Relief Valve

A possible cause of poor cutting performance and/or excessive heating of hydraulic oil is low relief pressure.

The relief valve (A) is factory-set at 4000 psi (27.6 MPa). See your Dealer for adjustment or service.

A pressure gauge can be installed at the gauge port (B).

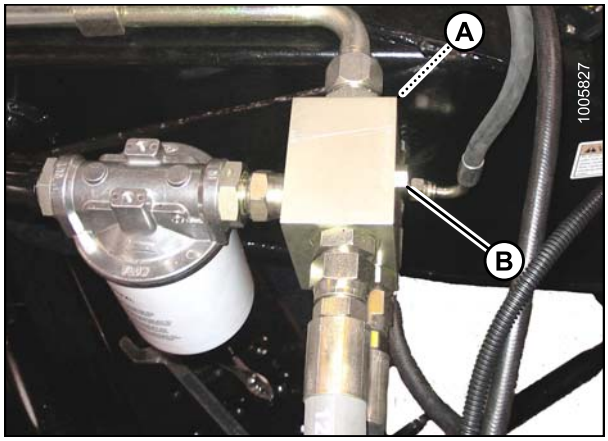


Figure 8.33

8.6.3 Checking Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

⚠ WARNING

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

Figure 8.34

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

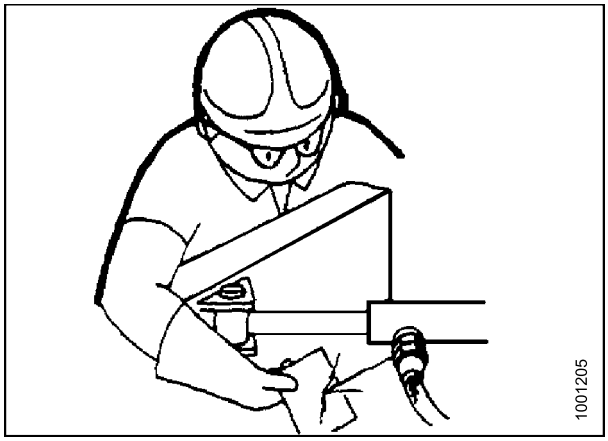


Figure 8.35: Cardboard to Search for Leaks

8.7 Cutterbar

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

WARNING

Wear heavy gloves when working around or handling knife.

WARNING

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

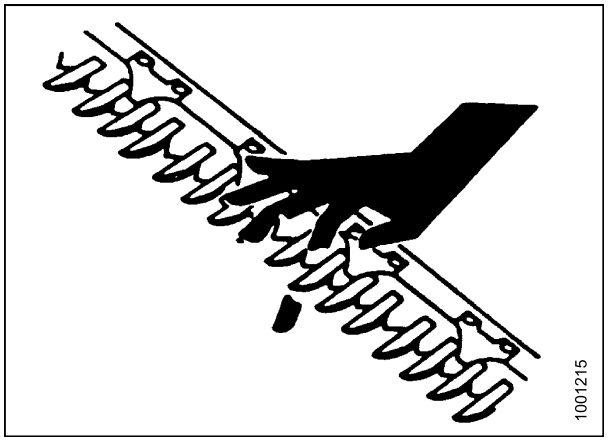


Figure 8.36

8.7.1 Replacing Knife Section

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

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

   IMPORTANT:
   Do NOT mix heavy and light knife sections on same knife.

3. Clean any dirt off of knife back, and position new knife section on bolts.
4. Secure with lock nuts, and tighten to required torque.

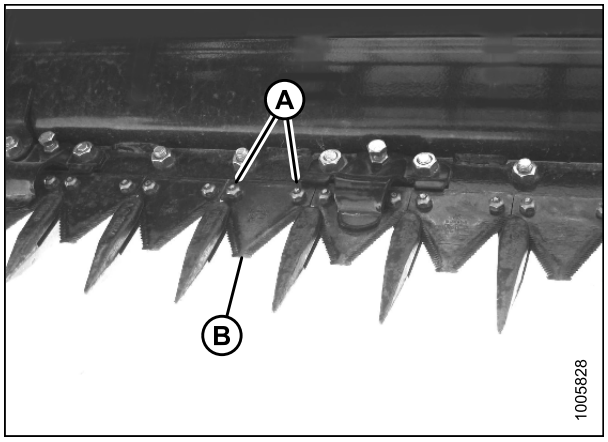


Figure 8.37

8.7.2 Removing Knife

WARNING

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

1. Manually stroke knife to its outer limit and clean area around the knifehead.
2. Remove bolt (A).
3. Remove the grease zerk (B) from the pin.
4. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
5. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
6. Push the knife assembly inboard until it is clear of the output arm.
7. Seal bearing in knifehead with plastic or tape, unless it is being replaced.
8. Wrap a chain around knifehead and pull knife out.

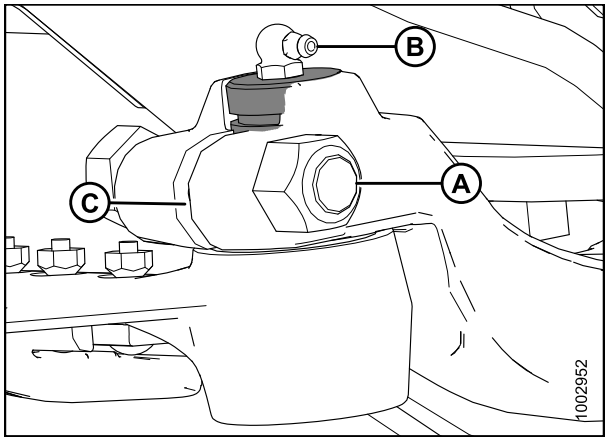


Figure 8.38: Knifehead

8.7.3 Installing Knife

⚠ WARNING

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

IMPORTANT:
Align guards, and reset knife hold-downs while replacing knife.

1. If knifehead pin (A) is installed in the knifehead (B), remove the pin.
2. Slide knife into place, and align knifehead (B) with pitman arm (C).
3. Install knifehead pin (A) in pitman arm (C), and tap it down into the knifehead, ensuring pin is bottomed out in the knifehead.
4. Tap underside of the knifehead until pin is flush with the upper face of the pitman arm (C).
5. Carefully adjust to achieve a 0.010 in. (.25 mm) gap at (D) with the knife laying flat on the first few guards.
6. Replace bolt (E) and nut.
7. Tighten nut to 160 ft·lbf (220 N·m).

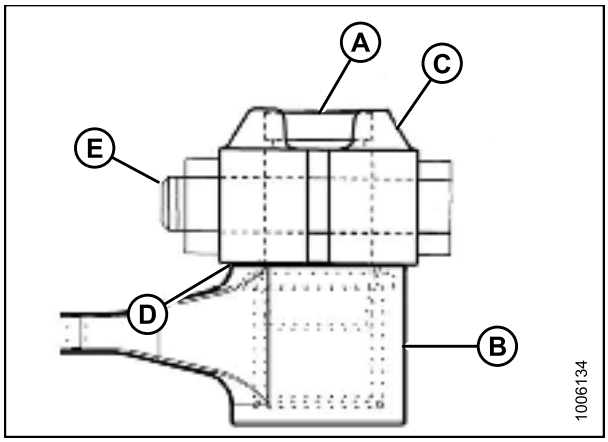


Figure 8.39

A - Knifehead Pin **B - Knifehead** **C - Pitman Arm**
D - GAP: .010 in (.25 mm) **E - Bolt**

8. Replace grease zerk (A) in pin.
9. Grease bearing (if it has been replaced).

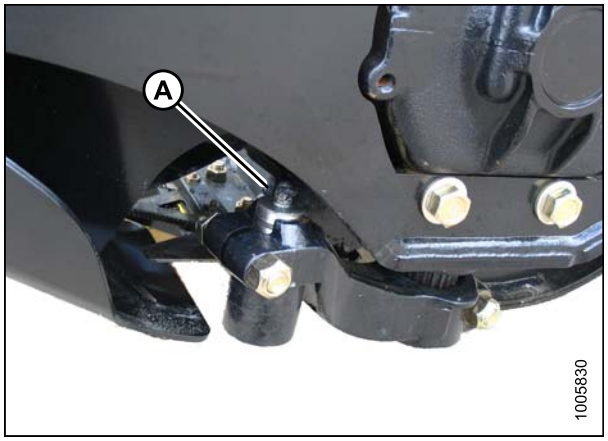


Figure 8.40

8.7.4 Removing Knifehead Bearing

1. Remove knife. Refer to *8.7.2 Removing Knife, page 206*.
2. Using a flat-ended tool (A) with approximately the same diameter as the plug (D), tap out the seal (B), bearing (C), plug (D), and O-ring (E) from the underside of the head.

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

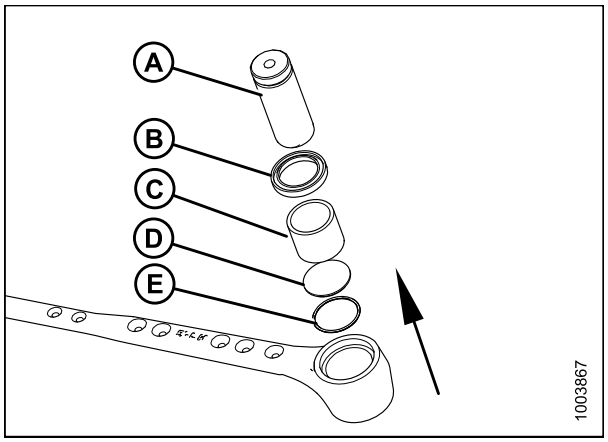


Figure 8.41: Bearing Removal

8.7.5 Installing Knifehead Bearing

To install the knifehead bearing, follow these steps:

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

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

2. Using a flat-ended tool (A) with approximately the same diameter as the bearing (C), push the bearing into the knifehead until the top of the bearing is flush with the step in knifehead.
3. Install seal (B) into the knifehead with the lip facing outwards.

   IMPORTANT:
   To avoid premature knifehead or knife drive box failure, be sure there is no looseness in the fit of the knifehead pin and the needle bearing, and the fit of the knifehead pin and output arm.

4. Install knife. Refer to *8.7.3 Installing Knife, page 207*.

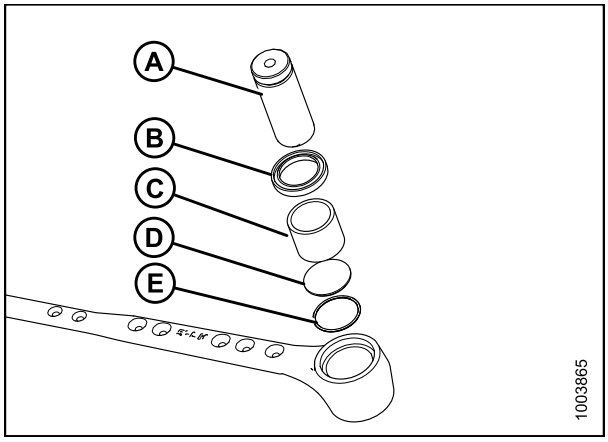


Figure 8.42: Knifehead Bearing Assembly

8.7.6 Removing Spare Knife from Storage

CAUTION

Stop engine, and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

NOTE:
For **DOUBLE-KNIFE headers**, a spare knife with knifehead may be stored inside the lean bar (A):

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

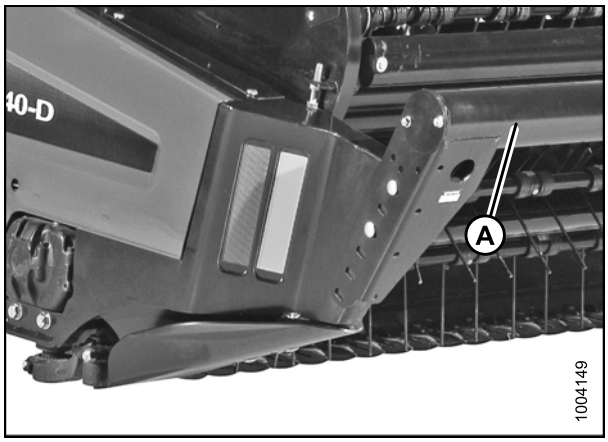


Figure 8.43: Spare Knife Location – Double Knife

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

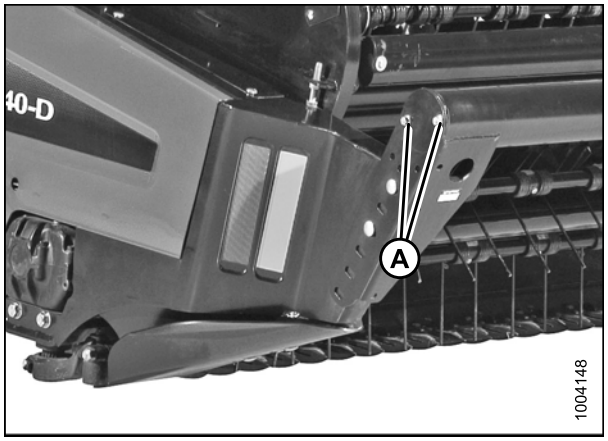


Figure 8.44: Spare Knife – Double-Knife

8.7.7 Guards

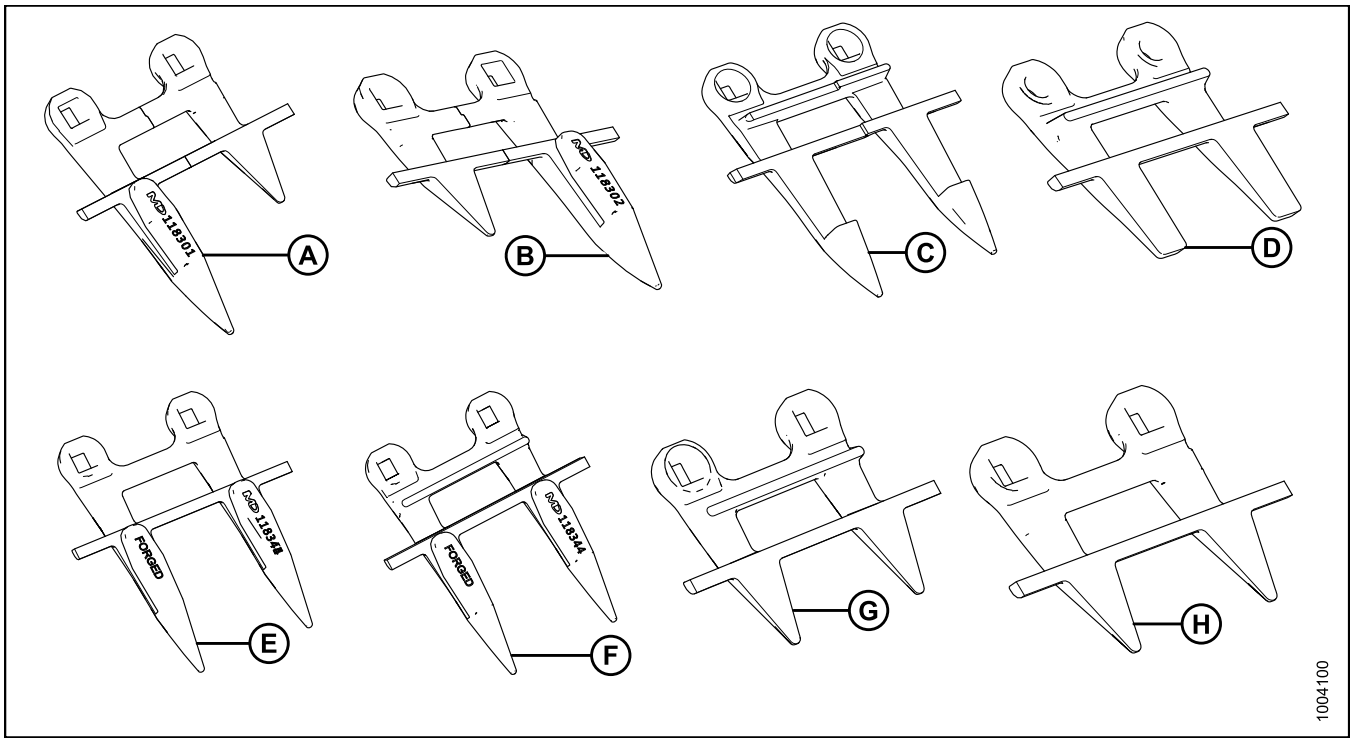


Figure 8.45: Guards

A - Outboard LH Guard (MD #118301)
B - Outboard RH Guard (MD #118302)
C - Bottom Center Pointed Guard (MD #124338)
D - Top Center Pointed Guard (MD #124344)
E - Pointed Guard without Ledger Plate (MD #118345)
F - Pointed Guard with Ledger Plate (MD #118344)
G - Stub Guard with Ledger Plate (MD #118346)
H - Stub Guard without Ledger Plate (MD #118347)

Guards serve two purposes. The first purpose is to protect the knife from damage from rocks and other objects. The second purpose is to provide a surface for the knife to cut against, much like a pair of scissors. This is why it is important for your guards to be adjusted properly.

There are two main types of guards:

- Pointed guards
- Stub guards

Within each of these types, there are five different guards, each of them used in a different position on the cutterbar:

- ***Outboard left-hand side*** – The guard installed at the end of the cutterbar, on the left-hand side.
- ***Outboard right-hand side*** – The guard installed at the end of the cutterbar, on the right-hand side.
- ***Center*** – On double-knife headers, center guards are installed in the middle of the cutterbar, where the two knives meet. There are actually two center guards, one bottom guard and one top guard.
- ***Without ledger plate*** – Three of these are installed on each end of the cutterbar, inside the outboard guards. These guards have no ledger plates in order to allow for some front-to-back movement generated by the knife drive box.
- ***With ledger plate*** – This is the standard guard, used everywhere else.

IMPORTANT:
When replacing guards, it is essential to use only one guard type on a header (pointed or stub), and that the correct guard must be install for each position on the cutterbar. If unsure, check the part number on each guard that are to be replaced. Using the wrong guards is likely to cause knife damage.

Aligning Guard

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

1. Retrieve tool from left-hand side of header.

Figure 8.46

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

Figure 8.47

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

TIP: If trouble is encountered cutting tangled, or fine-stemmed material, replace guards with stub guards.

If material is tough to cut, install stub guards with top guard and adjuster plate. A stub guard conversion kit for the header/mower conditioner is available from your Dealer. Refer to *10.1.5 Stub Guard Conversion Kit, page 308*.

Figure 8.48

Replacing Guards

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

Replacing Pointed Guards

⚠ CAUTION

Stop engine, and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stroke the knife so that knife sections are spaced midway between the guards.

2. Remove two nuts (A), and carriage bolts that attach guard (B), and hold-down (C) (if applicable) to the cutterbar.
3. Remove the guard (B), and the hold-down (C).

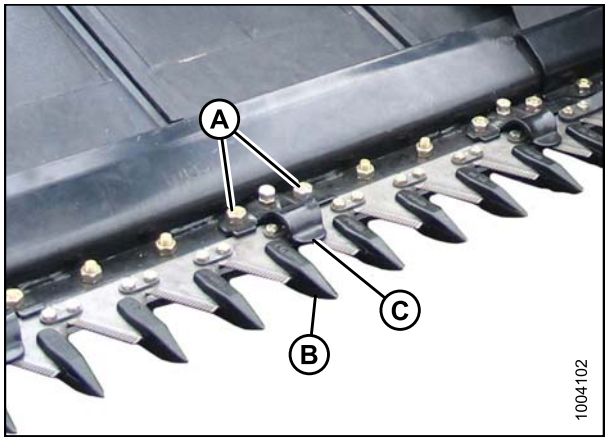


Figure 8.49: Pointed Guard – SK

4. Position new guard on cutterbar, and install carriage bolts.

   IMPORTANT:
   The second, third, and fourth outboard guards on drive side of the header do not have a support. Ensure that the proper replacement is installed.

5. Install hold-down, and secure with nuts. Tighten nuts to 50 ft·lbf (68 N·m).
6. Check and adjust clearance between hold-down and knife. Refer to *8.7.8 Hold-Downs, page 217*.

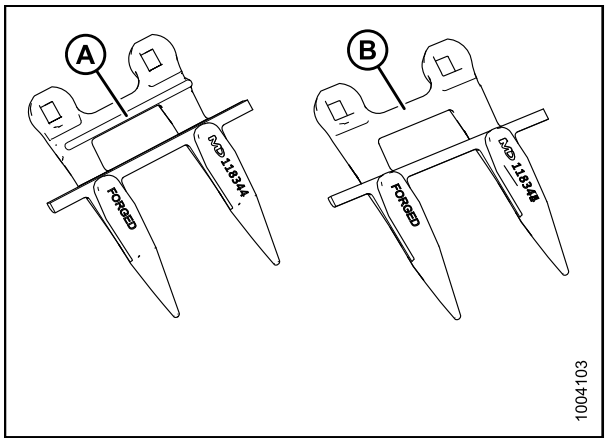


Figure 8.50

A - Normal **B - Drive Side**

Replacing Pointed Center Guard on Double-Knife Header

The guard near the center of the double-knife header, where the two knives overlap, requires a slightly different replacement procedure.

IMPORTANT:
Replace adjacent guards when replacing center guard.

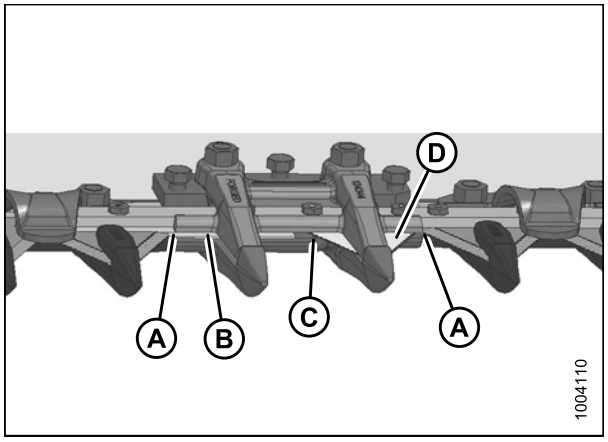


Figure 8.51

A - Cutting Surfaces Aligned
B - Section is NOT present when knife is stroked out
C - Offset
D - Inverted Section

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

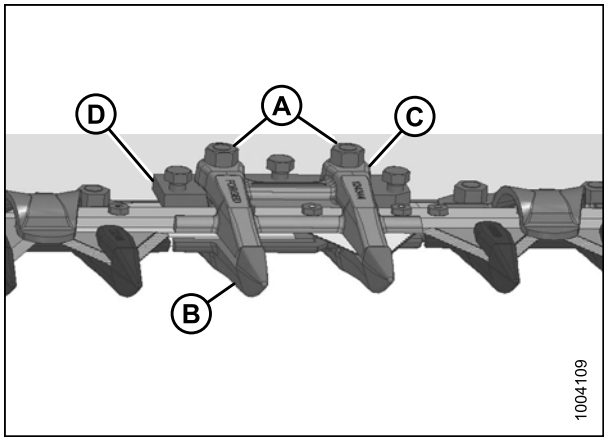


Figure 8.52: Pointed Guard Replacement

IMPORTANT:
Ensure center guard (B) has offset (A) cutting surface. Refer to illustrations.

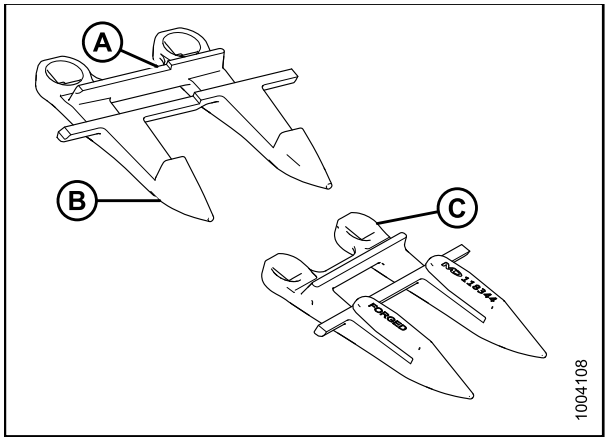


Figure 8.53: Pointed Guard Identification

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

NOTE:
Top guide (C) must accommodate the two overlapping knives at center guard (B) location on double-knife header. Ensure replacement is the correct part.

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

3. Check and adjust clearance between top guide (C), and knife. Refer to *8.7.8 Hold-Downs, page 217*.

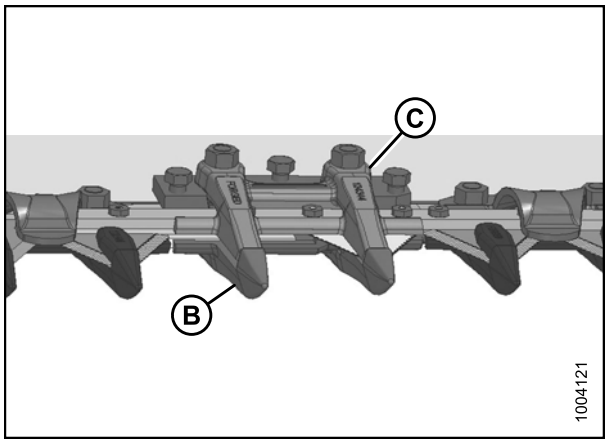


Figure 8.54: Pointed Guard Identification

Replacing Center Stub Guard on Double-Knife Header

The guard near the center of the double-knife header, where the two knives overlap, requires a slightly different replacement procedure.

IMPORTANT:
Replace adjacent guards when replacing center guard.

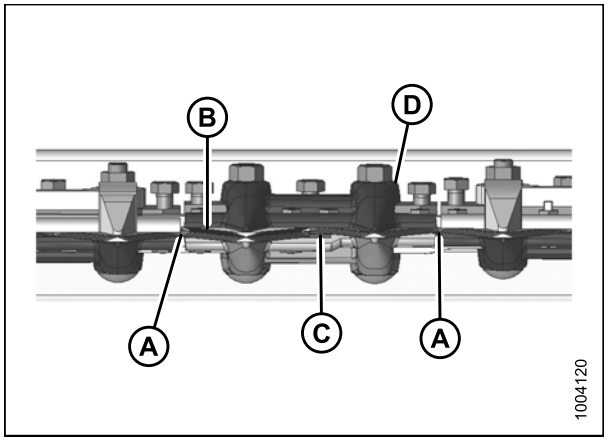


Figure 8.55: Stub Guard Parts

A - Cutting Surfaces Aligned
B - Inverted Section
C - Offset
D - Top Guide is an Inverted Stub Guard

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

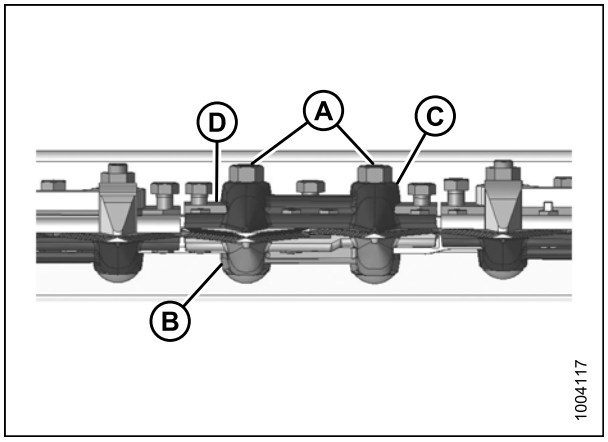


Figure 8.56: Stub Guard Replacement

IMPORTANT:
Ensure center guard (B) has offset cutting surfaces. Refer to illustration.

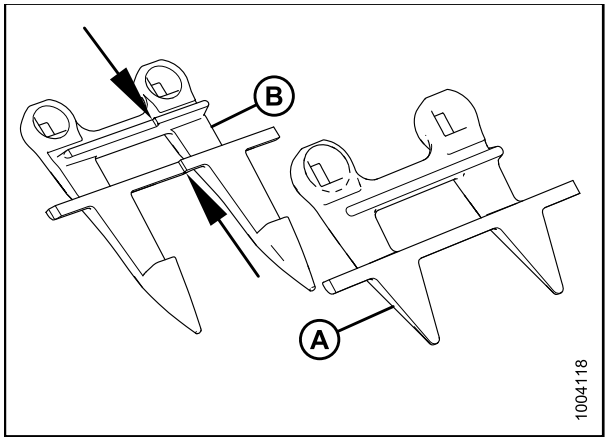


Figure 8.57: Stub Guard Identification

A - Normal **B - Center**

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

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

3. Position replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do **NOT** tighten.
4. Check and adjust clearance between hold-down, and knife. Refer to *8.7.8 Hold-Downs, page 217*.

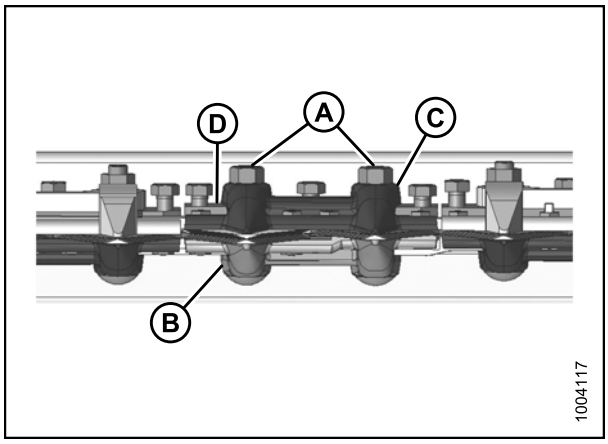


Figure 8.58: Stub Guard Adjustment

8.7.8 Hold-Downs

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

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

NOTE:
Guards should be aligned prior to adjusting hold-downs.

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

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

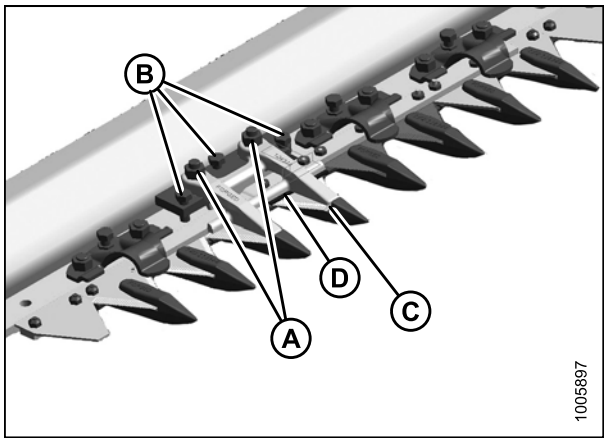


Figure 8.59: Knife Hold-Down – DK

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

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

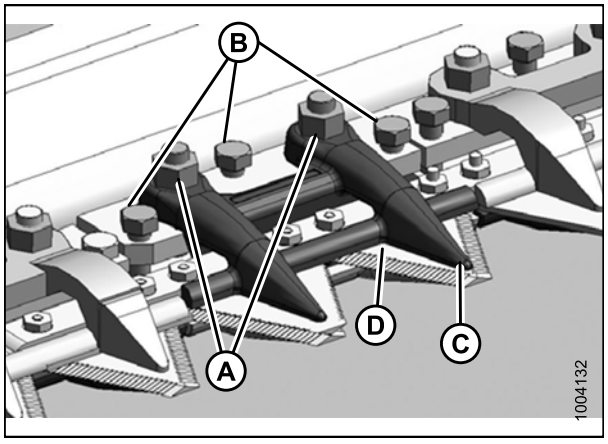


Figure 8.60: Stub Guard – DK

8.7.9 Knife Drive Box

The heavy-duty, oil bath, knife drive box uses tapered roller bearings on the input shaft and yoke for increased durability. The pulley and drive arm connections are straight splines with clamping bolts to ensure a tight fit.

The oil level in the knife drive box is easily checked with the dipstick incorporated into the breather. The function of the knife drive box is to convert the rotational force from the tractor's or windrower's header driveshaft to side-to-side cyclical motion. This is done simply by a camshaft.

Figure 8.61: Knife Drive Box

Mounting Bolts

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

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

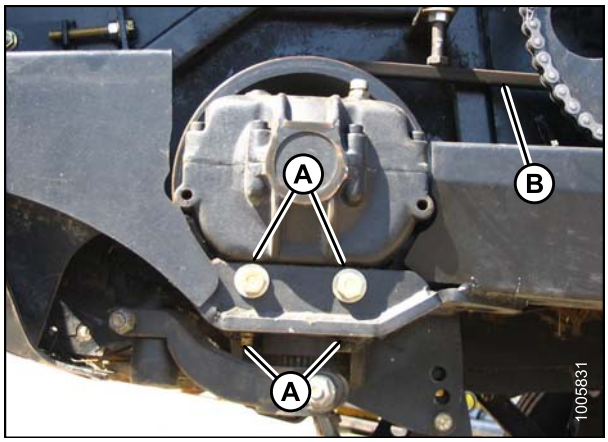


Figure 8.62

Removing Knife Drive Box

1. Loosen knife drive belt (B), and slip off knife drive box pulley. Refer to one of the following sections, depending on your equipment:
   - *Checking/Adjusting Timing Belt Tension on Left Side, page 227*
   - *Checking/Adjusting Timing Belt Tension on Right Side, page 231*
   - *Checking/Adjusting Timing Belt Tension on Left Side, page 240*
   - *Checking/Adjusting Timing Belt Tension on Right Side, page 244*

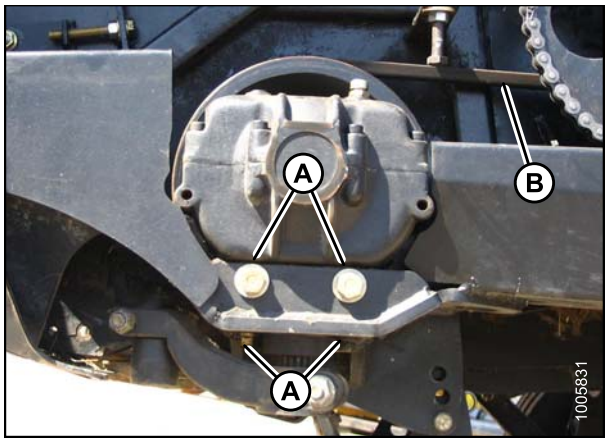


Figure 8.63

2. Stroke knife to its outer limit.
3. Clean area around knifehead.
4. Remove grease zerk (A) from knifehead pin (B).
5. Remove nut and bolt (C).
6. Insert screwdriver in groove of pin (B), and pry up on pin to free knife. Pin does not have to be removed from arm.

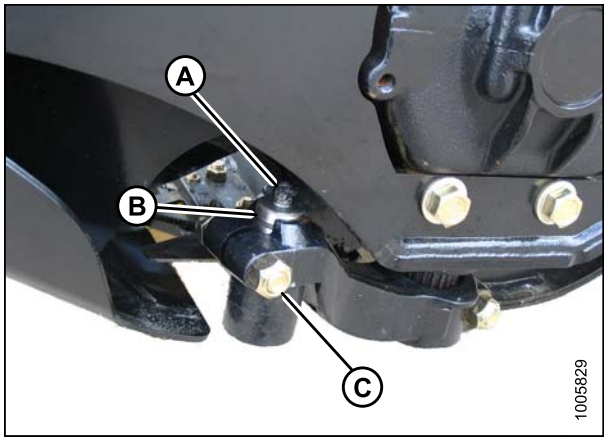


Figure 8.64

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

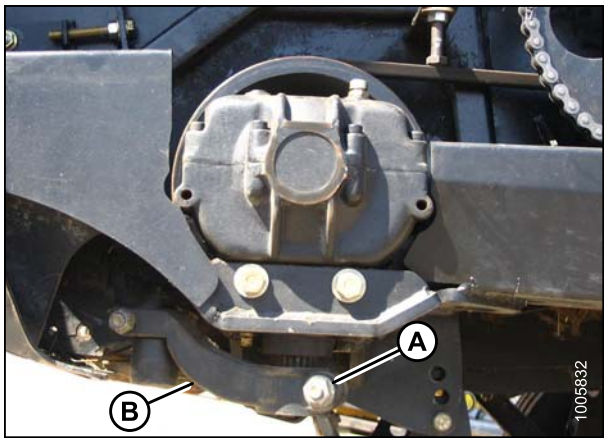


Figure 8.65

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

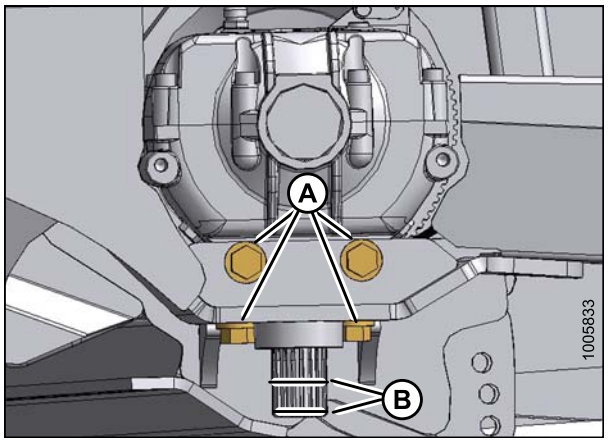


Figure 8.66

Installing Knife Drive Box

1. Position knife drive box as shown, and install four bolts (A). Torque side bolts, and then torque bottom bolts to 200 ft·lbf (270 Nm).

   IMPORTANT:
   Use only Grade L9 bolts and flat washers.

2. Apply Loctite® #243 adhesive (or equivalent) in two bands (B) around shaft as shown, with one band at end of shaft, and one band approximately mid-way.

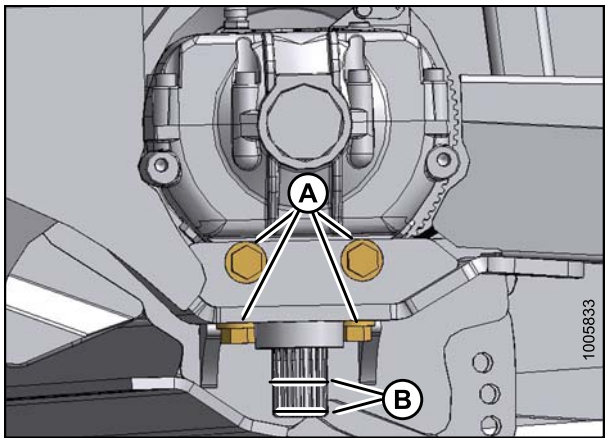


Figure 8.67

3. Slide pitman arm (B) onto knife drive box output shaft.
4. Rotate knife drive box pulley to ensure pitman arm just clears frame to ensure proper placement on splines. Remove arm (B), and reposition on splines as required.
5. Rotate knife drive box pulley to locate pitman arm at furthest outboard position.

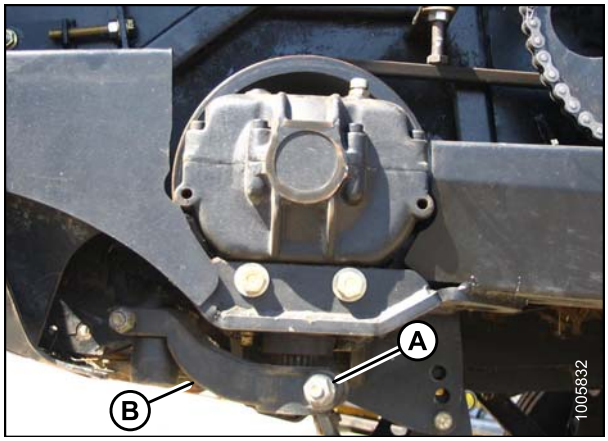


Figure 8.68

6. Slide pitman arm (C) up or down on shaft until it just contacts knifehead (B), (0.010 in. [0.25 mm]) gap.
7. Install bolt (E) and nut, and torque to 160 ft·lbf (217 N·m).
8. Align knifehead (B) with pitman arm (C).
9. Install knifehead pin (A) in pitman arm (C), and tap it down into the knifehead, ensuring pin is bottomed out in the knifehead.
10. Tap underside of the knifehead until the pin is flush with the upper face of the pitman arm (C).
11. Carefully adjust to achieve a 0.010 in. (.25 mm) gap at (D) with the knife laying flat on the first few guards.

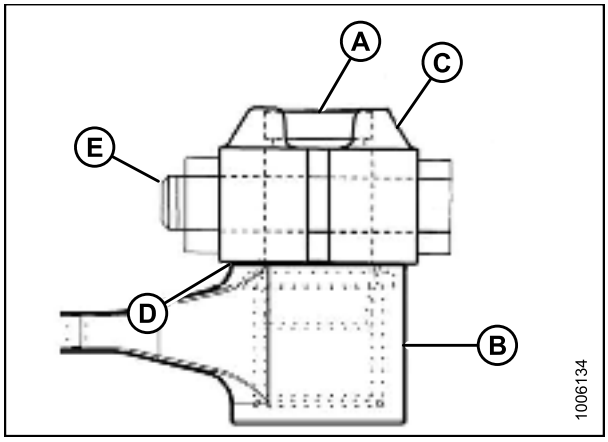


Figure 8.69

A - Knifehead Pin **B - Knifehead** **C - Pitman Arm**
D - GAP: .010 in (.25 mm) **E - Bolt**

12. Replace bolt (C) and nut.
13. Tighten nut to 160 ft·lbf (220 N·m).
14. Replace grease zerk (A) in pin.
15. Install drive belt onto knife drive box pulley and tighten. Refer to one of the following sections, depending on your equipment:
    - *Checking/Adjusting Timing Belt Tension on Left Side, page 227*
    - *Checking/Adjusting Timing Belt Tension on Right Side, page 231*
    - *Checking/Adjusting Timing Belt Tension on Left Side, page 240*
    - *Checking/Adjusting V-Belt Tension on Left Side, page 239*
    - *Checking/Adjusting Timing Belt Tension on Right Side, page 244*

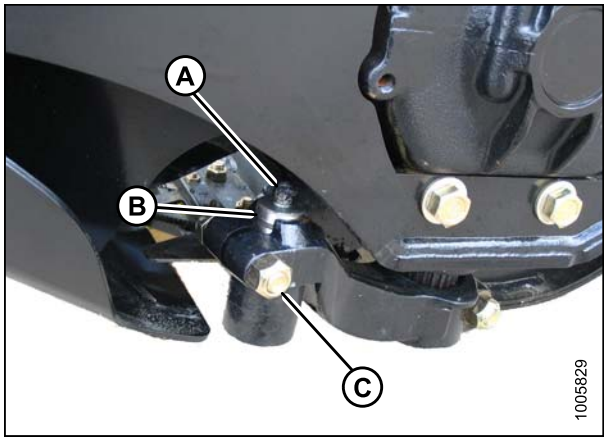


Figure 8.70

Removing Pulley

1. Remove knife drive box. Refer to *Removing Knife Drive Box, page 219*.
2. Loosen nut and bolt from pulley.
3. Remove pulley using a three-jaw puller.

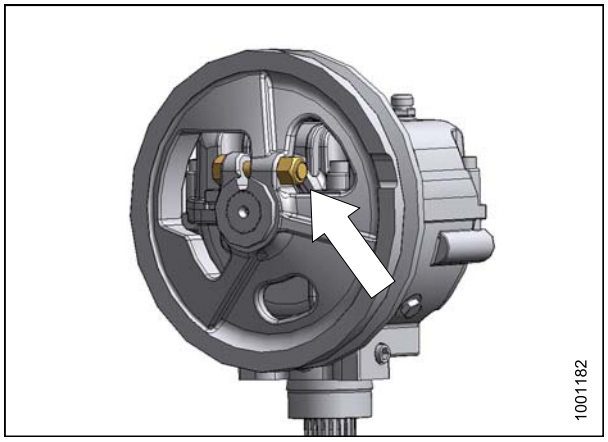


Figure 8.71

Installing Pulley

1. Remove any rust or paint from inner spline. For replacement parts, remove oil/grease with degreasing agent.
2. Apply Loctite® #243 adhesive (or equivalent) in two bands around shaft as shown, with one band at end of spline, and one band approximately mid-way.

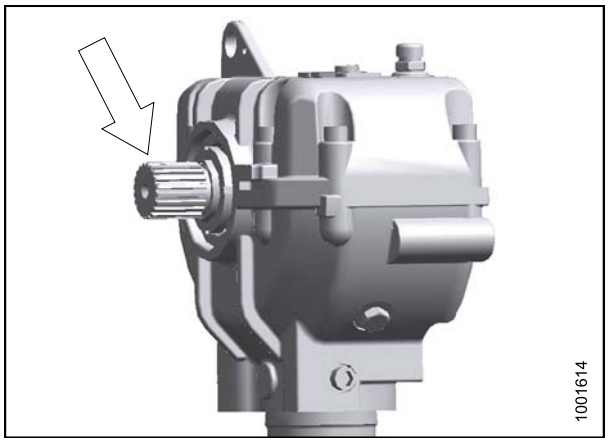


Figure 8.72

3. Install pulley on shaft until flush with end of shaft, and secure with bolt and nut. Torque bolts to 160 ft·lbf (217 N·m).

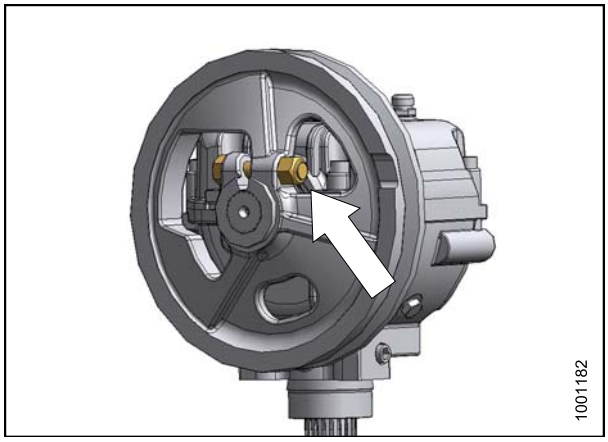


Figure 8.73

Changing Knife Drive Box Oil

Change knife drive box lubricant after the first 50 hours operation, and every 1000 hours (or 3 years) thereafter.

To change lubricant, follow these steps:

1. Raise header, and then place a suitable container under the knife drive box drain to collect oil.

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

2. Engage header lift cylinder stops.
3. Remove breather/dipstick and drain plug, and allow oil to drain.
4. Replace drain plug and add oil to required level. Use Gear Lubricant, SAE 85W-140, API Service Class GL-5, 2.3 quarts (2.2 liters).
5. Disengage lift cylinder stops.

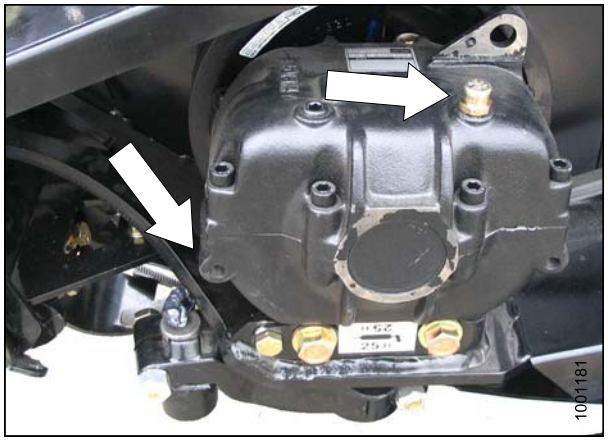


Figure 8.74

8.7.10 Adjusting Knife Timing

Double-knife A30-D and A40-D header/mower conditioners require that the knives are properly timed to move in opposite directions. Knives moving in the same direction will result in unnecessary vibration.

To adjust the knife timing, follow these steps:

1. Remove the right-side knife drive belt (A), if it is not already removed.

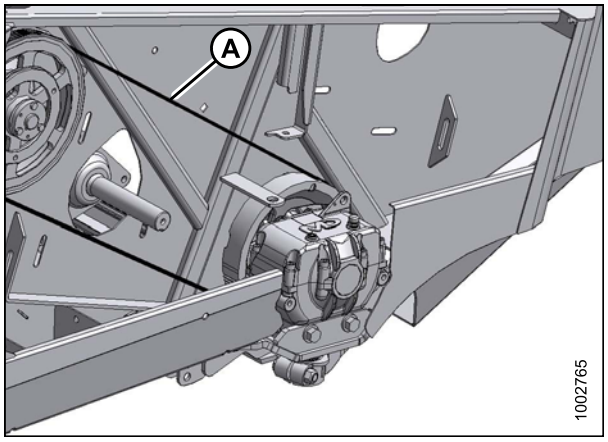


Figure 8.75: RH Knife Drive Belt

2. Rotate the left-side knife drive box driven pulley (A) clockwise until the left-side knife is at the center of the inboard stroke (moving towards center of header).

   NOTE:
   Center stroke is when the knife points are centered between guard points.

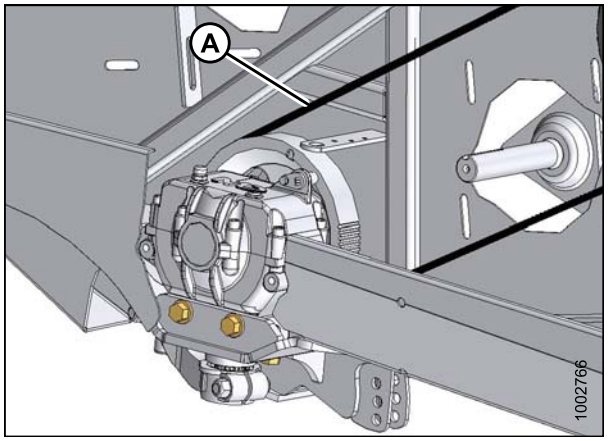


Figure 8.76: Knife Position Adjustment

3. Rotate the right-side knife drive box pulley counterclockwise until the right-side knife is at the center of the inboard stroke.

   NOTE:
   You may want to clamp the sections together at this point, so that the knives do not move when installing the belts.

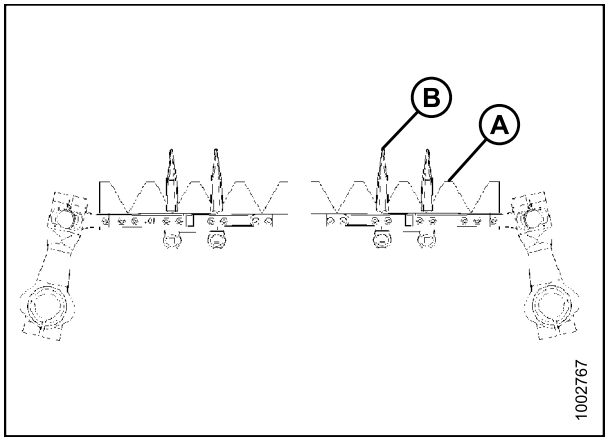


Figure 8.77: Knife Sections Centered Between Guard Points

A - Knife Point **B - Guard Point**

4. Install the right-side knife drive box drive belt and tension.

   ## ⚠ CAUTION

   To maintain timing, knife drive box driver and driven pulleys must NOT rotate as the belt is tightened.

5. Check that the timing belt (A) is properly seated in the grooves on both driver and driven pulley on the right-hand side, and is tensioned correctly. The belt should be tensioned to a 9/16 in. (14 mm) deflection, this is achieved by applying 5–6.5 ft·lbf (22–30 N·m) to the belt at mid-span.

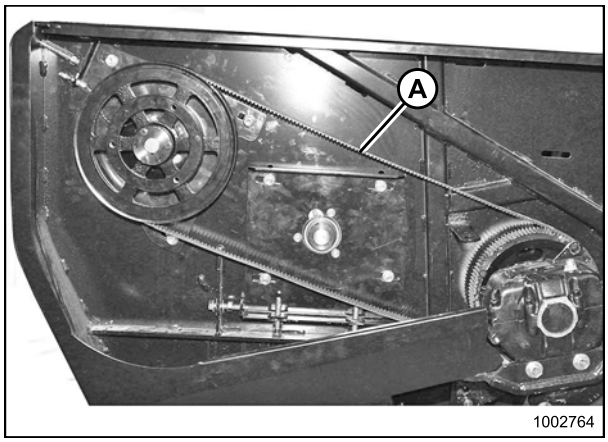


Figure 8.78: Timing Belt Deflection and Torque

6. Check for correct knife timing by rotating the driveshaft (A) slowly with an unplugging wrench (B), and observe knives where they overlap at the centre of the header.

   IMPORTANT:
   Knives must move in opposite directions, and must begin moving at exactly the same time.

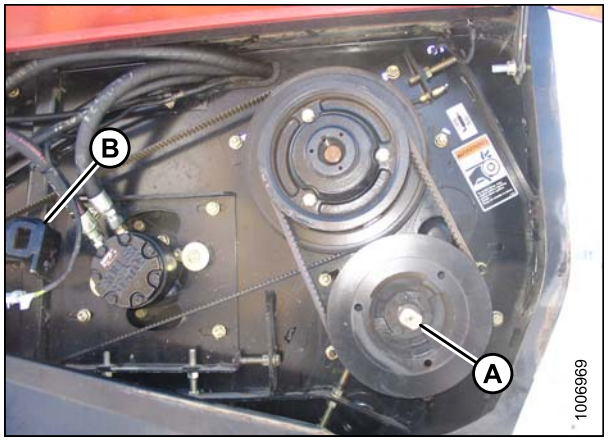


Figure 8.79: Knife Timing

7. If timing is correct, skip the remaining steps.
8. If timing is off, loosen right-side timing belt sufficiently to allow skipping the belt one or more teeth as required.
   a. **If right knife LEADS left knife,** rotate RIGHT HAND driven pulley (C) clockwise.
   b. **If right knife LAGS left knife,** rotate RIGHT HAND driven pulley (C) counterclockwise.
   c. Tighten right-side timing belt.

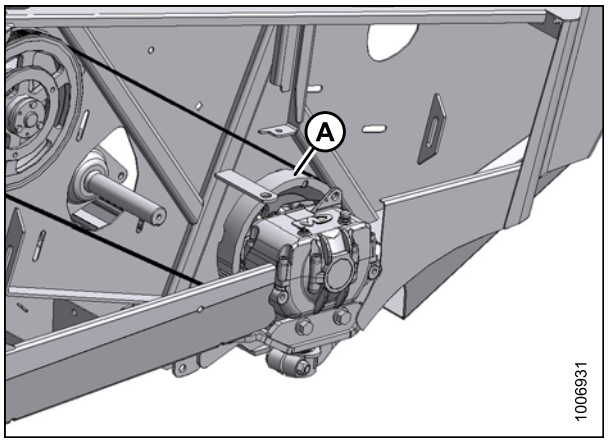


Figure 8.80: Knife Timing

8.8 A30-D Drive Systems

8.8.1 Knife Drive – A30-D

The A30-D double-knife header is driven by a windrower-powered hydraulic motor that drives each knife with two belt-driven knife drive boxes.

Checking/Adjusting Timing Belt Tension on Left Side

IMPORTANT:
To prolong belt and drive lift, do not overtighten belts.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.
2. Apply a force of 5–6.5 lbf (22–30 N) on belt (D) at mid-span. Belt should deflect 9/16 in. (14 mm). If necessary, adjust as follows:
   a. Loosen three nuts (A).
   b. Loosen jam nut on adjuster bolt (B).
   c. Turn adjuster bolt (B) to move pulley (C) to achieve required deflection.
   d. Tighten jam nut at (B), and three nuts (A).
3. Close endshield.

   NOTE:
   Readjust tension of new belts after about 5 hours of operation.

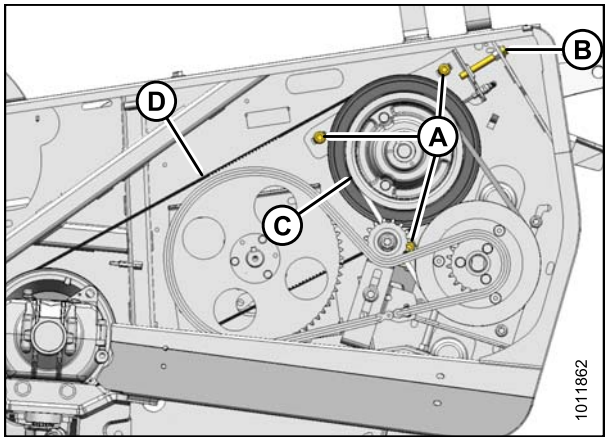


Figure 8.81

Removing Timing Belt on Left Side

1. Open left-hand endshield.
2. Remove auger drive chain (A). Refer to *Removing Auger Drive Chain, page 238*.
3. Remove auger drive v-belts (B). Refer to *Removing Double V-Belts on Left Side, page 230*.

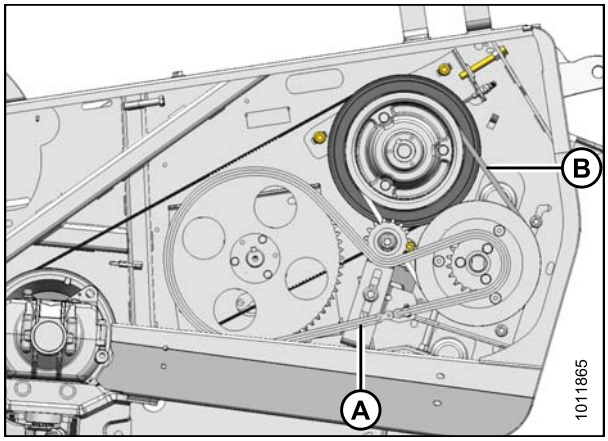


Figure 8.82

4. Loosen three nuts (A).
5. Loosen jam nut on adjuster bolt (B), and turn adjuster bolt (B) so that knife drive belt (C) can be slipped off pulley (D) and clear of sprocket.

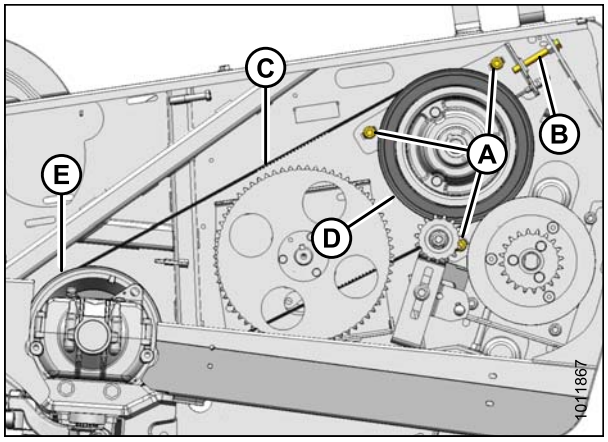


Figure 8.83

6. Remove bolt (A) and remove cover (B) in left endsheet.
7. Slip belt off knife drive box pulley, and route belt through opening to remove it.

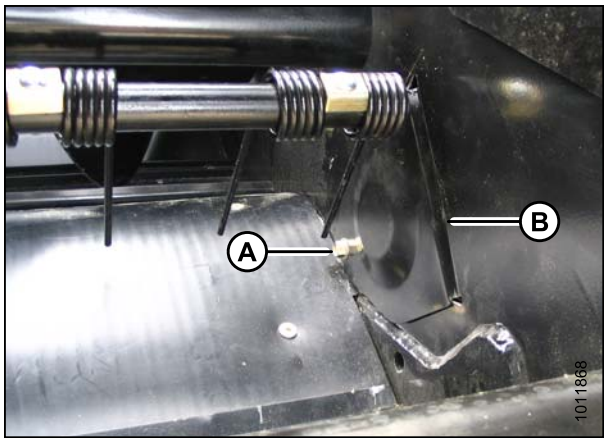


Figure 8.84

Installing Timing Belt on Left Side

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Route knife drive timing belt from inboard side of endsheet through opening (A).

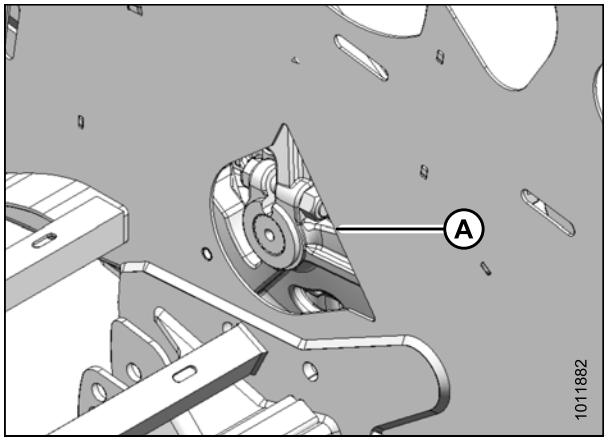


Figure 8.85

2. Locate knife drive belt (A) onto knife drive box pulley (B).
3. Route knife drive belt (A) over sprocket and onto knife drive pulley (C).

   NOTE:
   When installing new belt, never pry belt over pulley. Ensure drive pulley (C) is fully forward.

   IMPORTANT:
   To prolong belt and drive lift, do not overtighten belts.

4. Tension knife drive belt. Refer to *Checking/Adjusting Timing Belt Tension on Left Side, page 227*.
5. Install knife drive v-belts (B) and tension. Refer to *Checking/Adjusting V-Belts Tension on Left Side, page 229*.
6. Install auger drive chain (A) and tension. Refer to *Checking/Adjusting Auger Drive Chain Tension, page 237*.
7. Install plate (B) in left endsheet with bolt (A).
8. Readjust tension of a new belt after a short run-in period (about 5 hours).
9. Close endshield.

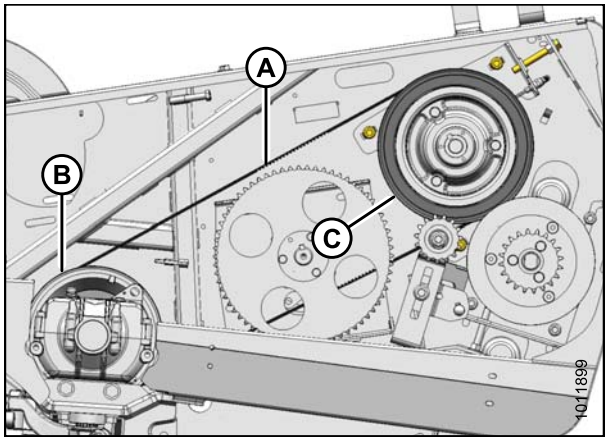


Figure 8.86

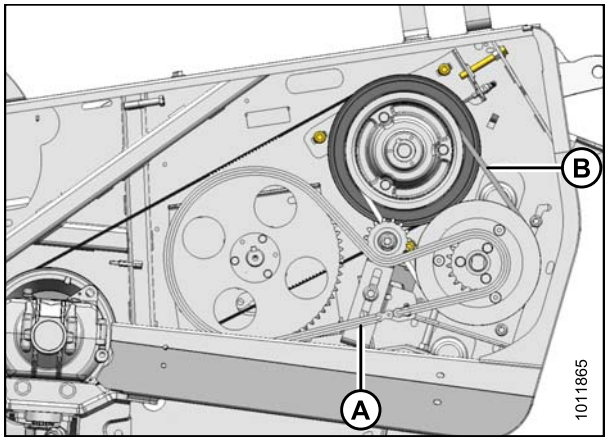


Figure 8.87

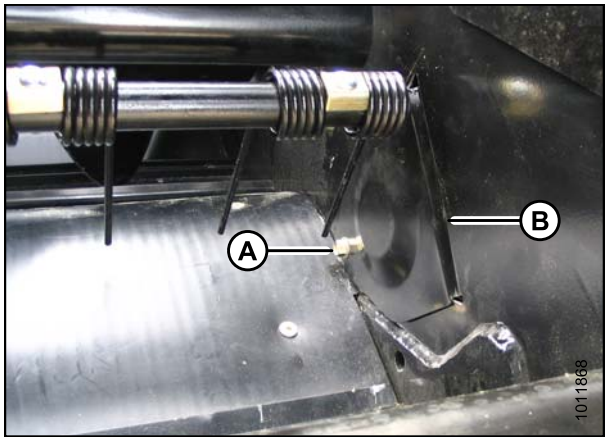


Figure 8.88

Checking/Adjusting V-Belts Tension on Left Side

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.

   NOTE:
   Minor belt tension adjustments may be made without affecting chain tension. For major adjustments, such as repositioning or auger, adjust belt tension **BEFORE** chain tension.

2. Apply a force of 8–12 lbf (35–50 N) on each belt (C) at mid-span. Belt should deflect 3/16 in. (4 mm). If necessary, adjust as follows:
   a. Loosen three bolts (A).
   b. Loosen jam nut on adjuster bolt (B).
   c. Turn adjuster bolt (B) to achieve required deflection.
   d. Tighten bolts (A), and jam nut at (B).
3. Check reel drive chain tension, and adjust if necessary. See *Checking/Adjusting Reel Drive Chain Tension, page 234*.
4. Close shield before engaging header.

   NOTE:
   Readjust tension of new belts after about 5 hours of operation.

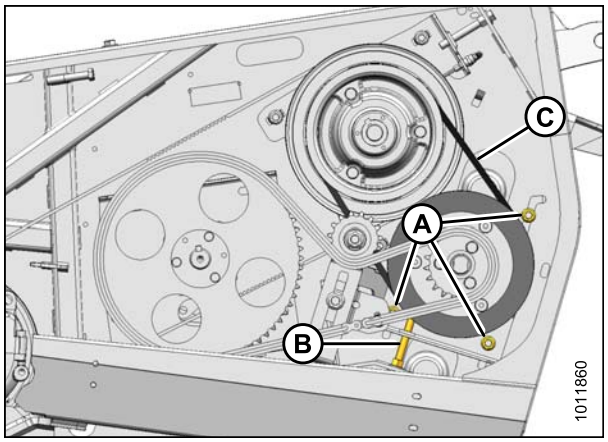


Figure 8.89

Removing Double V-Belts on Left Side

1. Open left endshield.
2. Remove auger drive chain. Refer to *Removing Auger Drive Chain, page 238*.
3. Loosen three bolts (A).
4. Loosen jam nut on adjuster bolt (B).
5. Turn adjuster bolt (B) to loosen v-belts (C).
6. Remove belts (C).

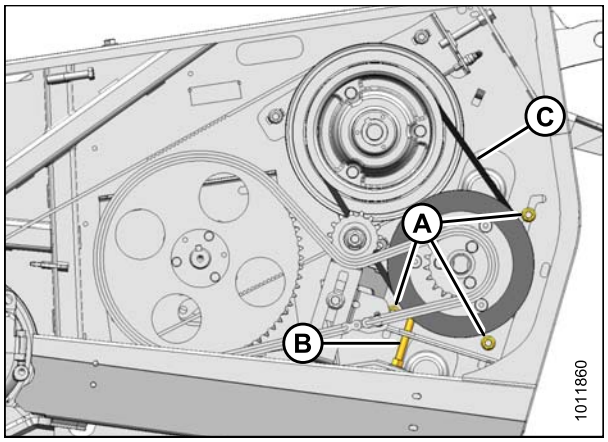


Figure 8.90

Installing Double V-Belts on Left Side

IMPORTANT:
Belts are a matched set. Replace both drive belts even if only one needs replacing.

NOTE:
When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.

IMPORTANT:
To prolong belt and drive life, do not overtighten belts.

1. Position auger drive belts (C) as shown in illustration.
2. Turn adjuster bolt (B) so that belts (C) deflect 3/16 in. (4 mm) at mid-span when a load of 8–12 lbf (35–50 N) is applied to each belt.
3. Tighten bolts (A) and jam nut at (B).
4. Install auger drive chain. Refer to *Installing Auger Drive Chain, page 238*.
5. Readjust tension of a new belt after a short run-in period (about 5 hours).

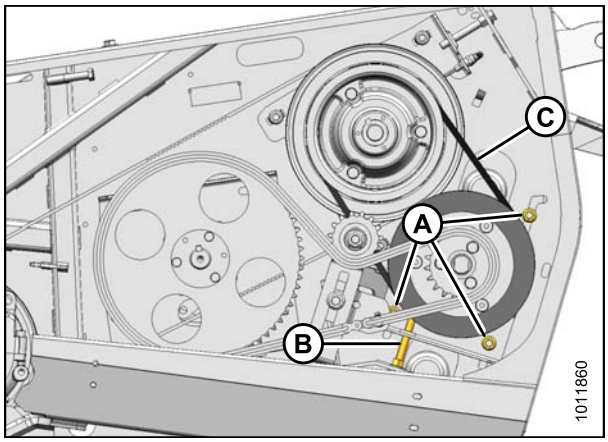


Figure 8.91

Checking/Adjusting Timing Belt Tension on Right Side

IMPORTANT:
To prolong belt and drive lift, do not overtighten belts. Belt slippage is used to protect the reel in an overload situation.

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open right endshield.
2. Apply a force of 5–6.5 lbf (22–30 N) on belt (D) at mid-span. Belt should deflect 9/16 in. (14 mm). If necessary, adjust as follows:
   a. Loosen three nuts (A), and jam nut on adjuster bolt (B).
   b. Turn adjuster bolt (B) to move pulley (C) until required deflection is achieved.
   c. Tighten jam nut at (B), and three nuts (A).
3. Close endshield.

   NOTE:
   Readjust tension of new belt after about 5 hours of operation.

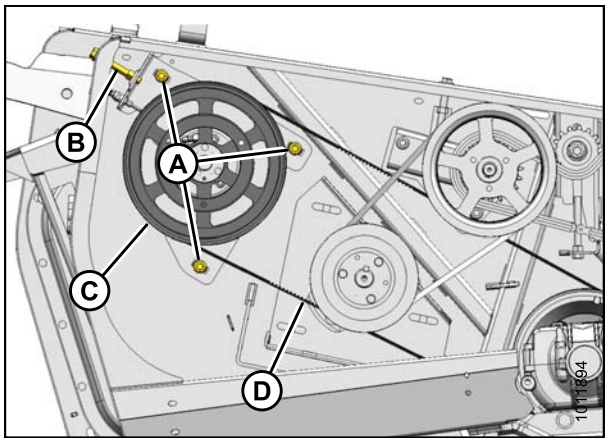


Figure 8.92

Removing Timing Belt on Right Side

1. Open shield on header right side.
2. Remove the reel drive belts (A). Refer to *Removing Reel Drive Belt, page 236*.

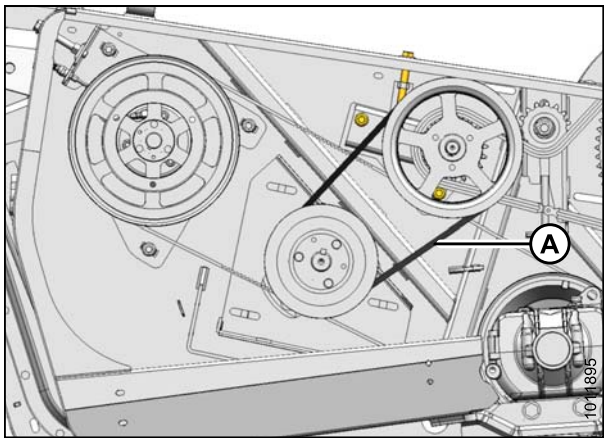


Figure 8.93

3. Loosen three nuts (A), and jam nut on adjuster bolt (B).
4. Turn adjuster bolt (B) so that knife drive belt (D) can be slipped off pulley (C) and knife drive box pulley (E).

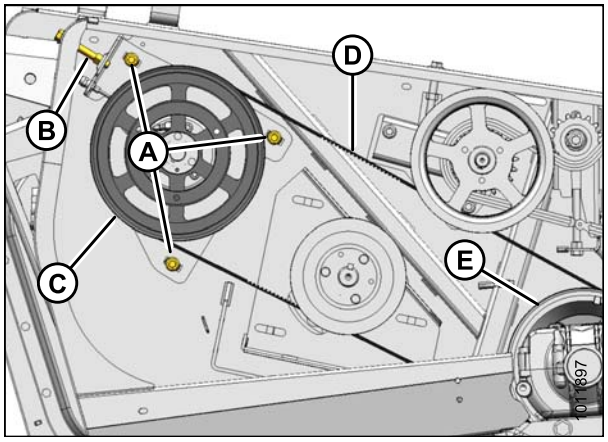


Figure 8.94

5. Remove bolt (A) and remove cover (B) in left endsheet.
6. Slip belt off knife drive box pulley, and route belt through opening to remove it.

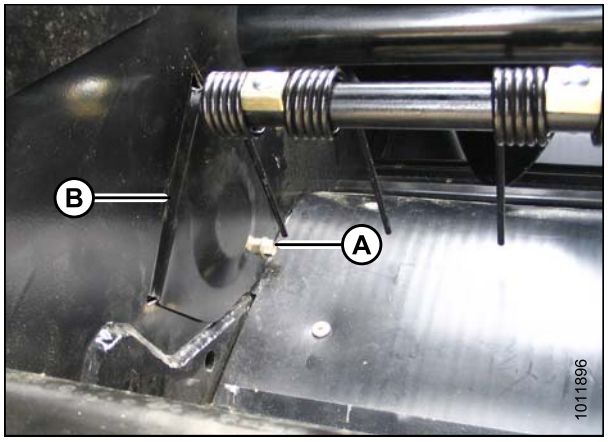


Figure 8.95

Installing Timing Belt on Right Side

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Route knife drive timing belt from inboard side of endsheet through opening (A).

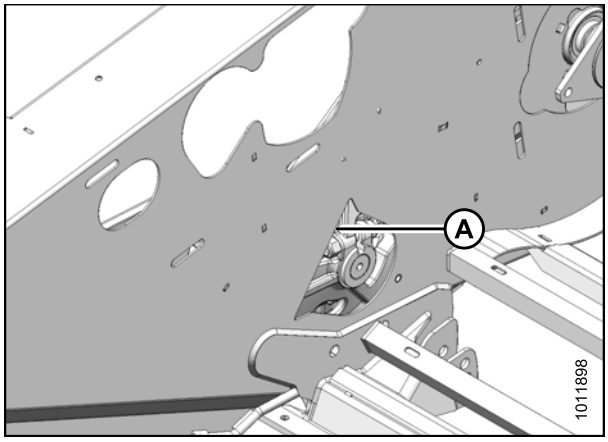


Figure 8.96

2. Locate knife drive belt (A) onto knife drive box pulley (B) and drive pulley (C).

   NOTE:
   When installing new belt, never pry belt over pulley. Ensure drive pulley (C) is fully forward.

   IMPORTANT:
   To prolong belt and drive life, do not overtighten belt.

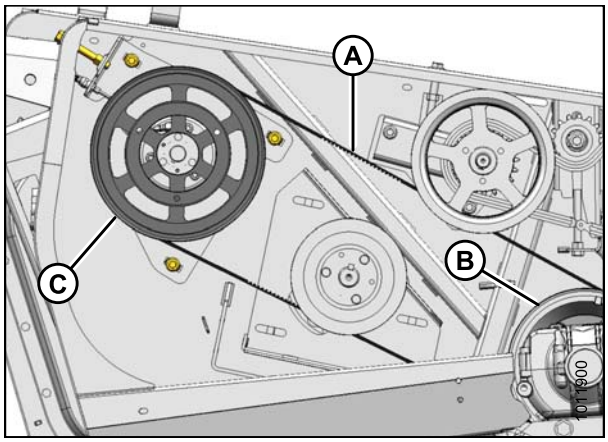


Figure 8.97

3. Tension knife drive belt. Refer to *Checking/Adjusting Timing Belt Tension on Right Side, page 231*.

4. Install reel drive belts (A). Refer to *Installing Reel Drive Belt, page 237*.

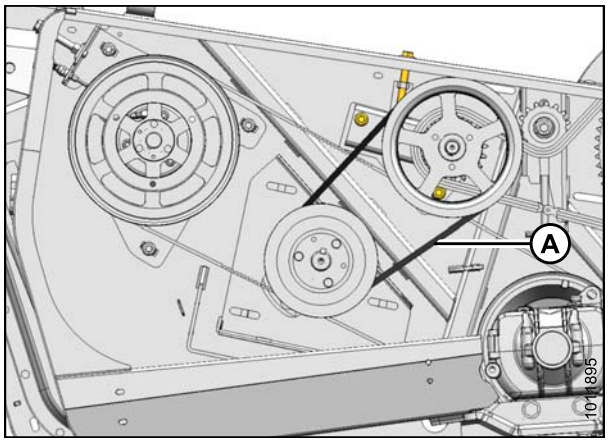


Figure 8.98

5. Install plate (B) in right endsheet with bolt (A).
6. Close endshield.
7. Readjust tension of a new belt after a short run-in period (about 5 hours).

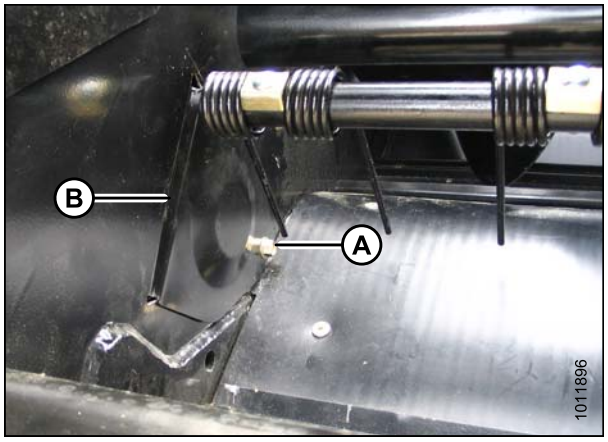


Figure 8.99

8.8.2 Reel Drive – A30-D

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

Checking/Adjusting Reel Drive Chain Tension

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open right endshield.

   IMPORTANT:
   When making major adjustments, such as repositioning the reel or auger, adjust belt tension **BEFORE** chain tension.

2. Slack in chain at mid-point (A) of lower span should be 1/4 in. (6 mm). If necessary, adjust as follows:
   a. Loosen nut (B) on idler sprocket support.
   b. Turn adjuster bolt (C) to give required slack at mid-span (A) of chain. Tighten nut (B) on idler sprocket support.
   c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.
3. Close endshield.

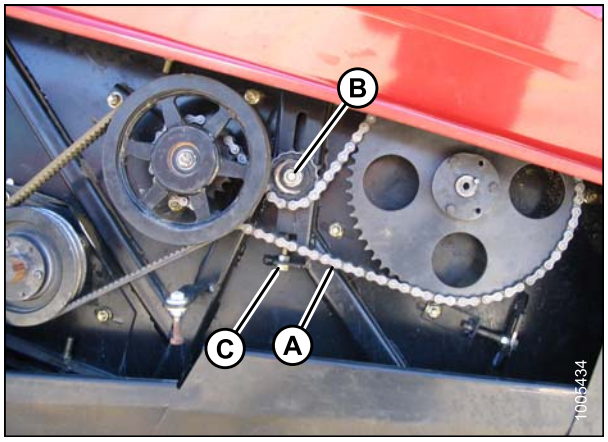


Figure 8.100

Removing Reel Drive Chain

Remove reel drive chain (A) as follows:

1. Open shield on header right-hand side.
2. Remove reel drive belt (D) from pulley (E). Refer to *Removing Reel Drive Belt, page 236*.
3. Loosen nut (B) on idler sprocket.
4. Loosen jam nut on adjuster bolt (C) and back off.
5. Turn adjuster bolt (C) to loosen chain.
6. Remove chain from sprockets.

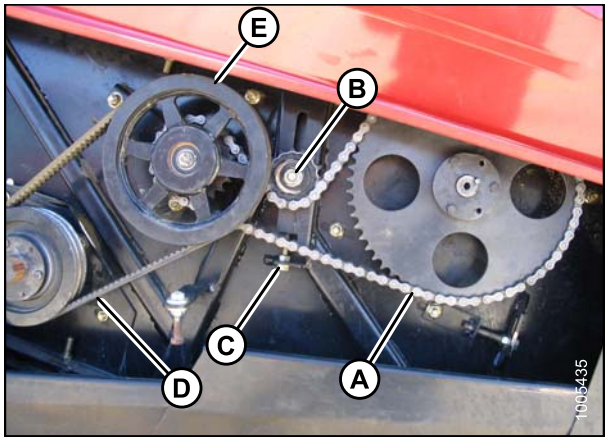


Figure 8.101

Installing Reel Drive Chain

Install reel drive chain (A) as follows:

1. Position chain (A) around sprockets as shown.
2. Install and tighten reel drive belts (D). Refer to *Installing Reel Drive Belt, page 237*.
3. Turn adjuster bolt (C) to move idler sprocket downward until total chain slack at (A) is 1/4 in. (6 mm).
4. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.
5. Tighten jam nut at (C) and nut (B), and recheck tension.
6. Close shield before engaging header.

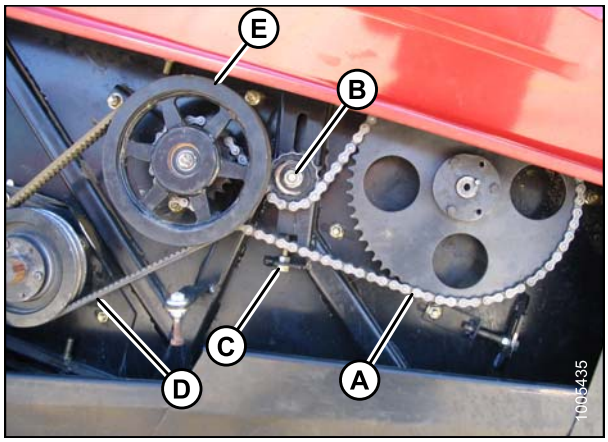


Figure 8.102

Checking/Adjusting Reel Drive Belt Tension

IMPORTANT:
To prolong drive life, do not over-tighten belts. Belt slippage is used to protect the reel in an overload situation.

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open right endshield.

   IMPORTANT:
   When making major adjustments, such as repositioning the reel or auger, adjust belt tension **BEFORE** chain tension.

2. Apply a force of 8–12 lbf (35–50 N) on each belt at mid-span (D). Belt should deflect 3/16 in. (4 mm). If necessary, adjust as follows:
   a. Loosen jam nut on adjuster bolt (A), and nuts (B).
   b. Turn adjuster bolt (A) to move pulley (C) to achieve required tension.
   c. Tighten jam nut on adjuster bolt (A), and nuts (B).
3. Check reel drive chain tension, and adjust if necessary. Refer to *Checking/Adjusting Reel Drive Chain Tension, page 234*.
4. Close shield before engaging header.

NOTE:
Readjust tension of new belts after about five hours of operation.

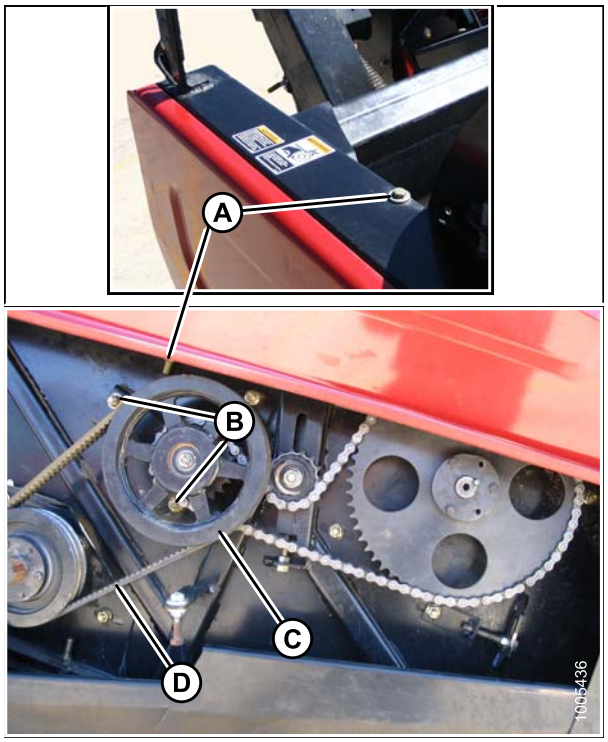


Figure 8.103

Removing Reel Drive Belt

Remove reel drive belts (A) as follows:

1. Open shield on header right-hand side.
2. Loosen jam nut on adjuster bolt (B) and nuts (C) at reel drive arm.
3. Turn adjuster bolt (B) to loosen reel drive belts (A).
4. Remove drive belts (A).

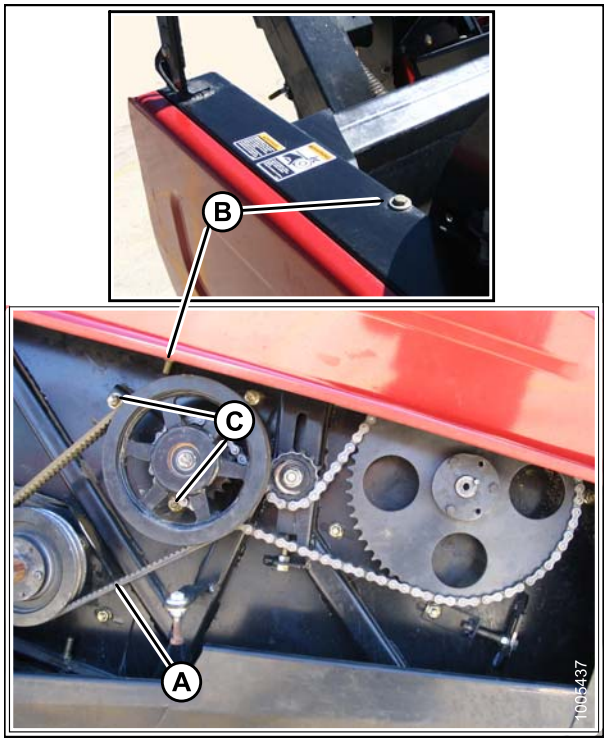


Figure 8.104

Installing Reel Drive Belt

IMPORTANT:
Reel drive belts are a matched set. Replace BOTH drive belts even if only one needs replacing.

To install a reel drive belt (D) on an A30-D mower conditioner, follow these steps:

1. Position drive belts (D) on pulleys, ensuring both belts are identical.
2. Turn adjuster bolt (A) to move pulley (C) so that each belt (D) deflects 3/16 in. (4 mm) when a load of 8–12 lbf (35–40 N) is applied to each belt at mid-span.
3. Tighten jam nut on adjuster bolt (A), and nuts (B).

   NOTE:
   Readjust tension of new belts after about five hours of operation.
4. Check reel drive chain tension, and adjust if necessary. Refer to *Checking/Adjusting Reel Drive Chain Tension, page 234*.
5. Close shield before engaging header.

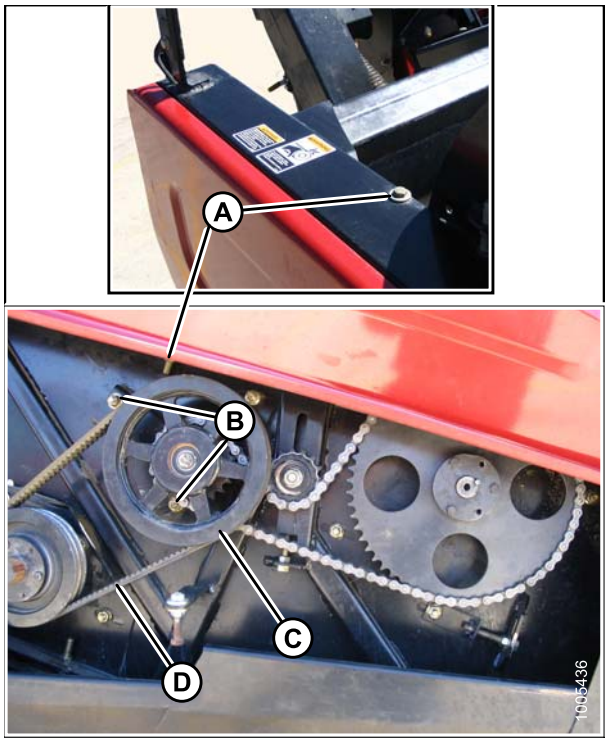


Figure 8.105

8.8.3 Auger

The auger on an A30-D mower conditioner is mechanically-driven.

Checking/Adjusting Auger Drive Chain Tension

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.

   IMPORTANT:
   Do **NOT** adjust v-belt belt tension after chain tension is set. Ensure v-belt tension is set before adjusting chain tension.

2. Slack in chain at mid-point (A) of lower span should be 3/16 in. (5 mm). If necessary, adjust as follows:
   a. Loosen nut (B) on idler sprocket support.
   b. Turn adjuster bolt (C) to give required slack at mid-span (A) of chain. Tighten nut (B) on idler sprocket support.
   c. Rotate auger, and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.

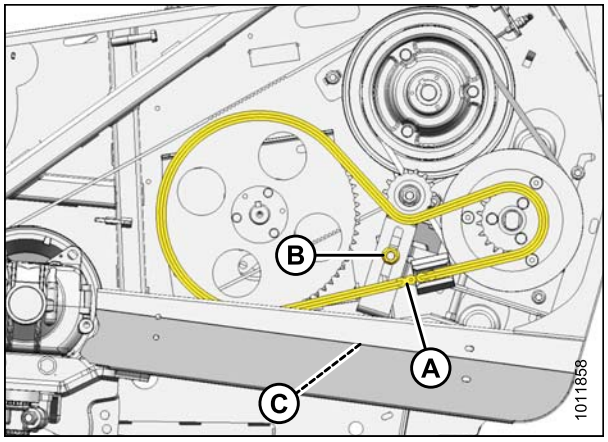


Figure 8.106

3. Close endshield.

Removing Auger Drive Chain

To remove the auger drive chain from an A30-D mower conditioner, follow these steps:

1. Open left endshield.
2. Loosen nut (B) on idler sprocket support.
3. Turn adjuster bolt (C) to loosen chain (A) so that it can be removed from small sprocket.
4. Remove chain (A) from large sprocket.

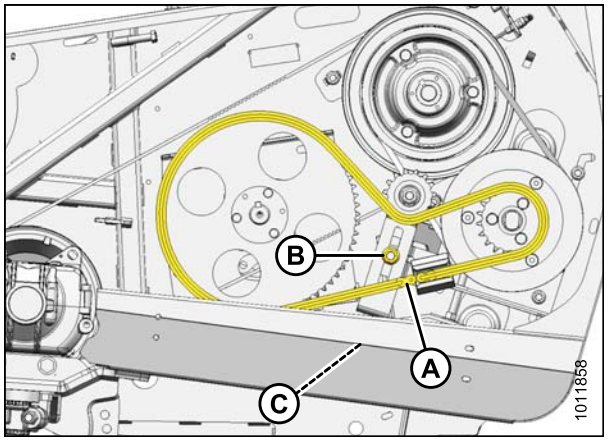


Figure 8.107

Installing Auger Drive Chain

1. Position chain (A) around sprockets as shown.
2. Turn adjuster bolt (C) to give 0.2 in. (5 mm) slack at mid-span of chain. Tighten nut (B) on idler sprocket support.
3. Rotate auger and check chain for slack at tightest point. Readjust position of idler sprocket to achieve required slack.
4. Close endshield before engaging header.

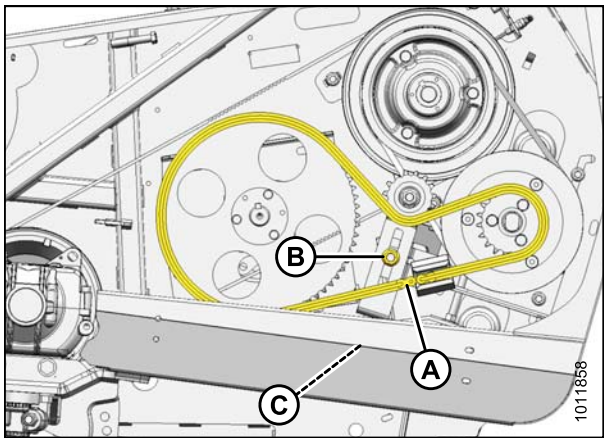


Figure 8.108

8.9 A40-D Drive Systems

8.9.1 Knife Drive – A40-D

The A40-D double-knife header is driven by a windrower-powered hydraulic motor that drives each knife with two belt-driven knife drive boxes.

Checking/Adjusting V-Belt Tension on Left Side

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.
2. Apply a force of 8–12 lbf (35–50 N) on each belt at mid-span (D). Belt should deflect 3/16 in. (4 mm). If necessary, adjust as follows:
   a. Loosen three nuts (A), and jam nut on adjuster bolt (B).
   b. Turn adjuster bolt (B) to move pulley (C) to achieve required deflection at (D).
   c. Tighten jam nut at (B), and three nuts (A).
3. Close endshield.

NOTE:
Readjust tension of new belts after about 5 hours of operation.

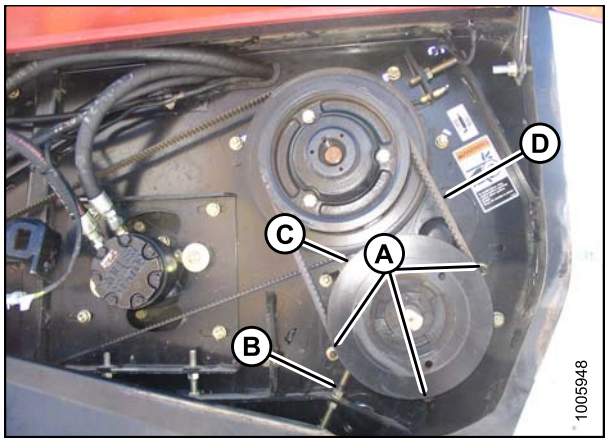


Figure 8.109

Removing Double V-Belts on Left Side

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.
2. Loosen three nuts (A), and jam nut on adjuster bolt (B).
3. Turn adjuster bolt (B) so that drive belts (C) can be slipped off pulleys (D) and (E).

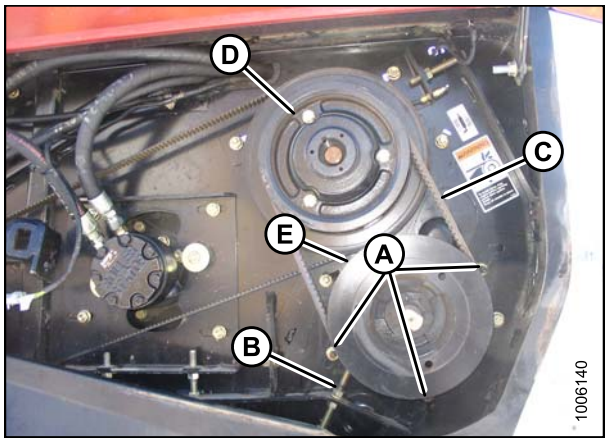


Figure 8.110

Installing Double V-Belts on Left Side

IMPORTANT:
Belts are a matched set. Replace both drive belts even if only one needs replacing.

NOTE:
When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.

IMPORTANT:
To prolong belt and drive life, do not overtighten belts.

1. Slip belts (A) onto pulleys (B) and (C).
2. Turn adjuster bolt (D) to move pulley (B) until a force of 8–12 lbf (35–50 N) applied at mid-span to each belt deflects each belt (A) 3/16 in. (4 mm).
3. Tighten jam nut at (D), and three nuts (E).
4. Close endshield.

   NOTE:
   Readjust tension of a new belt after a short run-in period (about 5 hours).

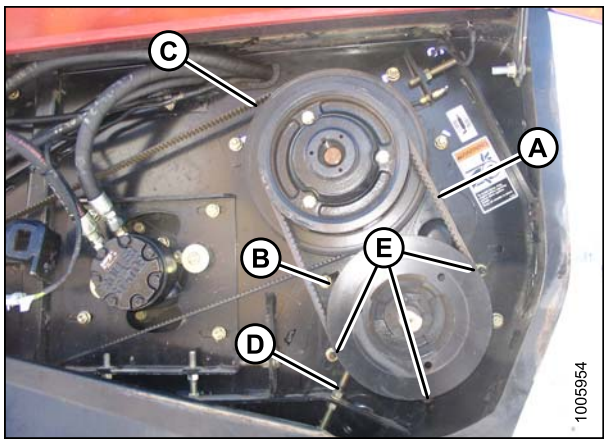


Figure 8.111

Checking/Adjusting Timing Belt Tension on Left Side

IMPORTANT:
To prolong belt and drive lift, do not overtighten belt.

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open left endshield.
2. Apply a force of 5–6.5 lbf (22–30 N) on belt (A) at mid-span. Belt should deflect 9/16 in. (14 mm). If necessary, adjust as follows:
   a. Loosen three nuts (B), and jam nut on adjuster bolt (C).
   b. Turn adjuster bolt (C) to move pulley (D) until required tension is achieved.
   c. Tighten jam nut at (C), and three nuts (B).
3. Close endshield.

   NOTE:
   Readjust tension of new belt after about 5 hours of operation.

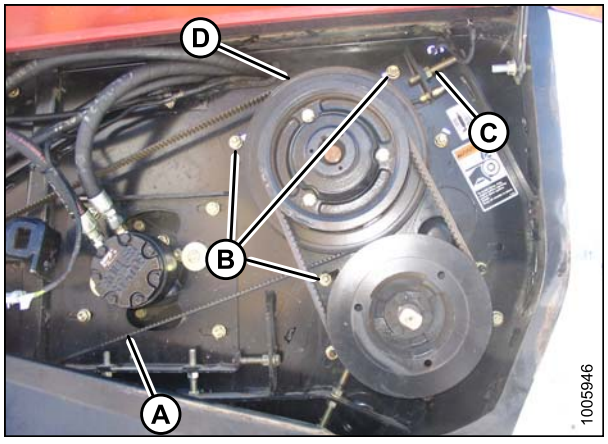


Figure 8.112

Removing Timing Belt on Left Side

To remove the knife drive timing belt from the left side of an A40-D header, follow these steps:

1. Open shield on left-hand of the header.
2. Loosen the three bolts (A) that lock the bottom drive pulley in place.
3. Loosen adjusting bolt (B); this will loosen the belts.

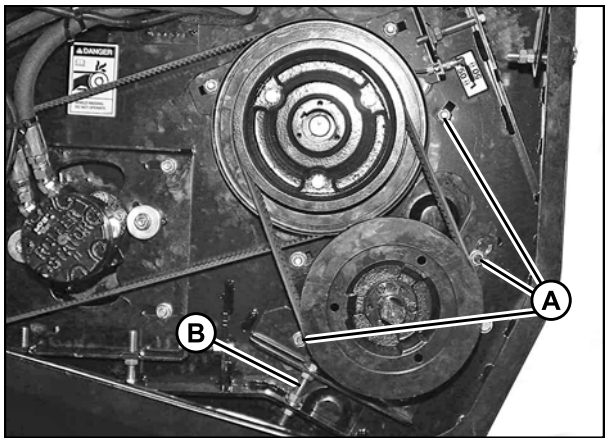


Figure 8.113: Gearbox Locking Bolts

4. Loosen the three bolts (A) that lock the pulley in position.
5. Loosen adjusting bolt (B); this will loosen the knife drive belt.
6. Remove the two belts (C) that drive the cross shaft.
7. Remove the knife drive timing belt (D) from the rear pulley.

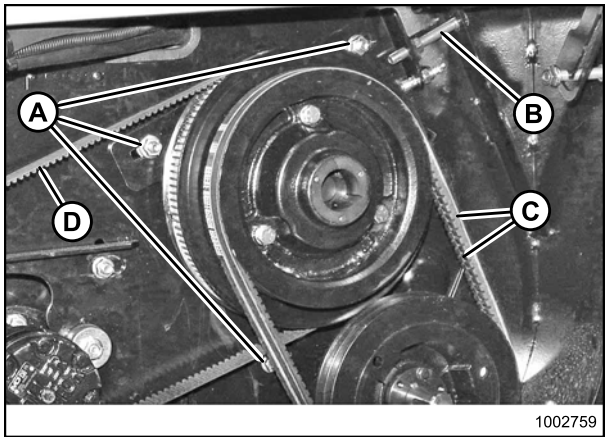


Figure 8.114: Belts Tension Bolts

8. Open the access panel located beside the knife drive box. Line up the belt with the notch machined into the knife drive box pulley. Rotate the pulley with the belt in the notch until it is free for removal.

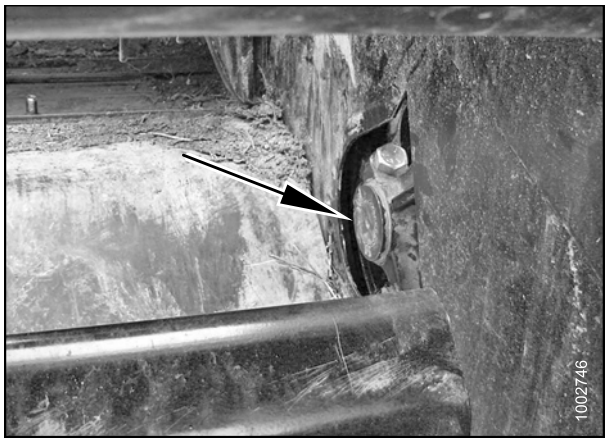


Figure 8.115: Knife Drive Belt Access Panel

NOTE:
Mark the ports and hoses and place port caps or plastic bags with tie wraps to prevent contamination.

9. To completely remove the belt, you will need to remove the two hoses (A) off of the auger drive motor, and disconnect the knife speed harness (B).

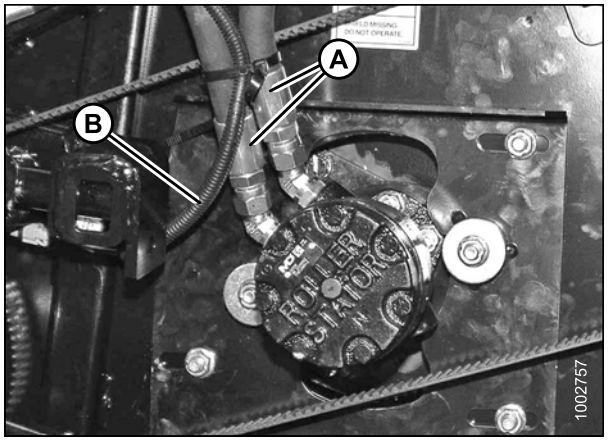


Figure 8.116: Auger Hoses

NOTE:
Knife drive timing belt deflection should be 0.55 in. (14 mm), when applying about 5–6.5 ft·lbf (22–30 N·m) of pressure at mid span. Once proper belt tension is achieved, tighten the locking bolts (A).

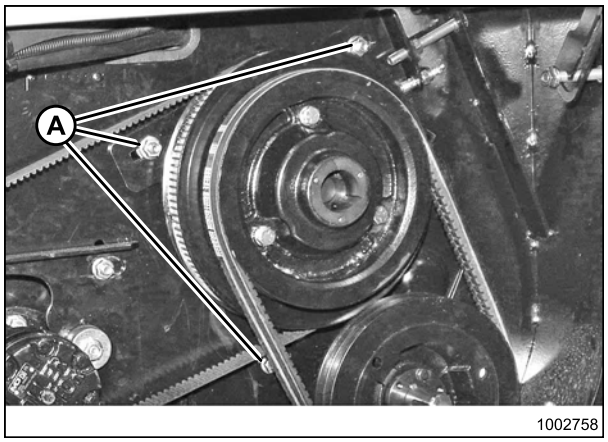


Figure 8.117: Knife Driving Belt Tensioning

NOTE:
Cross shaft belt deflection should be 0.16 in. (4 mm), when applying 8–12 ft·lbf (35–50 N·m) pressure at mid span of the belt. Once proper belt tension is achieved, tighten the locking bolts (A).

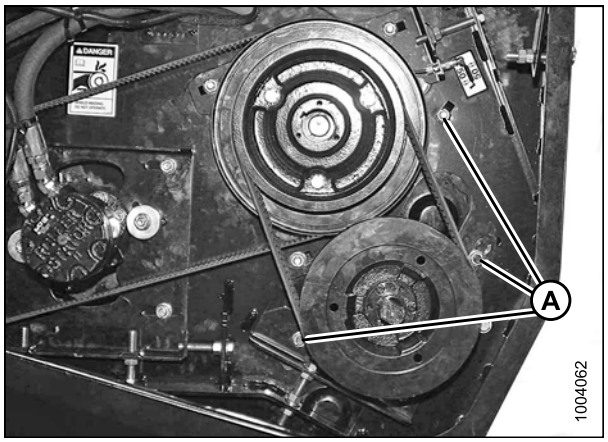


Figure 8.118: Knife Driving Belt Tensioning

Installing Timing Belt on Left Side

⚠ CAUTION

Stop engine, and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Route knife drive timing belt from inboard side of endsheet through opening (A).

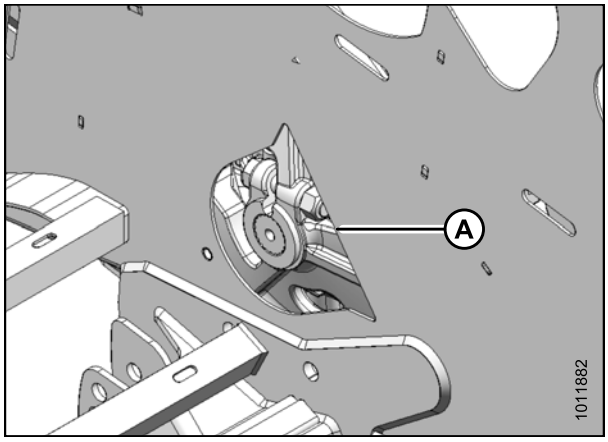


Figure 8.119

2. Locate knife drive belt (D) onto knife drive box pulley (F).
3. Route knife drive belt (D) onto knife drive pulley (E).

   NOTE:
   When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.

   IMPORTANT:
   To prolong belt and drive life, do not overtighten belts.

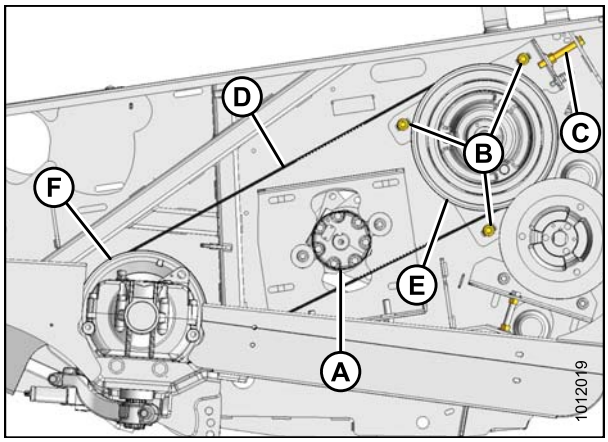


Figure 8.120

4. Turn adjuster bolt (C) to move pulley (E) until a force of 5–6.5 lbf (22–30 N) deflects belt 9/16 in. (14 mm) at mid-span (D).
5. Tighten jam nut at (C), and three nuts (B).
6. Reconnect hoses onto hydraulic motor (A).
7. Install knife drive v-belts. Refer to *Installing Double V-Belts on Left Side, page 240*.
8. Install cover (B) in endsheet and secure with bolt (A).
9. Close endshield.

   NOTE:
   Readjust tension of a new belt after a short run-in period (about 5 hours).

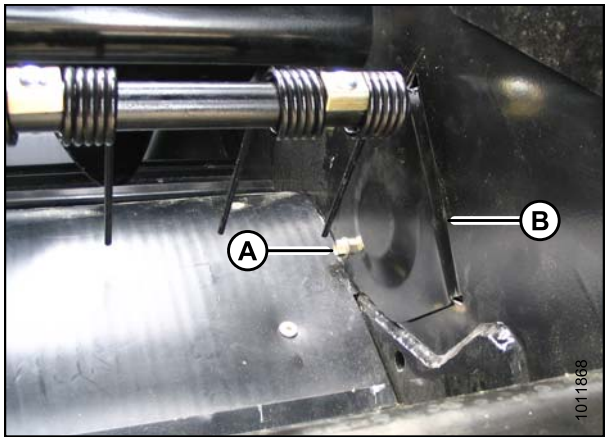


Figure 8.121

Checking/Adjusting Timing Belt Tension on Right Side

IMPORTANT:
To prolong belt and drive life, do not overtighten belt.

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open right endshield.
2. Apply a force of 5–6.5 lbf (22–30 N) on belt (D) at mid-span. Belt should deflect 9/16 in. (14 mm). If necessary, adjust as follows:
   a. Loosen three nuts (A), and jam nut on adjuster bolt (B).
   b. Turn adjuster bolt (B) to move pulley (C) until required tension is achieved.
   c. Tighten jam nut at (B), and three nuts (A).
3. Close endshield.

NOTE:
Readjust tension of new belt after about 5 hours of operation.

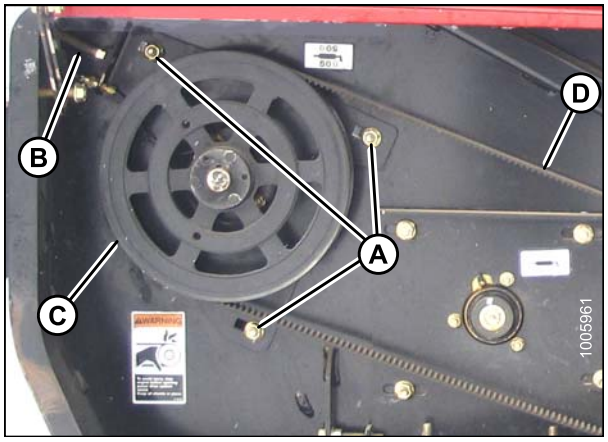


Figure 8.122

Removing Timing Belt on Right Side

⚠ CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove bolt (A) and remove cover (B) in right endsheet.

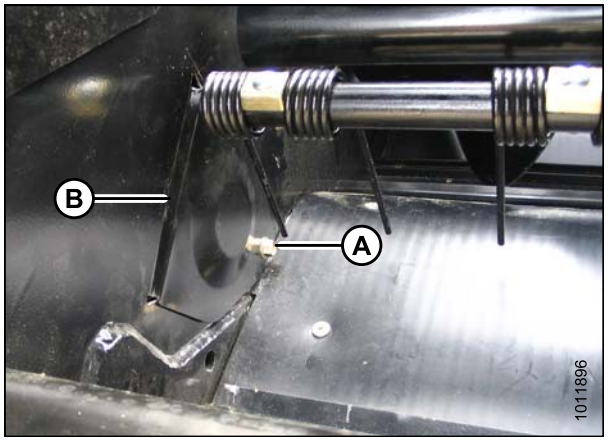


Figure 8.123

2. Open right endshield.
3. Loosen three nuts (A), and jam nut on adjuster bolt (B).
4. Turn adjuster bolt (B) so that knife drive belt (C) can be slipped off pulley (D).
5. Remove belt (C) from pulley (E) and remove belt through hole in endsheet.

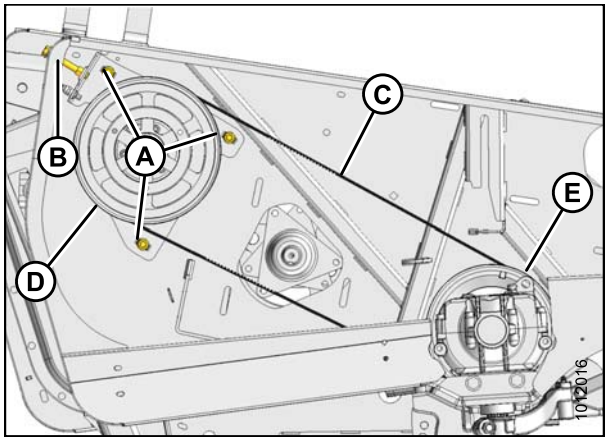


Figure 8.124

Installing Timing Belt on Right Side

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Route knife drive timing belt from inboard side of endsheet through opening (A).

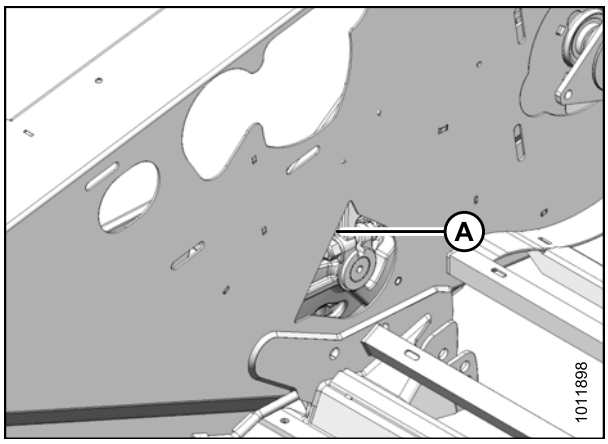


Figure 8.125

2. Locate belt (C) onto knife drive box pulley (E) and knife drive pulley (D) as shown.

   NOTE:
   When installing new belt, **NEVER** pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.

3. Turn adjuster bolt (B) to move pulley (C) until a force of 5–6.5 lbf (22–30 N) deflects belt (C) 9/16 in. (14 mm) at mid-span.
4. Tighten jam nut at (B), and three nuts (A).

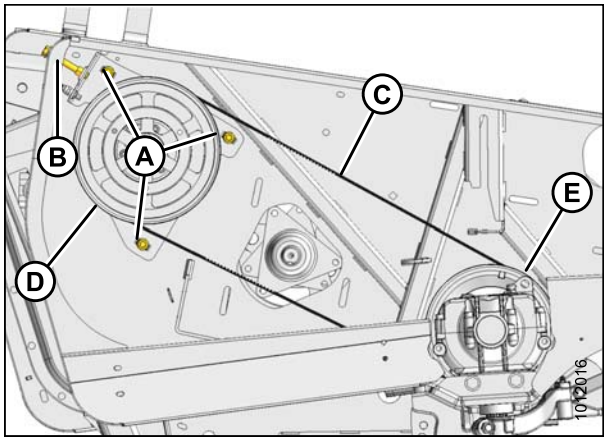


Figure 8.126

5. Install cover (B) in endsheet at knife drive box and secure with bolt (A).
6. Close endshield.

   NOTE:
   Readjust tension of a new belt after a short run-in period (about 5 hours).

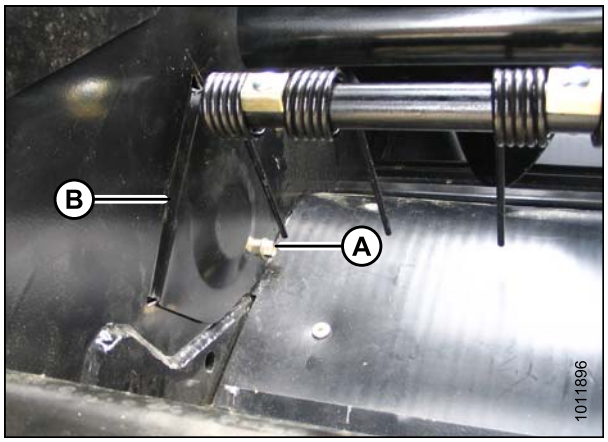


Figure 8.127

8.9.2 Reel Drive – A40-D

The reel drive gearbox and hydraulic motor are a factory-assembled unit. The gearbox is sealed, and requires no scheduled maintenance. If service is required for either the gearbox or motor, see your Dealer.

8.9.3 Auger Drive – A40-D

The A40-D header auger is driven directly from a hydraulic motor, and there are no belts or chains to maintain.

For auger and stripper bar maintenance procedures, refer to the following sections:

- *8.11.1 Straightening Auger Pans, page 263*
- *8.11.2 Replacing Rubber Fingers, page 263*
- *8.11.3 Stripper Bar, page 264*

8.10 Reel Tines and Tine Bar Bearings

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

8.10.1 Reel Tines and Tine Bar Bearings – A30-D

IMPORTANT:
Keep reel tines in good condition. Straighten or replace as required.

Separate procedures are required to replace reel tines, depending on their location on the reel.

Removing Tines and Bearings: Cam End

WARNING

Wear heavy gloves when working around or handling knife.

NOTE:
It is recommended that a light coating of anti-sieze compound be applied to tine tube connections and all bolts prior to reassembly.

1. Loosen bolt on cover (A), and slide cover to expose hole in cam disc. Rotate reel, and align bearing with hole.

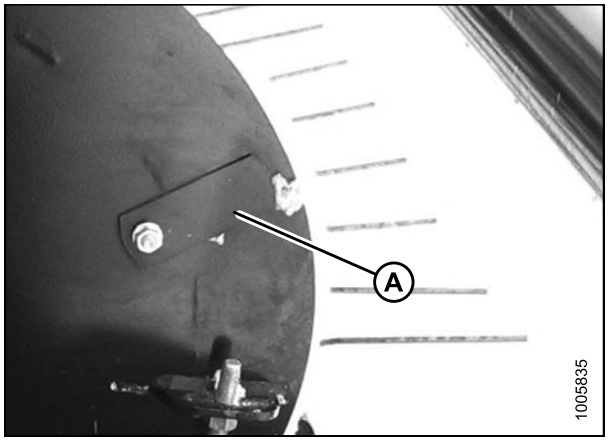


Figure 8.128

2. Remove cam follower bearing bolt (A), bearing (B), and nut.
3. Disengage cam arm (C) from the cam track with a pry bar.
4. Remove bolt (D), bolt (E), and keeper (F) that connect cam arm (C) and end tines to tine bar.
5. Remove bolts (G) securing tine bar bearing support (H) to reel arm.
6. Position end of tine bar clear of cam disc, and remove cam arm assembly (C).
7. Slide bearing support (H) off tine bar, and remove bearing halves (J).
8. Remove nut, bolt, and keeper on each tine to be removed, and slide tine off the bar.

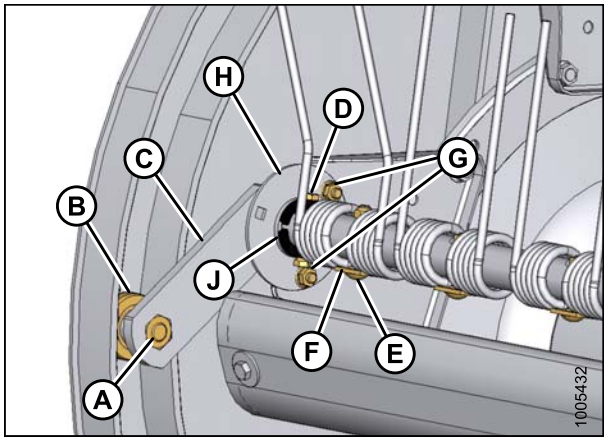


Figure 8.129

Removing Tines and Bearings: Opposite Cam End

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove bolts (A) securing tine bar bearing support (B) to reel arm.
2. Remove bolt (C), and keeper (D) that connect end tines to tine bar.
3. Remove bolt (E) securing bearing halves to tine bar.
4. Position end of tine bar clear of cam disc, and slide tines off bar.
5. Slide bearing support (B) off tine bar, and remove bearing halves (F).
6. Remove nut, bolt, and keeper on each tine to be removed, and slide tine off the bar.

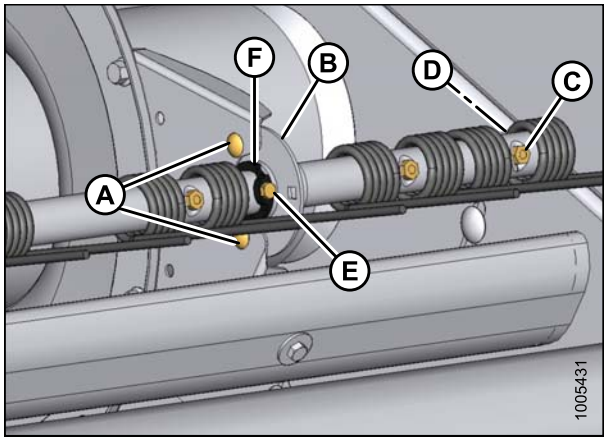


Figure 8.130

Installing Tines and Bearings: Opposite Cam End

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Slide tines and bearing support (A) onto tine bar.
2. Locate bearing halves (B) inside the bearing support (A).

   NOTE:
   Ensure bearings are installed with flanges of bearing facing the centerline of the header/mower conditioner.
3. Install bolt (C) through the bearings, tine bar and cam arm shaft. Secure with nut, and torque to 2–3 ft·lbf (2.5–4 N·m).
4. Attach bearing support to reel arm with bolts and nuts (D). Torque nuts to 21 ft·lbf (29 N·m).
5. Secure tines on tine bar with bolt (E) and keeper (F). Install nut with tapered side against tine bar.

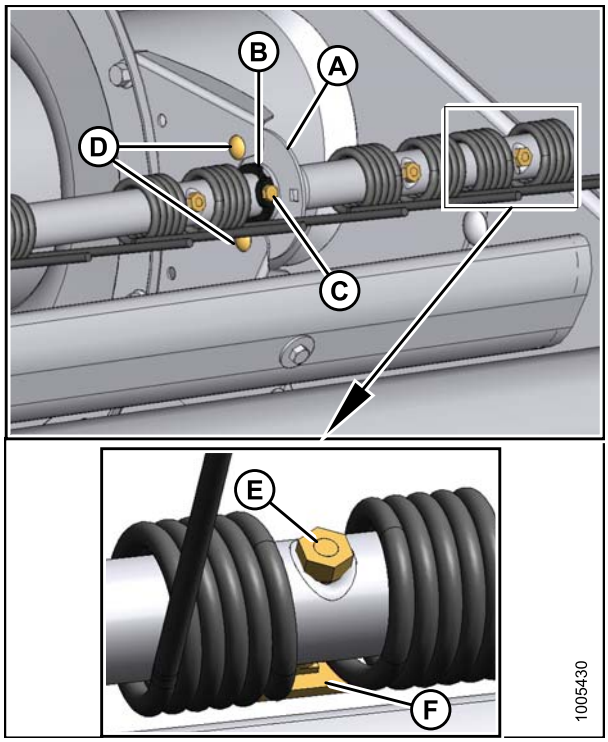


Figure 8.131

8.10.2 Reel Tines and Tine Bar Bearings – A40-D

Separate procedures are required to replace reel tines, depending on their location on the reel.

IMPORTANT:
Keep reel tines in good condition. Straighten or replace as required.

Replacing Tine and Bearing: Cam End – Disc #1

NOTE:
It is recommended that a light coating of anti-sieze compound be applied to tine tube connections and all bolts prior to re-assembly.

Replace tines and bearing at disc #1 (A) as follows:

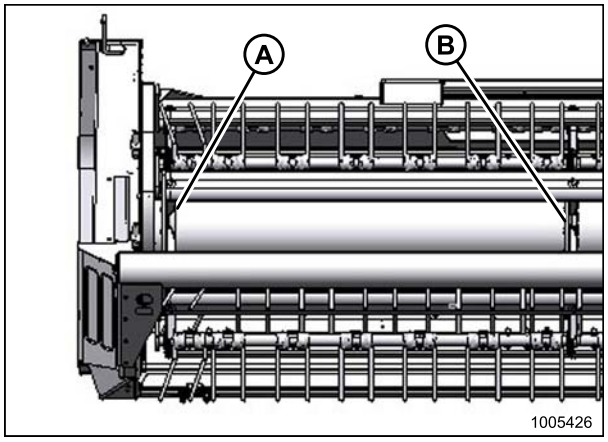


Figure 8.132: Cam End Discs

1. Loosen bolt on cover (A), and slide cover to expose hole in cam disc. Rotate reel, and align bearing with hole.

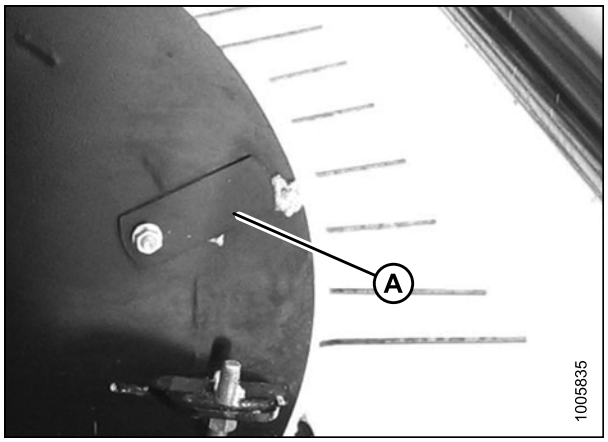


Figure 8.133: Cam Disc

2. Remove cam follower bearing bolt (A), bearing (B), and nut.
3. Disengage cam arm (C) from the cam track with a pry bar.
4. Remove flangette mounting bolts (D).

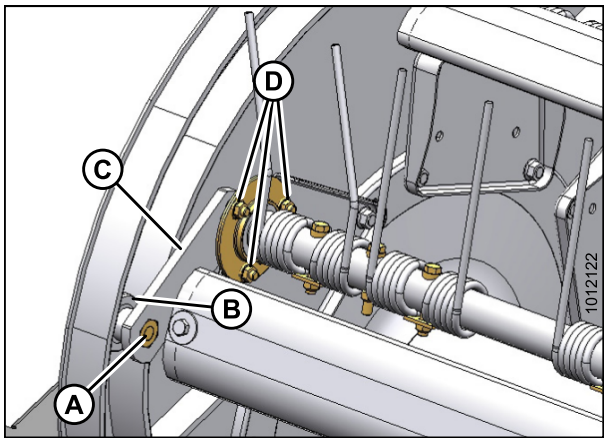


Figure 8.134: Cam Follower

5. Remove nuts (A), keepers (B), and shoulder bolts (C) that connect cam arm (D) and end tines (E) to tine bar.

   IMPORTANT:
   Tine attachment hardware and configuration may vary. Identify locations so that tine hardware will be reinstalled at same locations.

6. Position end of tine bar clear of cam disc, and remove cam arm assembly (D), complete with bearing assembly.

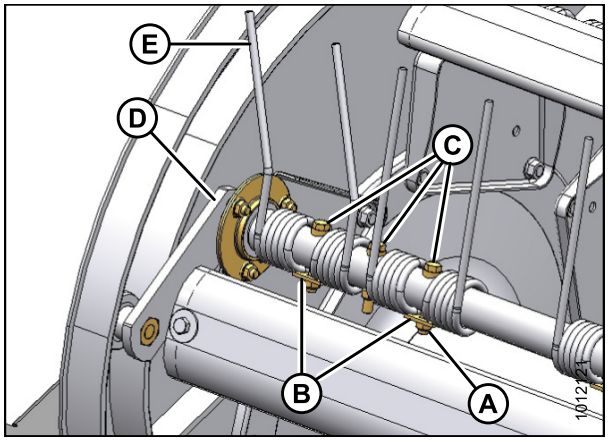


Figure 8.135: Tine Bar Type B

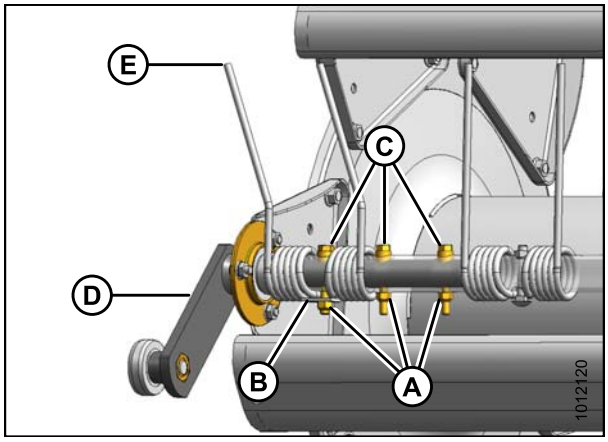


Figure 8.136: Tine Bar Type A

7. Replace bearing (A). Refer to *8.5.4 Installing Sealed Bearings, page 201*.

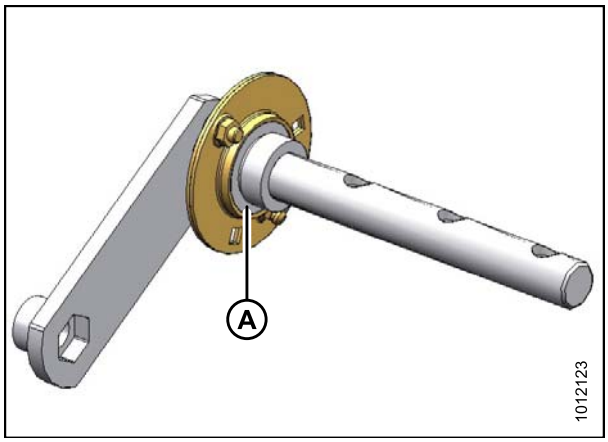


Figure 8.137: Cam Arm Assembly

8. Replace tines as follows:
   a. Remove bolt (A) and keeper (B) on tine to be replaced.
   b. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
   c. Slide tines off tine bar.
   d. Install replacement tine on tine bar and secure with bolt (A) and keeper (B). Install nut with flat side against tine bar.
   e. Slide remaining tines onto tine bar and attach to tine bar. Do **NOT** install bolts in end tines at this time.
9. Install cam arm assembly (A), complete with bearing onto tine bar.
10. Engage cam arm (A) into cam track as shown.
11. Attach bearing flangettes with bolts (B). Tighten bolts to 23–26 ft·lbf (31–36 N·m).
12. Lock the bearing.

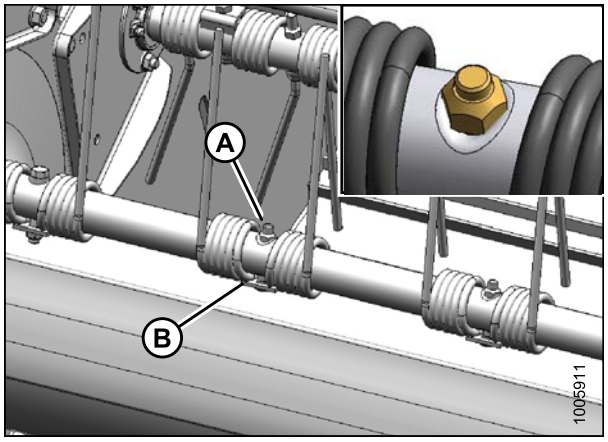


Figure 8.138: Tine Installation

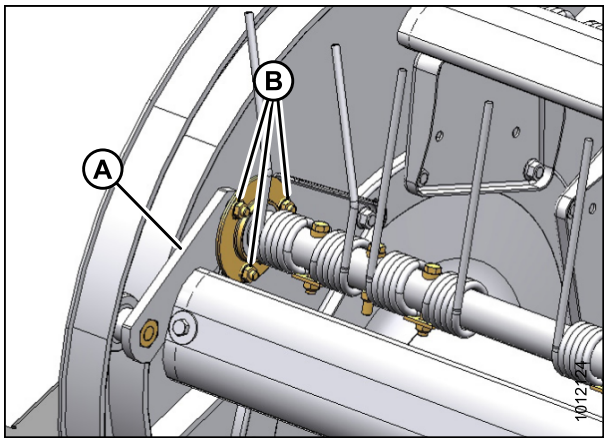


Figure 8.139: Cam End Tine Bar Early-Build 2015 with Shoulder Bolts (B) Tine Bar Shown

IMPORTANT:
It is recommended to replace hardware at cam end of tine bar with hardware as specified in the following steps.

13. Position tines as shown and install bolts (A) with keepers, spacers (B) and nuts (C).
14. Install bolts (D), spacers (B), and nuts (C) between tines as shown.
15. Alternate hardware configuration for later-build 2015:
    a. 5/16 x 2-1/2 Carriage Bolt (A), MD #136348
    b. Spacer (B), MD #170622
    c. Lock Nut (C), MD #018690
    d. 5/16 x 2 Hex Head Bolt (D), MD #021569

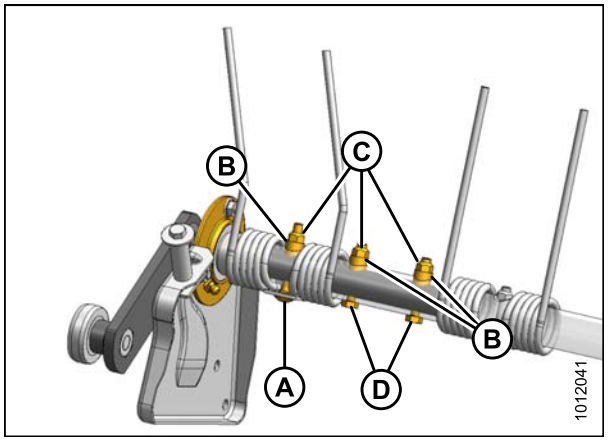


Figure 8.140: Type A Tine Bar – Later-Build 2015 Shown

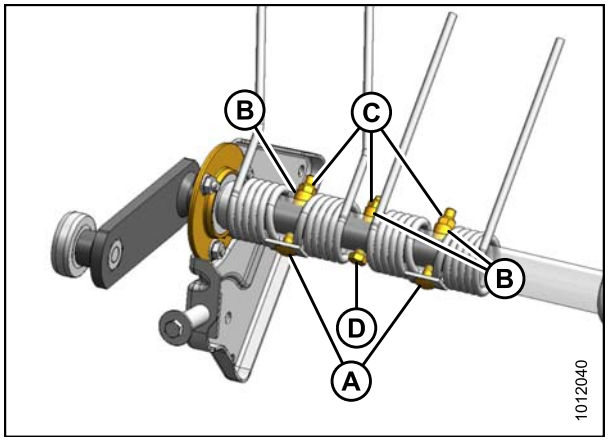


Figure 8.141: Type B Tine Bar – Later-Build 2015 Shown

16. Install cam follower bearing (A) with bolt (B). Apply Loctite® #262 (or equivalent) to bolt threads, and torque to 90 ft·lbf (122 N·m).

    IMPORTANT:
    Install nut with distorted thread **TOWARDS** bolt head.

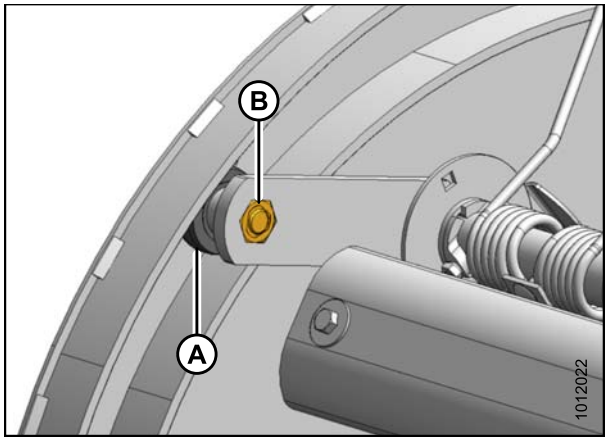


Figure 8.142: Cam Arm Bearing

17. Reposition cover (A) on cam, and tighten bolt.

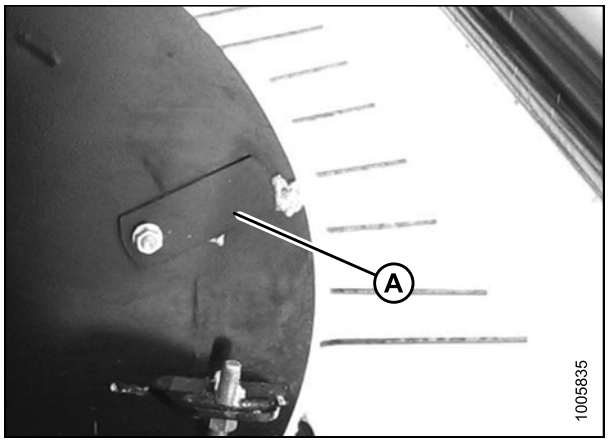


Figure 8.143: Cover

Replacing Tine and Bearing: Disc #2

Replace Tine and Bearing at disc #2 (B) as follows:

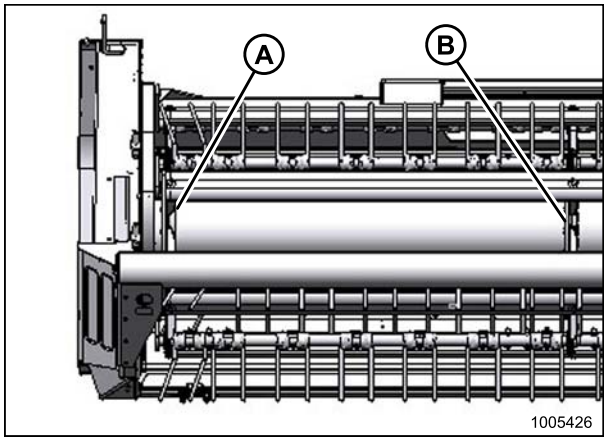


Figure 8.144: Cam End Discs

Type A Tine Bars

1. Remove flangette mounting bolts (A) at reel disc #2.
2. Remove shoulder bolts (B) and keeper (C) from tine bar.
3. Separate left tine bar (D) with bearing from center tine bar (E).
4. Remove tine from center tine bar (E).

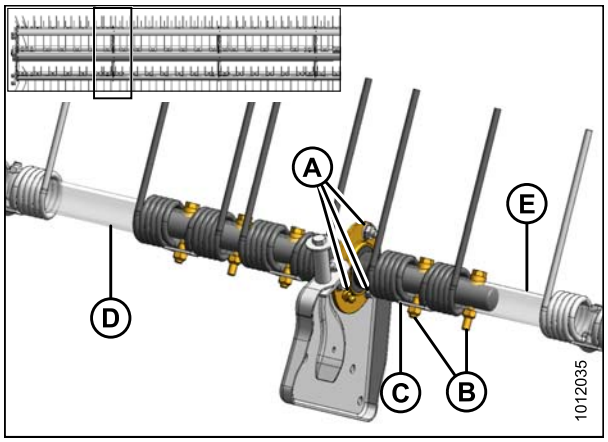


Figure 8.145: Tine Bar Type A

5. Remove bearing (A) from tine bar connecting shaft (B). Refer to *8.5.4 Installing Sealed Bearings, page 201*.
6. Remove nuts (C), shoulder bolts (D), keepers (E) from left tine bar (F) and remove tines (G).

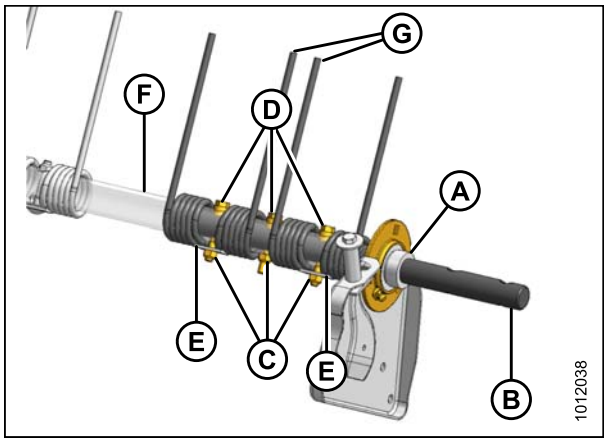


Figure 8.146: Tine Bar Type A

7. Replace tines as follows:
   a. Remove bolt (A) and keeper (B) on tine to be replaced.
   b. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
   c. Slide tines off tine bar.
   d. Install replacement tine on tine bar and secure with bolt (A) and keeper (B). Install nut with flat side against tine bar.
   e. Slide remaining tines onto tine bar and attach to tine bar. Do **NOT** install bolts in end tines at this time.
8. Install end tines (G) onto left tine bar (F) with shoulder bolts (D), keepers (E) and nuts (C).
9. Assemble new bearing (A) with flangettes onto connecting shaft (B). Refer to *8.5.4 Installing Sealed Bearings, page 201*.
10. Slip new tine onto center tine bar (E).
11. Assemble left tine bar (D) to center tine bar (E) and secure with shoulder bolts (B), keeper (C), and nuts.
12. Install tine bar onto reel disc with hardware (A). Tighten bolts to 23–26 ft·lbf (31–36 N·m).

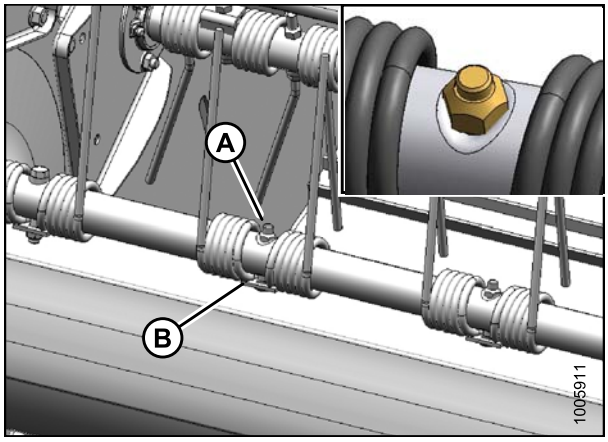


Figure 8.147: Tine Installation

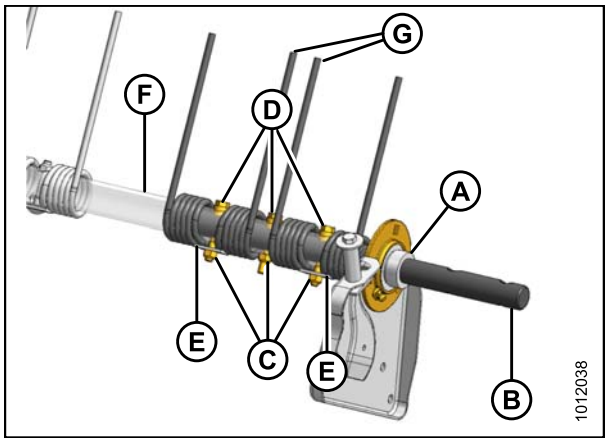


Figure 8.148: Tine Bar Type A

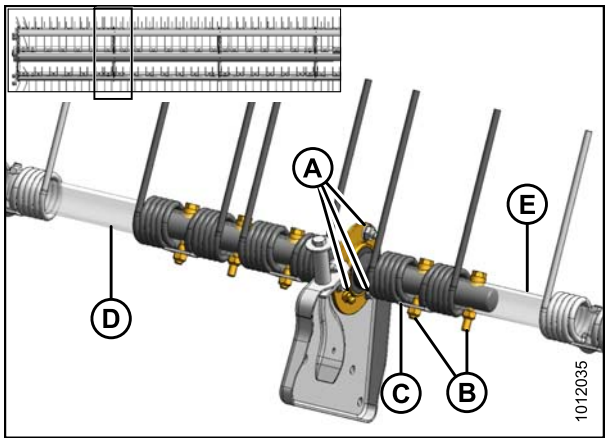


Figure 8.149: Tine Bar Type A

Type B Tine Bars

13. Remove flangette mounting bolts (A) at reel disc #2.
14. Remove shoulder bolts (B) and keeper (C) from tine bar.
15. Separate left tine bar (D) with bearing from center tine bar (E).
16. Remove tine from center tine bar (E).

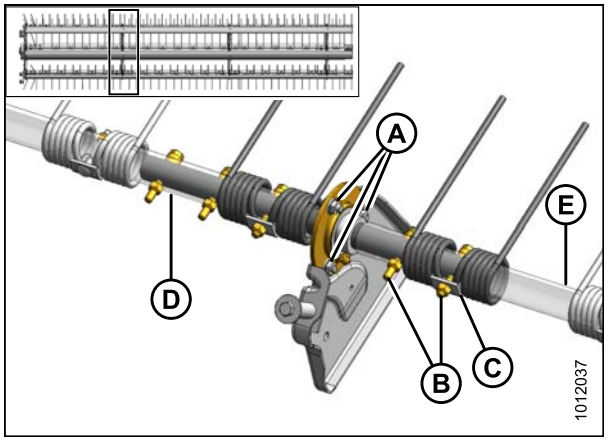


Figure 8.150: Tine Bar Type B

17. Remove bearing (A) from tine bar connecting shaft (B). Refer to *8.5.4 Installing Sealed Bearings, page 201*.
18. Remove nut (C), shoulder bolt (D), keeper (E) from left tine bar (F) and remove tine (G).

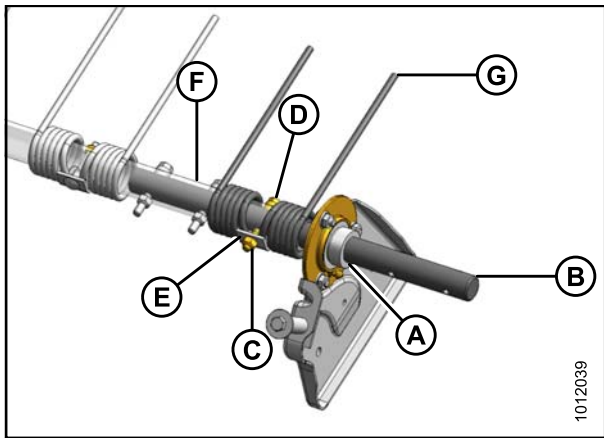


Figure 8.151: Tine Bar Type B

19. Install new tine (G) onto left tine bar (F) with shoulder bolt (D), keeper (E) and nut (C).
20. Assemble new bearing (A) with flangettes onto connecting shaft (B). Refer to *8.5.4 Installing Sealed Bearings, page 201*.

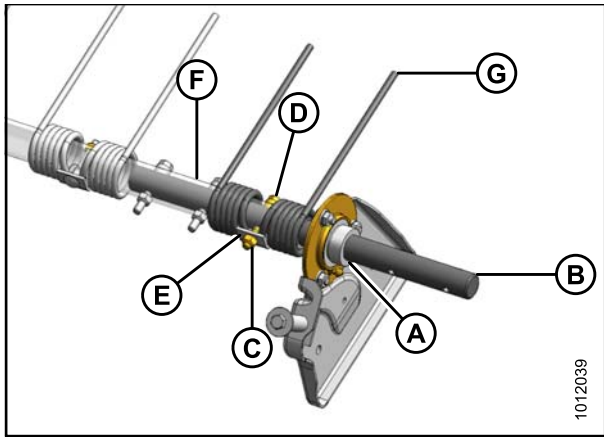


Figure 8.152: Tine Bar Type B

21. Replace tines as follows:
    a. Remove bolt (A) and keeper (B) on tine to be replaced.
    b. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
    c. Slide tines off tine bar.
    d. Install replacement tine on tine bar and secure with bolt (A) and keeper (B). Install nut with flat side against tine bar.
    e. Slide remaining tines onto tine bar and attach to tine bar. Do **NOT** install bolts in end tines at this time.
22. Slip new tine onto center tine bar (E).
23. Assemble left tine bar (D) to center tine bar (E) and secure with shoulder bolt (B) and nut.
24. Secure tine onto center tine bar (E) with shoulder bolt (B), keeper (C) and nut.
25. Install tine bar onto reel disc with hardware (A). Tighten bolts to 23–26 ft·lbf (31–36 N·m).

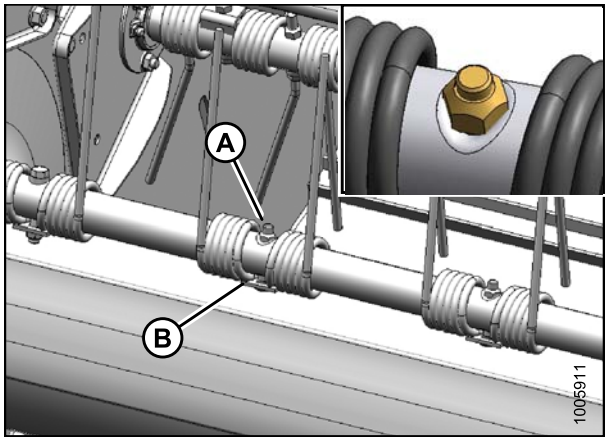


Figure 8.153: Tine Installation

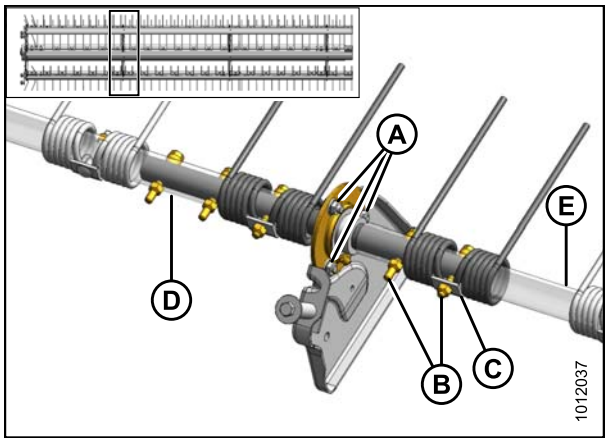


Figure 8.154: Tine Bar Type B

Replacing Tine and Bearing: Center Section X

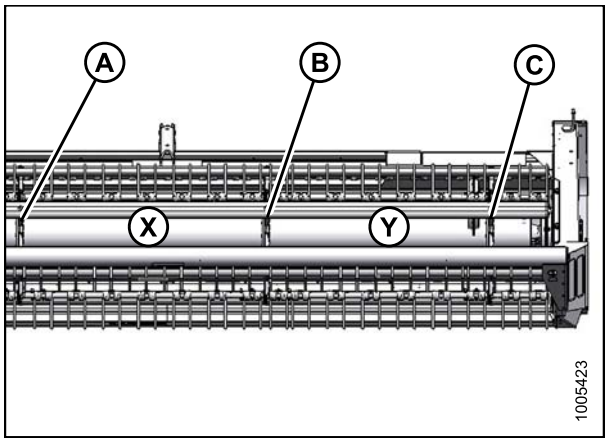


Figure 8.155

A - Disc #2
B - Disc #3
C - Disc #4
X - Section X
Y - Section Y

1. Remove flangette mounting bolts (A) at reel discs #3 and #4.

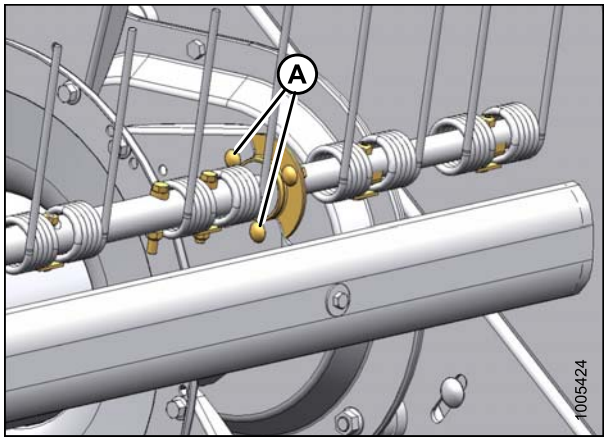


Figure 8.156: Disc #4

2. Remove shoulder bolts (B) and keeper (C) connecting tine bar sections '**X**' and '**Y**' at reel disc #3.
3. Lift tine bar away from reel arms, and remove complete tine bar section '**Y**' (including reel bearings at discs #3 and #4).
4. To replace tine bar bearing, refer to *8.5.4 Installing Sealed Bearings, page 201*.

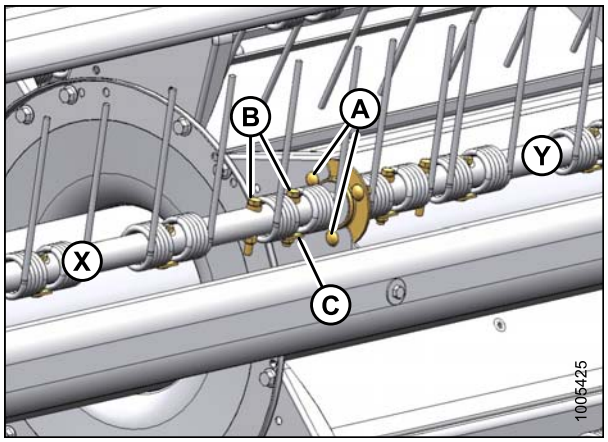


Figure 8.157: Disc #3

A - Flangette Mounting Bolts
B - Shoulder Bolts
C - Keeper
X - Section X
Y - Section Y

5. Remove tine as follows:
   a. Remove bolt (A) and keeper (B) on tine to be replaced.
   b. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
   c. Slide tines off tine bar.
   d. Install tines on tine bar, and secure with bolts (A) and keepers (B). Install nut with tapered side against tine bar. Do **NOT** install bolts in end tines at this time.

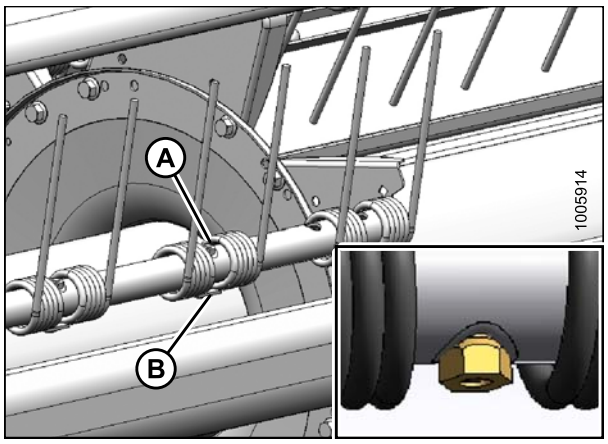


Figure 8.158: Disc #3

6. Assemble tine bar section '**Y**' (including reel bearings at discs #3 and #4) to tine bar section '**X**' at reel disc #3.
7. Position tines as shown, and install shoulder bolts (B) with keeper (C).

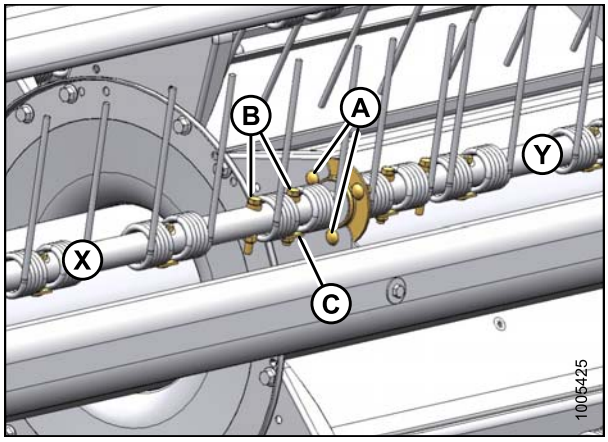
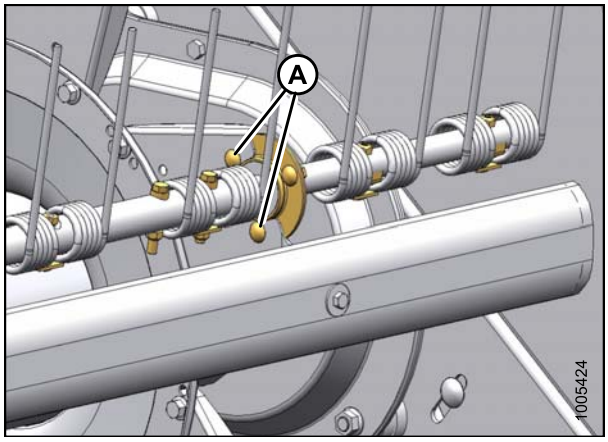


Figure 8.159: Disc #3

A - Flangette Mounting Bolts **B - Shoulder Bolts**
C - Keeper **X - Section X**
Y - Section Y

8. Attach bearing flangettes to reel arm at discs #3 and #4 with bolts (A). Tighten bolts to 23–26 ft·lbf (31–36 N·m).



Replacing Tine and Bearing: Opposite Cam – Section Y

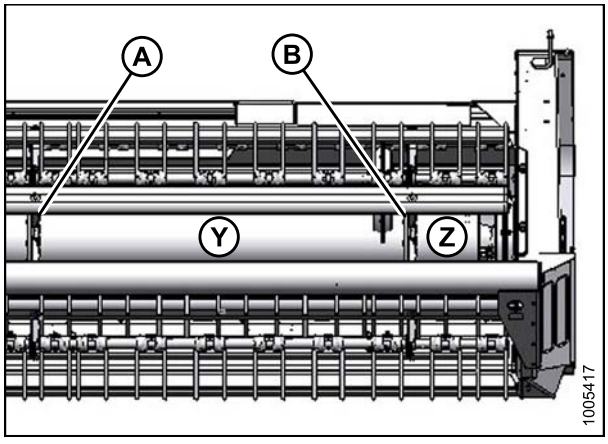


Figure 8.160

A - Disc #3 **B - Disc #4**
Y - Section Y **Z - Section Z**

1. Remove shoulder bolts (A) and keeper (B) connecting tine bar sections '**Z**' and '**Y**' at reel disc #4.
2. Remove flangette mounting bolts (C) at reel disc #4.
3. Lift tine bar away from reel arms, and remove complete tine bar section '**Z**', complete with bearing assembly.
4. To replace tine bar bearing, refer to *8.5.4 Installing Sealed Bearings, page 201*.

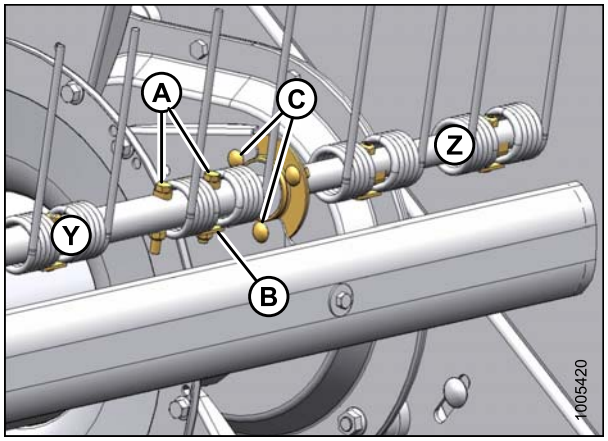


Figure 8.161: Disc #4

A - Shoulder bolts **B - Keeper**
C - Flangette mounting bolts **Y - Section Y**
Z - Section Z

5. Replace tine as follows:
   a. Remove bolt (A) and keeper (B) on tine to be replaced.
   b. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
   c. Slide tines off tine bar.
   d. Install tines on tine bar, and secure with bolts (A) and keepers (B). Install nut with tapered side against tine bar. Do **NOT** install bolts in end tines at this time.
6. Install tine bar extension '**Z**' including bearing to section '**Y**' at reel disc #4.

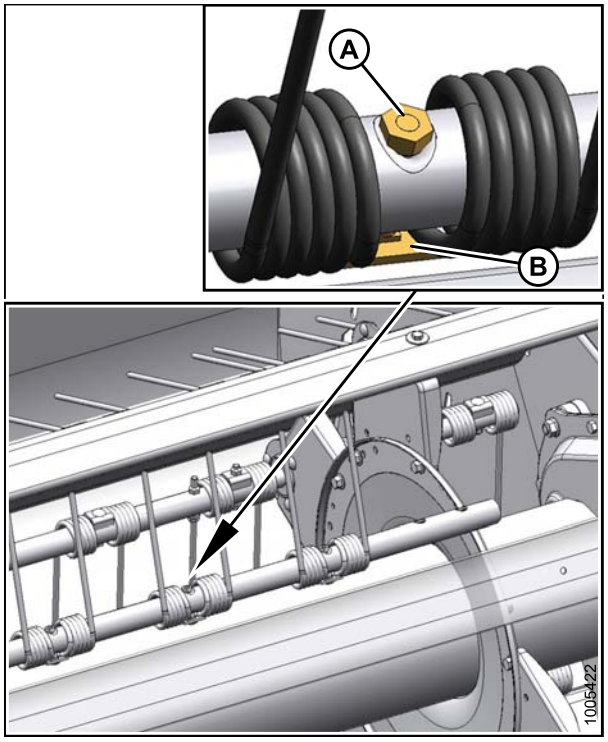


Figure 8.162: Disc #4

A - Bolt **B - Keeper**
Y - Section Y

7. Install shoulder bolts (A) and keeper (B) with tine to connect tine bar extension.
8. Install flangette mounting bolts (C) at reel disc #4. Tighten to 16–20 ft·lbf (21–27 N·m).

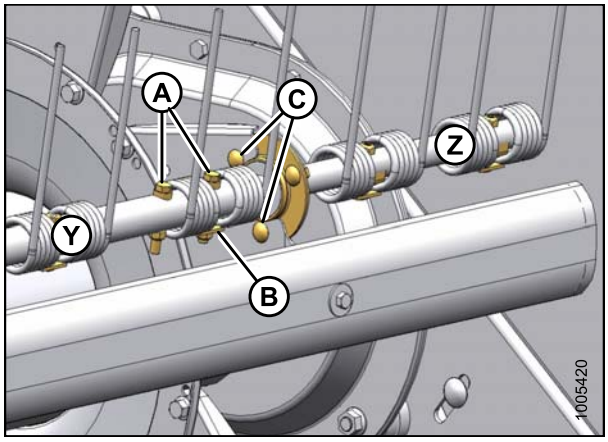


Figure 8.163: Disc #4

A - Shoulder Bolts
B - Keeper
C - Flangette Mounting Bolts
Y - Section Y
Z - Section Z

Replacing Tine: Tine Bar Extension – Section Z

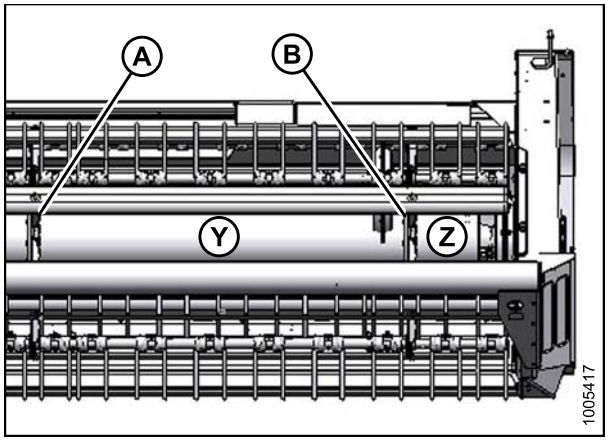


Figure 8.164

A - Disc #3
B - Disc #4
Y - Section Y
Z - Section Z

1. Remove bolt (A) and keepers (B) on tine to be replaced, and slide tines off tine bar.

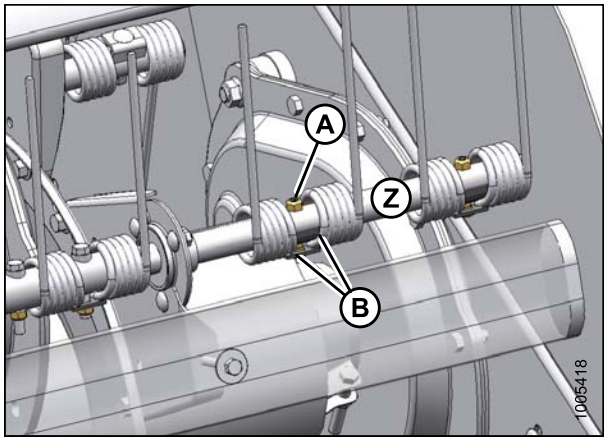


Figure 8.165: Disc #4

A - Bolt **B - Keepers**
Z - Section Z

2. Install tines on tine bar, and secure with bolt (A) and two keepers (B). Tine (C) must be clamped between keepers (B). Install nut with flat side against tine bar extension.

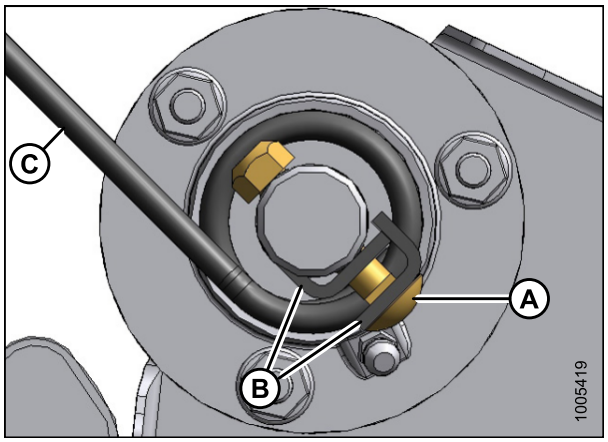


Figure 8.166: End View of Tine Bar

A - Bolt **B - Keepers**
C - Tine

8.11 Auger

The auger on an A30-D mower conditioner is mechanically-driven.

8.11.1 Straightening Auger Pans

The high density polyethylene auger pans are repairable and replaceable. Refer to your Dealer for details on replacing the pans.

IMPORTANT:
To prolong the life of the auger pan, be sure to check that reel tines do not contact the pans when adjusting the reel position or tine pitch.

Stones and other debris can deform the polyethylene pans. If this occurs, the pans can be straightened.

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*, and *1 Safety, page 1*.

1. Heat the deformed area with a heat gun until the poly is almost sticky.
2. Push out the dent, and then apply a cold wet rag. Keep wetting the rag in cold water, and applying it on the area until cool. This ensures the poly retains its shape.

   NOTE:
   If the dent is too severe, and has stretched the poly, it may be necessary to locally remove the poly. Use a plastic welder to rejoin the material. Replacement pans are also available from your Dealer.

8.11.2 Replacing Rubber Fingers

Rubber fingers should be replaced if missing or damaged.

To replace a rubber finger, follow these steps:

1. Remove nut and bolt (A), and then remove finger (B).
2. Position new finger in holder, and then install bolt and nut. Rubber finger should be free to move after bolt is tightened.

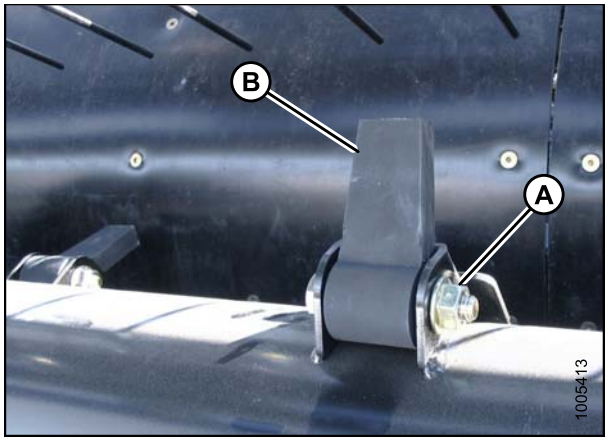


Figure 8.167: Auger Finger

8.11.3 Stripper Bar

Stripper bars help prevent the crop from wrapping around the auger and improve crop flow into the conditioner.

To maintain 1/32–5/32 in. (1–4 mm) clearance (B) between auger (A) flighting and stripper bars, bars may need replacing due to wear or damage. Shims may also need to be installed to compensate for local irregularities in the structure.

If after adjusting stripper bars, auger position needs to be adjusted, refer to *3.7.4 Setting Auger Position, page 59*.

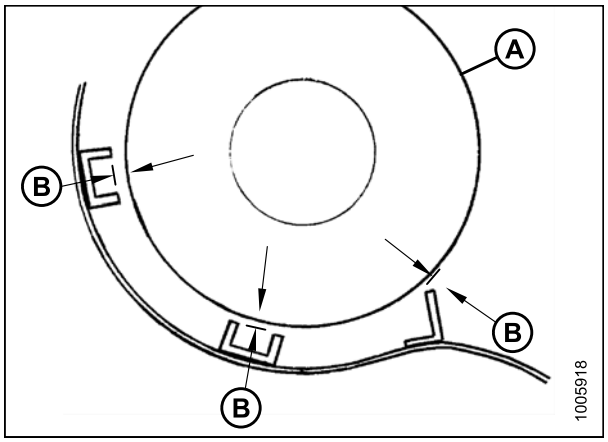


Figure 8.168: Auger to Stripper Bar Clearance

Removing Stripper Bar

Heavy crops may cause plugging across the auger due to restricted flow at the stripper bars. To address this problem, remove the lower stripper bar (A), and if necessary, the center stripper bar (B) at each end of the header.

WARNING

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

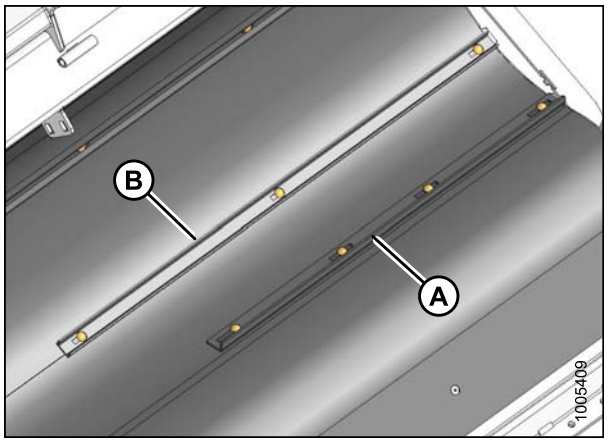


Figure 8.169: Stripper Bars

To remove a stripper bar, follow these steps:

1. Remove bolts attaching stripper bar to pan.
2. Remove stripper bar.
3. Replace bolts in pan.

NOTE:
Special countersunk bolts are available from your Dealer.

Replacing Stripper Bars

WARNING

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

1. Remove four nuts and bolts (A) that secure each stripper bar (B) (LH and RH) to the pan, and remove bars. There are six bars in total.
2. Position new bars (B) on pan as shown, with upper flange on front bar facing forward.
3. Install three bolts and nuts (A) in each bar, and torque to 150 ft·lbf (203 N·m).
4. Check clearance between auger and stripper bars.
5. Loosen bolts (A), and add shims between stripper bars and pan at bolt locations as required to obtain clearance as shown.
6. Retighten bolts to specified torque.

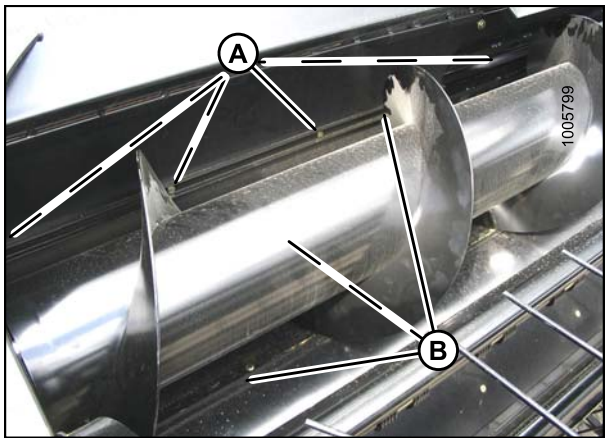


Figure 8.170

Installing Front Stripper Bar Extensions

Extensions for the front stripper bar are provided for installation (if required for certain crop conditions), especially in tall crops that cause material to bunch up at the ends of the conditioner rolls.

Stripper bar extensions will allow the auger to carry the crop more towards the center, rather than prematurely feeding it to the conditioner.

To install front stripper bar extensions, follow these steps:

1. Raise header, and engage lift cylinder stops.
2. Remove nuts and carriage bolts (A) securing the two extensions (B) to underside of header pan support, and retain for reinstallation.

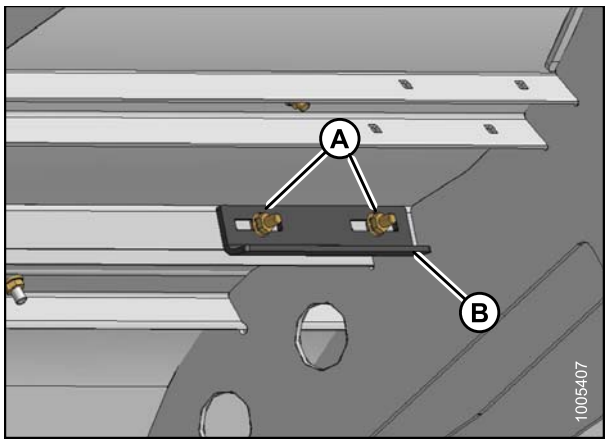


Figure 8.171

3. Position extension (D) at inboard end of front stripper bars (E), and mark locations of the two holes onto the plastic pan.
4. Drill two 5/16 in. (8 mm) holes at these locations.
5. Install extension with previously removed carriage bolts (C).
6. Repeat above steps for other extension.

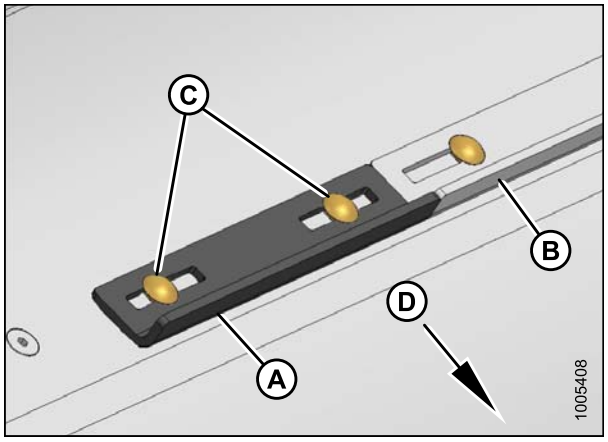


Figure 8.172

A - Stripper bar extension
B - Stripper bar
C - Carriage bolts
D - Forward

8.12 Conditioner

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

8.12.1 Changing Gearbox Oil

NOTE:
Change conditioner drive gearbox lubricant after the first 50 hours of operation, and every 1000 hours (or 3 years) thereafter.

To change the oil in the conditioner gearbox, follow these steps:

1. Lower header to ground.
2. Open driveline shield.
3. Place a suitable container under gearbox drain to collect oil.
4. Remove breather (A), and check plug (B).

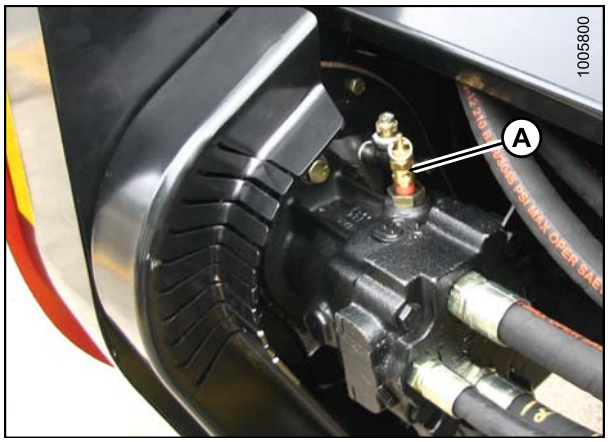


Figure 8.173: Gearbox Plugs

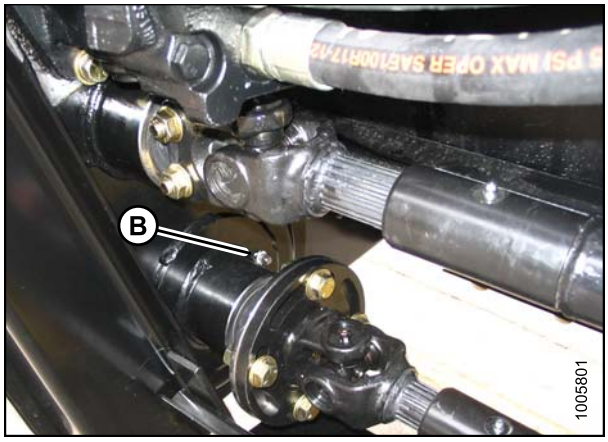


Figure 8.174

5. Remove drain plug (C) and allow oil to drain.
6. Replace drain plug (C), and add oil at (A) to required level. Use Gear Lubricant, SAE 85W-140, API Service Class GL-5, 1.5 quarts (1.4 liters).
7. Oil is at required level when it runs out of check plug (B).

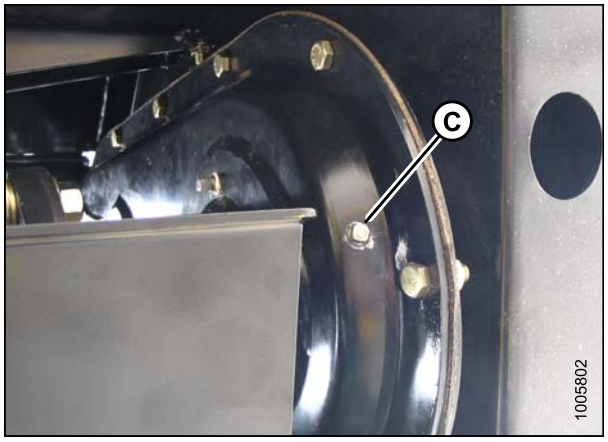


Figure 8.175: Gearbox Drain

8.12.2 Removing Forming Shield (A40-D)

1. Remove hairpins (B), and washers that secure straps (A) to frame.
2. Hold onto forming shield, and slip straps off pins. Lower forming shield to ground.

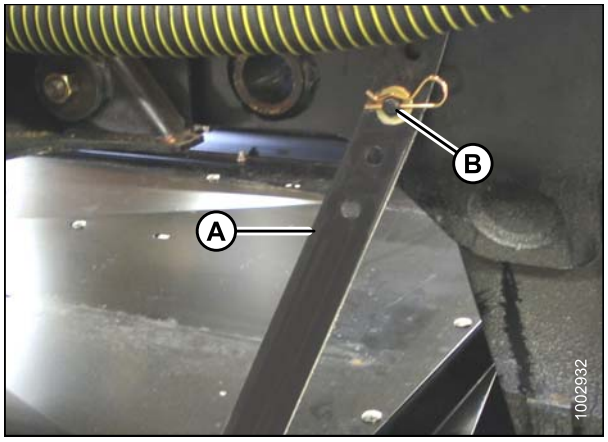


Figure 8.176: Forming Shield

3. Remove two clevis pins (B) from forming shield forward end.
4. Lift forming shield off bolts (A) in windrower legs, and lower to ground. Replace clevis pins in forming shield.
5. Slide forming shield out from under windrower, or drive windrower away from forming shield.

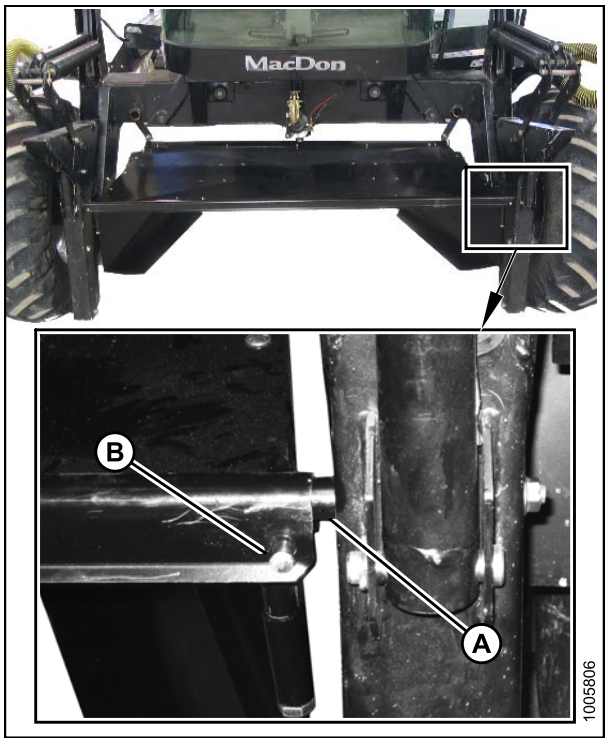


Figure 8.177: Forming Shield

8.12.3 Disassembling Forming Shield (A40-D)

To disassemble the forming shield, follow these steps:

1. Invert forming shield onto top.
2. Remove lynch pin (A) from adjuster rods (B), and disassemble rods from side deflectors (C).

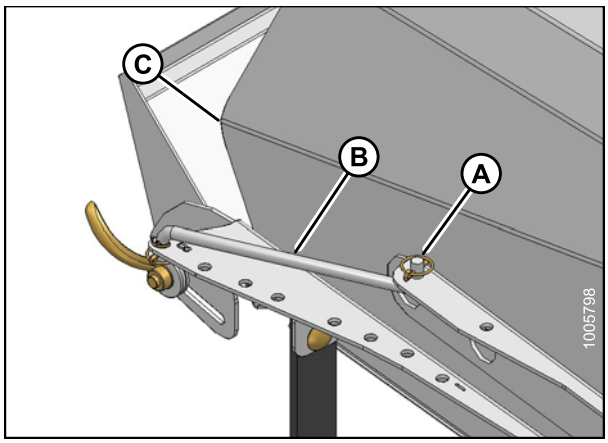


Figure 8.178: Forming Shield

3. Disassemble nut (A) from bolt (B), and lift deflector (C) and washer (D) off forming shield. Repeat for other deflector.

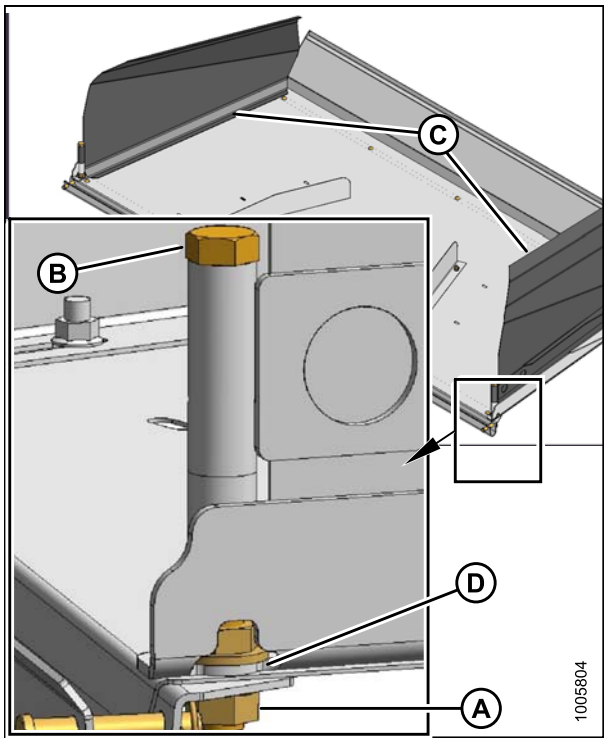


Figure 8.179: Forming Shield

4. Disassemble locking handles (A), and remove bolts.
5. Disassemble fluffer shield (B) from forming shield cover.

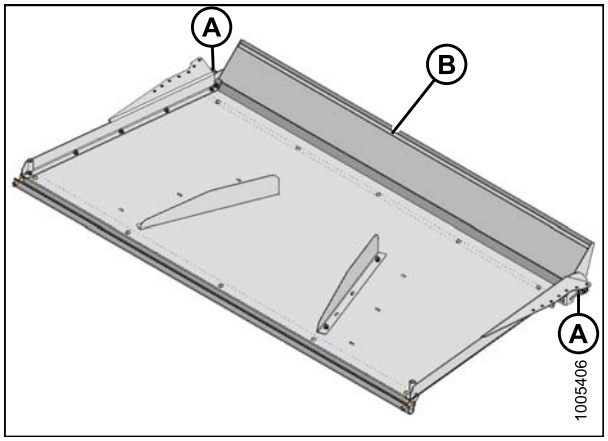


Figure 8.180: Cover

6. Remove bolts (A) to remove deflector fins (B) from cover.

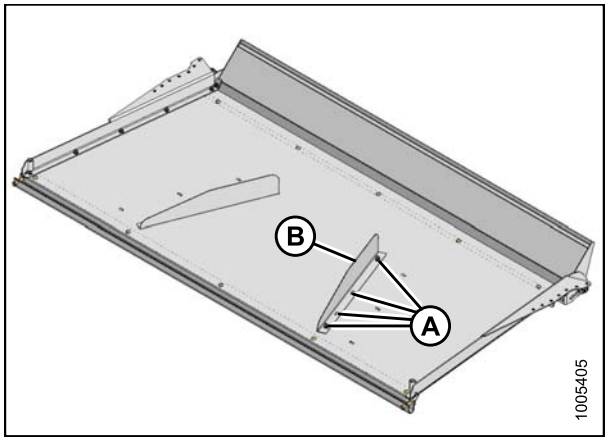


Figure 8.181: Cover

8.12.4 Assembling Forming Shield (A40-D)

To assemble the forming shield, follow these steps:

1. Attach deflector fins (B) to forming shield cover with bolts (A).

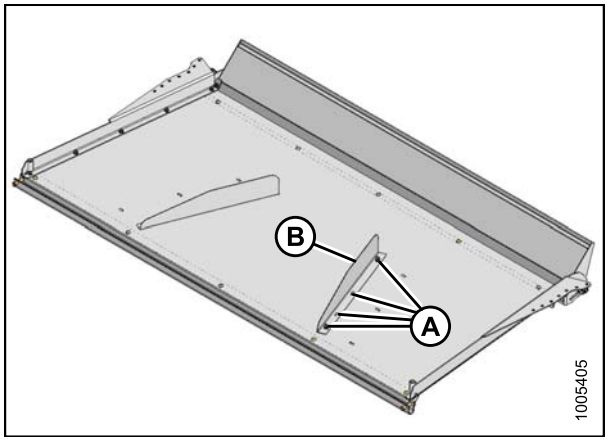


Figure 8.182: Cover

2. Attach fluffer shield (B) to forming shield cover.
3. Attach locking handles (A) to forming shield cover with bolts.

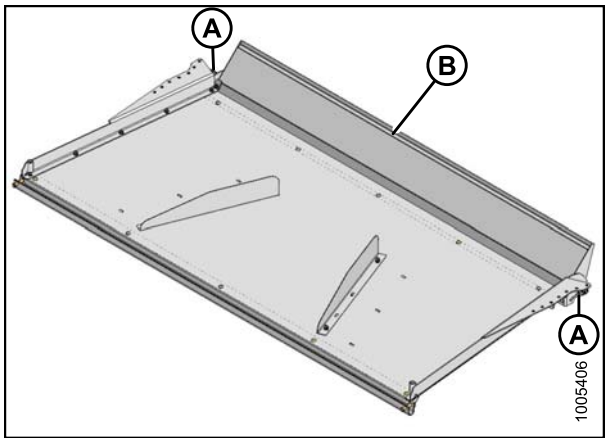


Figure 8.183: Cover

4. Attach deflectors (C) and washers (D) to forming shield cover with nuts (A) and bolts (B).

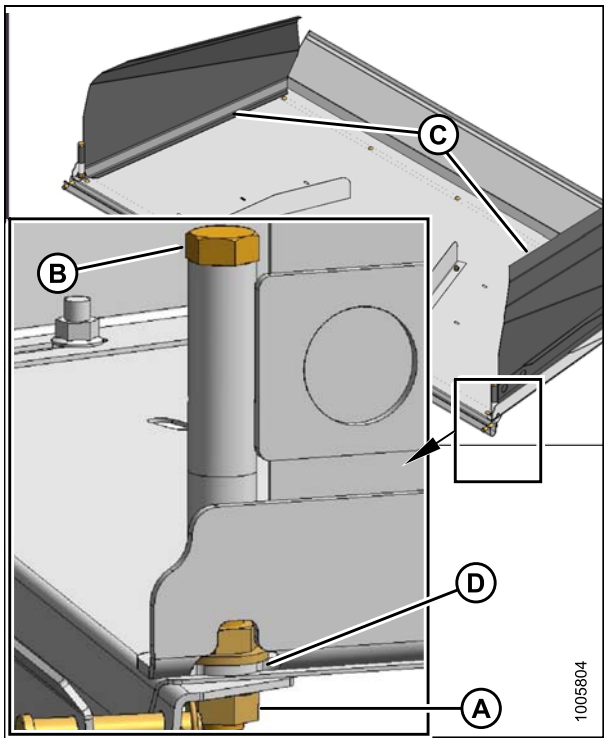


Figure 8.184: Forming Shield

5. Attach adjuster rods (B) to side deflectors (C) with lynch pin (A).

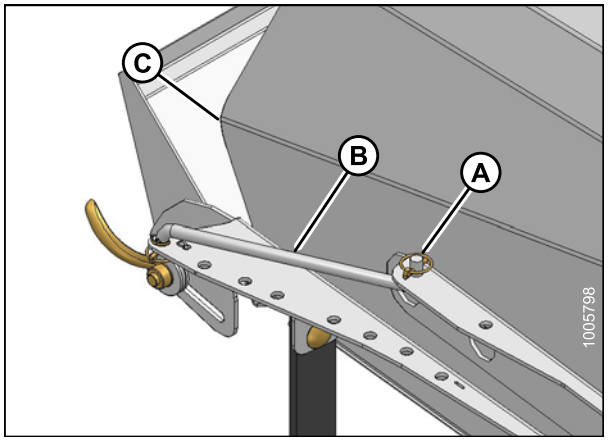


Figure 8.185: Forming Shield

8.12.5 Installing Forming Shield (A40-D)

To install forming shield, follow these steps:

1. Remove two clevis pins (A) from forming shield forward end.

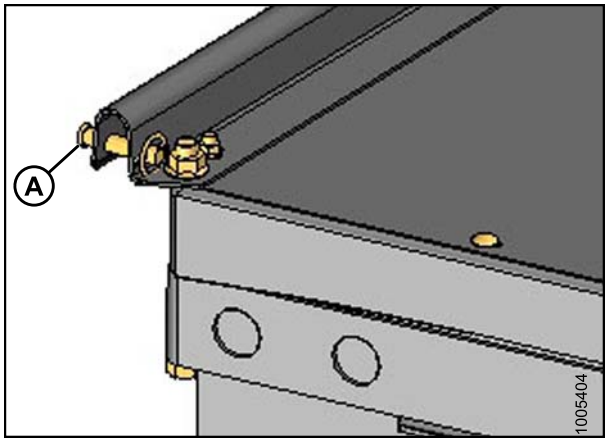


Figure 8.186: Forming Shield

2. Position forming shield (A) under the windrower frame.

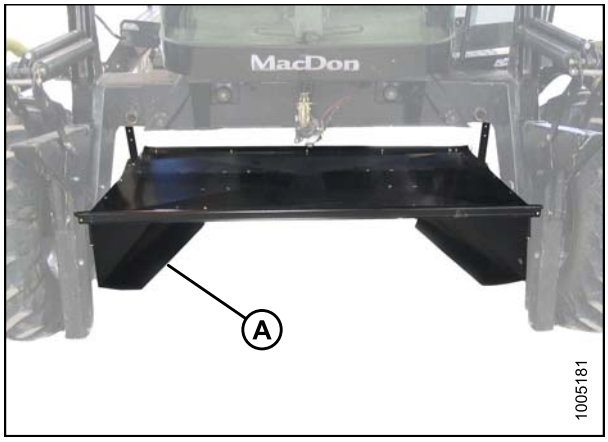


Figure 8.187: Forming Shield

3. Lift forming shield onto bolts (A) in windrower legs, and secure with clevis pins (B) and hairpin.

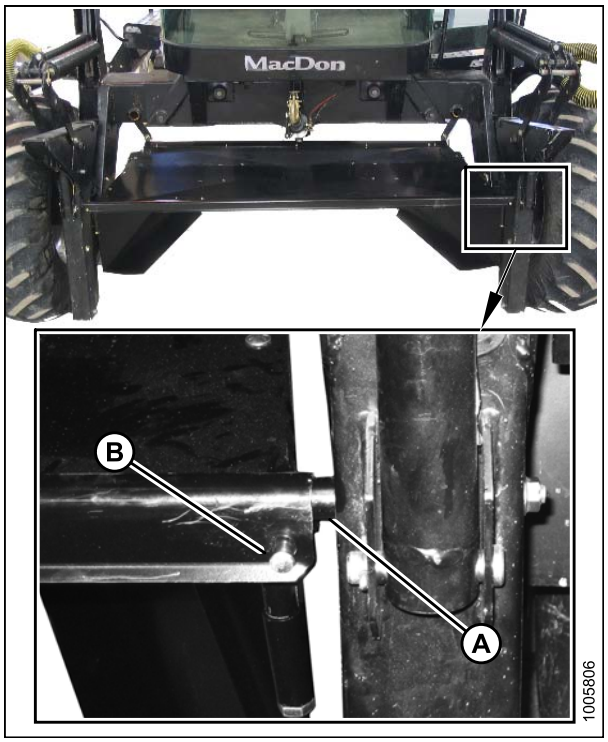


Figure 8.188: Forming Shield

4. Lift aft end of forming shield, and attach straps (A) to pins (B) on windrower frame. Install washer and hairpin to secure strap. Use the middle hole, and adjust height to suit the crop.

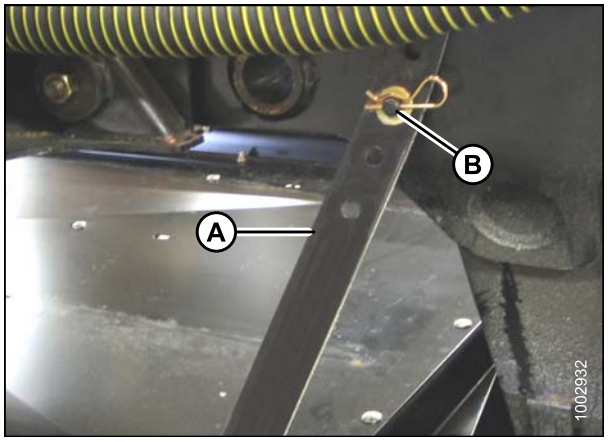


Figure 8.189: Straps

5. Set forming shield side deflectors to desired width by repositioning adjuster bars (A). Use the same hole location on both sides.
6. Adjust fluffer shield (B) to middle position. Loosen handles (C) if required.

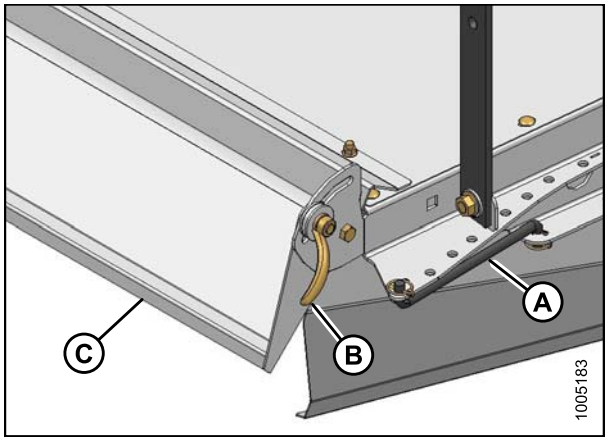


Figure 8.190: Forming Shield

8.12.6 Removing Hydraulic Motor

1. Open shield covering conditioner drive.

   IMPORTANT:
   Mark your hoses and make a diagram of hose routing. This will be useful during reassembly.

2. For **PULL-TYPE units**, disconnect hydraulic hoses from the motor, and install caps on hose ends and motor ports.
3. For **SELF-PROPELLED units**, disconnect hoses at couplers on motor.
4. Remove two bolts (A) securing motor to gearbox, and remove motor.

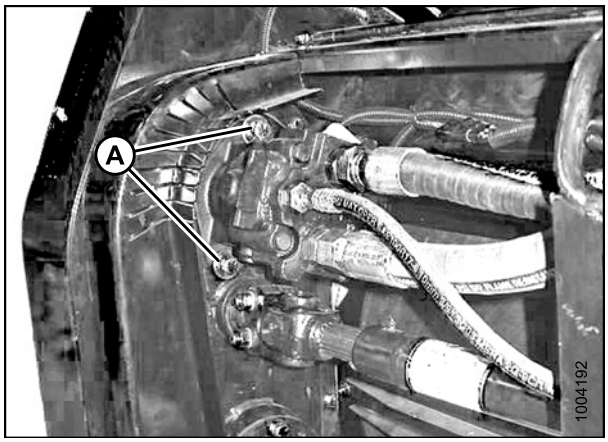


Figure 8.191: Motor Bolts

8.12.7 Installing Hydraulic Motor

Install hydraulic motor onto the gearbox as follows:

1. Apply light coat of silicone to motor flange, and position motor on gearbox as shown until mounting holes are aligned, and pinion engages gear in gearbox.
2. Clean off excess sealant from motor flange and gearbox face.
3. Install bolts (A), and washers, and torque to 75 ft·lbf (102 N·m).
4. Reconnect hoses to motor.

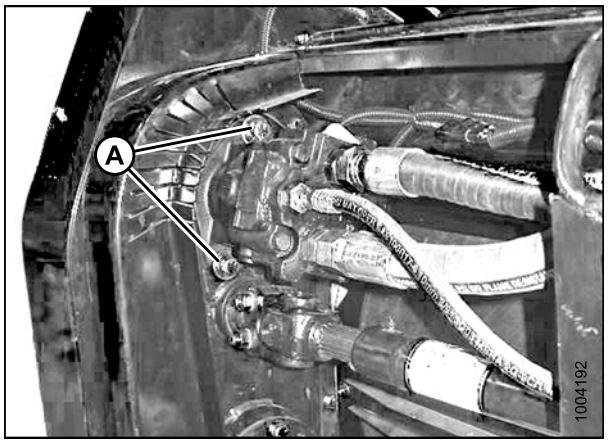


Figure 8.192: Motor Bolts

8.12.8 Removing Conditioner Gearbox – A30-D

To remove the conditioner drive gearbox from an A30-D header, follow these steps:

1. Open the conditioner driveshield.
2. Remove two bolts (A) and nuts securing channel (B) to the frame.

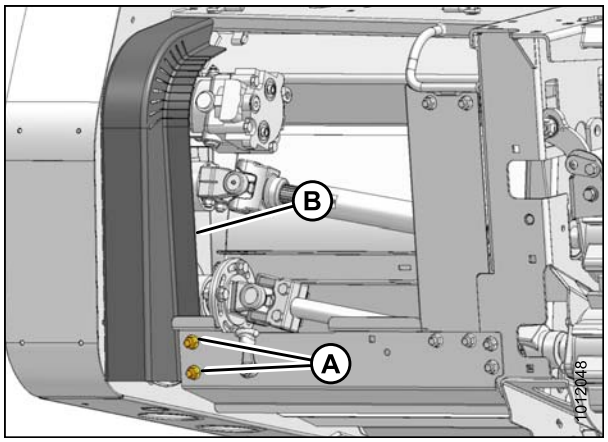


Figure 8.193: Conditioner Drive

3. Remove two hex bolts (A), and one carriage bolt (B) securing channel (C) to endsheet, and remove channel (C).

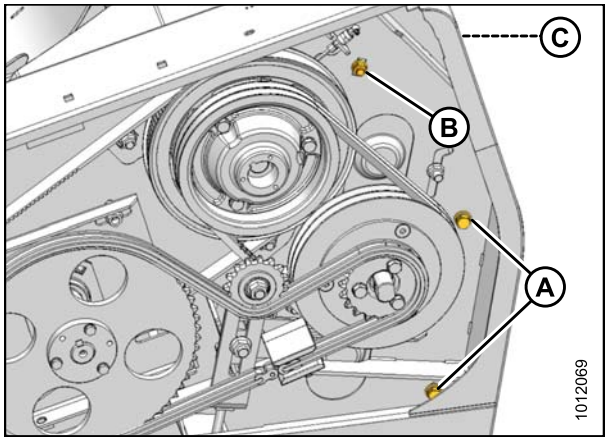


Figure 8.194: Header Drives

4. Remove two bolts (A) securing motor (B) to gearbox. Do **NOT** disconnect hoses.

   NOTE:
   Hoses not shown for clarity.

5. Carefully pull motor (B) from gearbox and move it clear of work area.

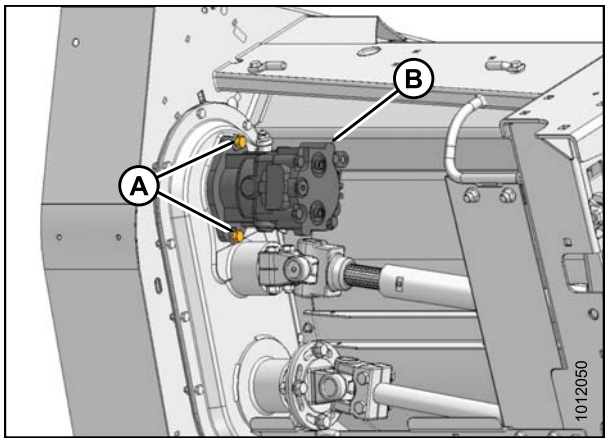


Figure 8.195: Motor

6. Remove two bolts (A) in upper driveline (B).
7. Pull driveline (B) off gearbox. If necessary, use a screwdriver or equivalent to spread yoke. Move driveline clear of work area.
8. Remove four bolts (C) from flange on lower driveline (D) and remove driveline from gearbox. Move driveline clear of work area.

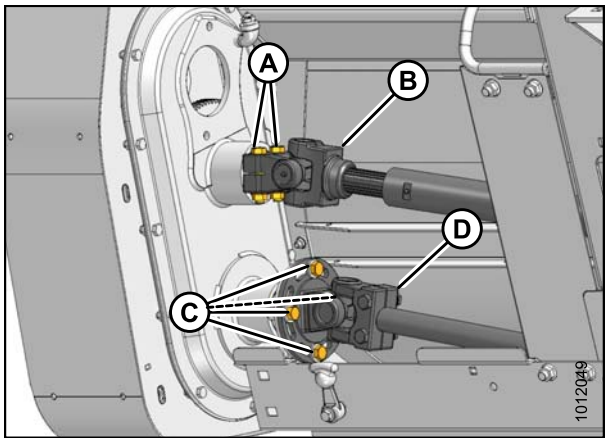


Figure 8.196: Top Driveline

9. Remove auger drive chain (A). Refer to *Removing Auger Drive Chain, page 238*.
10. Remove knife drive v-belts (B). Refer to *Removing Double V-Belts on Left Side, page 230*.

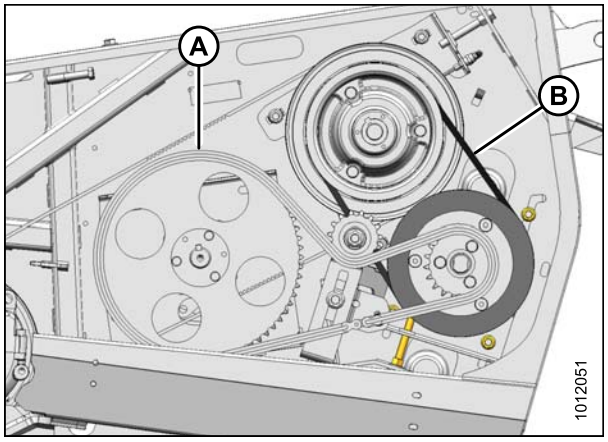


Figure 8.197

11. Remove the three bolts (A) from hub (B) and remove hub and sprocket.

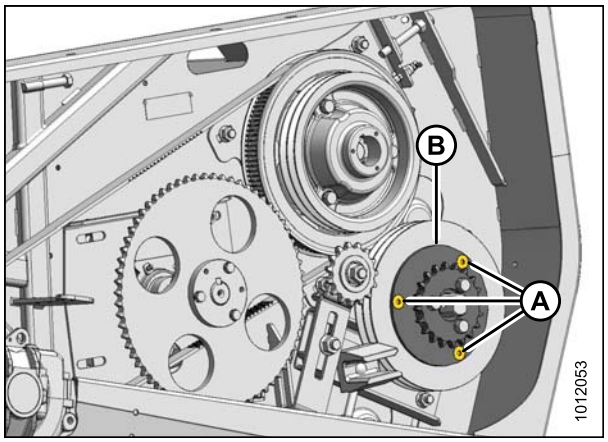


Figure 8.198: Header Drive

12. Remove the three bolts (A) from the tapered bushing (B).
13. Install two bolts (A) in the two threaded holes (C) in bushing (B) and tighten to release the bushing.
14. Remove bushing (C) and key.
15. Remove pulley (D).

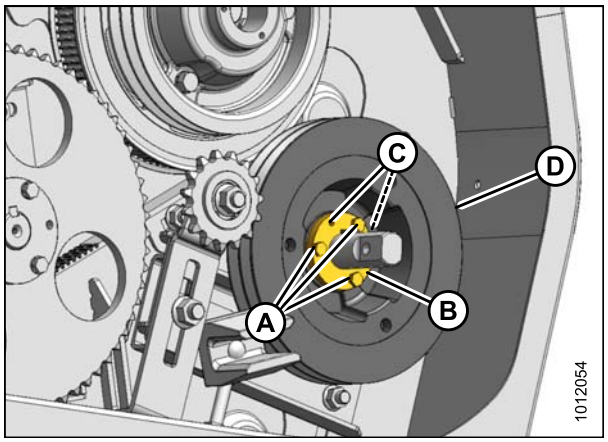


Figure 8.199: Pulley

16. Remove three nuts (A) securing gearbox (B) to frame and remove gearbox (B).

CAUTION

Be sure to support the gearbox when removing the bolts. Gearbox weighs 79 lb. (34 kg).

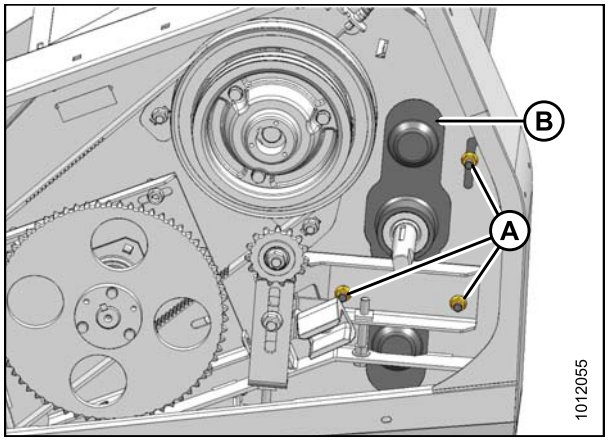


Figure 8.200

8.12.9 Installing Conditioner Gearbox – A30-D

To install the conditioner drive gearbox on an A30-D header, follow these steps:

1. Position gearbox (B) as shown, picking up the three holes in the end sheet and secure with three flanged lock nuts (A). Do not fully tighten.

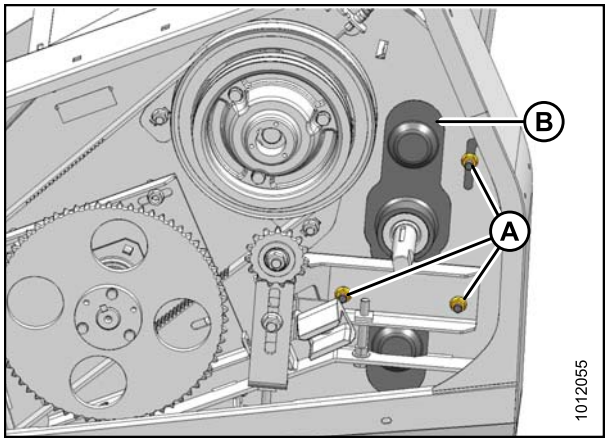


Figure 8.201

2. Locate key (A) in shaft.
3. Place pulley (B) onto shaft.

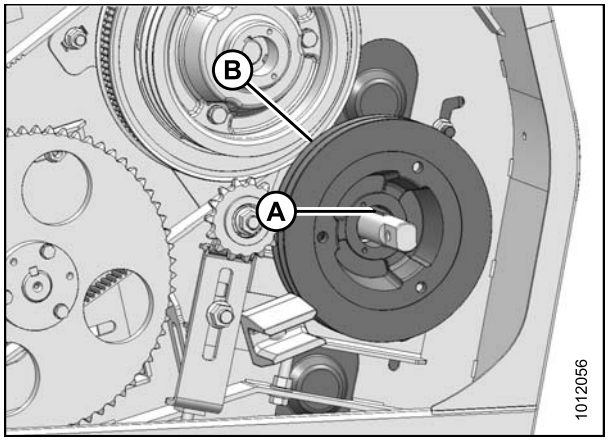


Figure 8.202

4. Place tapered bushing (A) onto shaft, align with key (B) in shaft and push bushing (A) into place.
5. Align slot in pulley (C) with key (D) in tapered bushing and slide pulley (C) onto bushing (A).
6. Align pulley (C) and countershaft pulley (F) faces to within 1/16 in. (1.5 mm).
7. Install three bolts (E) in tapered bushing (A) and tighten to 18 ft·lbf (25 N·m).
8. Tap bushing (A) and re-torque. Repeat until bolts no longer turn at 18 ft·lbf (25 N·m).

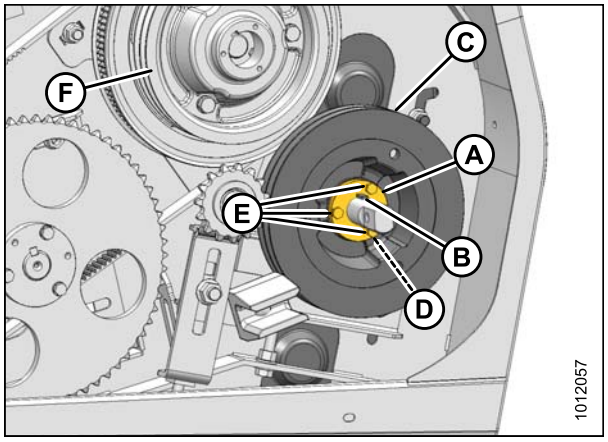


Figure 8.203: Gearbox Pulley

9. Install hub (B) and sprocket with three bolts and nuts (A). Tighten to 83 ft·lbf (112 N·m).

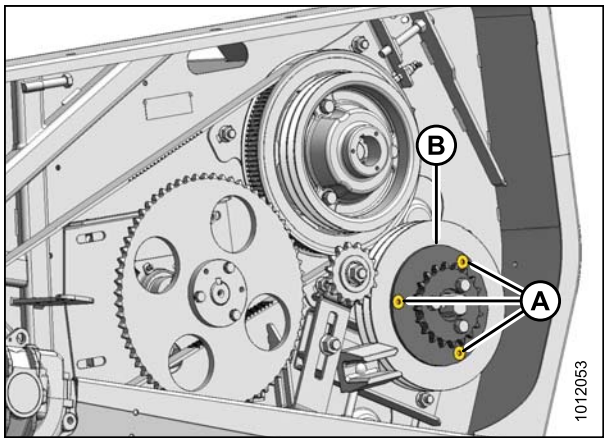


Figure 8.204: Sprocket

10. Install knife drive v-belts (B). Refer to *Installing Double V-Belts on Left Side, page 230*.
11. Install auger drive chain (A). Refer to *Installing Auger Drive Chain, page 238*.

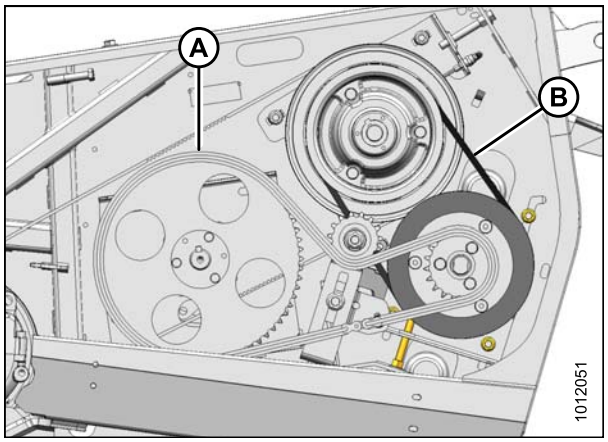


Figure 8.205: Header Drive

12. Remove oil level check plug in gearbox. If oil does not run out, add oil to required level. Refer to *8.12.1 Changing Gearbox Oil, page 267*.

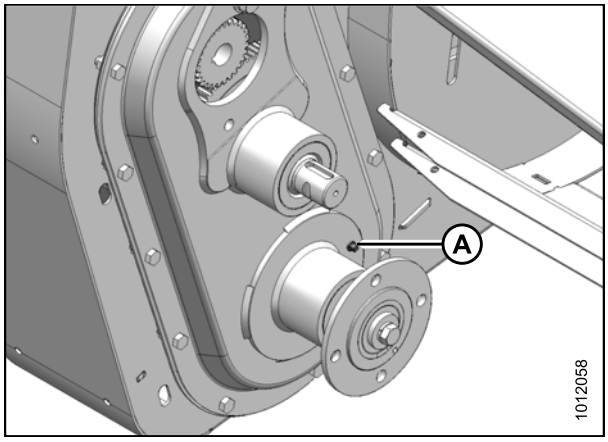


Figure 8.206: Gearbox

13. Align keyway in upper driveline yoke (B) with key in gearbox shaft and attach yoke (B) to shaft.
14. Install two hex head bolts (A) and flanged lock nuts to secure yoke. Tighten bolts.
15. Install timing flange on lower driveline (D) onto lower shaft on gearbox with four hex head bolts (C), two flat washers (E) under each bolt head, lock washers (F) and plain nuts (G). Do not tighten.

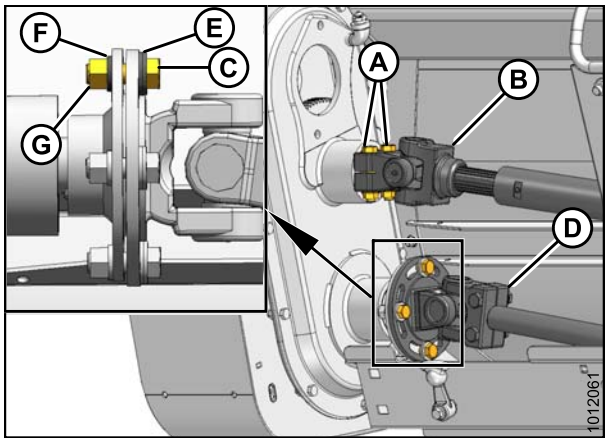


Figure 8.207

16. Apply a light coat of silicone to motor flange.
17. Position hydraulic motor (A) onto gearbox as shown and secure with two hex head bolts (B) with thread locking compound, two flat washers (C), and two lock washers (D). Torque to 83 lbf·ft (112 N·m).
18. Time the rolls. Refer to *8.12.13 Adjusting Conditioner Roll Timing, page 289*.

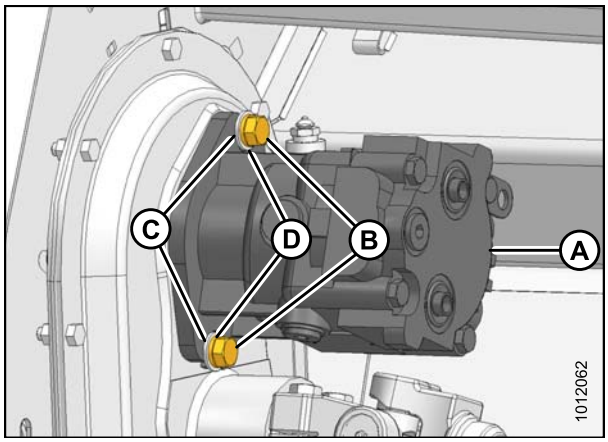


Figure 8.208

19. Position channel against endsheet as shown, picking up the three holes in endsheet.
20. Install two carriage bolts and nuts in lower two holes.

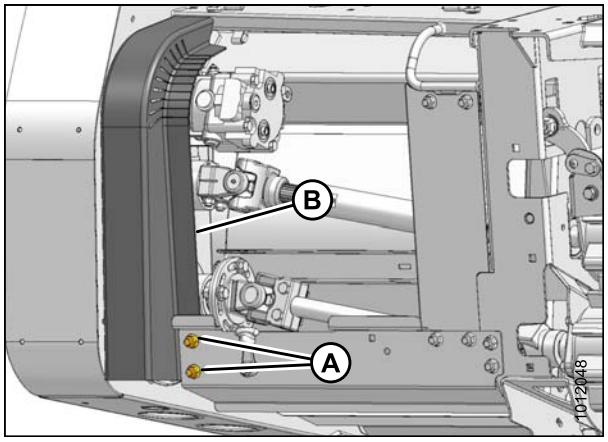


Figure 8.209: Conditioner Drive

21. Install carriage bolt and nut in upper hole (B) with head facing inboard.
22. Install two hex bolts with lock washers, and flat washers in remaining locations (A).
23. Tighten hardware on channel (C).
24. Close conditioner driveline shield and endshield.

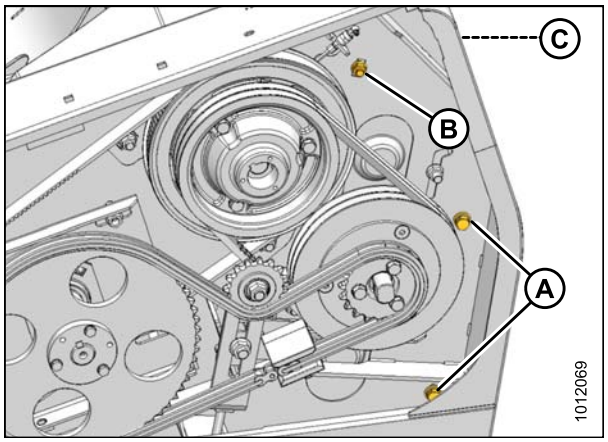


Figure 8.210: Header Drives

8.12.10 Removing Conditioner Gearbox – A40-D

To remove the conditioner drive gearbox from an A40-D header, follow these steps:

1. Open the conditioner drive shield and header left endshield.
2. Remove two bolts (A) securing channel (B) to frame.

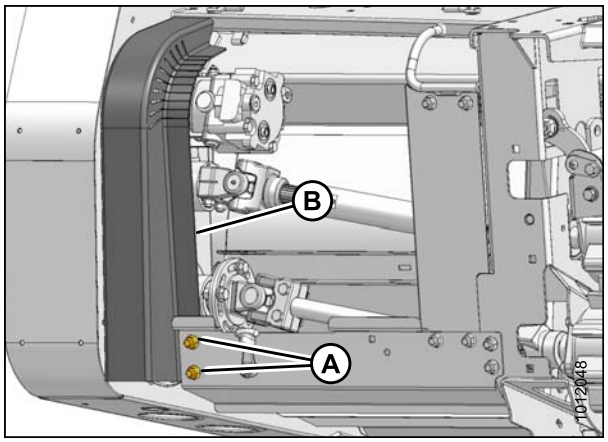


Figure 8.211: Conditioner Drive

3. Remove two hex bolts (A), and one carriage bolt (B) securing channel (C) to endsheet and remove channel (C).

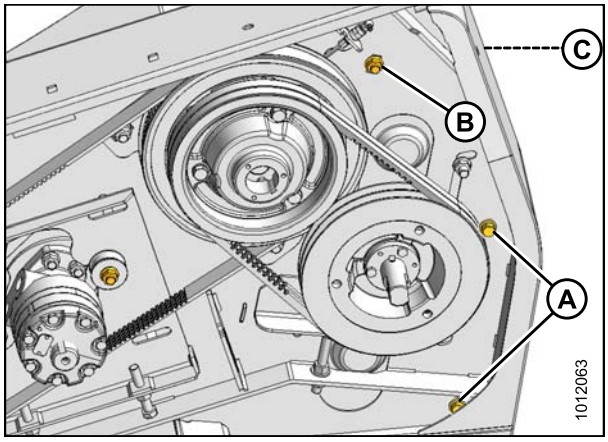


Figure 8.212: Header Drive

4. Remove two bolts (A) securing motor (B) to gearbox. Do **NOT** disconnect hoses.

   NOTE:
   Hoses not shown for clarity.

5. Carefully pull motor (B) from gearbox and move it clear of work area.

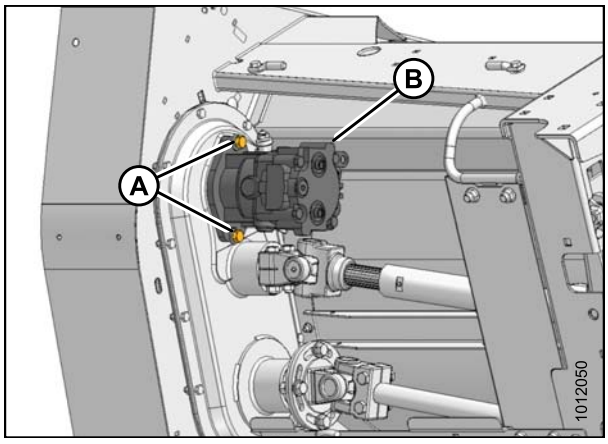


Figure 8.213: Motor

6. Remove two bolts (A) in upper driveline (B).
7. Pull driveline (B) off gearbox. If necessary, use a screwdriver or equivalent to spread yoke. Move driveline clear of work area.
8. Remove four bolts (C) from flange on lower driveline (D) and remove driveline from gearbox. Move driveline clear of work area.

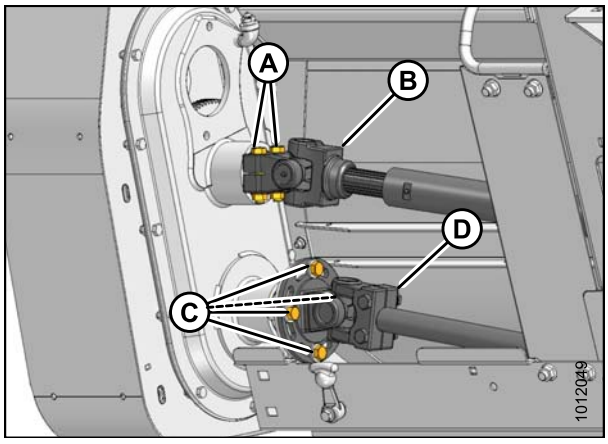


Figure 8.214: Drivelines

9. Remove knife drive v-belts (A). Refer to *Removing Double V-Belts on Left Side, page 230*.
10. Remove the three bolts (B) from the tapered bushing (D).
11. Install two bolts (B) in the two threaded holes (C) in bushing (D) and tighten to release the bushing.
12. Remove bushing (D), and key.
13. Remove pulley (E).

CAUTION

Be sure to support the gearbox when removing the nuts. Gearbox weighs 79 lb (34 kg).

14. Remove three nuts (A) securing gearbox (B) to frame and remove gearbox (B).

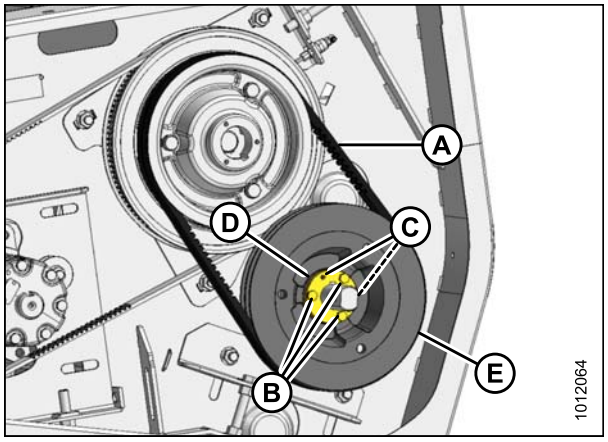


Figure 8.215: Knife Drive

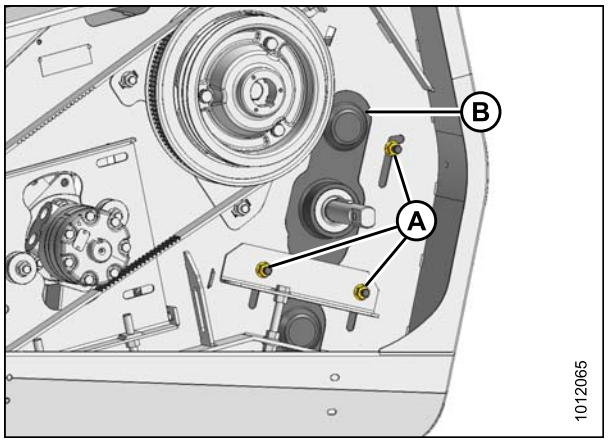


Figure 8.216: Conditioner Detachment

8.12.11 Installing Conditioner Gearbox – A40-D

To install the conditioner drive gearbox on an A40-D header, follow these steps:

1. Position gearbox (B) as shown, picking up the three holes in the end sheet and secure with three flanged lock nuts (A). Do not fully tighten.

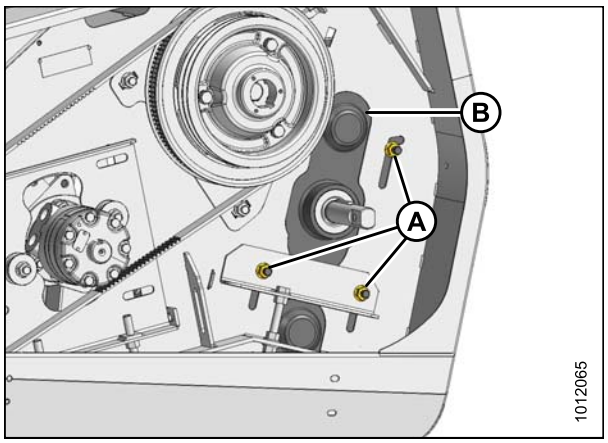


Figure 8.217

2. Locate key (A) in shaft.
3. Place pulley (B) onto shaft.

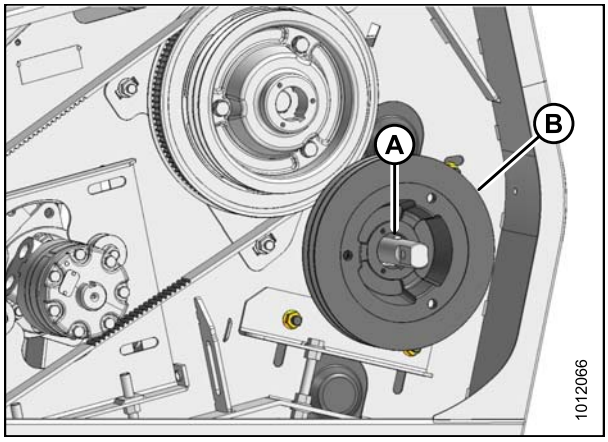


Figure 8.218

4. Place tapered bushing (A) onto shaft, align with key (B) in shaft and push bushing (A) into place.
5. Align slot in pulley (C) with key (D) in tapered bushing and slide pulley (C) onto bushing (A).
6. Align pulley (C) and countershaft pulley (F) faces to within 1/16 in. (1.5 mm).
7. Install three bolts (E) in tapered bushing (A) and tighten to 18 ft·lbf (25 N·m).
8. Tap bushing (A) and re-torque. Repeat until bolts no longer turn at 18 ft·lbf (25 N·m).

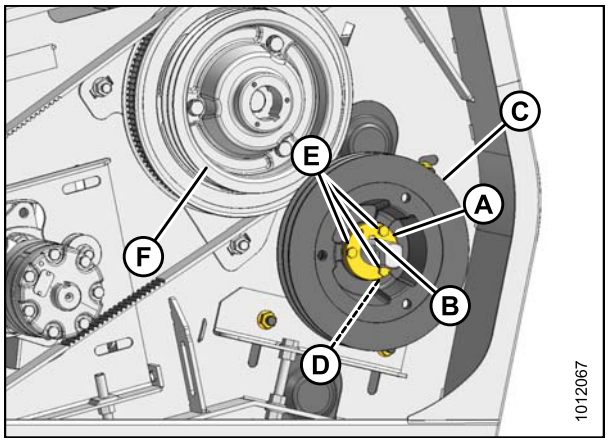


Figure 8.219: Gearbox Pulley

9. Install knife drive v-belts (B). Refer to *Installing Double V-Belts on Left Side, page 230*.

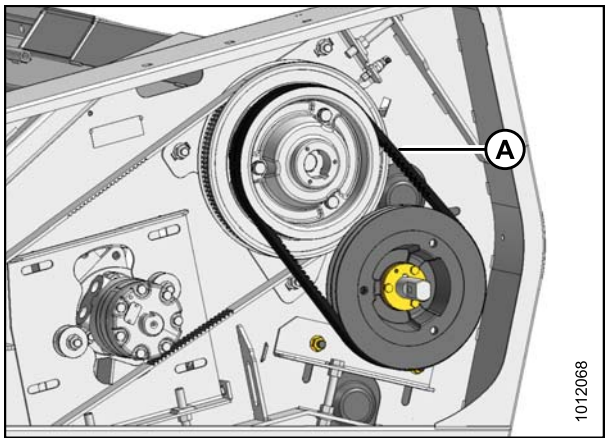


Figure 8.220: Header Drive

10. Remove oil level check plug in gear box. If oil does not run out, add oil to required level. Refer to *8.12.1 Changing Gearbox Oil, page 267*.

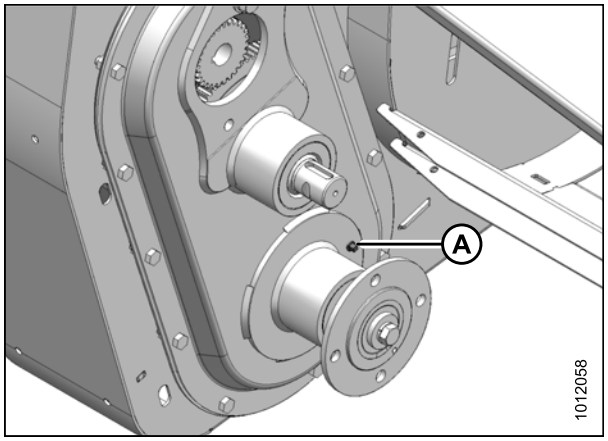


Figure 8.221: Gearbox

11. Align keyway in upper driveline yoke (B) with key in gearbox shaft and attach yoke (B) to shaft.
12. Install two hex head bolts (A) and flanged lock nuts to secure yoke. Tighten bolts.
13. Install timing flange on lower driveline (D) onto lower shaft on gearbox with four hex head bolts (C), two flat washers (E) under each bolt head, lock washers (F) and plain nuts (G). Do not tighten.

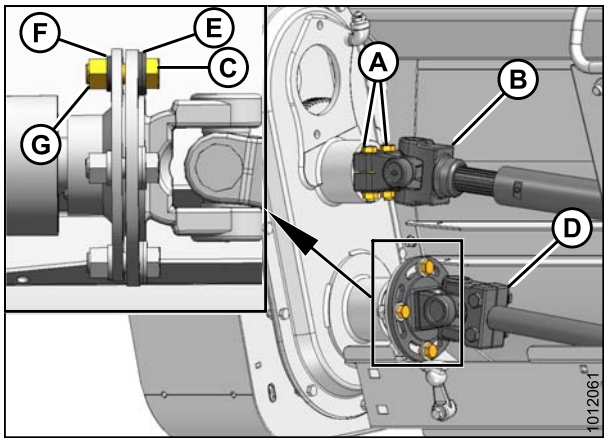


Figure 8.222

14. Apply a light coat of silicone to motor flange.
15. Position hydraulic motor (A) onto gearbox as shown and secure with two hex head bolts (B) with thread locking compound, two flat washers (C), and two lock washers (D). Torque to 83 lbf·ft (112 N·m).
16. Time the rolls. Refer to *8.12.13 Adjusting Conditioner Roll Timing, page 289*.

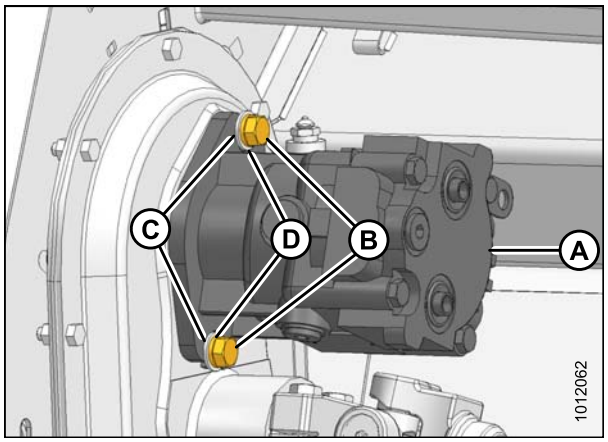


Figure 8.223

17. Position channel against endsheet as shown, picking up the three holes in endsheet.
18. Install two carriage bolts and nuts in lower two holes.

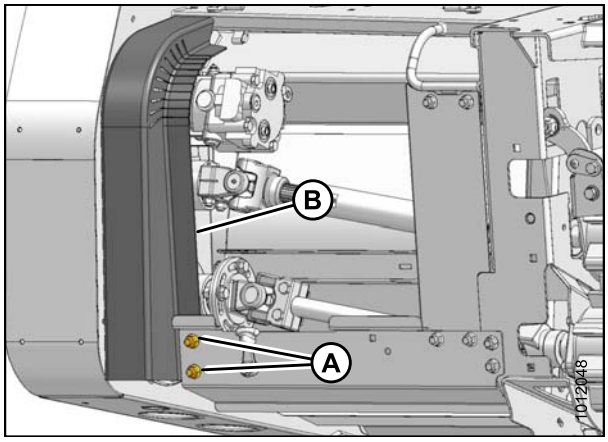


Figure 8.224: Conditioner Drive

19. Install carriage bolt and nut in upper hole (B) with head facing inboard.
20. Install two hex bolts with lock washers, and flat washers in remaining locations (A).
21. Tighten hardware.
22. Close conditioner driveline shield and endshield.

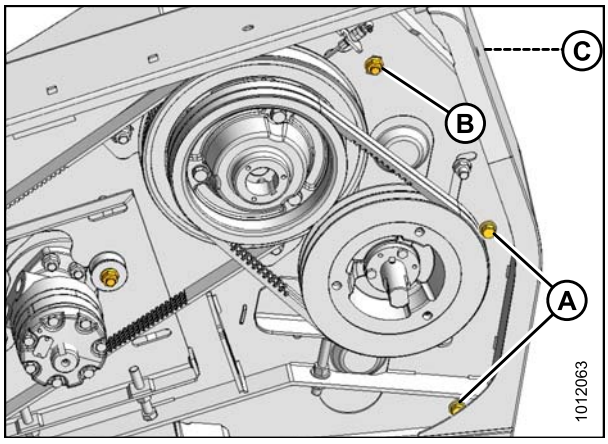


Figure 8.225: Header Drive

8.12.12 Checking/Adjusting Roll Alignment

Rolls are aligned at the factory, but adjustment is provided in case the rolls become misaligned during operation.

1. Lower header until it rests on the ground.
2. Open conditioner driveshield.
3. Loosen bolt (A), and rotate cover (B) to expose access port.

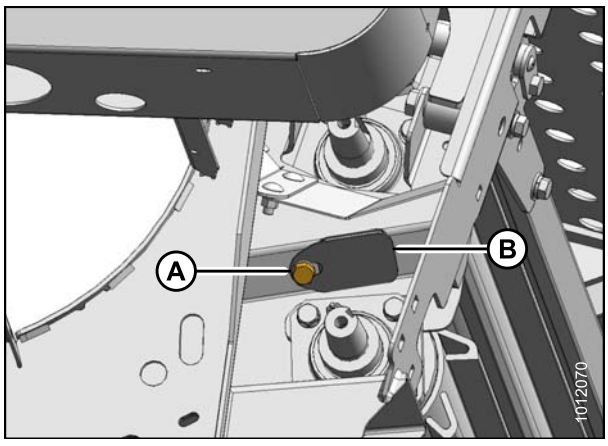


Figure 8.226: Roll Alignment

4. Examine roll bar spacing '**X**' at each end of the rolls. The rolls are aligned if '**X**' varies less than 1/16 in. (1.6 mm) from one end to the other.

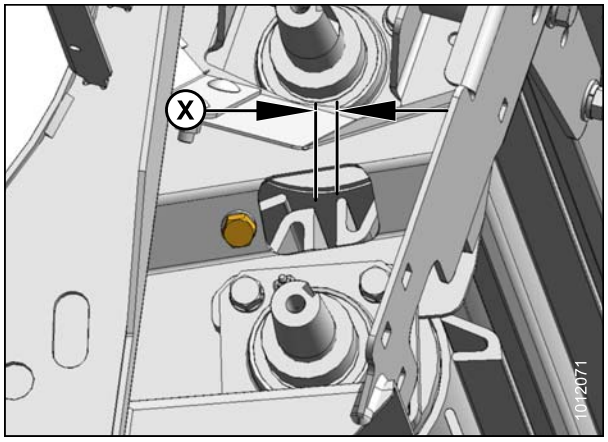


Figure 8.227: Roll Bar Spacing

5. If '**X**' varies more than 1/16 in. (1.6 mm), align rolls as follows:
   a. Remove nuts and bolts (A), and remove shims (B). The shims can be lifted off the pivot rod.
   b. Move upper roll until dimension '**X**' at both ends looking through port (as shown in previous step 4. above) is within 1/16 in (1.6 mm).
   c. Reinstall shims, ensuring hardened washer (C) is against the pivot tube.
   d. Reinstall bolts (A) and nuts.

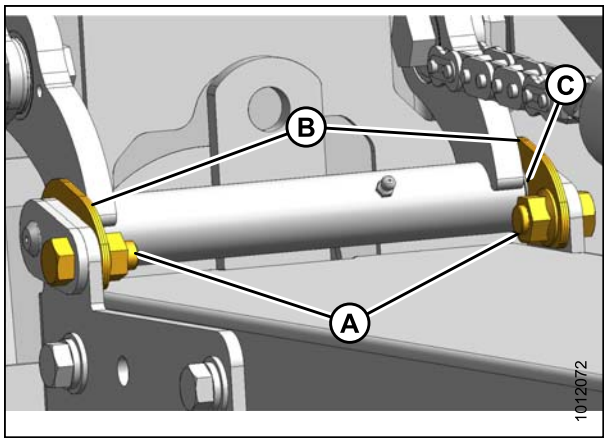


Figure 8.228: Adjustment

6. Operate header/mower conditioner, and recheck alignment.
7. Close cover (B), and tighten bolt (A).
8. Close conditioner driveshield.

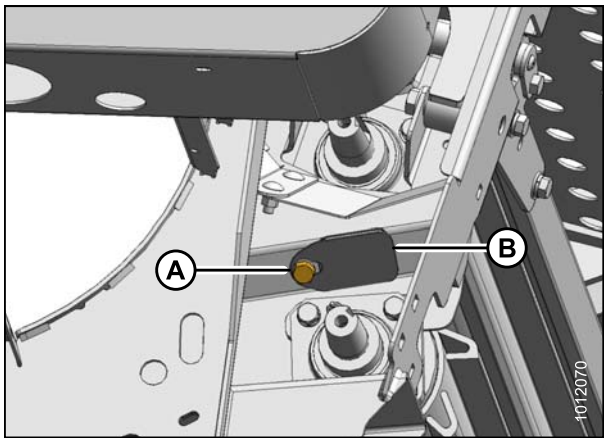


Figure 8.229: Access Cover

8.12.13 Adjusting Conditioner Roll Timing

For proper conditioning, the conditioner rolls must be properly timed, and aligned with each other.

The N-style conditioner bars must be set, so that the flat part of the N-bar is parallel to the opposing N-style bar. Refer to *8.12.12 Checking/Adjusting Roll Alignment, page 287*.

CAUTION

Header/mower conditioner must be fully lowered to the ground when checking or adjusting the alignment of the conditioner rolls. The upper roll rises up when the header is lifted (pull-type models only).

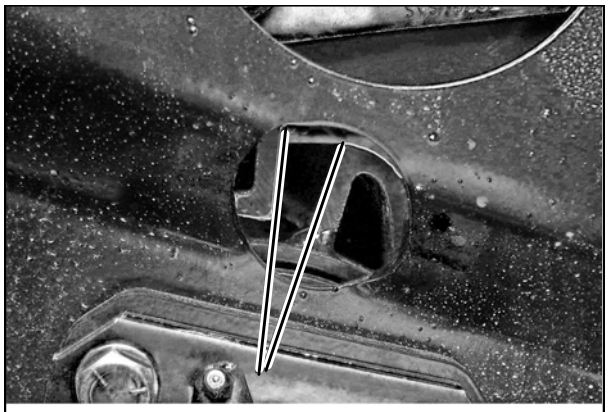


Figure 8.230: Conditioner Bars Not in Time (Right Side)

To adjust the conditioner roll timing, follow these steps:

1. Fully lower the header to the ground and examine roll timing. The flat side of the “n” bars should be parallel to each other.
2. Remove the plates that cover the roll timing inspection hole.

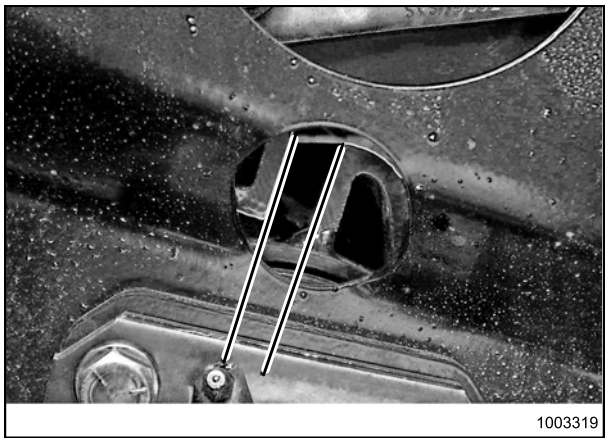


Figure 8.231: Conditioner Bars Timed (Right Side)

3. Loosen the four bolts (A) on the bottom conditioner roll timing plate.
4. Remove the roll inspection hole cover between the two conditioner rolls on the right-hand side of the conditioner.
5. Turn bottom roll until both bars are parallel with each other, the spacing should be around 1/2 in. (12.6 mm).
6. When the “n” bars are timed satisfactorily, tighten bolts (A) to secure the position.
7. Recheck the bars at both ends of the rolls to make sure they have not become misaligned after tightening.

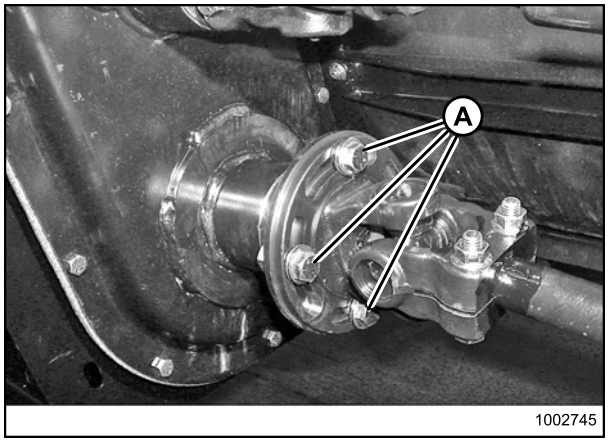


Figure 8.232: Tighten Bolts on Conditioner Roll Timing Plate

8.13 Wheels and Tires – A30-D

CAUTION

To avoid personal injury, before servicing header/mower conditioner or opening drive covers, follow procedures in *8.1 Preparing for Servicing, page 167*.

8.13.1 Checking Wheel Bolts

IMPORTANT:
Check and tighten wheel bolts after the first hour of operation, and every 100 hours thereafter.

IMPORTANT:
Whenever a wheel is removed and reinstalled, check torque after one hour of operation. Maintain 120 ft·lbf (160 N·m) torque.

8.13.2 Removing Wheel

To remove a wheel from a pull-type mower conditioner, follow these steps:

1. Lower header to the ground.
2. Retrieve jack (minimum 5000 lb. [2270 kg] capacity) from storage position on articulated power turn (APT).
3. Position jack on mount (A) provided on frame leg as shown, and raise tire just off the ground. Place block under frame leg (B).
4. Remove wheel bolts.
5. Remove wheel.

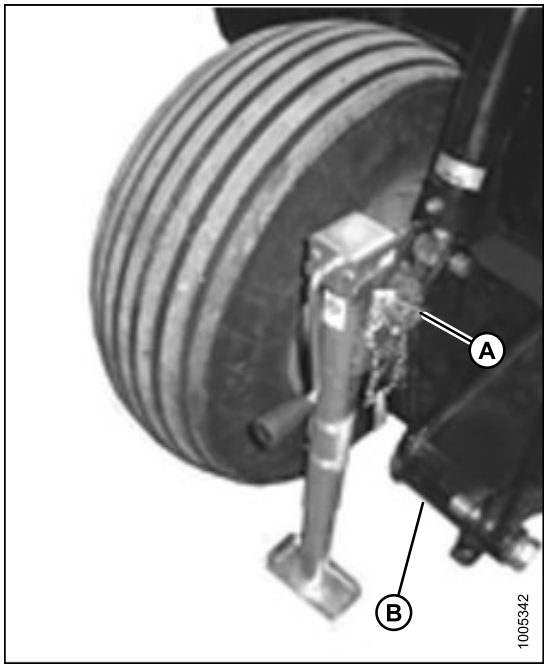


Figure 8.233

8.13.3 Installing Wheel

CAUTION

When installing wheel be sure to use the holes that are countersunk to match bolt head profile. The uncountersunk holes do NOT seat the bolts correctly.

IMPORTANT:
Follow proper bolt tightening sequence shown. Be sure valve stem (A) points away from wheel support

1. Position wheel on spindle, and install bolts. Partially tighten.
2. Remove blocks, and raise jack until tire contacts the ground.
3. Torque bolts to 120 ft·lbf (160 N·m) in accordance with tightening sequence shown.
4. Raise jack completely, remove from leg and store on articulated power turn (APT).

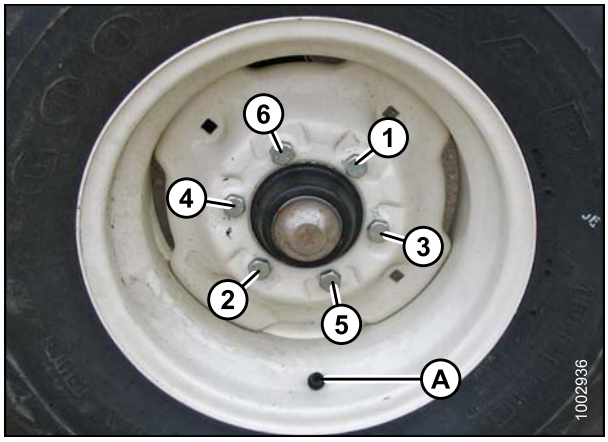


Figure 8.234

8.13.4 Inflating Tire

Check tire pressure daily. Maintain 30 psi (207 kPa).

WARNING

Service tires safely:

- **A tire can explode during inflation and cause serious injury or death.**
- **Do NOT stand over tire. Use a clip-on chuck and extension hose.**
- **Never increase air pressure beyond 35 psi (241 kPa) to seat the bead on the rim.**
- **Replace the tire if it has a defect.**
- **Replace a wheel rim that has cracks, wear, or severe rust.**
- **Never weld a wheel rim.**
- **Never use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not in correct position on the rim, or is too full of air, the tire bead can loosen on one side, causing air to leak at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in the area.**
- **Make sure all the air is removed from a tire before removing the tire from a rim.**
- **Do not remove, install or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job.**
- **Take the tire and rim to a qualified tire repair shop.**

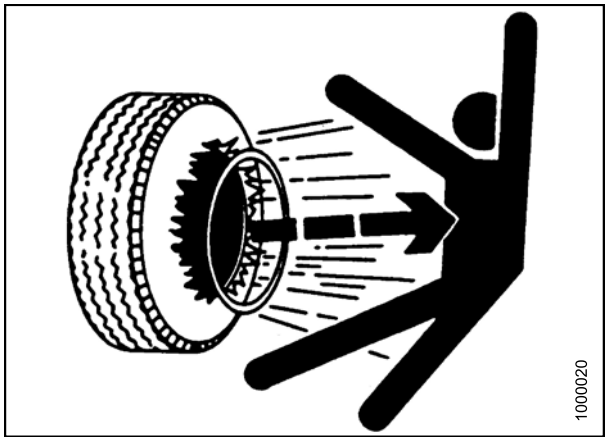


Figure 8.235

8.14 Replacing Skid Shoe Wear Plate

Skid shoes are equipped with replaceable wear plates that can be reversed for increase service life. It is recommended that wear plates be replaced when the skid shoe weldment becomes exposed.

To replace skid shoe wear plates, follow these steps:

1. Raise header, and engage lift cylinder stops.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

2. Remove bolts and clips (A) from forward edge of skid shoe.

NOTE:
Use a socket and ratchet wrench to access the nuts.

3. Remove clevis pins (B), and disengage tabs on skid shoe from slots in cutterbar.
4. Remove eight bolts (A), and remove wear plates (B).
5. Position replacement wear plate (B) as shown. (The same wear plate can be reinstalled, but in the reverse position).
6. Secure wear plate with bolts and nuts (A).

IMPORTANT:
If bolt heads are worn down, replace them with new 1/2 in. x 1 carriage bolts.

7. Insert tabs on skid shoe into slots (A) on cutterbar at inboard mounting locations on frame, and secure with clevis pin (B).

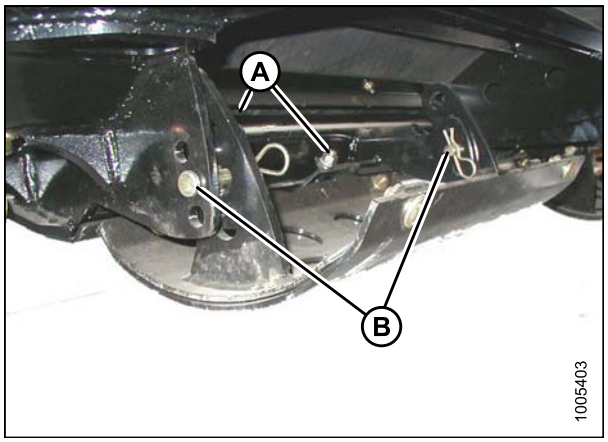


Figure 8.236

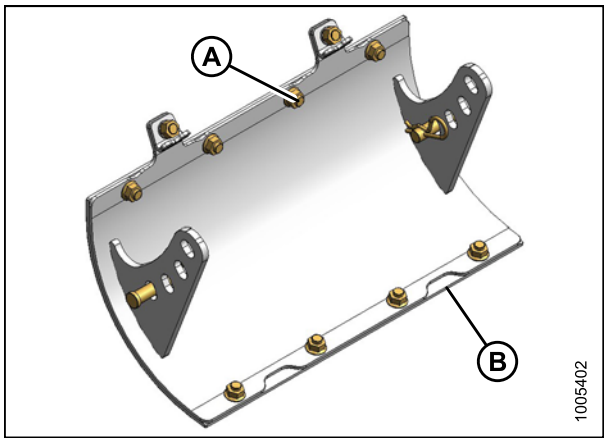


Figure 8.237

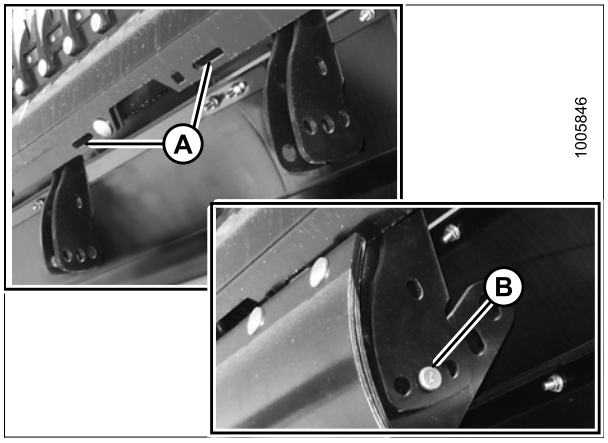


Figure 8.238

8. Reinstall clips (A) with bolts and nuts removed at Step *2, page 292* to secure skid shoe to cutterbar.

   NOTE:
   Use a socket and ratchet wrench to access the nuts.

9. Remove clevis pin (B), adjust skid shoe to desired height, and reinstall two clevis pins. Secure with lynch pins.

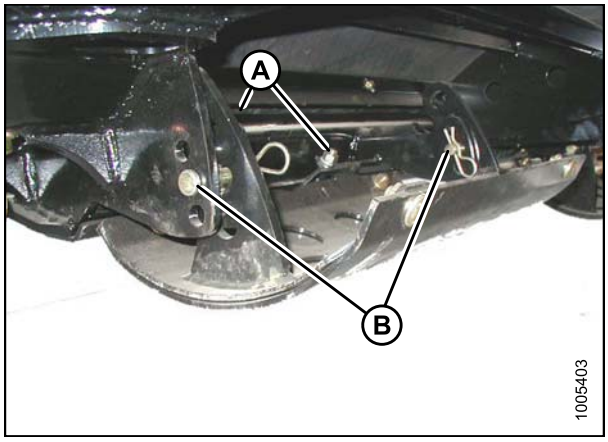


Figure 8.239

8.15 Gauge Rollers

Gauge rollers can be removed for replacement or repair.

8.15.1 Removing Gauge Rollers

1. Raise header, and engage lift cylinder stops.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

2. Remove bolts and clips (A) from forward edge of gauge roller assembly.

   NOTE:
   Use a socket and ratchet wrench to access the nuts.

3. Remove hairpins on pins (B).
4. Support gauge roller, and remove pins (B).
5. Disengage tabs on mounting plate from slots in cutterbar to remove roller assembly.

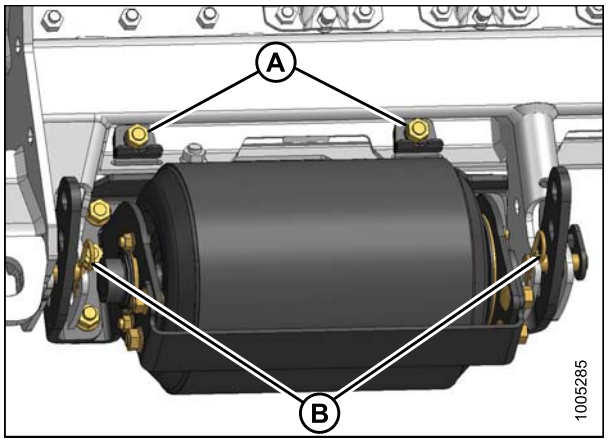


Figure 8.240

8.15.2 Installing Gauge Rollers

To install gauge rollers, follow these steps:

1. Position gauge roller assembly below cutterbar, and insert tabs on roller assembly into slots (A) in frame.

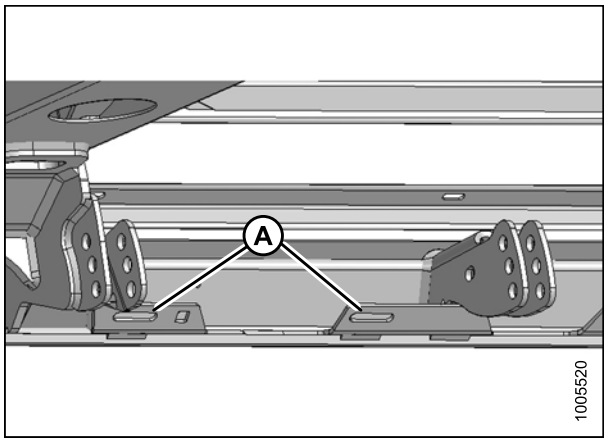


Figure 8.241

2. Secure with two pins (B) at lowest position.
3. Attach clips (A) with bolts and nuts to secure roller assembly to cutterbar.

   NOTE:
   Use a socket and ratchet wrench to access the nuts.

4. Tighten nuts.

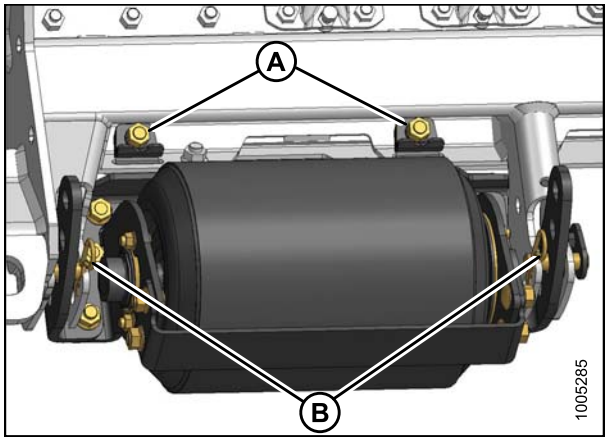


Figure 8.242

5. Remove pins (A), and adjust rollers to desired height. Reinstall the two pins (A).
6. Ensure that nut (B) on each pin registers in adjacent hole in support bracket.
7. Secure pins with hairpins (C).

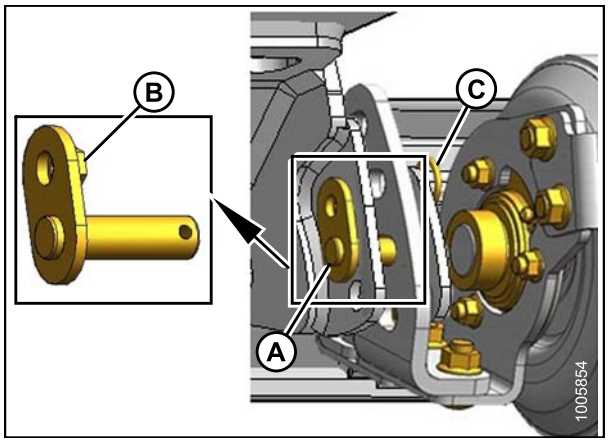


Figure 8.243

8.16 Maintaining the Electrical System

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

Keep lights clean, and replace defective bulbs.

To replace light bulbs, follow these steps:

1. Using a Phillips screwdriver, remove screws (A) from fixture, and remove plastic lens.
2. Replace bulb, and reinstall plastic lens and screws.

Figure 8.244: A30-D Tail Light

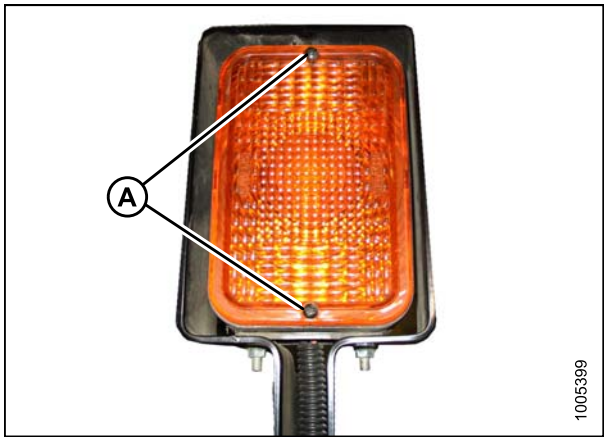


Figure 8.245: A40-D Hazard Light

9 Troubleshooting

9.1 Header/Mower Conditioner Performance

Symptom	Problem	Solution	Section
Carryover of Crop On Reel.	Reel speed tooroblem fast.	Reduce reel speed (sprocket size).	A30-D:*3.7.3 Setting Reel Speed, page 58* or A40-D: *4.5.3 Adjusting Reel Speed, page 136*
Material Build-Up On Header Frame.	Auger speed too fast.	Reduce auger speed (sprocket size).	A30-D:*3.7.2 Setting Auger Speed, page 57* or A40-D: *4.5.2 Adjusting Auger Speed, page 136*
	Very light crop.	Reduce tractor / windrower rpm.	—
Insufficient Conditioning Of Stems.	Roll gap too large.	Decrease roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
Leaves Damaged, Crushed Or Stripped Off Stems.	Reel speed too fast.	Reduce reel speed.	A30-D:*3.7.3 Setting Reel Speed, page 58* or A40-D: *4.5.3 Adjusting Reel Speed, page 136*
	Roll gap too small.	Increase roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Rolls improperly timed.	Adjust roll timing.	*8.12.13 Adjusting Conditioner Roll Timing, page 289*
Slow Crop Drying.	Rolls not crimping crop sufficiently.	Decrease roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Crop is spread too narrow.	Adjust forming shields for wider swath.	*4.5.12 Positioning the Forming Shields, page 148*
	Crop is bunched in windrow.	Adjust forming shields/baffle.	
Excessive Drying Or Bleaching Of Crop.	Excessive crimping.	Increase roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Crop is spread too wide in windrow.	Adjust forming shields.	*4.5.12 Positioning the Forming Shields, page 148*

Symptom	Problem	Solution	Section
Leaving Small Strip Of Flattened, Uncut Material.	Crowding of the uncut material.	Steer tractor slightly away from uncut crop.	—
	Reel position incorrect.	Move reel forward and down.	A30-D: *3.7.5 Setting Reel Position, page 64* or A40-D: *4.5.5 Setting Reel Position, page 139*
	Knife sections or guards are worn or broken.	Replace worn or broken parts.	*8.7.1 Replacing Knife Section, page 206* and *Replacing Guards, page 212*
Long Stubble In Down Crop.	Cutting height too high.	Lower cutting height with skid shoes.	A30-D: *3.7.6 Setting Cutting Height, page 69* or A40-D: *4.5.8 Setting Cutting Height, page 144*
	Ground speed too fast.	Slow down.	*5 Selecting Ground Speed, page 159*
	Header angle too flat for guards to pick up down crop.	Increase header angle.	A30-D: *3.7.8 Setting Header Angle, page 71* or A40-D: *4.5.7 Adjusting Header Angle of A40-D, page 144*
	Reel position incorrect.	Move reel forward and down.	A30-D: *3.7.5 Setting Reel Position, page 64* or A40-D: *4.5.5 Setting Reel Position, page 139*
	Tine aggressiveness too low.	Rotate cam clockwise (viewed from RH end) for more aggressive tine action.	A30-D: *3.7.7 Setting Tine Aggressiveness, page 70* or A40-D: *4.5.6 Setting Tine Aggressiveness, page 142*

Symptom	Problem	Solution	Section
Pulling Material By The Roots Or Tall Material Leaning Into Machine.	Ground speed too slow.	Increase ground speed.	*5 Selecting Ground Speed, page 159*
	Reel position incorrect.	Move reel forward and down.	A30-D: *3.7.5 Setting Reel Position, page 64* or A40-D: *4.5.5 Setting Reel Position, page 139*

Symptom	Problem	Solution	Section
Ragged Or Uneven Cutting Of Crop.	Bent or misaligned guards causing poor shearing action.	Align guards for proper shearing action.	*Aligning Guard, page 211*
	Bent knife causing binding.	Straighten bent knife. Check alignment, and adjust if necessary.	*8.7.2 Removing Knife, page 206*
	Ground speed too fast.	Slow down. Ground speed should not exceed 8 mph (13 km/h).	*5 Selecting Ground Speed, page 159*
	Header angle too flat for guards to pick up down crop.	Increase header angle.	A30-D: *3.7.8 Setting Header Angle, page 71* or A40-D: *4.5.7 Adjusting Header Angle of A40-D, page 144*
	Header float too light, causing bouncing.	Adjust to heavier float setting.	A30-D:*3.7.9 Setting Float, page 72* or A40-D: *4.5.9 Checking/Adjusting Float, page 145*
	PTO speed too slow (pull-type).	Maintain proper RPM on PTO. Check for proper match of pump and gear-drive at PTO.	*2.3 Product Specifications, page 29*
	Reel drive chain too loose (except A40-D).	Increase chain tension.	*Checking/Adjusting Reel Drive Chain Tension, page 234*
	Reel position incorrect.	Move reel forward and down.	A30-D: *3.7.5 Setting Reel Position, page 64* or A40-D: *4.5.5 Setting Reel Position, page 139*
	Relief valve pressure too low.	Replace valve.	See Dealer
	Knife drive belt too loose.	Increase belt tension.	A30-D:*8.8.1 Knife Drive – A30-D, page 227* or A40-D:*8.9.1 Knife Drive – A40-D, page 239*
	Knife sections or guards are worn or broken.	Replace worn or broken parts.	*8.7.1 Replacing Knife Section, page 206* and *8.7.7 Guards, page 210*

Symptom	Problem	Solution	Section
Conditioner Plugging. Knife, Plugging. Uneven Formation And Bunching Of Windrow.	Ground speed too fast.	Slow down.	*5 Selecting Ground Speed, page 159*
	Roll gap too large for proper feeding.	Decrease roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Roll gap too small in thick stemmed cane-type crops.	Increase roll gap.	
	Rolls improperly timed.	Adjust roll timing.	*8.12.13 Adjusting Conditioner Roll Timing, page 289*
	Extremely thick or wet undergrowth.	Raise cutting height to clear undergrowth.	A30-D: *3.7.6 Setting Cutting Height, page 69* or A40-D: *4.5.8 Setting Cutting Height, page 144*
		Consider use of stub guards.	*8.7.7 Guards, page 210*
	Header float too heavy.	Adjust to lighter float setting.	A30-D:*3.7.9 Setting Float, page 72* or A40-D: *4.5.9 Checking/Adjusting Float, page 145*
	PTO speed too slow (pull-type).	Maintain proper rpm on PTO. Check for proper match of pump and gear-drive at PTO.	*2.3 Product Specifications, page 29*
	Wet undergrowth.	Cut when undergrowth is dry.	—
	Reel position incorrect.	Move reel back and down (close to guards).	A30-D: *3.7.5 Setting Reel Position, page 64* or A40-D: *4.5.5 Setting Reel Position, page 139*
	Knife drive belt too loose.	Adjust belt tension.	*8.8.1 Knife Drive – A30-D, page 227* or *8.9.1 Knife Drive – A40-D, page 239*
	Knife hold-downs improperly adjusted.	Adjust hold-downs so knife works freely.	*8.7.8 Hold-Downs, page 217*
	Knife sections or guards are worn or broken.	Replace worn or broken parts.	*8.7.1 Replacing Knife Section, page 206*, *Replacing Guards, page 212*,

Symptom	Problem	Solution	Section
Conditioner Plugging. Knife Plugging. Uneven Formation And Bunching Of Windrow (Cont'd)	Reel not feeding properly in heavy crops.	Decrease ground speed.	*5 Selecting Ground Speed, page 159*
	Bent or misaligned guards causing poor shearing action.	Align guards for proper shearing action.	*Aligning Guard, page 211*
	Forming shields improperly adjusted - fluffer too low.	Adjust forming shields, raise fluffer.	*4.5.12 Positioning the Forming Shields, page 148*
	Fluffer bypassing or dragging crop.	Adjust fluffer for proper crop control.	
	Auger to stripper clearance too wide.	Adjust auger to stripper bars clearance.	A30-D: *3.7.4 Setting Auger Position, page 59* or A40-D: *4.5.4 Setting Auger Position, page 136*
	Roll gap too large.	Adjust roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Conditioner running too slow.	Maintain rated knife/conditioner speed.	*2.3 Product Specifications, page 29*
	Uneven crop flow across auger.	Remove front stripper bar or stripper bar extension if installed.	*8.11.3 Stripper Bar, page 264*
	Excessive center feeding of crop.	Remove front stripper bar extensions if installed.	
	Build up of crop at ends of rolls, especially in tall crops.	Add front stripper bar extension.	
Uneven Windrow Formation In Light Crop.	Rear of feed pan too low.	Raise rock drop tine bar.	*3.7.10 Setting Feed Pan and Rock Drop Tine Position, page 73*

Symptom	Problem	Solution	Section
Reel Causes Seed Loss (e.g. Grass Seed).	Reel speed too fast.	Adjust flow control on tractor / windrower.	A30-D: *3.7.3 Setting Reel Speed, page 58* or A40-D: *4.5.3 Adjusting Reel Speed, page 136*
	Header angle too steep, causing tines to contact ground.	Flatten header angle, and check header float.	*3.7.8 Setting Header Angle, page 71*, and for A30-D: *3.7.9 Setting Float, page 72* or for A40-D: *4.5.9 Checking/Adjusting Float, page 145*
	Reel not correctly positioned.	Lower reel speed, move reel rearward, as close as possible to auger, and downward as close as possible to knife and pan.	A30-D: *3.7.3 Setting Reel Speed, page 58* or A40-D: *4.5.3 Adjusting Reel Speed, page 136* and *Setting Reel Position*
Auger Plugging In Heavy Grass Seed.	Poor crop flow across auger.	Remove lower stripper bar and middle stripper bar if necessary.	*8.11.3 Stripper Bar, page 264*
Plugging At Delivery Opening In Heavy Grass Seed.	Opening too narrow.	Move pan extensions to widest position.	*4.8 Grass Seed Special A40-D, page 155*
Grass Seed Windrow Too Wide or Too Narrow.	Pan extensions not adjusted properly.	Adjust pan extensions.	

9.2 Mechanical

Symptom	Problem	Solution	Section
Auger and/or Conditioner Rolls Damaged By Stones.	Feed pan doesn't allow stones to fall through.	Lower rock-drop tines.	*3.7.10 Setting Feed Pan and Rock Drop Tine Position, page 73*
Excessive Breakage Of Knife Sections Or Guards.	Ground speed too high in stony conditions.	Reduce ground speed.	*5 Selecting Ground Speed, page 159*
	Cutting height too low in stony conditions.	Raise cutting height with skid shoes.	A30-D: *3.7.6 Setting Cutting Height, page 69* or A40-D: *4.5.8 Setting Cutting Height, page 144*
	Header angle too steep in stony conditions.	Decrease header angle.	A30-D: *3.7.8 Setting Header Angle, page 71* or A40-D: *4.5.7 Adjusting Header Angle of A40-D, page 144*
	Header float too heavy in stony conditions.	Adjust to lighter float setting.	A30-D:*3.7.9 Setting Float, page 72* or A40-D: *4.5.9 Checking/Adjusting Float, page 145*
	Knife speed too slow.	Maintain proper RPM on PTO. Check for proper match of pump and gear-drive at PTO.	*2.3 Product Specifications, page 29*
	Guards, knife and hold-downs misaligned.	Straighten guards, align hold-downs.	*8.7.7 Guards, page 210 8.7.8 Hold-Downs, page 217*
Excessive Heating Of Hydraulic Oil.	Relief pressure too low.	Replace relief valve.	See Dealer

Symptom	Problem	Solution	Section
Header Stalling In Extremely Tall, Heavy Crop (6+ Tons Per Acre).	Insufficient crop clearance at rear of feed pan.	Lower rock drop tines (rear of header pan).	*3.7.10 Setting Feed Pan and Rock Drop Tine Position, page 73*, or A30-D Float: *Checking Header Flotation* or A40-D Float: *4.5.9 Checking/Adjusting Float, page 145*
		Remove rubber fingers from auger at delivery opening.	*8.11.2 Replacing Rubber Fingers, page 263*
		Increase roll gap.	*4.5.10 Adjusting Conditioner Roll Gap, page 145*
	Feeding aids for shorter, lighter crop impede flow of heavy or thick stemmed crops (cane, sudan grass etc.).	Remove front set of stripper bars.	*8.11.3 Stripper Bar, page 264*
Header Turns While Unloaded But Slows Or Stops When Starting To Cut.	Low reservoir oil level.	Add oil to reservoir.	*Adding Hydraulic Oil, page 203*
	Defective motor.	Repair motor.	See Dealer
	Defective O-ring inside relief valve.	Replace relief valve.	
	Defective pump.	Repair pump.	
	Defective relief valve.	Repair relief valve.	
	PTO slipping on tractor.	Repair tractor PTO system.	
Knocking In Knife Drive.	Worn needle bearing in knifehead.	Replace.	*8.7.4 Removing Knifehead Bearing, page 208*
	Worn knifehead pin.		*8.7.3 Installing Knife, page 207*
	Incorrect end guards.	Replace with special end guards.	*8.7.7 Guards, page 210*
Header Turns While Unloaded But Slows Or Stops When Starting To Cut.	Cold oil in system.	Reduce ground speed until oil reaches operating temperature.	*5 Selecting Ground Speed, page 159*

Symptom	Problem	Solution	Section
Knife Back Breakage.	Dull knife.	Replace.	*8.7.4 Removing Knifehead Bearing, page 208*
	Worn knife head pin.		*8.7.3 Installing Knife, page 207*
	Bent or broken guard.	Straighten or replace.	*8.7.7 Guards, page 210*
	Incorrect end guards at knifehead.	Replace with correct number of special guards.	
Windrower Side Drift.	Header is dragging on one end and pulling to that side.	Adjust skid shoes to prevent cutterbar dragging.	A30-D: *3.7.6 Setting Cutting Height, page 69* or A40-D: *4.5.8 Setting Cutting Height, page 144*
		Adjust header float.	A30-D:*3.7.9 Setting Float, page 72* or A40-D: *Adjusting Float for A40-D*
	Low tire pressure on one side (pull-type).	Check and correct tire pressure (30 psi [(207 kPa]).	*8.13.4 Inflating Tire, page 291*
Lights Malfunctioning	Improper ground.	Check for proper grounding between light base and header.	*8.16 Maintaining the Electrical System, page 296*
	Burned out bulb.	Replace bulb.	
	Poor connection.	Check connector at tractor / windrower.	*3.2.3 Connecting Hydraulics, page 41*

10 Optional Equipment

10.1 Options and Attachments

10.1.1 Additional Skid Shoes

In addition to the standard skid shoes, two additional skid shoes may be added for extra control of cutting height and protection of cutting components.

Figure 10.1: MD #B4594

10.1.2 Gauge Roller Kit

The gauge roller kit replaces the outer skid shoes with rollers. They can be adjusted for varying cutting heights.

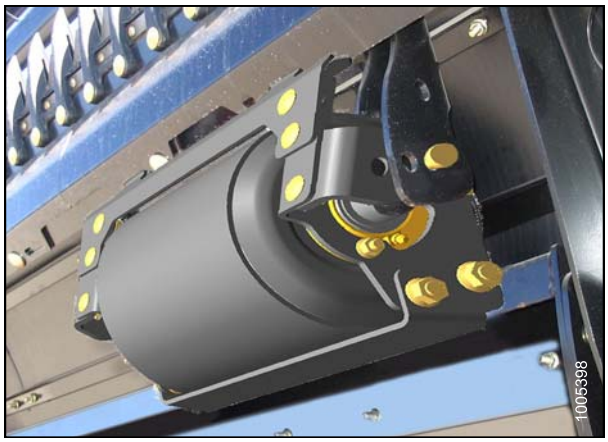


Figure 10.2: MD #B4593

10.1.3 Hydraulic Header Angle Kits

NOTE:
This kit is only available for A30-D Pull-Type Mower Conditioners.

This kit allows the header angle to be adjusted hydraulically with a cylinder that replaces the standard mechanical link. A separate hydraulic circuit is required or the existing articulated power turn (APT) steering cylinder hydraulic circuit can be used, depending on the tractor hydraulics. Installation instructions are included with the kits.

Figure 10.3: MD #B4894

10.1.4 Replacement Reel Bat Kit

This kit consists of one complete bat assembly for ease of replacement. Separate kits are available for different header widths.

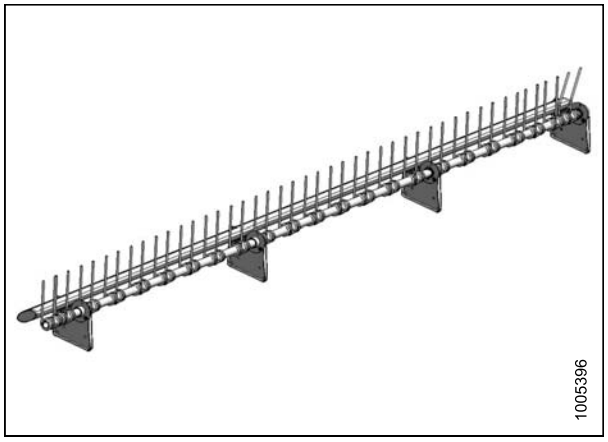


Figure 10.4

10.1.5 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster plates are designed to cut tough crops.

Separate kits are available for different header widths. Installation and adjustment instructions are included with the kit.

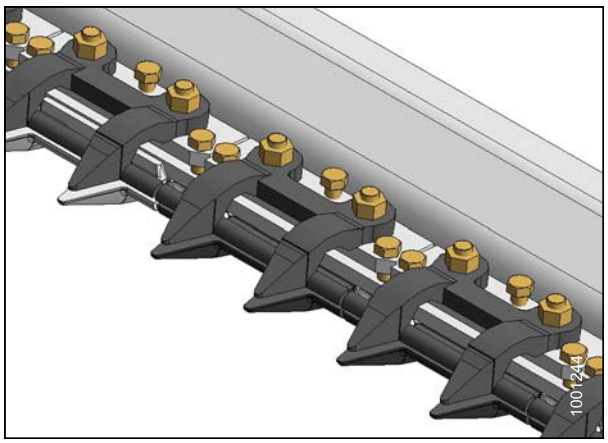


Figure 10.5

10.1.6 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the header for clean crop dividing and reel entry in tall crops. The kit includes left and right dividers, lean bar extensions and attachment hardware.

Figure 10.6: MD #B4690

11 Unloading and Assembly

Header-specific instructional manuals for unloading, assembly and set-up procedures are included with your shipment.

Header Description	Used on	Instruction Part Number
A30-D	Pull-Type Mower Conditioner	MD #169001
A40-D	Self-Propelled Windrower	MD #169957

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