

M205

Self-Propelled Windrower

Gearbox Service Kit (MD #271303) Installation Instructions

147700 Revision D

Original Instruction

M205 Self-Propelled Windrower



1000141

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Introduction

The M205 Gearbox Service Kit (MD #271303) includes all the parts required to replace all gearbox components as well as the traction drive pump shaft, gear, and seals. This document explains how to install the kit. A list of parts included in the kit is provided in *2 Parts List, page 5*.

It is recommended that the engine seal also be replaced. For parts and service procedures, contact Cummins at 1-800-DIESELS (1-800-343-7357) or <https://cumminsengines.com>.

NOTE:

Engine seal replacement is not covered under MacDon warranty.

Installation time

Installation time for this kit is approximately 20 hours.

Conventions

The following conventions are followed in this document:

- Right and left are determined from the operator's position, facing forward with the windrower in cab-forward position.
- Unless otherwise noted, use the standard torque values provided in the windrower operator's manual and technical manual.

NOTE:

Keep your MacDon publications up-to-date. The most current version of this instruction can be downloaded from our Dealer-only site (<https://portal.macdon.com>) (login required).

NOTE:

This document is currently available in English only.

Summary of Changes

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

| Section | Summary of Change | Internal Use Only |
|---|------------------------------------|-------------------|
| 2.1 Traction Drive Pump and Header Drive Pump Parts, page 6 | Removed threadlocker from the kit. | ECN 59638 |

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Chapter 1: Safety

Understanding and following safety procedures consistently will help to ensure the safety of machine operators and bystanders.

1.1 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

Indicates an imminently hazardous situation that, if 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.

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.2 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

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

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

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

In addition, take the following precautions:

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



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

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

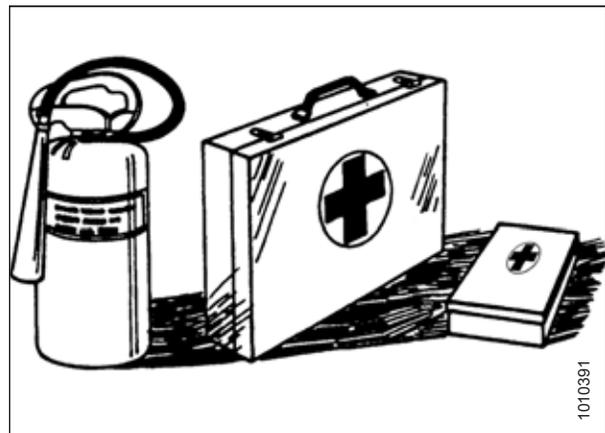


Figure 1.3: Safety Equipment

SAFETY

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



Figure 1.4: Safety around Equipment

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

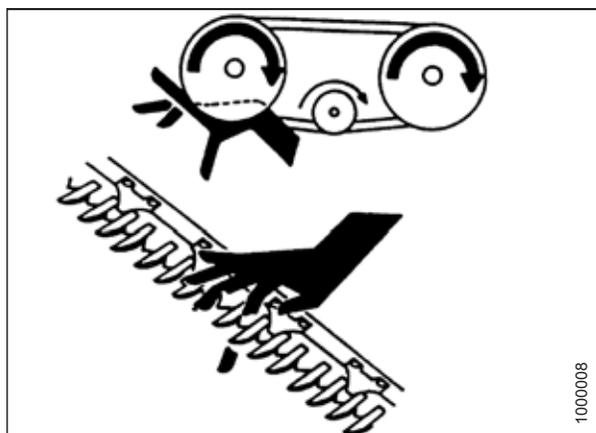


Figure 1.5: Safety around Equipment

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



Figure 1.6: Safety around Equipment

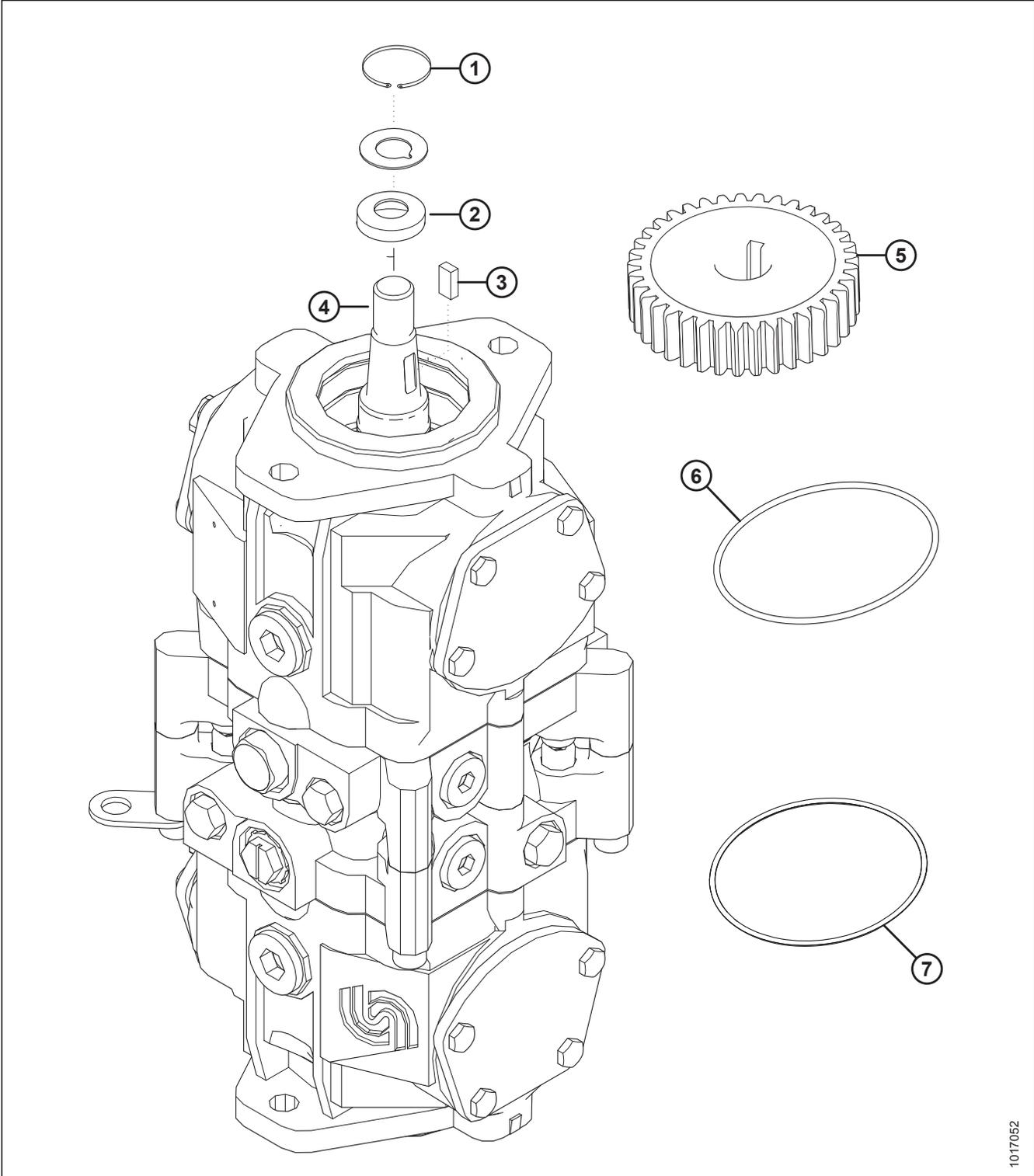
Chapter 2: Parts List

A parts list is provided in this instruction so that you can confirm that you have received all required parts before you begin installation.

2.1 Traction Drive Pump and Header Drive Pump Parts

A parts list is provided in this instruction so that you can confirm that you have received all required parts before you begin installation.

Figure 2.1: Traction Drive Pump and Header Drive Pump Parts



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PARTS LIST

| Ref | Part Number | Description | Quantity |
|-----|-------------|------------------------------------|----------|
| 1 | 111897 | RING – RETAINING | 1 |
| 2 | 203048 | SEAL – LIP | 1 |
| 3 | 111895 | KEY | 1 |
| 4 | 111898 | SHAFT – FRONT | 1 |
| 5 | 208699 | GEAR – PUMP (37T) ¹ | 1 |
| 6 | 139322 | O-RING ² | 1 |
| 7 | 30045 | O-RING ³ | 1 |
| | 111896 | BEARING – ROLLER (NOT ILLUSTRATED) | 1 |

NOTE:

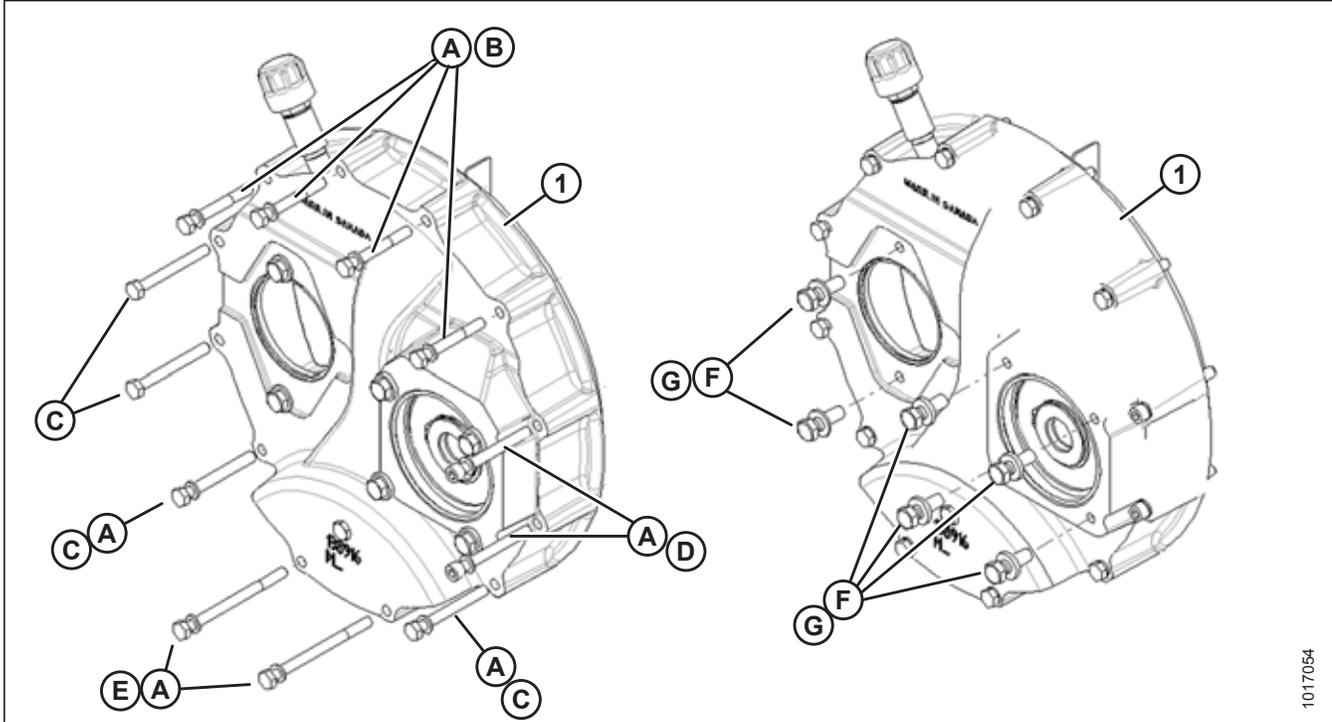
Unlabelled parts are illustrated for reference only; they are not included in the kit.

-
1. install on traction drive pump.
 2. install between header drive pump and gearbox.
 3. install between traction drive pump and gearbox.

2.2 Gearbox Assembly Parts

A parts list is provided in this instruction so that you can confirm that you have received all required parts before you begin installation.

Figure 2.2: Gearbox Assembly and Hardware



| Ref | Part Number | Description | Quantity |
|-----|------------------|--|----------|
| 1 | NSS ⁴ | ASSEMBLY – M205 ENGINE GEARBOX | 1 |
| A | 184711 | WASHER – FLAT, M10-200HV-A3L | 10 |
| B | 135657 | BOLT – HEX HEAD M10 X 1.5 X 80-8.8-A3L | 4 |
| C | 30682 | BOLT – HEX HEAD M10 X 1.5 X 90-8.8-A3L | 4 |
| D | 162426 | SCREW – HEX SOCKET HEAD M10 X 1.5 X 90-10.9-A3L | 2 |
| E | 135304 | BOLT – HEX HEAD M10 X 1.5 X 130-8.8-A3L | 2 |
| F | 136027 | WASHER – HARDENED, OIL FINISH | 6 |
| G | 135460 | BOLT – HEX HEAD 1/2-13NC X 1.5 LONG L9 ZINC PLATED | 6 |

4. Not sold separately.

Chapter 3: Installation Instructions

To install the M205 Gearbox Service kit (MD #271303), follow these instructions in order.

NOTE:

Throughout these instructions, when parts included in the kit are initially referenced, the part name is followed by its MacDon part number (MD #xxxxxx). If the part is not sold separately, the part name is followed by (MD #NSS). For more information, cross reference the part number to the parts list description and illustration.

1. Remove the header or weight box.
2. Park the windrower on level ground and block all wheels.

3.1 Opening Hood – Highest Position

To access the engine and its components, the hood should be at its highest position.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Locate latch (A) behind the grill and lift the latch to release the hood.
3. Raise the hood until strap (B), which should be looped under hooks (C) and (D), stops at approximately a 40° angle.
4. Remove strap (B) from hook (C) and allow the hood to rise slightly farther.
5. Remove the strap from hook (D) and allow the hood to rise fully to approximately a 65° angle.

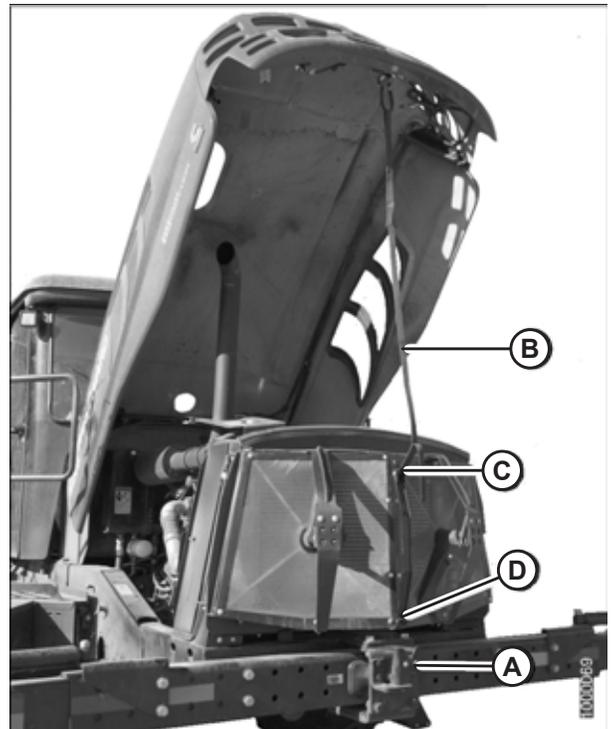


Figure 3.1: Hood Open – Highest Position

INSTALLATION INSTRUCTIONS

3.2 Draining Hydraulic Oil

Drain hydraulic oil before changing lift oil filter.

NOTE:

You will need a new lift oil filter (MD #112419) which is not provided in the kit.

1. Place a clean container (at least 75 liters [20 U.S gallons]) under the drain at the bottom of the hydraulic reservoir to collect the oil.
2. Remove drain plug (A) and allow oil to drain.

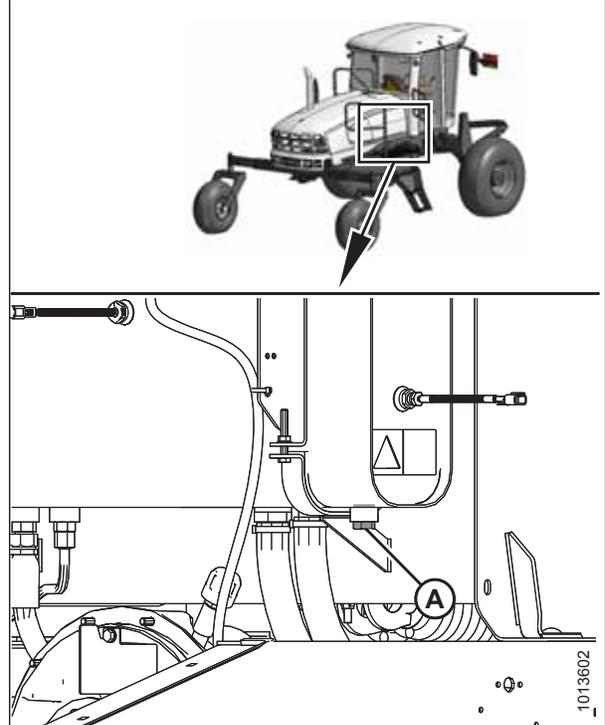


Figure 3.2: Hydraulic Oil Drain Plug

3. Locate oil filter (A) below the hydraulic oil reservoir.
4. Place a container underneath the filter to catch any oil that may leak.
5. Clean around the head of the filter.
6. Unscrew filter (A) with a filter wrench.

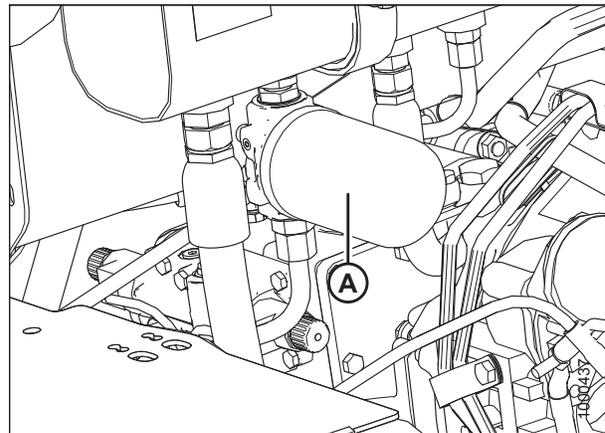


Figure 3.3: Oil Filter

INSTALLATION INSTRUCTIONS

7. Remove gasket (C) from groove (B) in filter head (A).
8. Clean gasket groove (B) in filter head (A).
9. Apply a thin film of clean oil to filter gasket (C).
10. Install the new gasket into groove (B) in filter head (A).
11. Screw new filter (D) onto the filter head until the gasket contacts the filter.

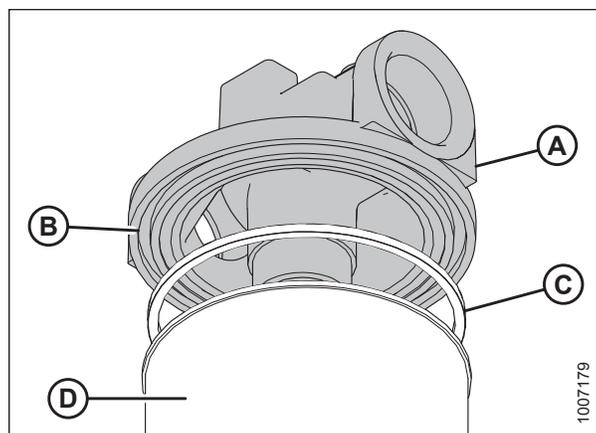


Figure 3.4: Oil Filter

12. Tighten filter (A) an additional 3/4 turn by hand.

IMPORTANT:

Do **NOT** use a filter wrench to install oil filter. Over-tightening can damage gasket and filter.

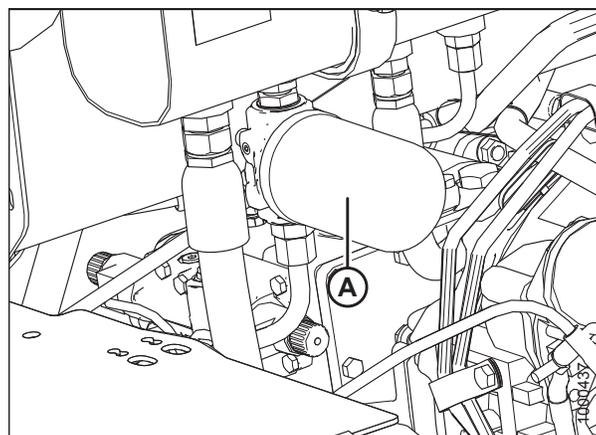


Figure 3.5: Oil Filter

INSTALLATION INSTRUCTIONS

13. Clean off any metal debris that may have accumulated on the magnetic plug. Wipe the plug with a clean cloth.
14. Check O-ring condition. Look for cracking, breakage, or deformation that may impede sealing ability and replace as required.
15. Reinstall drain plug (A).

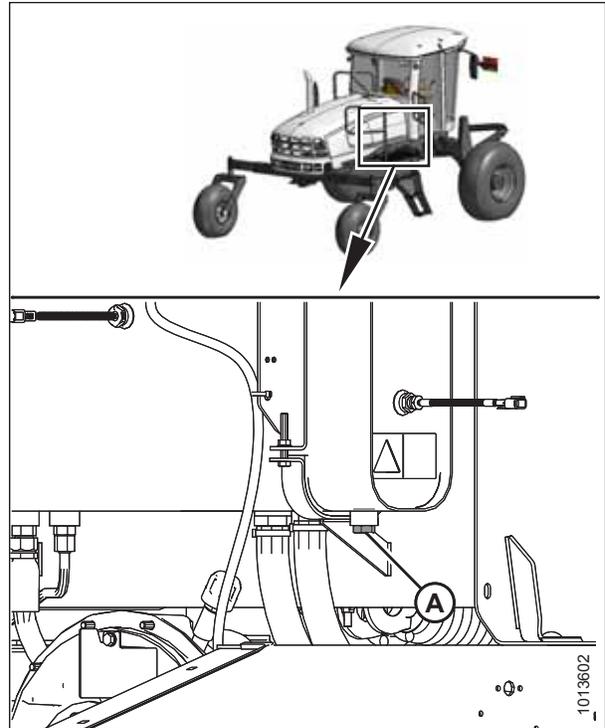


Figure 3.6: Hydraulic Oil Drain Plug

3.3 Removing Triple Gear Pump

Remove the triple gear pump before replacing the gearbox.

WARNING

Use the following precautions when working around high pressure fluids:

- Relieve pressure before disconnecting hydraulic lines.
- Tighten all connections before applying pressure.
- Use a piece of cardboard or paper to search for leaks.
- Keep away from pinholes and nozzles that eject fluids under high pressure. Escaping fluid can penetrate the skin, causing serious injury. 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.

1. Locate triple gear pump (A), and wash it off before removing it.

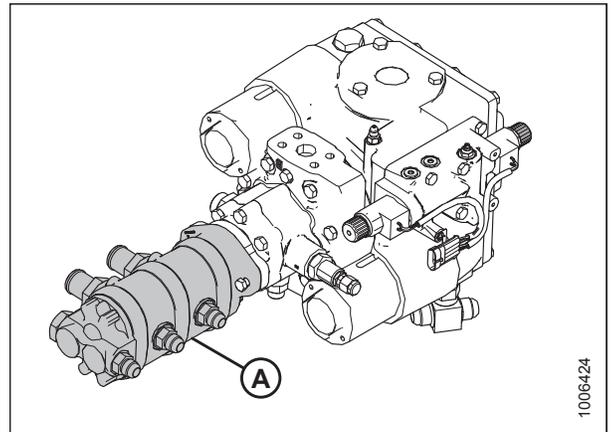


Figure 3.7: Triple Gear Pump Assembly

2. Disconnect five hydraulic lines (B), (C), (D), (E), and (F) that connect to triple gear pump (A). Cap hoses and plug ports once disconnections are made.
3. Remove bolts (G) that secure the triple gear pump to the header drive pump.
4. Remove triple gear pump (A).

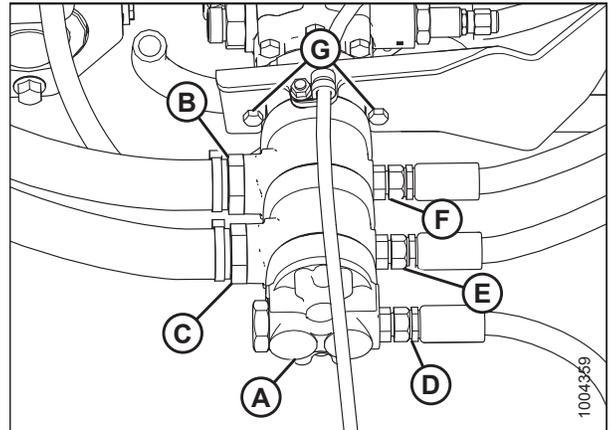


Figure 3.8: Triple Gear Pump Assembly

3.4 Removing Header Drive Pump

Remove the header drive pump before replacing the gearbox.

WARNING

Use the following precautions when working around high pressure fluids:

- Relieve pressure before disconnecting hydraulic lines.
- Tighten all connections before applying pressure.
- Use a piece of cardboard or paper to search for leaks.
- Keep away from pinholes and nozzles that eject fluids under high pressure. Escaping fluid can penetrate the skin, causing serious injury. 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.

1. Remove hose clamp (A).
2. Remove bolt (B), then remove line support (C).

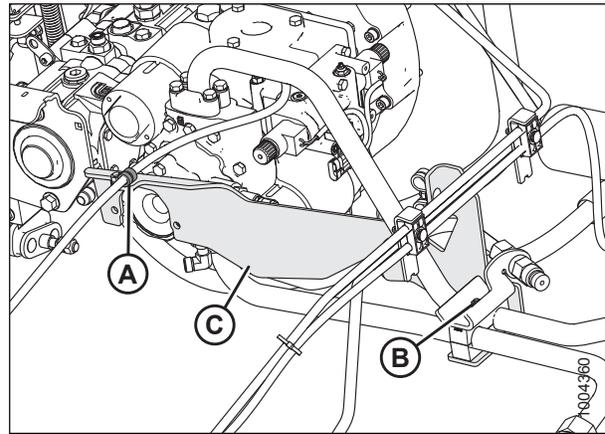


Figure 3.9: Hydraulic System

3. Remove O-ring (A).

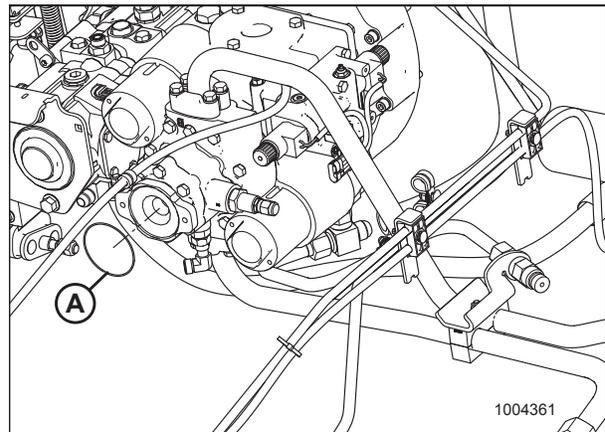


Figure 3.10: Hydraulic System

INSTALLATION INSTRUCTIONS

4. Disconnect seven hydraulic hoses (A), (B), (D), (E), (F), (H), (K), and one electrical connector (J) that connect to the header drive pump (Z).

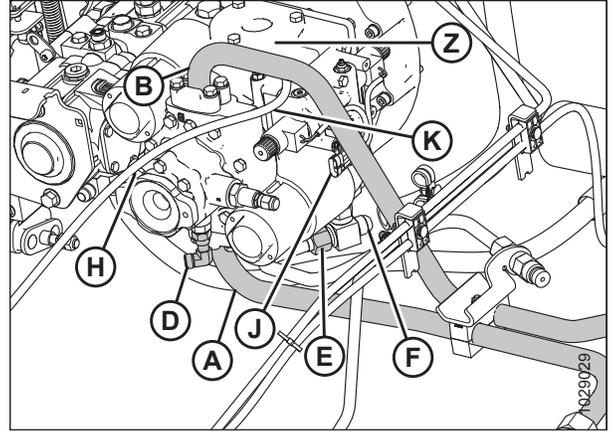


Figure 3.11: Hydraulic System

A - Port A Connects to Port B on Draper/Auger Manifold (Port A on Rotary Motor)

B - Port B Connects to Port A on Draper/Auger Manifold (Port B on Rotary Motor)

D - Inlet Port D Connects to Port E on Traction Drive Pump

E - Port F Connects to Case Drain for Rotary Header⁵

F - Port F Connects to Hydraulic Tank

H - Port H Connects to Cooler Bypass

K - Port D Connects to GSL Servo (IN Port)

J - Electrical Connector

Z - Header Drive Pump

5. Support header drive pump (A), then remove four bolts (B). There are two per side.
6. Remove header drive pump (A).

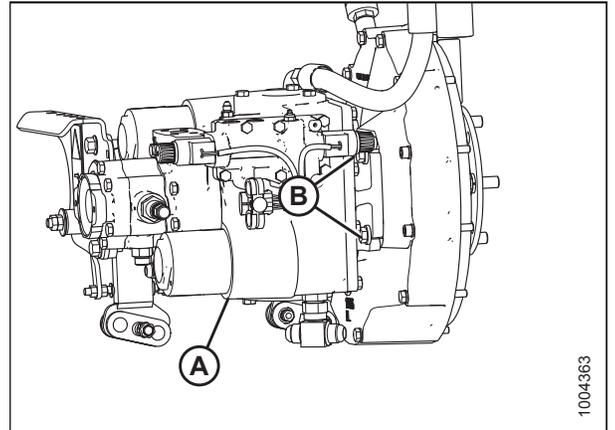


Figure 3.12: Hydraulic System

5. This connection is capped for all other headers.

3.5 Removing Traction Drive Pump

Remove the traction drive pump before replacing the gearbox.

WARNING

Use the following precautions when working around high pressure fluids:

- Relieve pressure before disconnecting hydraulic lines.
- Tighten all connections before applying pressure.
- Use a piece of cardboard or paper to search for leaks.
- Keep away from pinholes and nozzles that eject fluids under high pressure. Escaping fluid can penetrate the skin, causing serious injury. 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.

1. Locate the traction drive pump and wash it off before removing it.
2. Remove four nuts (A) that hold right and left steering rods (B) to the pintle arms. Detach the steering rods.

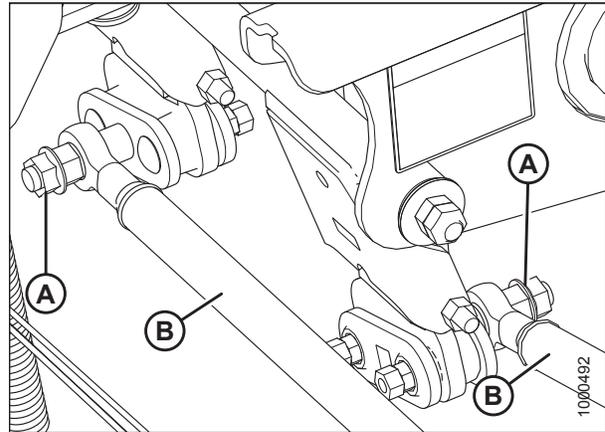


Figure 3.13: Traction Drive Assembly

3. Remove the upper end of both springs (A).

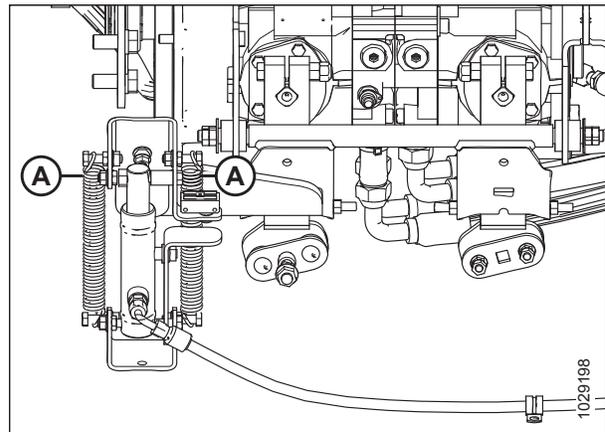


Figure 3.14: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

4. Cut the cable ties on interlock bracket (A).
5. Remove bolts (B) that hold interlock bracket (A) to the pump.
6. Remove nuts (C) and (D) and washer (E) that hold the interlock bracket to interlock pivot (F).
7. Remove interlock bracket (A).

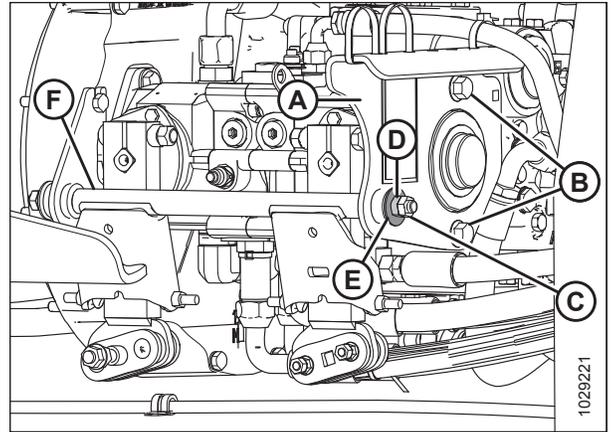


Figure 3.15: Traction Drive Assembly

8. Loosen two bolts (A) from the engine end of the interlock hanger. Rotate interlock pivot assembly (B) out of the way. Leave the interlock assembly attached to the cylinder. Tie it up, out of the way.

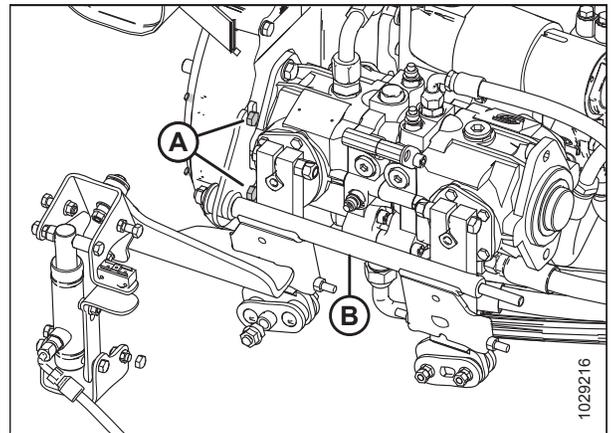


Figure 3.16: Traction Drive Assembly

9. Remove and retain jam nuts (A), hex head nuts (B), and hex head bolts (C).
10. Remove and retain pintle arms (D).

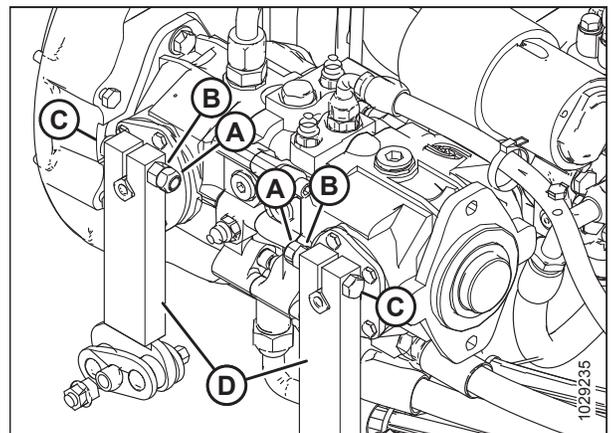


Figure 3.17: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

11. On top of the pump, remove hoses connected to case drain port (A), port E (E), and port D (D).

NOTE:

Case drain port (A) is closer to the gearbox and connects to the hydraulic reservoir. Port E (E) in the middle of the pump connects to header drive pump port D (D). Be sure to cap, plug, and color code hydraulic lines and ports. This will aid in reassembly.

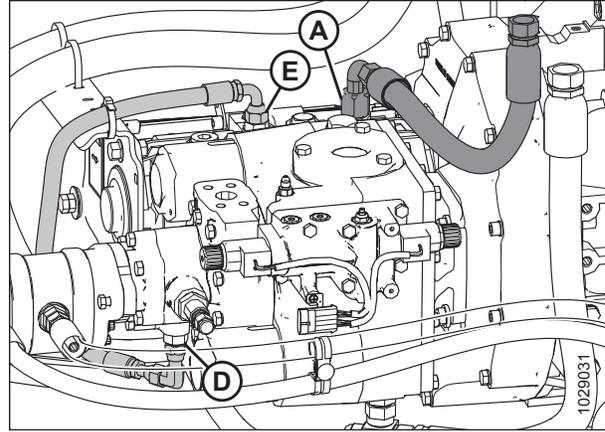


Figure 3.18: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

12. Detach the hydraulic hoses from the bottom of the pump:

- Model years 2016–2019: Refer to Figure 3.19, page 19. Six hoses attach to the bottom of the pump.
- Model year 2015: Refer to Figure 3.20, page 19. Five hoses attach to the bottom of the pump.

NOTE:

Be sure to cap, plug, and color code hydraulic lines and ports. This will aid in reassembly.

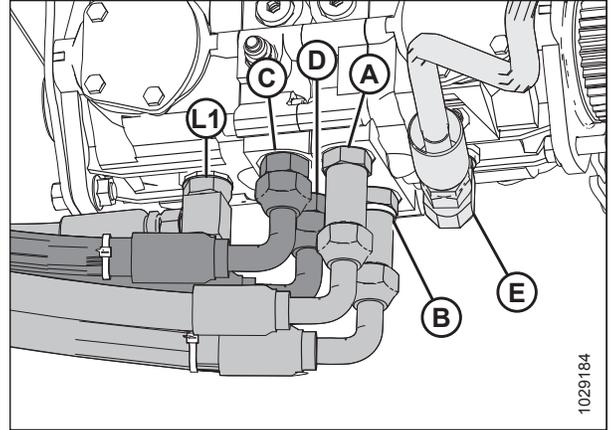


Figure 3.19: Model Years 2016–2019 Connection at the Pump (View from LH Side Cab-Forward)

- A - Port A (Extended Adapter) Connects to Port B RH Wheel Motor
- B - Port B (Extended Adapter – Red Tie) Connects to Port A RH Wheel Motor
- C - Port C (Short Adapter – Yellow Tie) Connects to Port B LH Wheel Motor
- D - Port D (Short Adapter) Connects to Port A LH Wheel Motor
- E - Unlabeled Port Connects to Port DR Bypass Manifold
- L1 - Case Drain Port L1 Connects to Tee then Port L3 Wheel Motor

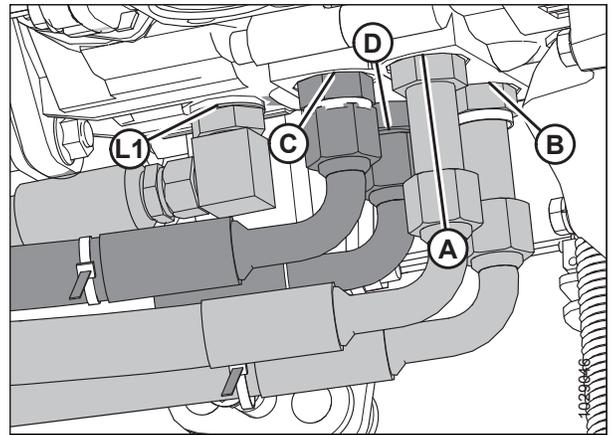


Figure 3.20: Model Year 2015 Connection at the Pump (View from LH Side Cab-Forward)

- A - Port A (Extended Adapter) Connects to Port B RH Wheel Motor
- B - Port B (Extended Adapter – Red Tie) Connects to Port A RH Wheel Motor
- C - Port C (Short Adapter – Yellow Tie) Connects to Port B LH Wheel Motor
- D - Port D (Short Adapter) Connects to Port A LH Wheel Motor
- L1 - Case Drain Port L1 Connects to Tee then Port L3 Wheel Motor

INSTALLATION INSTRUCTIONS

13. Remove bottom bolt (A) from the traction pump.
14. Support the pump and remove top bolt (B) from the traction pump.

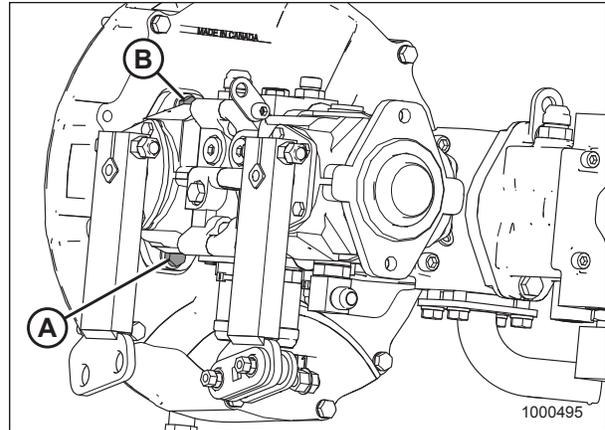


Figure 3.21: Traction Drive Assembly

15. Remove pump (A) and place it on a work bench.

IMPORTANT:

Traction drive pump is heavy, be sure to support it correctly.



Figure 3.22: Traction Drive Assembly

3.6 Removing Gearbox Assembly

To remove the gearbox assembly, follow these steps:

1. Find a suitable container to place used oil in. Remove drain plug (A) on the bottom of the gearbox and drain the oil out.
2. Once the oil is drained, clean off any debris that has accumulated on the drain plug, and then reinstall the plug.
3. Remove 10 of the 12 bolts (B) that hold the machined cover to the engine. Discard bolts.

NOTE:

Leave two bolts (C) in the gearbox to hold it loosely to the engine. This will assist you when you pry it off.

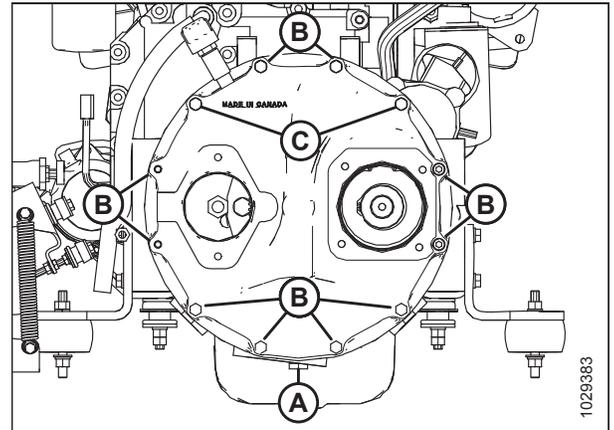


Figure 3.23: Engine Gearbox

4. Install one 1/2 in. fully threaded rods into pump mounting holes (A). Thread them in far enough till they touch the engine flywheel. Tighten the bolt enough to push the machined cover off and break the silicone seal holding the gearbox to the engine.

NOTE:

Do not thread bolt in too far as it may cause the gearbox to become lodged.

5. Remove last two bolts (B) securing gearbox to engine. Discard bolts.

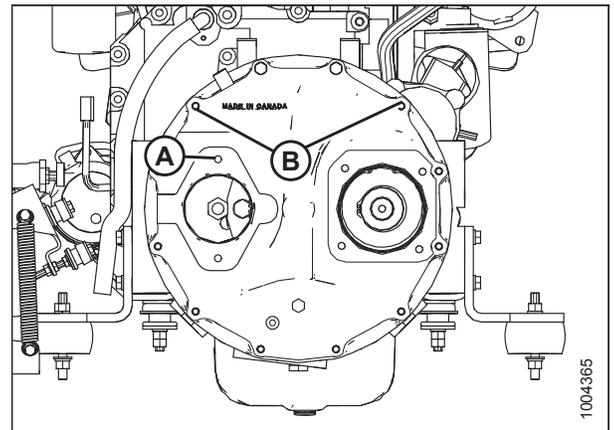


Figure 3.24: Engine Gearbox

6. Remove the gearbox complete with the center gear. Discard the gearbox.

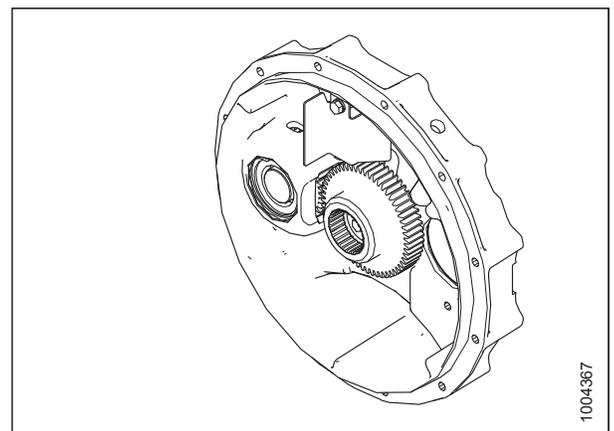


Figure 3.25: Gearbox with Center Gear

INSTALLATION INSTRUCTIONS

7. Leave spline coupling (A) on the engine.

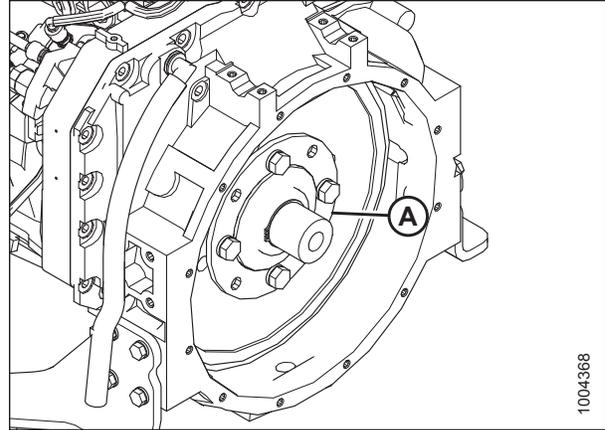


Figure 3.26: Spline Coupling

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3.7 Removing Front Shaft from Traction Drive Pump

To remove the front shaft from the traction drive pump, follow these steps:

⚠ CAUTION

Pump must be secured to work bench to keep from toppling or secure with overhead device.

1. Secure motor (A) in upright position.
2. Ensure all oil is drained from the pump at port L2.

IMPORTANT:

Do **NOT** remove or install shaft while pump is horizontal. Some pins may work loose and fall into pump cavity.

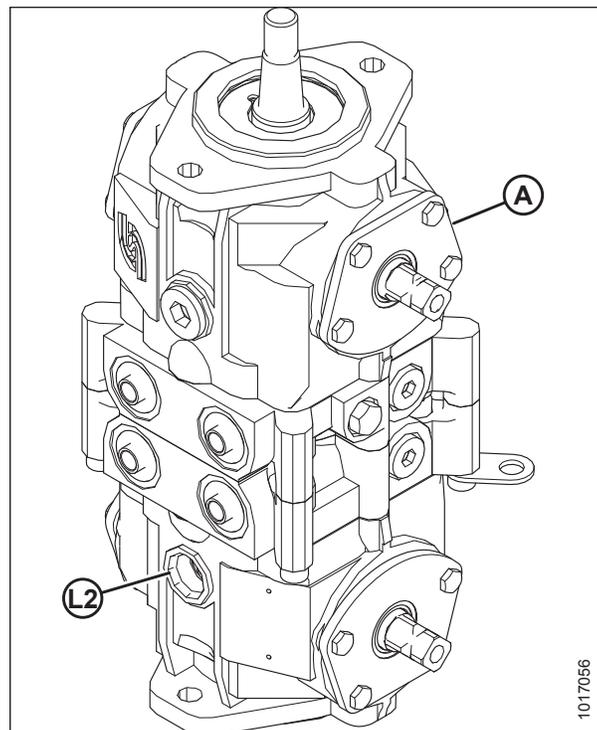


Figure 3.27: Traction Drive

INSTALLATION INSTRUCTIONS

3. Remove and retain nuts (A).
4. Remove and discard gear (B).

NOTE:

Gear is tight to tapered shaft; use a bearing splitter to separate gear from pump shaft.

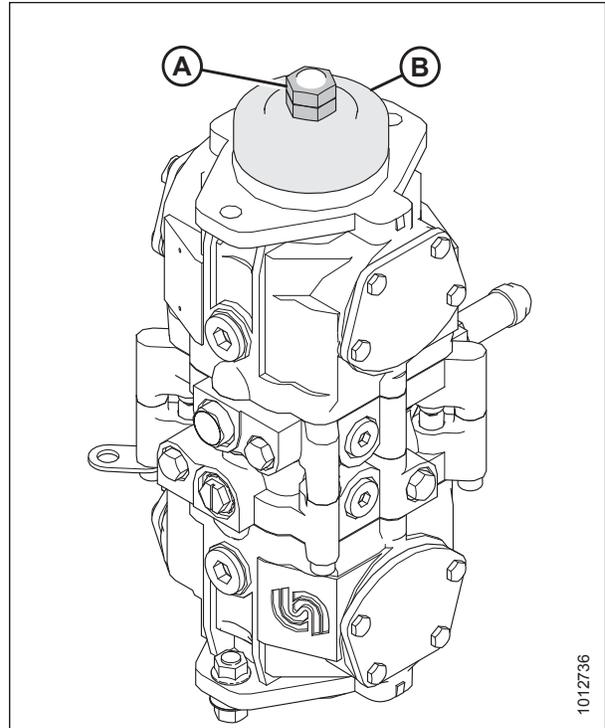


Figure 3.28: Traction Drive

5. Remove and discard snap ring (A).
6. Remove and discard key (D).
7. Remove and retain washer (B).
8. Remove and discard oil seal (C).

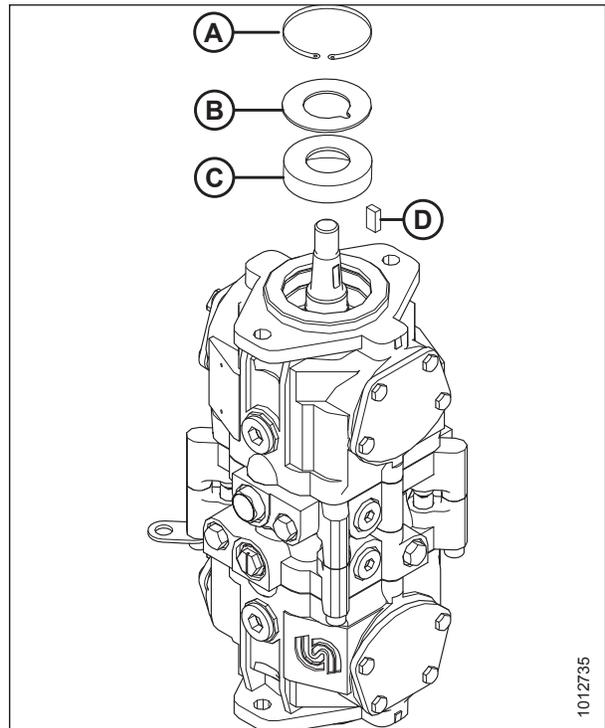


Figure 3.29: Traction Drive

INSTALLATION INSTRUCTIONS

9. Remove shaft complete with bearing (A).

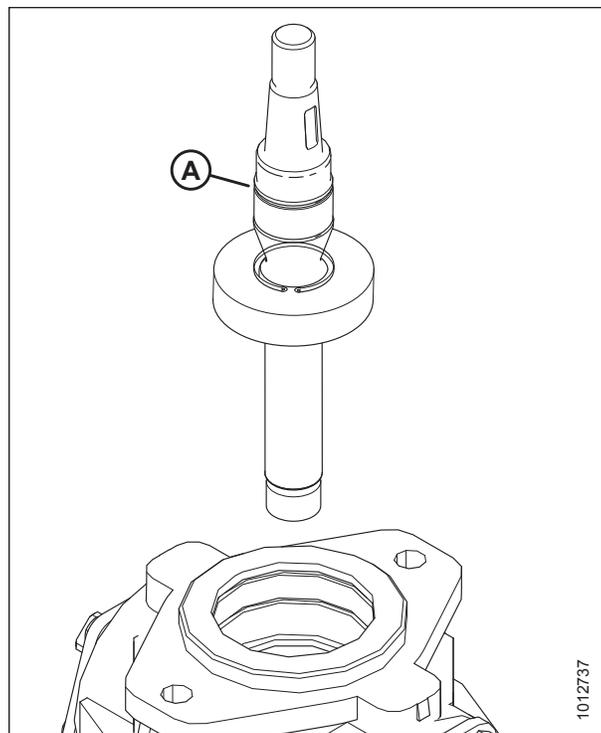


Figure 3.30: Front Shaft

10. Remove and retain snap rings (A).

NOTE:

There is a snap ring on each side of the bearing.

11. Discard bearing (B) and shaft.

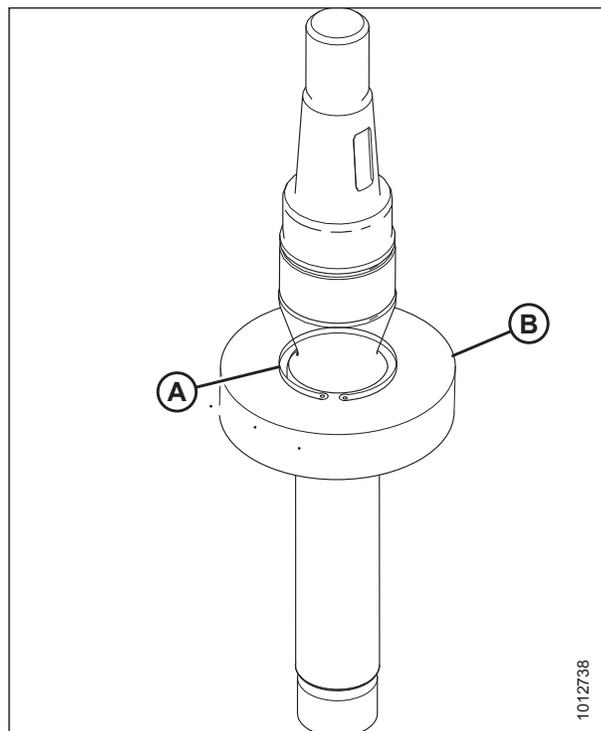


Figure 3.31: Front Shaft

3.8 Replacing Engine Seal

It is recommended that the engine seal also be replaced. For parts and service procedures, contact Cummins at 1-800-DIESELS (1-800-343-7357) or <https://cumminsengines.com>.

NOTE:

Engine seal replacement is not covered under MacDon warranty.

3.9 Installing New Front Shaft on Traction Drive Pump

To install the new front shaft (MD #111898) provided in the kit, follow these steps:

1. Remove bag containing new front shaft (MD #111898) from the kit and open it.
2. Press new roller bearing (B) (MD #111896) onto the shaft. The roller bearing is provided in the kit.
3. Install snap rings (A).

NOTE:

There should be a snap ring on each side of the bearing. Reuse the snap rings used on the old front shaft.

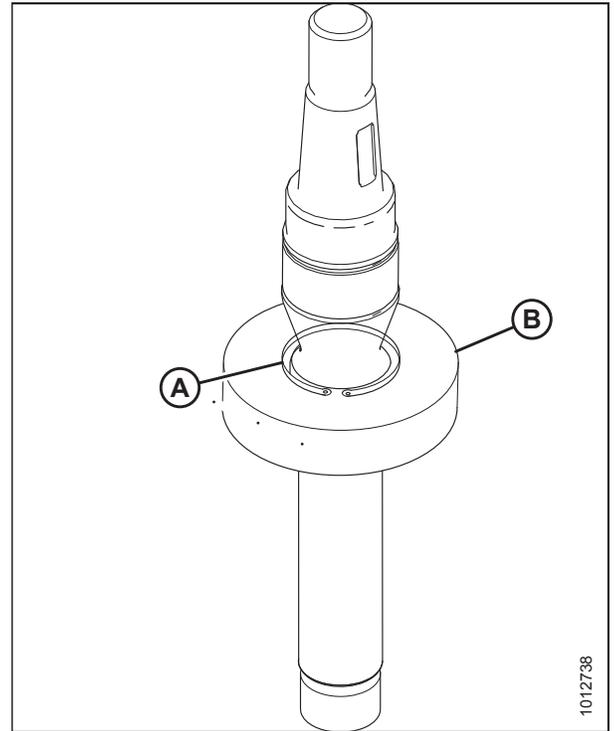


Figure 3.32: Front Shaft

4. Install the shaft complete with bearing (A) into the pump. Splines must engage internal coupling to rear shaft. Press shaft far enough to allow for seal, washer and external snap ring described in Steps 5, page 28 to 7, page 28 to seat properly.

IMPORTANT:

Do **NOT** tap the shaft into place as this will cause more damage to the pump. You will need to maneuver the shaft into position by hand.

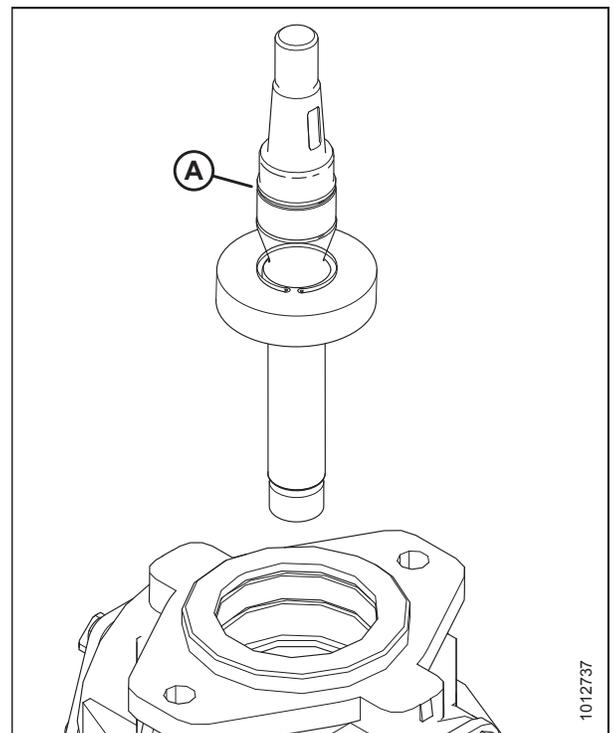


Figure 3.33: Traction Drive

INSTALLATION INSTRUCTIONS

NOTE:

Cover the end of the shaft with cellophane (plastic wrap) to prevent seal damage.

5. Install new oil seal (C) (MD #203048) provided in the kit.
6. Install washer (B).
7. Install new snap ring (A) (MD #111897) provided in the kit.
8. Install new key (D) (MD #111895) provided in the kit.

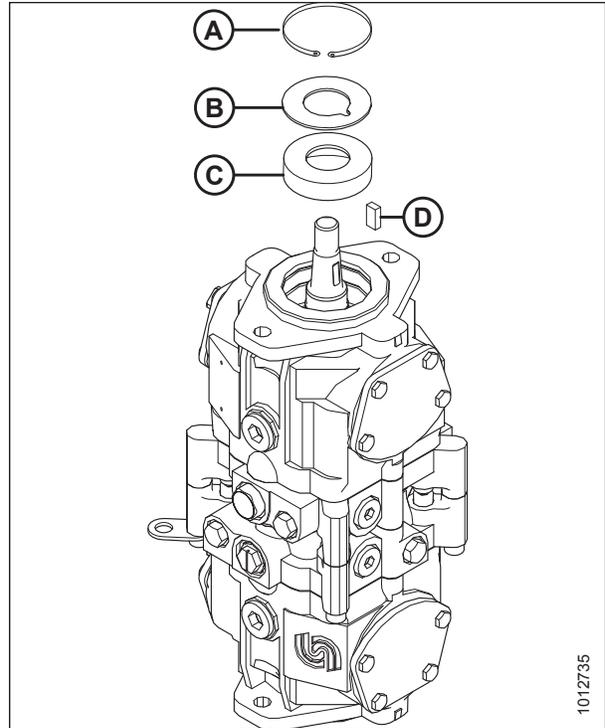


Figure 3.34: Traction Drive

9. Install new pump gear (B) (MD #208699) provided in the kit.
10. Install nuts (A) (retained from removal of the old front shaft). Install first nut and torque it to 149–190 Nm (110–140 lbf-ft), then jam second nut against the first nut. While holding the first nut, torque the second nut to 149–190 Nm (110–140 lbf-ft).

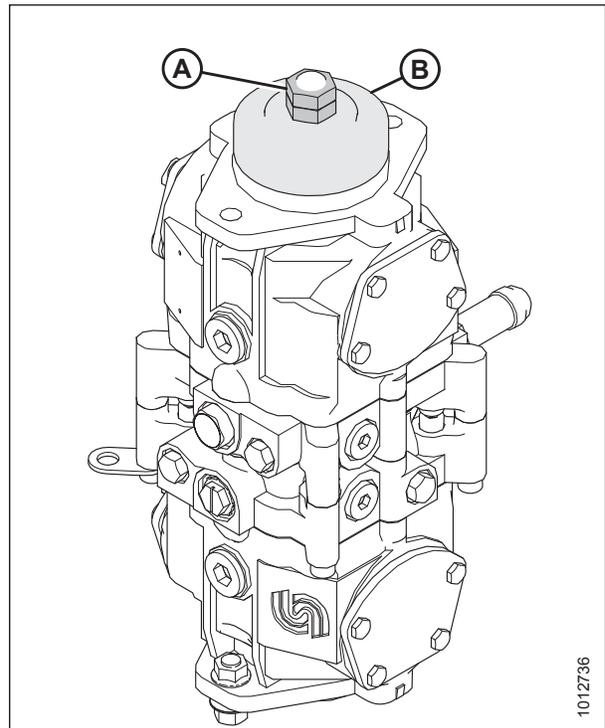


Figure 3.35: Traction Drive

3.10 Installing New Gearbox Assembly

Install the new engine gearbox assembly using the hardware provided in the kit.

1. Make sure the mating surface on the engine is free of silicone from the previous gearbox. Scrape any excess silicone off. The mating surface should be as clean as possible.
2. Remove engine gearbox assembly and bag of hardware from the kit. Open the bag.
3. Install two pieces of M10 x 127 mm threaded rod into two of the machined gearbox mounting holes (A). This will support the gearbox while installing it.

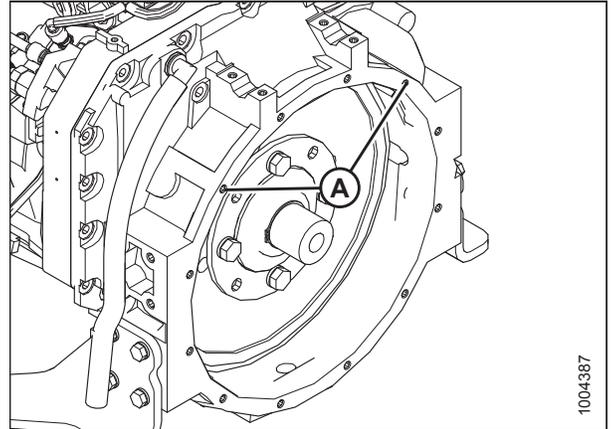


Figure 3.36: Gearbox Mounting Holes

4. Place a 5–7 mm (3/16–1/4 in.) diameter bead of silicone (B) onto the gearbox around the inside edge.

NOTE:

Do **NOT** use excessive silicone as it may get into the threaded holes on the gearbox and may cause cracks.

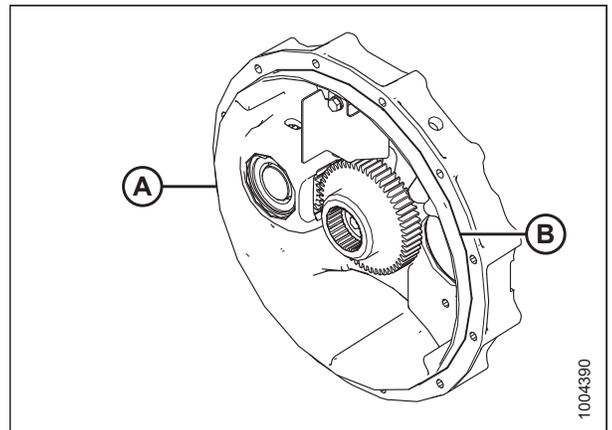


Figure 3.37: Engine Gearbox

INSTALLATION INSTRUCTIONS

- After applying the silicone, apply high-strength threadlocker (Loctite® 262 or equivalent) to all bolts (A), (B), (C), and (D), **EXCEPT** bolts (C)*. Install bolts (A), (B), (C), and (D), and washers around the perimeter of the housing. Wipe off any silicone that may get on the bolts. Torque bolts to 55 Nm (40 lbf-ft) according to the torque sequence shown in Figure 3.39, page 30.

NOTE:

Bolts (C)* will have to be removed later to install the triple gear pump. Bolts (C)* do not have washers.

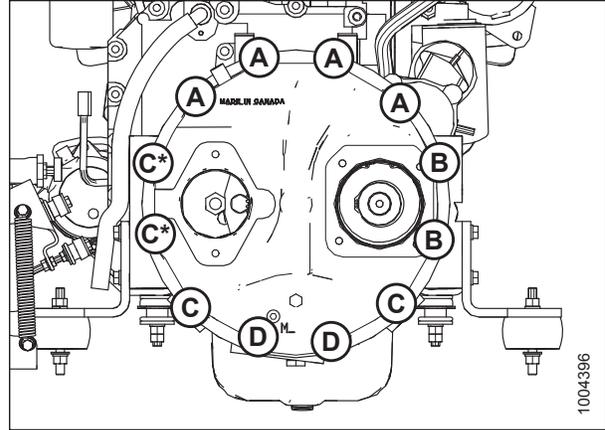


Figure 3.38: Gearbox Hardware

A - M10 X 1.5 X 80 (8.8) B - M10 X 1.5 X 90 (10.9)
C - M10 X 1.5 X 90 (8.8) D - M10 X 1.5 X 130 (8.8)

- Add lubricant to the gearbox. Use SAE 80W-140, API service class GL-5, fully synthetic gear lubricant (SAE J2360 preferred).

NOTE:

Gearbox capacity is 2.1 liters (2.2 U.S. quarts).

- Reach into the gearbox through one of the pump holes and check that the spline coupling has some movement.

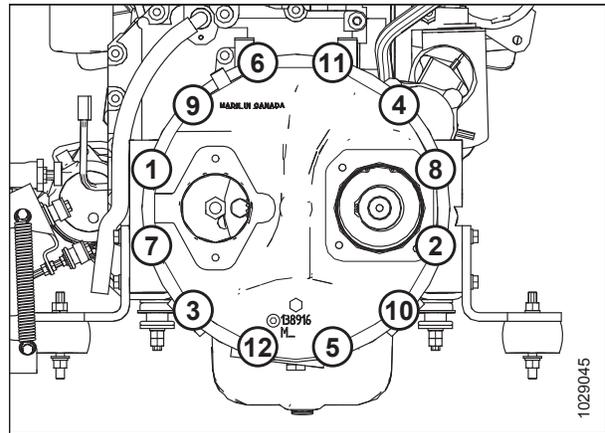


Figure 3.39: Gearbox Hardware Torque Sequence

3.11 Reinstalling Traction Drive Pump

To reinstall the traction drive pump, follow these steps:

1. Make sure the mounting surfaces on the pump and engine gearbox housing are clean.
2. Install new $\varnothing 101.27$ mm ID x 2.62 mm, Nitrile 70 O-ring (A) (MD #30045) before reassembly. O-ring is provided in the kit.
3. If you removed gear (B) from the end of the shaft, check that the key is seated in the keyway on the input shaft on the traction drive pump, and then tighten nuts (C). Torque inner nut to 149–190 Nm (110–140 lbf-ft) to seat the gear. Hold the inner nut and tighten the outer nut against the inner nut. Torque outer nut to 149–190 Nm (110–140 lbf-ft).

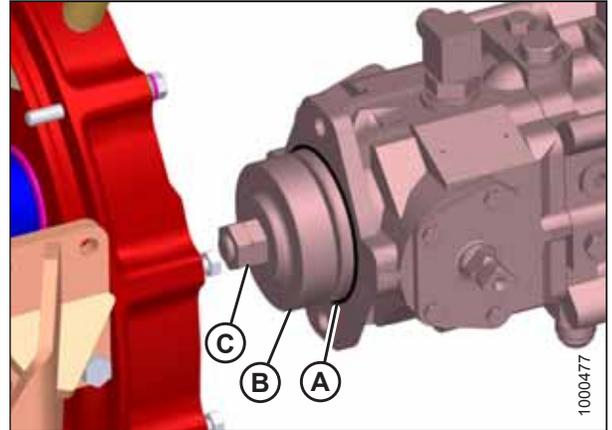


Figure 3.40: Traction Drive Assembly

4. Support traction drive pump (A) and raise it into position, then insert it into the gearbox.

IMPORTANT:

Traction drive pump is heavy, make sure to support it adequately.



Figure 3.41: Traction Drive Assembly

5. Install two bolts (A) that hold the pump to the gearbox. Use high-strength threadlocker (Loctite® 262 or equivalent) on both bolt and torque them to 106 Nm (78 lbf-ft).

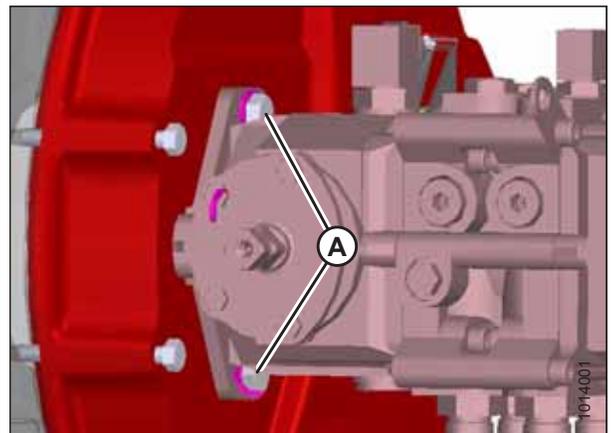


Figure 3.42: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

6. Reattach the hoses to the bottom of the pump:
- Model years 2016–2019: Refer to Figure 3.43, page 32. Six hoses attach to the bottom of the pump.
 - Model year 2015: Refer to Figure 3.44, page 32. Five hoses attach to the bottom of the pump.

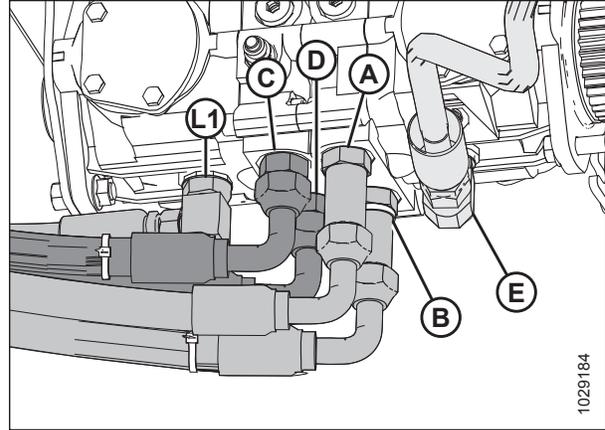


Figure 3.43: Model Years 2016–2019 Connection at the Pump (View from LH Side Cab-Forward)

- A - Port A (Extended Adapter) Connects to Port B RH Wheel Motor
- B - Port B (Extended Adapter – Red Tie) Connects to Port A RH Wheel Motor
- C - Port C (Short Adapter – Yellow Tie) Connects to Port B LH Wheel Motor
- D - Port D (Short Adapter) Connects to Port A LH Wheel Motor
- E - Unlabeled Port Connects to Port DR Bypass Manifold
- L1 - Case Drain Port L1 Connects to Tee then Port L3 Wheel Motor

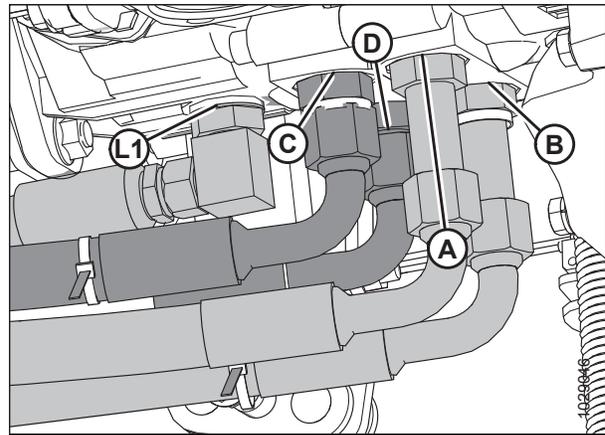


Figure 3.44: Model Year 2015 Connection at the Pump (View from LH Side Cab-Forward)

- A - Port A (Extended Adapter) Connects to Port B RH Wheel Motor
- B - Port B (Extended Adapter – Red Tie) Connects to Port A RH Wheel Motor
- C - Port C (Short Adapter – Yellow Tie) Connects to Port B LH Wheel Motor
- D - Port D (Short Adapter) Connects to Port A LH Wheel Motor
- L1 - Case Drain Port L1 Connects to Tee then Port L3 Wheel Motor

INSTALLATION INSTRUCTIONS

7. Reattach two hoses to the top of the pump as follows:
 - a. Case drain port (A), closer to the front of the windrower, connects to the hydraulic tank.
 - b. Port E (E), in the middle of the pump, connects to header drive pump port D (D).

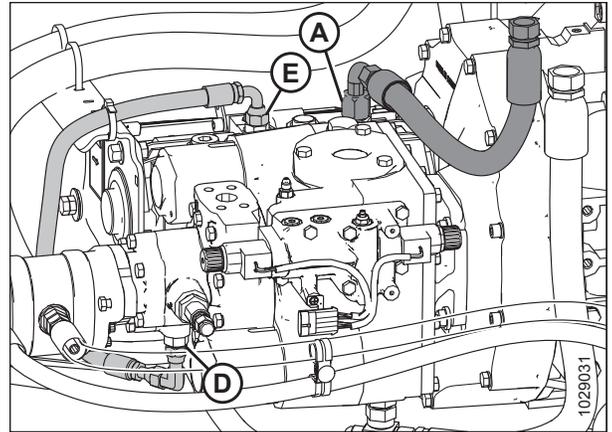


Figure 3.45: Traction Drive Assembly

8. On the pintle arms, check the condition of rubber insulator (A) and replace if necessary. To install the rubber insulator, follow these steps:
 - a. Lubricate the insulator and plate with water.
 - b. Place the insulator in the plate hole and twist by hand as far as it will go without cocking.
 - c. Insert a 3/8 x 2 in. hex bolt into the insulator, and tap the bolt head to fully insert the insulator. There should be no gap between the under surface of the insulator and the plate.

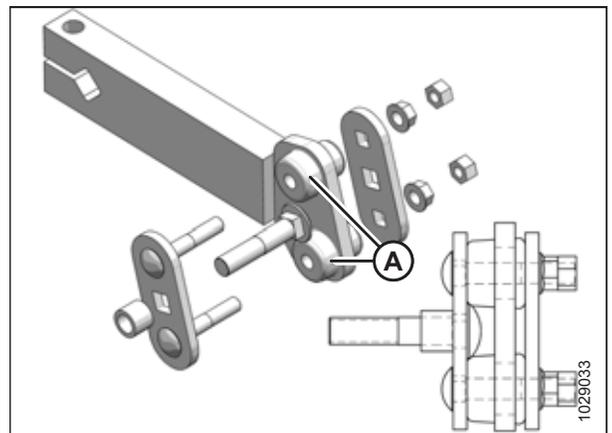


Figure 3.46: Traction Drive Assembly

9. Remove 3/8 x 2 in. hex bolt and assemble parts. Torque nuts (A) to 20–24 Nm (15–18 lbf·ft).

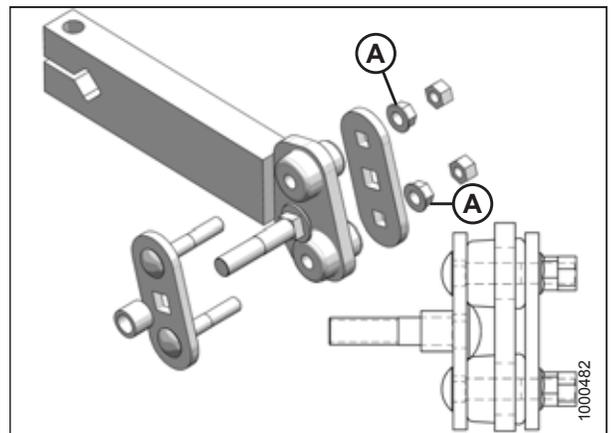


Figure 3.47: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

10. Install both pintle arms (A) onto the pump shafts (B). Ensure the arms are installed the correct way, if the bottom is angled the wrong way, steering will be affected.

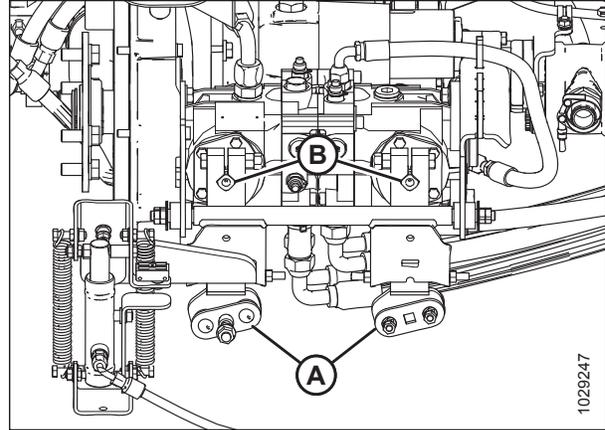


Figure 3.48: Traction Drive Assembly

11. Make sure ends of pump shafts (B) are installed onto pintle arms (A) according to dimension (C). Ends of pump shafts (B) can be flush with pintle arms (A) or protrude up to 2 mm (1/16 in.) out of the pintle arms.

IMPORTANT:

Ends of pump shafts (B) must **NOT** be recessed into pintle arms (A). The pump shafts must fully engage with the cutout on the arms.

12. Make sure there is enough clearance (D) between the pintle arms and the bolt heads directly behind them.

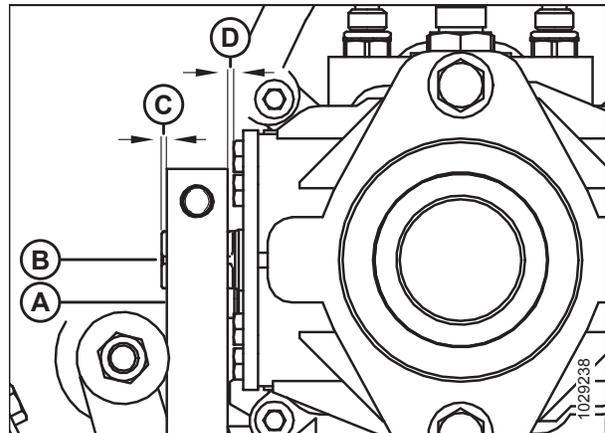


Figure 3.49: Pintle Arm Installation Specifications

C - 0-2 mm (0-1/16 in.)

D - 2.8 mm (1/8 in.)

13. Install 1/2 x 3 in. bolts (A) and nuts (B) onto pintle arms (C).
14. Torque nut (B) to 108 Nm (80 lbf·ft). Then install jam nut (D) and torque to 108 Nm (80 lbf·ft).

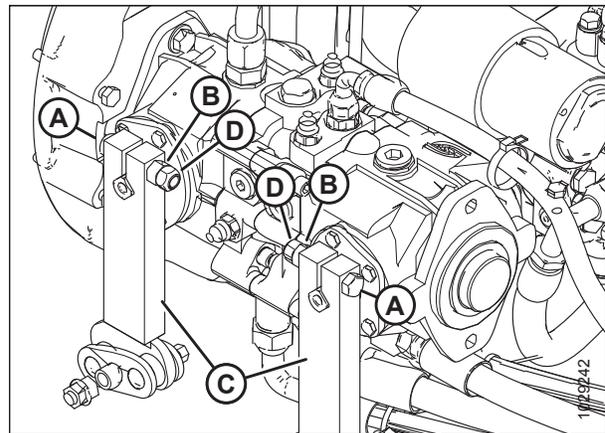


Figure 3.50: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

- Interlock pivot assembly (C) was attached to the cylinder in Step 8, page 17. Detach it from the cylinder and rotate it into position.

Reinstall interlock hanger (A) and bolts (B). Bolts (B) do not require washers, only use high-strength threadlocker (Loctite® 262 or equivalent) and torque the bolts to 106 Nm (78 lbf-ft).

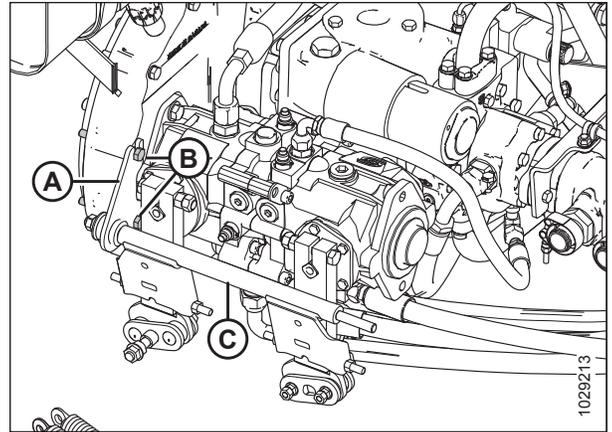


Figure 3.51: Traction Drive Assembly

- Rotate interlock pivot assembly (A) until head of carriage bolt (B) contacts pintle arm (C) that is **CLOSER** to the gearbox. Adjust the position of **OTHER** pintle arm (D) so that there is a clearance (E) of 1.5–2.5 mm (1/16–1/8 in.) between head of carriage bolt (F) and pintle arm (D).

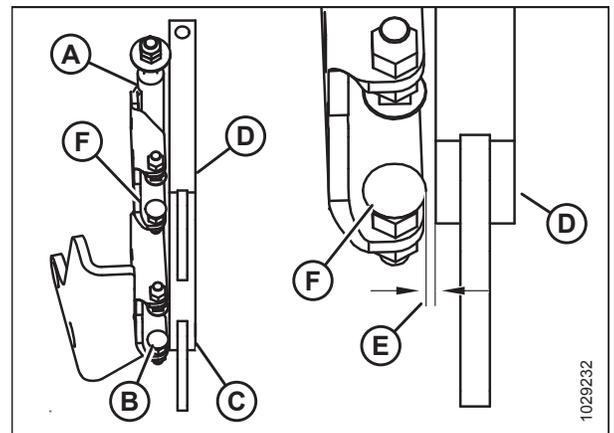


Figure 3.52: Traction Drive Assembly

- Install neutral interlock (A) and neutral interlock bracket (B). Secure the neutral interlock with washer (C) and nut (D). Torque interlock nut (D) to 61 Nm (45 lbf-ft). Then install jam nut (E) and torque 61 Nm (45 lbf-ft).
- Install two bolts (F) that secure the interlock bracket.

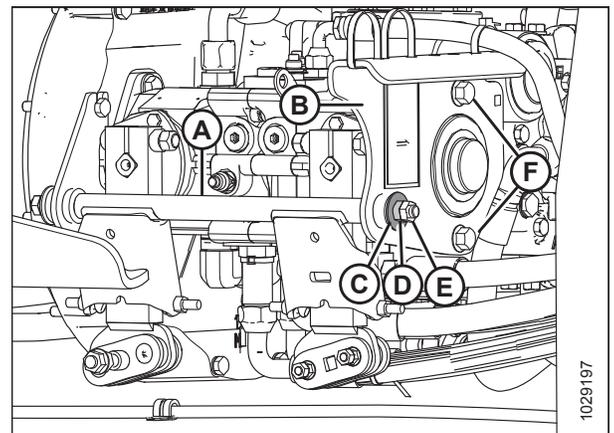


Figure 3.53: Traction Drive Assembly

INSTALLATION INSTRUCTIONS

19. Install both springs (A) onto neutral interlock.

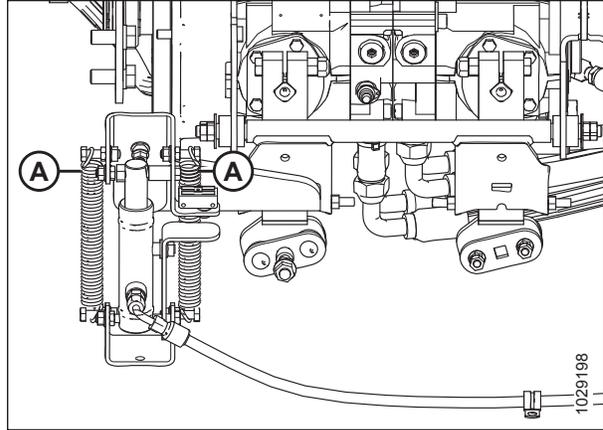


Figure 3.54: Traction Drive Assembly

20. Set interlock pivot (B) away from the shank of the pintle arm (A) that is **CLOSER** to the gearbox until there is a gap of 2–5 mm (1/16–3/16 in.). If you need to adjust the interlock pivot to achieve the correct gap, adjust nuts (D) to increase or decrease the gap.

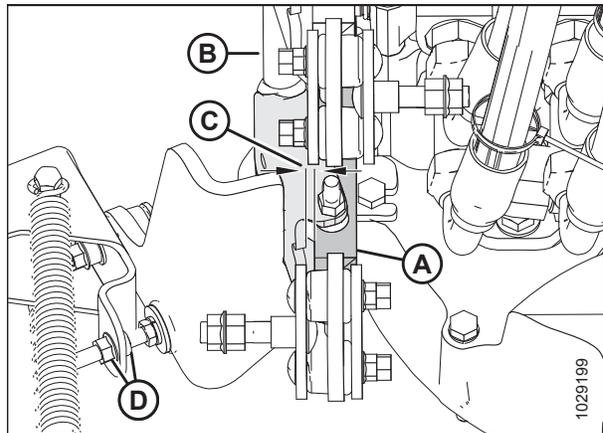


Figure 3.55: Traction Drive Assembly

21. Attach the steering link arms to pintle arms (A) and (B). Tighten first nuts (C) to 61 Nm (45 lbf·ft). Tighten second nuts (D) to 113 Nm (83 lbf·ft).

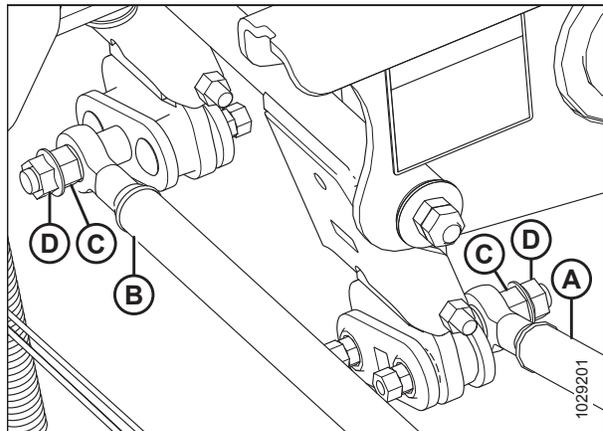


Figure 3.56: Traction Drive Assembly

3.12 Reinstalling Header Drive Pump

To reinstall the header drive pump, follow these steps:

1. Make sure the mounting surfaces on the pump and engine gearbox housing are clean.
2. Install new 4.86 in. ID x \varnothing 0.139 in. Nitrile 70 O-ring (A) (MD #139322) before reassembly.

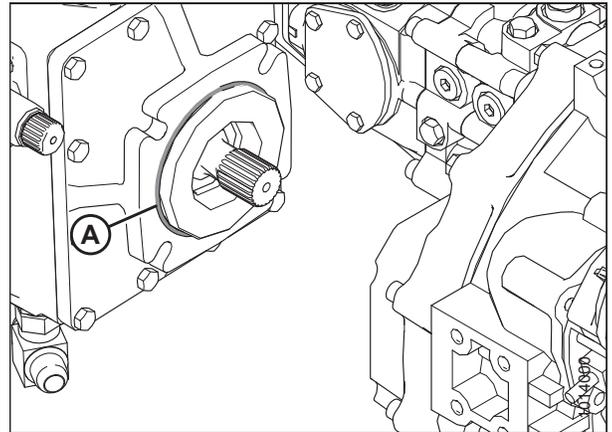


Figure 3.57: Hydraulic System

3. Install header drive pump (A).
4. Secure the header drive pump with four 1.5 in. long hex head bolts (B) (MD #135460) and hardened washers (MD #136027) provided in the kit. Use high-strength threadlocker (Loctite® 262 or equivalent) on threads and torque bolts to 106 Nm (78 lbf-ft).

NOTE:

Only two of the bolts are visible in the illustration at right. For the location of the other two bolts, refer to Figure 2.2, page 8.

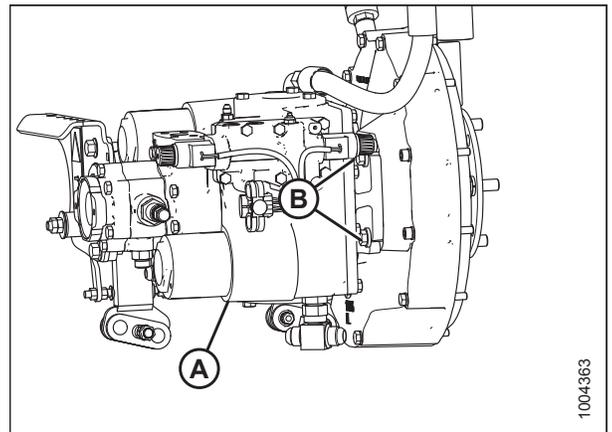


Figure 3.58: Header Drive Pump Attached to Gearbox

INSTALLATION INSTRUCTIONS

- Remove cap and plugs. Reconnect five hydraulic hoses (D), (E), (F), (H), and (K), two lines (A) and (B), and one electrical connector (J) that connect to header drive pump (Z).

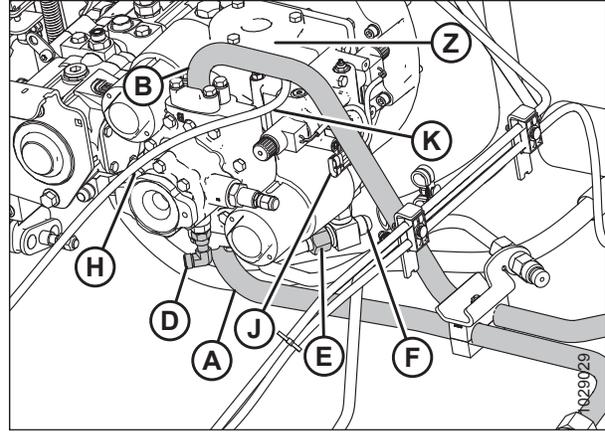


Figure 3.59: Hydraulic System

A - Port A Connects to Port B on Draper/Auger Manifold (Port A on Rotary Motor)

B - Port B Connects to Port A on Draper/Auger Manifold (Port B on Rotary Motor)

D - Inline Port D Connects to Port E on Traction Drive Pump

E - Port F Connects to Case Drain for Rotary Header⁶

F - Port F Connects to Hydraulic Tank

H - Port H Connects to Cooler Bypass

K - Port D Connects to GSL Servo (IN Port)

J - Electrical Connector

Z - Header Drive Pump

- Install line support (C). Align the bolt holes in the line support with the pump and tighten bolt (B) to 17 Nm (150 lbf-in).
- Install hose clamp (A).

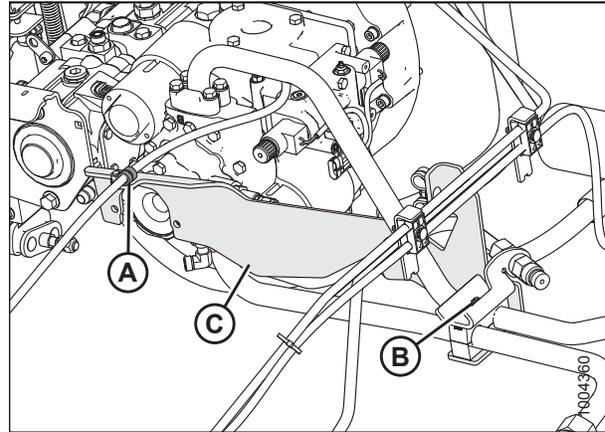


Figure 3.60: Hydraulic System

⁶ This connection is capped for all other headers.

3.13 Reinstalling Triple Gear Pump

To reinstall the triple gear pump, follow these steps:

1. Clean the mating surfaces of the header drive pump and the triple gear pump with cleaning solution or brake cleaner. Allow the mating surfaces to dry completely. Make certain there is no oil residue or dirt of any kind on the mating surfaces.
2. Install triple gear pump (A).

NOTE:

Ensure O-ring (MD #166737) is lubricated and installed on the pilot diameter of the gear pump before installing it onto the gearbox.

3. Apply high-strength threadlocker (Loctite® 262 or equivalent) to two 1.5 in long hex head bolts (G), and then use them to secure the triple gear pump to the header drive pump. Torque bolts to 46 Nm (34 lbf-ft).
4. Remove any caps, and reconnect five hydraulic lines (B), (C), (D), (E), and (F) that connect to triple gear pump (A). Refer to the illustration at right for hose locations. Secure hoses (B) and (C) with clamps (H). Torque clamps (H) according to the type of clamp:
 - If the clamp is a T-bolt (J) clamp, torque it according to standard torque values.
 - If the clamp is a worm gear clamp (K), torque it to 4–5 Nm (35–40 lbf-in).

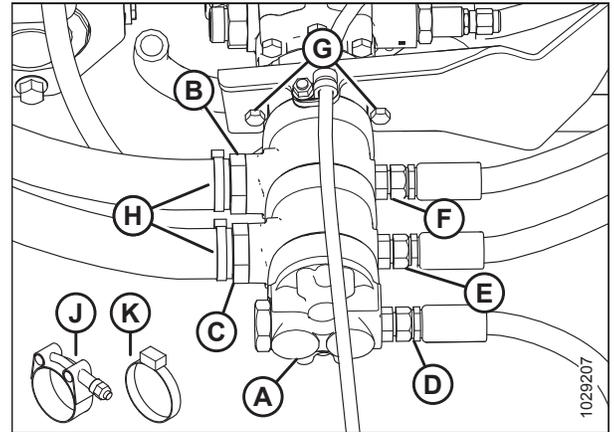


Figure 3.61: Triple Gear Pump Assembly

- A - Gear Pump
- B - Connects to Hydraulic Tank
- C - Connects to Hydraulic Tank
- D - Connects to P1 on Multifunction Control Block
- E - Auger/Draper Configured: Connects to Port P on Drive Manifold; Disc Configured: Connects to Port B on Cooler Bypass
- F - Connects to Port A on Cooler Bypass; DWA Installed: Connects to Port P
- G - Bolts
- H - Hose Clamps
- J - T-bolt Clamp
- K - Worm Gear Clamp

3.14 Refilling Hydraulic Oil Reservoir

To refill the hydraulic oil reservoir, follow these steps:

1. Stand on left (cab-forward) platform to access the filler pipe.
2. Turn filler cap (A) counterclockwise to unlock cap and remove dipstick.

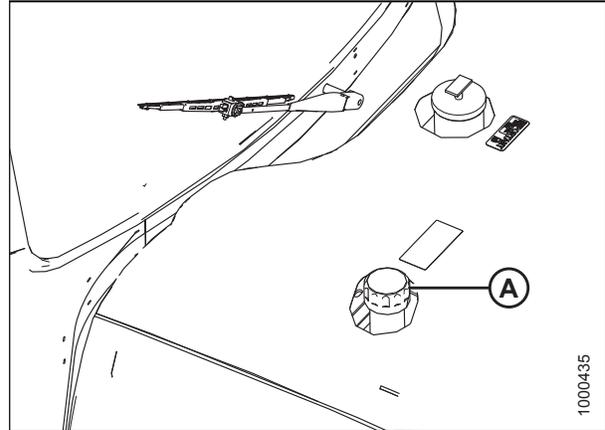


Figure 3.62: Engine Hood

3. Add SAE 15W-40 oil (compliant with SAE specs for API class SJ and CH-4 engine oil) until level is between low (L) and full (H) marks on the dipstick.

IMPORTANT:

- Use good quality, prefiltered oil
- Exercise care to prevent debris from falling into tank

4. Reinstall dipstick and filler cap, but leave loose for the next procedure.

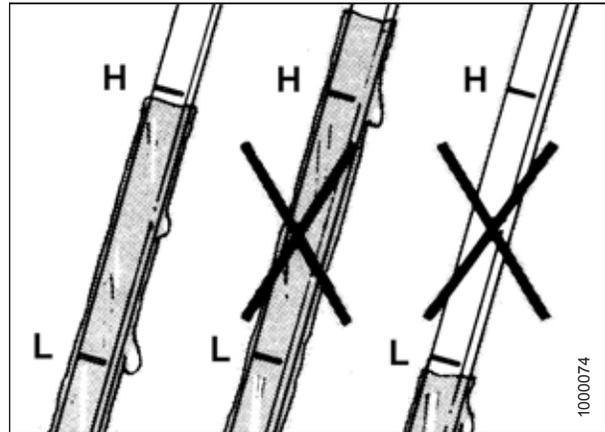


Figure 3.63: Hydraulic Oil Levels

3.15 Charging the Hydraulic System

To charge the hydraulic system, follow these steps:

⚠ CAUTION

Use a hydraulic jack with minimum lifting capacity of 2268 kg (5000 lb.) to provide adequate support for the machine.

1. Raise both drive wheels from the ground following these steps:
 - a. Place a jack under one leg jack point (A) and raise the drive wheel until it is slightly off ground. Place a jack stand beneath lift cylinder mount (B).

NOTE:

Do **NOT** place jack stand under the cylinder. Use a small metal plate on top of the jack stand.

- b. Lower the windrower onto the jack stand.

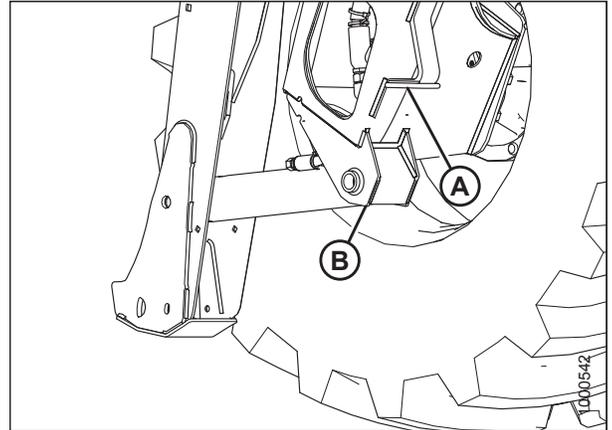


Figure 3.64: Drive Wheel Jack Point

2. On top of the traction drive pump, loosen plug (A) to allow air to bleed out of the pump housing, and then fill the housing with oil. Once the oil starts to run out from the housing, reinstall and tighten plug.

IMPORTANT:

This procedure must be done prior to the engine cranking. Pumps are damaged very quickly without oil in the housings.

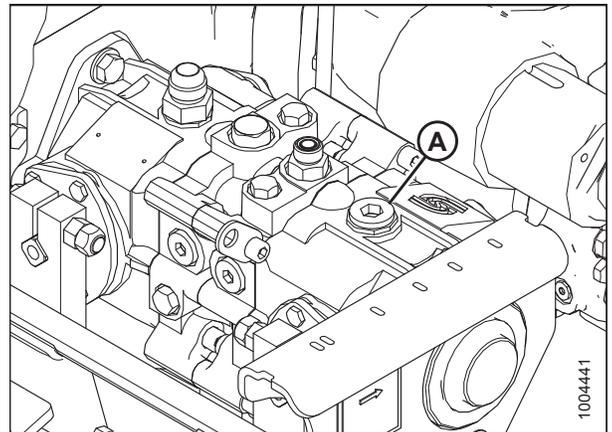


Figure 3.65: Traction Drive Assembly

3. To open the right platform (cab-forward) rearward, push latch (A) and pull platform (B) toward walking beam until it stops and latch engages in open position.

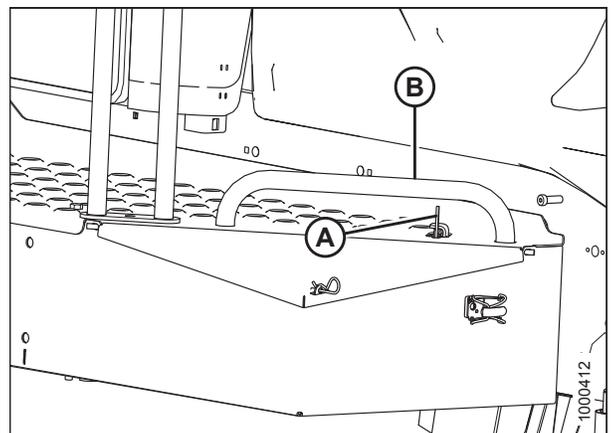


Figure 3.66: Platform Latch

INSTALLATION INSTRUCTIONS

4. Open fuse box (A) and remove fuse F7 from the fuse block. Crank engine over with starter for approximately 15 seconds.
5. Reinstall the fuse and start the engine, running it at 1100 rpm with the windrower in the neutral position.

NOTE:

On the cab display module (CDM) display, the transmission low charge pressure warning should turn off in less than 30 seconds. If it does not, stop the engine immediately and determine the cause.

6. After adequate charge pressure has been achieved (warning display has shut off) slowly move the speed control lever approximately 25 mm (1 in.) out of the neutral position and into the forward position for 20 seconds. This will fully charge the hydraulic system.
7. Run the engine up to 2000 rpm, slowly move the speed control lever fully in one direction and then fully in the opposite direction. Check that the wheels respond positively. Turn steering wheel and check to see that wheels turn in the correct direction.
8. Once the initial run up is complete, cycle the lift linkage and table angle cylinder a few times.



Figure 3.67: Fuse Box

WARNING

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

9. Shut down the engine, and remove the key from the ignition.
10. Remove oil fill cap and top up the hydraulic oil reservoir to the full mark. Tighten oil fill cap. Check the system thoroughly for signs of leakages.
11. Close the platform.
12. While drive wheels are raised, check to make sure neutral is set properly, and adjust if necessary. For instructions, refer to the windrower technical manual.

CAUTION

Use a hydraulic jack with minimum lifting capacity of 2268 kg (5000 lb.) to provide adequate support for the machine.

13. Lower both drive wheels to the ground following these steps:
 - a. Place a jack under leg jack point (A) and raise the drive wheel slightly off the jack stand.
 - b. Remove the jack stand from under cylinder lift mount (B) and lower the drive wheel to the ground.
 - c. Remove the jack.

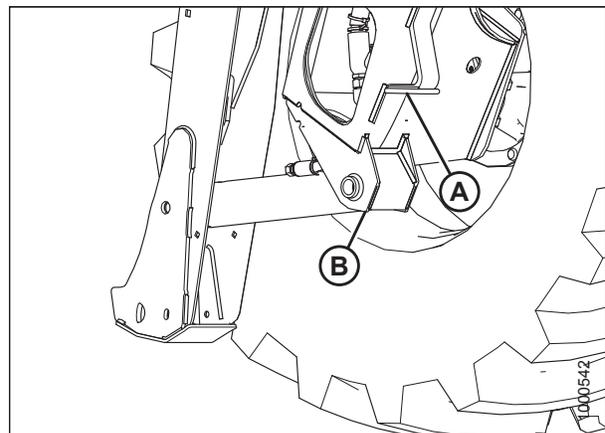


Figure 3.68: Drive Wheel Leg Jacking Point

3.16 Closing Hood – Highest Position

Close and secure the hood after servicing the engine compartment and before starting operation.

1. Pull down on strap (B) and loop it under lower hook (D).
2. Grasp strap (B) and loop it under upper hook (C).

IMPORTANT:

Failure to hook the strap may result in it becoming entangled with the screen cleaners or the latch.

3. Pull down on strap (B), grasp the hood when within reach, and lower until the hood engages latch (A).

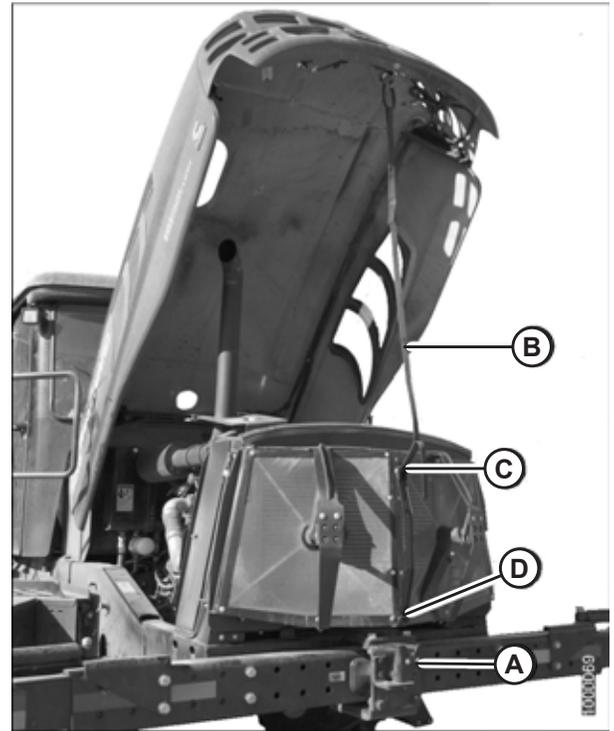


Figure 3.69: Hood Open – Highest Position

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