Challenger®

9195 / 9196 / DKHE / DKHET
Rotary Disc Header

SERVICE MANUAL
79034610 B Rev.

CONTENTS

Part Number 79034610 B Rev. (English)

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Flying Debris

Never stand near the machine during operation. Debris can be thrown from the machine during operation possibly resulting in injury.

WARNING: Be careful when operating along the side of a road or building. Rocks or other debris can be thrown from the machine during operation possibly resulting in injury.

Tilt the header back in fields where stones and foreign objects are present. This will raise the cutting knives and minimize debris being thrown by the rotating knives.

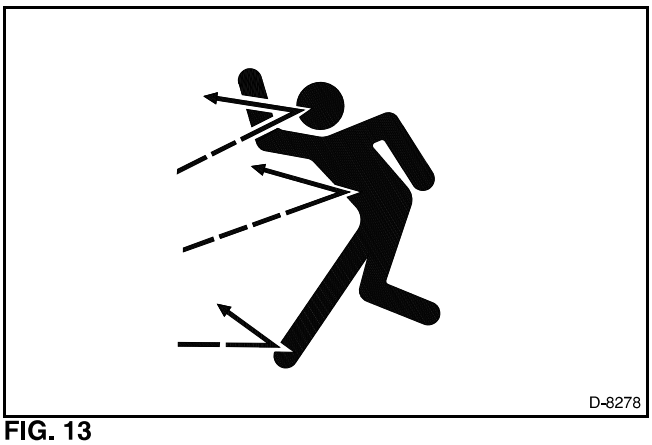

FIG. 13

Handrails

Face the ladder and use the handrails when getting on or off the machine.

FIG. 14

Agricultural Chemicals

Agricultural chemicals can be very hazardous. Improper use of fertilizer, fungicides, herbicides, insecticides and pesticides can injure people, plants, animals, soil and other people's property.

Always read and follow all manufacturers' instructions before opening any chemical container.

Even if you think you know the instructions, read and follow instructions each time you use a chemical.

Use the same precautions when adjusting, servicing, cleaning or storing the machine as used when installing chemicals into the hoppers or tanks.

Inform anyone who comes in contact with chemicals of the potential hazards involved and the safety precautions required.

Stand upwind and away from smoke from a chemical fire.

Store or dispose of all unused chemicals only in a manner as specified by the chemical manufacturer.

TRAVEL ON PUBLIC ROADS

Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine before you travel on public roads.

Use good judgment when traveling on public roads. Maintain complete control of the machine at all times. Never coast down hills.

The maximum speed of farm equipment is governed by local regulations. Adjust travel speed to maintain control at all times.

Familiarize yourself with and obey all road regulations that apply to your machine. Consult your local law enforcement agency for local regulations regarding movement of farm equipment on public roads. Use headlights, flashing warning lights, taillights and turn signals, day and night, unless prohibited by local law.

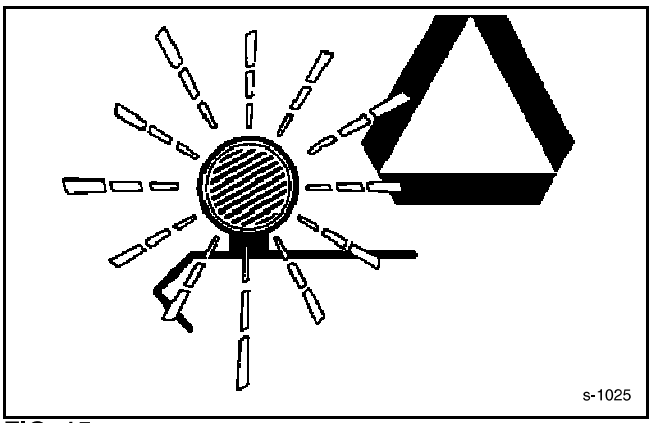

FIG. 15

NOTES

Cutterbed Drive Shafts

FIG. 13: One grease fitting (1) on each side for the splines. (10 hours)

Two grease fittings (2) on each side. (10 hours)

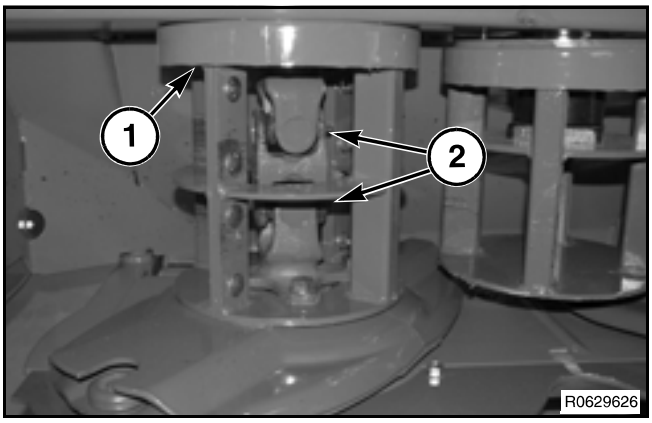

FIG. 13

Center Cage Drive

FIG. 14: One grease fitting (1) on each side. (10 hours)

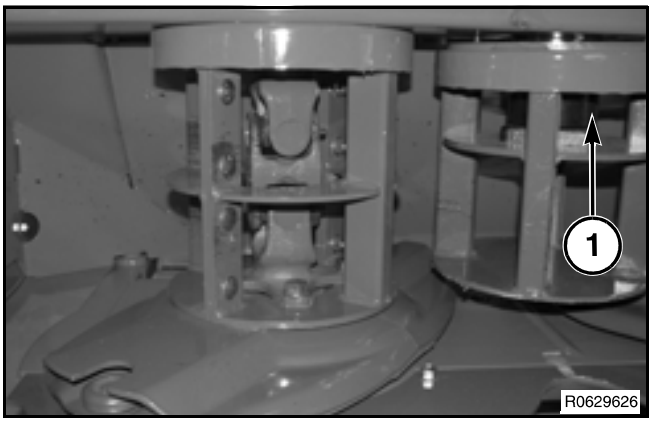

FIG. 14

Cutterbed Drive Gearboxes

FIG. 15: Left-hand cutterbed drive gearbox

(1) Lubricant level plug

(2) Fill plug

(3) Drain plug

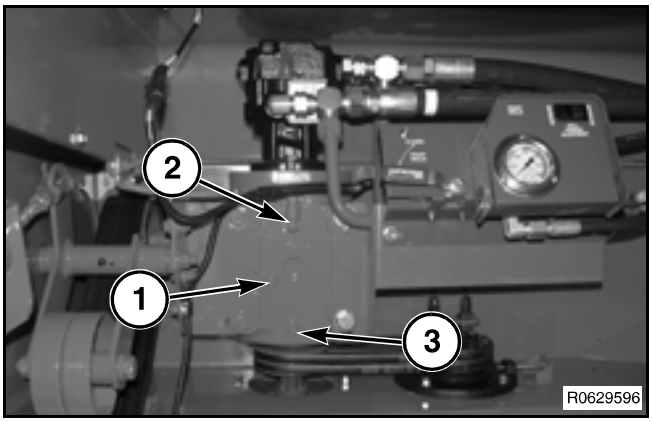

FIG. 15

NOTES

Installation

FIG. 21: To install the belt (1), twist the back side of the belt and move the belt around the end of the driven sheave (2). Do not move the belt fully onto the four ribs at this time.

Push the excess belt under the idler assembly and against the drive sheave.

Twist the backside of the belt and move the belt around the drive sheave using the hole in the side panel for clearance. Move the belt on the drive sheave and the driven sheave one rib at a time until all four ribs are installed in the proper grooves.

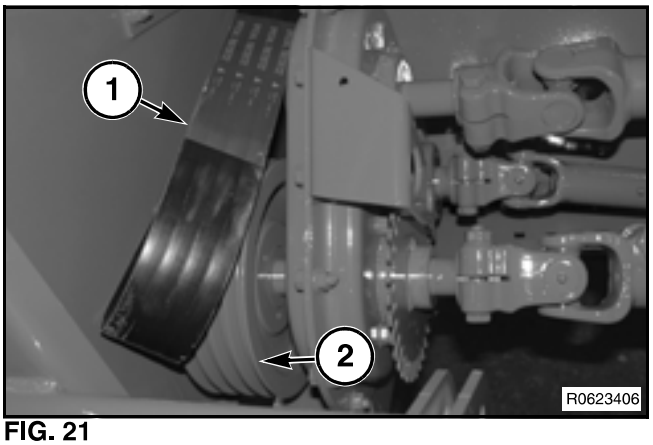

FIG. 21

Adjustments

FIG. 22: The belt (1) must be centered on the idler pulley (2).

Make sure the driven sheave and the drive sheave (3) are aligned.

To center the idler pulley on the belt, loosen and remove the flange top lock nut (4) located on the idler pivot bolt (5).

Remove the pivot bolt and add or remove washers (6) to either side of the idler pulley to center the idler pulley on the belt.

Install the pivot bolt and flange top lock nut.

NOTE: The washers are used to center the idler assembly to the belt. The washers may all be located on one side or the other, or any combination.

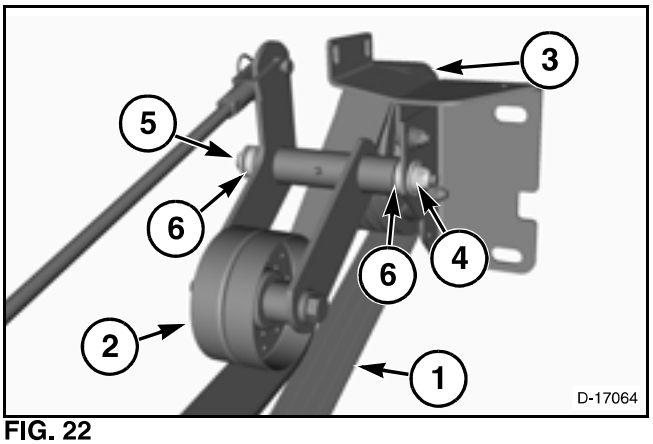

FIG. 22

FIG. 23: Other adjustments must be made when the alignment of the idler pulley (1) to the belt (2) is not correct.

Loosen the two bolts (3) that attach the idler plate (4) to the pivot support bracket (5).

Adjust the idler plate up and down until the idler pulley's flat surface is parallel to the face of the belt.

Tighten the two bolts that attach the idler plate to the pivot support bracket.

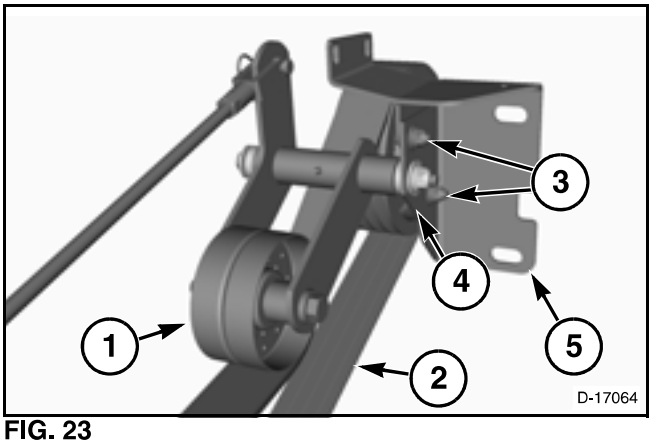

FIG. 23

Installation

FIG. 42: Install the grass ring (1) and the center cage (2) into the machine.

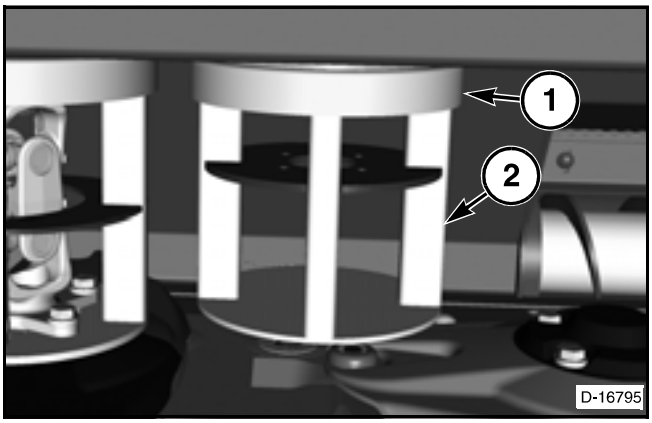

FIG. 42

FIG. 43: Install the spindle assembly (1).

Loosely install the four flange head screws (2) securing the spindle assembly to the frame.

NOTE: Do not tighten the flange head screws that secure the spindle assembly to the frame.

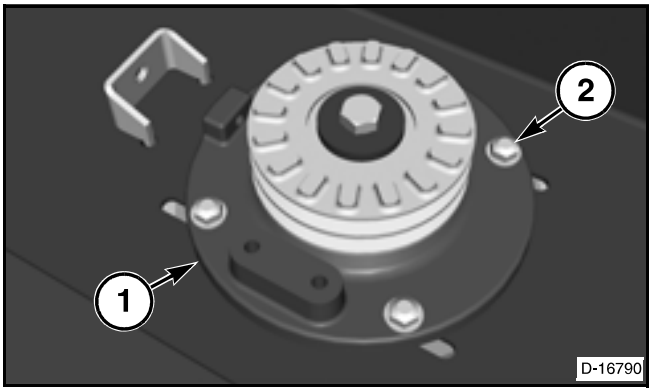

FIG. 43

FIG. 44: Install the matched set of drive belts (1) onto the sheave (2) of the spindle assembly (3).

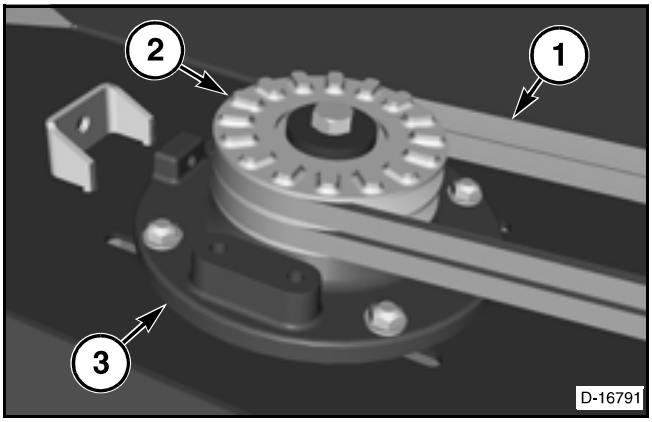

FIG. 44

FIG. 45: Align the center cage (1) with the grass ring (2) and the spindle assembly (3).

Install the four flange head screws (4) securing the center cage to the spindle assembly.

Tighten the flange head screws.

NOTE: The grass ring has a fixed relationship to the spindle.

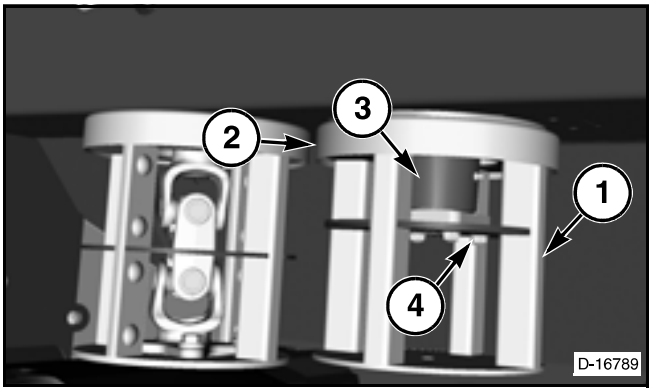

FIG. 45

FIG. 66: Gearbox Components of Primary Conditioner Roll and Cutterbed Drive.

(1) Output Shaft
(2) Key, Woodruff
(3) Seal
(4) Tapered Bearing Assembly
(5) Extension
(6) Capscrew
(7) Tapered Bearing Assembly
(8) Shims 40.3 X 63.5
(9) Crown Gear
(10) Shim 40.3 X 1.0 mm
(11) Locking Washer
(12) Spanner Nut
(13) Seal
(14) Housing
(15) Plugs
(16) Elbow
(17) Breather
(18) Pinion Shaft
(19) Spacer 45.3 X 63.5 X 2.5 mm
(20) Motor Flange
(21) Socket Head Screw
(22) Seal
(23) Shim

FIG. 89: Apply silicone sealant to the extension flange. Install the extension (1) into the housing. Make sure the marks made before disassembly are aligned.

Install the capscrews (2) securing the extension to the housing. Tighten the capscrews.

Check the rolling torque of he gearbox on the input shaft before installing the seals. The rolling torque must be 3 to 10kg cm (2.6 to 8.7 lbf inch).

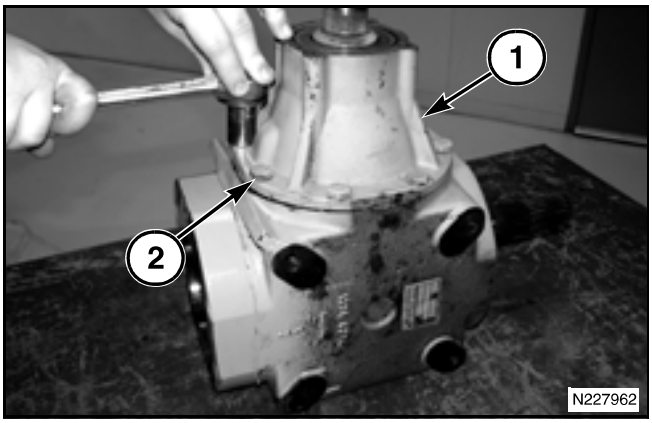

FIG. 89

FIG. 90: Apply clean oil to the new seal (1) for the motor flange. Start the seal into the bore. The lip of the seal must be toward the inside of the gearbox. Drive the seal into the bore until the seal is flush with the top of the bore. Use a driver that is as close to the size of the bore as possible. Be careful not to damage the lip of the seal.

Apply oil to the new seal (2) for the output shaft. Start the seal into the bore. The lip of the seal must be toward the inside of the extension. Use a driver that is larger than the outside diameter of the seal. Drive the seal into the bore until the face of the seal is even with the face of the extension. Be careful not to damage the lip of the seal.

Apply oil to the new seal (3) for the lower shaft. Start the seal into the bore. The lip of he seal must be toward the inside of the gearbox. Use a driver that is larger than the outside diameter of the seal. Drive the seal into the bore until the face of the seal is even with the face of the housing. Be careful not to damage the lip of the seal.

Fill the gearbox with oil. See the Specifications section for the correct amount and type of oil.

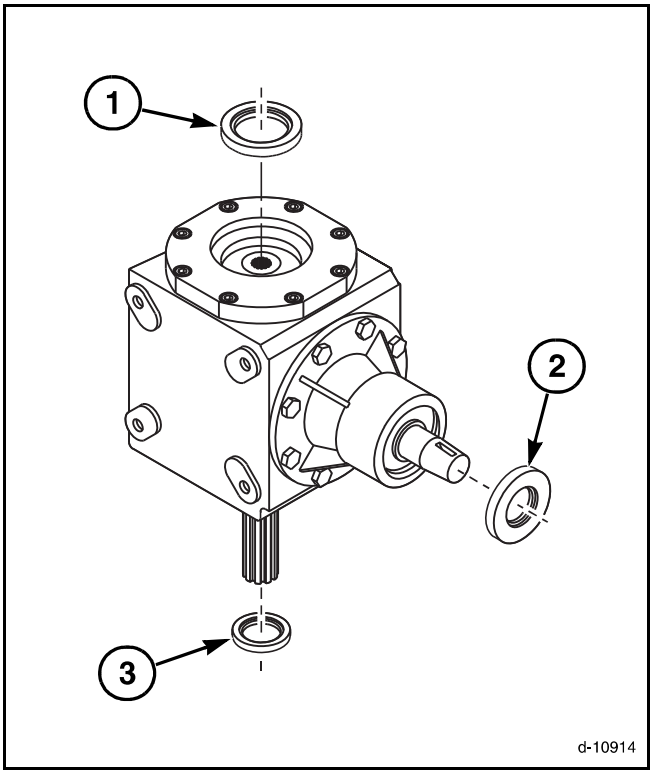

FIG. 90

Right-Hand Single Conditioner

Components

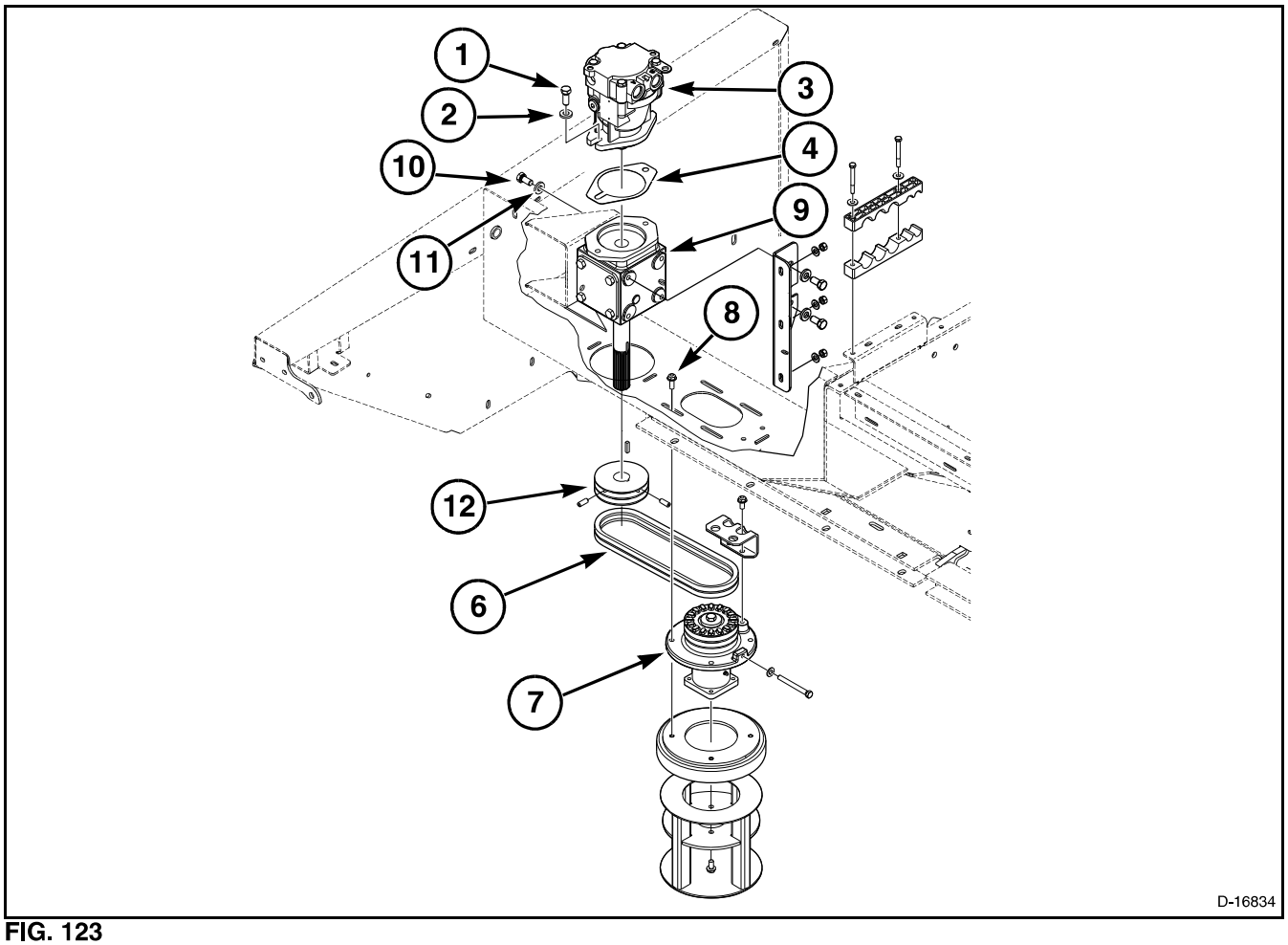

FIG. 123

FIG. 123: Right Header Drive and Housing Assembly.

This procedure can only be completed on the right-hand side of the single conditioner machine.

(1) Capscrew

(2) Plain Washer

(3) Hydraulic Motor

(4) Gasket

(5) Capscrew

(6) Belt-V - Matched Set

(7) Spindle Assembly

(8) Flange Screw

(9) Housing Assembly

(10) Capscrew

(11) Plain Washer

(12) Drive Sheave

FIG. 141: Slide the spindle assembly (1) all the way towards the drive housing.

Slide the shaft (2) of the drive housing down towards the cutterbed U-joint (3).

Slip the belts (4) around the shaft.

Apply grease to the splines (5) of the shaft.

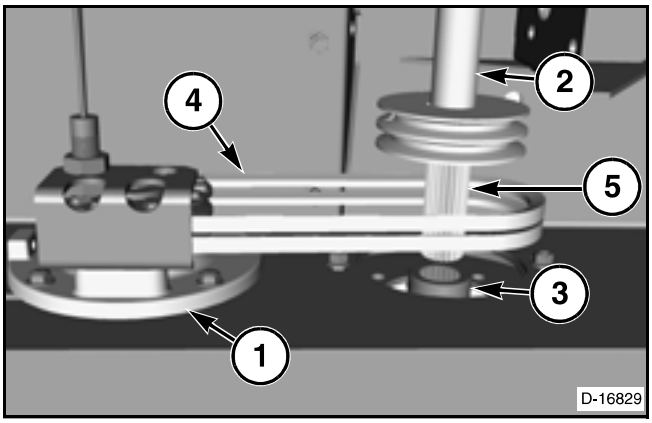

FIG. 141

FIG. 142: Slide the shaft (1) of the drive housing (2) into the cutterbed U-joint (3).

Slip the belts (4) around the drive sheave (5).

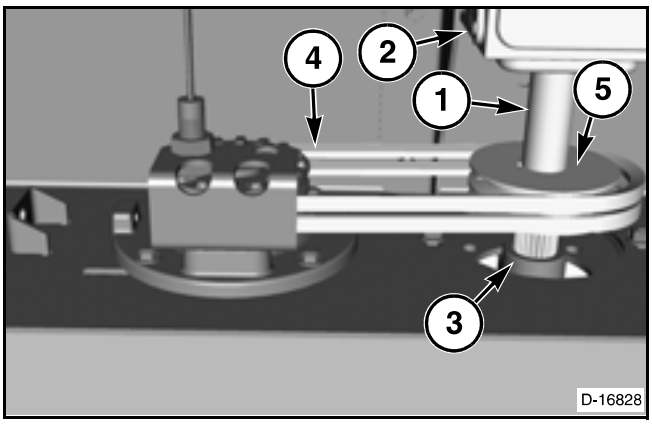

FIG. 142

FIG. 143: Locate the drive housing (1) into position.

Loosely install the two capscrews (2) along with the plain washers that secure the drive housing to the support angle (3).

NOTE: Do not tighten the two capscrews that secure the drive housing to the support angle.

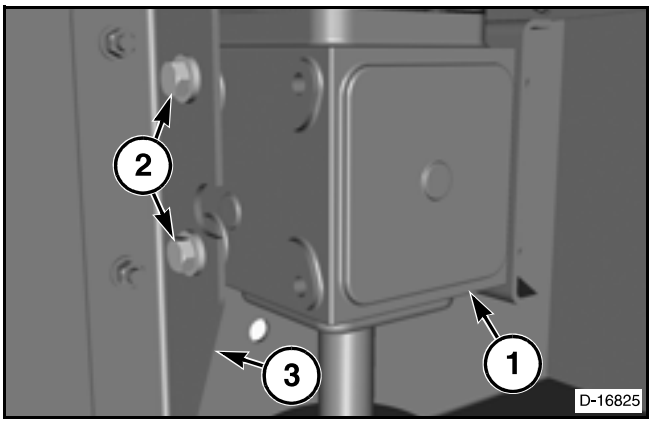

FIG. 143

FIG. 144: Loosely install the four capscrews (1) along with plain washers that secure the drive housing (2) to the support channel (3) on the frame.

Tighten all four capscrews that secure the drive housing to the support channel on the frame.

Tighten both capscrews that secure the drive housing to the support channel.

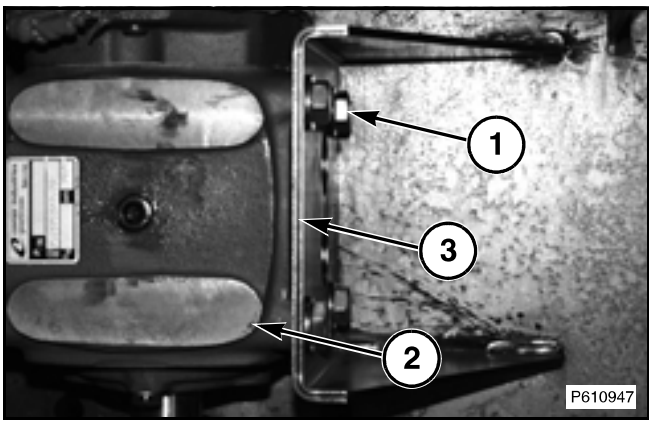

FIG. 144

FIG. 165: Remove the two flange screws, plain washers, and flange top lock nuts (1) securing the top of the pivot support (2) to the frame.

Remove the two capscrews and plain washers (3) securing the pivot support to the gearbox.

Remove the pivot support from the machine.

Move the belt (4) off of the drive sheave (5) one rib at a time toward the side panel.

Twist the backside of the belt and remove the belt from the drive sheave using the hole in the side panel for clearance.

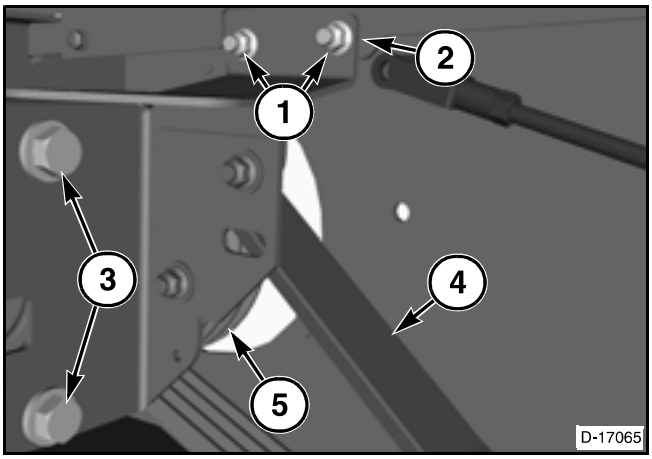

FIG. 165

FIG. 166: Loosen the capscrew (1) and the special washer (2) in the gearbox output shaft.

CAUTION: This is a tapered shaft. Do not remove the capscrew until the taper has broken loose.

Use a gear puller with the jaws sized to insert into the three holes of the drive sheave (3).

NOTE: Hardware can be installed through the three holes and a crow foot type puller used.

Remove the drive sheave and the woodruff key from the gearbox output shaft.

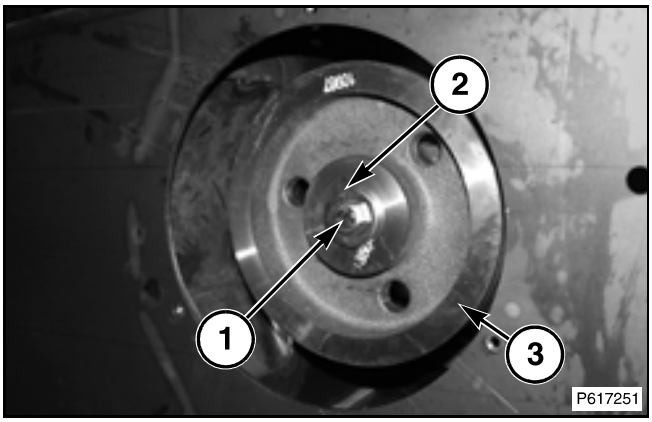

FIG. 166

FIG. 167: Open the cutterbed door for access to the capscrews (1).

Support the gearbox assembly and remove the four capscrews along with plain washers securing the drive housing to the frame.

Remove the gearbox assembly from the belts and the cutterbed U-joint.

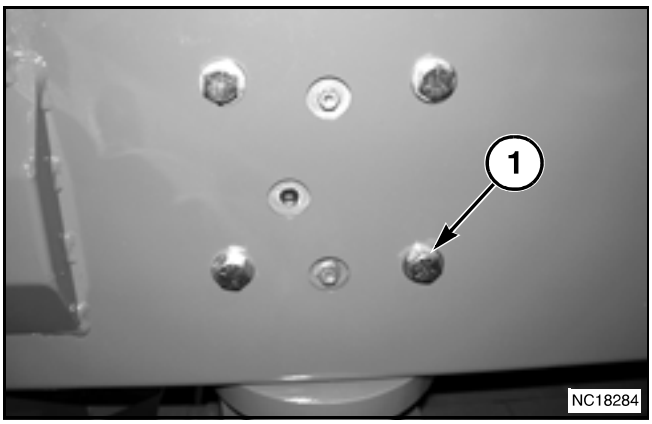

FIG. 167

FIG. 190: Apply silicone sealant to the extension flange. Install the extension (1) into the housing. Make sure the marks made before disassembly are aligned.

Install the capscrews (2) securing the extension to the housing. Tighten the capscrews.

Check the rolling torque of he gearbox on the input shaft before installing the seals. The rolling torque must be 3 to 10kg cm (2.6 to 8.7 lbf inch).

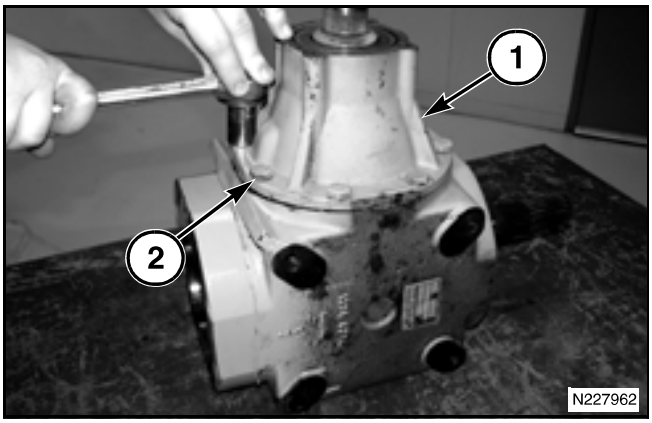

FIG. 190

FIG. 191: Apply clean oil to the new seal (1) for the motor flange. Start the seal into the bore. The lip of the seal must be toward the inside of the gearbox. Drive the seal into the bore until the seal is flush with the top of the bore. Use a driver that is as close to the size of the bore as possible. Be careful not to damage the lip of the seal.

Apply oil to the new seal (2) for the output shaft. Start the seal into the bore. The lip of the seal must be toward the inside of the extension. Use a driver that is larger than the outside diameter of the seal. Drive the seal into the bore until the face of the seal is even with the face of the extension. Be careful not to damage the lip of the seal.

Apply oil to the new seal (3) for the lower shaft. Start the seal into the bore. The lip of the seal must be toward the inside of the gearbox. Use a driver that is larger than the outside diameter of the seal. Drive the seal into the bore until the face of the seal is even with the face of the housing. Be careful not to damage the lip of the seal.

Fill the gearbox with oil. See the Specifications section for the correct amount and type of oil.

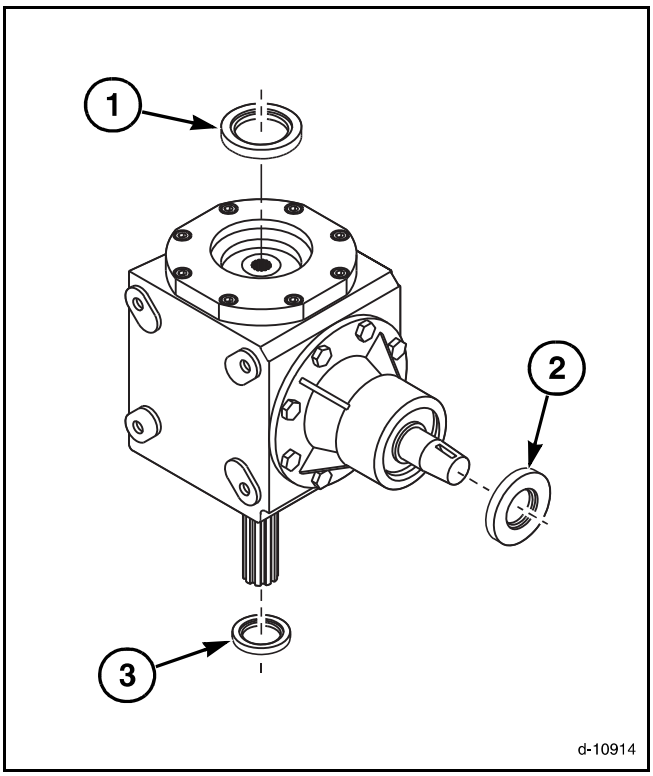

FIG. 191

Installation

FIG. 192: Insert the key (1) into the keyway in the lower output shaft (2).

With the groove of the drive sheave (3) containing the set screws (4) facing the gearbox (5), slide the drive sheave onto the lower output shaft.

The drive sheave must be set at 6.25 mm (0.25 in) from the machined face of the gearbox housing or at the distance noted during removal.

Tighten the set screw (4) over the key first.

Tighten the two set screws to 42 Nm (31 lbf ft).

Apply grease to the splines of the lower output shaft.

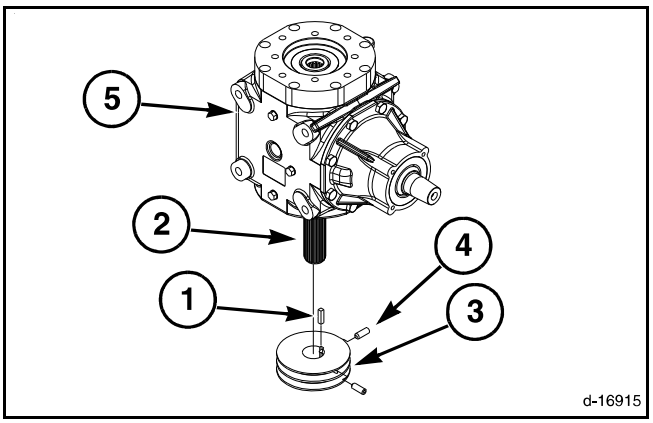

FIG. 192

Disassembly

FIG. 223: Remove the pivot tube (1) from the idler pivot weldment (2).

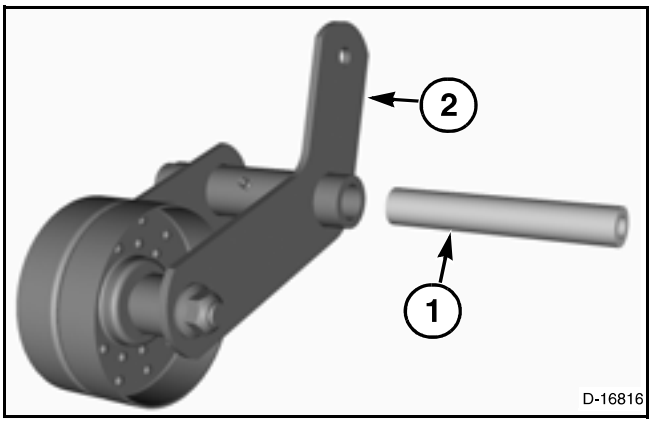

FIG. 223

FIG. 224: To remove the flat idler (1), remove the flange top lock nut (2) from bolt (3).

As the bolt and the plain washer (4) are removed, capture the two bushings (5) on each side of the flat idler.

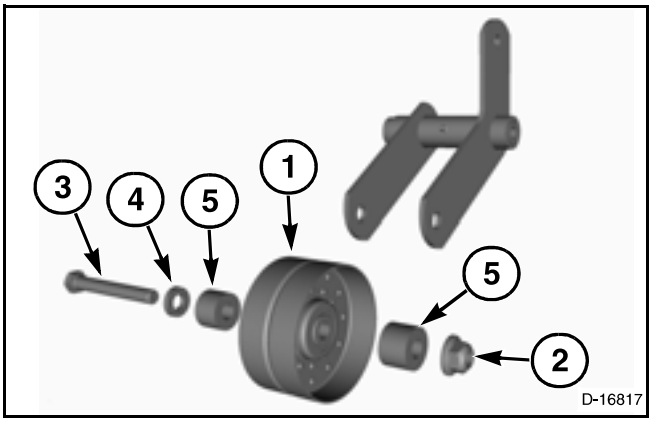

FIG. 224

FIG. 225: If being replaced, remove the bronze bushings (1) from each side of the tube in the idler pivot weldment (2).

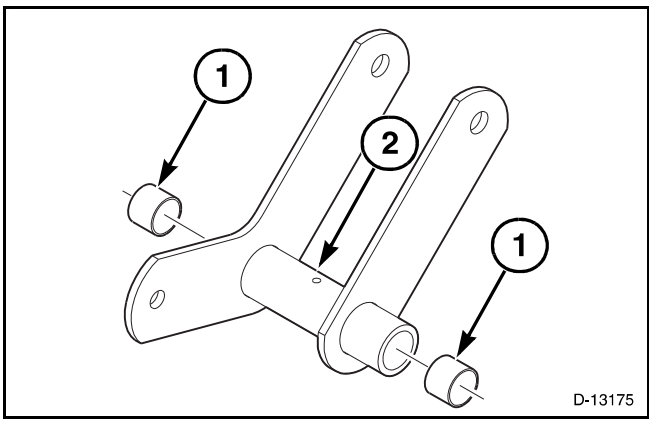

FIG. 225

Inspection

Check belts for excessive wear, tearing, breaking and unraveling.

Belts that are running hot, running in a hot environment, or from slipping will harden and form cracks from the bottom of the belt up.

Inspect for oil or grease leaking on the drive. This can indicate over lubricated parts or a fluid leak. If this material gets on rubber belts, the belts can increase in size and become distorted, causing an early belt failure.

NOTES

FIG. 25: Remove the u-joint assembly (1).

Remove the grass ring bulkhead (2).

Remove both lifters (3).

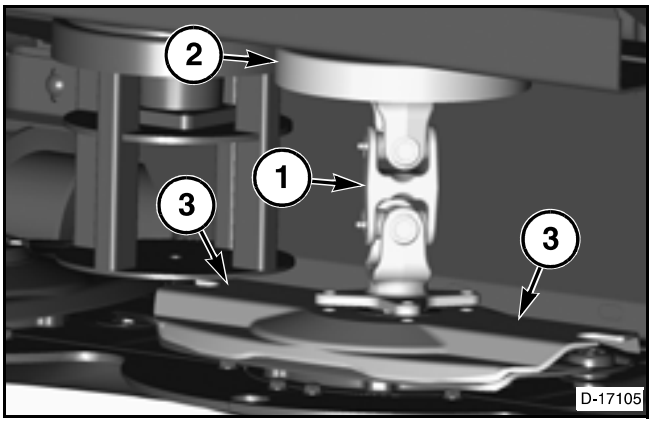

FIG. 25

FIG. 26: Remove the disc (1) from the disc hub.

Interchange discs and knives as needed.

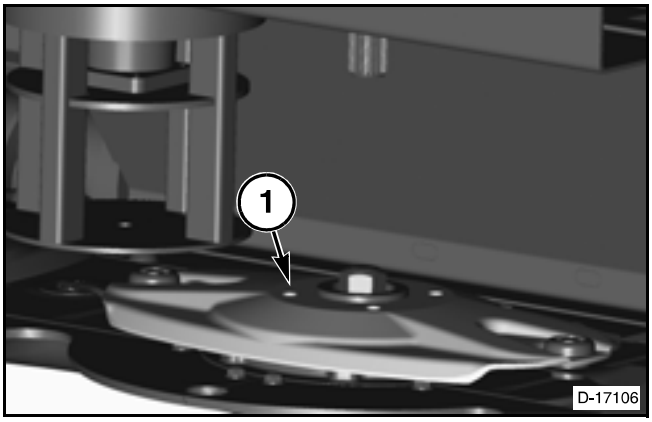

FIG. 26

Installation

FIG. 27: Install disc (1) onto disc hub.

Each disc must be installed 90 degrees to the adjoining disc.

Rotate the discs one complete revolution by hand to check the timing.

The knives must not contact the discs.

If there is any contact, change the position of the discs to correct the timing.

Install the knives according to the direction of rotation of the discs. See Knife Replacement in this section for more information.

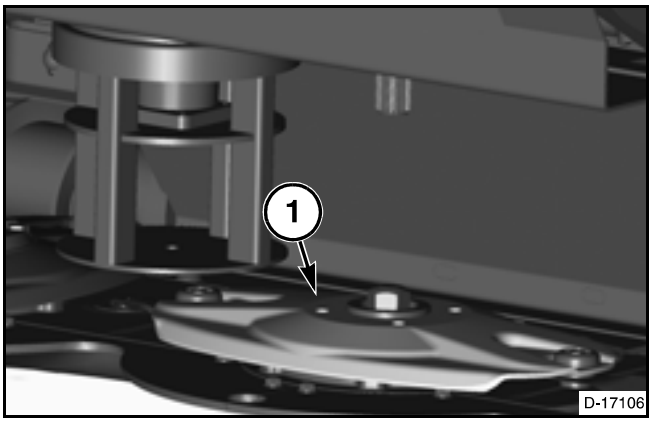

FIG. 27

LUBRICATION

The following process is the same for the single and double conditioner machines.

IMPORTANT: Change oil in cutterbed after the first 40 hours of operation, and at the beginning of each season thereafter, or every 100 hours of operation, whichever comes first.

IMPORTANT: The oil level in the cutterbed must be correct. Do not overfill the cutterbed. Excess oil will cause failure of the cutterbed due to overheating.

Oil Level - The oil level in the cutterbed cannot be checked. If in doubt as to the amount of oil in the cutterbed, drain the cutterbed and fill with the correct type and quantity of lubricant. To replace the fluid in the cutterbed add 3.3 kg (7.2 lb) of gear oil into the th add/ breather hose.

Drain Oil - Drain the cutterbed when the oil is warm. If the oil is cold, idle the machine for no less than 10 minutes before draining. To change the cutterbed oil, park the machine on a solid level surface.

Raise the header all the way and engage the header lift cylinder stops. Put the header angle at zero degrees. This will help drain the oil toward the drain plug at the rear the cutterbed. Stop the engine and take the key with you.

Tilting the cutterbed will let any contamination move toward the drain plug at the left-hand of the cutterbed. To tilt the cutterbed, put a jack stand extended to about 406 mm (16 in) under the right-hand end of the cutterbed. Put a 203 mm (8 in) block under the left-hand end of the cutterbed. Disengage the header lift cylinder stops. Start the engine and lower the header until the cutter bed is on the jack stand and the block. Stop the engine and take the key with you.

FIG. 45: The vent plug (1) is located on the right-hand side of the cutterbed.

Clean the area around the vent plug.

Remove the vent plug.

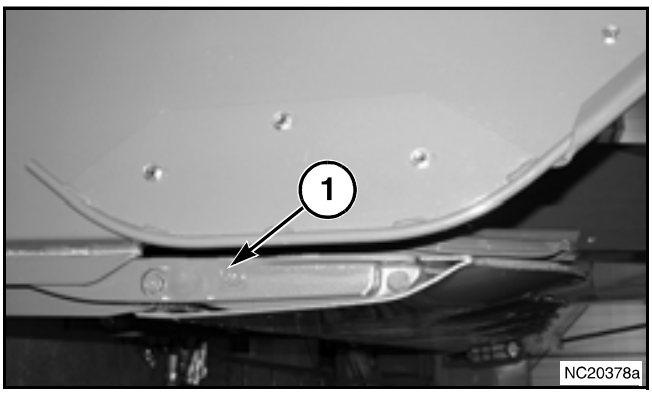

FIG. 45

FIG. 66: Remove the U-joint assembly (1) from the output shaft of the gearbox.

Remove both lifters (2) from the disc assembly (3).

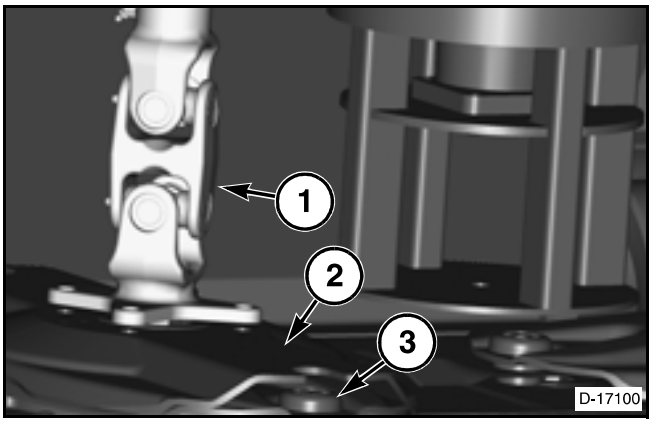

FIG. 66

FIG. 67: Remove the disc assembly (1).

Remove and interchange discs as needed.

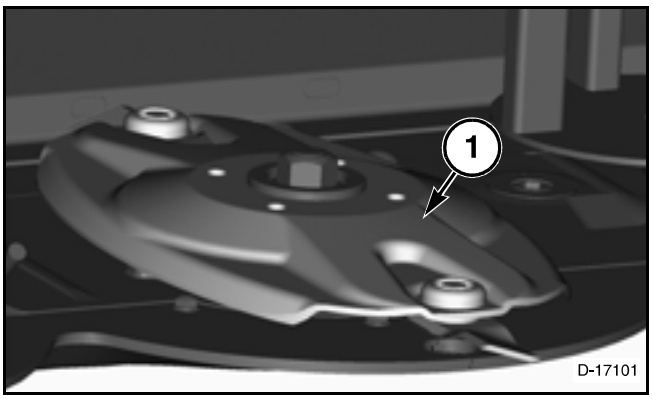

FIG. 67

Cutterbed

FIG. 68: Lift and open the right-hand drive shield.

Drain the lubricant from the cutterbed. See Lubrication in this section.

Remove the filler hose (1) from the right-hand end cap on the cutterbar.

After the removal of the filler hose, install a plug in the top of the right-hand end cap to prevent contamination.

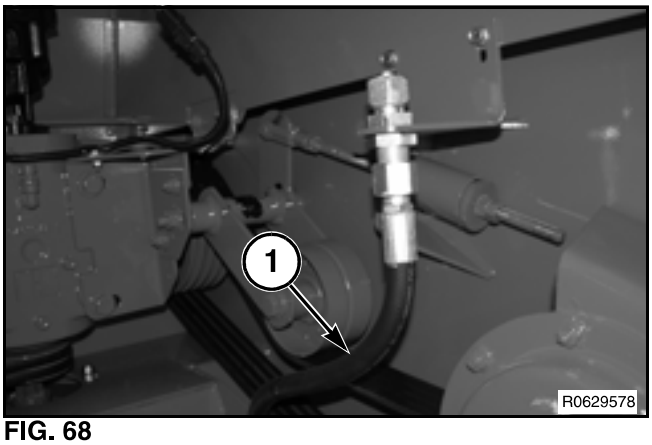

FIG. 68

FIG. 69: Remove the four flange screws (1) and top lock flange nuts securing the back of each rock guard (2) to the frame.

NOTE: The right-hand and the left-hand rock guards are different than the other rock guards.

Also the rock guard next to the end rock guards are different (wider) than the seven center (narrow) rock guards.

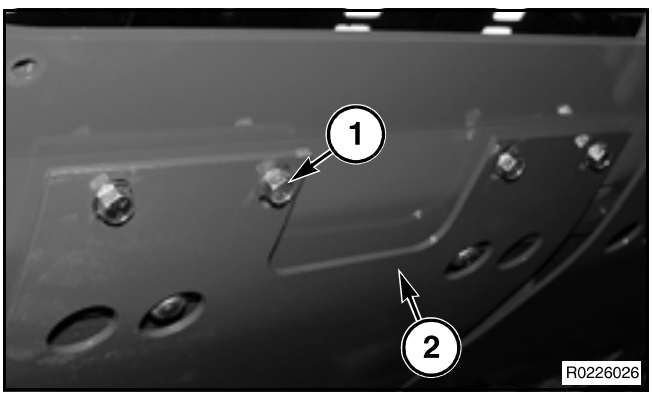

FIG. 69

Inspection

The cutterbar can be tested for leaks when the cutterbar is fully assembled.

The cutterbar can be removed or installed to perform a leak test.

When a leak is present between the housing assemblies, the cutterbar must be removed for the disassembly and assembly procedures.

When a leak is present at the idler mountings or the spinlde assembly locations the cutterbar does not have to be removed for the disassembly and assembly procedures.

There are three methods that can identify leaks in the cutterbar assembly.

FIG. 93: One method is to submerge the entire cutterbar (1) under water once the cutterbar has the correct amount of air pressure.

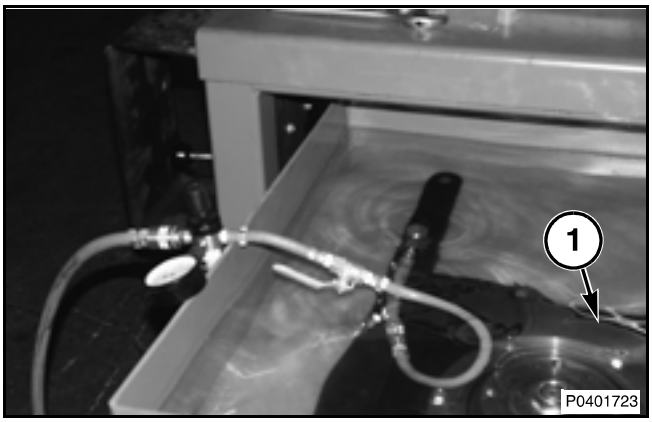

FIG. 93

FIG. 94: The third option of testing the cutterbar for leaks is to use a garden hose. Pressurize the cutterbar to the correct amount of air pressure and apply water from the garden hose over the entire cutterbar assembly.

Another method of testing the cutterbar for leaks is to use a spray bottle filled with soap and water. Pressurize the cutterbar to the correct amount of air pressure and spray the entire cutterbar assembly.

All three methods of checking for leaks require that the cutterbar has the correct amount of air pressure. The air pressure inside the cutterbar must be 0.2 bars (3 psi).

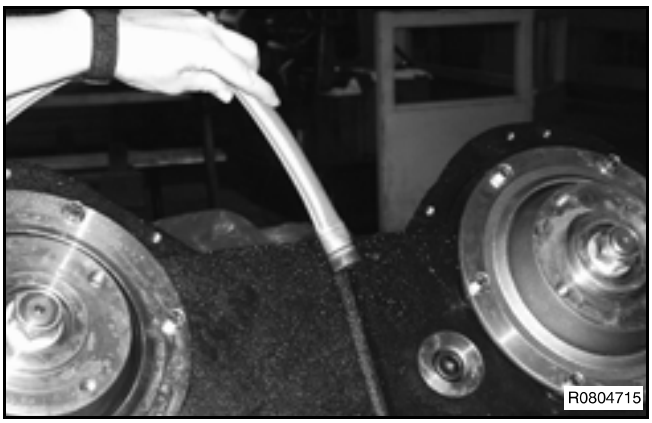

FIG. 94

FIG. 116: Install all bolts.

NOTE: The hardware needs to be installed with the head of the carriage bolts in the direction of rotation.

NOTE: The rotation of this disc and cage assembly is counter-clockwise.

Tighten the four capscrews (1) that fastens the cage (2) to the disc hub to 115 Nm (85 lbf ft).

Tighten the eight carriage bolts (3) and flange top lock nuts to the cage.

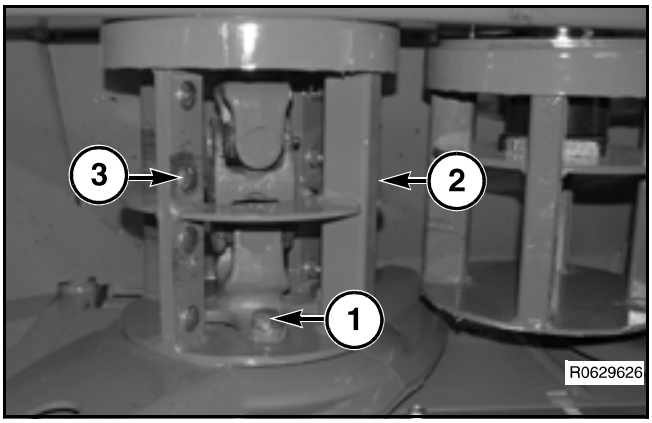

FIG. 116

FIG. 117: Install the bolts from the bottom of the grass ring bulkhead.

Loosely install the washers (1) and nuts (1).

NOTE: Do not tighten bolts and nuts that fasten the grass ring bulkhead to the frame of the header..

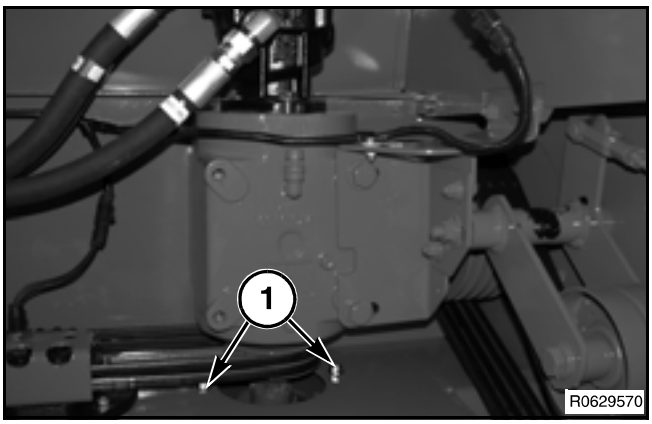

FIG. 117

Inspection

Inspect the cutter bed for the following:

- An excess of metal particles or large metal particles in the oil. Large metal particles indicate a failure of a bearing or gear teeth.

NOTE: A small amount of fine metal particles will be present because of normal wear.

- Loose parts such as broken gear teeth or ball bearings.
- Damaged, scored, or cracked gear teeth.
- Gear teeth discolored due to excessive heat.
- Roughness in any of the bearings.

If any of the conditions are present, completely disassemble the cutterbed. See Cutterbed Disassembly and Assembly write-up.

Clean all of the components that are damaged and assemble the cutterbed.

Make sure the inside of the housing is clean before assembly. It is important that all contamination be removed to prevent damage to the cutterbed components. Metal particles that are not removed can cause damage to the gears and bearings.

Assembly

FIG. 143: Press a new double row bearing (1) into the spindle bearing housing (2) until seated against the shoulder and the retaining ring groove is fully exposed.

IMPORTANT: Do not press against the inner race of the double row bearing.

Install the retaining ring (3).

Be sure that the retaining ring is fully seated in the spindle bearing housing.

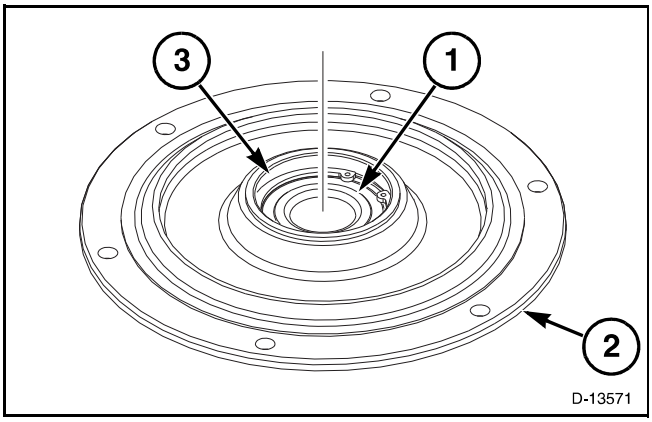

FIG. 143

FIG. 144: Position the face of the spindle gear on the bed of a press with the spindle facing up.

Put the spindle bearing housing and bearing assembly onto the spindle gear (1) with the retaining ring facing up.

Press the double row bearing onto the spindle gear until seated against the shoulder.

IMPORTANT: Do not press against the outer race of the double row bearing.

Use a tool that will press against the inner race of the bearing.

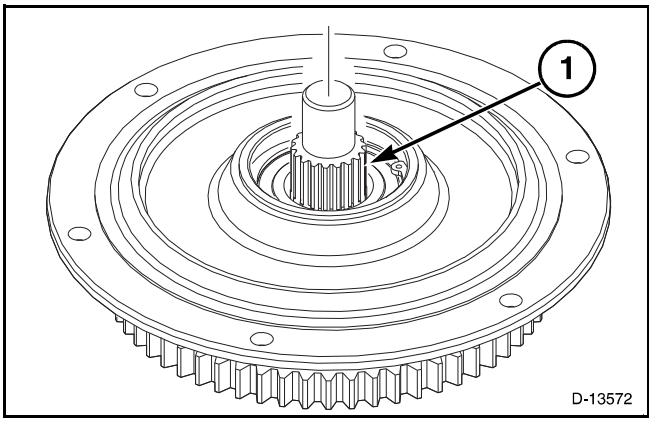

FIG. 144

FIG. 170: Remove the U-joint assembly (1) from the output shaft of the gearbox.

Remove both lifters (2) from the disc assembly (3).

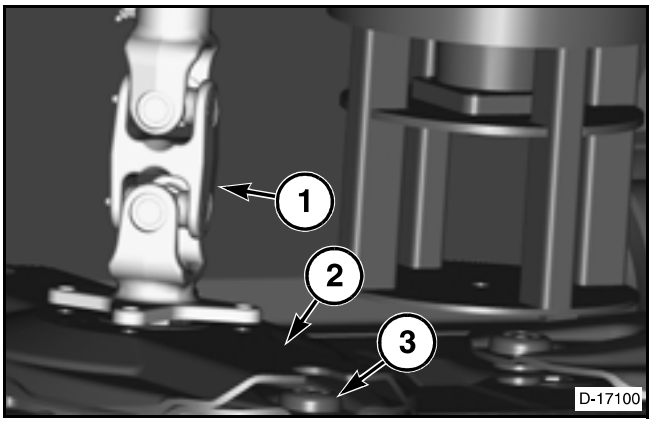

FIG. 170

FIG. 171: Remove the disc assembly (1).

Remove and interchange discs as needed.

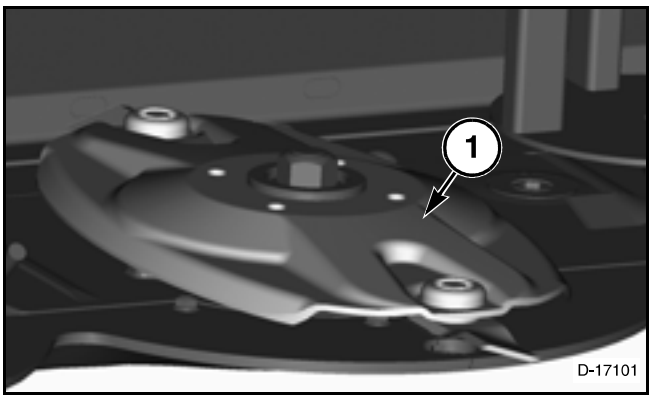

FIG. 171

FIG. 172: The spindle gear assembly (1) does not have to be removed if the idler mounting seals are replaced only.

The spindle gear assembly must be removed to remove the idler gear assembly if the cutterbar is fully assembled.

If the spindle gear assembly is to be disassembled refer to the Spindle Gear Assembly section in this division for the proper procedure.

If the idler gear assembly is to be removed, remove the six flange screws (2) securing the spindle gear assembly to the housing assembly.

IMPORTANT: Keep dirt out of the cutterbed.

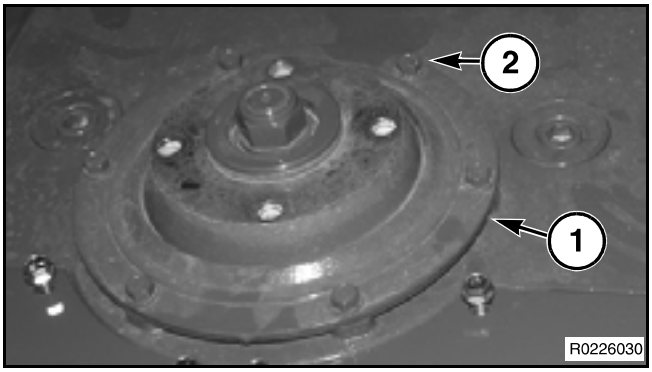

FIG. 172

FIG. 173: Remove the spindle gear assembly from the housing.

Remove the square cut seal (1) from the spindle bearing housing (2). Discard the square cut seal.

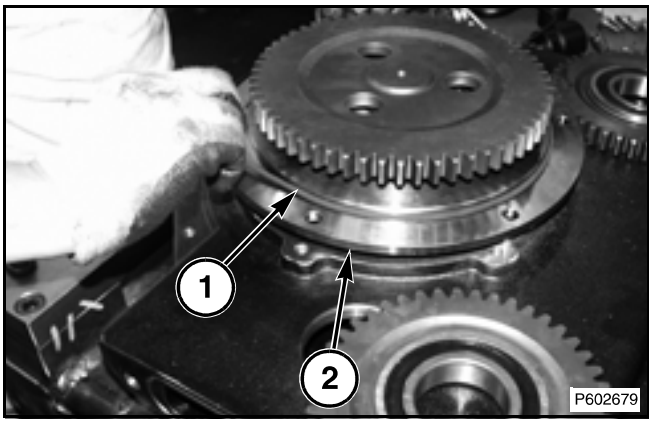

FIG. 173

Idler Gear Bearing

FIG. 200: Remove one of the two retaining rings (1) from the new bearing (2).

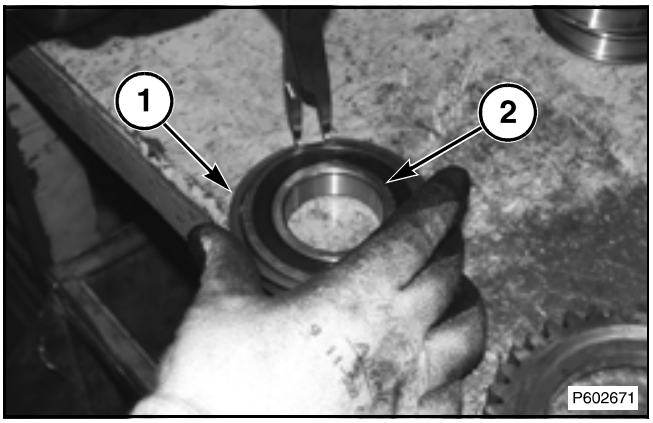

FIG. 200

FIG. 201: Press against the outside race of the bearing.

Press the bearing (1) into the idler gear (2) until the retaining ring that remained on the bearing contacts the idler gear.

IMPORTANT: Do not press against the inner race of the bearing.

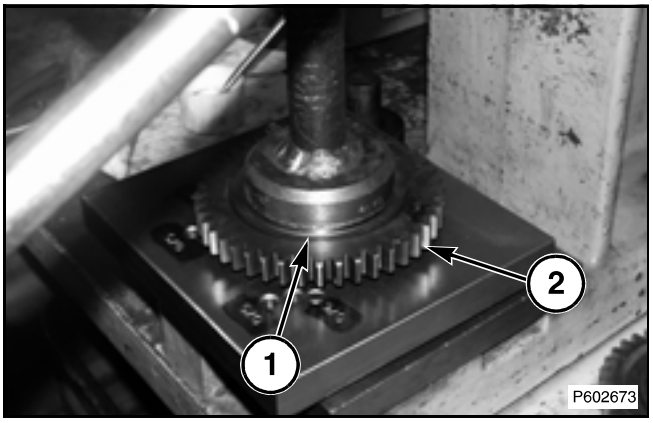

FIG. 201

FIG. 202: Re-install the new retaining ring (1), that was removed, onto the bearing.

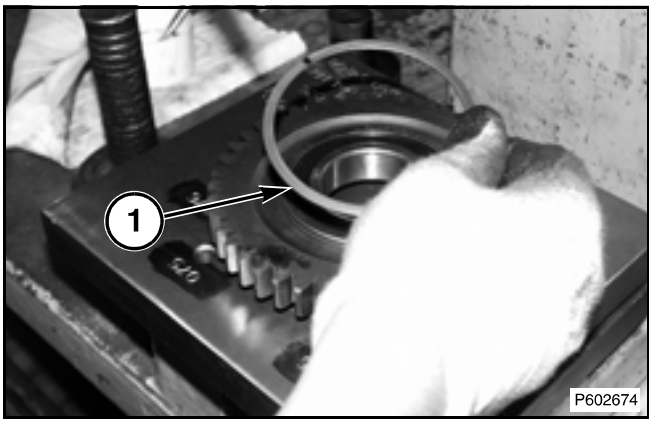

FIG. 202

NOTES

NOTES

Inspection

Inspect the shaft and the keyway in the shaft for wear (fretting corrosion), deformation, and the key way for cracks or damage. Replace the roll if the shaft is damaged.

Inspect the bore in the yokes and shaft surfaces of the rolls for wear (fretting corrosion), deformation, and for cracks or damage. Replace components as necessary.

Inspect the woodruff keys for wear, deformation, and chips. Replace the woodruff keys if damaged. Do not file the woodruff key to correct the profile.

Inspect the pivot bushing in the end of the bearing housing. A new bushing will have a nominal outside diameter of 31.67 to 31.75 mm (1.247 to 1.250 in). Replace the pivot bushing if the outside diameter is less than 31.27 mm (1.231 in).

FIG. 14: Inspect the bearing housing (1) for cracks. Replace the bearing housing if broken.

Inspect the spherical bearing for roughness or noise while turning the inner race. Replace the spherical bearing if rough or noisy.

The spherical bearing is installed at the factory with 7 to 54 Nm (5 to 40 lbf ft) of torque required to rotate the outer rim in and out of the bearing housing. If the outer rim of the spherical bearing can be rotated into or out of the housing by hand, replace the bearing housing.

Inspect the bronze bearing (2) for wear. The factory installed inside diameter is 31.88 to 32.00 mm (1.255 to 1.260 in). Replace the bronze bearing if the inside diameter is greater than 32.79 mm (1.291 in).

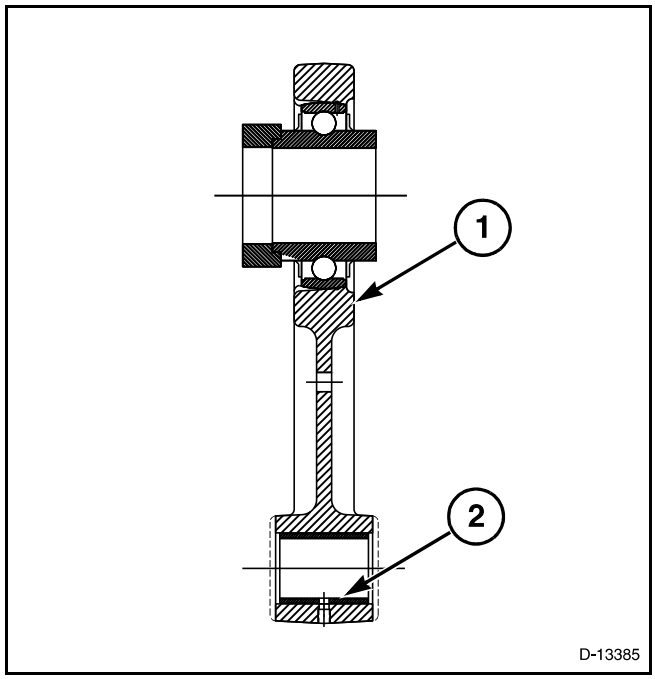

FIG. 14

FIG. 38: Inspect the bearing housing (1) for cracks. Replace the bearing housing if broken.

Inspect the spherical bearing for roughness or noise while turning the inner race.

Replace the spherical bearing if rough or noisy.

The spherical bearing is installed at the factory with 7 to 54 Nm (5 to 40 lbf ft) of torque required to rotate the outer rim in and out of the bearing housing. I

f the outer rim of the spherical bearing can be rotated into or out of the housing by hand, replace the bearing housing.

Inspect the bronze bearing (2) for wear.

The factory installed inside diameter is 31.88 to 32.00 mm (1.255 to 1.260 in).

Replace the bronze bearing if the inside diameter is greater than 32.79 mm (1.291 in).

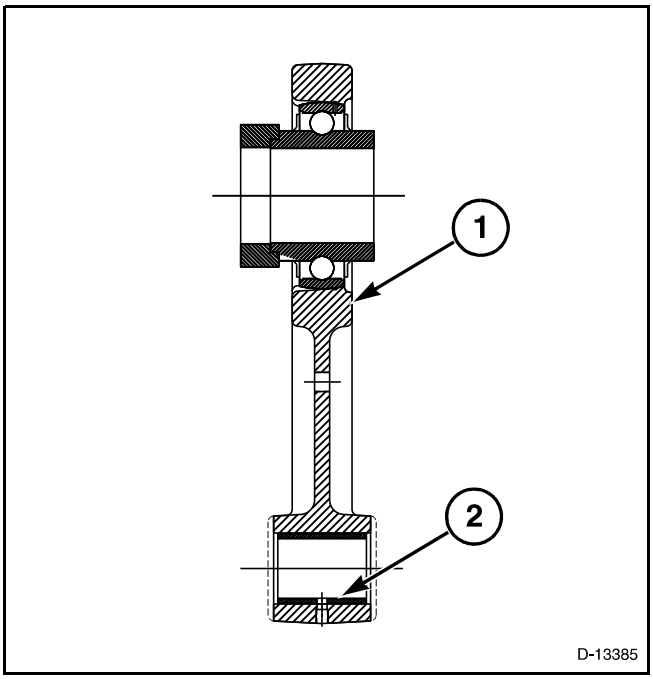

FIG. 38

FIG. 39: Inspect bearing housing (1) for cracks. Replace the bearing housing if broken.

Inspect the spherical bearing for roughness or noise while turning the inner race.

Replace the spherical bearing if rough or noisy.

The spherical bearing is installed at the factory with 7 to 54 Nm (5 to 40 lbf ft) of torque required to rotate the outer rim in and out of the bearing housing.

If the outer rim of the spherical bearing can be rotated into or out of the housing by hand, replace the bearing housing.

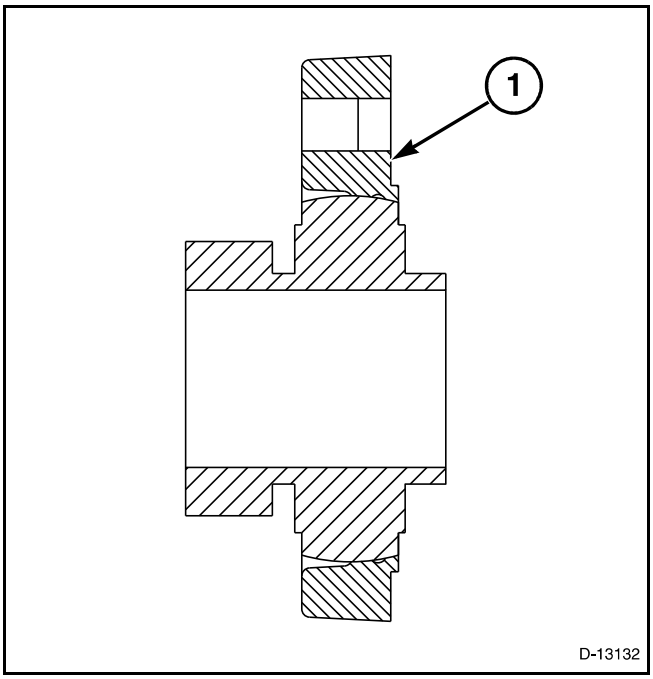

FIG. 39

Inspection

FIG. 59: If the conditioning rolls rumble or there is excessive vibration, check the rolls for straightness.

Increase the conditioning roll spacing and determine if the rumble or vibration is eliminated or reduced. Refer to the Adjusting section, Roll Spacing to set the roll spacing.

Change the roll timing from centered to a lead or lag in roll timing and determine if the rumble or vibration is eliminated or reduced. Refer to the Adjusting section, Roll Timing to set the roll timing.

If necessary, replace the conditioner roll or rolls.

FIG. 59

FIG. 77: Set the roll pressure. Refer to the Adjustment section, Roll Pressure write-up for the procedure to set the pressure in the roll tension system.

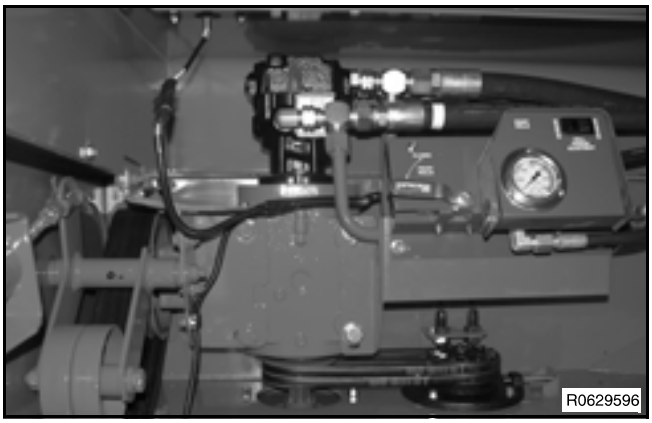

FIG. 77

Top Roll - Front

Components

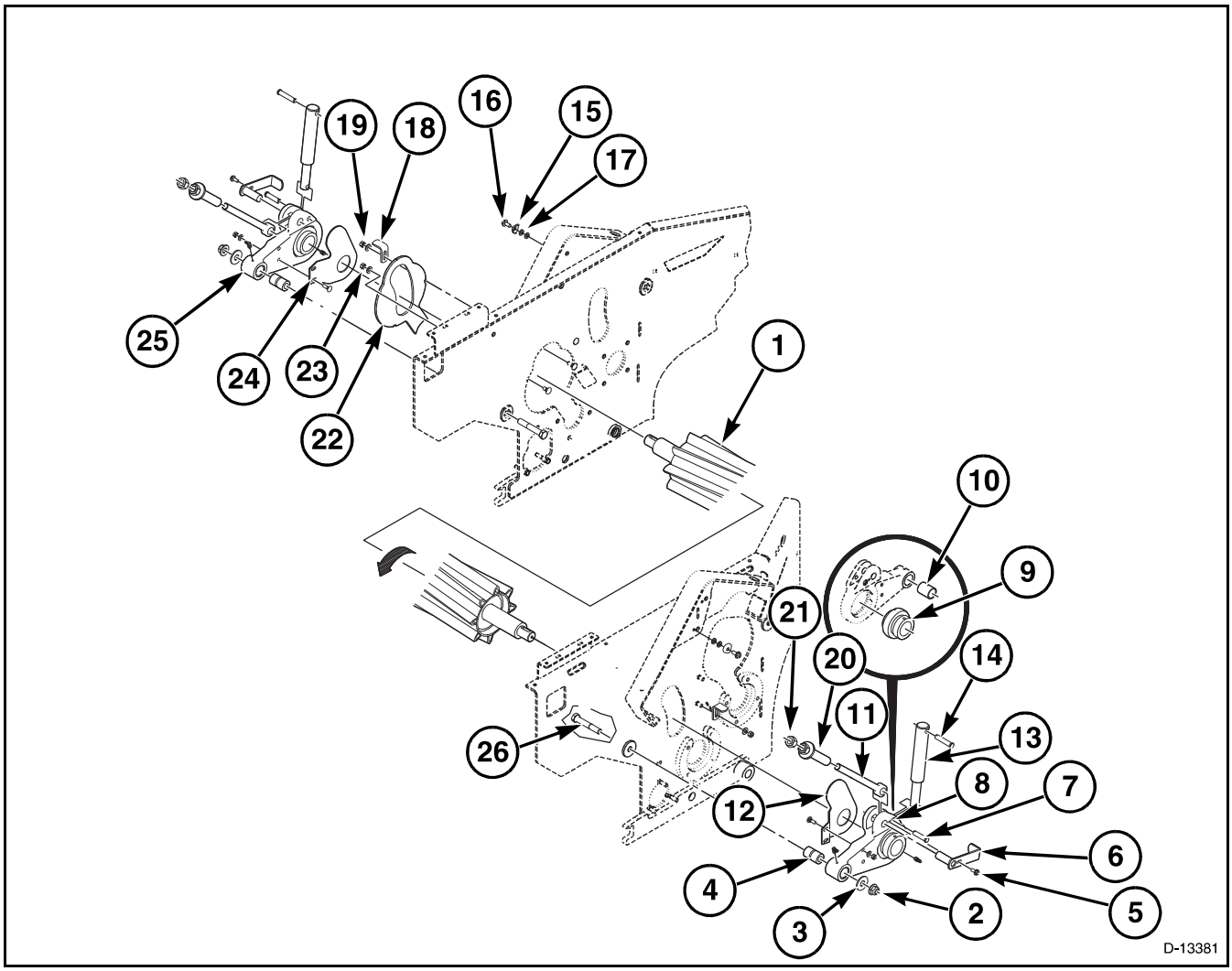

FIG. 100

FIG. 100: Exploded view of top roll

(1) Top Roll
(2) Top Lock Flange Nut
(3) Hardened Wide Plain Washer
(4) Bushing
(5) Flange Screw
(6) Pin Weld Assembly
(7) Clevis Pin
(8) Left-Hand Bearing Housing
(9) Spherical Bearing
(10) Bronze Bearing
(11) Adjustment Rod
(12) Left Bearing Shield
(13) Cylinder
(14) Clevis Pin
(15) Clip - Tine
(16) Flange Screw
(17) Spring Washer
(18) Stop - Indicator
(19) Carriage Bolt, Plain Washer, Nut
(20) Stop Weldment
(21) Nut
(22) Filler Plate
(23) Carriage Bolt, Plain Washer, Nut
(24) Right Bearing Shield
(25) Right-Hand Bearing Housing
(26) Bolt - Pivot

General Information

To remove the bottom roll, the top roll must be removed first.

Removal

Remove the top roll. See the Top Roll, Removal write-up.

FIG. 123: Left End of Bottom Roll - Loosen the none interference capscrew (1) and flange lock nut in the U-joint assembly (2) on the end of the flange weldment.

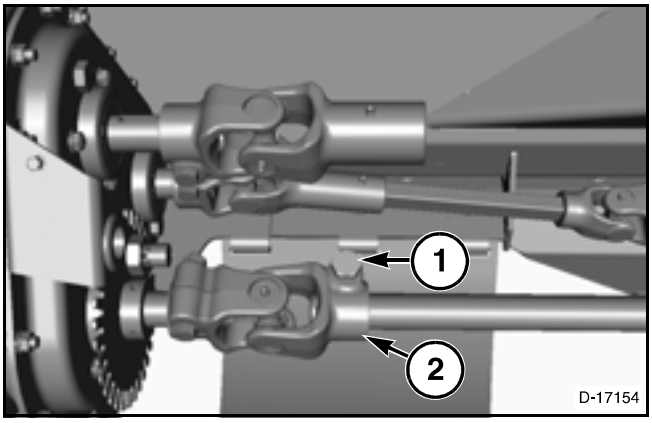

FIG. 123

FIG. 124: Remove the four flange screws (1) and top lock flange nuts from the timing flanges (2).

Separate the timing flanges flange from the timing U-joint assembly on the shaft of the hay conditioner roll.

NOTE: If timing marks have been scribed onto the flanges, remove any previous timing mark across the outside diameter of the joint formed by the two flanges. The roll timing will be adjusted after installation of the two hay conditioner roll U-joints.

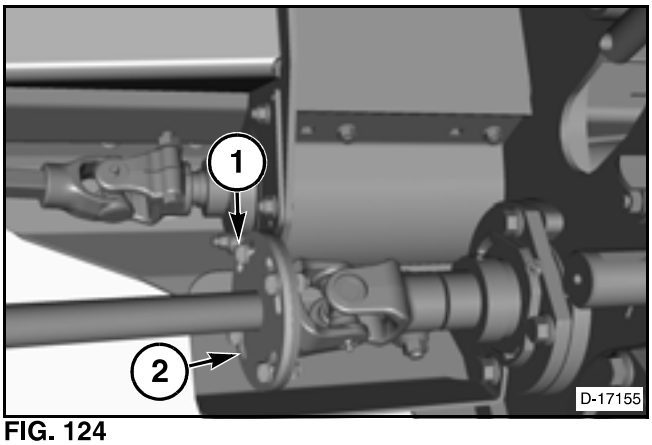

FIG. 124

FIG. 125: Remove the capscrew and flange lock nut (1) from the timing U-joint (2) on the left-hand end of the bottom roll.

Remove the U-joint assembly from the shaft.

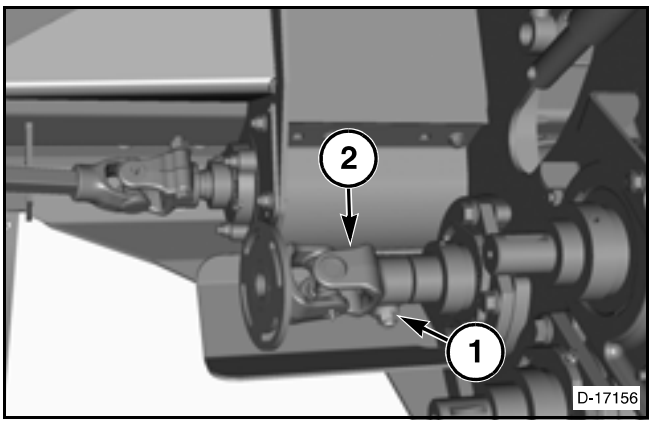

FIG. 125

Roll Timing

The hay conditioner roll timing must be set correctly for proper conditioning. If the hay conditioner rolls are out of time, header vibration and increased component wear can occur. The hay conditioner roll timing is adjusted with a timing flange.

FIG. 149: To set the hay conditioner roll timing:

Loosen the bolts (1) in the timing flanges (2) at the left-hand end of the header.

NOTE: On double conditioner headers, the timing flanges for the front rolls are located on the left-hand side of the header. The timing flanges for the rear rolls are located on the right-hand side of the header.

Rotate the bottom hay conditioner roll counterclockwise until contact is felt. Make a mark (A and B) on both timing flanges.

Rotate the bottom hay conditioner roll clockwise until contact is felt. Make another mark (C) on the outer timing flange in alignment with the mark (A) on the inner timing flange.

Rotate the bottom hay conditioner roll until the mark on the inner timing flange is centered between the marks on the outer timing flange.

Tighten the bolts in the timing flanges to 42 Nm (31 lbf ft). Be careful not to move either timing flange when tightening the bolts.

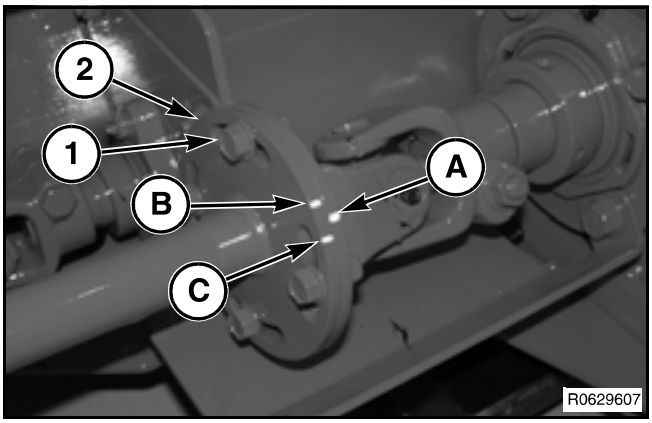

FIG. 149

Auger Strippers

FIG. 150: The auger strippers (1) must be 1.5 mm (0.06 in) from the auger.

To adjust an auger stripper, loosen the two carriage bolts (2). Move the auger stripper and tighten the carriage bolts.

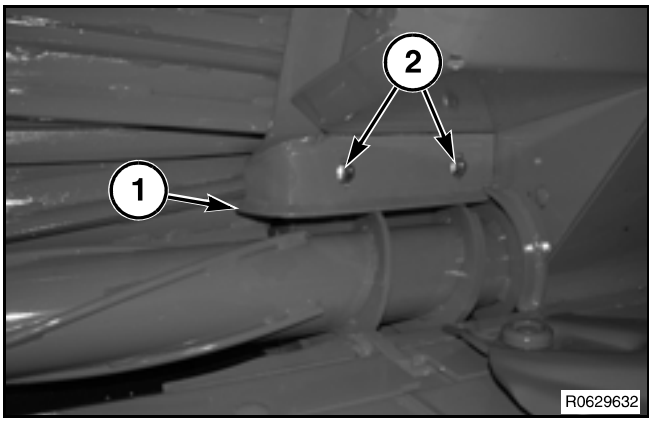

FIG. 150

FIG. 174: Remove any paint, corrosion or burrs from the shaft (1) of the helper roll.

Install the bearing housing (2) onto the helper roller shaft.

Loosely install the three hex nuts (3) along with plain washers securing the bearing housing.

Loosely install the locking collar (4) onto the helper roller shaft.

NOTE: Do not tighten the locking collar.

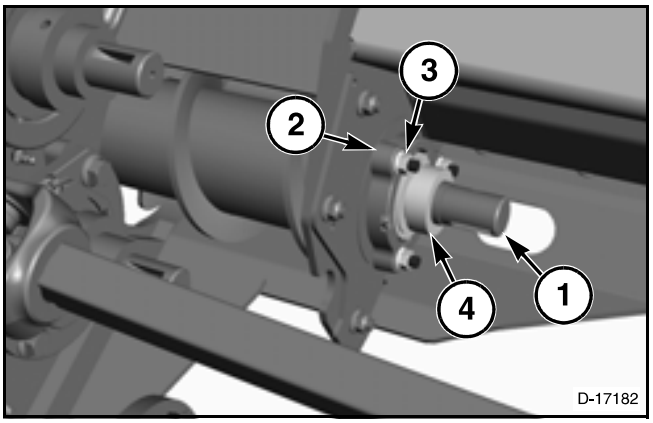

FIG. 174

FIG. 175: Install the shield (1) and the stripper angle (2).

Install the bolt (3) that secures the shield to the machine.

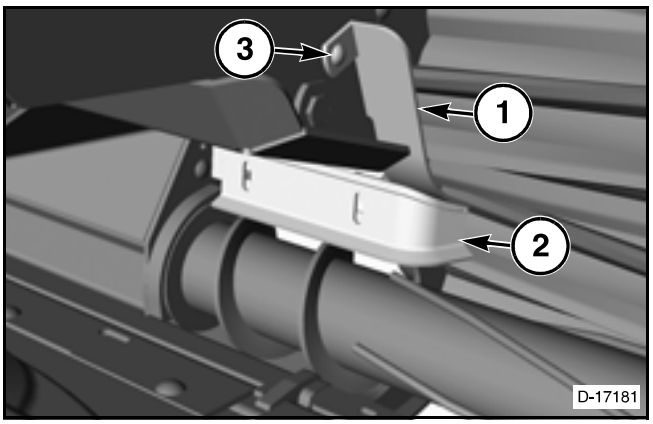

FIG. 175

FIG. 176: Install the wraper (1) onto the machine.

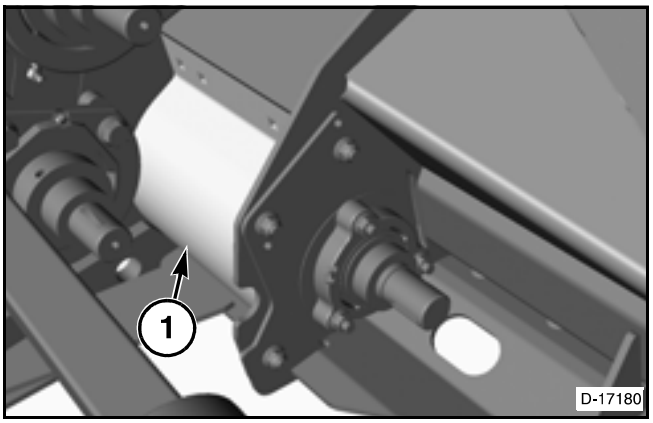

FIG. 176

FIG. 177: Install the two nuts (1) and bolts that attach the wraper (2) to the machine.

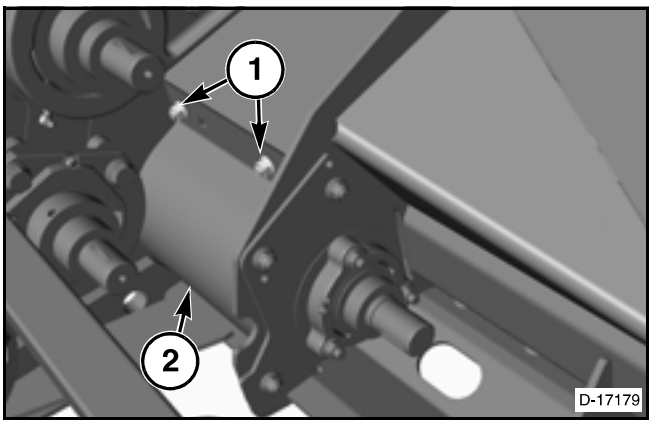

FIG. 177

FIG. 201: Remove the three U-joint assemblies (1) from the shafts of the gearcase (2).

Be careful not to lose the woodruff keys in the shafts.

Remove the woodruff keys.

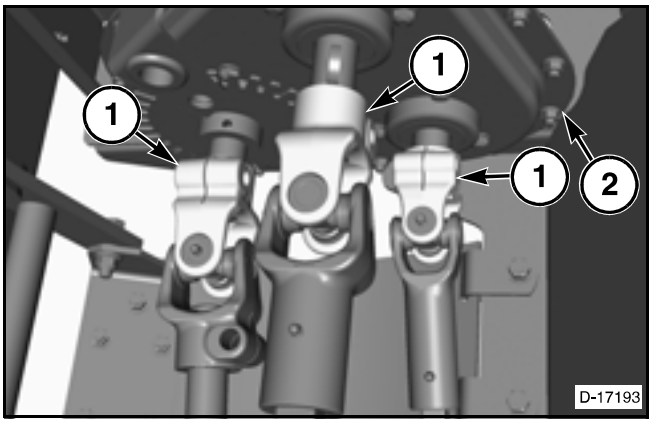

FIG. 201

FIG. 202: Remove the four flange screws and top lock flange nuts (1) from the timing flanges.

Separate the flange weldment from the timing U-joint assembly (2) on the shaft of the hay conditioner roll.

NOTE: If timing marks have been scribed onto the flanges, remove any previous timing mark across the outside diameter of the joint formed by the two flanges. The roll timing will be adjusted after installation of the hay conditioner roll U-joints.

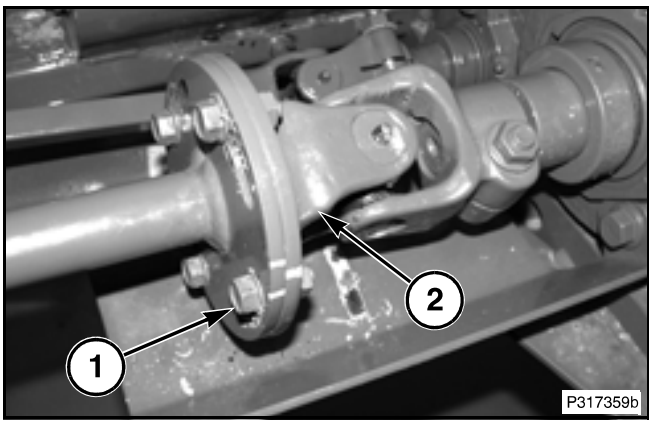

FIG. 202

FIG. 203: Gearcase - Support the gearcase (1) with a lifting device.

Remove a flange screw and flange lock nut from flange of the gear case.

Remove the two flange screws and top lock flange nuts (2) securing the top mounting channel (3) to the end panel of the header frame.

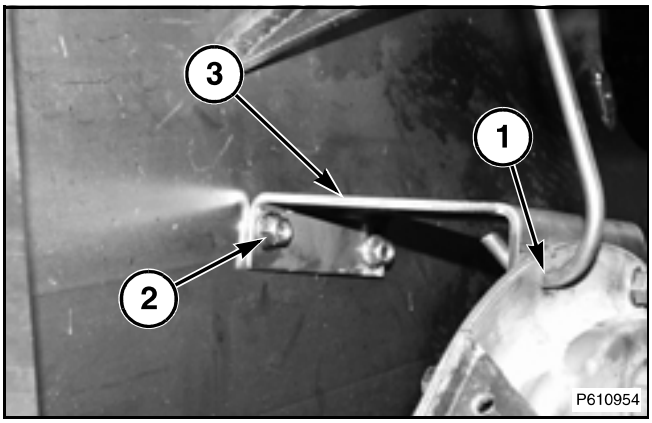

FIG. 203

FIG. 204: Remove the two grade 8 flange screws and top lock flange nuts (1) securing the bottom mounting plate (2) to the header frame.

Remove the gearcase from the machine.

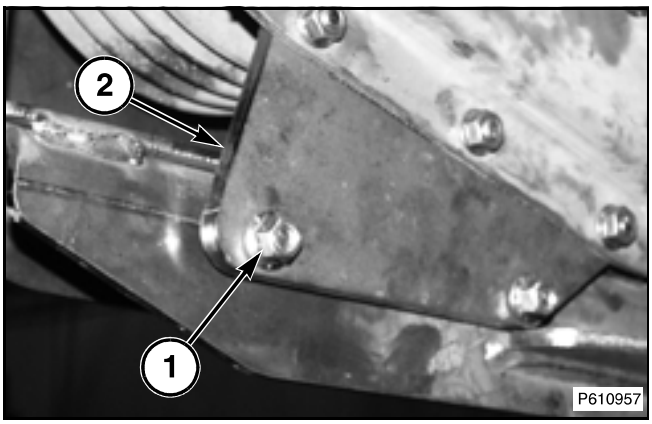

FIG. 204

FIG. 225: Inspect the cup plug (1) in the outer bearing retainer (2).

If the cup plug must be replaced, push the cup plug out toward the outside of the outer bearing retainer.

Push the new cup plug into the outer bearing retainer. Push the cup plug into the opening until the edge of the cup is even with the inside surface of the outer bearing retainer. If necessary, use a press to install the cup plug.

Install the outer bearing retainer onto the outer bearing.

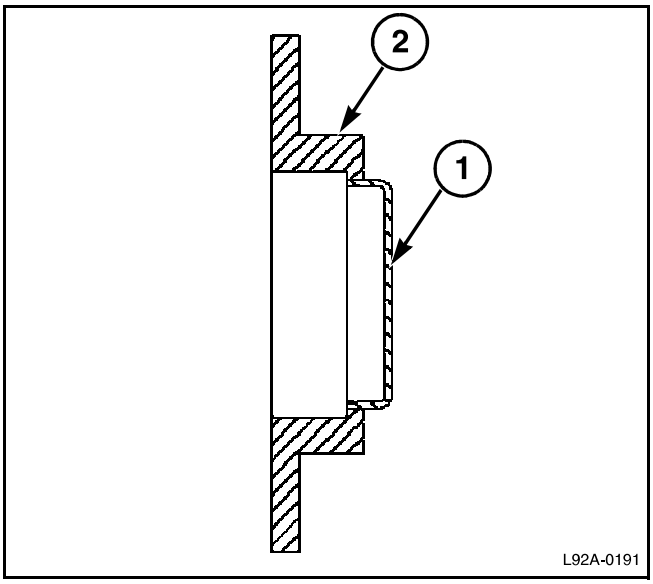

FIG. 225

Installation

FIG. 250: Gearcase - Attach a lifting device to the gearcase (1).

Position the gearcase at the mounting points in the machine.

Install the two flange screws and top lock flange nuts (2) securing the top mounting channel (3) to the end panel of the header frame.

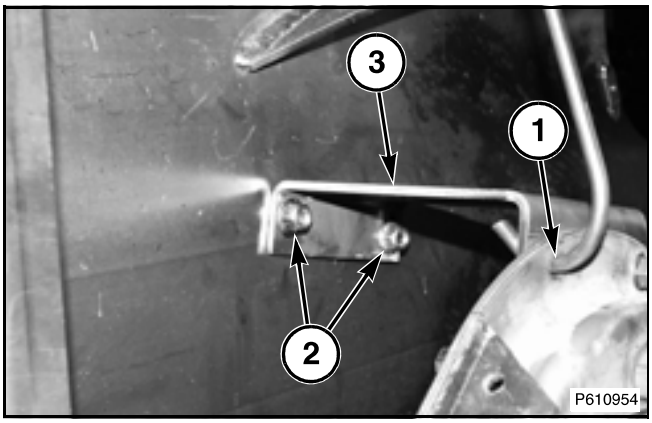

FIG. 250

FIG. 251: Install the two grade 8 flange screws and top lock flange nuts (1) securing the bottom mounting plate (2) to the header frame.

Tighten the top lock flange nuts.

Remove the lifting device. Install the flange screw and flange lock nut that was removed.

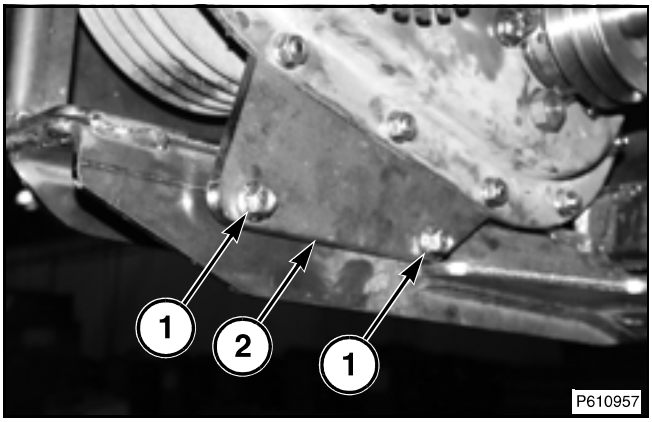

FIG. 251

FIG. 252: U-Joint Assemblies - Install a woodruff key into each output shaft (1) of the gearcase (2).

Put the U-joint assemblies (3) onto the output shafts of the gearcase.

Align all the grease zerks (4) within 90 degrees of eachother to aid in lubricating the u-joint assemblies.

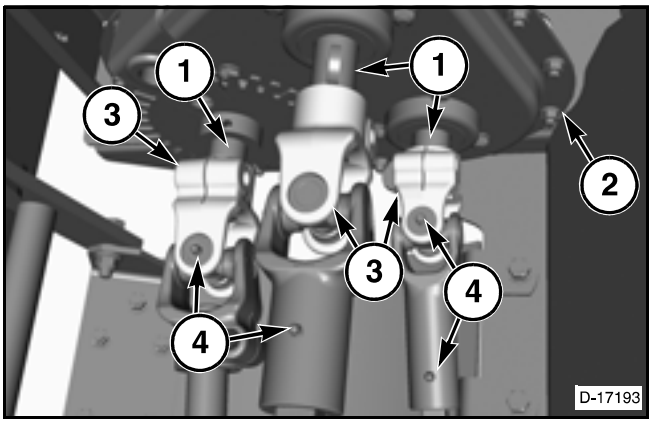

FIG. 252

FIG. 278: Remove the three flange screws and top lock flange nuts (1) securing the bottom mounting plate (2) to the header frame.

Remove the gearcase from the machine.

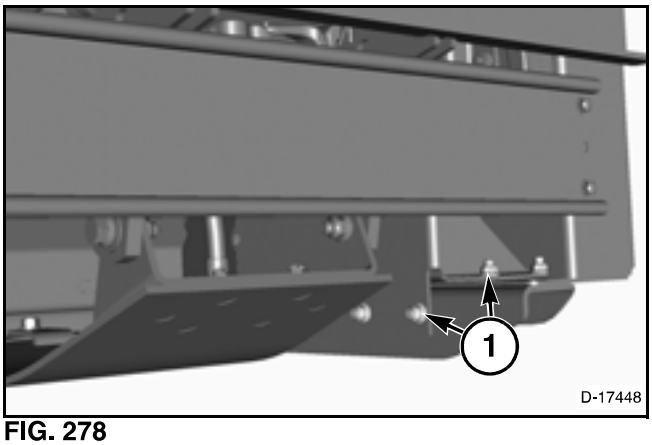

FIG. 278

FIG. 291: Make sure that all of the parts are clean.

Use Loctite® 7070 Cleaner to clean the sealing surfaces of the gearcase halves (1) and the bearing retainers.

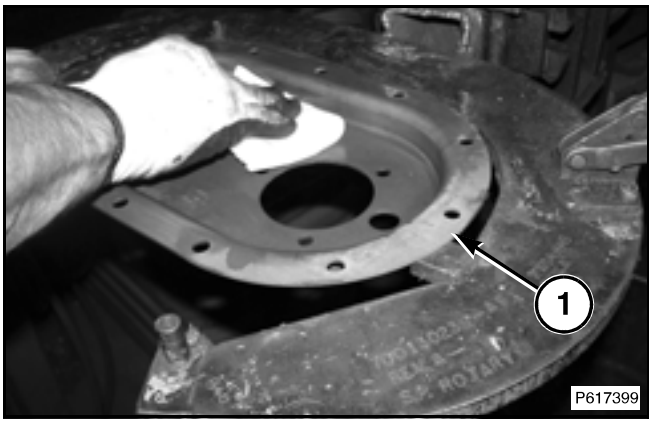

FIG. 291

FIG. 292: Apply Loctite® 5900 (1) to the sealing surfaces on what will be the inner bearing retainers on the input/output shaft assembly and the output shaft assembly. Spread the sealant over the surfaces and around the holes.

NOTE: The inner bearing retainers, when the shaft assemblies are assembled, are the bearing retainers adjacent to the end of the shaft with the two keyways cut into the end of the shaft.

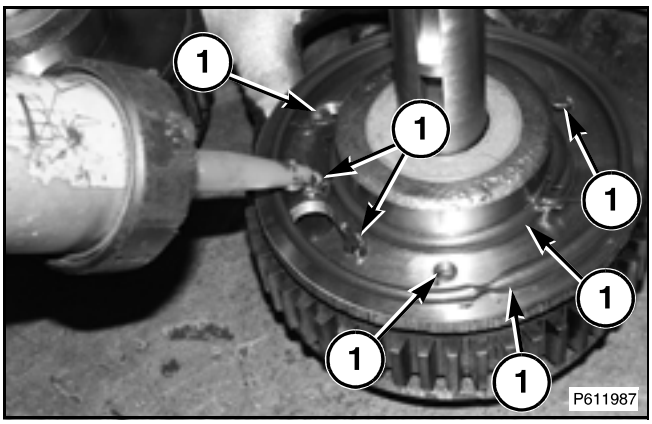

FIG. 292

FIG. 293: Install the input/output shaft and gear assembly (1) onto the hole in the inner gearcase half using three flange screws to secure the bearing retainer. Install the output shaft and gear assembly (2) onto the other hole in the inner gearcase half using three flange screws to secure the bearing retainer.

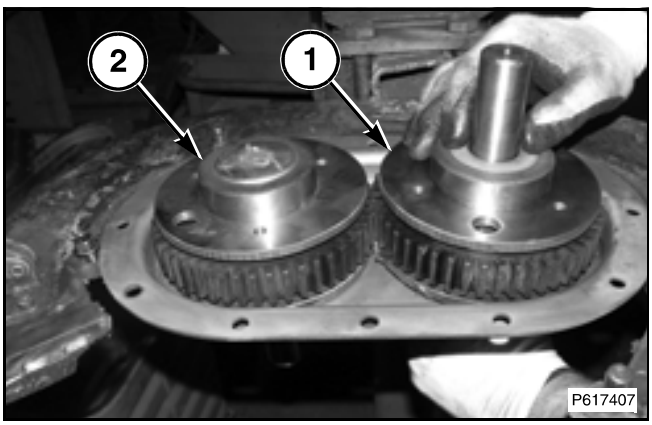

FIG. 293

U-JOINTS

Components

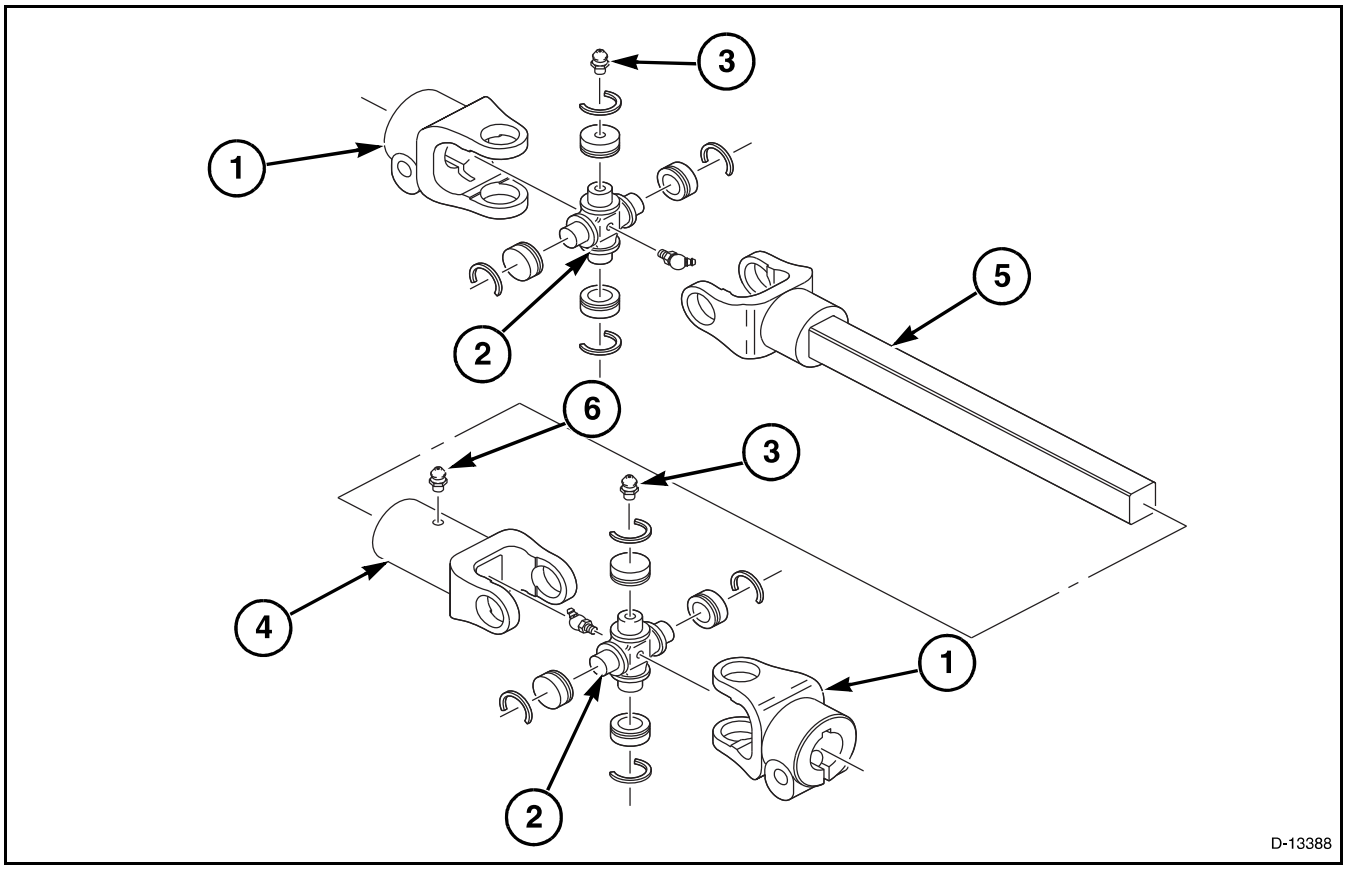

FIG. 317

FIG. 317: Exploded view of roll drive U-Joint assembly.

(1) Yoke - Clamp

(2) Kit - Cross and Bearing

(3) Fitting - Grease (Straight)

(4) Yoke - Slip

(5) Yoke and Shaft

(6) Fitting - Grease (Straight)

FIG. 339: Start one of the new bearing caps (2) into the yoke (1).

Press the bearing cap into the yoke approximately half the length of the bearing cap.

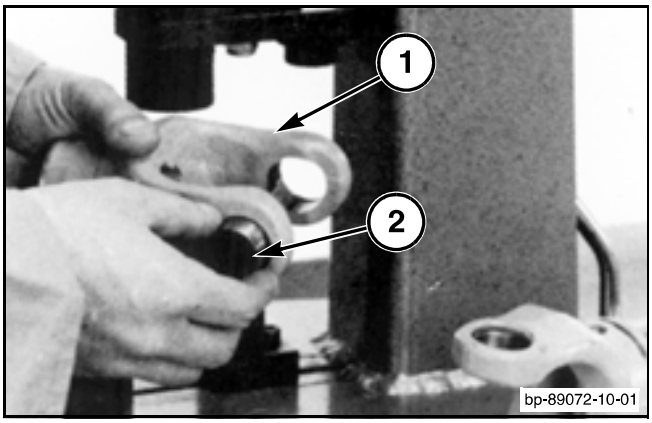

FIG. 339

FIG. 340: Install the new cross (1) into the bearing cap (2).

IMPORTANT: If equipped, the cross grease fitting must be rotated in the yoke opening so that the grease fitting faces toward the tube yoke.

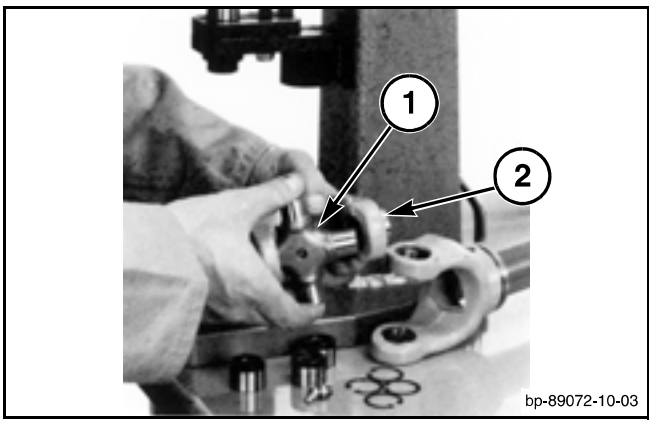

FIG. 340

FIG. 341: Carefully press the other new bearing cap (1) into the yoke (2) until the groove for the snap ring can be seen.

IMPORTANT: Make sure the cross is centered in both of the bearing caps and that all of the needle bearings remain in position.

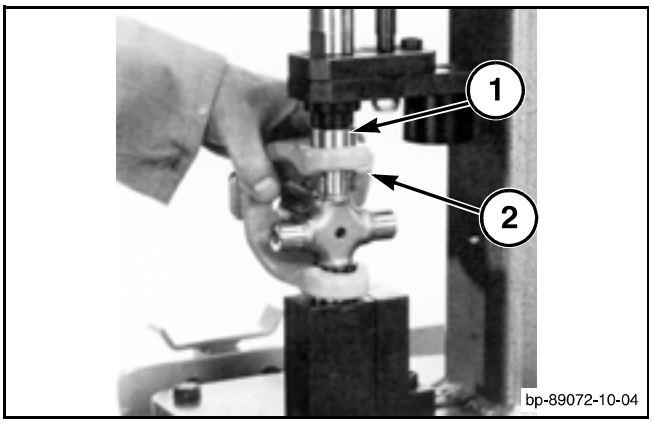

FIG. 341

FIG. 342: Install the new snap ring (1).

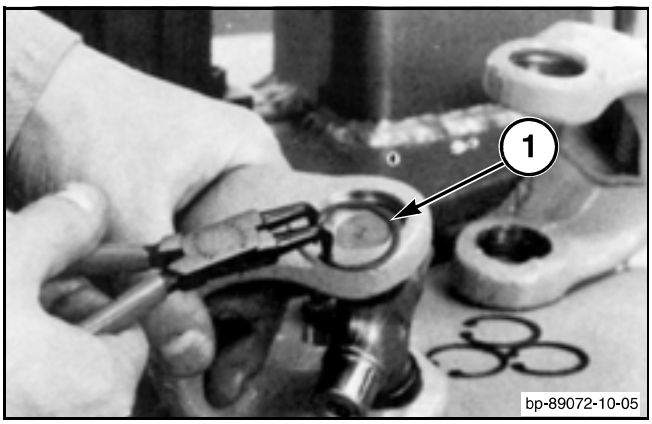

FIG. 342

Components

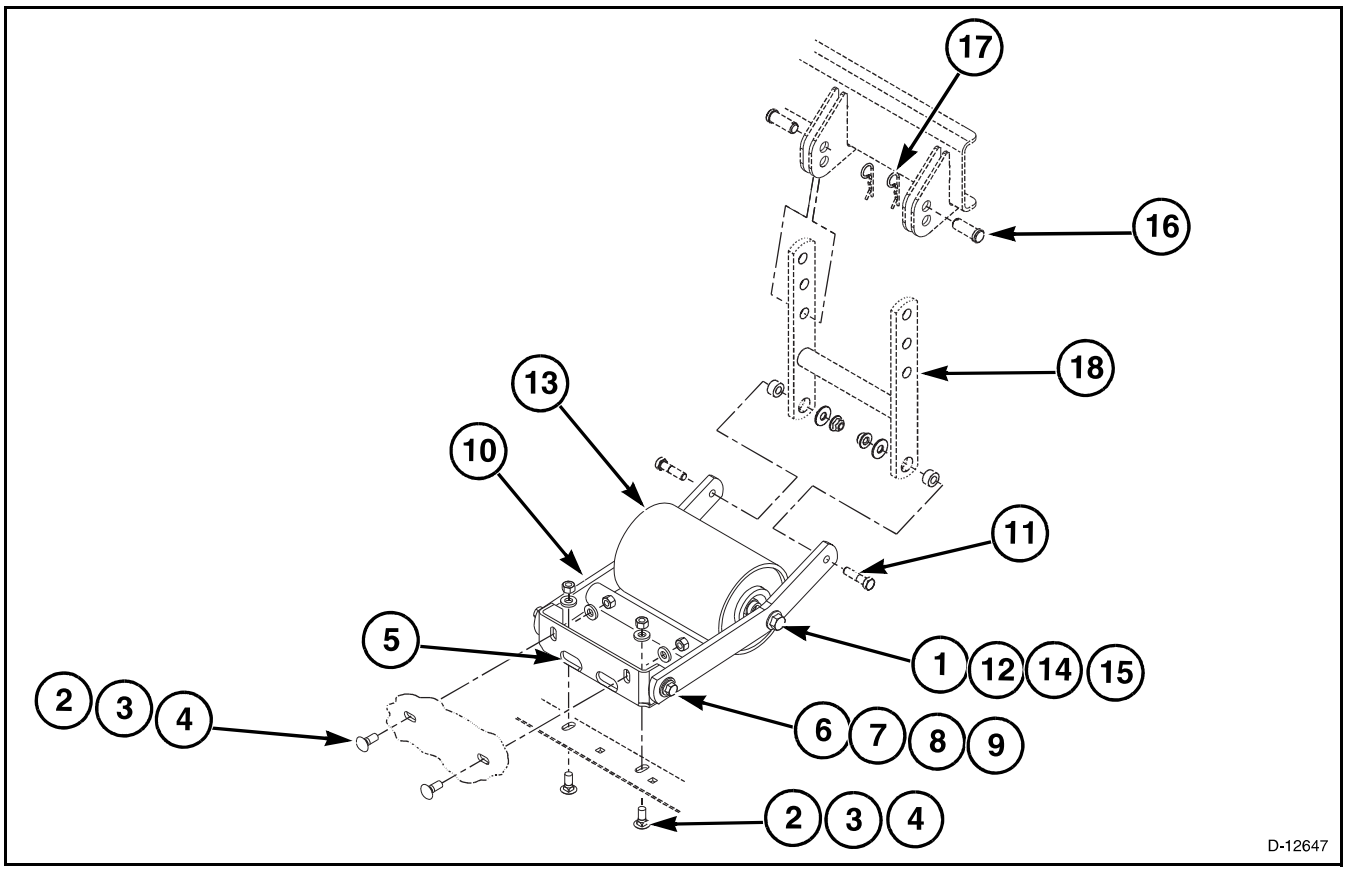

FIG. 366

FIG. 366: Gauge roller components.

(1) Screw - Flange, Grade 8
(2) Bolt - Carriage
(3) Washer - Plain
(4) Nut
(5) Angle - Mounting
(6) Screw - Flange Grade 8
(7) Washer - Hardened, Wide Plain
(8) Nut - Top Lock, Flange
(9) Bushing
(10) Strap Weldment
(11) Capscrew
(12) Shaft
(13) Wheel Weldment - Gauge
(14) Bearing
(15) Spacer
(16) Pin - Clevis
(17) Pin - Hair, Cotter
(18) Strap Weldment

NOTES

FIG. 12: Idnetify and mark all hydrualic connections to aid in the installation process.

Relieve all hydraulic pressure.

Remove the the nut (1) on the hard hydraulic line (2).

Remove both female swivels (3) on the soft hydraulic lines (4) that are connected to the left-hand hydraulic motor (5).

Install caps and plugs on the hoses, fittings, and motor ports.

NOTE: If the hoses are not connected to the correct ports at assembly, the header drive motor will rotate in the wrong direction and will lock up. The header drive motors on a rotary header rotate in opposite directions. Make sure to fasten identification tags to the hoses before removal.

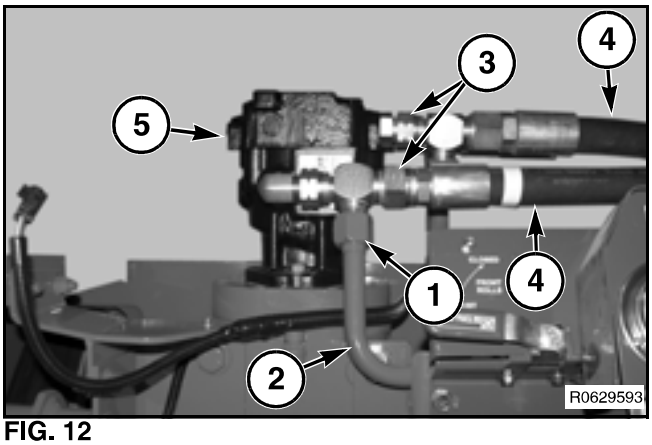

FIG. 12

FIG. 13: Remove the two 1/2-13 X 1-1/4 inch cap screws (1) with hardened plain washers that secure the motor (2) to the gear box (3).

Remove the motor from the motor mount on the header.

Remove and discard the gasket from the motor mount.

NOTE: Inspect the internal splines in the gear box pinion shaft on the right-hand and the left-hand sides of later units.

Replace if necessary before installing a new or repaired motor.

Cover the motor mount on the header to prevent contamination.

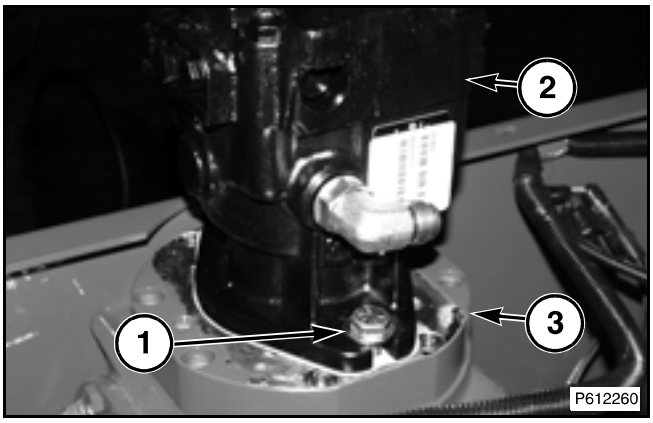

FIG. 13

FIG. 14: If necessary, repeat the above procedures for the opposite side of the machine.

NOTE: The procedure is the same for the single and double conditioner machines.

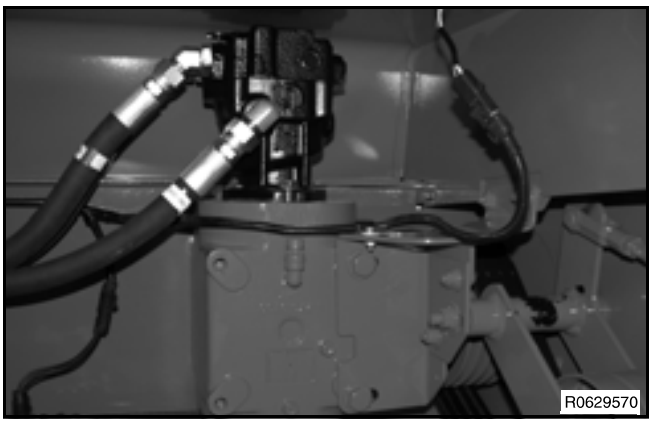

FIG. 14

FIG. 40: Remove the charge relief valve hex plug with O-ring (1) and the spring (2). Discard the old O-ring.

IMPORTANT: Protect the open surfaces and cavities from damage and foreign material.

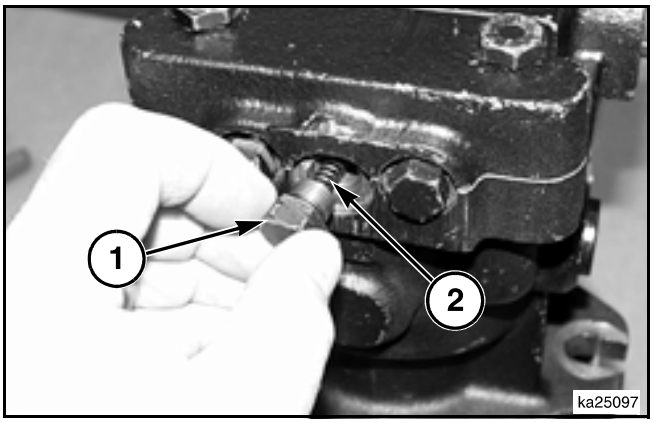

FIG. 40

FIG. 41: If the poppet (1) was not removed with the spring and hex plug, remove the poppet from the end cap (2).

Inspect the poppet and the seat in the end cap for damage or foreign material. Make sure the poppet moves freely in the body. Check the poppet and the body for wear and damage. Replace the parts as necessary.

Make sure that the three orifices at the seat end of the poppet are not plugged.

NOTE: Replace the end cap if the seat is damaged.

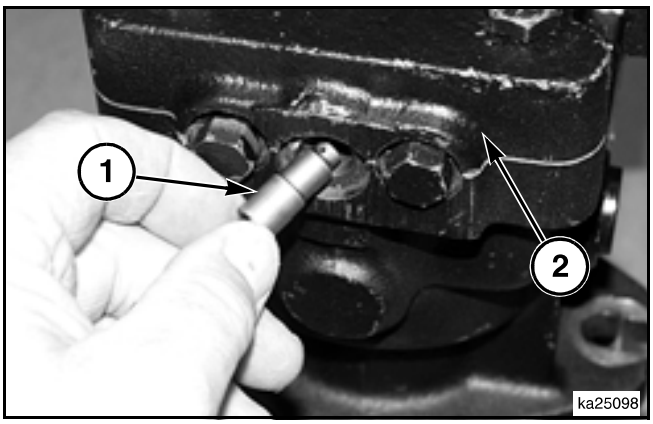

FIG. 41

FIG. 42: Lightly lubricate the new O-ring with clean petroleum jelly prior to assembly. Install the new O-ring onto the hex plug (1).

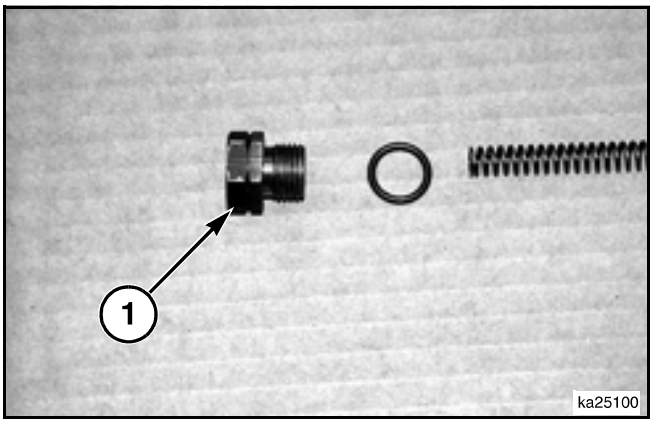

FIG. 42

FIG. 43: Install the poppet (1), the spring (2), and the plug (3) with a new O-ring into the end cap.

Tighten the plug (3).

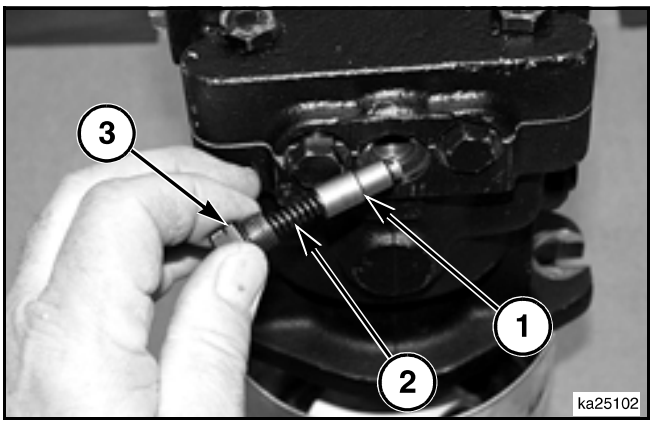

FIG. 43

Removal

FIG. 71: Park the machine on a level surface and lower the header to the ground.

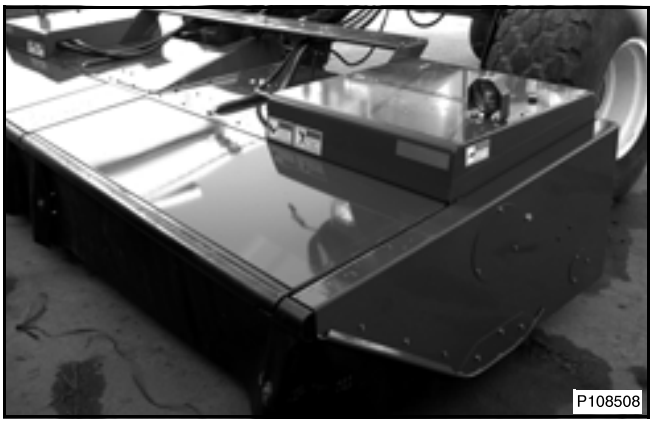

FIG. 71

FIG. 72: Stop the engine and apply the parking brake switch (1).

WARNING: Make sure the steering wheel is centered and locked.

FIG. 72

FIG. 73: Left Hand Shown - Lift the shield and push the shield forward.

Wash the outside of the motor, hoses, fittings, and the area around the motor (frame, shields, gearboxes, etc.).

IMPORTANT: Hydraulic components must be kept clean so contamination will not enter the system. When disconnecting hydraulic components, areas around the connections must be steam cleaned or washed with solvent. Always keep caps and plugs on the hoses, connections, and ports to keep contamination out of the system.

FIG. 73

FIG. 101: Remove the needle bearing (1) from the end cap using a suitable puller.

IMPORTANT: Do not damage the valve plate surface of the end cap.

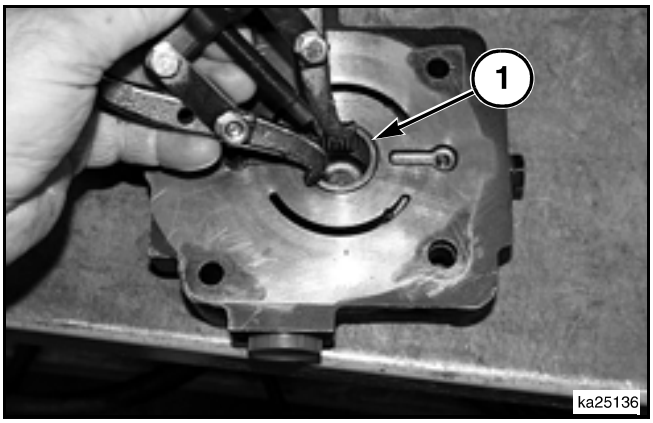

FIG. 101

FIG. 102: Press a new needle bearing into the end cap using a suitable press pin.

When installed correctly, the bearing cage will extend from 2.41 to 2.67 mm (0.095 to 0.105 in) from the valve plate surface of the end cap. This will be a pilot for the valve plate.

IMPORTANT: When installing the needle bearing, the end of the bearing cage with writing (numbers) must face the press pin.

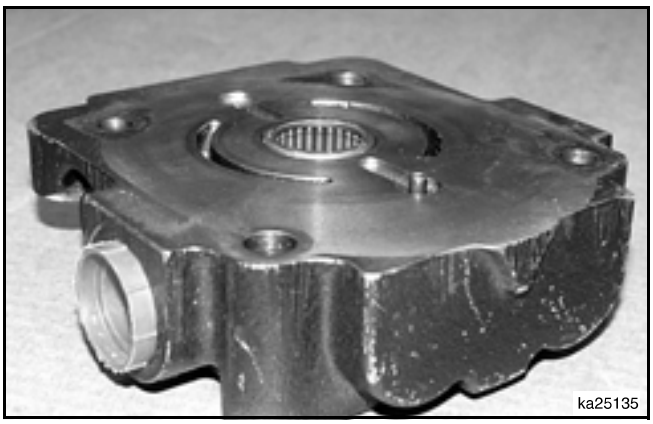

FIG. 102

FIG. 103: Press the valve plate locating spring pin (1) into the end cap. The spring pin must extend 4.19 to 4.70 mm (0.165 to 0.185 in) from the valve plate surface of the end cap.

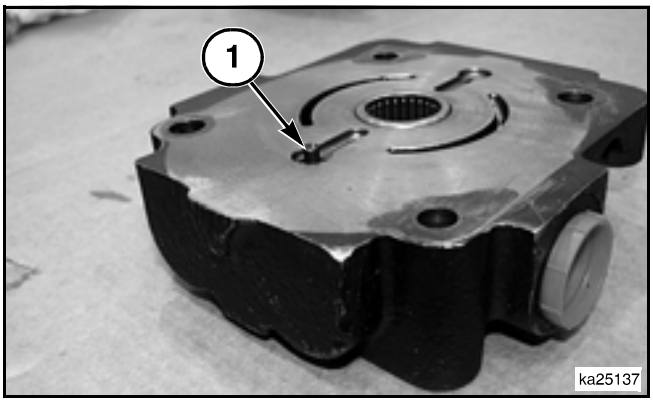

FIG. 103

FIG. 104: Compress the cylinder block spring and remove the spiral retaining ring (1), the outer washer (2), the spring (3) and the inner washer (4).

Assemble in the reverse order.

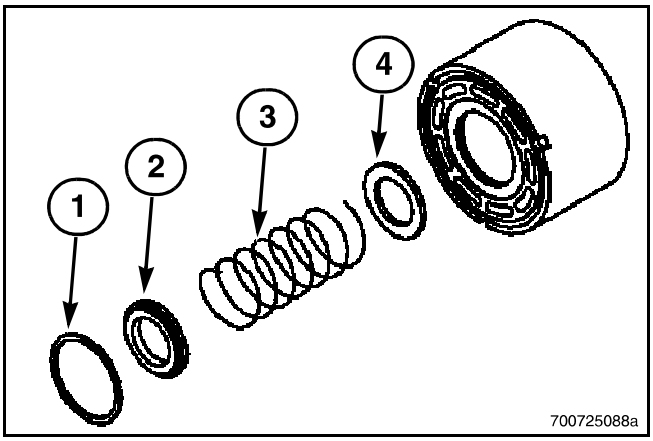

FIG. 104

FIG. 136: Close the shield (1). Make sure the shields lower lip is behind the support channel.

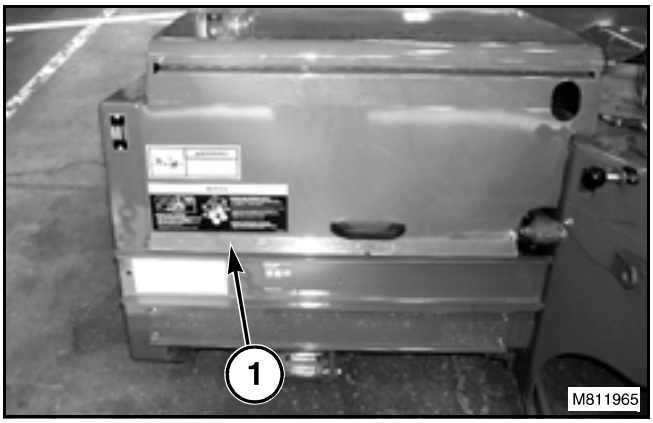

FIG. 136

FIG. 137: Repeat the above procedures for the Right-Hand side.

NOTE: The procedure is the same for the single and double conditioner machines.

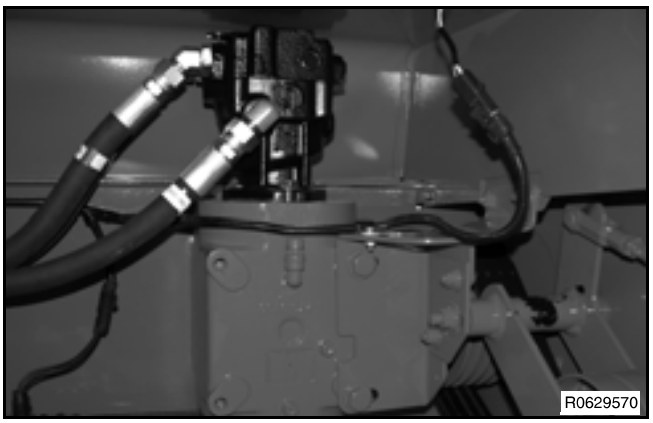

FIG. 137

Installation

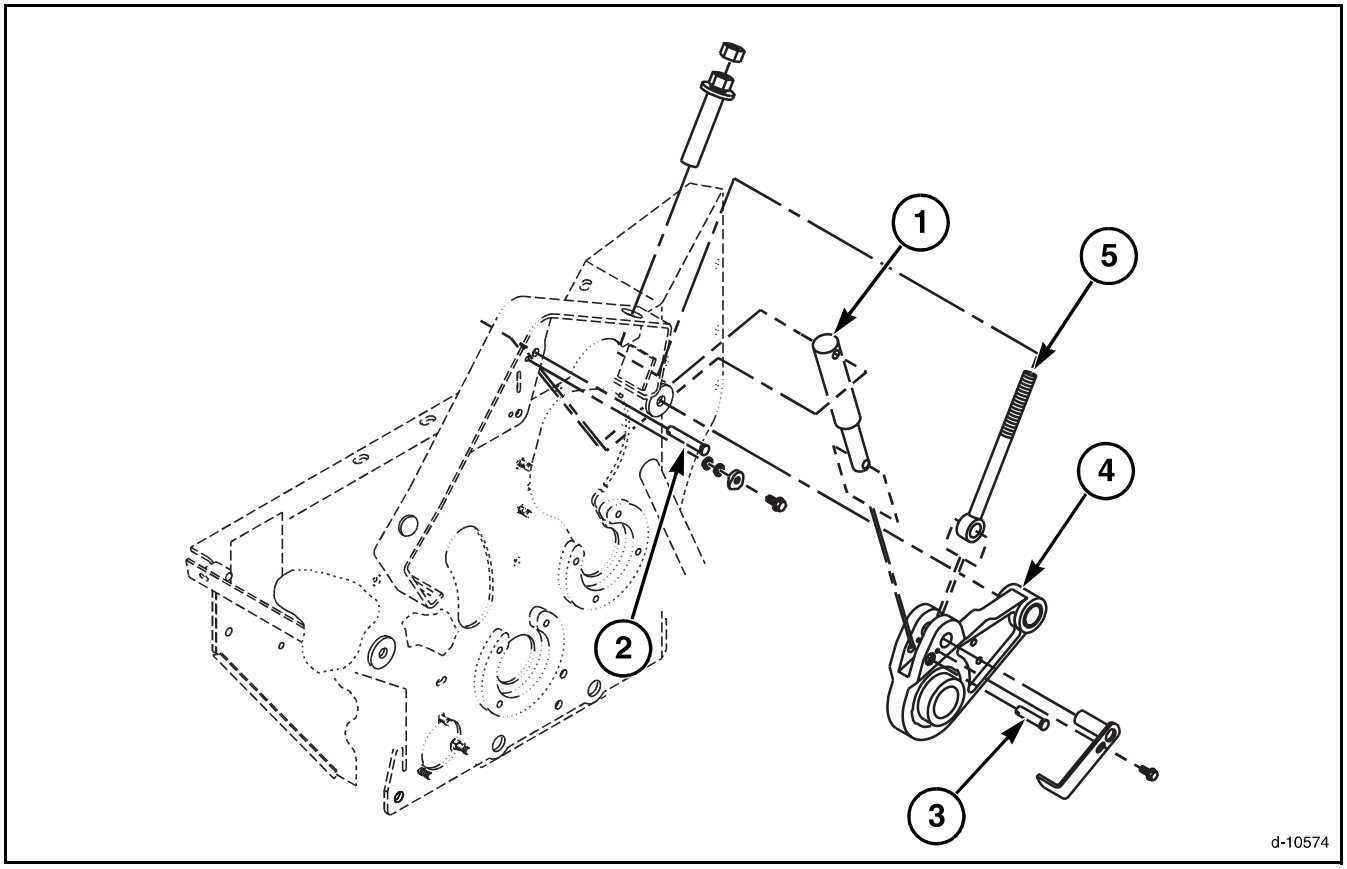

FIG. 149

FIG. 149: Hold on to both the rod and the tube of the cylinder (1) to keep the rod from separating from the tube. Install the cylinder into the header.

Install the clevis pins (2) and (3) into the base end and the rod end of the cylinder.

NOTE: The clevis pin for the base end is longer than the clevis pin for the rod end.

Align the hole in the bearing housing (4) with the hole in the adjustment rod (5).

Roll Spacing Indicator

FIG. 166: To reset the roll spacing indicator (1), loosen the nuts holding the roll spacing stops (2) on both sides of the machine.

Loosen the jam nut (3) on the adjustment bolt (4) on the hay conditioner pivot assembly on both sides of the machine.

Slowly turn the adjustment nuts (5) counterclockwise until a steel angle (6) on the bottom roll (7) just touches the valley (8) between the steel angles on the top roll (9). Make sure the adjustment is the same at both ends of the rolls. Turn both of the adjustment bolts clockwise 1/2 turn to make a slight gap between the rolls.

Move the roll spacing stop against the roll spacing indicator on both sides of the machine. Tighten the nut on the roll spacing stop on both sides of the machine.

See Hay Conditioner Roll Spacing in this section to make the proper roll spacing adjustment.

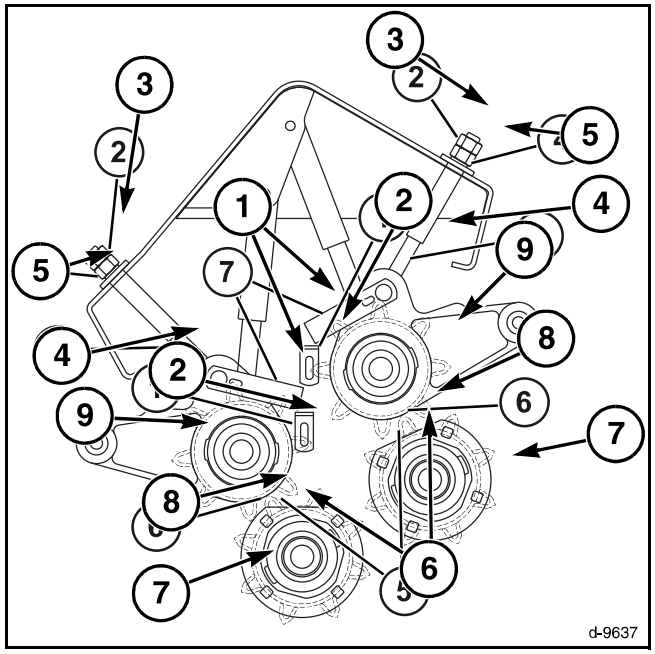

FIG. 166

Specifications

Hay Conditioner

Engaging rollers

- Hay conditioner type ..... herringbone steel on steel
- Length ..... 2790 mm (109.8 in)
- Diameter of rolls ..... 196 mm (7.7 in)
- Speed, maximum
  - Front rolls ..... 1290 rev/min
  - Rear rolls ..... 1231 rev/min
- Drive ..... 4HA banded belt and enclosed gearcase with U-joints
- Accumulator charge pressure - dry Nitrogen ..... 2760 kPa (400 psi)

Helper roll

- Length ..... 3250 mm (128 in)
- Diameter of roll
  - bars ..... 121 mm (4.75 in)
  - flighting ..... 152.4 mm (6 in)
- Speed, maximum ..... 1290 rev/min
- Drive ..... U-joint

Windrow width (depending on conditions)

- Maximum ..... 2438 mm (96 in)
- Minimum ..... 1016 mm (40 in)

Lubrication

Grease fitting lubricant ..... No. 2 Multi-Purpose Lithium Grease

Gearboxes

- Quantity (each) ..... 1.9 liters (2 U.S. quarts)
- Lubricant ..... SAE EP 90W or 80w90 Gear Oil

Cutterbed

- Quantity ..... 5.7 liters (6.0 U.S. quarts)
- Lubricant ..... SAE EP 90W or 80w90 Gear Oil

Hay conditioner gearcase

- Quantity ..... 0.11 kg (4 oz)
- Lubricant ..... SAE EP 90W or 80w90 Gear Oil