SERVICE MANUAL

Crawler

550H

7-16170

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

550H

7-16170

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

550H

7-16170

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

SERVICE MANUAL

Crawler

550H

7-16170

1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	Thread Size	Pound-Inches	Newton metres
O-ring Face Seal End					**O-ring Boss End Fitting or Lock Nut**		
-4	1/4 inch 6.4 mm	9/16-18	120 to 144	14 to 16	7/16-20	204 to 240	23 to 27
-6	3/8 inch 9.5 mm	11/16-16	216 to 240	24 to 27	9/16-18	300 to 360	34 to 41
-8	1/2 inch 12.7 mm	13/16-16	384 to 480	43 to 54	3/4-16	540 to 600	61 to 68
					Thread Size	Pound-Inches	Newton metres
-10	5/8 inch 15.9 mm	1-14	552 to 672	62 to 76	7/8-14	60 to 65	81 to 88
Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Inches	Newton metres	1-1/16-12	85 to 90	115 to 122
					1-3/16-12	95 to 100	129 to 136
-12	3/4 inch 19.0 mm	1-3/16-12	65 to 80	90 to 110	1-5/16-12	115 to 125	156 to 169
-14	7/8 inch 22.2 mm	1-3/16-12	65 to 80	90 to 110	1-5/8-12	150 to 160	203 to 217
-16	1.0 inch 25.4 mm	1-7/16-12	92 to 105	125 to 140	1-7/8-12	190 to 200	258 to 271
-20	1-1/4 inch 31.8 mm	1-11/16-12	125 to 140	170 to 190			
-24	1-1/2 inch 38.1 mm	2-12	150 to 180	200 to 254			

SECTION INDEX

ENGINES

FOR ENGINE REPAIR, SEE THE ENGINE SERVICE MANUAL

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Hamilton, ON L7N 3M6 CANADA

Bur 7-17610

July, 2000

RADIATOR

Removal

STEP 1

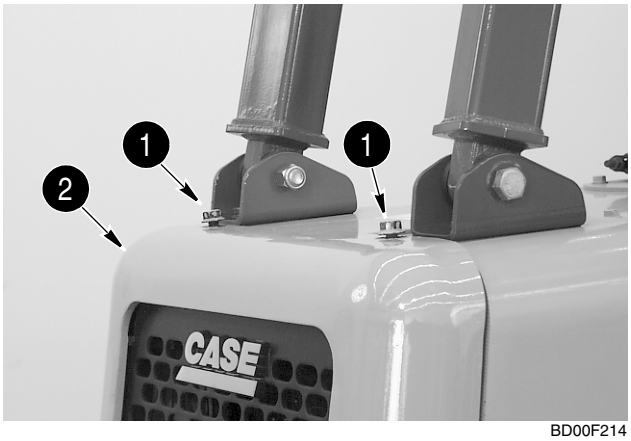
Park the machine on a level surface. Lower the blade to the floor and stop the engine.

STEP 2

BD00F263

Disconnect the negative battery cable.

STEP 3



BD00F214

Remove the two bolts (1) securing the grille (2).

STEP 4

BD00F215

Lower the grille. Install lifting eyes in the two holes in the grille from which the bolts were removed. Connect suitable lifting equipment to the lifting eyes.

STEP 5

BD00F216

Remove the grille stop bolts to gain access to the grille hinge bolts.

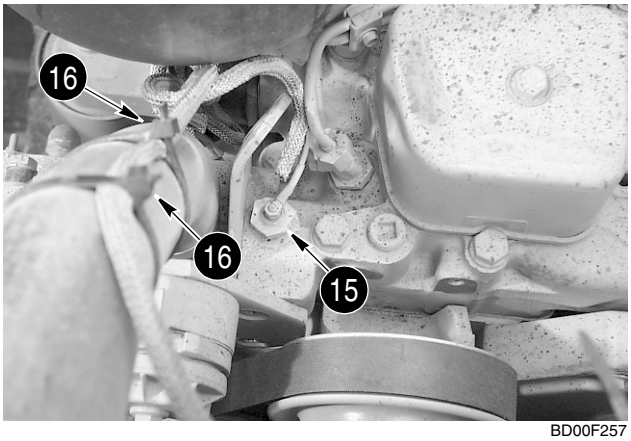
BD00F261

Remove the bolts (14) from both sides of the radiator guard.

BD00F260

Connect suitable lifting equipment to the radiator guard and remove.

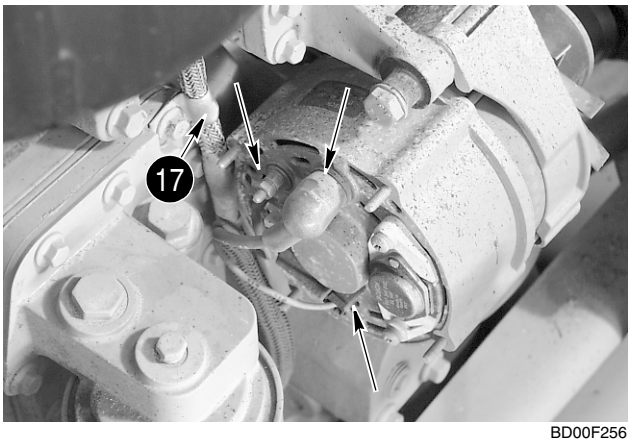
STEP 50



BD00F257

Tag and disconnect the wiring harness wire from the coolant temperature sender (15). Cut, remove, and discard the two tie straps (16) holding the wiring harness to the radiator hose.

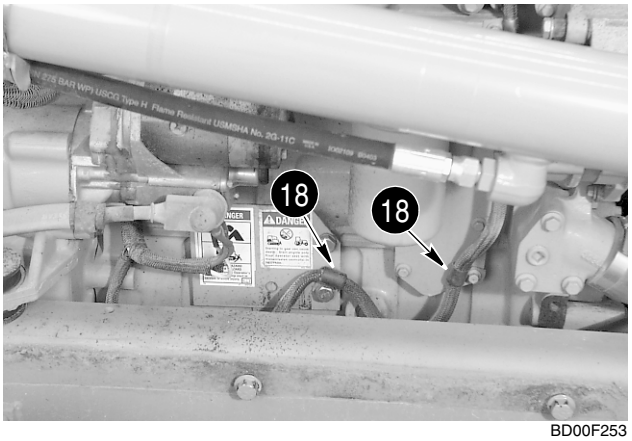
STEP 51



BD00F256

Tag and disconnect the wires from the alternator. Remove the bolt securing the clamp (17). Remove the clamp.

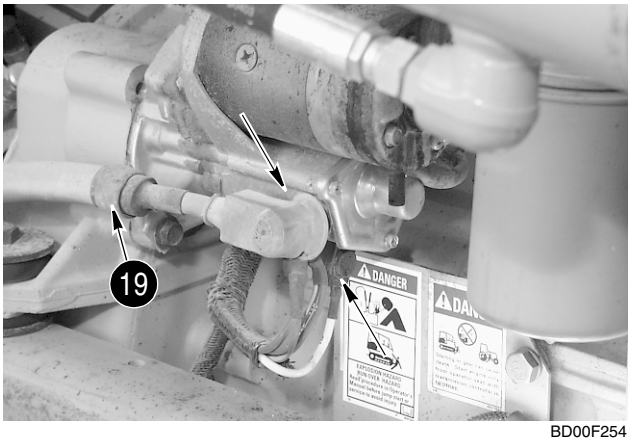
STEP 52



BD00F253

Remove the bolts securing the two clamps (18). Remove the clamps.

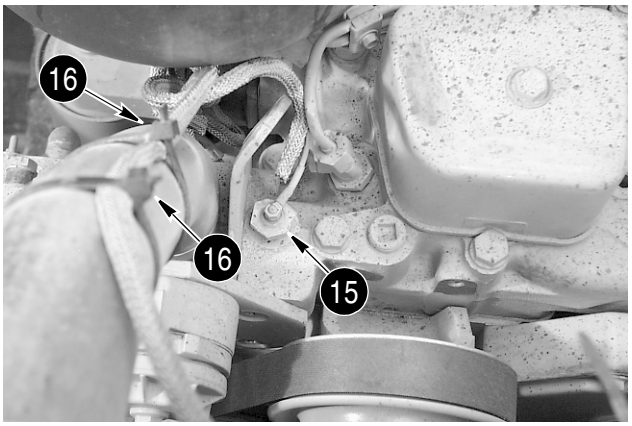
STEP 53



BD00F254

Tag and disconnect the battery cable and the four wiring harness wires from the starter. Remove the bolt securing the clamp (19) and the battery cable to the starter. Move the battery cable out of the way.

STEP 111



BD00F257

Route the horn wire from the wiring harness up the hose and secure using two tie straps (16). Connect the wiring harness wire to the coolant temperature sender (15). Remove and discard the tag.

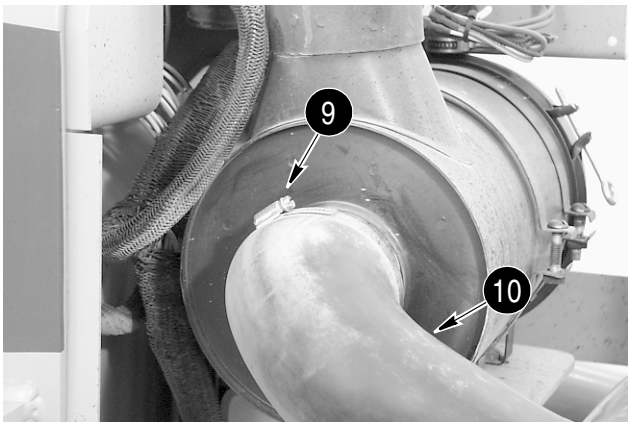
STEP 112

BD00F260

BD00F261

Position the radiator cover on the frame and install the two bolts (14). Tighten the bolts to a torque of 366 to 441 Nm (270 to 335 lb-ft).

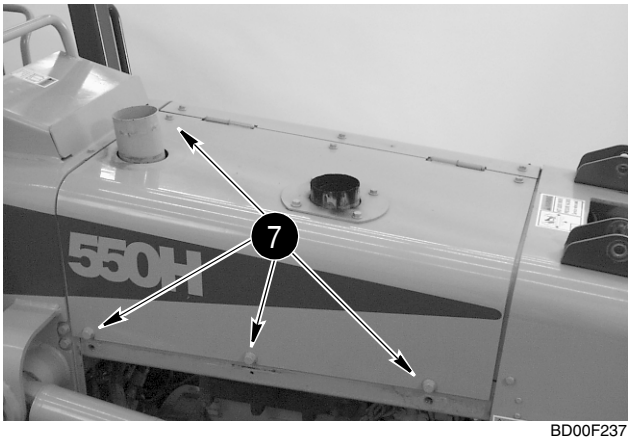
STEP 113



BD00F250

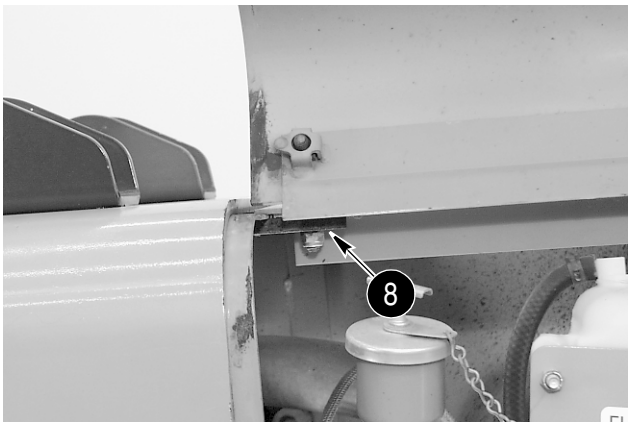
Loosen the clamp (9) and connect the hose (10) to the air cleaner assembly. Tighten clamps on each end of hose to a torque of 9.6 to 13 Nm (85 to 115 lb-inch).

STEP 114



BD00F237

Position the RH and LH engine hoods and hinge on the machine. Install the four bolts (7) to secure the engine hood.

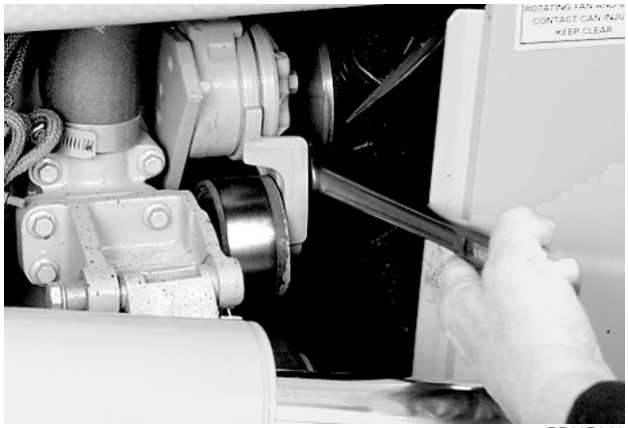


BD00F239

At the front of the engine hood, install bolt, lock nut, washer, and plate (8).

DRIVE BELT REPLACEMENT

1. Park the machine on a level surface.
2. Lower the attachments to the floor.
3. Apply the parking brake and stop the engine.
4. Fasten a Do Not Operate tag to the instrument panel.
5. Loosen the lower cap screws for the right-hand side panel.
6. Remove the upper cap screws for the right-hand side panel.
7. Remove the right-hand side panel.
8. Install a 1/2 inch drive breaker bar in the bracket for the automatic belt tensioner.



BP00B041

9. Lift up on the breaker bar to release the belt tension while you remove the old drive belt.
10. Use the breaker bar to hold the tension pulley out of the way while you install the new drive belt on the pulleys. Make sure that the drive belt is seated in the grooves in each of the pulleys.
11. Install the right-hand side panel on the lower cap screws.
12. Hold the right-hand side panel in position while you install the upper cap screws.
13. Tighten all of the cap screws for the right-hand side panel.
14. Remove the Do Not Operate tag from the instrument panel.

4 – No Start Switch

The no start switch is located next to the key switch on the instrument panel.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Disconnect electrical connector from no start switch.*		
Check switch for continuity across terminals 4 and 5.	Continuity	Bad no start switch (4).
NOTE: *If naturally aspirated engine, put key switch in ON position. If turbo charged engine, disconnect the electrical connector from the fuel shutoff solenoid on the injection pump. Put the neutral lock/parking brake control lever in the ENGINE START/PARKING BRAKE APPLIED position. Have another person hold the key switch in the START position.*		
Terminal for wire 13A to ground (naturally aspirated engine).	12 volts	Bad wire 13A or wire 13 between the no start switch and the key switch (8). Bad key switch (8).
Terminal for wire 24A to ground (turbo charged engine).	12 volts	Bad wire 24A, wire 24AA, or wire 21C splice between the no start switch and normally open brake relay (11). Bad normally open brake relay (11).

5 – Fuel Shutoff Solenoid (Naturally Aspirated Engine)

The fuel shutoff solenoid is located on the fuel injection pump at the left front of the engine.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
NOTE: *Put the key switch in the ON position.*		
Terminal for wire 24C to ground.	12 volts	Bad wire 24C between the fuel shutoff solenoid and the no start switch (4). Bad fuel shutoff solenoid (5) or no start switch (4).

6 – Injection Pump Relay (Turbo Charged Engine)

The injection pump relay is located on the rear of the relay/fuse block mounting bracket.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
Terminal for wire 0 to ground.	Continuity	Bad ground circuit.
Terminal for wire 24P to ground.	12 volts	Bad wire 24P between the starter (3) and injection pump relay.
NOTE: *Disconnect the electrical connector from the fuel shutoff solenoid on the injection pump. Put the neutral lock/parking brake control lever in the ENGINE START/PARKING BRAKE APPLIED position. Have another person hold the key switch in the START position.*		
Terminal for wire 24B to ground.	12 volts	Bad wire 24B between no start switch (4) and injection pump relay. Bad no start switch (4).
Terminal for wire 24 to ground.	12 volts	Bad injection pump relay.

26 – Transmission Temperature Sender

The transmission temperature sender is located on the torque converter housing.		
Check Points	**Reading**	**Possible Cause of Bad Reading**
Check between the housing of the transmission temperature sender and the torque converter housing.	Continuity	Bad ground connection.
NOTE: *Disconnect the wiring harness connector from instrument cluster (19) connector. Turn the key switch to ON.*		
Terminal T2 to ground.	12 volts	Check wire 19E between the connector terminal T2 and the instrument panel relay (18). Check the 10 ampere fuse in location D on fuse block 1; check key switch (8).
NOTE: *Put the key switch in the OFF position. Connect the wiring harness connector to the instrument cluster (19). Disconnect the terminal of wire 32T from the transmission temperature sender terminal. Put the key switch in the ON position.*		
Check oil temperature gauge reading with wiring harness terminal of wire 32T disconnected from sender terminal.	Low green area	Bad oil temperature gauge.
Terminal of wire 32T to ground.	12 volts	Check wire 32T between transmission temperature sender and terminal T11 of instrument cluster (19) connector. Check oil temperature gauge in instrument cluster (19). Check instrument cluster (19).
Connect terminal of wire 32T to ground and check reading of oil temperature gauge.	High red area	Bad oil temperature gauge.
NOTE: *If all readings are good, replace the transmission temperature sender.*		

SAFETY RULES

WARNING: *Never try to charge the battery if the electrolyte in the battery is frozen.*

47-83A

WARNING: *Never cause sparks to occur or smoke near batteries that are charging or have been recently charged.*

13-8A

WARNING: *Disconnect the ground cable first when the battery cables are disconnected from the battery.*

Connect the ground cable last when the battery cables are connected to the battery.

47-55A

WARNING: *Some batteries have a ventilation tube. If there is battery acid in the ventilation tube, this battery acid can be released when the battery is turned upside down. If you turn the battery upside down, make sure that the end of the ventilation tube is away from you and away from any other people in the area. Battery acid can cause severe burns.*

48-57B

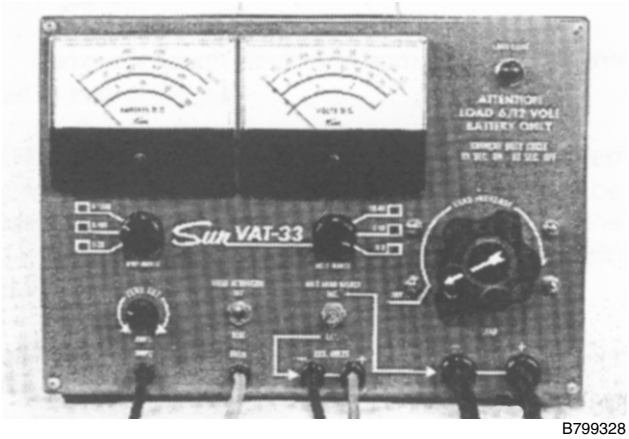
WARNING: *Battery acid causes severe burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote: EXTERNAL-Flush with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes: Flush with water for 15 minutes and get prompt medical attention.*

Batteries produce explosive gases. Keep sparks, flame, and cigarettes away. Ventilate when charging or using in enclosed area. Always shield eyes when working near batteries.

Keep out of reach of children.

D-47-53A

SPECIAL TOOLS



B799328

The CAS-10147 tester is used to do the Capacity (Load) Test. This tool is first used on Page 6.

B. Check for corrosion or bad connections at the socket in the instrument cluster and at the alternator.

C. Check for a damaged wire between the alternator and the instrument panel.

2. If the warning lamp illuminates when the engine is running, the cause is probably the alternator or voltage regulator. See section 4001 and check the alternator and the voltage regulator.

Hydraulic Filter, Air Filter, and Transmission Filter

1. All three warning lamps must illuminate when the key switch is turned half the distance between ON and ST.

If one of the warning lamps will not illuminate, check for:

A. A bad bulb.

B. Dirty connection at the instrument cluster.

C. An open circuit in a diode or in the wire between the diodes.

D. An open circuit in the wire between a diode and the instrument cluster.

If none of the warning lamps illuminate, check for:

A. A damaged wire between the instrument cluster and the IGN terminal of the key switch.

B. A damaged wire between the diodes and the GRD terminal of the key switch.

C. A bad key switch.

2. None of the three warning lamps must illuminate when the engine is running.

If any one of the three warning lamps illuminate when the engine is running, the cause can be:

A. A dirty filter.

B. A bad switch for the warning lamp

C. A short circuit in the wire between the switch and the warning lamp.

If all three warning lamps illuminate when the engine is running, the cause can be:

A. A dirty filter.

B. A bad switch for the warning lamp.

C. A short circuit in the wire between the switch and the warning lamp.

D. A bad key switch.

E. One of the warning lamps has illuminated for one of the causes above, and the other warning lamp has illuminated because of a bad diode.

CHECKING THE GAUGES

Water Temperature, Oil Temperature, or Fuel Level

1. If the gauge does not work correctly:

A. Disconnect the wire from the sender.

B. Turn the key switch to ON.

C. Hold the wire against the frame or the engine to make a good ground connection.

D. Have another person look at the gauge. If you are checking the water temperature gauge or the oil temperature gauge, the needle must move all the way to the top of the gauge. If you are checking the fuel level gauge, the needle must go all the way to the bottom of the gauge.

E. If the needle moved, the sender is bad and must be replaced, if the needle did not move, the gauge is bad or there is an open circuit in the wires between the sender and the gauge.

F. Install the wire on the sender.

G. See page 4 and remove the instrument cluster from the instrument console and disconnect the wiring harness from the instrument cluster.

H. See wiring schematic in Section 4001 for the location of the terminal in the connector on the wiring harness. Connect one lead of an ohmmeter to the terminal in the connector. Connect the other lead of an ohmmeter to a good ground connection.

I. If the ohmmeter did not indicate continuity, there is a short circuit in the wires between the connector and the sender. Repair or replace the wires. If the ohmmeter indicated continuity, the wires are good and the gauge must be replaced.

2. If the gauge only works part of the time, the cause can be:

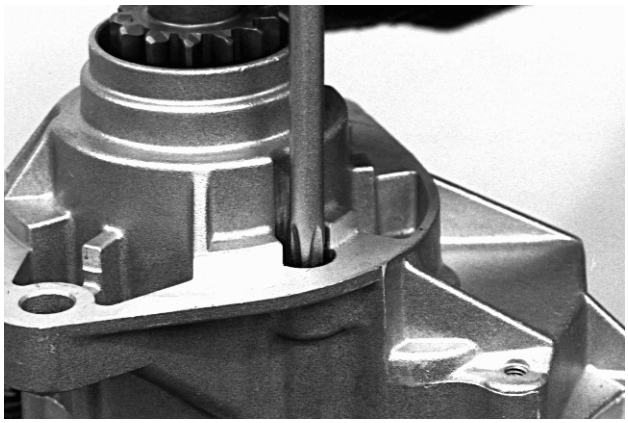
A. A bad connection at the sender.

B. A bad connection at the instrument cluster.

Understanding No Load Test Results

1. If the current draw and the armature shaft speed are within the ranges under Specifications, the starter is good.
2. Low armature shaft speed and high current draw are indications of too much friction. Possible causes of too much friction are:
   A. Tight, dirty, or worn bearings.
   B. A bent armature shaft.
   C. Loose pole shoes (pole shoes make contact with the armature).
   D. A short circuit in the armature coil. Disassemble the starter. Use an armature tester to test the armature. Use the instructions included with the armature tester.
   E. Damaged field coil. Do the test on Page 4006-12.
3. If the armature does not rotate and the current draw is high, possible causes are:
   A. Field terminal making contact with the field frame. Inspect the insulators for the field terminal.
   B. Damaged field coil. Do the tests on Page 4006-13.
   C. Damaged bearings.
4. If the armature does not rotate and the current draw is zero, possible causes are:
   A. An open field circuit. Disassemble the starter and inspect the field coil connections.
   B. An open armature coil. Disassemble the starter and check for burned commutator bars. Use an armature tester to test the armature. Use the instructions included with the armature tester.
   C. Brushes not making good contact with the commutator bars. Check for high insulation between the commutator bars, broken brush springs, or worn brushes.
5. Low armature shaft speed and low current draw are indications of:
   A. Dirt or corrosion on connections.
   B. Damaged wiring.
   C. Dirty commutator bars.
   D. All causes in Step 4.
6. High armature shaft speed and high current draw are indications of a short circuit in the field coil. It is difficult to find a short circuit in a field coil. Install a new field coil. Do the No Load Test again to check for improvement in the operation of the starter.

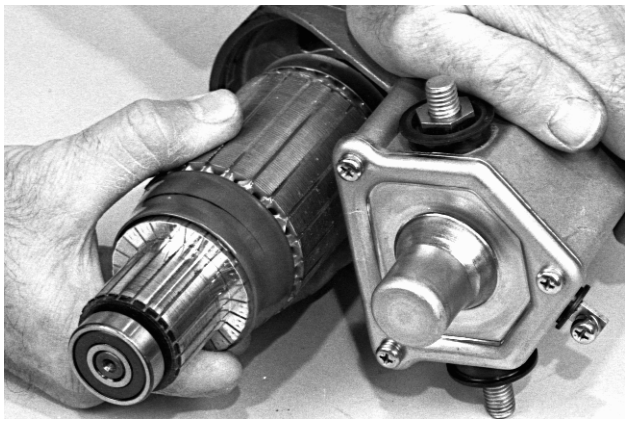
STEP 19



B330740

Fasten the starter solenoid in the vise and tighten the screws that hold the starter drive housing.

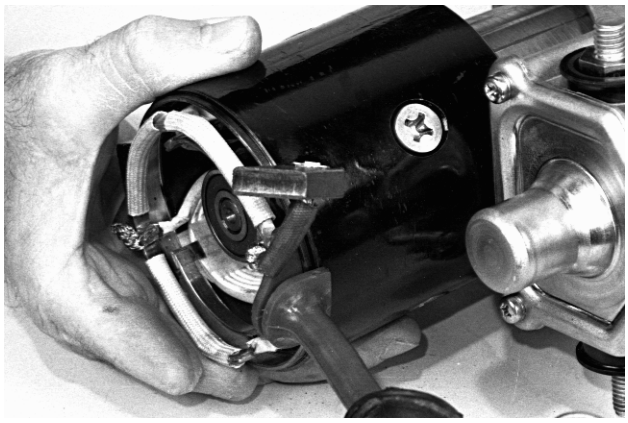
STEP 20



B330739

Install the armature.

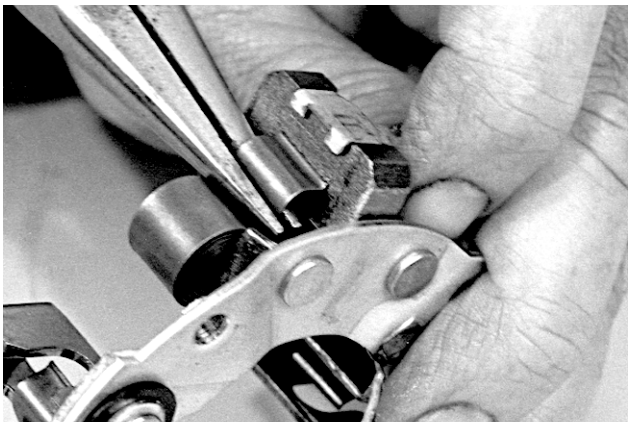
STEP 21



B330738

Install the field frame assembly.

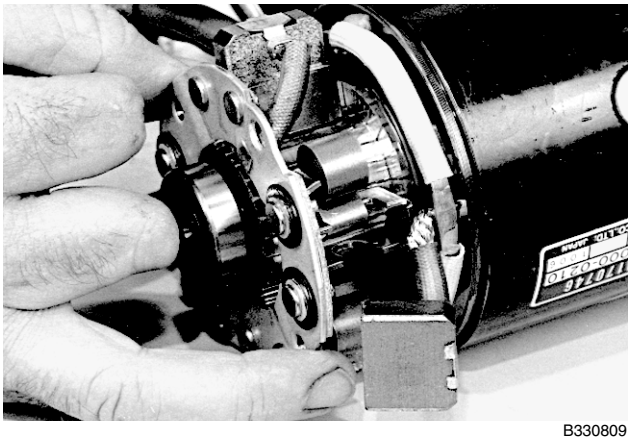
STEP 22



B330808

Use the springs to hold the brushes in the brush holder as shown.

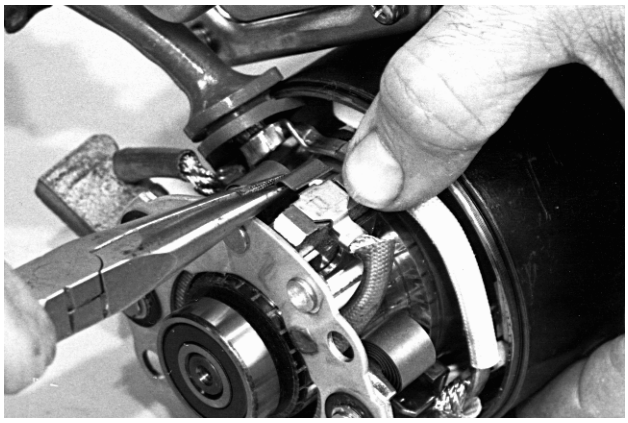
STEP 23



B330809

Install the brush holder.

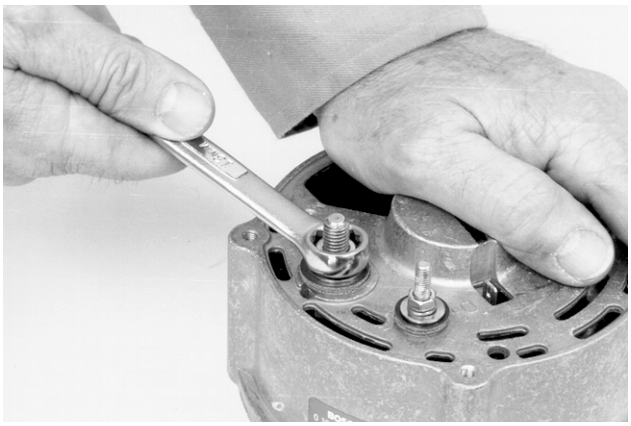
STEP 24



B330810

Put the springs on top of the brushes connected to the brush holder.

STEP 19



B9064217

Loosen and remove the nut, lock washer and flat washer from the B + terminal.

STEP 20

B9064220

Remove the insulators from the B+ terminal.

STEP 21

B9064223

Loosen and remove the nut, look washer and flat washer from the D + terminal.

STEP 22

B9064226

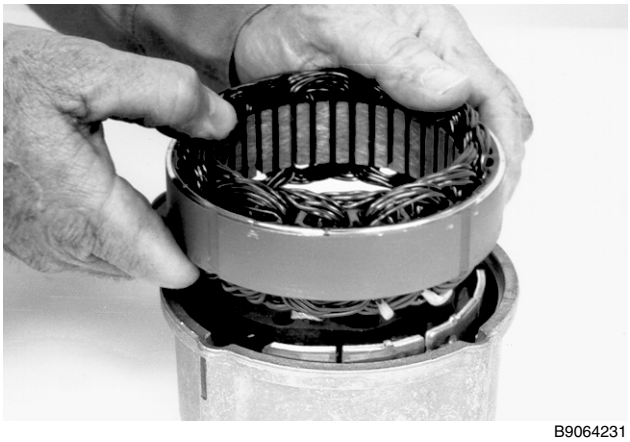
Remove the insulators from the D + terminal.

STEP 23

B9064229

Use a screwdriver and separate the stator from the rear housing.

STEP 24



B9064231

Carefully remove the stator and rectifier bridge from the rear housing.

STEP 58

B9064207

Install and tighten the screw that holds the condenser.

STEP 59

B9064505

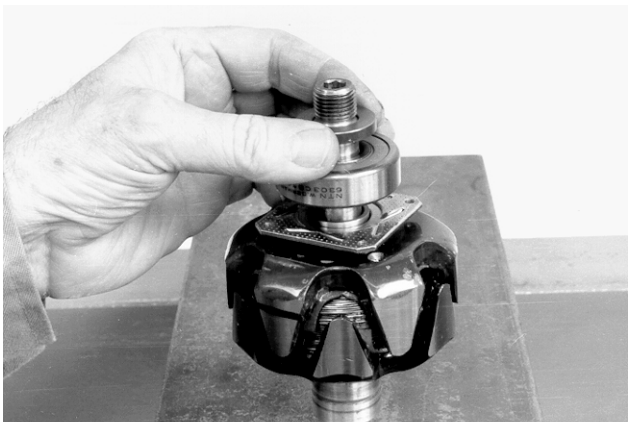
Install the retainer with the smooth side up.

STEP 60

B9064509

Install the bearing.

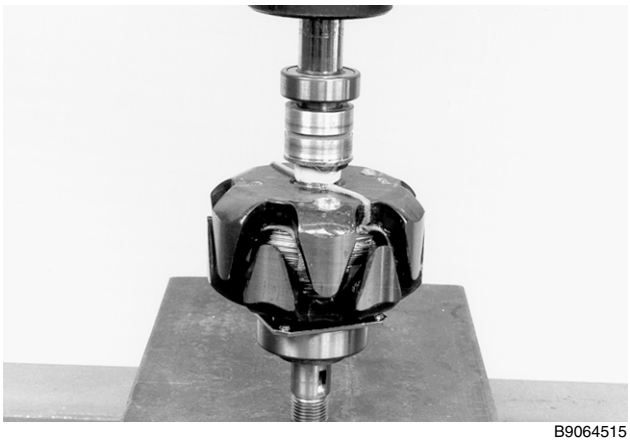
STEP 61



B9064511

Install the spacer with the smooth surface up.

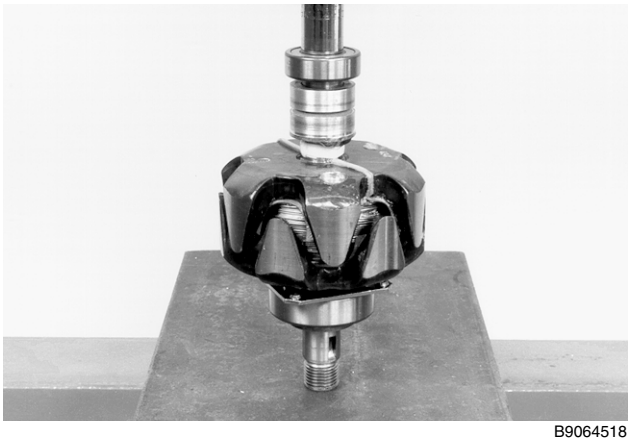
STEP 62



B9064515

Use an acceptable driver and press the bearing and spacer all the way onto the shaft.

STEP 63



B9064518

Use an acceptable driver and press the other bearing all the way onto the shaft.

CRAWLER UNDERCARRIAGE COMPONENTS

Undercarriage components make up a major cost of purchasing, owning and maintaining a crawler dozer. Equipping a dozer properly with the right undercarriage components can maximize up time productivity and minimize operating expenses. In selecting the proper undercarriage items such as application usage, soil conditions, types of chain assemblies, sprocket types, shoe widths, and maintenance practices should be reviewed with your customer.

Case offers several choices to fit a variety of applications and needs:

CASE SEALED TRACK: (C.S.T.) This assembly is a non-lubricated system between the pin and bushing. To prevent contamination from entering into the pin and bushing area, metal seals are located on both sides of each bushing. This option provides good wear life, but wear still occurs on the pin and on both inside and outside diameters of the bushing.

CASE LUBRICATED TRACK: (C.L.T.) This assembly is sealed (oil seals) and lubricated with an oil reservoir in each pin. Each pin and bushing are sealed to keep contamination out and lubrication in. This option provides excellent wear life. Although wear between the pin diameter and inside bushing diameter is eliminated because of the lubricant, outside bushing wear still exists.

CASE EXTENDED LIFE TRACK: (C.E.L.T.) This system uses lubricated track with a large diameter bushing that is free to rotate on the standard bushing. This allows wear to be distributed over the entire circumference of the outer bushing. Because the bushing is free to rotate, it does not create the scrubbing action between the sprocket and bushing as the conventional crawler track chain does. The service life has doubled (Case Test) with this design and is recommended for **HIGH ABRASIVE AND LOW IMPACT** applications where bushing and sprocket wear may be severe.

Abrasive Soils: Each type of soil a machine works in has a different level of abrasiveness. Generally, the higher the abrasiveness, the higher the wear rate.

Low Abrasiveness: Silts and clays are in this category. When wet, this type of soil feels slick and can be easily molded.

Moderate Abrasiveness: Silts and clays that contain a low amount of rounded sand particles and enough moisture to stick together are in this category.

High Abrasiveness: These soils contain a high amount of sharp, irregular - shaped sand particles.

Impact: Impact is best described as the amount of grouser penetration on the ground. The effect of high impact loads can be reduced by reducing the machine speed and by using the smallest track shoes possible.

SPROCKET TYPES: Types include standard for most applications, relieved which is to be used in extrudable material, rubber track only, wide track option and sprockets for extended life track.

Low Impact: Track shoe grousers will completely penetrate the ground surface with little or no rock or other irregularities.

High Impact: Track shoe grousers will not penetrate the ground surface. Large rock or large irregularities cause high impact loads on the undercarriage system.

RUBBER TRACK: This assembly is specifically designed for job sites requiring minimal surface damage. Usage includes working on finished surfaces, preparing job sites for driveways, or sidewalks, or highway and street work. For 550H models only and should not be a substitute for applications requiring steel track.

SHOE WIDTHS: Dependent on the machine, standard widths may vary from 16 inches to 34 inches and are closed center. The shoes must provide adequate traction and flotation, but no wider than necessary. Flotation is the ability to stay on the surface of soft ground or mud. Correct flotation occurs when the grouser bar penetrates into the ground without letting the shoe go below the surface.

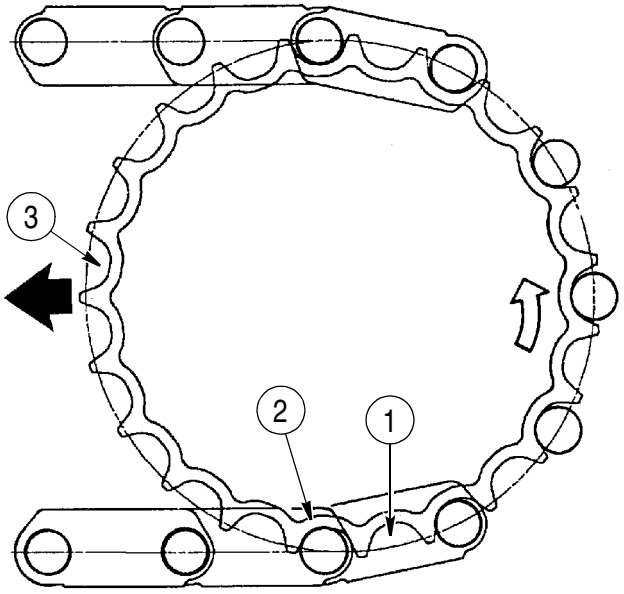
MAINTENANCE: Correct track tension is important. Check the track tension frequently when operating. When working in mud, snow, and some sandy conditions, check the track tension more often. A loose track or a track that is too tight will accelerate track wear.

SPROCKET WEAR AND MEASUREMENT

Sprocket tooth wear is the most obvious of all wear patterns. Track bushing wear is not as obvious but still must be considered when evaluating corrective action.

Clean Track

When the undercarriage is clean, each bushing seats against a sprocket tooth. The bushing is engaged at the 6 o'clock position and carries approximately 85% of the driving load. At 5 o'clock the load is reduced on this bushing to 10% and at 4 o'clock down to 5% of the drive load.



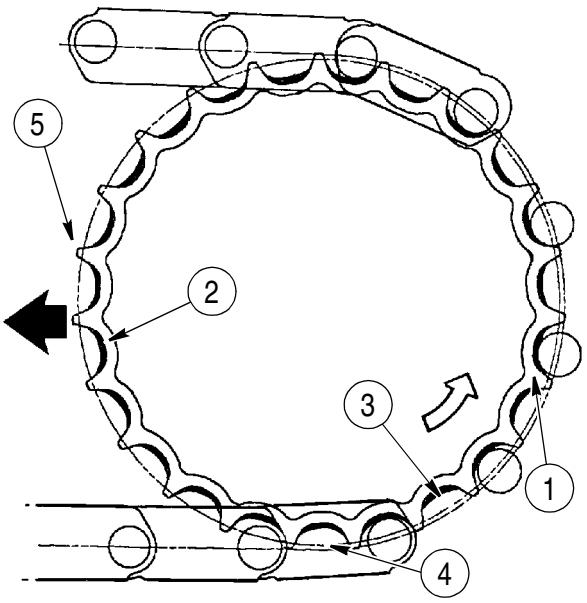
B912375

1. TRACK CHAIN AND SPROCKET ARE ON THE SAME PITCH DIAMETER
2. BUSHING AND DRIVE TOOTH ENGAGED (AT 6 O'CLOCK)
3. LEFT DRIVE SPROCKET

SPROCKET BEGINS TO PACK

A material begins to pack into the sprocket teeth, the bushing must be engaged at a higher position on the tooth. See the following illustration. The first bushing will be seated against a tooth and there will be a space between the next bushing and tooth. As the sprocket rotates, each bushing that is to be engaged will be progressively further from the driving tooth.

The first bushing continues to receive the full load as the sprocket rotates. When this bushing leaves the sprocket, the track chain will re-seat on the sprocket. This re-seating results in the bushing impacting against the sprocket tooth. At the same time, the increased track tension causes the track recoil spring to be compressed. As the bushing re-seats, the impact of the bushing along with the release of the recoil spring causes a loud "banging" noise.



B912376

1. BUSHING AND DRIVE TOOTH ENGAGED (AT 3 O'CLOCK)
2. PACKING ON THE DRIVE SPROCKET
3. ORIGINAL CHAIN PITCH
4. CHAIN PITCH WHEN PACKING STARTS
5. LEFT DRIVE SPROCKET

SEVERE PACKING

When severe packing occurs, bushing engagement starts much later in the sprocket rotation, around 1 to 2 o'clock. The chain pitch is increased to the maximum. As a result, (1) the chain is tightened, (2) the recoil spring is compressed and, (3) bushing engagement moves out to the tip of the sprocket tooth. The driven bushing continues to receive full load until this bushing leaves the sprocket tooth. At that time the track chain seats again on the sprocket. At the same time, the recoil spring is released against the stop and a loud noise is heard.

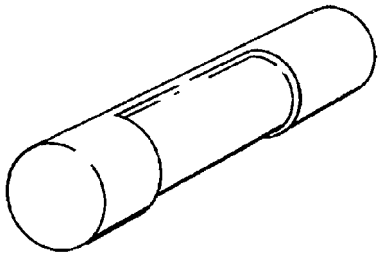
This severe packing condition can also cause the chain bushing to climb up and go over the top of the sprocket tooth. This condition, called jumping, will also cause a loud noise.

The best action to take is to loosen the tracks to the correct tension. Or, you can install special relieved drive sprockets if the packing material is extrudable. The special relieved drive sprockets will help to clean material from the sprocket root.

NOTE: *Special relieved drive sprockets can reduce the life of the track chain bushings as there is less contact area on the sprocket.*

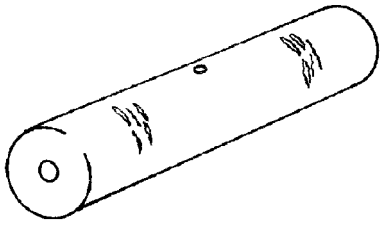
TRACK PIN WEAR

Pin Surface Wear



B912305

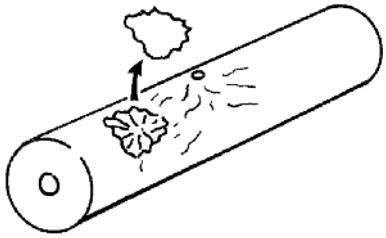
NON-LUBRICATED TRACK - Track pin wear is accelerated by tight track, high speed operation, and abrasives between the pins and bushings. As the tracks turn around the sprocket and idler, the pins and bushings pivot internally. This pivoting action wears the outside surface of the pins and the inside surface of the bushings. But, because the chain is under tension, this wear occurs only on one side of the pins and bushings (regardless of forward or reverse direction of the tracks). The pin and bushing wear, called “pitch wear”, eventually increases the length of the chain.



B912306

CASE LUBRICATED TRACK AND CASE EXTENDED LIFE TRACK - Track pin wear is greatly reduced with the C.L.T. and C.E.L.T. However, tight tracks with high speed operation, operating in packing conditions, or using track shoes that are too wide will cause the pins to gall (score marks on the surface).

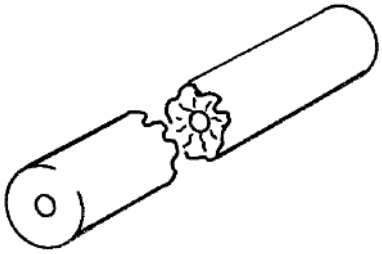
Pin Spalling



B912307

CASE LUBRICATED TRACK AND CASE EXTENDED LIFE TRACK - If you operate the machine with tight tracks, heavy packing, or flexing of the chain caused by shoes that are too wide, cracks can begin to form at the oil reservoir hole and spread out.

Pins Breaking

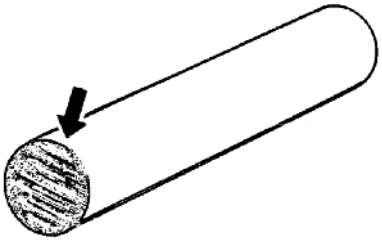


B912308

CASE LUBRICATED TRACK AND CASE EXTENDED LIFE TRACK - This condition can be caused by tight track, high impact loads, severe packing, and using track shoes that are too wide. This problem can also be caused by not installing the pins correctly at assembly.

Cracks start at the outer surface at the reservoir hole and spread through the pin at a rapid rate. This condition is not common with sealed track pins.

Pin End Wear



B912309

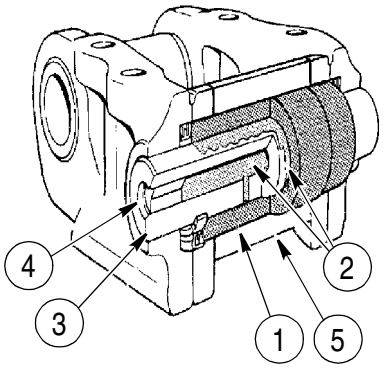
Pin end wear is caused by misalignment, track shoes that are too wide, worn idlers or worn roller flanges. This condition can also result from hillside operation. The pin ends rub against the track guides/rock guards.

CASE EXTENDED LIFE TRACK (C.E.L.T.)

The Case extended life track (C.E.L.T.) is a sealed and lubricated track and incorporates a large diameter bushing that is free to rotate on the standard track bushing. This allows wear to be distributed over the entire circumference of the bushing and because it is free to rotate, it does not create the scrubbing wear between the sprocket and the bushing as the conventional track does.

The Case Extended Life Track provides the long service life that the Case Lubricated Track provides with the internal lubrication. It also provides up to twice the bushing wear life on the external surface of the bushing, because of the rotating bushing and greater wear material.

The rotating bushing can make a clanging noise “when worn” during Hi speed operation. The bushing will make less noise when crawler is dozing.



BS96A027

1. BUSHING
2. LUBRICANT
3. PIN
4. RUBBER PLUG
5. ROTATING BUSHING

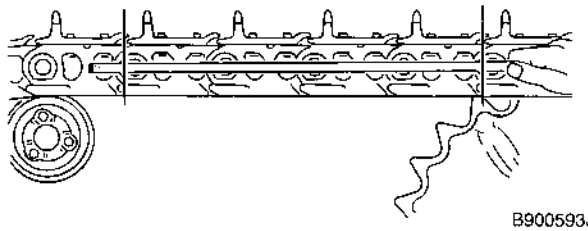
GLOSSARY

AERIAL PHOTOGRAPHY	Photo taken from the air at regular intervals and used in photo interpretation to provide much information about forests and landforms.
ABRASIVES	Gritty or abrasive types of soils that accelerate wear on the undercarriage parts. Wear is accelerated with moist abrasives and tight tracks.
APPRAISAL MANUAL	A Case publication (Form Number BUR 8-17960) that has charts for finding the wear percentage after measuring an undercarriage component.
BACK-BENDING	A pushing together of the track chain parts between the bottom of the sprocket and the rear track roller. This occurs during reverse travel with excessively loose track. The condition is sometimes called *Back Jamming*.
BUSHING	A component of the track link assembly through which the pin of the next assembly passes. The pin of the next assembly then pivots on the bushing.
CARRIER ROLLER	The carrier roller guides and supports the upper part of the track chain between the sprocket and idler wheel.
CASE EXTENDED LIFE TRACK (C.E.L.T.)	A track chain assembly that is sealed and lubricated with an oil reservoir in each pin. It incorporates a large diameter rotating bushing that rotates on the standard bushing. Each link is sealed to keep contaminants out and the lubricant in.
CASE LUBRICATED TRACK (C.L.T.)	A track chain assembly that is sealed and lubricated with an oil reservoir in each pin. Each link is sealed to keep contamination out and the lubricant in.
CASE RUBBER TRACK	A track composed of steel cords and metal embedded in a rubber casing.
DRY JOINT	This is a Case Lubricated Track (C.L.T) track joint that has lost all lubricant. Internal wear begins after loss of lubricant.
DRY TURN	A procedure to turn the track pins and bushings without putting new oil in each pin. This reduces the service cost but results in a shorter track life.
EXTERNAL WEAR	Wear that occurs on the outside surface of track bushings.
EXTRUDABLE MATERIAL	Material that squeezes out from between undercarriage parts instead of lodging and becoming compressed.
FLOTATION	The ability to stay on the surface of the ground. Correct flotation occurs when the track shoes penetrate fully into the ground without sinking below the surface.
FORWARD DRIVE SIDE WEAR	The wear pattern of the sprocket teeth that results from the bushings wearing into the sprocket tooth during forward travel.
GROUSER	The metal bars on the track shoes that give traction to the machine.
HOURS OF USE	The number of hours a machine has worked according to the hour-meter.
IDLER	The wheel that guides the track chain around the front of the track frame.
INTERNAL WEAR	The wear between a track pin and bushing. This is also called pitch wear.
LIFETIME LUBRICATED	This refers to a part that is filled with lubricant and then sealed. No maintenance is required.
LINKS	Component parts of a track link assembly. One inner link and one outer link are required for one assembly.
LINK HEIGHT	The distance from the link wear surface to the track shoe mounting surface. This distance is measured to determine link surface wear.

PIN AND BUSHING WEAR FOR SEALED TRACK

Because of the constant force applied to the the pins and bushings in forward and reverse, wear occurs on the ID of the bushing and the OD of the pin surface inside the bushing. This wear is normal. The deflection of the track chain is important because the tighter the track chain, the faster the wear.

To measure internal bushing and pin wear, measure the track pitch in three places. When measuring the track pitch, the measurement must be taken at least four track links away from the master link and master pin. The master pin has a hole in each end. Use the track adjuster to tighten the track chain. Measure from the front of a track pin to the front of the fifth track pin. If using a tape measure, do not use the hook to hold the tape measure. Make a record of the measurements on the Track Component Appraisal Form.



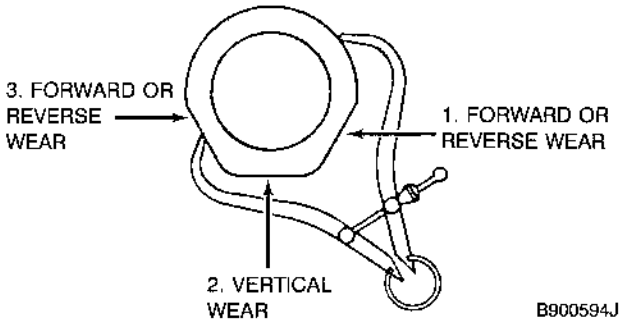
B900593J

See the chart on page 12. If the measurement was equal to 100% worn or less turn the pins and bushings for maximum life of these parts.

As the bushings move around the sprocket, the bushings also wear on the OD of the bushings. The faster the speed of the machine and excessive use of reverse, the faster the wear of the bushings.

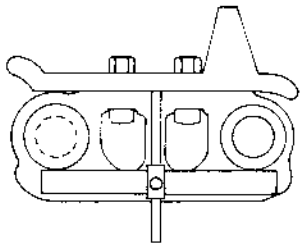
Increased track pitch is also a cause of wear on the OD of the bushings. As the track pitch increases, the bushings come into contact with the sprocket teeth nearer the ends of the sprocket teeth and slide to the bottom of the sprocket teeth. This wear occurs on the rear of the bushings.

Use the small caliper from the CAS-1950A kit and measure the wear on the front and rear of a bushing as shown. Make several measurements across the worn area to find the most wear. Make sure that the bushing is clean and that the caliper is 90 degrees to the bushing. Record the measurements on the Track Component Appraisal Form. Measure two more bushings at 3 to 4 feet (0.9 to 1.2 M) intervals and record the measurements on the Track Component Appraisal Form. See the chart on page 13 to find the percent of wear.



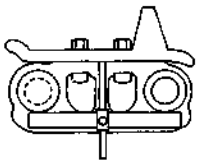
B900594J

Use the depth gauge to measure the vertical wear of a bushing as shown. Make several measurements across the worn area to find the most wear. Make sure that the bushing and track shoe are clean and that the depth gauge is perpendicular to the track shoe. Record the measurement on the Track Component Appraisal Form. Measure two more bushings at 3 to 4 feet (0.9 to 1.2 M) intervals and record the measurements on the Track Component Appraisal Form. See the chart on page 15 to find the percent of wear.



B900595J

WEAR CHART FOR VERTICAL BUSHING WEAR FOR SEALED TRACK WITH 6.29 IN (159.7 mm) PITCH



B900595S

Inch	Percent worn for high impact conditions	Percent worn for low impact conditions	(mm)
2.61	0	0	66.30
2.60	10	8	66.04
2.59	20	16	65.79
2.58	30	24	65.53
2.57	40	32	65.28
2.56	50	40	65.02
2.55	60	48	64.77
2.54	70	56	64.52
2.53	79	64	64.26
2.52	84	72	64.01
2.51	89	76	63.75
2.50	93	80	63.50
2.49	97	83	63.25
2.48	100*	86	62.99
2.47	103	89	62.74
2.46	106	92	62.48
2.45	108	94	62.23
2.44	110	96	61.98
2.43	112	98	61.72
2.42	114	100*	61.47
2.41	116	102	61.21
2.40	118	104	60.96
2.39	120	106	60.71
2.38	122	107	60.45
2.37	124	108	60.20

*Turn pins and bushings before this point. It is recommended pins and bushings be replaced if wear is beyond this point.

Section 5504

CASE LUBRICATED TRACK

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Hamilton, ON L7N 3M6 CANADA

Bur 7-17700

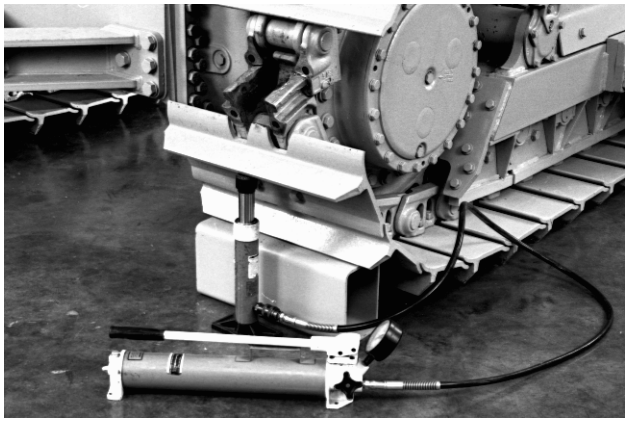
Printed in U.S.A.
March, 2000

STEP 25

B5971489M

Apply antiseize compound to the locking surfaces of the halves of the master link.

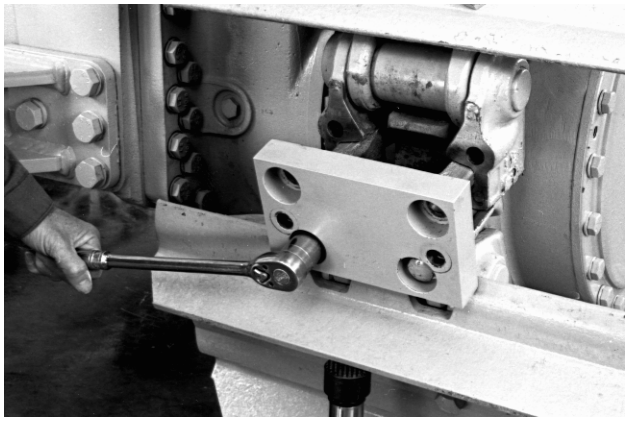
STEP 26



B5971689M

Use a hydraulic ram as shown to start the halves of the master link together.

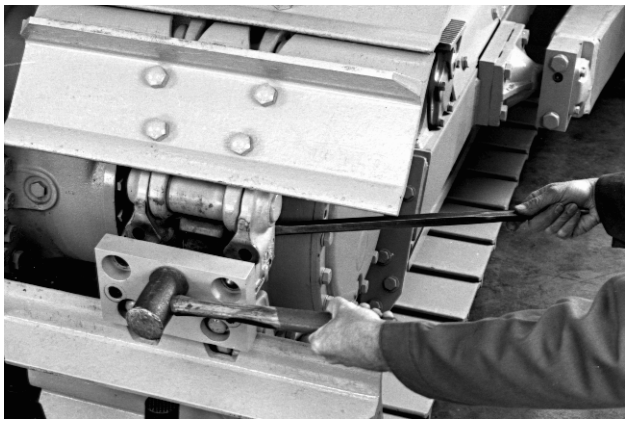
STEP 27



B6020889M

Fasten tool CAS-1848A to the bottom half of the master link.

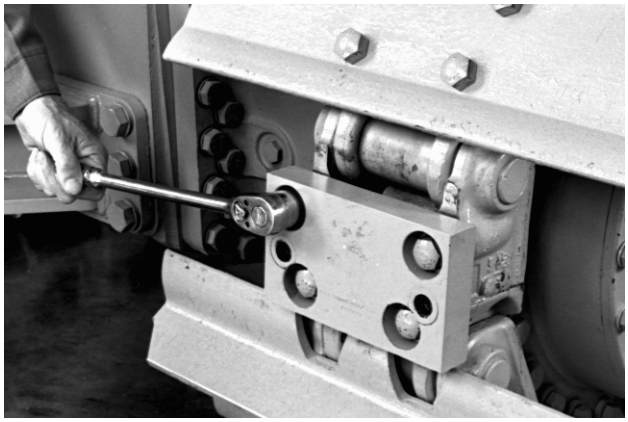
STEP 28



B6022289M

Hit the tool with a brass hammer to drive the bottom half of the master link into the top half of the master link until the top bolts can be installed.

STEP 29



B6023289M

Install and tighten the top bolts to pull the halves of the master link together.

STEP 30

Make sure that the holes in the halves of the master link are free of lubricant. Make sure the track shoe mounting surface is free of paint, rust or lubricant.

22. If the bushing projection is not as specified, add or remove shims as required for the long driver.
23. Repeat steps 14 through 17 and step 19 and install the second set of links.
24. Check the end play of the outside links at the pin joint.
    A. Use a dial indicator against one of the outside links or the end of the pin.
    B. Set the dial indicator to 0 (zero).
    C. Use a screwdriver between the inside the outside link to move the outside link and read the dial indicator.
    D. Check the end play several times to make sure that the reading is correct.
    E. The end play must not be more than 0.13 mm (0.005 inch). Zero end play is the best, but not required.

If the end play is not as specified, add shims as required for the short driver.

Repeat steps 14 through 17 and step 19 until the track chain is assembled.

As soon as possible, begin to fill the pins with gear lubricant.

    A. Make sure that the nozzle CAS-10762-1 is installed on the tube on the control handle.
    B. Prepare the lubrication equipment according to the instructions of the manufacturer.
    C. Push the nozzle all the way into the plug.
    D. Push down and hold the vacuum button until the gauge reads 68 to 91 kPa (20 to 27 inches) vacuum.
    E. Release the vacuum button. The reading must not decrease for a minimum or 5 seconds.
    F. If the joint will not hold the vacuum for 5 seconds, push down and hold the vacuum button for a long time to see if the joint will hold vacuum as specified.
    G. Before disassembling the links, use a prybar and move the link in both directions to seat the seal(s). Do the vacuum check again. If the joint still does not hold the vacuum, the links must be removed and the cause found.
    H. Push down and hold the oil button until gauge reads 551 to 586 kPa (80 to 85 psi) then release the oil button.
    I. After the oil button is released, the reading of the pressure gauge must be 140 to 205 kPa (20 to 30 psi).
25. Make sure the mounting surfaces on the track shoes and track chain are clean and smooth.
26. Install the track shoes and new nuts and bolts.
27. Tighten the bolts to 258 to 312 Nm (190 to 230 lb ft).

STEP 25

Move the track forward or backward until the bushings are in alignment with the teeth on the sprocket.

STEP 26

Align the track with the idler.

STEP 27

Lower the machine onto the track.

STEP 28

Connect a chain hoist to the end of the track.

STEP 29

Use the chain hoist to lift the track over the sprocket, carrier roller, and the idler. Use a prybar to align the chain links in the track with the teeth in the sprocket.

STEP 30

Disconnect the chain hoist from the track.

STEP 31

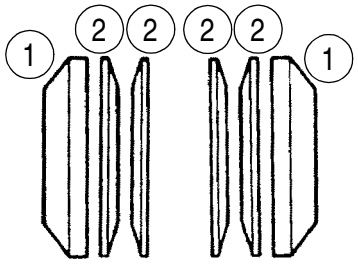
If necessary, clean the master bushing and master pin.

STEP 32

Lubricate the master bushing, master pin, and seals with the oil specified on Page 3.

STEP 33

It is recommended that new seals be used. Install two seals and a spacer in each side of the master link as shown below.



852L92

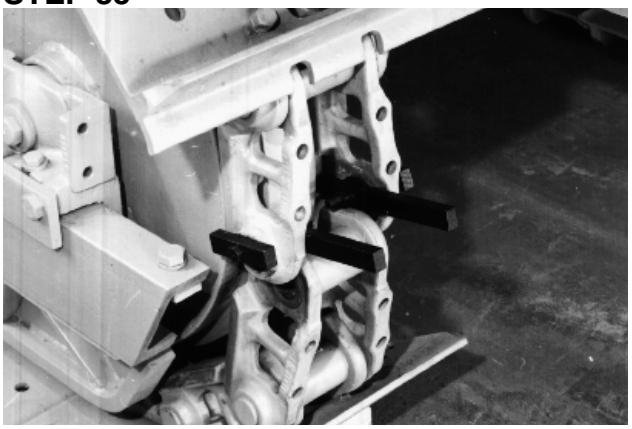
1. SPACER 2. SEALS

STEP 34

B805036M

Use the tools on Page 3 to push the seals into the master link. Make sure the seals are even with the sides of the master link.

STEP 35



B805035M

Put the two ends of the chain together. Push the chain together until the end of the chain holds the seals in position.

STEP 36

B805038M

Use a prybar to help hold the chain together. Remove the seal holding tools.

GENERAL INFORMATION

Rubber tracks can provide less noise, less vibration, less operator fatigue, and no damage to road surfaces. For maximum track life, do the following items:

Track Deflection

Track deflection must be 0 to 12 mm (0 to 1/2 inch) during all operating conditions. Tracks that are too tight will wear faster and can cause damage to track rollers, idler, sprocket, and other track components. Tracks that are too loose can come off the track frame and damage the machine.

Oil Contamination

If fuel or oil comes in contact with the track, wipe or wash the tracks as soon as possible to keep the tracks from becoming damaged. Wash tracks regularly if working in salt, chemicals, fertilizer, or acidic soils.

Track Operation

Sharp objects can cut the track. Be careful when operating the machine on rocks and other sharp objects to prevent damage to the track.

Keep the edge of the track from riding on or against a curb or side of a concrete wall.

Avoid sharp turns on concrete or other abrasive materials.

When working on a hillside or slope, adjust the track tension to 6 mm (1/4 inch) or less.

Temperatures

Temperatures affect the operation of the tracks. Operate the machine in temperatures between -25 to 55 degrees C (-15 to 130 degrees F).

Sprocket and Roller Wear

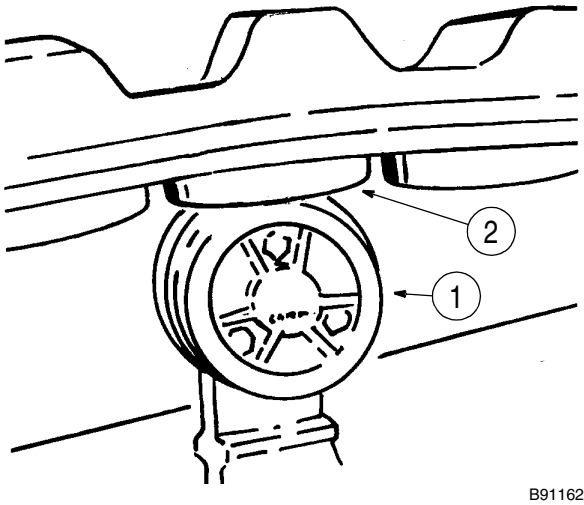
If the sprockets or rollers are badly worn, do not install a new rubber track. Replace all components that are worn at the same time to prevent damage to the new track.

Storage

When the machine is not used for long periods of time, park the machine inside a building or cover the tracks to prevent damage by the sun or weather. Move the machine once a month rotating the tracks and stopping so the hinge points that were at the idler and sprocket are in a flat position.

TRACK DEFLECTION

1. Park the machine so that a track guide projection is centered on the carrier roller.



B911626J

1. CARRIER ROLLER 2. TRACK GUIDE PROJECTION

2. Put a straightedge over the track between the idler and the carrier roller.
3. Measure the track deflection in the center of the straightedge. The measurement must be 0 to 12 mm (0 to 1/2 inch).

To Tighten the Track

The rubber track tensioning system uses the machine hydraulic system pressure to tighten the track. This system is set to provide 6 mm (1/4 inch) deflection or less.

1. In an open area, raise the dozer blade and drive forward at 1/4 throttle.
2. Pull the Tilt control lever completely to the left (TILT LEFT) and hold in that position.
3. When the blade stops tilting to the left, the relief valve opens and both tracks are tightened automatically.

SPECIFICATION

Idler

Lubricant	Case Gear Lube
Capacity	473 ml (16 U.S. ounces)
End travel	0.051 to 0.813 mm (.002 to .032)

Track Adjuster

Tighten valve to	61 to 74 Nm, 6 to 8 kg/m (45 to 55 pound-feet)
Type of grease	Molydisulfide multipurpose grease

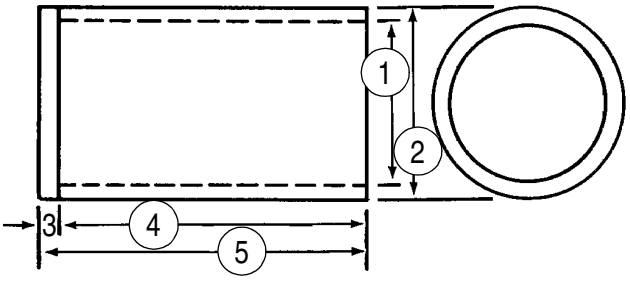
Carrier Roller

Mounting bolt torque	109 to 130 Nm, 11 to 13 kg/m (80 to 96 pound-feet)

SPECIAL TOOLS

915532

The tool shown is used to remove the bearings in the idler. The part number of the tool is CAS-1260.



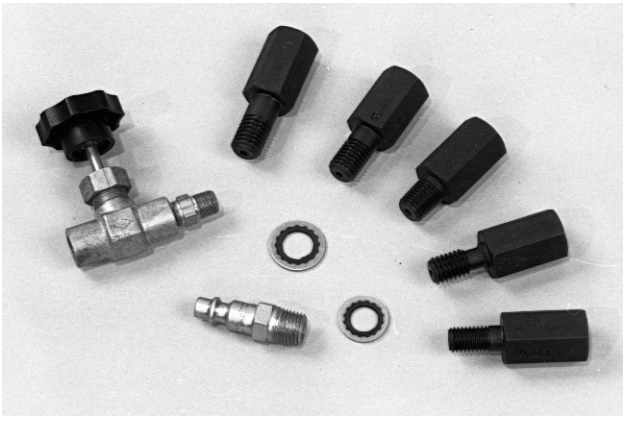
790898

1. 53.9 MM (2.125 INCHES)
2. 63.5 MM (2.5 INCHES)
3. 6.4 MM (.25 INCH) PLATE WELD TO TUBE
4. 102.0 MM (4.0 INCHES)
5. 108.0 MM (4.25 INCHES)

The tool shown is used to install the wiper in the track adjuster cylinder. Make this tool to the specifications shown.

B407315

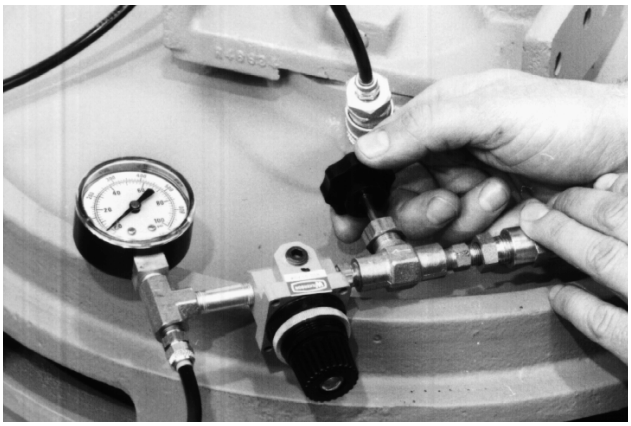
CAS-1450



B407317

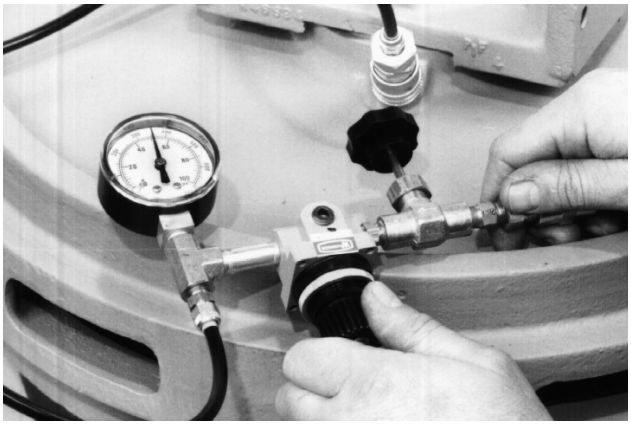
CAS-1682

5. Make sure that the shutoff valve is open.



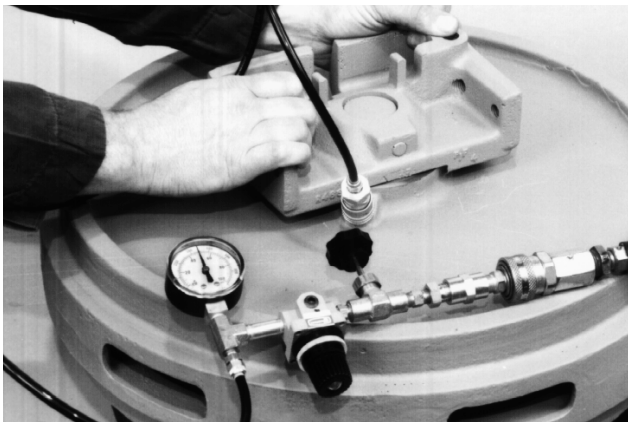
409816

6. Open the pressure regulator valve until the pressure gauge indicates 50 psi (344 kPa, 3.5 kg/cm2).



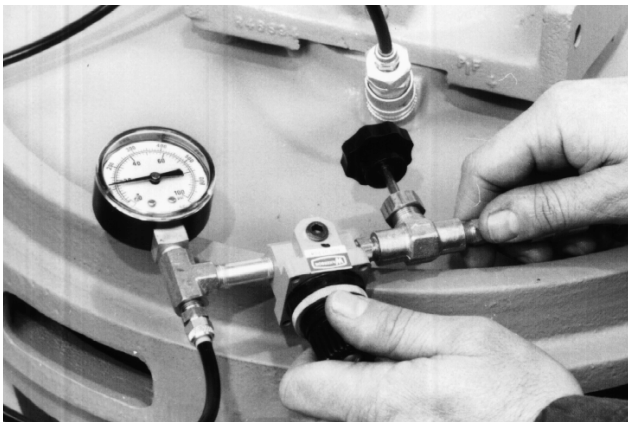
409819

7. Turn the shaft both directions four times.



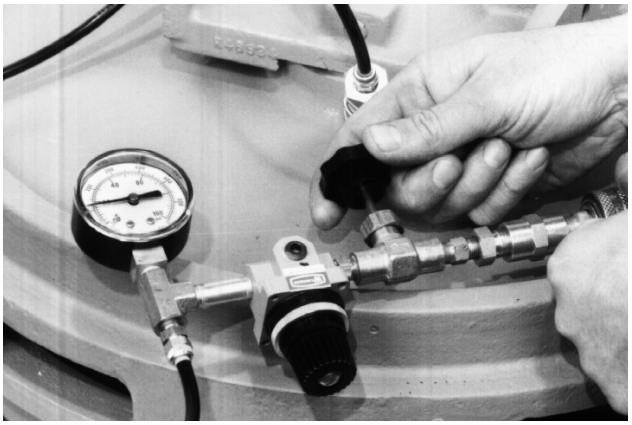
409820

8. Close the pressure regulator valve until the pressure gauge indicates 110 kPa 1 kg/cm2 (15 psi).



409817

9. Close the shutoff valve. The idler must hold this pressure for 10 seconds. Loss of air pressure during this time indicates seal leakage.



409818

Installation

1. Check the wear plates on both sides of the track frame. If the wear plates are worn, install new wear plates.
2. Connect a chain hoist to the mounting brackets. Use the cap screws for the guide plates to hold the chain hoist to the idler mounting brackets.
3. Use the chain hoist to help install the idler. Slide the idler onto the track frame. Make sure the hole for putting oil in the idler is away from the machine.
4. Disconnect the chain hoist from the mounting brackets.

Section 5509

SPROCKET

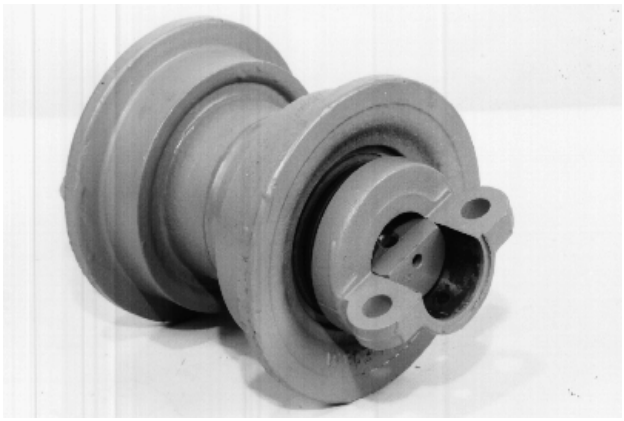
CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Hamilton, ON L7N 3M6 CANADA

Bur 7-17740

Printed in U.S.A.
March, 2000

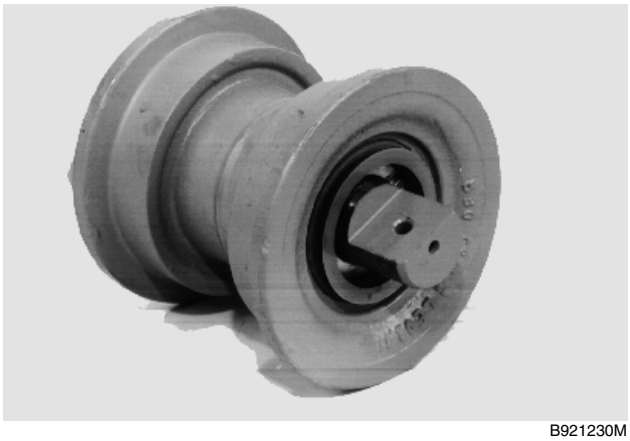
STEP 3



B921229M

Drive the shaft out of the end cap and remove the end cap.

STEP 4



B921230M

Remove the metal seal ring.

STEP 5

B921231M

Remove the rubber seal ring and the O-ring on the shaft.

STEP 6

B921232M

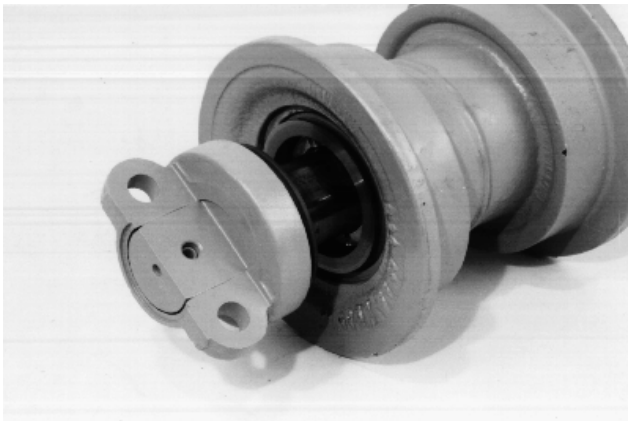
Remove the metal seal ring.

STEP 7

B921233M

Remove the rubber seal ring.

STEP 8



B921234M

Remove the shaft.

SECTION INDEX

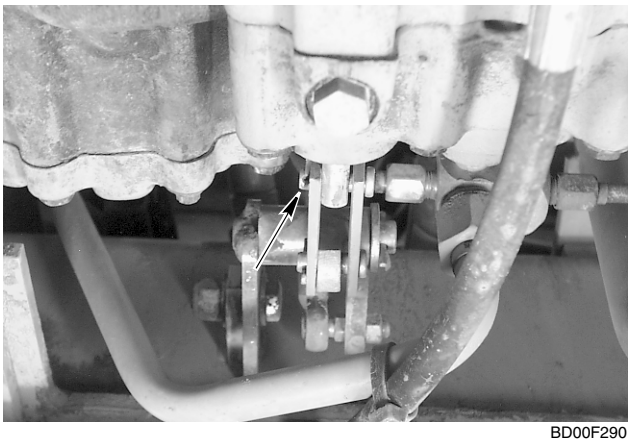
POWER TRAIN

CASE CORPORATION
700 State Street
Racine, WI 53404 U.S.A.

CASE CANADA CORPORATION
3350 South Service Road
Hamilton, ON L7N 3M6 CANADA

Bur 7-17760

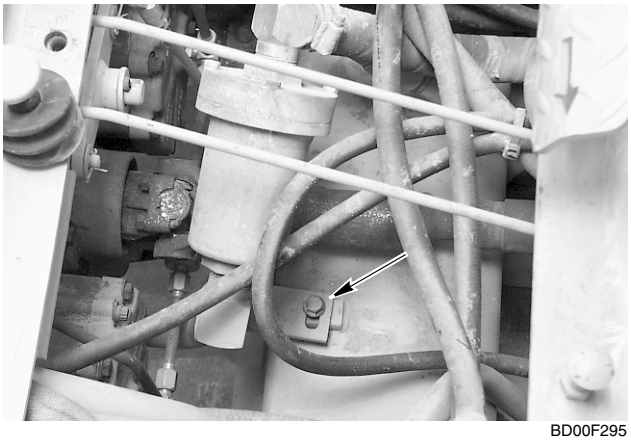
STEP 41



BD00F290

Install the pin and cotter pin for the two speed spool linkage.

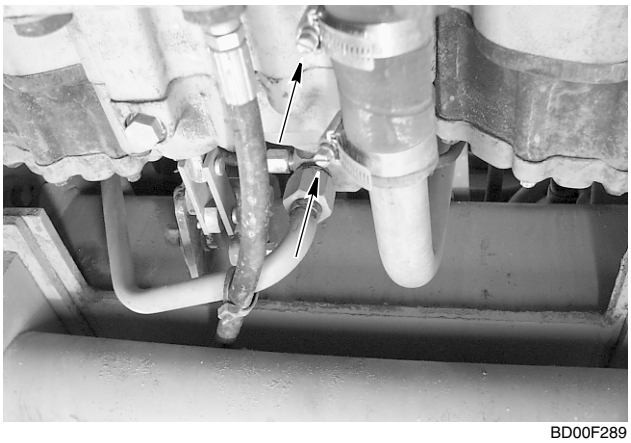
STEP 42



BD00F295

Install the suction filter and tube assembly and install the bolt to secure the clamp.

STEP 43



BD00F289

Install the suction filter hose and tighten the two clamps.

STEP 44

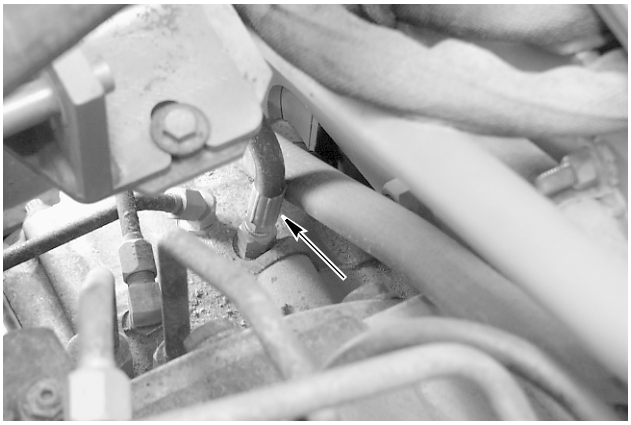
Remove the wire holding the drive shaft up out of the way. Install the U-bolts, washers, and nuts to secure the drive shaft universal joint to the transmission input yoke. Tighten the nuts to a torque of 19 to 23 Nm (14 to 17 lb-ft).

STEP 45

BD00F288

Connect the hose to the suction filter and tighten the clamp.

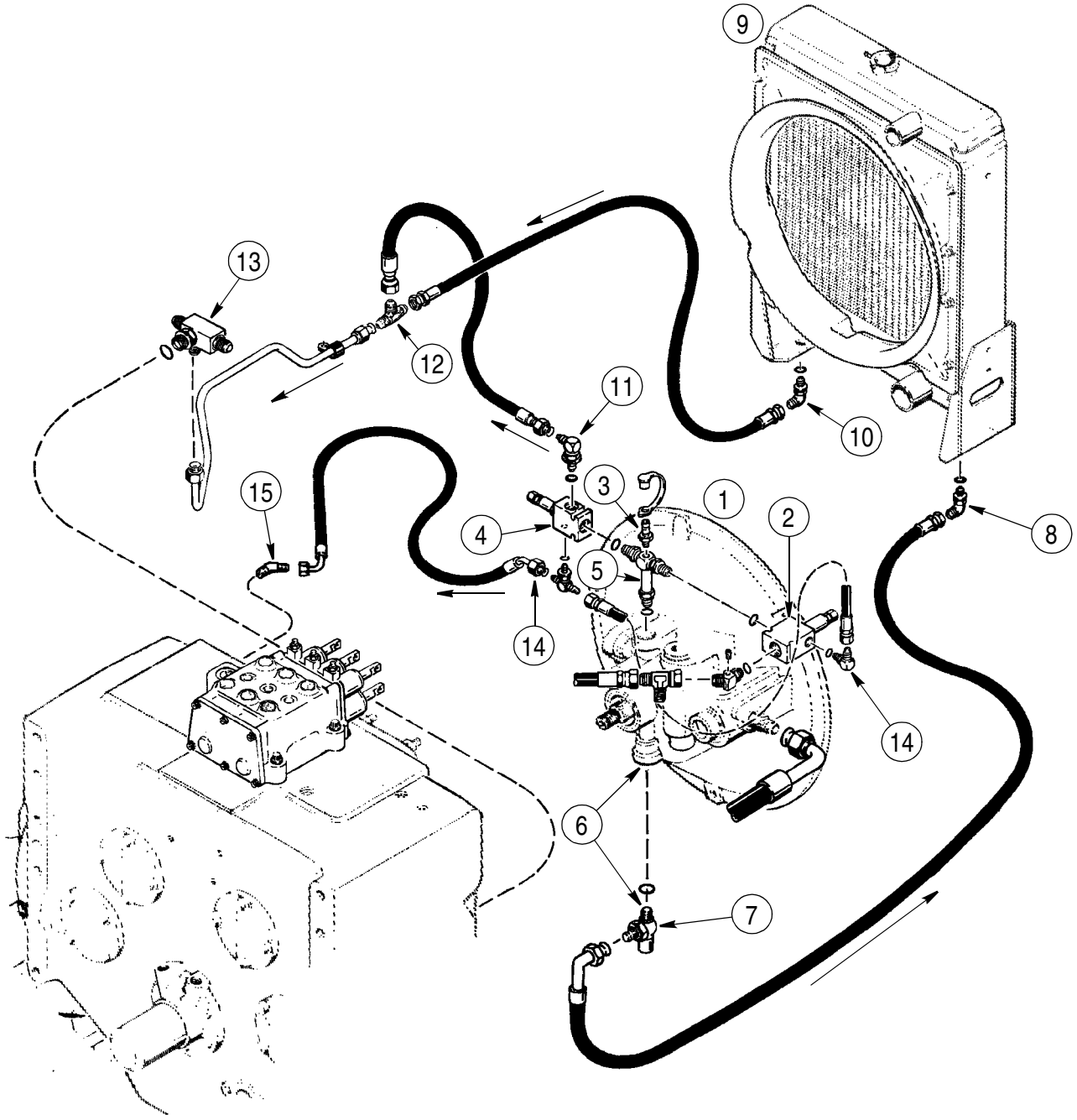
STEP 46



BD00F287

Connect the brake hose to the brake housing. Repeat for the other brake.

COOLING AND LUBRICATION CIRCUIT



BS99M109

NOTE: *The arrows indicate direction of the fluid flow.*

1. TORQUE CONVERTER AND CHARGE PUMP
2. TRANSMISSION SYSTEM RELIEF VALVE
3. CONVERTER PRESSURE TEST ADAPTER
4. TORQUE CONVERTER INLET RELIEF VALVE
5. INLET TEE TO TORQUE CONVERTER
6. OUTLET PORT FROM TORQUE CONVERTER
7. FITTING FOR TEMPERATURE GAUGE
8. INLET ELBOW TO OIL COOLER
9. RADIATOR WITH BOTTOM TANK OIL COOLER
10. OUTLET ELBOW FROM OIL COOLER
11. ELBOW AT OUTLET PORT OF RELIEF VALVE
12. JUNCTION TEE FOR LUBRICATION CIRCUIT
13. LUBRICATION DISTRIBUTION MANIFOLD
14. DRAIN LINE FOR PILOT OF RELIEF VALVES
15. ELBOW FOR DRAIN LINE AT TRANSMISSION

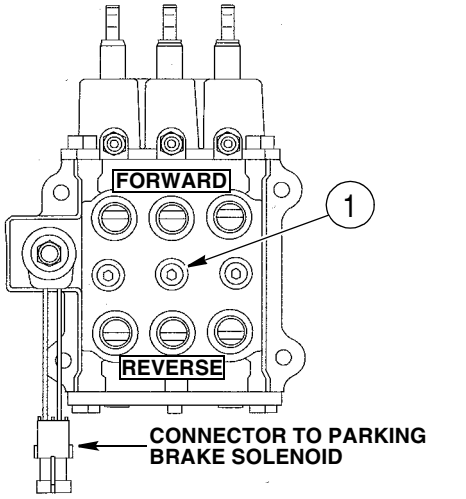
CHECKING PRESSURE OF FORWARD AND REVERSE CLUTCHES

Equipment Required

41Bar (600 psi) pressure gauge and test hose.

O-ring adapter fitting for 7/16-20 UNF thread from the pressure test fitting kit.

Test Number 4 - Pressure Test Procedure



991L93

1. PRESSURE TEST PORT

1. Remove the plug from the center test port on top of the transmission control valve. Install the adapter fitting and connect the pressure gauge to the test port.
2. Make sure the transmission fluid is at operating temperature with the needle on the transmission temperature gauge in the green zone. See Section 2001 for the Procedure to Heat the Oil.
3. Make sure the parking brake is applied by disconnecting the electrical harness from the connector at the parking brake solenoid. Put the track speed controls in the NEUTRAL position.
4. Start and run the engine at 2200 r/min (rpm).
5. Make sure the Forward and Reverse control spool in the transmission control valve is in the NEUTRAL position. Record on the check sheet on Page 19 the reading on the pressure gauge for NEUTRAL pressure.
6. Compare the pressure recorded for the NEUTRAL position to the Charging System Pressure recorded in Step 5 on Page 11. If the NEUTRAL pressure is more than 2.1 bar (30 psi) less than the Charging System Pressure, do Step 3 in Understanding Results of the Test before continuing this test procedure.
7. Put the transmission controls in the FORWARD position. Record on the check sheet on Page 19 the reading on the pressure gauge for FORWARD clutch circuit pressure.
8. Put the transmission controls in the REVERSE position. Record on the check sheet on Page 19 the reading on the pressure gauge for REVERSE clutch circuit pressure.
9. Stop the engine.
10. Calculate the pressure drop for each of the clutch circuits by subtracting the pressure recorded for the FORWARD and REVERSE clutch circuits from the pressure recorded for the NEUTRAL position pressure recorded in Step 5.
11. Check that the pressure drop calculated for each of the clutch circuits is within the specification on Page 3.

Understanding Results of the Test

1. If the pressure drop in Step 10 was more than the specification on Page 3 in one or both clutch circuits:
   A. Disconnect and plug the hoses at the elbow fittings in the FORWARD and REVERSE ports of the control valve and install caps on the elbow fittings.
   B. Repeat Steps 4 through 10 of the Pressure Test Procedure.
   C. If the pressure drop is good in Step B, the problem is in one or both clutch circuits. Possibilities are the control rings and cover on the end of a shaft or a clutch piston seal.
   D. If the pressure drop in Step B remained more than the specification on Page 3, the problem is in the control valve. Check and make sure the control linkage is adjusted and working correctly before inspecting the control valve for wear.
2. If the pressure drop in Step 10 was not more than the specification on Page 3, the clutch hydraulic circuits are good.
3. If the NEUTRAL pressure in Step 5 was more than 2.1 bar (30 psi) less than the Charging System Pressure recorded in Step 5 on Page 11, inspect the modulator assembly for wear, a restricted orifice, and damaged return springs or incorrect spring pins.

TABLE OF CONTENTS

Assembly

STEP 29

Lubricate all the parts with clean transmission fluid before assembly.

STEP 30

If a new converter support bushing is installed, make sure that it fits against the internal shoulders.

STEP 31

B9052016M

Use an acceptable driver and install a new seal into the body with the flat face up. Press the seal into the body until it is level with the outer face of the body.

STEP 32

B9052010M

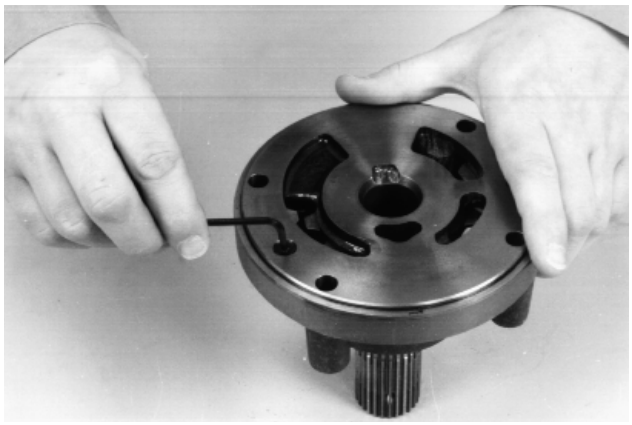
Align the marks on the body and the driven gear and install the driven gear.

STEP 33

B9052006M

Align the marks on the drive gear and the driven gear and install the drive gear with the small diameter down.

STEP 34

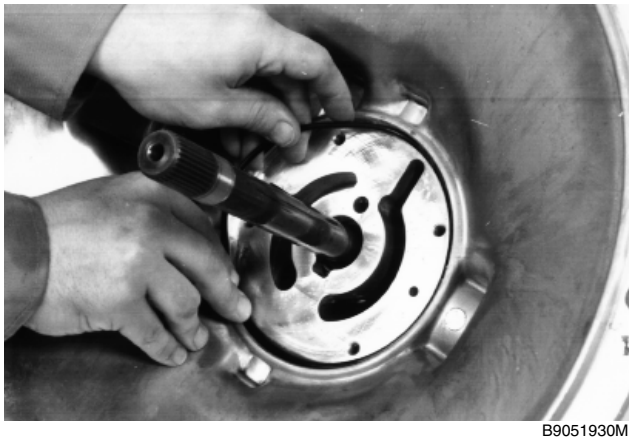


B9051932M

Install the stator support on the body and fasten using the Allen head screw.

Installation

STEP 35



B9051930M

Lubricate and install a new O-ring in the torque converter housing.

TRANSMISSION CONTROL VALVE

Removal

1. Park the machine on a level surface and lower the blade to the ground.
2. Put the master disconnect switch in the OFF position.
3. Remove the seat and the seat plate.
4. Remove the rear door.
5. Discinnect the batteries and remove the battery or batteries.
6. Disconnect the linkage from the spools in the transmission control valve.
7. Tag and disconnect the tubes from the transmission control valve.
8. Remove the bolts that fasten the transmission control valve to the transmission.
9. Remove the transmission control valve.

Disassembly

Control Valve

IMPORTANT: *To disassemble the modulation spool, make the spool return spring compression tool shown on page 3.*

Refer to illustration on page 7 for the correct call out numbers.

1. Loosen the lock nut (1) and count the number of turns it takes to remove the adjusting screw (2). Record the number of turns for use during assembly.
2. Remove the spring (3) and detent pin (4).
3. Repeat procedures 1 and 2 for the other two adjusting screws (2).
4. Loosen and remove the five bolts (5) from the front cover (6).
5. Remove the front cover (6) and gasket (13).
6. Remove the spool seals (7) from the front cover (6).
7. Remove the springs (8) from the clutch cutout spools (9).
8. Put identification tags on the spools so that the spools can be installed in the correct bores.
9. Remove the track speed spool LH (10), direction spool (11), and the track speed spool RH (12).
10. Loosen and remove the bolts (14) from the rear cover.
11. Remove the rear cover (15) and gasket (16).
12. Remove the modulation spool (17).
13. Loosen the jam nut (28) on the solenoid valve (19) and remove the solenoid valve (19).
14. Remove the O-rings (22), (23), and (24).
15. Remove the plug (20) and O-ring (21).
16. Remove the three plugs (25) and O-rings (26).

Clutch Cut Out Spools

Refer to illustration on page 8 for the call out numbers.

1. Remove the retaining spring (1).
2. Remove the pin (2).
3. Remove the outer spring (3), track speed modulation piston (4), spool return spring (5), track speed modulation spool (6), check valve ball (7), and ball spring (8) from the sleeve and rod assembly (9).

Modulation Spool

Refer to illustration on page 9 for the correct call out numbers.

1. Remove the retaining ring (1).
2. Remove the pin (2).
3. Remove the outer spring (3), inner spring (4), and forward/reverse modulation piston (5) from the sleeve (11).
4. Remove pin (6).

NOTE: *Pin (6) is longer than pin (2).*

5. Remove the spool return spring (7), forward/reverse modulation spool (8), check valve ball (9), and ball spring (10) from the sleeve (11).

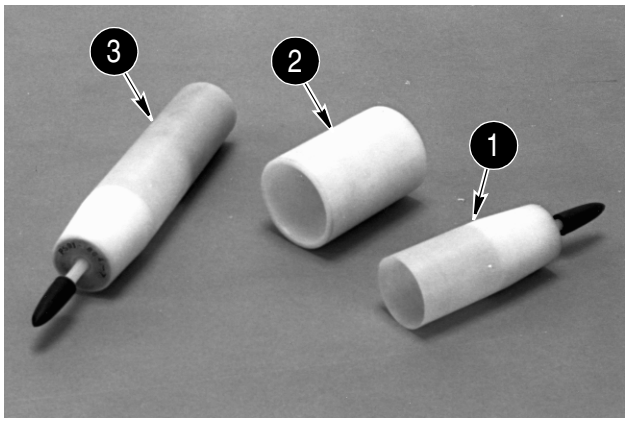
NOTE: *Do Not remove the spool stop (12) unless replacement is necessary.*

Inspection

1. Clean all parts in cleaning solvent.
2. Discard the seals, O-rings, and gaskets.

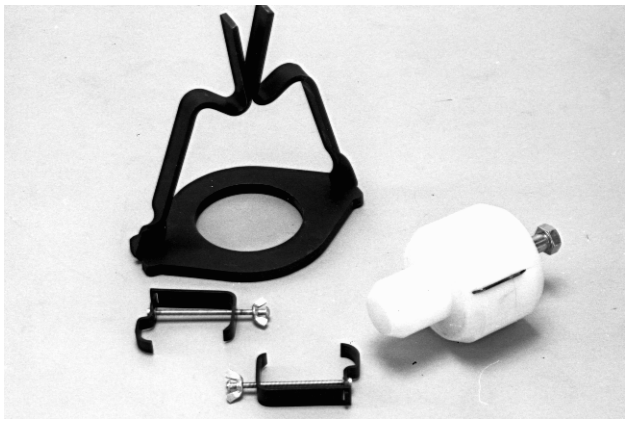
B4074691M

CAS-2229



B4075191M

1. CAS-2225 2. CAS-2226 3. CAS-2228



B4074491M

CAS-2232

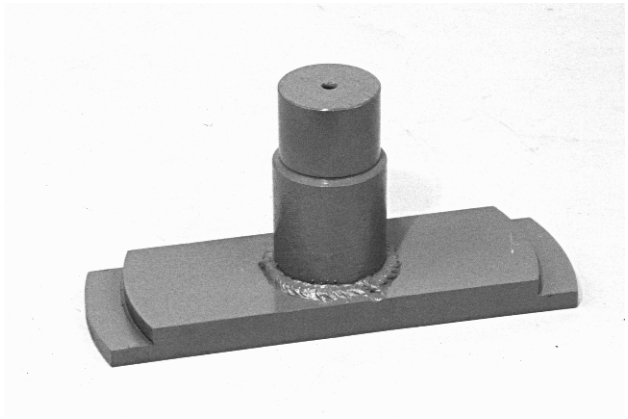
The small clamps shown in the photo have been replaced by four brass pins (CAS-2232-2A). Aluminum roofing nails with a diameter of 3.56 to 3.68 mm (.140 to.145 inches) can be used.

B4074791M

CAS-2199-2

B4075091M

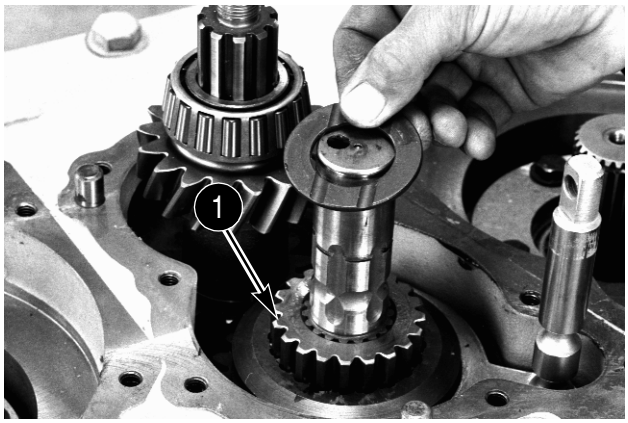
CAS-2231



B923944M

CAS-1102

STEP 34

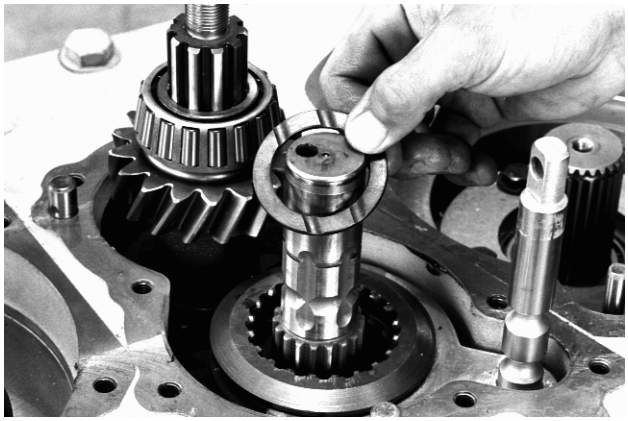


A16952

1. COUPLING

Remove the second thrust washer and the coupling.

STEP 35



A16954

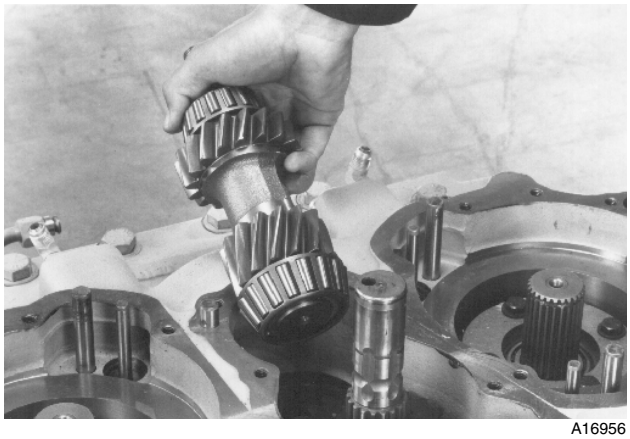
Remove the third thrust washer.

STEP 36

A16955

Remove the shift fork assembly and shift collar.

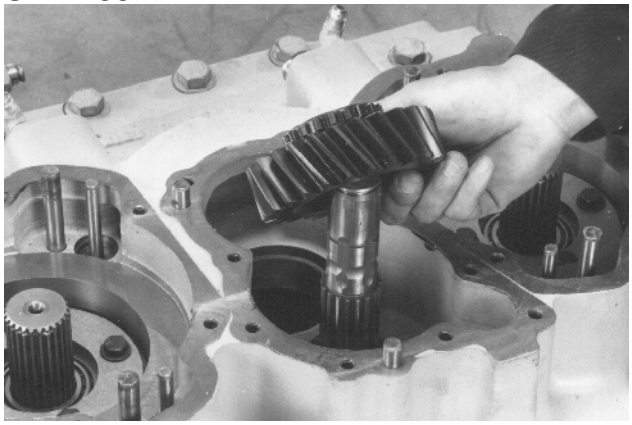
STEP 37



A16956

Remove the input shaft.

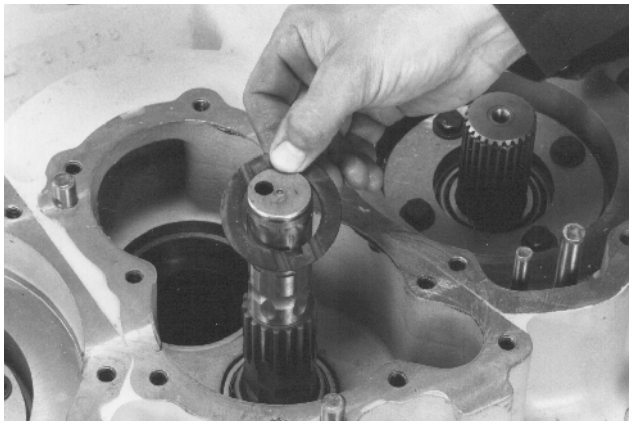
STEP 38



A16957

Remove the low range gear.

STEP 39



A16958

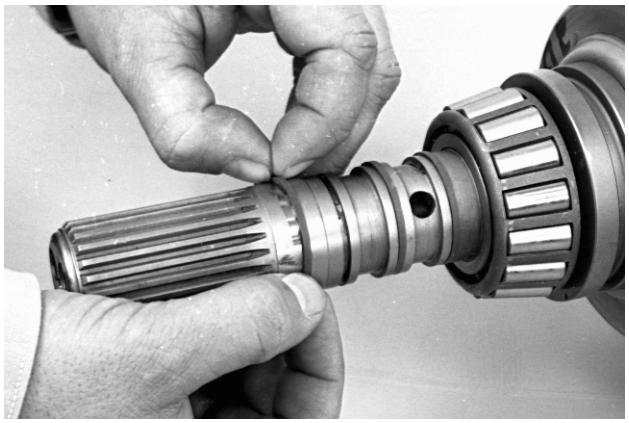
Remove the final thrust washer.

Main Shaft

NOTE: *Any time a clutch is disassembled, (the gear is removed from the clutch pack), the friction discs must be replaced. The use of old friction discs in a clutch that has been disassembled will probably cause broken teeth on the friction discs.*

NOTE: *There is a band around the outer edge of each clutch housing on the main shaft. These bands are shown in the illustration on page 28, but not in the photos below. The procedure is the same.*

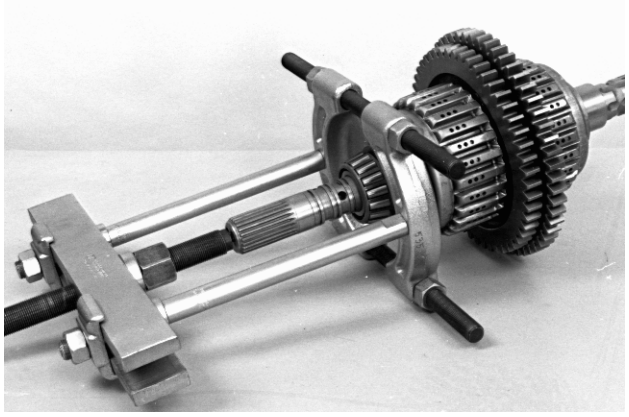
STEP 69



B9112212M

Remove the three sealing rings and discard.

STEP 70



B9112214M

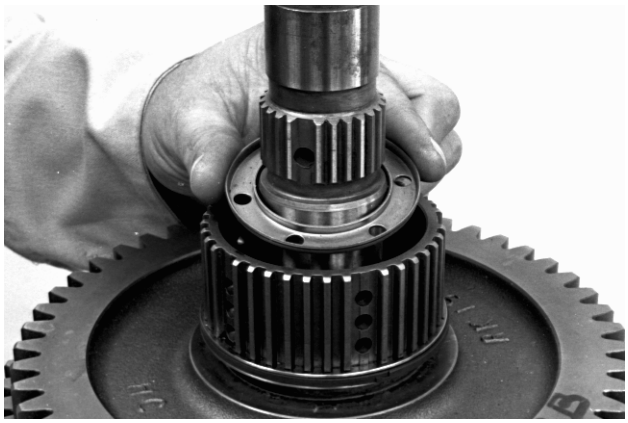
Pull the clutch housing, bearing, and O-ring from the main shaft.

STEP 71

B9112834M

Remove the spring.

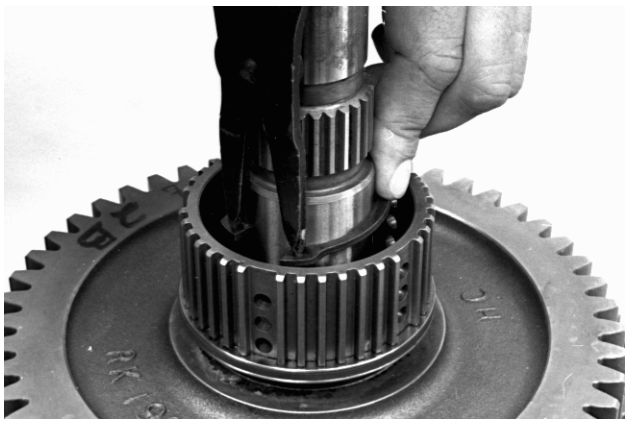
STEP 72



B9112832M

Remove the spring seat.

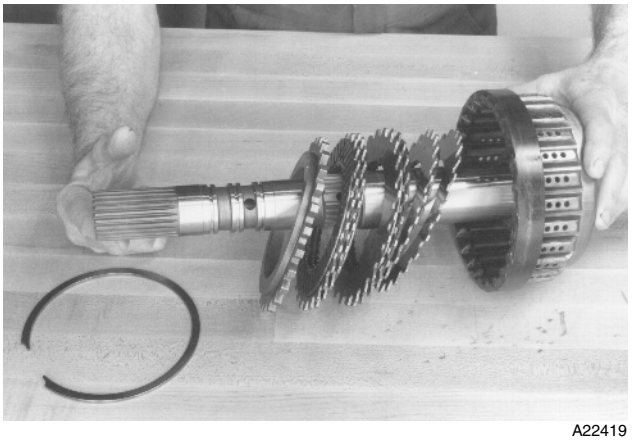
STEP 73



B9112830M

Remove the snap ring.

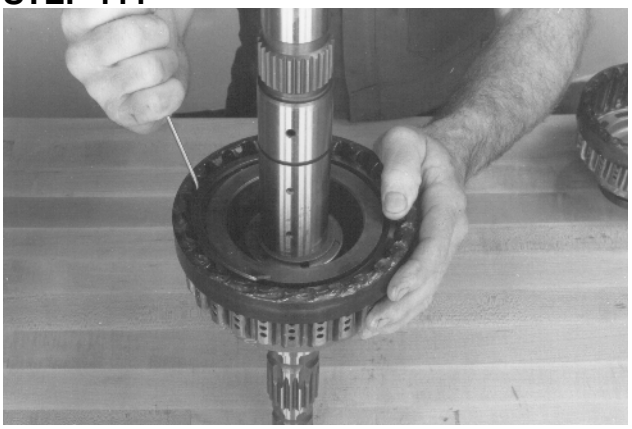
STEP 110



A22419

First install a metal disc and then a friction disc. Repeat process until six sets of discs have been installed. Then install the clutch backing plate.

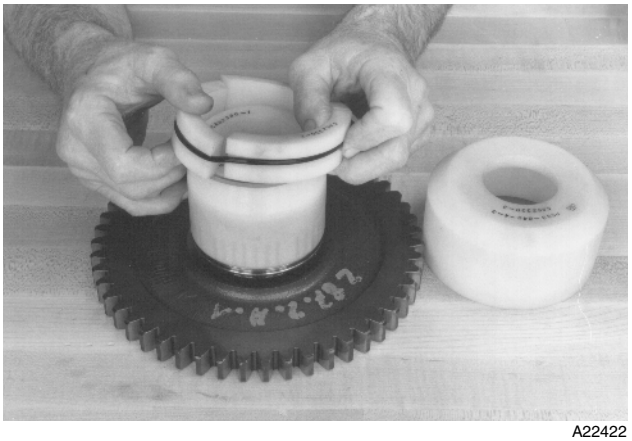
STEP 111



A22420

Install the snap ring.

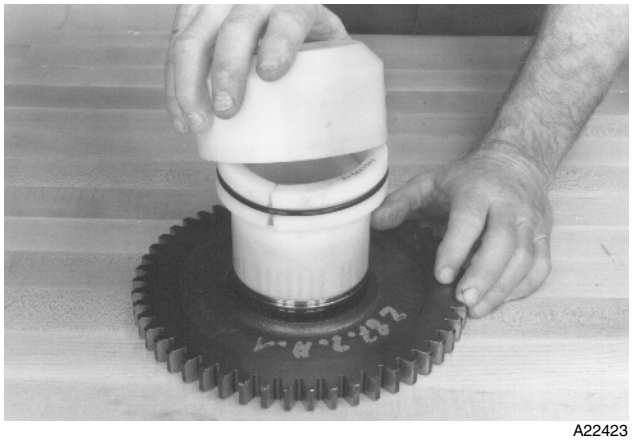
STEP 112



A22422

Position CAS-2330-1 special tool on reverse gear. Apply coating of Lubriplate grease to the new seal. Slide the new seal onto the CAS-2330-1 special tool. Then slide the CAS-2330-2 special tool onto the CAS-2330-1 special tool.

STEP 113

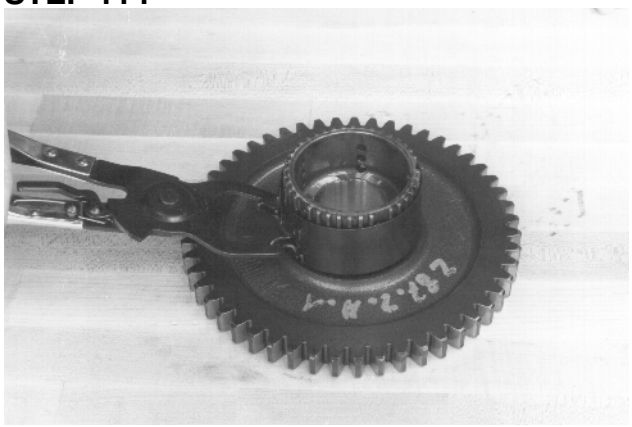


A22423

Using CAS-2330-3 special tool, push CAS-2330-2 special tool and the new seal down into the groove of the reverse gear. Remove special tools.

NOTE: *Install seal as quickly as possible to prevent overstretching seal.*

STEP 114



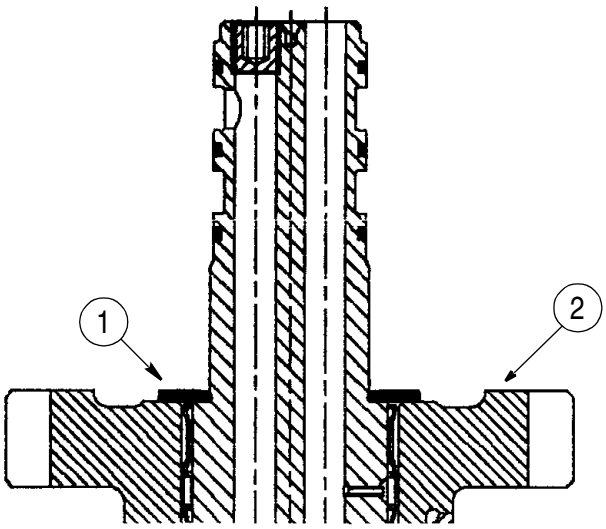
A22425

Place tool CAS-2229-6 over the seal. Tighten tool to compress the seal into the groove. After waiting for three minutes, loosen the tool. Rotate the tool about 1/4 turn around the gear and tighten the tool again. Repeat this process until the seal is compressed into the groove all around the gear.

STEP 115

Repeat steps 112 through 114 to install a new seal on the forward gear.

STEP 164

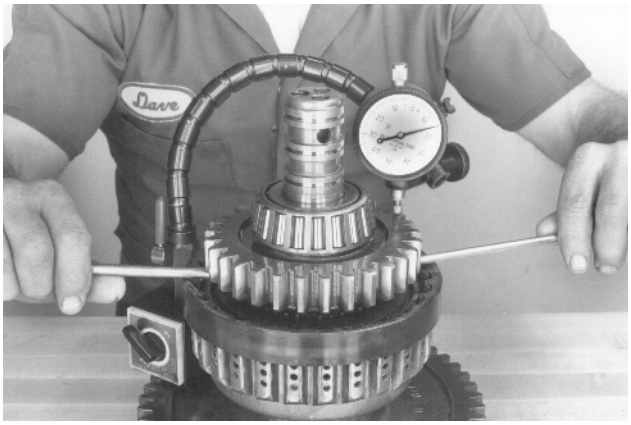


520L92

1. THRUST WASHER 2. HIGH GEAR

Repeat steps 160 through 163 to install the high gear and bearings. The only difference is that the first thrust washer installed on this end of the shaft must have the larger I.D. The high gear is properly installed when the smaller I.D. thrust washer sits on the shoulder of the shaft as shown.

STEP 165



A22469

Use a dial indicator to check the end play of the high speed clutch. The end play must be 0.152 to 0.559 mm (0.006 to 0.022 inch). If the end play is not correct, the clutch is not properly assembled.

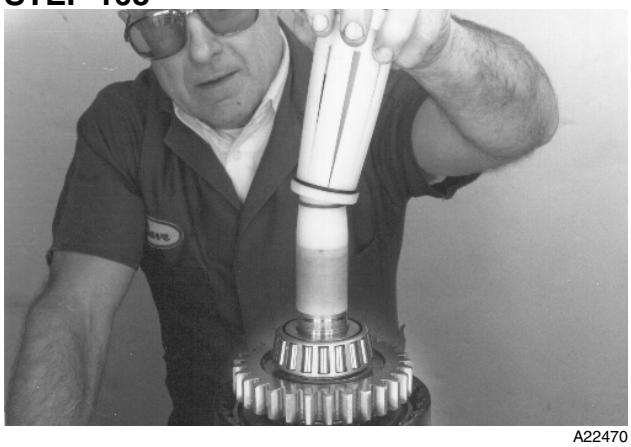
STEP 166

Repeat step 164 to check end play of the low speed clutch. The end play must be 0.051 to 0.559 mm (0.002 to 0.022 inch).

STEP 167

See Seal Installation Tips on page 29. Apply Lubriplate grease to three new track speed shaft seals.

STEP 168



A22470

Position CAS-2225 seal protector sleeve so it is 6.35 mm (1/4 inch) above the lowest seal ring groove on the track speed shaft. Place new lubricated seal ring on protector and use CAS-2327 pusher to slide seal ring into seal ring groove. Put your finger below the seal ring groove to prevent the seal ring from sliding beyond the seal ring groove.

NOTE: *Do this as quickly as possible to prevent over-stretching the seal ring.*

STEP 169

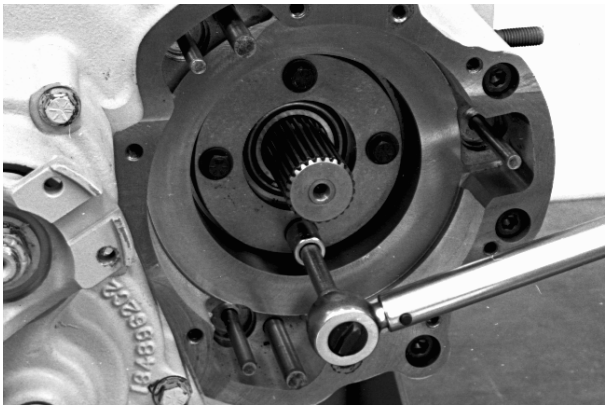
Repeat step 168 to install seal rings in other two grooves of track speed shaft.

STEP 170

A22471

Slide end of CAS-2226 seal ring compressor marked “This end first” onto track speed shaft and over seal rings. Wait three minutes for seal rings to compress. Then remove compressor and repeat process using other end of compressor.

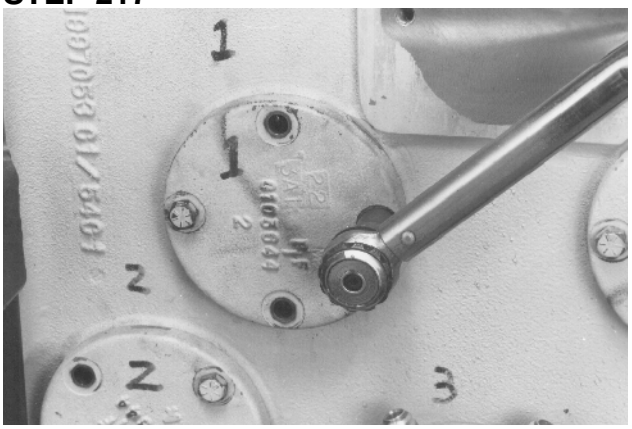
STEP 216



B9113104M

Install the retainer, bolts, and hardened washers. Tighten the bolts evenly to 47 to 54 Nm (35 to 40 pound-feet).

STEP 217

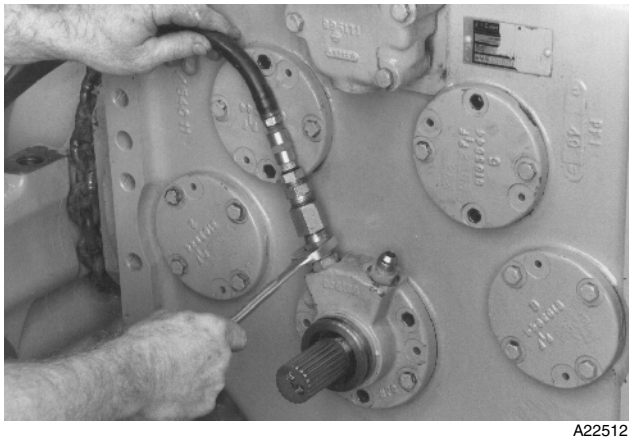


A17005

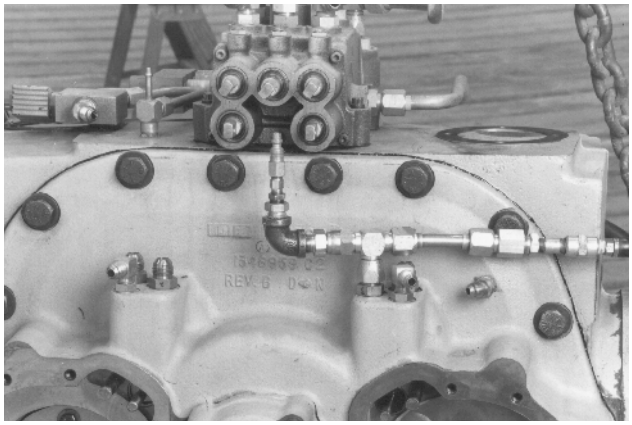
Install two bolts with washers 180 degrees apart on each bearing retainer. Do not install any shims or O-rings at this time.

NOTE: *The next three photos show a transmission that is different from your transmission. The procedure is the same.*

STEP 218



A22512



A22514

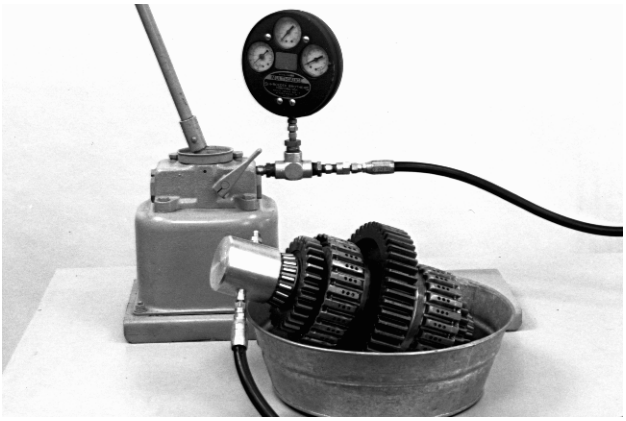
Make up a special air hose to connect to either forward/reverse fitting and one track speed fitting. You will have to connect the air hose to a track speed fitting on the other side of the transmission to rotate the other track speed shaft. Connect the special tool hose assembly to a compressed air source to engage the transmission clutches.

CHECKING CLUTCH LEAKAGE

High and Low Clutches on the Track Speed Shafts

1.Make sure the sealing rings are installed on the track speed shaft.

2. Install CAS-2231-A clutch test adapter on the end of the track speed shaft. Connect CAS-10090 hand pump to the adapter.



B9112714M

3. Make sure the hand pump is filled with Case TCH Fluid and the oil is at a temperature of 21 to 27°C (70 to 80°F).

4. Operate the hand pump to keep the pressure at 2068 kPa, 20 bar (300 psi) for one minute.

5. Measure the amount of oil that leaked from the clutch. If the leakage is more than 237 to 355 mL (8 to 12 fluid ounces), the piston seals or shaft seals are damaged. Repair the clutch as necessary.

6. Check the plugs at the end of the track speed shaft for any leakage. If leakage occurs, remove the plugs. Then install the plugs as shown on page 64.

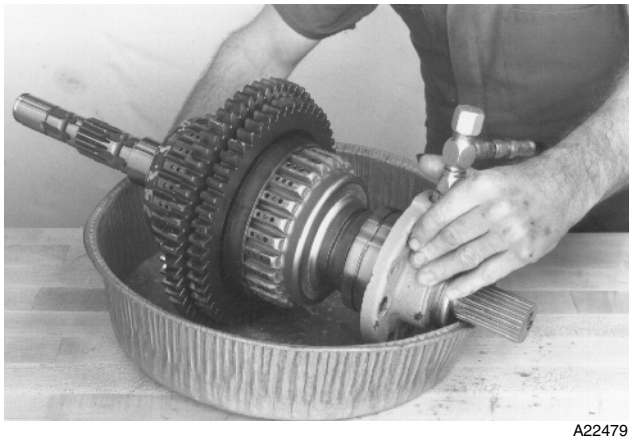
7. Connect the hand pump to the other connector on the adapter and repeat steps 3 through 5 to check the other clutch.

8. Repeat entire procedure to check clutch leakage on the other track speed shaft.

Forward and Reverse Clutches on the Main Shaft

1. Make sure the sealing rings are installed on the main shaft.

2. Install the rear retainer for the main shaft. Connect CAS-10090 hand pump to a connector on the rear retainer.



A22479

3. Make sure the hand pump is filled with Case TCH Fluid and the oil is at a temperature of 21 to 27°C (70 to 80°F).

4. Operate the hand pump to keep the pressure at 2068 kPa, 20 bar (300 psi) for one minute.

5. Measure the amount of oil that leaked from the clutch. If the leakage is more than 237 to 355 mL (8 to 12 fluid ounces), the piston seals or shaft seals are damaged. Repair the clutch as necessary.

6. Check the plugs at the end of the main shaft for any leakage. If leakage occurs, remove the plugs. Then install the plugs as shown on page 64.

7. Connect the hand pump to the other connector on the rear retainer and repeat steps 3 through 5 to check the other clutch.

Procedure for Installing Transmission Shaft Plugs

Use the following procedure EXACTLY as written. Failure to follow the procedure exactly can cause plug leakage.

1. Spray Loctite Cleaning Solvent (Case Part Number M20863) on the plugs and into the tapped holes in the shaft. Then use compressed air to blow out any grease, oil, and solvent. Continue this procedure until all traces of oil, grease, and solvent are removed from the tapped holes and plugs. These areas MUST be clean. Use compressed air to dry the areas completely.

STEP 16

B403025M

Tighten the studs evenly to remove the sprocket shaft from the inner bearing cone.

STEP 17

B403026M

Remove the sprocket shaft.

STEP 18

B204106M

Remove the face seal from the sprockets shaft.

STEP 19

B204330M

Remove the face seal from the housing.

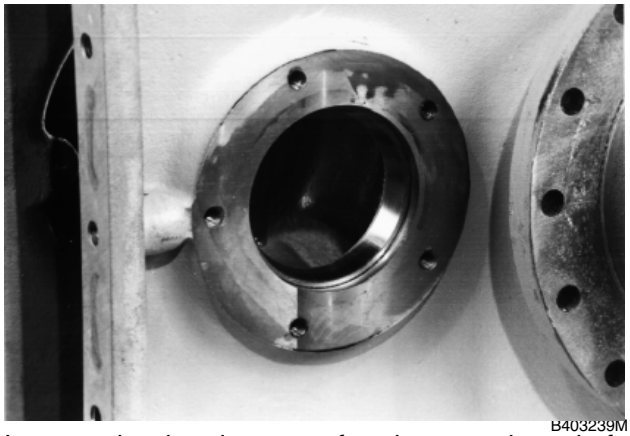
NOTE: *The face seal halves are a matched set, do not mix.*

STEP 20

B403029M

Inspect the bearings and the bearing cup for the sprocket shaft. Remove the cup if necessary.

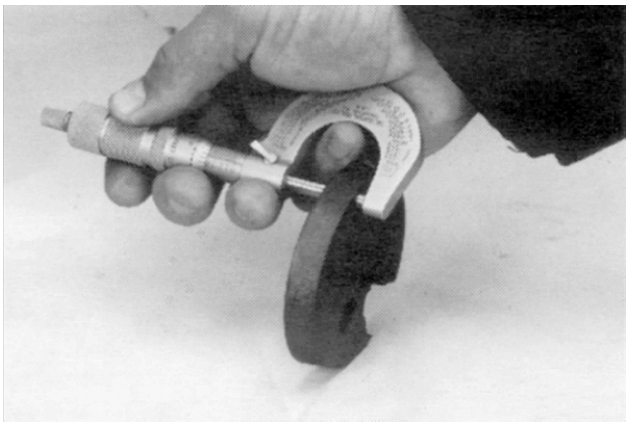
STEP 21



B403239M

Inspect the bearing cup for the sprocket shaft. Remove the bearing cup if necessary.

STEP 59



A17414

Remove the retainer and measure the thickness.

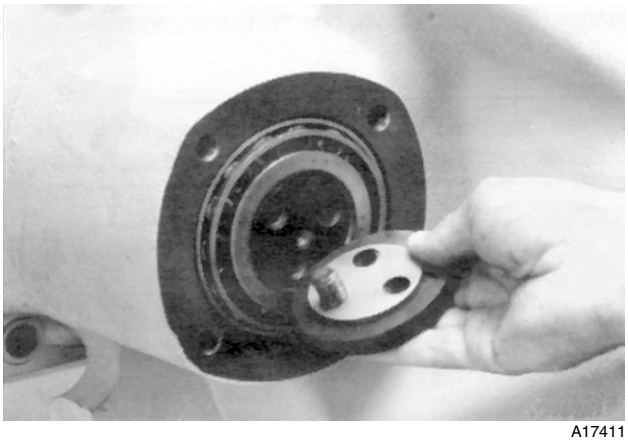
Subtract the thickness of the retainer plate from the measurement in Step 58. The answer is the required shim pack dimension for the input shaft.

STEP 60

B403330M

Measure shims to get the proper shim pack dimension.

STEP 61



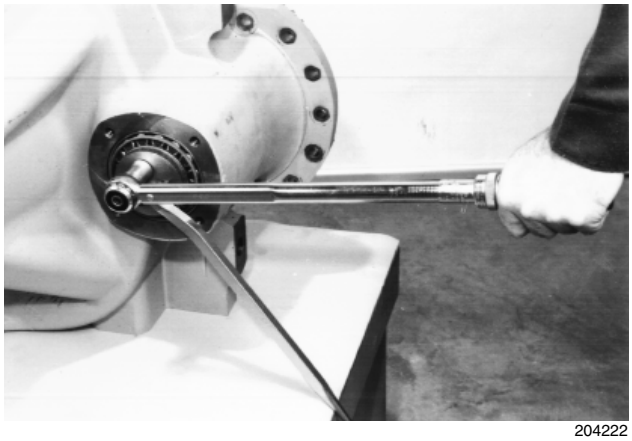
A17411

Apply Loctite 242 to the threads in the holes in the input shaft.

Install the shim pack, new retainer and three new bolts.

The bolts and retainer plate must be replaced for maximum operating life.

STEP 62



204222

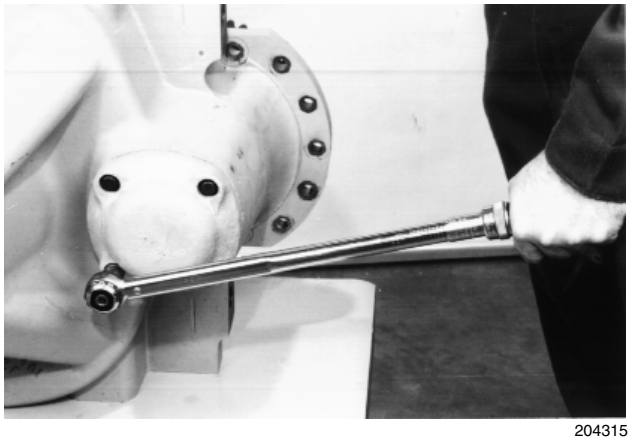
Prevent the input shaft from turning and tighten the bolts.

STEP 63

204313

Put a new gasket on the cover. Install the cover and bolts.

STEP 64



204315

Tighten the bolts.

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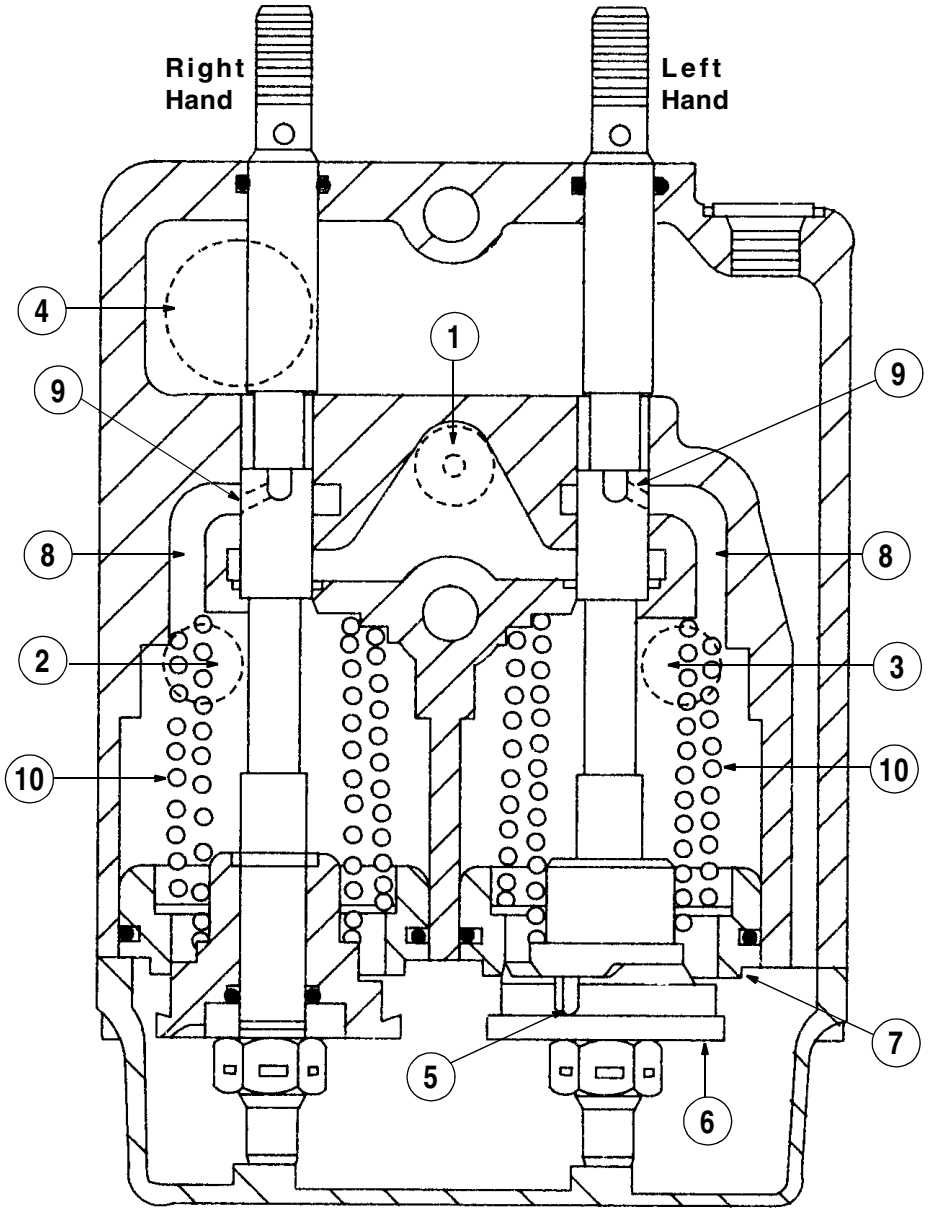
BRAKE CONTROL VALVE CUTAWAY VIEW



737L94

1. Inlet Port and Orifice
2. Port to Right Steering Brake
3. Port to Left Steering Brake
4. Return Port to Sump
5. Feather Groove
6. Small Piston
7. Large Piston
8. Air Bleed Piston
9. Bleed Land
10. Return Springs

NOTE: Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

ASSEMBLY

STEP 24

B9112322M

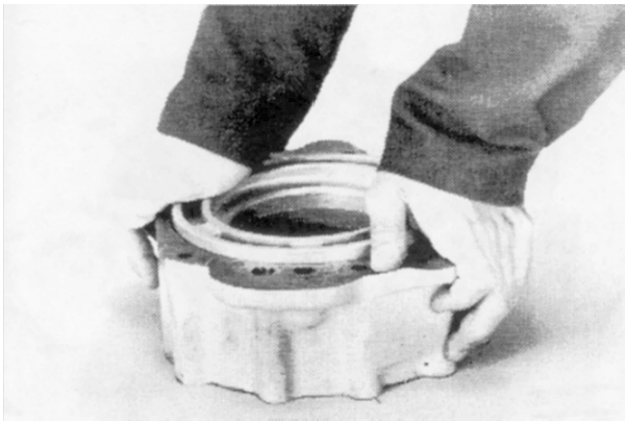
Apply Lubriplate grease to the backup O-rings and piston seals. Install the backup O-rings in the grooves of the pistons. Install the piston seals on top of the backup O-rings. Make sure the piston seals are not twisted. Slowly and carefully use the CAS-2229 tool to work the piston seal down into the groove of the piston. Compress the piston seal in small amounts to prevent damage to the piston seal. After each small amount of compression, release and rotate the tool. Continue this procedure until the piston seal is against the backup O-ring all the way around the piston.

STEP 25

B9112324M

Repeat the procedure in Step 24 for all the other piston seals.

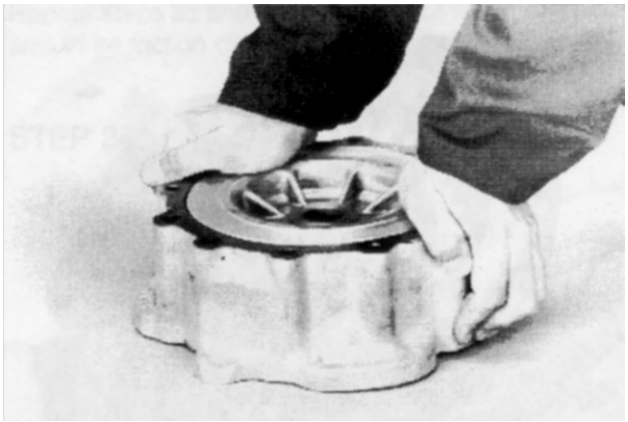
STEP 26



A17264

Lubricate the piston seals with Lubriplate grease. Install the inner piston as shown in the photo.

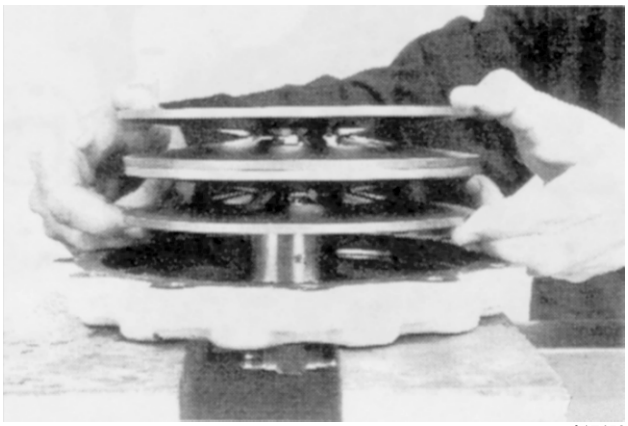
STEP 27



A17265

Install the outer piston as shown in the photo.

STEP 28



A17453

Install the four brake springs on the cover as shown in the photo.

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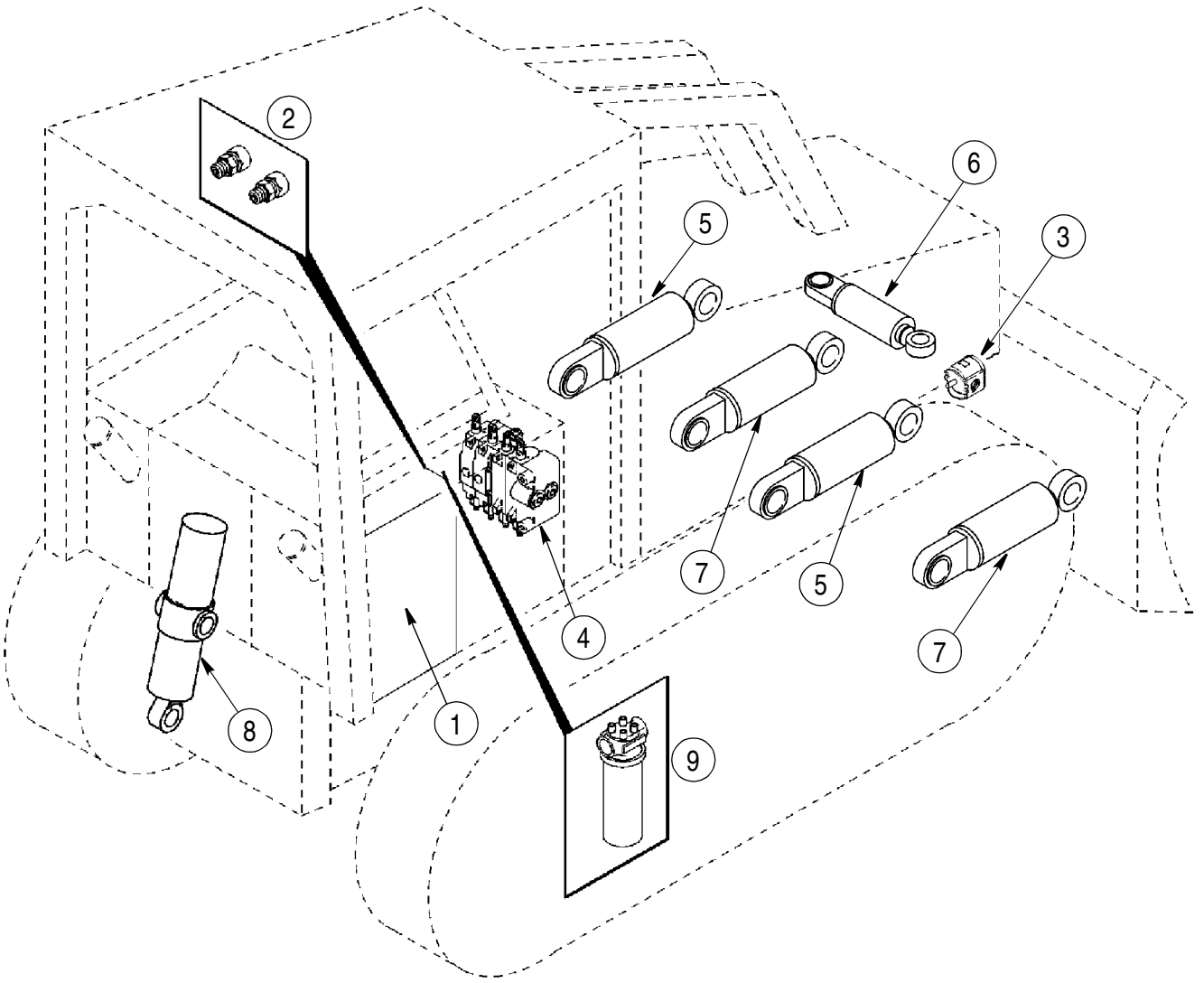
HYDRAULIC SYSTEM COMPONENT LOCATIONS

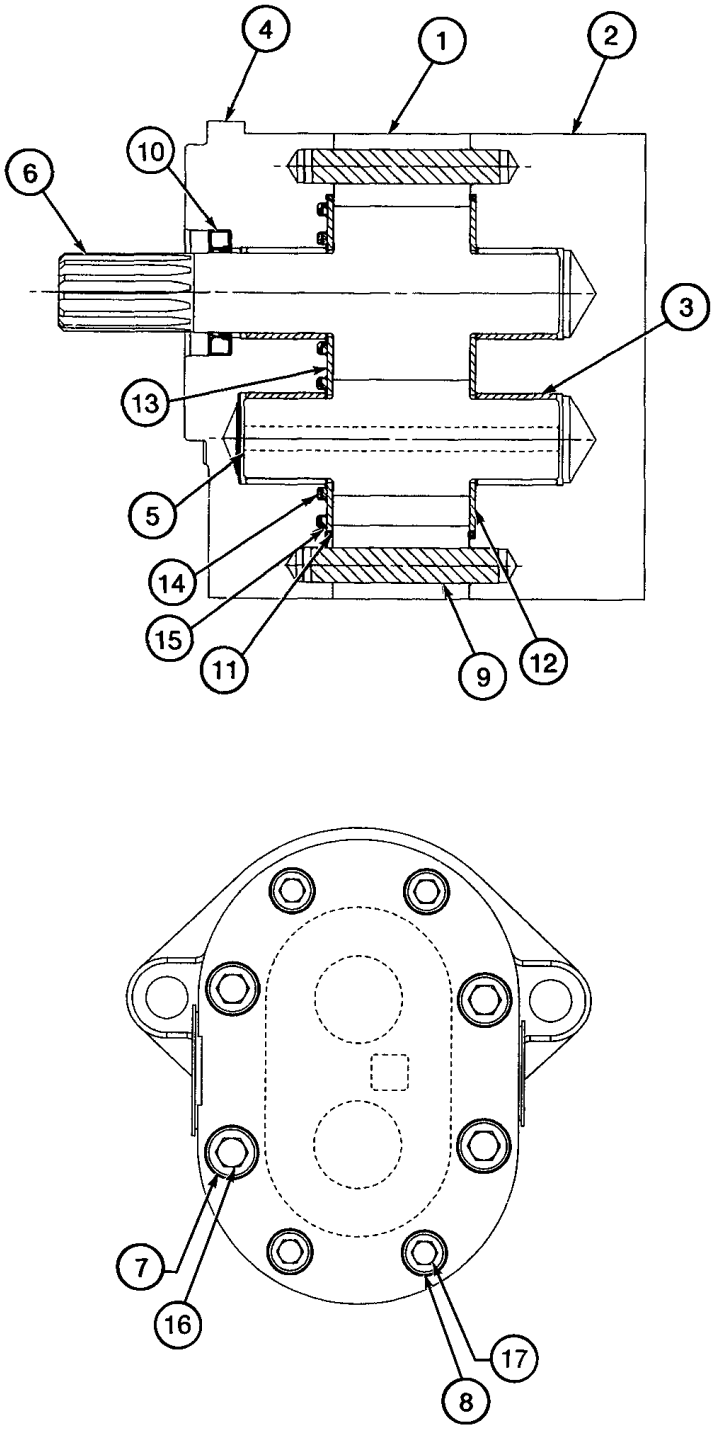


BS99M037

1. HYDRAULIC RESERVOIR
2. VACUUM AND PRESSURE RELIEFS
3. HYDRAULIC SYSTEM PUMP
4. HYDRAULIC SYSTEM CONTROL VALVE
5. DOZER LIFT CYLINDERS
6. DOZER TILT CYLINDER
7. DOZER ANGLE CYLINDERS
8. RIPPER LIFT CYLINDER
9. HYDRAULIC SYSTEM RETURN FILTER

NOTES

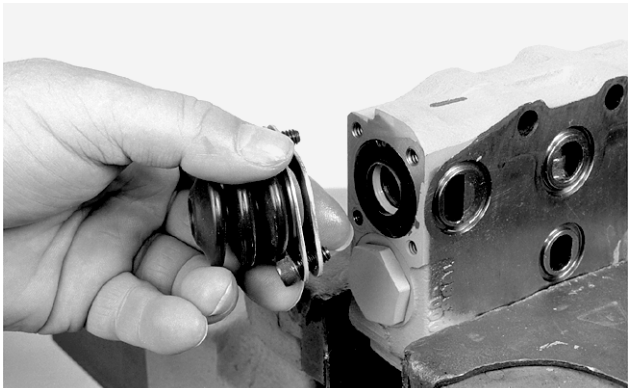
EQUIPMENT PUMP CROSS-SECTION



BS98F177

1. GEAR PLATE
2. COVER
3. BEARING SLEEVE
4. BODY
5. IDLER SHAFT
6. DRIVE SHAFT
7. WASHER
8. WASHER
9. DOWEL PIN
10. OIL SEAL
11. SEAL RING
12. WEAR PLATE
13. WEAR PLATE
14. SEAL
15. SEAL
16. SOCKET HEAD BOLT
17. SOCKET HEAD BOLT

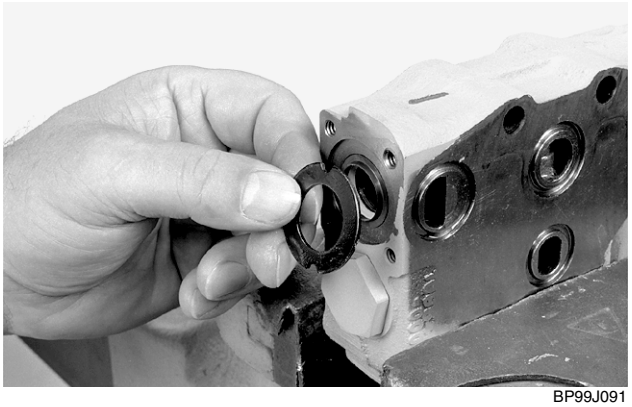
STEP 26



BP99J090

Remove the spool boot, the boot retainer, the retainer plate, and the Allen head screws from the body.

STEP 27

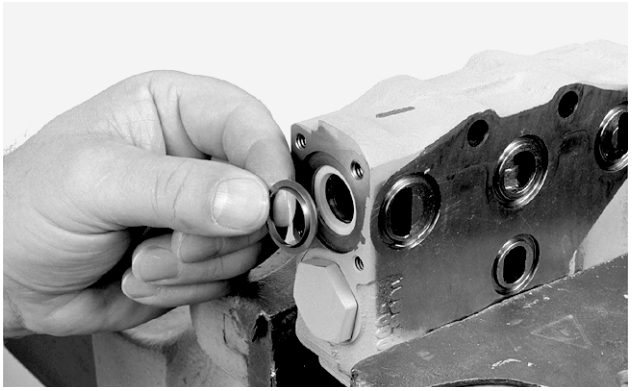


BP99J091

Remove the seal retainer from the body.

NOTE: *Step 28 and Step 29 show the removal of a wiper and a lip seal. It is possible that your section will have a backup ring and an O-ring in place of the the wiper and lip seal. The procedure is the same.*

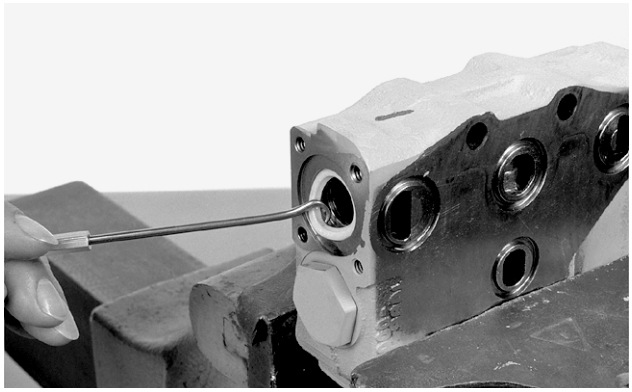
STEP 28



BP99J092

Remove and discard the wiper (or the backup ring, if equipped) from the body.

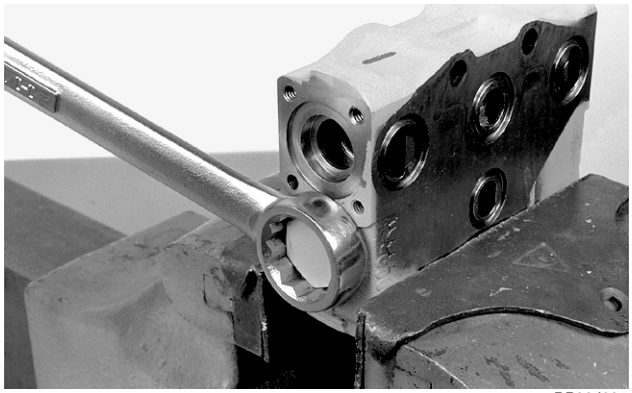
STEP 29



BP99J094

Remove and discard the lip seal (or the O-ring, if equipped) from the body.

STEP 30



BP99J095

Loosen the load check valve.

STEP 31

BP99J096

Remove the load check body, the spring, and the poppet.

STEP 32

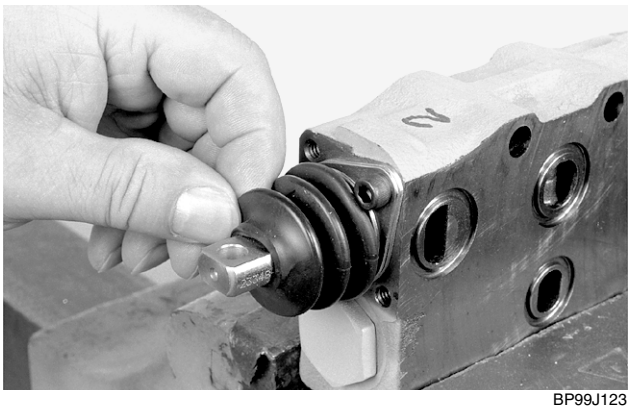
Repeat Step 30 and Step 31 for the load check valve at the opposite end of the body.

TILT, ANGLE, AND AUXILIARY SECTIONS

See the illustration on page 6. The auxiliary section has a circuit relief valve at each end of the section. The tilt and angle sections have a load check valve at each end of the section. The following photos show a tilt or angle section. Use a similar procedure to disassemble and assemble the other tilt or angle and auxiliary sections.

Disassembly

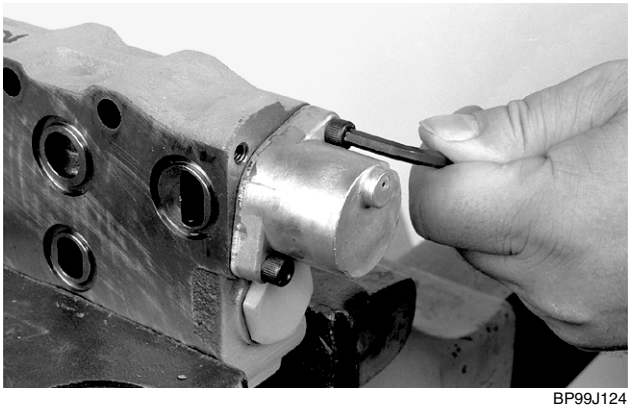
STEP 76



BP99J123

Fasten the section in a vise with soft jaws. If the section has a spool boot at the top of the spool, pull the top of the spool boot out of the groove in the spool.

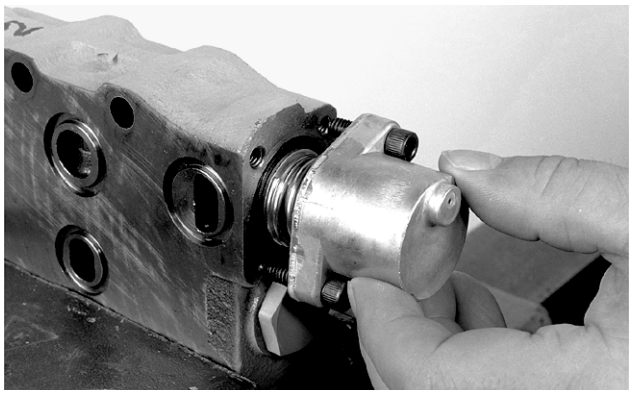
STEP 77



BP99J124

Loosen the Allen head screws that fasten the spring cap to the body.

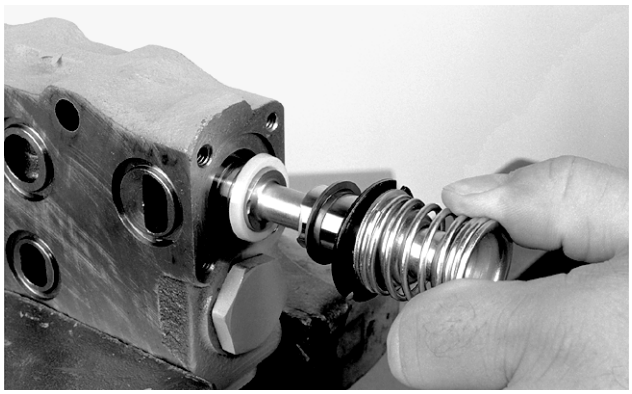
STEP 78



BP99J125

Remove the Allen head screws and the spring cap.

STEP 79



BP99J126

Remove the spool assembly from the body.

NOTE: *Step 80 and Step 81 show a section with a spool boot and boot retainer in addition to a retainer plate. It is possible that your section will not have a spool boot and boot retainer. The procedure is the same.*

STEP 80

BP99J127

Loosen the Allen head screws which fasten the boot retainer and the retainer plate to the body.

STEP 121

B9051130M

Remove the spring.

STEP 122

B9051133M

Replace the O-ring and the backup ring in the housing.

B9051135M

Tap the main relief valve lightly against a solid surface so that the poppet can be removed from the housing.

STEP 123

B9051204M

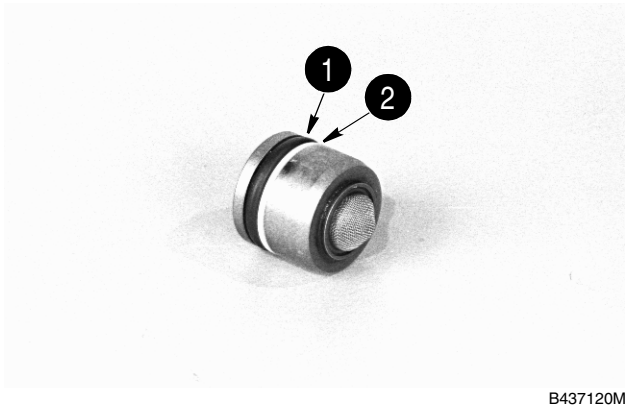
Replace the O-ring on the body.

STEP 124

B9051209M

Replace the O-ring on the adjusting screw.

STEP 125



B437120M

1. O-RING
2. BACKUP RING

Replace the O-ring and the backup ring on the poppet.

Inspection

Inspect all parts for wear and damage. See page 34 for instructions.

Assembly

For Assembly, do the reverse of Disassembly.

Inspection

1. Discard the parts that were removed from the piston and the gland.

2. Clean all parts in cleaning solvent.

3. Check to be sure that the piston rod is straight. If the piston rod is not straight, install a new piston rod.

4. Illuminate the inside of the tube. Inspect the inside of the tube for deep grooves and other damage. If there is any damage to the tube, use a new tube.

5. Remove small scratches on the piston rod or inside the tube with emery cloth of medium grit. Use the emery cloth with a rotary motion.

6. Inspect the bushings in the piston rod eye and the tube. Replace the bushings as required.

7. Inspect the gland for rust. Clean and remove rust as necessary.

8. Inspect the gland end of the tube for sharp edges that will cut the gland O-ring and remove as necessary.

9. Inspect the piston for damage and wear. If the piston is damaged or worn, use a new piston.

Assembly

NOTE: *If a new gland is being used, put the part number of the cylinder on the new gland.*

1. Install the new bushing (11) into the gland (8).

2. Install the wide seal (6) in the gland (8). The wide seal (6) must be installed so that the lips of the wide seal (6) are toward the small end of the gland (8). The wide seal (6) can be difficult to install. See the tool shown on page 3 to install the wide seal (6).

3. Install the narrow seal (7) in the gland (8). The side of the narrow seal (7) with the groove must be toward the small end of the gland (8).

4. Press a new wiper (5) into the gland (8). The lips of the wiper (5) must be toward the outside end of the gland (8).

5. Install a new backup ring (9) in the groove on the outside of the gland (8). If both sides of the backup ring (9) are not flat, the side that is not flat must be toward the small end of the gland (8).

6. Install the O-ring (10) next to the backup ring (9) in the groove on the outside of the gland (8). The O-ring (10) must be toward the small end of the gland (8).

7. Fasten the piston rod eye in the vise.

8. Remove any marks and sharp edges on the chamfer at the end of the piston rod (4). Make sure that the piston rod (4) is clean.

9. Use clean oil to lubricate the bore of the gland (8) and the piston rod (4).

10. Push the gland (8) onto the piston rod (4). If necessary, use a soft hammer to drive the gland (8) onto the piston rod (4).

11. Put a support below and near the end of the piston rod (4). Use a shop cloth between the support and the piston rod (4) to prevent damage to the piston rod (4).

12. Put the piston (12) on the end of the piston rod (4).

13. Put the hardened washer (17) on the cap screw (18).

14. Use Loctite cleaning solvent to clean the threads in the end of the piston rod (4) and the threads on the cap screw (18). Allow to dry. Apply Loctite 243 to the piston rod threads 6 mm (1/4 inch) from the open end of the piston rod (4) so that there is Loctite 243 on 13 mm (1/2 inch) of the piston rod threads. DO NOT apply Loctite 243 to the first 6 mm (1/4 inch) of the piston rod threads.

15. Install the cap screw (18). See Specifications in this section and tighten the cap screw (18) to the torque value for the cylinder that is being repaired. A torque multiplier can be used to help tighten the cap screw.

16. See the illustration on the following page. If you are assembling a lift cylinder or a tilt cylinder, install a new backup ring (13) in the groove on the outside of the piston (12). Then install a new seal (14) on top of the backup ring (13). If you are assembling an angle cylinder, install a new seal assembly (15) in the groove on the outside of the piston (12).

17. Install a new wear ring (16) in the groove on the outside of the piston (12).

18. Fasten the tube (20) in a vise or other holding equipment. Be careful to prevent damage to the tube (20).

19. Use clean oil to lubricate the inside of the tube (20) and the piston (12).

20. Push the piston (12) straight into the tube (20).

21. Use clean oil to lubricate the O-ring (10) on the gland (8).

Continued on page 8

REPLACING BUSHINGS

1. Use a press and an acceptable driver to press the bushings out of the bore.

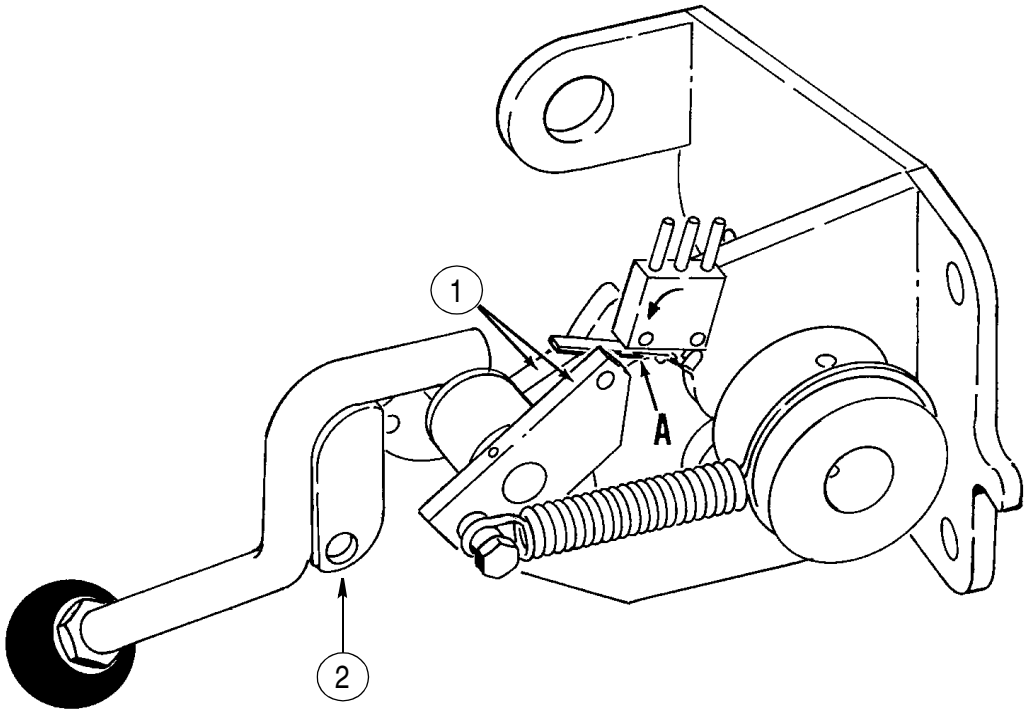
2. Clean the bore for the bushing.

3. Start the new bushing into the bore.

4. Use the press and an acceptable driver to press the bushing into the bore until the bushing is flush with the outside of the piston rod eye or tube.

NOTE: *When two bushings are used in the same bore, pressing a bushing in too far can close the passage to the grease fitting.*

ADJUSTMENT OF NEUTRAL START SWITCH



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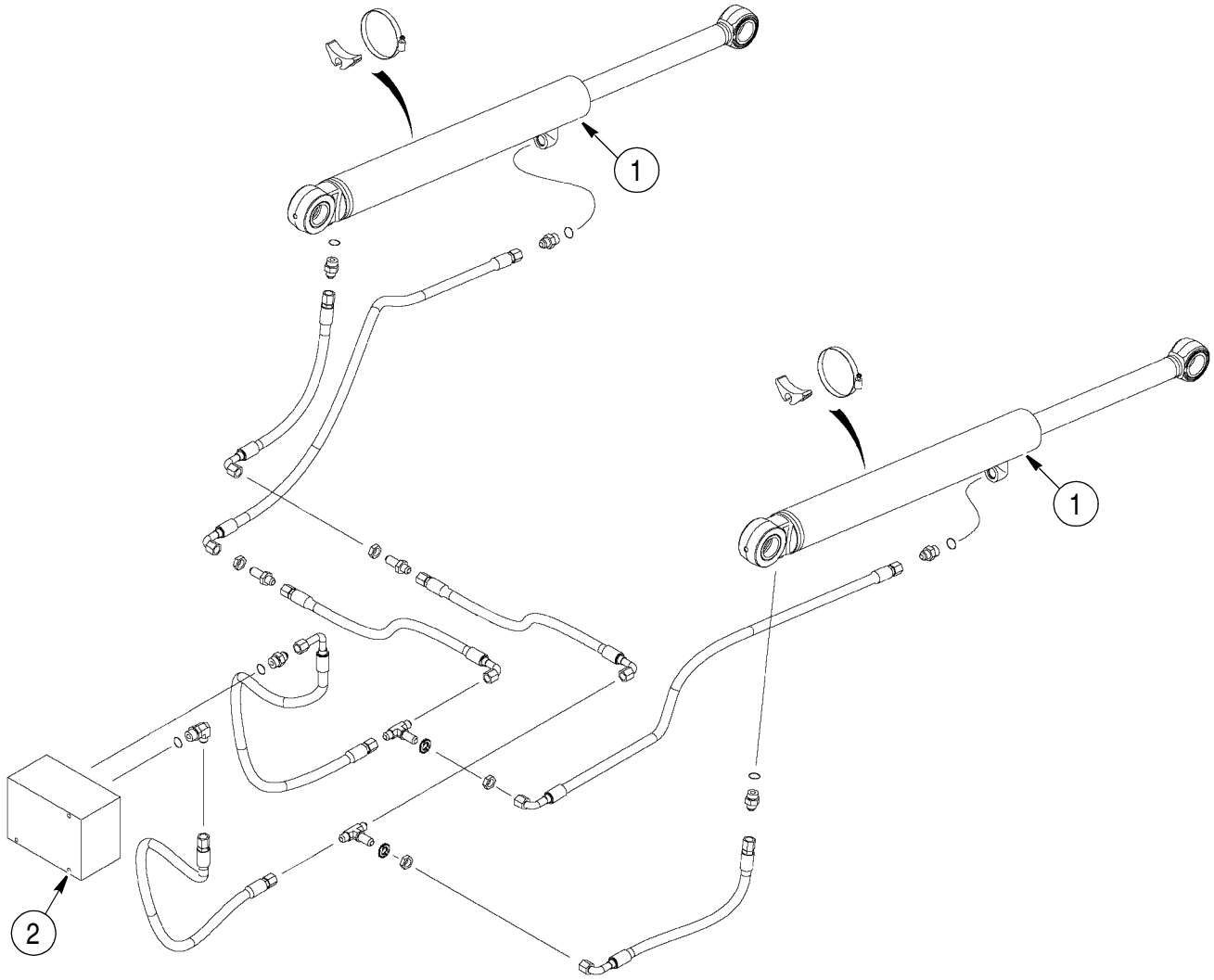
NOTE: *If adjustment of the neutral start switch is necessary, tighten the mounting screws that hold the neutral start switch to 0.339 to 0.678 Nm (3 to 6 pound-inches).*

1. Move the parking brake lever until the surfaces (1) in the illustration are parallel. Rotate the neutral start switch until the contact (A) is closed. Tighten the mounting screws holding the neutral start switch. Do not over tighten!
2. Check by moving the parking brake lever into the fully down position so the parking brake will be applied. The contacts in the neutral start switch must be closed so the engine will start.
3. Move the parking brake lever up into the locked position with a padlock through tabs (2). The contacts to the neutral start switch must be open so the engine will not start when the parking brake is released.



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1. LIFT CYLINDER
2. DOZER CONTROL VALVE

LIFT CYLINDER HYDRAULIC INSTALLATION