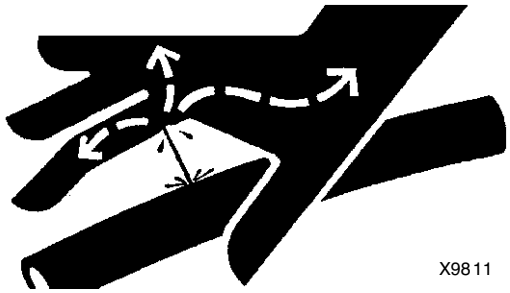
USE CARE AROUND HIGH-PRESSURE FLUID LINES

- **AVOID HIGH-PRESSURE FLUIDS**


X9811

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

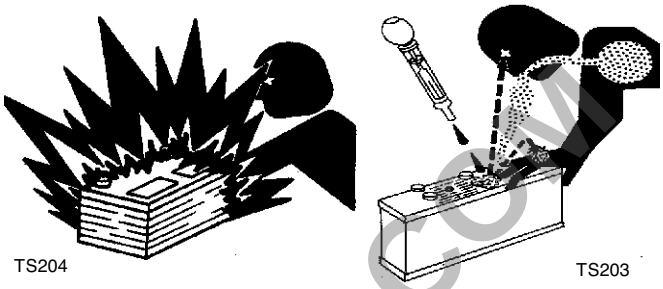
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

- **AVOID HEATING NEAR PRESSURIZED FLUID LINES**


TS953

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.

USE CARE IN HANDLING AND SERVICING BATTERIES


TS204 TS203

- **PREVENT BATTERY EXPLOSIONS**
  - Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.
  - Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.
  - Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

- **PREVENT ACID BURNS**
  - Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

- **Avoid acid burns by:**

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

- **If you spill acid on yourself:**

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10_15 minutes.
4. Get medical attention immediately.

- **If acid is swallowed:**

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

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Piston O.D.

Distance A . . . . . 23 mm (0.905 in.)

Standard Size Piston

Standard. . . . . 83.94 - 83.97 mm (3.305 - 3.306 in.)
Wear Limit . . . . . 83.90 mm (3.303 in.)

0.25 mm (0.010 in.) Oversize Piston

Standard. . . . . 84.19 - 84.22 mm (3.315 - 3.316 in.)
Wear Limit . . . . . 84.15 mm (3.313 in.)

Cylinder Bore I.D.

Standard Size Bore

Clearance. . . . . 0.040 - 0.070 mm (0.0016 - 0.0028 in.)
Standard. . . . . 84.00 - 84.03 mm (3.307 - 3.308 in.)
Wear Limit . . . . . 84.20 mm (3.315 in.)

0.25 mm (0.010 in.) Oversize Bore

Standard. . . . . 84.25 - 84.28 mm (3.317 - 3.318 in.)
Wear Limit . . . . . 84.45 mm (3.325 in.)

Deglazing . . . . . 30 - 40° cross-hatch pattern

Reboring . . . . . 30 - 40° cross-hatch pattern

Crankcase Extension Housing

Mounting Cap Screw Torque

Flywheel Housing/Plate-to-Extension . . . . . 49 N•m (36 lb-ft.)
Seal Case-to-Extension . . . . . 26 N•m (226 lb-in.)
Extension-to-Block . . . . . 27 N•m (20 lb-ft.)
Extension-to-Timing Gear Cover . . . . . 22 N•m (195 lb-in.)

Crankshaft Rear Oil Seal

Seal Case-to-Block Cap Screw Torque . . . . . 26 N•m (226 lb-in.)
Seal Case-to-Extension Cap Screw Torque . . . . . 21 N•m (180 lb-in.)

Crankshaft and Main Bearings

Main Bearing Cap Screw Torque. . . . . 98 N•m (72 lb-ft.)
Crankshaft Maximum Bend . . . . . 0.02 mm (0.0007 in.)

Connecting Rod Journal O.D.

Standard. . . . . 47.952 - 47.962 mm (1.8879 - 1.8883 in.)
Wear Limit . . . . . 47.91 mm (1.886 in.)

Main Bearing Journal O.D.

Standard. . . . . 53.952 - 53.962 mm (2.124 - 2.125 in.)
Wear Limit . . . . . 53.91 mm (2.122 in.)

Main Bearing I.D.

Clearance. . . . . 0.038 - 0.068 mm (0.0015 - 0.0027 in.)
Standard. . . . . 53.995 - 54.025 (2.123 - 2.127)
Wear Limit 54.020 (2.127)

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Intake Manifold

Mounting Cap Screw Torque . . . . . 26 N•m (226 lb-in.)

Valve Seat Angles

Valve Seat Surface

Exhaust Valve. . . . . 45°
Intake Valve . . . . . 30°
Lower Seat Surface . . . . . 70°
Upper Seat Surface . . . . . 15°



Piston-to-Cylinder Head Clearance

Standard . . . . . 0.64 - 0.82 mm (0.025 - 0.032 in.)

Piston and Connecting Rod Cap Screw Torque . . . . . 39 N•m (29 lb-ft.)

Connecting Rod Bearing I.D.

Standard . . . . . 48 - 48.028 mm (1.888 - 1.891 in.)
Wear Limit. . . . . 48.07 mm (1.893 in.)
Clearance . . . . . 0.038 - 0.074 mm (0.0015 - 0.0029 in.)

Piston Ring Groove Clearance

First Compression Ring

Standard. . . . . 0.070 - 0.105 mm (0.0028 - 0.0041 in.)
Wear Limit . . . . . 0.25 mm (0.0098 in.)

Second Compression Ring

Standard. . . . . 0.035 - 0.070 mm (0.0014 - 0.0028 in.)
Wear Limit . . . . . 0.25 mm (0.0098 in.)

Oil Ring

Standard. . . . . 0.030 - 0.060 mm (0.0012 - 0.0024 in.)
Wear Limit . . . . . 0.20 mm (0.0078 in.)

Piston Ring End Gap

Standard. . . . . 0.20 - 0.40 mm (0.008 - 0.016 in.)
Wear Limit . . . . . 1.50 mm (0.0591 in.)

Piston Pin

Pin O.D.

Standard. . . . . 25.987 - 26.00 mm (1.023 - 1.024 in.)
Wear Limit . . . . . 25.90 mm (1.020 in.)

Bore I.D.

Clearance. . . . . 0.022 mm (0.0009 in.)
Standard. . . . . 26.00 - 26.009 mm (1.0236 - 1.0240 in.)
Wear Limit . . . . . 26.02 mm (1.024 in.)

Bushing I.D.

Clearance. . . . . 0.025 - 0.051 mm (0.0009 - 0.0020 in.)
Standard. . . . . 26.025 - 26.038 mm (1.0246 - 1.0251 in.)

Piston O.D.

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CRANKSHAFT MAIN BEARING CLEARANCE CHECK

Reason:

To measure oil clearance between main bearing and crankshaft journal.

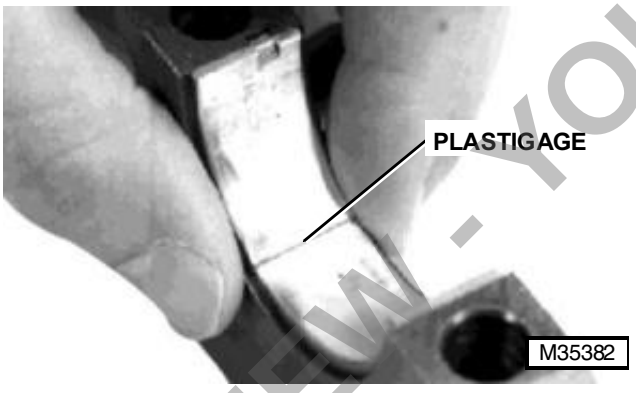
Equipment:

- PLASTIGAGE®

Procedure:

IMPORTANT: Main bearing caps must be installed on the same main bearing and in the same direction to prevent crankshaft and main bearing damage.

1. Remove main bearing cap.
2. Wipe oil from bearing insert and crankshaft journal.
3. Put a piece of PLASTIGAGE, or an equivalent, along the full length of the bearing insert approximately 6 mm (0.250 in.) off center.

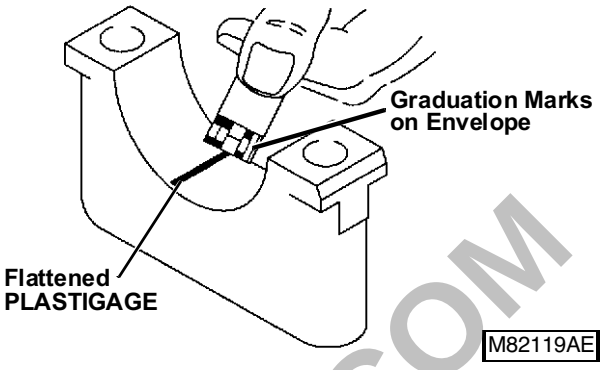


4. Install main bearing cap and cap screws. Tighten cap screws to **98 N•m (72 lb-ft)**.
5. Remove cap screws and main bearing cap.

NOTE: The flattened PLASTIGAGE will be found on either the bearing insert or crankshaft journal.

6. Use the graduation marks on the envelope to compare the width of the flattened PLASTIGAGE at its widest point.
7. Determine main bearing clearance. The number within the graduation marks indicates the bearing clearance in inches or millimeters depending on which side of the envelope is used.
8. Remove PLASTIGAGE.

®PLASTIGAGE is a registered trademark of the DANA Corporation.



Specifications:

Standard Clearance . . . . . 0.038 - 0.068 mm
. . . . . (0.0015 - 0.0027 in.)

Results:

- If clearance exceeds specification, replace bearing inserts.

VALVE LIFT CHECK

Reason:

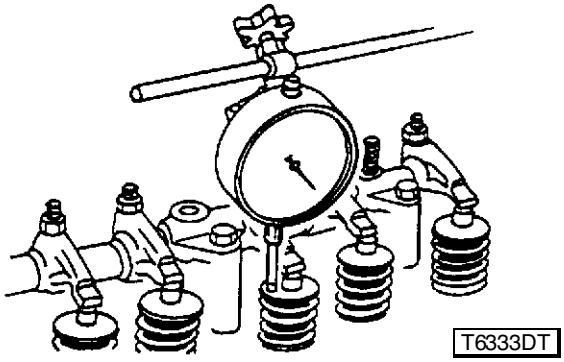
Can indicate excessive wear on cam lobes, followers, and/or push rods.

Equipment:

- Dial Indicator

Procedure:

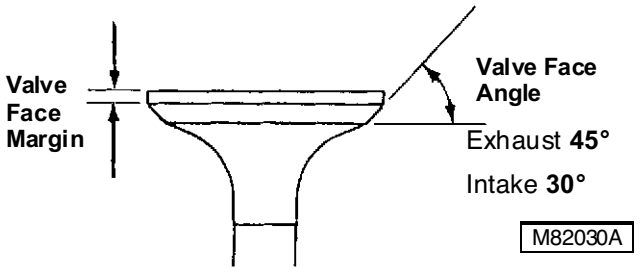
1. Adjust valve clearance. (See "VALVE CLEARANCE CHECK AND ADJUSTMENT" on page 51 in this section.)
2. Remove rocker arm cover. (See "ROCKER ARM COVER" on page 68 in this section.)



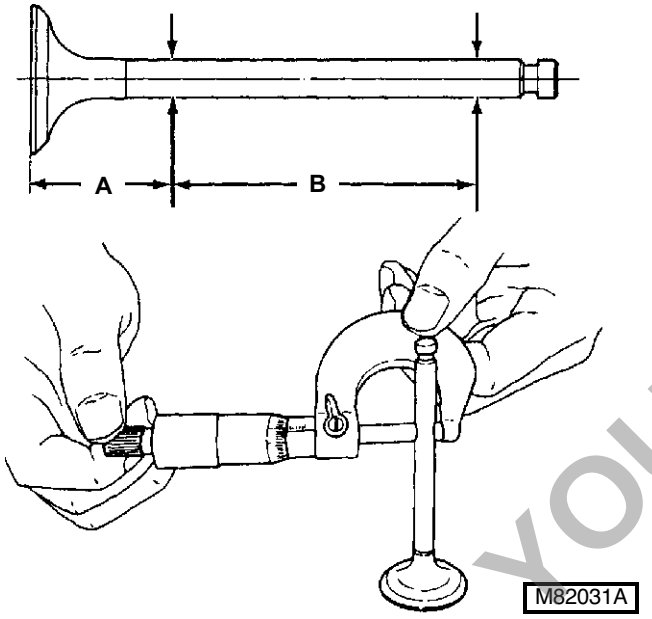
3. Fasten dial indicator to engine and position indicator tip on valve retainer. Valve must be fully closed and rocker arm must move freely.
4. Zero the dial indicator.

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- Measure valve stem diameter at two locations shown. Replace valve if measurement exceeds wear limit.



Valve Stem O.D.:

Distance A . . . . . 43 mm (1.693 in.)
Distance B . . . . . 60 mm (2.360 in.)

Intake Valve

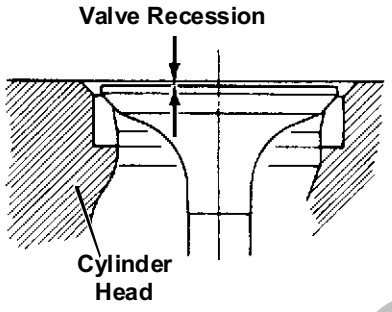
Standard . . . . . 7.96 - 7.98 mm
. . . . . (0.3134 - 0.3142 in.)
Wear Limit . . . . . 7.90 mm (0.3110 in.)

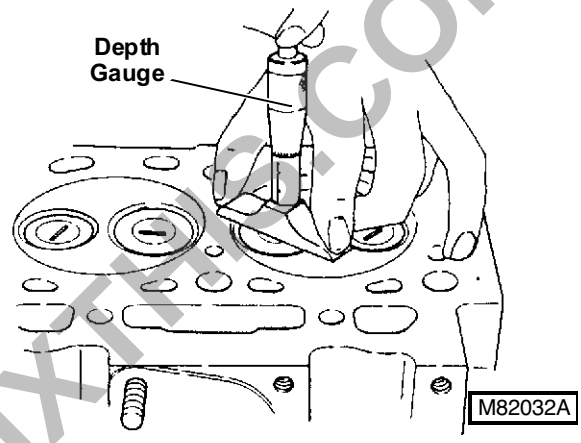
Exhaust Valve

Standard . . . . . 7.96 - 7.97 mm
. . . . . (0.3134 - 0.3138 in.)
Wear Limit . . . . . 7.90 mm (0.3110 in.)

Valve Recession

- Measure valve recession using a depth gauge. Replace valve or cylinder head if measurement exceeds wear limit.





Valve Recession:

Standard . . . . . 0.30 - 0.50 mm
. . . . . (0.012 - 0.020 in.)
Wear Limit . . . . . 1.00 mm (0.039 in.)

Valve Guides

- Clean valve guides using a valve guide brush.
- Measure valve guide inside diameter.

Valve Guide I.D.:

Standard . . . . . 8.010 - 8.025 mm
. . . . . (0.315 - 0.316 in.)
Wear Limit . . . . . 8.10 mm (0.318 in.)
Oil Clearance . . . . . 0.035 - 0.070 mm
. . . . . (0.001 - 0.003 in.)

If diameter exceeds wear limit, knurl or replace guide.

If diameter is less than wear limit, determine guide-to-stem clearance (guide diameter minus stem diameter).

If clearance exceeds **0.15 mm (0.006 in.)** but is less than **0.20 mm (0.008 in.)**, knurl valve guides.

- Knurl valve guides using:
- D-20019WI Valve Guide Knurler

If clearance exceeds **0.20 mm (0.008 in.)**, replace valve guide.

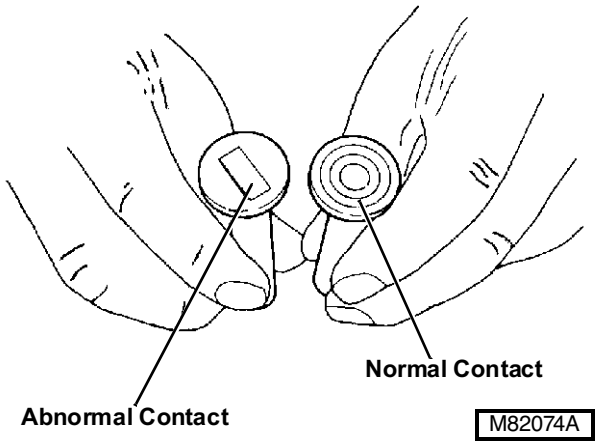
- Replace valve guides using JDE118 Valve Guide Driver.
- New valve guides must be cooled in a container of liquid nitrogen or equivalent before driving into cylinder head.

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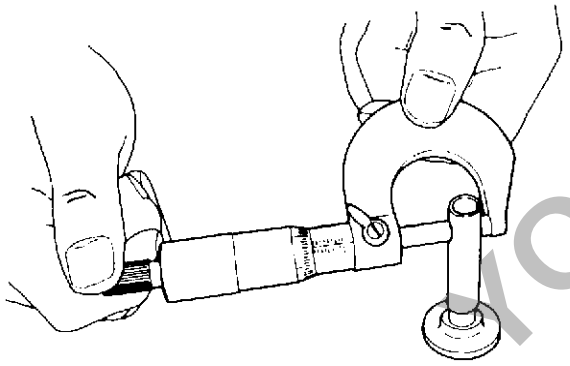
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Inspection

• Inspect cam follower contact surface for abnormal wear. Replace if necessary.



• Measure cam follower stem diameter.



Cam Follower Stem O.D.:

Standard . . . . . 11.975 - 11.990 mm (0.471 - 0.472 in.)

Wear Limit . . . . . 11.93 mm (0.470 in.)

If stem diameter is less than wear limit, replace cam follower.

• Measure cam follower bore diameter in cylinder block.

Cam Follower Bore I.D.:

Standard . . . . . 12.000 - 12.018 mm (0.472 - 0.473 in.)

Wear Limit . . . . . 12.05 mm (0.474 in.)

Clearance . . . . . 0.10 mm (0.004 in.)

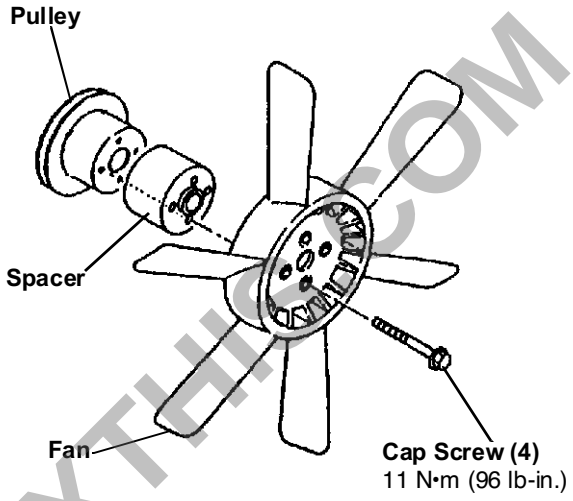
If cam follower bore diameter exceeds wear limit, replace cylinder block.

If bore clearance (bore I.D. minus follower stem O.D.) exceeds specification, replace cam follower, cylinder block or both.

TIMING GEAR COVER

Removal/Installation

1. Remove alternator and belt.
2. Remove fan, spacer and pulley.



3. Remove crankshaft pulley cap screw and washer.
4. Remove crankshaft pulley using a two-jaw puller kit.

NOTE: It is not necessary to remove end cover and O-ring or fuel injection pump gear cover to remove timing gear cover.

5. Remove mounting cap screws and timing gear cover.

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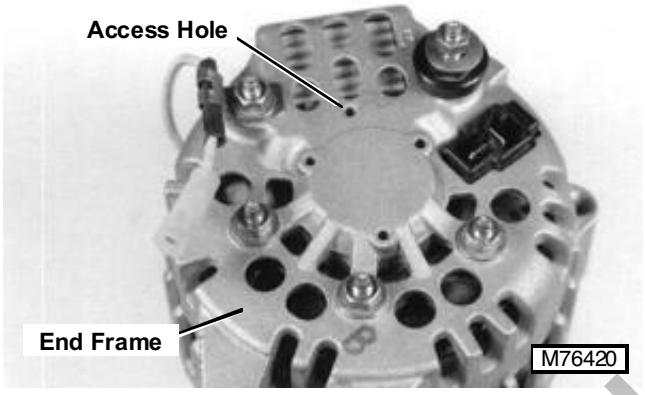
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Assembly

Assembly is done in the reverse order of disassembly.

- Bend the stator lead wires, as necessary, to obtain an approximate distance of **33.50 mm (1.300 in.)** from stator to rectifier. Connect the three leads using a soldering gun.
- If additional solder is needed, use ONLY 60-40 rosin-core solder.

IMPORTANT: Be sure stator lead wires do not contact end frame when installed.

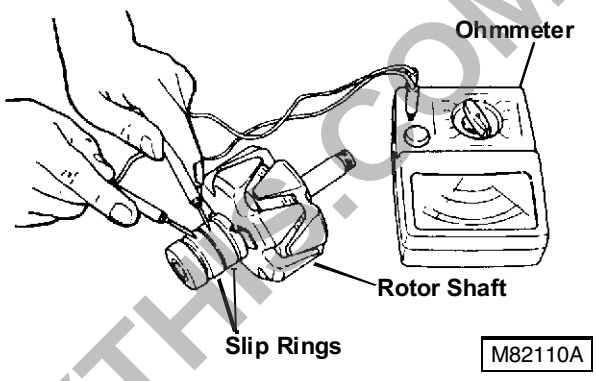


- Before assembling stator assembly to rotor assembly, push brushes into brush holder and insert a wire through access hole to lock brushes in place.
- Use alignment marks made on alternator during disassembly to aid in assembly.
- Assemble rotor assembly to stator assembly and fasten with three attaching screws. Remove wire from access hole.

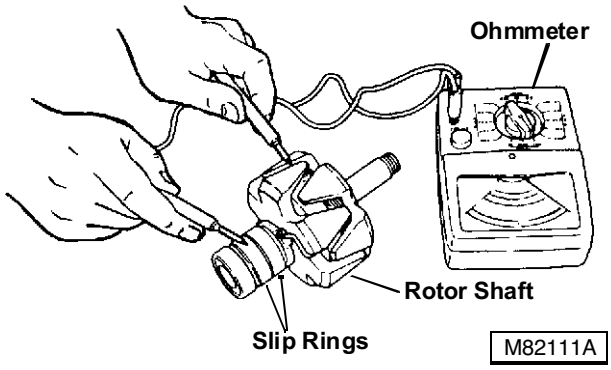
Inspection/Test

Rotor:

- Inspect the rotor slip rings for dirt build-up, rough spots, or out of roundness. If necessary, polish the surface of the slip rings using No. 00 sandpaper or 400-grit silicon carbide paper.



- Touch the probes of an ohmmeter to slip rings. Replace rotor if test indicates no continuity (no needle movement).



- Touch the probes of the ohmmeter to the shaft and one of the slip rings. Repeat for other slip ring. Replace rotor if test shows continuity (needle movement).

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CRANKING CIRCUIT OPERATION

Function:

To energize the starter solenoid, and engage starter motor to crank engine.

Operating Conditions:

- To crank the engine with the service start switch in the “RUN” position, the operator must be on the seat with the seat belt fastened. The key switch must be in the "START" position.
- With the service start switch in the “SERVICE” position, the seat belt and seat switches are bypassed, and the engine will crank anytime the key switch is in the “START” position.

System Operation:

With the service start switch (S2) in the "RUN" position:

With the key switch in the "START" position, current flows from the key switch (S3), through the service start switch (S2) (White wire), to energize the coil of the start interlock relay (K2). One set of contacts on the start interlock relay (K2) carries current from the seat and seat belt switches (Wht/Org) to energize the start relay (K1) (Wht/Dk Blu wire). With the start relay contacts closed, current flows to the “S” terminal of the starter solenoid (M1). When the starter solenoid contacts close, the starter motor (M1) and fuel shutoff solenoid pull-in coil are energized through the power circuit (Red wire).

The electronic instrument panel module is not used in the cranking circuit but is helpful for diagnosing the seat and seat belt switches. When the operator seats on the seat, current from the seat switch flows to the service start switch, electronic instrument panel module and lights the module symbols. If the module symbols light up, the seat switch is good. After the module symbol lights go out, the seat belt light will flash until the operator buckles the seat belt. When the seat belt is buckled, current from the seat belt switch (Lt Grn wire) flows to the electronic instrument panel and the seat belt light goes out. If the seat belt light goes out, the seat belt switch is good.

With the service start switch (S2) in the “SERVICE” position:

With the key switch in the "START" position, current flows from the key switch (S3), through the service start switch (S2) (White wire), to energize the start relay (K1) (Wht/Dk Blu wire). With the start relay contacts closed, the starter solenoid and fuel shutoff solenoid pull-in coil (Y1) are energized. When the starter solenoid contacts close, the starter motor (M1) is energized through the power circuit (Red wire).

The service position of the service start switch is used for diagnostics and adjustments. When the service start switch is in the service position, the seat switch, seat belt switch and start interlock relay are bypassed. This allows the engine to crank and run with the operator off the seat so the neutral adjustment can be performed. For diagnostics purposes, if the engine will not crank with the service start switch in the run position, move the switch to the service position to bypass the components and see if the engine will crank now. If the engine cranks, the seat switch, seat belt switch or start interlock relay are defective.

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ENGINE OIL PRESSURE LIGHT CIRCUIT DIAGNOSIS

Test Conditions:

- Key switch in “OFF” position
- Service start switch in the “RUN” position
- Engine oil pressure switch lead disconnected
- Check connection for corrosion and loose terminals when testing

Procedure:

1. Raise off seat until electronic instrument panel module lights go OFF.
2. Depress and hold diagnostic program mode switch (A), *do not sit on seat.*
3. Turn key switch to “RUN” position
4. Release diagnostic program mode switch

The digital display will show a “d” in the left side of the display (B) indicating the module is in the diagnostic mode.

Test/Check Point	Normal	If Not Normal
1. Yel/blk wire at engine oil pressure switch B2	When Yel/Blk wire is touched to ground, the electronic instrument panel lights will flash and module alarm will “beep”	Check Yel/Blk wire and engine harness connector

Test Conditions:

- Exit diagnostic mode by turning key switch to “OFF” position
- Service start switch in “RUN” position
- Engine oil pressure switchYel/Blk lead jumpered to ground
- Engine coolant sensor Pur/Lt Grn lead jumpered to ground
- Start engine

Test/Check Point	Normal	If Not Normal
2. Electronic instrument panel module A4	Engine oil pressure light (H4) and stop engine light (H1) flashing, audible alarm sounds, fuel shutoff solenoid shuts engine down after 30 seconds	Test electronic instrument panel module

Test Conditions:

- Engine oil pressure switch yel/blk lead disconnected from ground, engine running

Test/Check Point	Normal	If Not Normal
3. Engine oil pressure switch B2	No continuity to ground (maximum resistance)	Check engine oil pressure, if OK replace engine oil pressure switch

Test Conditions:

- Key switch in “OFF” position

Test/Check Point	Normal	If Not Normal
Engine oil pressure switch B2	Maximum 0.1 ohms resistance to ground	Check ground circuit, if OK, replace oil pressure switch

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TESTS & ADJUSTMENTS

BATTERY TEST

Reason:

To check condition of battery and determine battery voltage.

Equipment:

- Hydrometer
- JTO5685 Battery Tester

Procedure:

1. Park machine on level surface and LOCK boom in up position with boom lock lever. Roll bucket back.
2. Turn key OFF and LOCK park brake
3. Open engine cover and remove right engine side cover.
4. Disconnect negative (-) and positive cable clamps from battery. Remove battery hold-down clamp
5. Remove battery from machine.
6. Clean battery terminals and case
7. Inspect battery terminals and case for breakage or cracks.
8. Check electrolyte level in each battery cell. Add clean, soft water as needed. If water was added, charge battery for 20 minutes at 10 amps.
9. Remove surface charge by placing a small load on the battery for 15 seconds.


M49596

10. Use a hydrometer to check for a **minimum specific gravity of 1.225 with less than 50 point variation in each cell:**
    - If all cells less than 1.175, charge battery at 10 amp rate (see Charge Battery).
    - If all cells are less than 1.225 with less than 50 point variation, charge battery at 10 amp rate (see charge battery).
    - If cells are above 1.225 with less than 50 point variation, load test battery (see Battery Load Test).
    - If more than 50 point variation, replace battery.
11. Use a voltmeter or JTO5685 Battery Tester to check for a **minimum battery voltage of 12.4 volts:**
    - If battery voltage less than 12.4 VDC, charge battery.
    - If voltage is above 12.4 VDC, test specific gravity (see Step 9).
12. Install battery.

CHARGE BATTERY

Reason:

To increase battery charge after battery has been discharged.

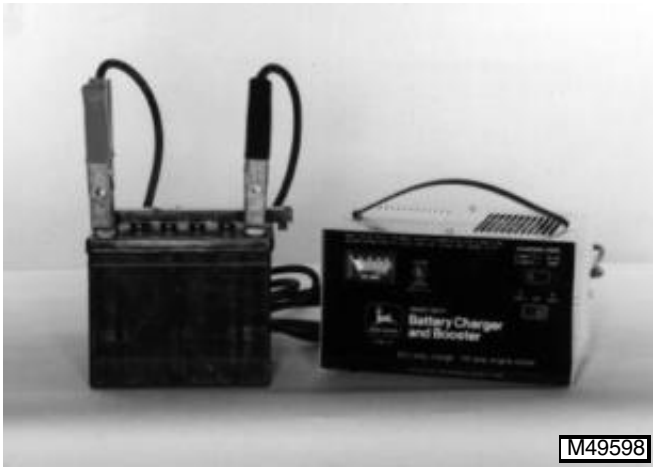
Equipment:

- Battery charger (variable rate) (use according to manufacturer's instructions).

Procedure:

NOTE: See BATTERY TEST in this group before charging battery.

1. Park machine on level surface and LOCK boom in up position with boom lock lever. Roll bucket back.
2. Turn key OFF and LOCK park brake
3. OPEN engine cover and REMOVE right engine side cover.
4. Disconnect negative (-) and positive (+) battery cable clamps. Remove battery hold-down.
5. Remove battery from machine.
6. Clean battery terminals and case



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TROUBLESHOOTING-6675/7775

Problem or Symptom / Check or Solution	Gear oil leak from gearbox	Oil leak from chain case	Oil leak from axle	Grease seepage from axle	Excessive axle play	Chain noise	Grinding noise	One drive wheel not powered	Both drive wheels on one side not powered
Check gearbox vent is clear	●								
Inspect gearbox front plate seal	●								
Inspect drive motor to gearbox sealant and O-ring	●								
Inspect seal at gearbox side plugs	●								
Inspect sealant between gearbox and chain case	●	●							
Inspect sealant on all bolt heads passing through chain case side	●	●	●						
Inspect sealant on removable side plate at chain case		●							
Inspect seal at chain case fill plug		●							
Check chain case vent is clear		●	●	●					
Inspect O-ring on axle housing		●	●						
Inspect outer grease seal at axle			●	●					
Inspect outer grease seal wear sleeve				●					
Inspect inner oil seal at axle		●	●	●					
See axle shaft end play adjustment					●				
Check chain case oil level						●	●		
Check gearbox oil level							●		
Check drive chain						●	●	●	●
See Drive Chain Tension Adjustment						●	●		

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29. Remove intermediate shaft retainer bolt and apply thread locking compound to bolt threads. Reinstall bolt and torque to **120 N•m (90 lb-ft).**
30. Clean bearing housing and inner cover of old sealant. Straighten outside lip of any distortion from removal. Apply a thin bead of form-in-place gasket sealant to mating surface of cover and install on housing.
31. Install anti-friction ring onto collar around intermediate shaft.
32. Bring large intermediate shaft chain sprocket back into chain case and place into recess behind dual sprockets.
33. Install intermediate drive chain onto large sprocket. Place smaller sprocket inside chain and push onto hydraulic drive motor shaft. Move large chain sprocket onto spline of intermediate shaft.
34. Install external snap rings onto intermediate shaft and into brake disc shaft.
35. Install brake discs and caliper cap (see *Brakes* section).
36. Install front final drive chain onto inner sprocket of intermediate drive shaft.
37. Install front axle (see *Front Axle Sprocket And Chain Installation* procedure).
38. Install rear final drive chain onto outer sprocket of intermediate drive shaft.
39. Install rear axle (see *Rear Axle Sprocket And Chain Installation* procedure).
40. Replace chain case cover (see *Chain Case Cover Removal & Installation).*

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9. Disconnect hydrostatic pump inlet hose and hydrostatic motor outlet hose.
10. Connect hydraulic tester inlet hose to motor outlet hose and hydraulic tester outlet hose to pump inlet port.
11. Connect other end of Hoses JTO3377 to DO1074AA In-Line Hydraulic Tester.
12. Operate hydraulic system until oil reaches normal operating temperature of 43°C (110°F),.
13. Using JTO5719 Hand Held Digital Tachometer, set throttle at 2000 rpm.
14. Fully actuate steering lever that controls pump and motor being tested in the **forward** drive position.
15. Record flow reading.

IMPORTANT: Accuracy in recording readings is very important!

IMPORTANT: While adjusting tester load valve, if pressure does not increase when valve is fully turned in, fluid flow through the tester is reversed. DO NOT move the steering lever in the opposite direction while the tester load valve is fully turned in. Excessive pressure will result.

16. Turn hydraulic tester load valve until pressure is 13,790 kPa (2000 psi).
17. Record flow reading.
18. Return load valve to full flow position and turn engine off.

Specifications:

6675/7775:

- Motor free flow should be approx. **76 L/Min (20 gpm)**.
- Divide **motor** flow reading recorded at 13,790 kPa (2000 psi) by **pump** flow reading recorded at 13,790 kPa (2000 psi) to determine motor efficiency.
- Motor efficiency must not be less than **80** percent.

4475/5575:

- Motor free flow should be approx. **38 L/Min (10 gpm)**.
- Divide **motor** flow reading recorded at 13,790 kPa (2000 psi) by **pump** flow reading recorded at 13,790 kPa (2000 psi) to determine motor efficiency.
- Motor efficiency must not be less than **80** percent.

Example:

Pump Flow With 13,790 kPa (2000 psi) load-20 GPM
Motor Flow With 13,790 kPa (2000 psi) load-19.4 GPM
Motor Efficiency= 19.4 ÷ 20 = 0.97 or 97 percent.

Results:

If readings do not meet specifications, verify control arm lever stops are adjusted correctly and repeat the procedure.

If motor flow or efficiency is still below the minimum requirements, rebuild and/or replace motor.

HYDROSTATIC MOTOR CASE DRAIN TEST

Reason:

To assure that hydrostatic motor is not bypassing excessive hydraulic fluid.

Equipment:

- JTO3111 Connector (2 req.)
- JTO3391 Plug
- 3/8" I.D. x 36" long Hose (2 req.)
- Hose Clamp (2 req.)
- JTO5719 Hand Held Digital Tachometer
- 1/2 Gallon Graduated Container.
- Stop Watch

Procedure:

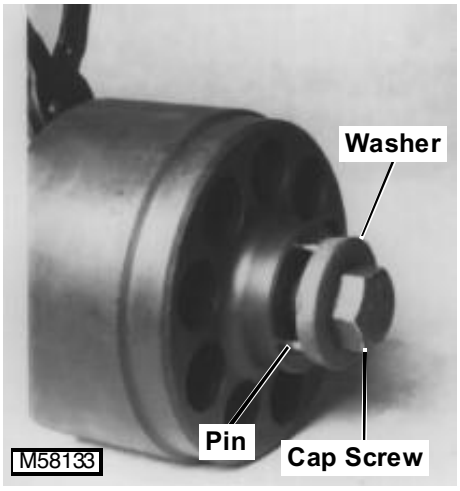
1. Park machine on level surface. Raise boom and set on boom stops.
2. Turn key switch to off position.
3. Put service start switch in service position.
4. Block skid steer off of the ground.

CAUTION

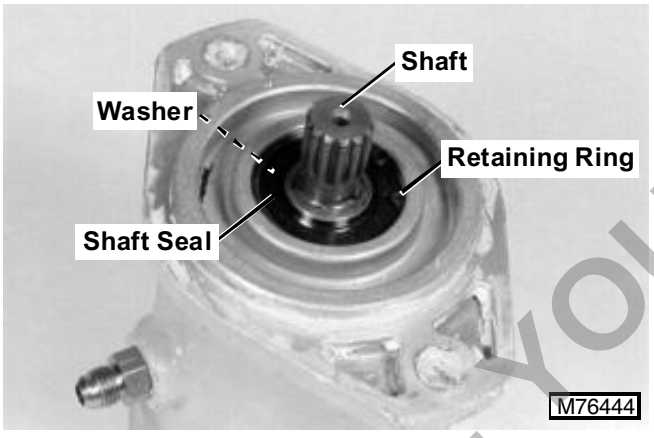
Failure to block skid steer properly could result in movement of vehicle during test procedure causing severe injury to operators and damage to equipment

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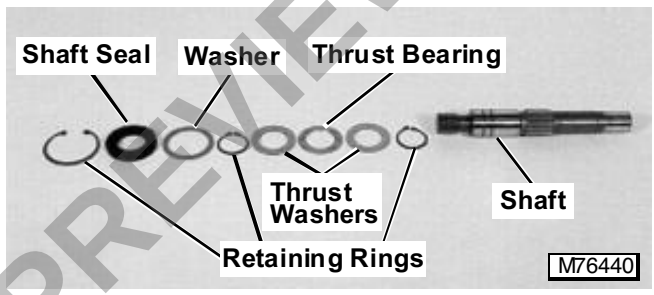
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12. Remove the nut, washer and cap screw.

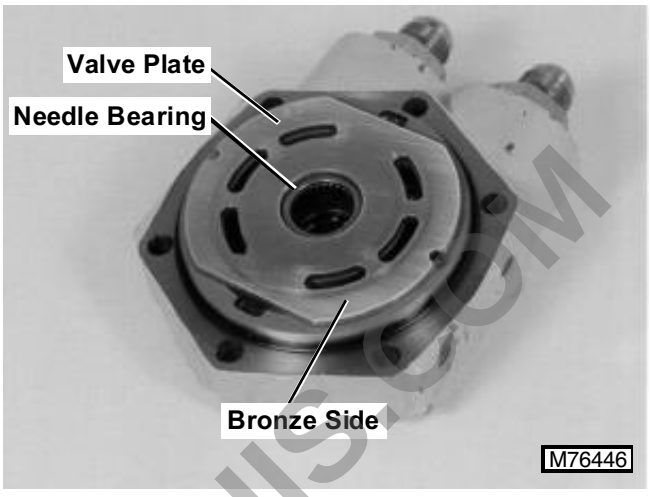


13. Remove retaining ring from housing. Press shaft from housing and remove shaft seal and washer.

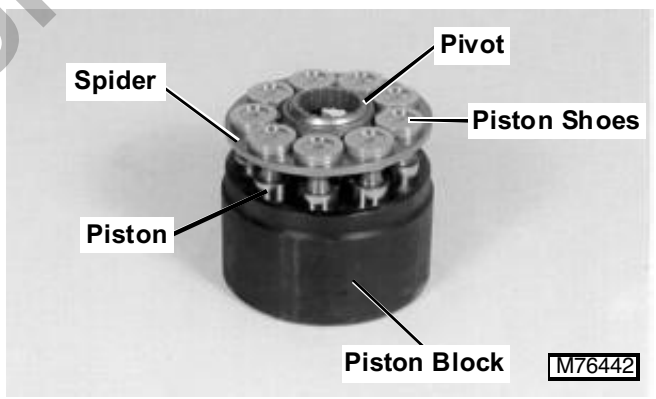


14. Remove retaining ring from shaft and remove thrust washers and thrust bearing.
15. Discard the shaft seal, and backplate O-ring and replace with new items upon reassembly.

INSPECTION



1. Check the condition of the needle bearing in backplate and replace if necessary.
2. Inspect valve plate on the bronze side next to the piston block for wear. A smooth surface is required. **DO NOT** lap valve plate bronze surface. Replace valve plate if any wear exists.

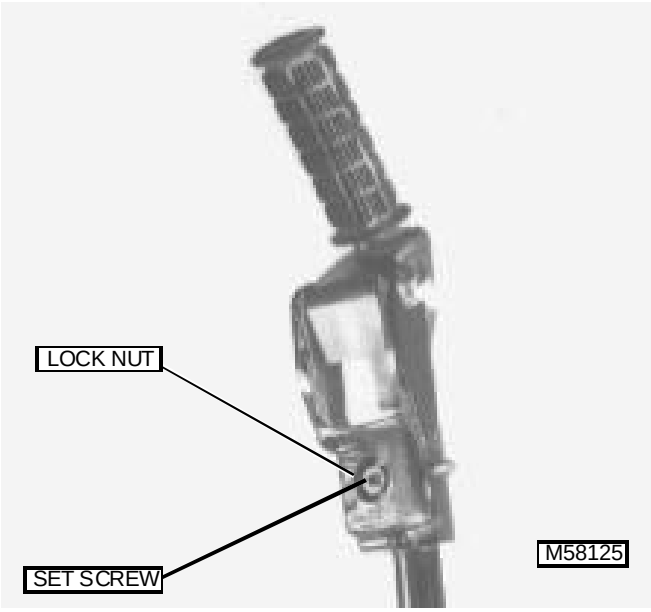


3. Inspect the piston block surface (bottom) that makes contact with valve plate. This surface should be smooth and free of deep scratches. **DO NOT** lap piston block.
4. The pistons should move freely in the piston block bore. If they are sticky in the bore, examine the bore for scoring or contamination.
5. Examine the O.D. of the pistons for finish condition. They should not show wear or deep scratches.
6. Inspect the shoes for a snug fit on the ball end of the pistons and a flat smooth surface that comes in contact with the camplate. **DO NOT** lap piston shoes. The polished finish on the shoe surface of the camplate insert should show no signs of scoring.
7. Examine the spider for wear in the pivot area.
8. Examine the pivot to insure smoothness and no signs of wear.

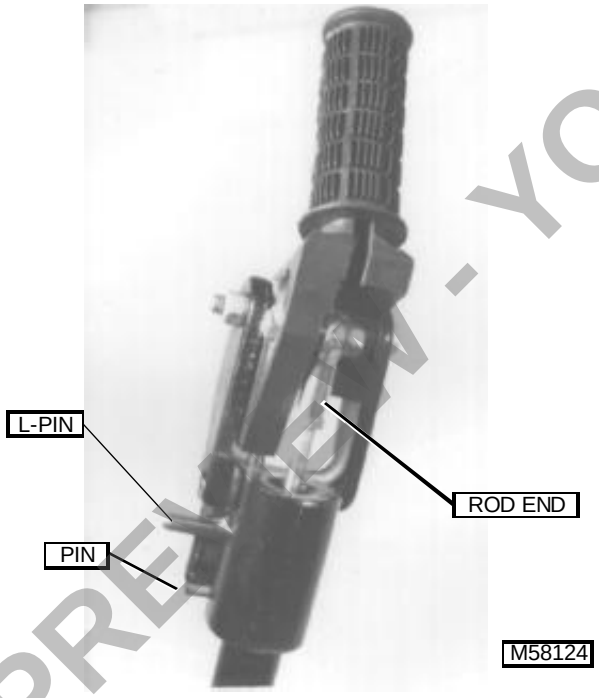
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AUXILIARY HANDLE DISASSEMBLY



1. Yoke can be removed from control arm by loosening lock nut and backing off set screw and removing bolt retaining rod end.



2. Remove L-pin by driving retaining pin from handle.

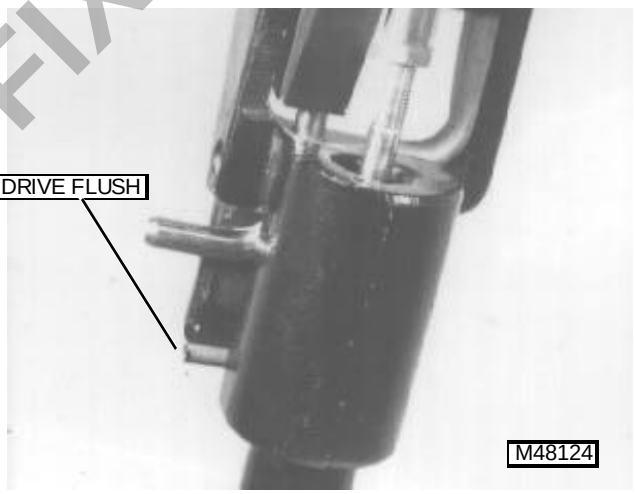
NOTE: Do not loose detent ball and spring located behind L-pin.

AUXILIARY HANDLE ASSEMBLY

1. Inspect all parts for excessive wear. Replace if necessary.



2. Install spring and ball in hole in handle yoke.
3. Compress spring and insert L-pin in place.

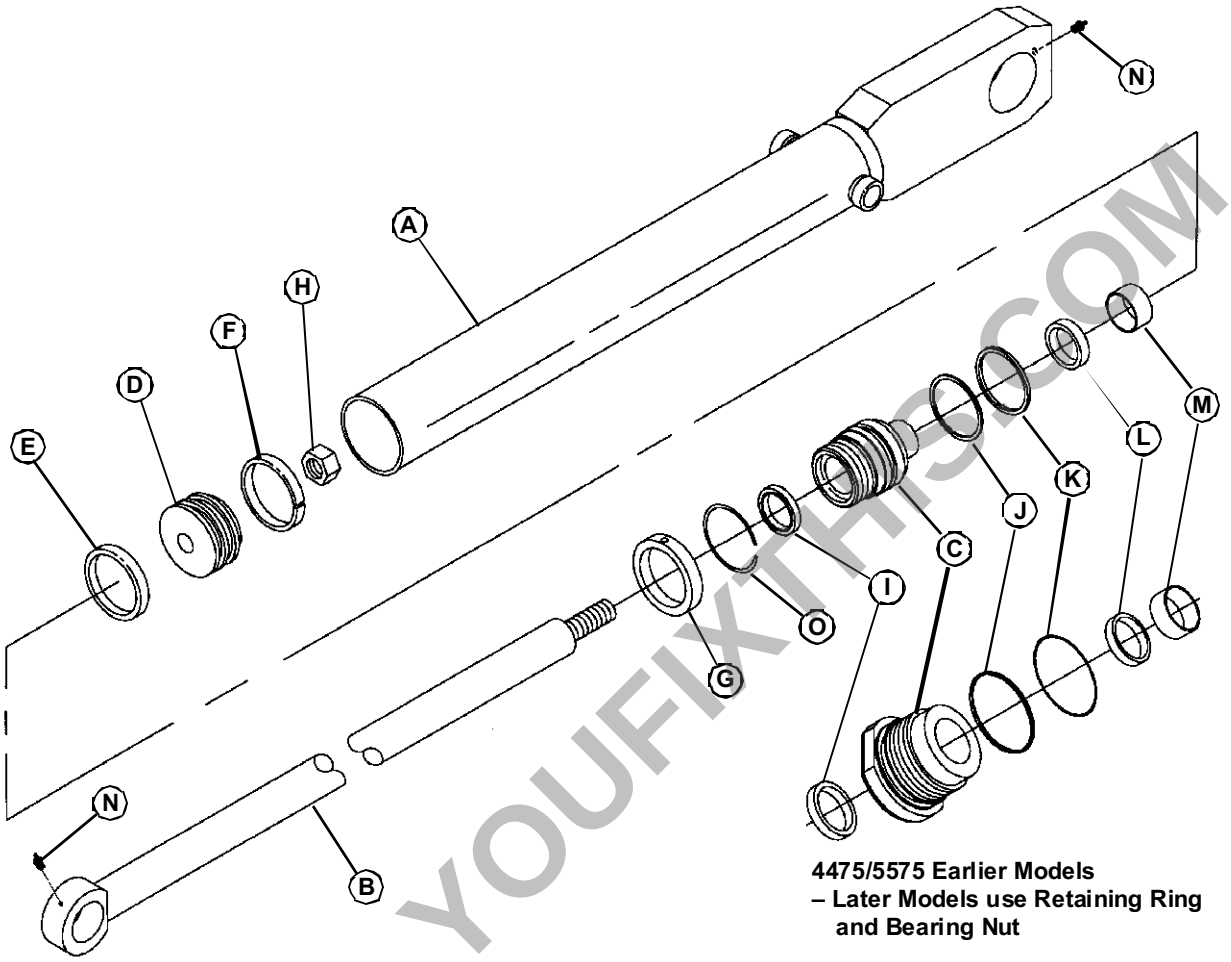


4. Drive C-pin in hole until it is flush with handle yoke.
5. Slide the handle assembly on to control arm.
6. Connect rod end to handle assembly.
7. Install set screw and lock nut. Tighten set screw to 9 N•m (80 lb-in.). Tighten lock nut to 13.5 N•m (120 lb-in.).

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LIFT CYLINDER COMPONENT LOCATION



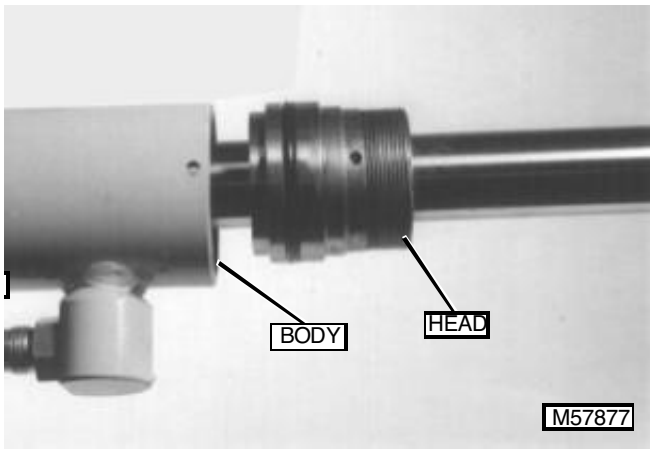
4475/5575 Earlier Models
– Later Models use Retaining Ring and Bearing Nut

M57922A

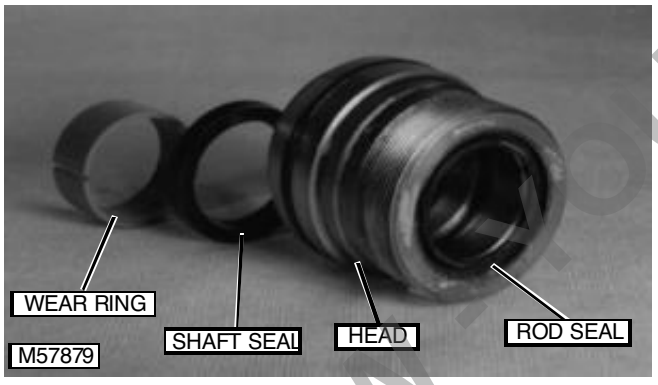
A. Cylinder Body
B. Rod
C. Head
D. Piston
E. Piston Seal
F. Piston Wear Ring
G. Bearing Nut
H. Nut
I. Rod Seal
J. Backup Washer
K. O-Ring
L. Shaft Seal
M. Rod Wear Ring
N. Zerk
O. Retaining Ring

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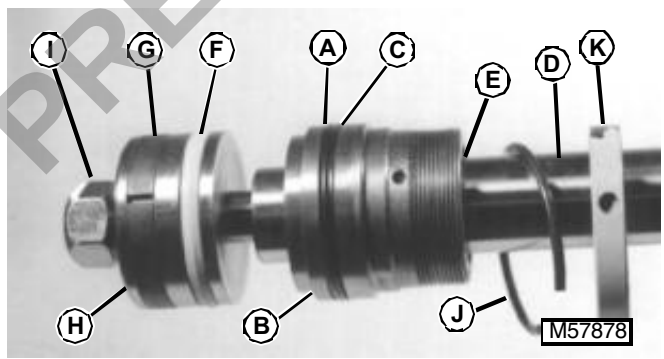


4. Push cylinder head into cylinder body bore far enough to remove retaining ring.
5. Pull piston rod and piston out of barrel.
6. Disassemble, clean and inspect parts. Remove any nicks or burrs with emery cloth.
7. Carefully inspect cylinder bore and piston for deep grooving or scratches. Replace entire cylinder if either are damaged.



NOTE: Shaft seal should be installed with the lip of the seal facing the piston.

8. Replace shaft seal and wear ring on inside of head.
9. Drive new rod seal into head.



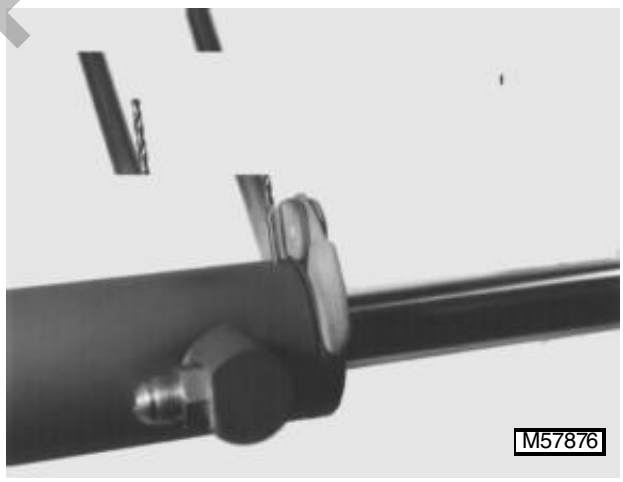
10. Replace O-ring (A) on outside of cylinder head (B).

NOTE: Check location of back up washer (C). Washer should be located toward threaded portion of head.

11. Lubricate inside of cylinder head with hydraulic oil.
12. Lubricate piston rod (D) and install cylinder head assembly on rod being careful not to tear seal (E).
13. Install a new piston seal (F) and wear ring (G) on piston (H).

NOTE: Piston seal will stretch as it is installed. Compress seal after installation using hose clamp or ring compressor.

14. Install piston and locknut (I) on rod. Tighten locknut to 169 N•m (125 lb-ft.).
15. Apply hydraulic oil to piston seal and wear ring. Insert piston and rod assembly into barrel. Be sure to align hole in cylinder body with hole in cylinder head.
16. **4475/5575 Early Models ONLY—**Torque head to **285 N•m (210 lb-ft.).**
17. Install retaining ring (J).



18. Insert 11/64" drill in hole in cylinder body. Hole should align with matching hole in cylinder head.
19. Tighten bearing nut (K) to 230 N•m (170 lb-ft.) with DO5112ST adjustable hook spanner wrench.
20. Pack drill hole with grease.
21. Install hydraulic fittings if removed.

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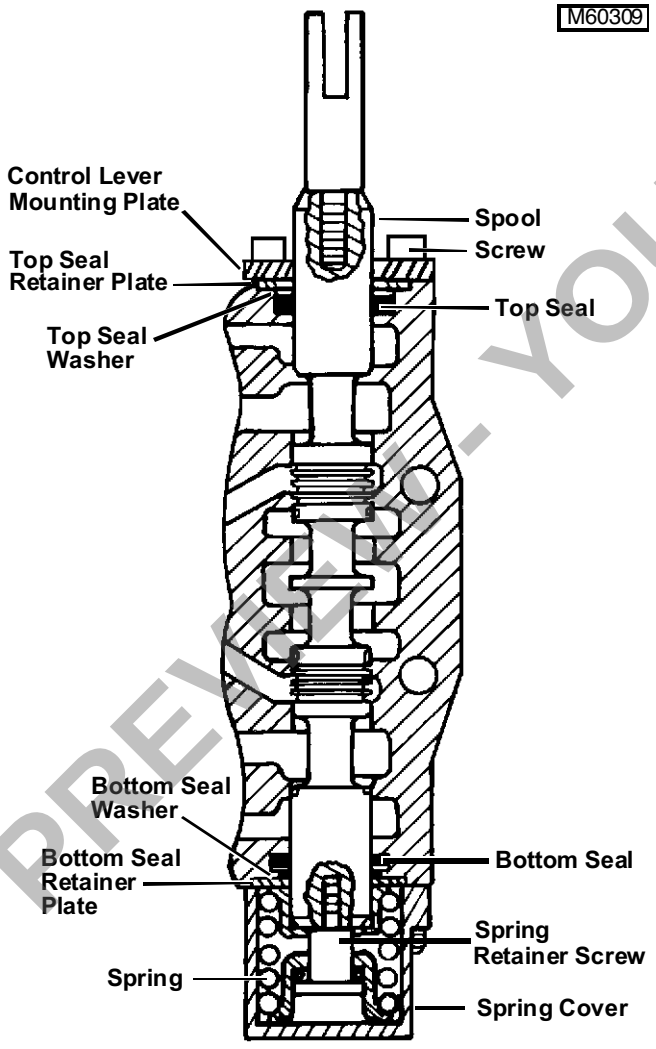
backup rings from seal kit.

3. Be sure poppet is seated properly in valve body.
4. Torque body of valve to **27 N•m (20 lb-ft).**

CONTROL VALVE SPOOL INSTALLATION

NOTE: Spools in the valve sections are identical, but each spool MUST be installed in the valve section from which it was removed.

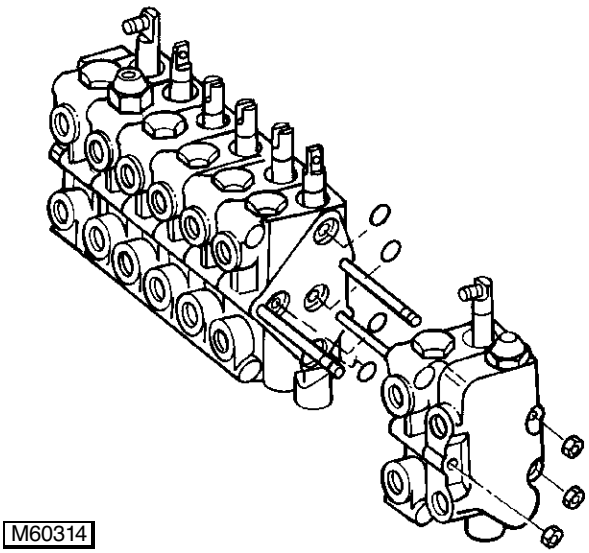
1. Thoroughly clean spool in solvent and air dry. Avoid scratching spool body.
2. Lubricate valve section bore and spool with engine oil.
3. Carefully install spool into valve body. Avoid scratching spool body.



4. Install top and bottom spool seals over ends of spools with lips of seals facing valve body. Push seals down into recess in valve body.
5. Place bottom seal washer over bottom of spool with raised lip facing away from seal.
6. Place bottom seal retainer plate over bottom of spool and over raised lip on seal washer. Fit retainer plate into recess in valve body.
7. Compress centering spring, spring retainers, and retainer screw against bottom of valve body and thread retainer screw into bottom of spool. **Torque to 13.5 N•m (10 lb-ft).**
8. Install spring cover over spring. Install two 1/4" Allen head cap screws into cover plate and **torque to 13.5 N•m (10 lb-ft).**
9. Install top seal washer over top of spool with raised lip facing away from valve.
10. Install top seal retainer plate over top of spool and over top of raised lip on seal washer. Fit retainer plate into recess in valve body.
11. On 800 Backhoe control valve, install spool retainer plate and Allen head screws. **Torque to 13.5 N•m (10 lb-ft.)**.

CONTROL VALVE ASSEMBLY

1. Install three long tie rods through holes in end plate.
2. Place two large and two small O-rings into machined grooves on end plate.
3. Slide bucket control valve onto tie rods and down to end plate. Be sure O-rings remain in place.
4. Install three large and one small O-ring into machined grooves on bucket control valve section.
5. Slide dipperstick control valve onto tie rods and down to bucket control valve section. Be sure O-rings remain in place.



6. Continue to stack valve sections in order. Place main relief valve on last and secure with three nuts.

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