Return to INDEX

200CLC 230CLC and 270CLC Excavator Repair

TECHNICAL MANUAL
200CLC, 230CLC, and 270CLC Excavator Repair

TM1931 09JAN04 (ENGLISH)

For complete service information also see:

200CLC, 230CLC, and 270CLC Excavator Operation and Tests	TM1930
POWERTECH® 4.5 L & 6.8 L (4045 and 6068) Diesel Engines, Base Engine	CTM104
POWERTECH® 4.5 L & 6.8 L (4045 and 6068) Diesel Engines, Level 4 Electronic Fuel Systems with Bosch VP44 Pump	CTM170
Alternators and Starting Motors	CTM77
Undercarriage Appraisal Manual	SP326

Worldwide Construction And Forestry Division

LITHO IN U.S.A.

Recognize Safety Information

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert for the potential of personal injury.

Follow the precautions and safe operating practices highlighted by this symbol.

A signal word — DANGER, WARNING, or CAUTION — is used with the safety alert symbol. DANGER identifies the most serious hazards.

On your machine, DANGER signs are red in color, WARNING signs are orange, and CAUTION signs are yellow. DANGER and WARNING signs are located near specific hazards. General precautions are on CAUTION labels.

T133555 –UN–28AUG00

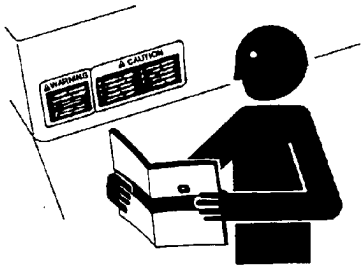
T133588 –19–28AUG00

TX03679,00016CC –19–21AUG00–1/1

Follow Safety Instructions

Read the safety messages in this manual and on the machine. Follow these warnings and instructions carefully. Review them frequently.

Be sure all operators of this machine understand every safety message. Replace operator's manual and safety labels immediately if missing or damaged.



T133556 –UN–24AUG00

TX03679,00016F9 –19–28AUG00–1/1

Operate Only If Qualified

Do not operate this machine unless you have read the operator's manual carefully and you have been qualified by supervised training and instruction.

Familiarize yourself with the job site and your surroundings before operating. Try all controls and machine functions with the machine in an open area before starting to work.

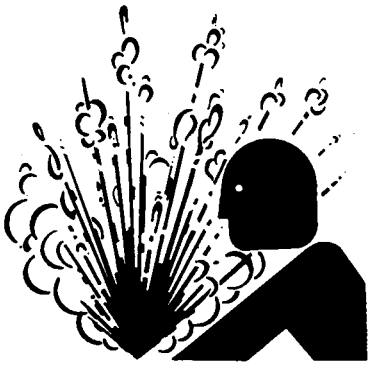
Know and observe all safety rules that may apply to your work situation and your work site.

TX03679,00016FA –19–30OCT00–1/1

Service Cooling System Safely

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.



TS281 –UN–23AUG88

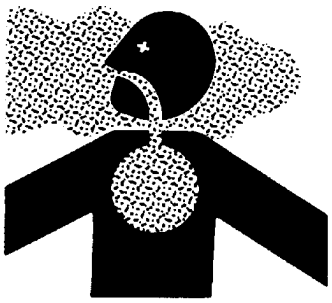
DX,RCAP –19–04JUN90–1/1

Remove Paint Before Welding or Heating

Hazardous fumes can be generated when paint is heated by welding or using a torch. Dust from sanding or grinding paint can also be hazardous.

Remove paint to at least 76 mm (3 in.) from area to be heated. Wear an approved respirator when sanding or grinding paint. If a solvent or paint stripper is used, wash area with soap and water. Remove solvent or paint stripper containers from work area and allow fumes to disperse at least 15 minutes before welding or heating.

Work outside or in a well-ventilated area. Dispose of waste, paint and solvents properly.



T133546 –UN–24AUG00

TX03679,0001732 –19–06SEP00–1/1

Make Welding Repairs Safely

NOTE: Disable electrical power before welding. Turn off main battery switch or disconnect positive battery cable. Separate harness connectors to engine and vehicle microprocessors.

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines fail as a result of heating. Do not let heat go beyond work area to nearby pressurized lines.

Remove paint properly. Do not inhale paint dust or fumes. Use a qualified welding technician for structural repairs. Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

T133547 –UN–31AUG00

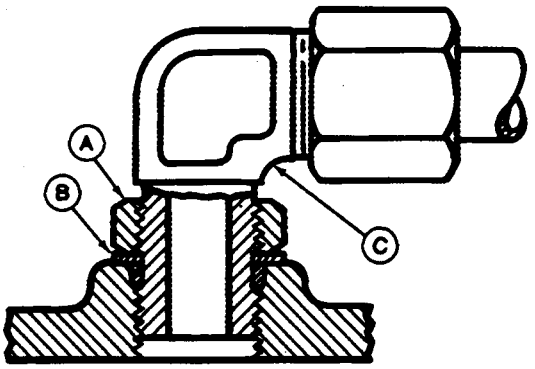
TX03679,00016D5 –19–02OCT00–1/1

Angle Fitting

1. Back-off lock nut (A) and back-up washer (B) completely to head-end (C) of fitting.
2. Turn fitting into threaded boss until back-up washer contacts face of boss.
3. Turn fitting head-end counterclockwise to proper index (maximum of one turn).

NOTE: Do not allow hoses to twist when tightening fittings.

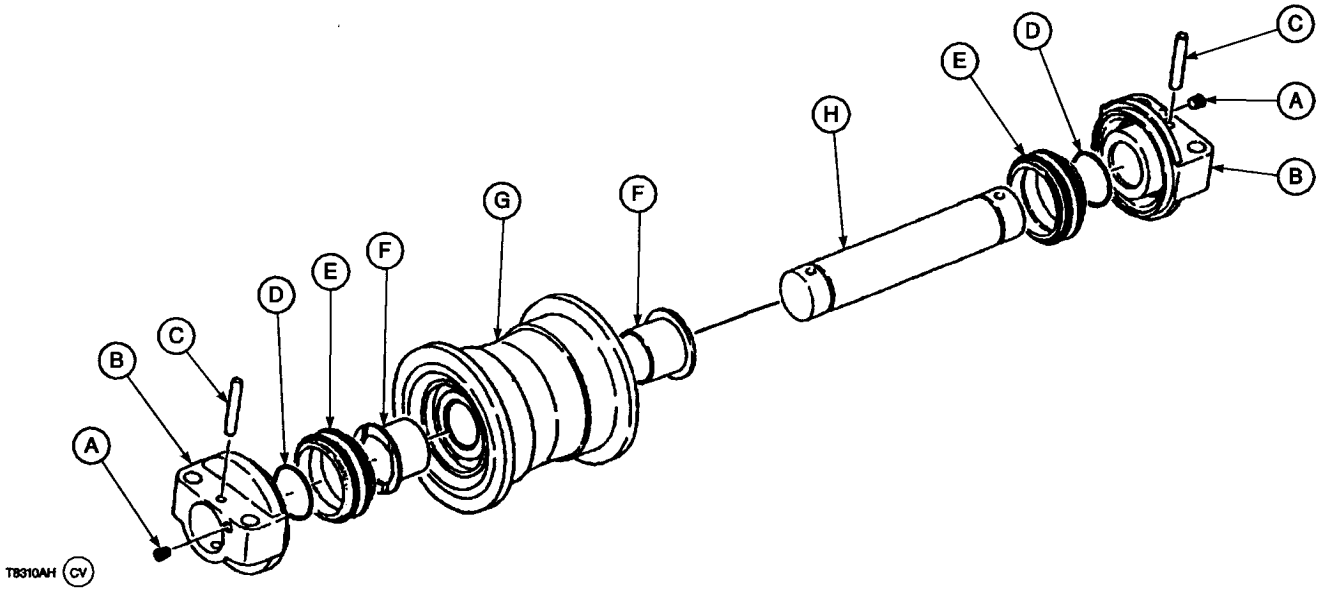
4. Hold fitting head-end with a wrench and tighten locknut and back-up washer to proper torque value.



T6520AB –UN–18OCT88

STRAIGHT FITTING OR SPECIAL NUT TORQUE CHART		
Thread Size	**N•m**	**lb-ft**
3/8-24 UNF	8	6
7/16-20 UNF	12	9
1/2-20 UNF	16	12
9/16-18 UNF	24	18
3/4-16 UNF	46	34
7/8-14 UNF	62	46
1-1/16-12 UN	102	75
1-3/16-12 UN	122	90
1-5/16-12 UN	142	105
1-5/8-12 UN	190	140
1-7/8-12 UN	217	160
NOTE: Torque tolerance is ± 10%.		

04T,90,K66 –19–29SEP99–2/2



T8310AH –UN–21SEP94

A—Plug (2 used)
B—Bracket (2 used)
C—Pin (2 used)
D—O-Ring (2 used)
E—Metal Face Seal (2 used)
F—Bushing (2 used)
G—Roller
H—Axle

Disassemble and Assemble Track Roller

1. Remove plug (A) and drain oil.
2. Remove pin (C).
3. Remove bracket (B) using a bearing puller attachment and adapters from puller set.

IMPORTANT: Metal face seals can be reused if they are not worn or damaged. A used seal must be kept together as a set because of wear patterns on seal ring face.

4. Remove metal face seal (E) from roller and bracket. Keep seal rings together as a matched set with seal ring faces together to protect surfaces.
5. Inspect metal face seals. See Metal Face Seals Repair. (See procedure in this group.) For seals that will be reused, put a piece of cardboard between seal rings to protect seal face.
6. Remove axle (H) from roller.

NOTE: Only remove bushing if replacement is necessary.

7. Remove bushing (F) using a 2 jaw puller and adapters from puller set.
8. Replace parts as necessary.

   Apply a thin film of oil to bushings (F) and install.

IMPORTANT: O-rings and seat surfaces for O-rings must be clean, dry, and oil free so O-rings do not slip when roller is turning.

9. Thoroughly clean O-rings and seat surfaces in brackets (B) and in seal rings using volatile, non-petroleum base solvent and lint-free tissues.
10. Install seals (E) in brackets (B) and in roller (G). Apply equal pressure with fingers at four equally spaced points on seal face. Seal must “pop” down into place so O-ring is tight against seal bore. A volatile, non-petroleum base solvent or talcum powder may be used as a lubricant.

Continued on next page

NOTE: Wear on pins and bushings does not extend over the entire surface. Turning pins and bushing is determined by the amount of wear.

2. Turn pins (C and K) and bushings (E and I) as required.

3. Clean any dust or rust from the surfaces of track link pin bores and counterbores and the ends of bushings.

4. Apply grease to the counterbore in track links, the seals, and the ends of bushings.

5. For each joint, fill the clearance between the pin OD and bushing ID with grease.

6. Install seal (H) so tapered side (L) is toward bushing.

OUOE049,0000065 –19–20JUN01–5/5

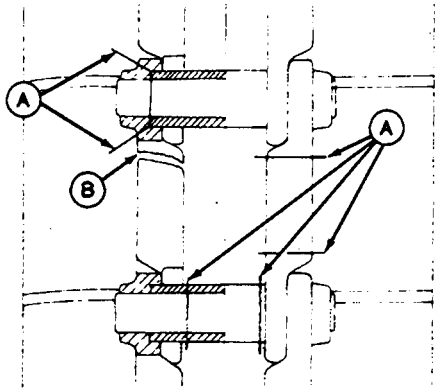
Broken Track Chain Part Repair

Disassemble and Assemble Track Chain to Replace Broken Part

1. Remove track shoes from each side of broken link assembly. See Track Shoe Repair. (See procedure in this group.)

IMPORTANT: When making cuts using cutting torch, be careful not to cut or gouge good parts.

2. Cut links, bushing, and pin at points (A) to remove broken link (B).



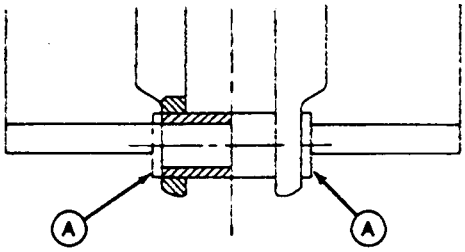
T5821AG –UN–26OCT88

A—Cut Locations
B—Broken Link

OUOE003,0000008 –19–28OCT01–1/4

3. Grind the ends of bushing (A) even with links to make it into a master bushing.

A—Bushing



T5821AH –UN–26OCT88

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OUOE003,0000008 –19–28OCT01–2/4

6. Install DFT1087 Track Recoil Spring Disassembly and Assembly Guard Tool (F). (Group 9900.)

7. Install plate top (A) and nuts (B) with smallest opening to allow access to nut (D).

8. Extend jack ram to provide enough travel to release spring to the approximate free length.

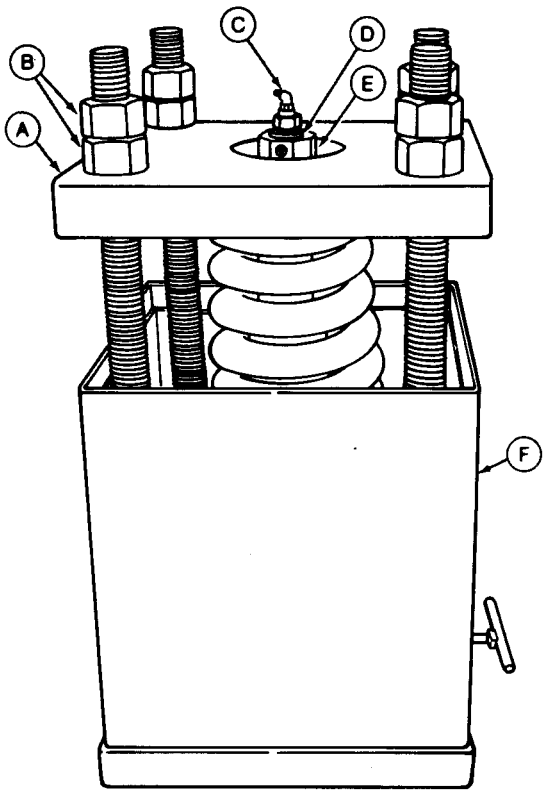
Track Adjuster and Recoil Spring—Specification

Recoil Spring (200CLC and 230CLC)—Free Length	626 mm (24.64 in.) approximate
Recoil Spring (270CLC)—Free Length	679 mm (26.73 in.) approximate

9. Tighten nuts (B) so plate is tight against retainer plate.

10. Remove valve (C) and special plug (E).

A—Top Plate
B—Nut (8 used)
C—Valve
D—Nut
E—Special Plug
F—DFT1087 Track Recoil Spring Disassembly and Assembly Guard Tool



T7720AG –UN–28APR92

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OUOE003,000000A –19–09NOV01–5/6

1—Third Planet Carrier
2—Third Planet Sun Gear
3—Thrust Plate (6 used)
4—Second Planet Gear (3 used)
5—Needle Bearing (3 used)
6—Pin (3 used)
7—Spring Pin (3 used)
8—Second Planet Carrier
9—Spacer (2 used)
10—Second Planet Sun Gear
11—First Planet Carrier
12—Shaft
13—Ring Gear
14—Thrust Pad
15—Cap Screw (12 used)
16—Cover
17—Cap Screw (24 used)
18—Spring Pin (3 used)
19—Pin (3 used)
20—Thrust Plate (6 used)
21—Needle Bearing (3 used)
22—First Planet Gear (3 used)
23—Spring Pin (3 used)
24—Pin (3 used)
25—Thrust Plate (6 used)
26—Needle Bearing (6 used)
27—Third Planet Gear
28—Propel Motor
29—Metal Face Seal
30—Bearing (2 used)
31—Drum
32—Bearing Nut
33—Dowel Pin

Disassemble and Assemble Propel Gearbox—200CLC and 230CLC

1. Remove cap screws (15) and cover (16).
2. Remove shaft (12) and first planet carrier (11).
3. Remove second planet sun gear (10) and second planet carrier (8).

CAUTION: Heavy component; use a hoist.

Propel Gearbox—Specification

Ring Gear (200CLC and 230CLC)—Weight..... 41 kg (90 lb) approximate

4. Install JT01748 Lifting Brackets to ring gear (13). Remove cap screws (17) and ring gear.

CAUTION: Heavy component; use a hoist.

Propel Gearbox—Specification

Third Planet Carrier (200CLC and 230CLC)—Weight..... 39 kg (85 lb) approximate

5. Remove third planet sun gear (2) and third planet carrier (1).

NOTE: Disassembly of first, second, and third planet carriers are similar. Repeat procedure as required.

6. Remove spring pins, pins, thrust plates, needle bearings, and planetary gears.

   Clean and inspect parts, replace as necessary. Oil parts with gear oil prior to assembly.

02 0250 5

OUOE049,0001000 –19–19NOV01–4/14

7. Install spring pins with slit (1) toward end of pin.
8. Install third planet gear (27) in third planet carrier (1) with marked side towards hole for spring.

1—Slit

T142429 –UN–22JUN01

Continued on next page

OUOE049,0001000 –19–19NOV01–5/14

Propel Motor Repair

Remove and Install Propel Motor—200CLC and 230CLC

NOTE: Propel motor is an integral part of propel gearbox.

If removal is required. See Propel Gearbox Repair. (Group 0250.)

Remove and Install Propel Motor—270CLC

CAUTION: Prevent possible injury from unexpected machine movement. Block both tracks when removing propel motors. When propel motors are removed, machine has no brakes and can move. The machine will roll free on a slope or while being towed.

1. Block tracks.
2. Drain oil from propel gearbox. Approximate capacity is 6.0 L (6.5 qt).

CAUTION: The hydraulic oil tank is pressurized. High pressure release of oil can cause serious burns or penetrating injury.

3. Do Hydraulic Oil Tank Vent Procedure. (Group 3360.)
4. Pull a vacuum in hydraulic oil tank using a vacuum pump or drain hydraulic oil tank. See 270CLC Drain and Refill Capacities. (Operator's Manual.)

Continued on next page

23. Install shoulder bolt (C) through link assembly (D) at end of servo piston. Install plug and O-Ring . Tighten shoulder bolt (C) and plug (B).

Propel Motor—Specification

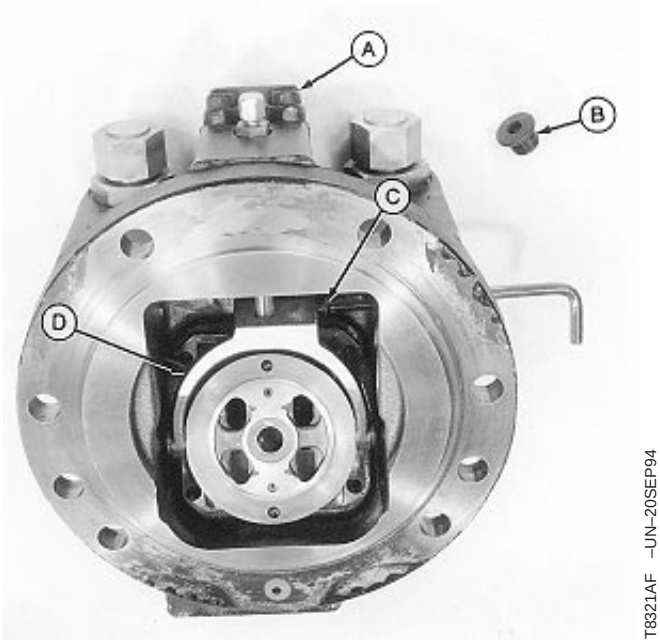
Shoulder Bolt (270CLC)—Torque ..... 49 N•m (36 lb-ft)

24. Install O-ring and cover (A). Tighten cover cap screws.

Propel Motor—Specification

Servo Piston Cover Cap Screw (270CLC)—Torque ..... 88 N•m (65 lb-ft)

A—Cover
B—Plug and O-Ring
C—Shoulder Bolt
D—Valve Plate and Link Assembly



T8321AF –UN–20SEP94

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0260
11

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ouoe049,0001010 –19–19NOV01–15/26

NOTE: Valves can be removed with propel motor on machine.

5. **Check Valves (M)**

Install parts and tighten plug.

Propel Motor—Specification

Check Valve Plug (270CLC)—
Torque ..... 235 N•m (173 lb-ft)

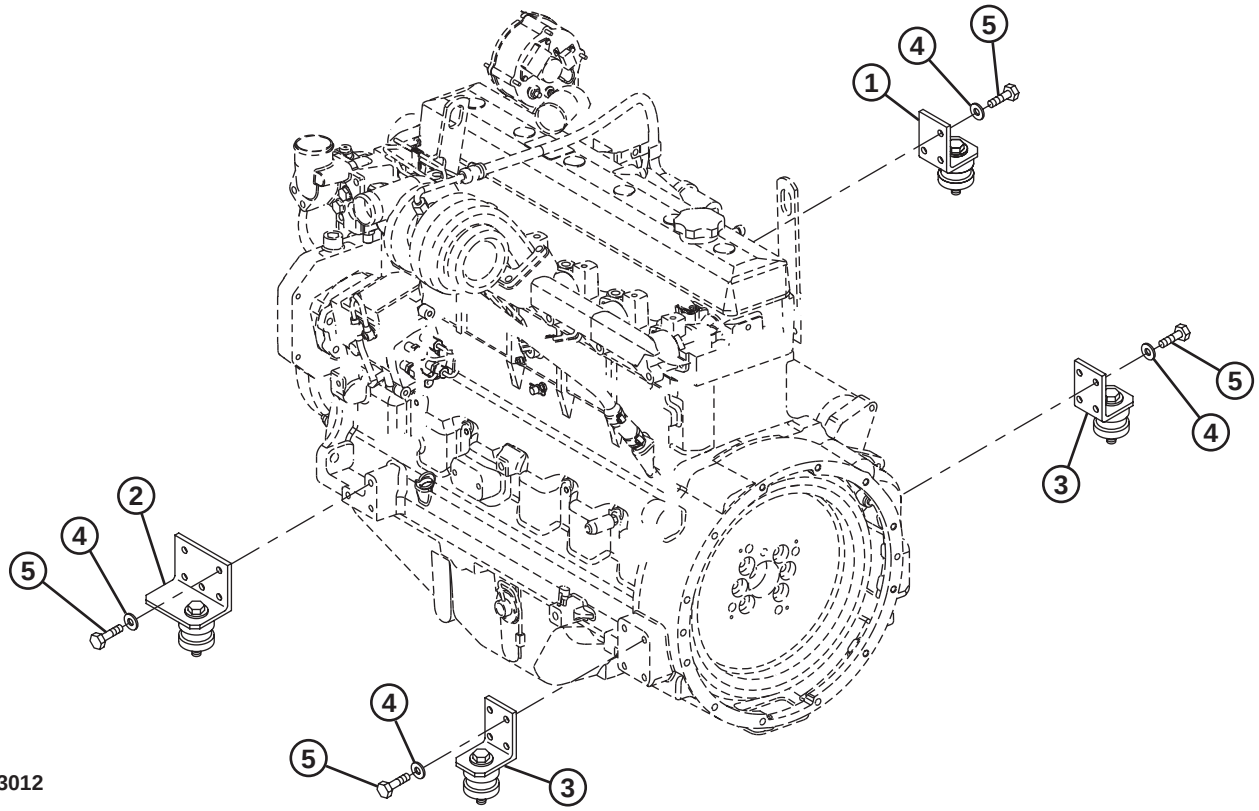
NOTE: Valve can be removed with propel motor on machine.

6. **Brake Pressure Reducing Valve (U)**

Install parts and tighten plug.

Propel Motor—Specification

Brake Pressure Reducing Valve
Plug (270CLC)—Torque..... 69 N•m (51 lb-ft)



T143012 –UN–19NOV01

1—Bracket, Right Front
2—Bracket, Left Front
3—Bracket, Rear (2 used)
4—Cap Screw (14 used)
5—Washer (14 used)

16. Remove cap screws (4) and washers (5) from engine mounts.

17. Raise engine slightly. Move engine away from hydraulic pump and drive gearbox. Lift and remove engine when disengaged from hydraulic pump drive coupling.

18. Repair or replace parts as necessary. If disassembly is necessary, see Engine Disassembly Sequence. (CTM104.)

CAUTION: Heavy component; lift engine using JDG23 Lifting Sling. Lifting force must be 90° to engine lift points.

Engine—Specification

Engine—Weight	954 kg (2100 lb) approximate

19. Use JDG23 Lifting Sling to install engine. Install engine mount cap screws (5) and washers (4). Tighten cap screws.

Engine—Specification

Engine Mount Cap Screw—Torque	350 N•m (260 lb-ft)

20. Align hydraulic pump and drive gearbox to engine and tighten cap screws.

Engine—Specification

Drive Gearbox-to-Flywheel Housing Cap Screw—Torque	50 N•m (37 lb-ft)

21. Connect engine wiring. See Machine Harness (W2) Component Location Diagram. (Group 9015-10.)

22. Fill radiator and reservoir with coolant. See Cooling System Fill and Deaeration Procedure. (Operator's Manual.)

23. Bleed Fuel System. (Operator's Manual.)

TX,04,DH5305 –19–19NOV01–4/4

Air Intake System Leakage Test

1. Remove air cleaner cover. Remove primary filter element.
2. Put a large plastic bag inside and over end of element as shown. Install element and cover.
3. Remove fitting for start aid nozzle from intake manifold.
4. Install the JDG51 Inlet Air Adapter (A).
5. Connect air pressure regulator to adapter using hose and fitting.

IMPORTANT: Plastic bag could be drawn into the engine causing damage if engine starts. Do not start the engine when turning the engine crankshaft to close valves.

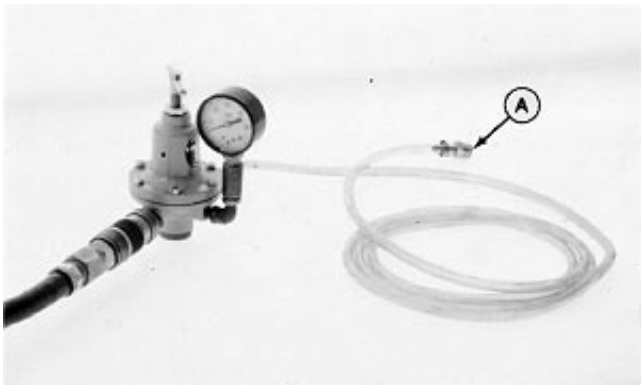
6. Pressurize air intake system to 14—21 kPa (0.14—0.21 bar) (2—3 psi). If intake system cannot be pressurized, turn engine crankshaft slightly to close valves.

Air Intake System—Specification

Leakage Test—Pressure	14—21 kPa (0.14—0.21 bar) (2—3 psi)

7. Spray a soap solution over all connections from the air cleaner to turbocharger and intake manifold. Check for leaks. Correct all leaks
8. When installing start aid nozzle, be certain arrow on nozzle is pointing against intake air flow.

T5906AP –UN–23FEB89



T6089AR –UN–25OCT88

A—JDG51 Inlet Air Adapter

TX,05,GG2309 –19–19NOV01–1/1

Section 17
Frame or Supporting Structure

Contents

6. Remove lock nuts (4) securing cab to rubber mounts at all four corners. Discard lock nuts.
7. Remove cap screws (1 and 3).

SMCLEAN,000000B –19–19NOV01–3/4

CAUTION: Heavy component; use a hoist.

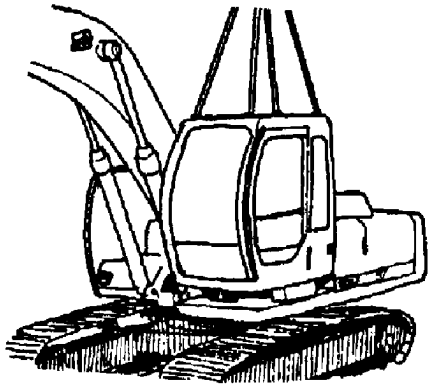
Cab—Specification

Cab—Weight ..... 290 kg (640 lb) approximate

8. Use lifting straps and connect cab to hoist.

NOTE: Move cab forward slightly to clear propel pedals during removal.

9. Remove cab.



T106453

T106453 –UN–15JAN97

10. Repair or replace parts as necessary.

NOTE: Check that all lines and cables are out of the way before installing cab.

11. Install cab.
12. Install cap screws (1 and 3).

Cab—Specification

Cab-to-Platform Cap Screw—
Torque ..... 50 N•m (37 lb-ft)

13. Install washers (5) and new lock nuts (4).

Cab—Specification

Cab Mount Lock Nut—Torque ..... 205 N•m (152 lb-ft)

14. Connect electrical connectors. See Monitor Harness (W3) Component Location and See Cab Harness (W1) Component Location Diagram. (Group 9015-05.)
15. Install monitor controller. See Remove and Install Monitor Controller and Display (A5). (Group 9015-20.)

SMCLEAN,000000B –19–19NOV01–4/4

18
1800
3

Flush and Purge Air Conditioner System

CAUTION: Liquid refrigerant will freeze eyes or skin on contact. Wear goggles, gloves and protective clothing.

See Refrigerant Cautions and Proper Handling. (See procedure in this group.)

NOTE: Flushing can be performed on machine.

1. Recover R134a Refrigerant. (See procedure in this group.)

   Add flushing solvent to system with JT02075 Flusher and JT02098 Flusher Fitting Kit.

2. Remove and discard receiver/dryer.

3. Connect flusher outlet hose to inlet end of compressor discharge line using JT02102 Adapter.

4. Fill flusher tank with solvent and fasten all connections. Dispose of solvent properly.

Flush and Purge Air Conditioner System—Specification

Flusher Tank—Capacity	4 L (1 gal)

NOTE: Air pressure must be at least at specification for flushing and purging.

Flush and Purge Air Conditioner System—Specification

Air Pressure—Pressure	620 kPa (90 psi) (6.2 bar) minimum for flushing and purging

5. Connect a supply line of moisture-free compressed air or dry nitrogen to flusher air valve.

6. Open air valve to force flushing solvent into condenser circuit. Flusher tank is empty when hose pulsing stops. Additional flushing cycles are required if system is heavily contaminated with burned oil or metal particles.

7. **Clean compressor as follows:**

   a. Remove compressor and measure oil drained from both manifold ports.

   b. Connect flusher outlet hose to inlet end of compressor discharge line using JT02102 Adapter.

   c. Pour flushing solvent into suction port and discharge port. Plug both ports in compressor manifold, using JT02099 and JT03194 Caps.

Flush and Purge Air Conditioner System—Specification

Flushing Solvent in Suction Port—Volume	240 mL (8 fl oz)
Flushing Solvent in Discharge Port—Volume	120 mL (4 fl oz)

   d. Turn compressor end for end and roll it side to side.

   e. Remove both plugs from manifold ports and drain solvent from compressor.

   f. Connect battery power to compressor clutch coil. Rotate pulley at least five revolutions to move solvent out of cylinders.

   g. Invert compressor. Roll end for end and side to side. Drain thoroughly.

   h. Repeat previous two steps at least three times.

8. **Divide system into two circuits:**

   - Condenser circuit, including inlet and outlet hoses.
   - Evaporator circuit, including inlet and outlet hoses.

9. **Condenser:**

IMPORTANT: DO NOT attempt to flush through compressor or receiver/dryer. Flushing through expansion valve is acceptable if refrigerant oil has a normal odor and appearance.

   a. Flush/Purge Condenser:

18
1830
3

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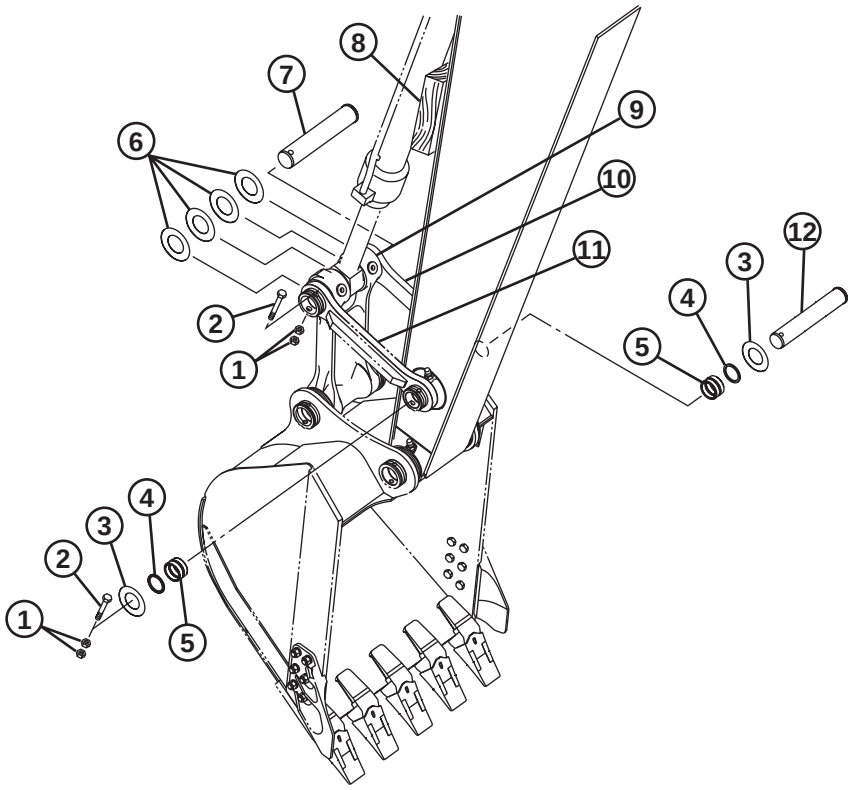
Bucket Links Repair



T142977

T142977 –UN–24JUL01

1—Nut (4 used)	4—Dust Seal (2 used)	7—Cylinder Pin	10—Right Side Link
2—Cap Screw (2 used)	5—Bushing (2 used)	8—Wooden Block	11—Left Side Link
3—Thrust Plate (2 used)	6—Thrust Plate (4 used)	9—Center Link	12—Pin

Remove and Install Bucket Links

NOTE: Removal of bucket is not necessary for removal of just bucket links.

1. Connect hoist to center link (9) using lifting strap. Put wooden block (8) between bucket cylinder and arm to hold cylinder up when cylinder pin (7) is removed.
2. Remove parts (1—5).

   As cylinder pin (7) is removed, lower links (10 and 11) to ground.

33
3340
1

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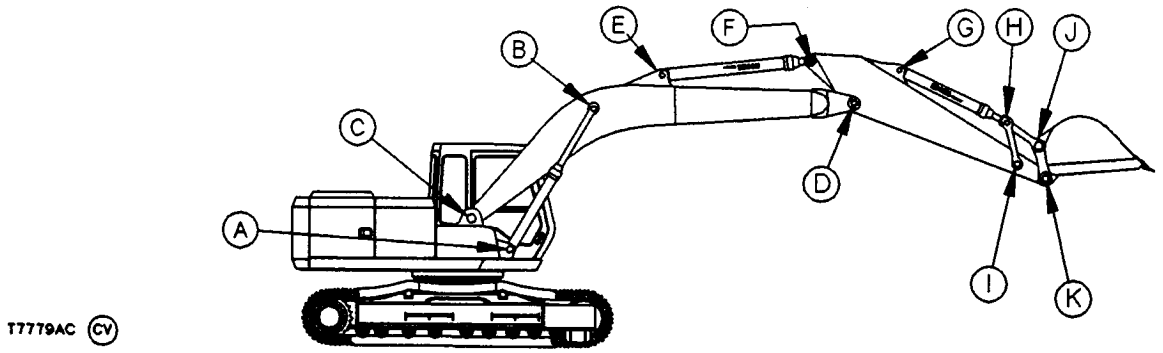
TX,33,GG2406 –19–19NOV01–1/2

Inspect Boom, Arm, and Bucket Pins, Bushings and Bosses



T7779AC –UN–11JUN92

A—Boom Cylinder Head End-to-Frame Joint
B—Boom Cylinder Rod End-to-Boom Joint
C—Boom-to-Frame Joint
D—Boom-to-Arm Joint
E—Arm Cylinder Head End-to-Boom Joint
F—Arm Cylinder Rod End-to-Arm Joint
G—Bucket Cylinder Head End-to-Arm Joint
H—Bucket Cylinder Rod End-to-Side and Center Links Joint
I—Side Links-to-Arm Joint
J—Center Link-to-Bucket Joint
K—Bucket-to-Arm Joint

Boom (200CLC)—Specification

Boom Cylinder Head
End-to-Frame Joint Pin
(200CLC)—OD ..... 80.0 mm (3.15 in.) nominal
OD..... 79.0 mm (3.11 in.) limit of use
Boom Cylinder Head
End-to-Frame Joint Bushing
(200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use
Boom Cylinder Head
End-to-Frame Joint Boss
(200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use
Boom Cylinder Rod
End-to-Boom Joint Pin
(200CLC)—OD ..... 90.0 mm (3.54 in.) nominal
OD..... 89.0 mm (3.50 in.) limit of use
Boom Cylinder Rod
End-to-Boom Joint Bushing
(200CLC)—ID ..... 90.0 mm (3.54 in.) nominal
ID ..... 91.5 mm (3.60 in.) limit of use
Boom Cylinder Rod
End-to-Boom Joint Boss
(200CLC)—ID ..... 90.0 mm (3.54 in.) nominal
ID ..... 91.5 mm (3.60 in.) limit of use
Boom-to-Frame Joint Pin
(200CLC)—OD ..... 90.0 mm (3.45 in.) nominal
OD..... 89.0 mm (3.50 in.) limit of use
Boom-to-Frame Joint Bushing
(200CLC)—ID ..... 90.0 mm (3.45 in.) nominal
ID ..... 91.5 mm (3.60 in.) limit of use
Boom-to-Arm Joint Pin
(200CLC)—OD ..... 90.0 mm (3.54 in.) nominal
OD..... 89.0 mm (3.50 in.) limit of use
Boom-to-Arm Joint Bushing
(200CLC)—ID ..... 90.0 mm (3.54 in.) nominal
ID ..... 91.5 mm (3.60 in.) limit of use

Arm (200CLC)—Specification

Arm Cylinder Head
End-to-Boom Joint Pin
(200CLC)—OD ..... 80.0 mm (3.15 in.) nominal
OD..... 79.0 mm (3.11 in.) limit of use
Arm Cylinder Head
End-to-Boom Joint Bushing
(200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use
Arm Cylinder Head
End-to-Boom Joint Boss
(200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use
Arm Cylinder Rod End-to-Arm
Joint Pin (200CLC)—OD ..... 80.0 mm (3.15 in.) nominal
OD..... 79.0 mm (3.11 in.) limit of use
Arm Cylinder Rod End-to-Arm
Joint Bushing (200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use
Arm Cylinder Rod End-to-Arm
Joint Boss (200CLC)—ID ..... 80.0 mm (3.15 in.) nominal
ID ..... 81.5 mm (3.21 in.) limit of use

Bucket (200CLC)—Specification

Bucket Cylinder Head
End-to-Arm Joint Pin
(200CLC)—OD ..... 71.0 mm (2.80 in.) nominal
OD..... 70.0 mm (2.76 in.) limit of use

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Continued on next page

1—Pump Housing
2—Lock Washer (6 used)
3—Cap Screw (6 used)
4—Spring Pin (4 used)
5—O-Ring (10 used)
6—O-Ring (2 used)
7—Cap Screw (4 used)
8—Right Regulator Pump 1 (Front)
9—Cap Screw (2 used)
10—Cap Screw (2 used)
11—Cap Screw (2 used)
12—Left Regulator Pump 2 (Rear)
13—O-Ring (4 used)
14—O-Ring (6 used)
15—Bearing Nut (2 used)
16—Roller Bearing (2 used)
17—Ring (2 used)
18—Roller Bearing (2 used)
19—Pump 1 (Front) Drive Shaft
20—Pin (2 used)
21—Center Shaft (2 used)
22—Spring (2 used)
23—Piston (14 used)
24—Cylinder Block (Rotor) (2 used)
25—Pump 2 (Rear) Drive Shaft
26—Spacer Ring (Pump 2 [Rear] Drive Shaft only)
27—O-Ring (2 used)
28—Plug (2 used)
29—O-Ring
30—Special Fitting
31—Spring Pin (2 used)
32—Oil Seal (2 used)
33—Snap Ring (2 used)
34—Fill Plug
35—Snap Ring (2 used)
36—Pump 1 (Front) Driven Gear
37—Gasket
38—Cap Screw (2 used)
39—Pump 2 (Rear) Drive Gear
40—Dipstick
41—Dipstick Tube
42—Gasket
43—Drain Plug
44—O-Ring
45—Cap Screw (2 used)
46—Lock Washer (2 used)
47—Washer (2 used)
48—Pilot Pump
49—Snap Ring
50—Snap Ring
51—Ball Bearing
52—Pilot Pump Drive Gear
53—Pilot Pump Drive Shaft
54—Snap Ring
55—Oil Seal
56—Pump Drive Gearbox
57—Set Screw (2 used)
58—Dampener Drive Coupling

Continued on next page

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29. For original parts, install drive (E) and driven (F) gears on shafts so timing marks (A, B, and C) are aligned.

    For new parts, install the JDG1054 Aligning Bar on the socket (I and J) end of drive shafts.

    Install aligning bar so end marked “Long Shaft Side” is to pump 2 (rear) drive shaft (H). Turn shafts so socket alignment dowels (L and M) engage a socket in drive shafts. The socket for pump 1 (front) drive shaft is slightly below the centerline of socket for pump 2 (rear) drive shaft when shafts are timed correctly.

    Install cap screws (N) to hold bar in position.

30. From the splined end of shafts, turn shafts to the left to remove any play between socket alignment dowels and sockets.

31. Install gear on pump 2 (rear) drive shaft. Install the snap ring.

    Install gear on pump 1 (front) drive shaft. As necessary, turn shaft slightly or turn gear to another position so teeth on gears engage. Install snap ring.

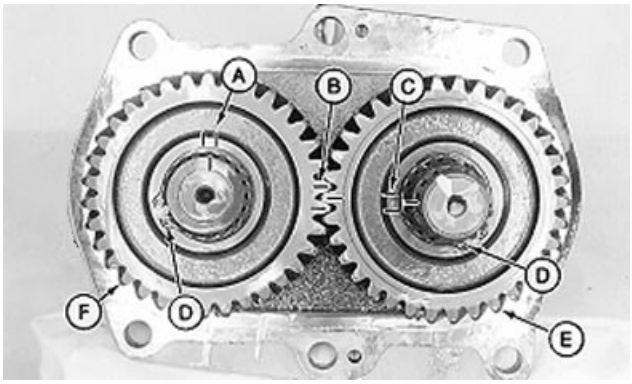
32. Apply oil to center shaft (21), pistons (23) and cylinder blocks (24). Use petroleum jelly to hold pin (20) in hole in center shaft.

33. Install cylinder block so pin engages slot in cylinder block.

34. Apply thread lock and sealer (medium strength) to threads of dowel pins (63). Tighten dowel pins into pump 1 (front) (64) and pump 2 (rear) (65) valve plates.

Hydraulic Pump and Drive Gearbox—Specification

Dowel Pin-to-Pump 1 (Front) and Pump 2 (Rear) Valve Plate—Torque	9.8 N•m (86 lb-in.)



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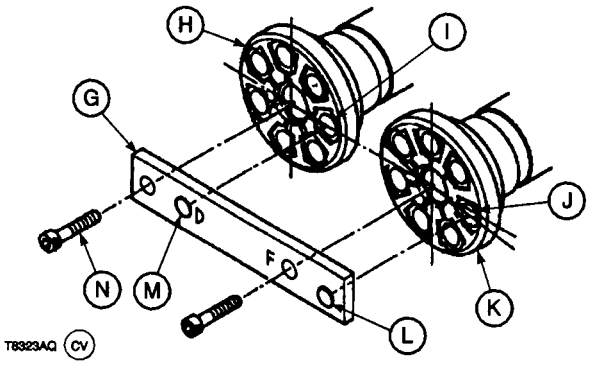

T8323AQ –UN–04OCT94

A—Pump 1 (Front) Drive Shaft-to-Driven Gear Timing Mark
B—Driven Gear-to-Drive Gear Timing Mark
C—Pump 2 (Rear) Drive Shaft-to-Drive Gear Timing Mark
D—Snap Ring (2 used)
E—Drive Gear
F—Driven Gear
G—JDG1054 Aligning Bar (Pump Timing Tool)
H—Pump 2 (Rear) Drive Shaft
I—Socket
J—Socket
K—Pump 1 (Front) Drive Shaft
L—Socket Alignment Dowel
M—Socket Alignment Dowel
N—M8-1.25 Cap Screw (2 used)

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Continued on next page

Pilot Pump Repair

Remove and Install Pilot Pump

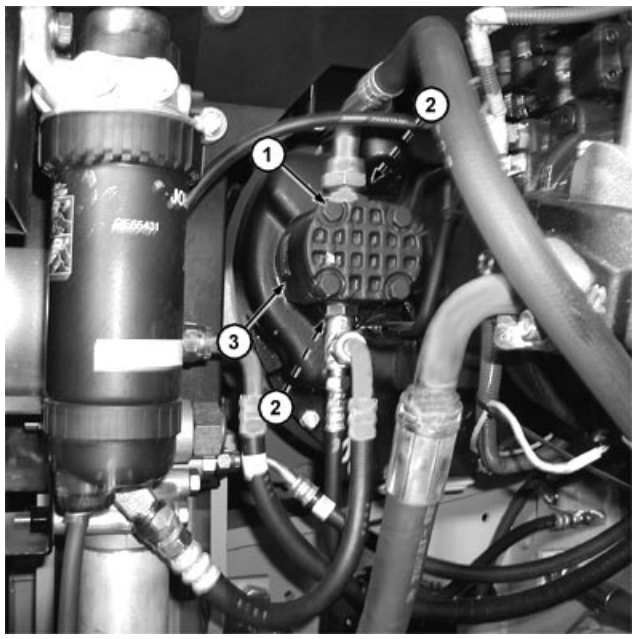
CAUTION: The hydraulic oil tank is pressurized. High pressure release of oil can cause serious burns or penetrating injury.

1. Do Hydraulic Oil Tank Vent Procedure. (See procedure in this group.)
2. Drain pump drive gearbox. Approximate oil capacity is 1.0 L (1.1 qt).
3. Pull a vacuum in hydraulic oil tank using a vacuum pump or drain hydraulic oil tank. See 200CLC Drain and Refill Capacities, 230CLC Drain and Refill Capacities, or 270CLC Drain and Refill Capacities. (Operator's Manual.)
4. Disconnect lines.
5. Remove adapter (1).
6. Remove cap screws (2) and pilot pump (3).
7. Repair or replace parts as necessary.
8. Apply Rigid Form-In-Place Gasket to mounting surface for pilot pump.
9. Tighten cap screw (2).

Pilot Pump—Specification

Pump-to-Drive Gearbox Cap Screw—Torque	49 N•m (36 lb-ft)

10. Install adapter (1) and O-ring.
11. Connect lines. See Main Hydraulic System Component Location. (Group 9025-15.)
12. Fill pump drive gearbox so level is above "H" mark on dipstick. See Change Pump Drive Gearbox Oil. (Operator's Manual.)



T142279B –UN–20JUL01

1—Adapter
2—Cap Screw (2 used)
3—Pilot Pump

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Continued on next page

Pilot Controller Repair

Remove and Install Pilot Controller

CAUTION: The hydraulic oil tank is pressurized. High pressure release of oil can cause serious burns or penetrating injury.

1. Do Hydraulic Oil Tank Vent Procedure. (See procedure in this group.)
2. Remove covers.
3. Disconnect wiring harness and remove lever.
4. Remove cap screws and remove pilot controller from console.
5. Disconnect lines.
6. Repair or replace parts as necessary.
7. Connect lines. See Main Hydraulic System Component Location. (Group 9025-15.)

NOTE: Position cap screw with spring pin, in lower right hole of controller.

8. Install pilot controller and tighten cap screws.

Pilot Controller—Specification

Pilot Controller-to-Console Cap Screw—Torque	10 N•m (7.2 lb-ft)

9. After pilot controller is installed, check operation of all functions to be sure they operate as shown on decal mounted on console.

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Continued on next page

1—Cap Screw (10 used)
2—Body
3—Gasket
4—Body
5—Gasket
6—Body
7—Gasket
8—Body
9—Gasket
10—Body
11—Name Plate
12—Screw (4 used)
13—Plate
14—Cap Screw (11 used)
15—Plug (7 used)
16—O-Ring (7 used)
17—Spring (4 used)
18—Spring
19—Spring Seat (7 used)
20—Spool (6 used)
21—Plate
22—O-Ring
23—Valve
24—O-Ring
25—Spring
26—Spool
27—Spring
28—Spring
29—Plate

Disassemble and Assemble Pilot Signal Manifold

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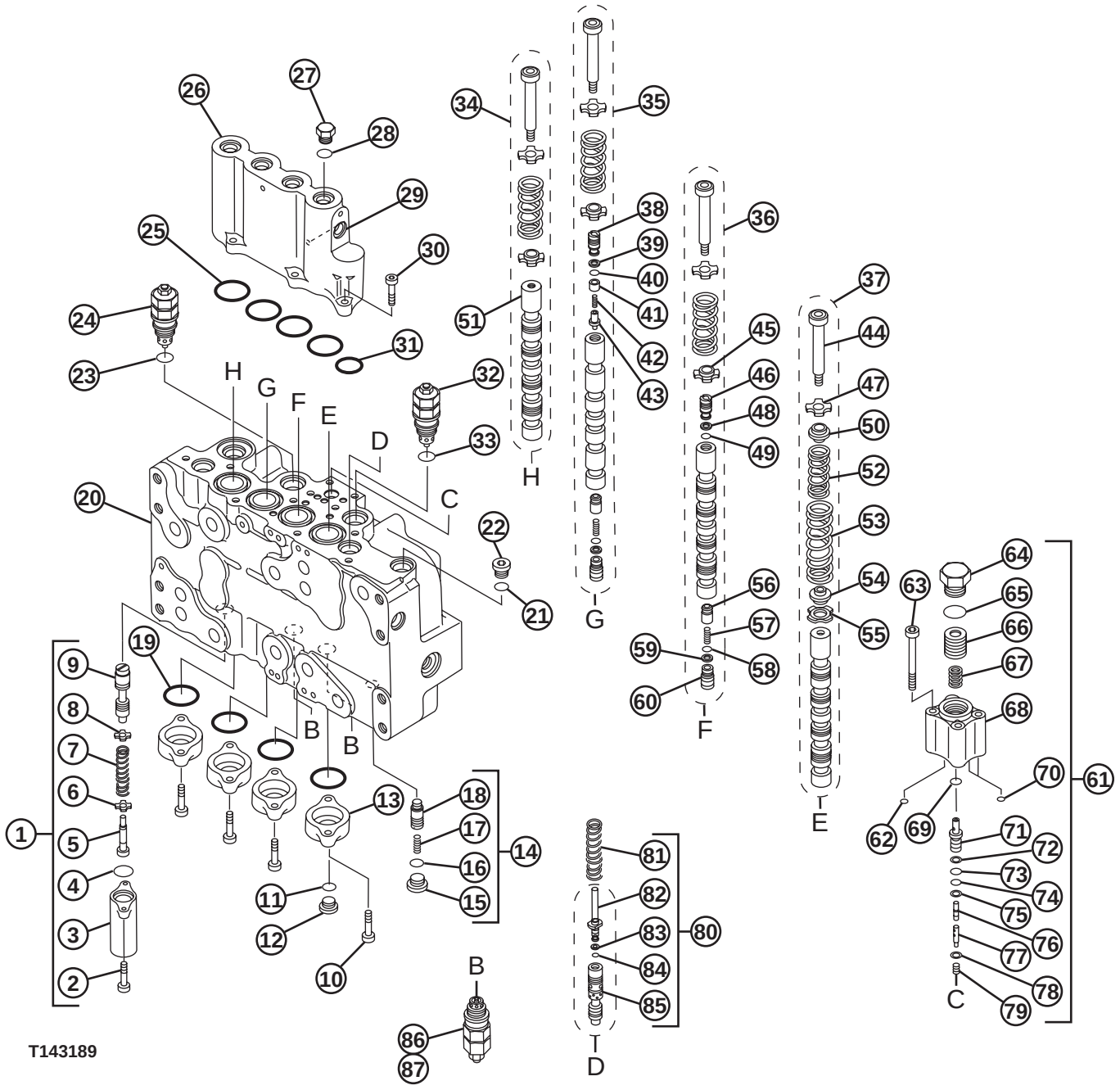

Control Valve—4-Spool

Disassemble and Assemble Control Valve 4-Spool

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TX,33,UU4002 –19–19NOV01–10/18

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5. Remove cap screws (1), lock washers (2) and washers (3).

CAUTION: Heavy component; use a hoist.

Hydraulic Oil Tank—Specification

Hydraulic Oil Tank—Weight ..... 150 kg (330 lb) approximate

6. Remove hydraulic oil tank using a hoist and lifting straps.

7. Repair or replace parts as necessary.

8. Install hydraulic oil tank (4).

9. Tighten cap screws (1).

Hydraulic Oil Tank—Specification

Oil Tank-to-Frame Cap Screw—
Torque ..... 205 N•m (152 lb-ft)

10. Connect lines. See Main Hydraulic System Component Location. (Group 9025-15.)

Hydraulic Oil Tank—Specification

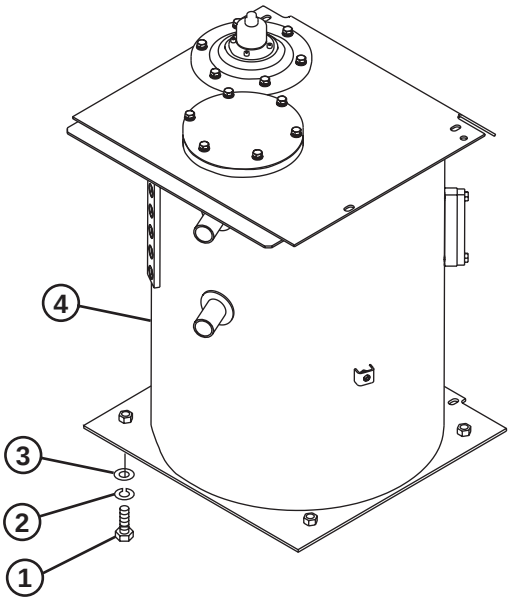
T-Bolt Type Clamp—Torque ..... 4.4 N•m (40 lb-in.)
Worm Gear Type Clamp—Torque ..... 5.9—6.9 N•m (52—61 lb-in.)

11. Connect electrical connector on bottom of tank.

12. Fill hydraulic oil tank. See 200CLC Drain and Refill Capacities, 230CLC Drain and Refill Capacities , 270CLC Drain and Refill Capacities, and Hydraulic Oil. (Operator's Manual.)

IMPORTANT: Hydraulic pump will be damaged if not filled with oil before starting. Procedure must be performed to fill pump housing whenever oil has been drained from the pump or hydraulic oil tank.

13. Do Hydraulic Pump and Drive Gearbox Start-Up Procedure. (See procedure in this group.)



T143359 –UN–20JUL01

1—Cap Screw (4 used)
2—Lock Washer (4 used)
3—Washer (4 used)
4—Hydraulic Oil Tank

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10. Disconnect hydraulic lines (7) from head end of boom cylinder (6).

11. Mark location of shims (8) to aid in assembly.

12. Remove parts (8—11) and remove boom cylinder (6).

13. Repair or replace parts as necessary.

14. Install shims equally on each side of cylinder head end to get the minimum amount of clearance in joint.

15. Align pin bores so Shims are not damaged as pin (10) is installed.

16. Connect boom cylinder head end to frame.

17. Tighten nuts (11) against each other allowing cap screws (9) to be free to turn in hole.

Specification

Boom Cylinder-to-Frame Pin Retainer Nut—200CLC—Torque..... 271 N•m (tighten nut against nut)
200 lb-ft (tighten nut against nut)

Specification

Boom Cylinder-to-Frame Pin Retainer Nut—230CLC, 270CLC—Torque..... 549 N•m (tighten nut against nut)
405 lb-ft (tighten nut against nut)

18. Connect lines. See Main Hydraulic System Component Location. (Group 9025-15.)

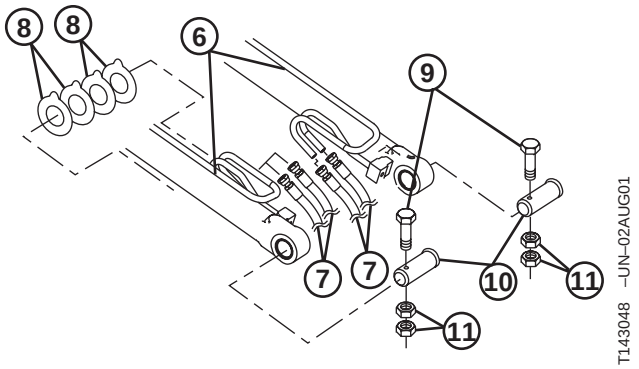
    Tighten boom cylinder hoses.

Specification

Boom Cylinder Hose—200CLC—Torque ..... 175 N•m
130 lb-ft

Specification

Boom Cylinder Hose—230CLC, 270CLC—Torque..... 206 N•m
152 lb-ft



6—Boom Cylinder
7—Rod End-to-Boom Section Bottom Port Line —Head End-to-Boom Section Top Port Line
8—Shim (as required)
9—Cap Screw (2 used)
10—Boom Cylinder-to-Frame Pin (2 used)
11—Nut (4 used)

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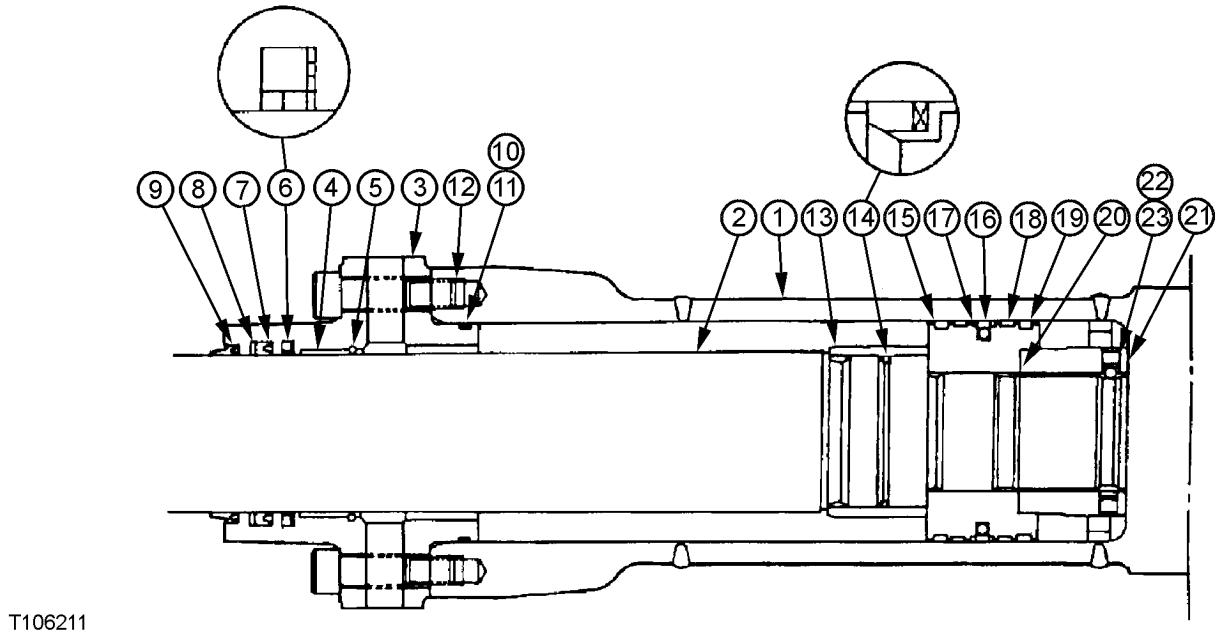


T106211 –UN–16JAN97

Boom Cylinder—200CLC, 270CLC

1—Cylinder Barrel and Bushings
2—Rod and Bushings
3—Rod Guide
4—Wear Ring
5—Snap Ring
6—Buffer Ring Seal
7—U-Cup Seal
8—Back-Up Ring
9—Wiper Seal
10—O-Ring
11—Back-Up Ring
12—Cap Screw (12 used)
13—Cushion
14—Cushion Seal
15—Piston
16—Cap Seal and O-Ring
17—Back-Up Ring (2 used)
18—Buffer Seal (2 used)
19—Wear Ring (2 used)
20—Shim
21—Nut
22—Set Screw
23—Steel Ball
25—Seal (2 used)
26—Retainer Ring
27—Seal (2 used)
28—Hydraulic Line
29—Hydraulic Line
30—O-Ring
31—Cap Screw (4 used)
32—O-Ring
33—Cap Screw (4 used)
34—Band
35—Clamp
36—Cap Screw (2 used)
37—Lock Washer (2 used)
38—Half Clamp (2 used)
39—Cap Screw
40—Lock Washer
41—Lubrication Fitting

Install boom cylinder barrel and rod bushings to a depth equal to the thickness of seals (25 and 27).

NOTE: The left and right boom cylinders are the same except for the head (28) and rod (29) end lines, and clamps (34 and 35).

NOTE: Use a cylinder repair kit when assembling a cylinder.

20. Install seals (25 and 27) tight against bushing with seal lip outward.

Continued on next page

FR91424,0000003 –19–05NOV03–10/20

13. Check for rod curvature on V-blocks using dial indicator.

Specification

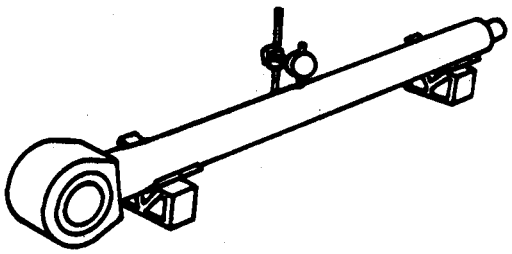
Boom Rod—Curvature ..... 0.5 mm per 1 m
0.020 in. per 3.25 ft

14. Inspect rod surface for scratches or wear.

Boom Cylinder—Specification

Boom Rod Allowable Scratch—
Depth ..... 0.1 mm (enough to detect by a fingernail)
0.004 in. (enough to detect by a fingernail)
Boom Rod—230CLC—OD..... 89.910—90.0 mm
3.536— 3.540 in.

15. Repair or replace parts as necessary.



T6585XG –UN–27OCT88

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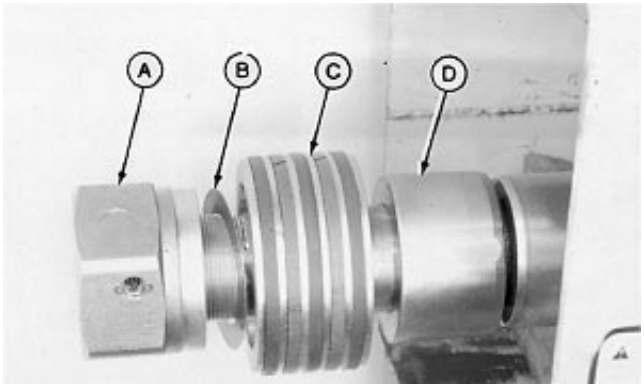
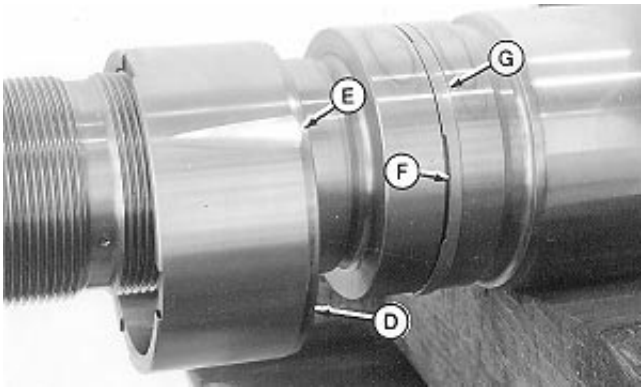
13. Remove parts (A—D and G).

NOTE: Note direction of flat face (E) on cushion and notches (F) in cushion seal and cushion for assembly.

A—Nut
B—Shim
C—Piston
D—Cushion
E—Flat Face
F—Notch
G—Cushion Seal



T6585XK –UN–27OCT88



T8286BL –UN–16JUL94

FR91424,0000005 –19–11NOV03–7/22

14. Remove ring (A).

Push cushion (C) against shoulder.

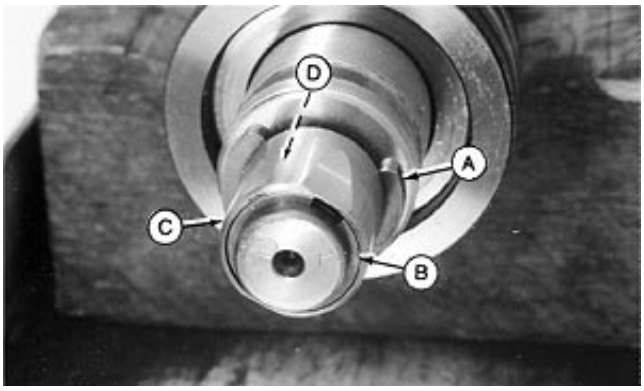
Remove retainer ring (B) and remove cushion.

NOTE: Note direction of flat face on cushion and notches in cushion seal for assembly.

Remove cushion seal (D).

15. Remove parts from rod guide and piston.

NOTE: Inspect the piston, inside the rod guide and barrel for wear, scratches and nicks that may cut or damage a seal or wear ring.



T7778AU –UN–10JUN92

Arm Cylinder Rod End Cushion

A—Ring
B—Retainer Ring
C—Cushion
D—Cushion Seal

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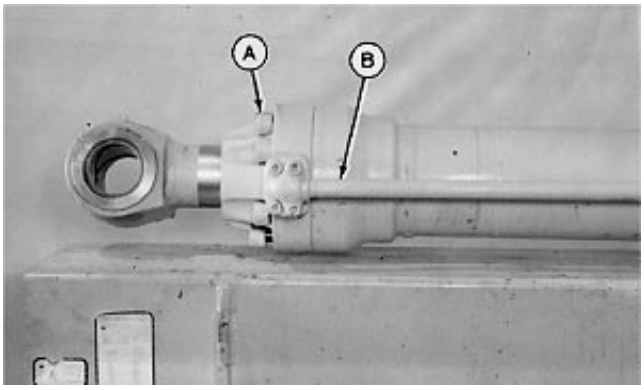
49. Apply clean oil to piston and seals. Attach a hoist to rod using a lifting strap. Carefully install piston, rod and rod guide into barrel.

50. Tighten cap screws (A).

Specification

Arm Cylinder Rod Guide-to-Barrel Cap Screw—Torque ..... 365 N•m (270 lb-ft)

51. Install the lines (B).



T6557HI –UN–27OCT88

A—Cap Screw
B—Lines

FR91424,0000005 –19–11NOV03–22/22

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19. Connect lines. See Main Hydraulic System Component Location. (Group 9025-15.)

    Tighten bucket cylinder hoses.

Bucket Cylinder—Specification

Bucket Cylinder Hose—200CLC—Torque	175 N•m 130 lb-ft
Bucket Cylinder Hose—230CLC, 270CLC—Torque	205 N•m 152 lb-ft

IMPORTANT: Trapped air suddenly compressed in a cylinder is heated and ignites the oil used for assembly causing cap seal and ring damage. Start with cylinder rod retraced and the rod end filled with clean oil. Connect the cylinder head end and lines. Operate function to slowly extend rod. Procedure will eliminate most of the air and reduce the possibility of damage.

20. Start engine.

21. Slowly extend bucket cylinder to align pin bores so shims are not damaged as pin is installed.

22. Install shims equally on each side of cylinder rod end and side links to get minimum amount of clearance in joint.

23. Connect bucket cylinder head end to arm.

24. Tighten nuts against each other allowing cap screw to be free to turn in hole.

Bucket Cylinder—Specification

Bucket Cylinder-to-Pin Retainer Nut—Torque	550 N•m (tighten nut against nut) 405 lb-ft (tighten nut against nut)

25. Lubricate all pivot joints. See Track Adjuster, Working Tool Pivot, Swing Bearing, and Swing Bearing Gear Grease. (Operator's Manual.)

26. Bleed air from cylinder. See Hydraulic Cylinder Bleed Procedure. (Group 3360.)

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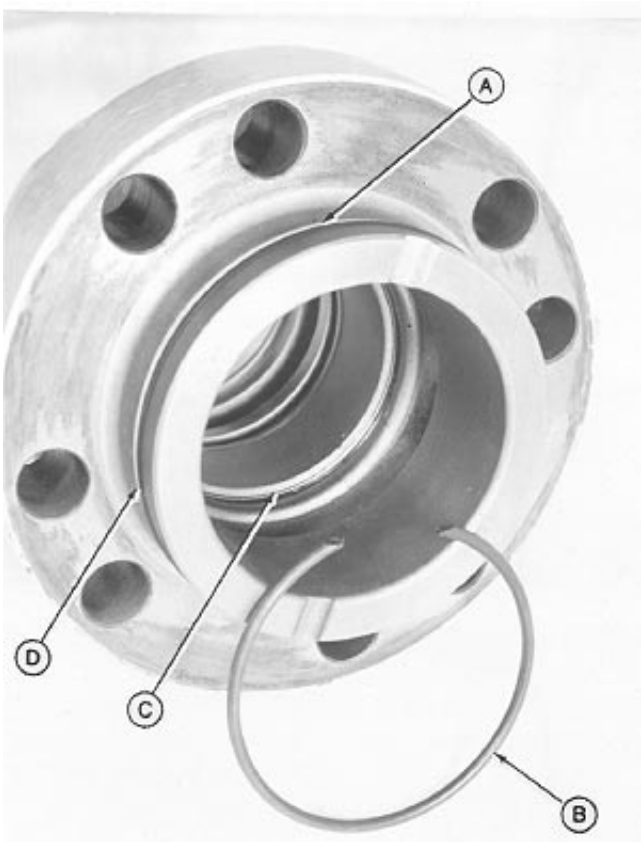
Continued on next page

21. Push wear ring (C) to bottom of bore using a driver disk and a press.

22. Install the snap ring (B).

23. Install back-up ring (A) and O-ring (D).

A—Back-Up Ring
B—Snap Ring
C—Wear Ring
D—O-Ring



T6585XN –UN–27OCT88

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FR91424,0000012 –19–21NOV03–11/20

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13. Check for rod curvature on V-blocks using dial indicator.

Specification

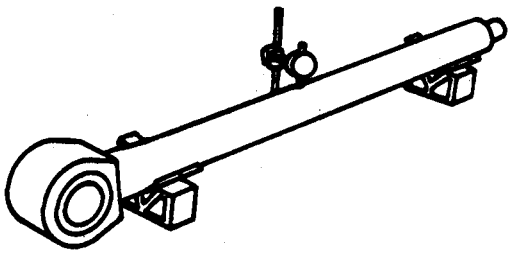
Bucket Rod—Curvature..... 0.5 mm per 1 m
0.020 in. per 3.25 ft

14. Inspect rod surface for scratches or wear.

Bucket Cylinder—Specification

Bucket Rod Allowable Scratch—
Depth..... 0.1 mm (enough to detect by a fingernail)
0.004 in. (enough to detect by a fingernail)
Bucket Rod—230CLC—OD..... 89.910—90.0 mm
3.536— 3.540 in.

15. Repair or replace parts as necessary.



T6585XG –UN–27OCT88

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14. Do Swing Gearbox Start-Up Procedure. (See procedure in this group.) See Swing Motor Start-Up Procedure . (Group 4360.)

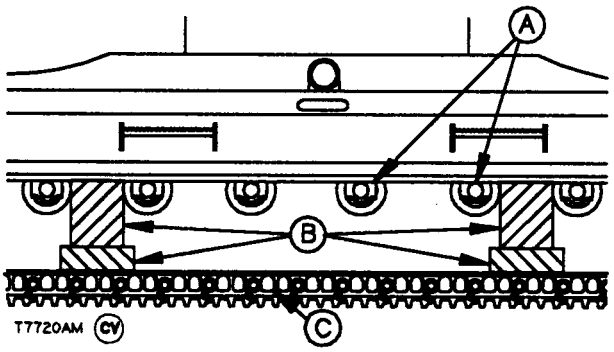
Continued on next page

AGALLARDO,0000039 –19–19NOV01–3/14

5. Put hardwood blocks (B), approximately 254 mm (10 in.) between lower track rollers (A) and track chain (C).

6. Turn upperstructure back to left side so it is 90° to track.

A—Track Rollers
B—Hardwood Blocks
C—Track Chain



TX,43,SB524 –19–19NOV01–3/10

CAUTION: Heavy component; use a hoist.

Upperstructure—Specification

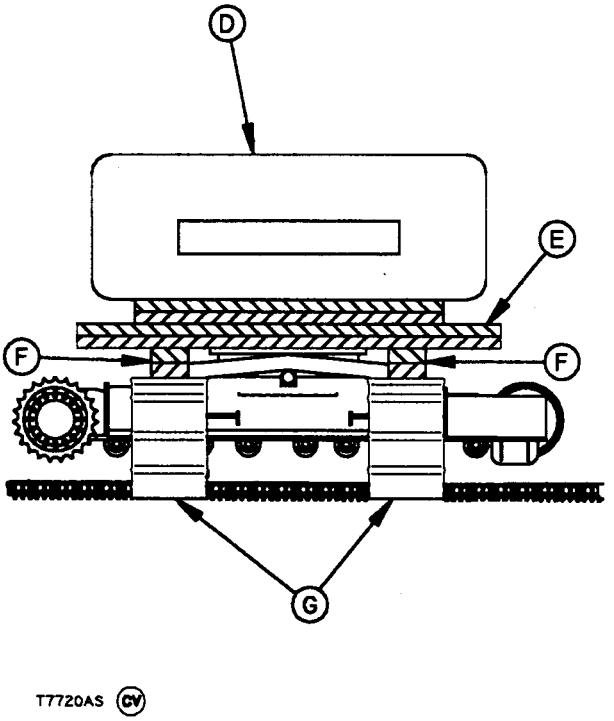
200CLC Machine—Without Tracks—Weight	17 330 kg (38,200 lb) approximate
230CLC Machine—Without Tracks—Weight	20 329 kg (44,818 lb) approximate
270CLC Machine—Without Tracks—Weight	22 453 kg (49,500 lb) approximate

7. Put two DFT1089 Barrel Support under counterweight (D). (Group 9900.)

   To provide enough clearance, use bridge planks (E) and hardwood blocks (F) to raise height of supports and planks to 1.4 m (55 in.). Height is approximate clearance needed to clear bottom of rotary manifold. Do not put blocks under cap screw heads. Keep height below maximum.

Upperstructure—Specification

Floor-to-Bottom of Main Frame—	
Height	1.4 m (55 in.) minimum
Height	1.45 m (57 in.) maximum



D—Counterweight
E—Bridge Plank (As Required)
F—Hardwood Block (As Required)
G—DFT1089 Barrel Support (4 used)

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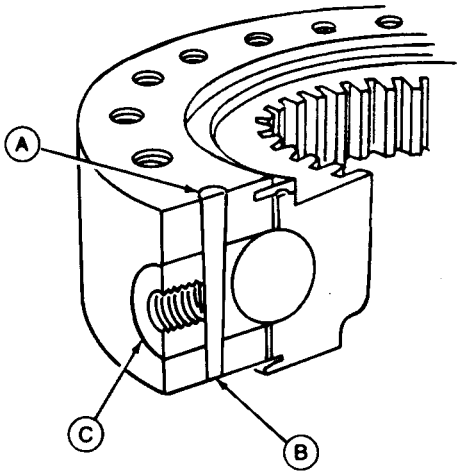
10. Install loading plug (C).
11. Install taper pin (B) even with top of swing bearing.
12. Tack weld pin (A) to swing bearing.
13. Add multi-purpose grease to swing bearing through lubrication fittings. See Track Adjuster, Working Tool Pivot, Swing Bearing, and Swing Bearing Gear Grease. (Operator's Manual.)

A—Tack Weld
B—Taper Pin
C—Loading Plug



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43
4350
23

1—Bearing
2—Snap Ring
3—Dowel Pin (2 used)
4—O-Ring
5—Crossover Relief Valve (2 used)
6—Valve Housing
7—Poppet (2 used)
8—Spring (2 used)
9—O-Ring (2 used)
10—Drain Plug (2 used)
11—Cap Screw (4 used)
12—O-Ring (2 used)
13—O-Ring (2 used)
14—Plate
15—Cap Screw (4 used)
16—O-Ring (2 used)
17—Plug (2 used)
18—Valve Plate
19—Spring (22 used)
20—Brake Piston
21—O-Ring
22—O-Ring
23—Friction Plate (3 used)
24—Plate (4 used)
25—Snap Ring
26—Spacer
27—Spring
28—Washer
29—Cylinder Block
30—Pin (12 used)
31—Washer
32—Ball Bushing
33—Retainer
34—Piston (9 used)
35—Thrust Plate
36—Plug
37—O-Ring
38—Cap Screw (3 used)
39—Brake Release Valve
40—Housing
41—Shaft
42—Snap Ring
43—Spacer (2 used)
44—Bearing
45—Snap Ring
46—O-Ring
47—Oil Seal
48—Cover
49—Snap Ring

Disassemble Swing Motor and Park Brake—270CLC

CAUTION: Heavy Component; use a hoist.

Swing Motor and Park Brake—Specification

Swing Motor and Park Brake (270CLC Machine)—Weight..... 66 kg (150 lb) approximate

CAUTION: Swing motor valve housing and cover is under spring pressure. Remove cap screws evenly to release spring force.

1. Mark alignment of swing motor housing and valve housing assembly. Loosen cap screws (11).

IMPORTANT: Valve plate has a polished surface. Valve plate may remain on valve housing or stay with cylinder block. Valve plate may be damaged if dropped. Hold valve plate during disassembly.

2. Remove valve plate (18) and springs (19).
3. Remove brake piston (20).
4. Remove parts (29—34) from shaft (41).
5. Remove snap ring (49) from housing (40) to remove cover (48) and O-ring (46).
6. Install cover (48) in vise and remove oil seal (47).
7. Tap shaft (41) assembly lightly and remove from housing (40). Bearing (44), snap rings (42 and 45), and spacers (43) are removed with shaft.
8. Replace parts as necessary.

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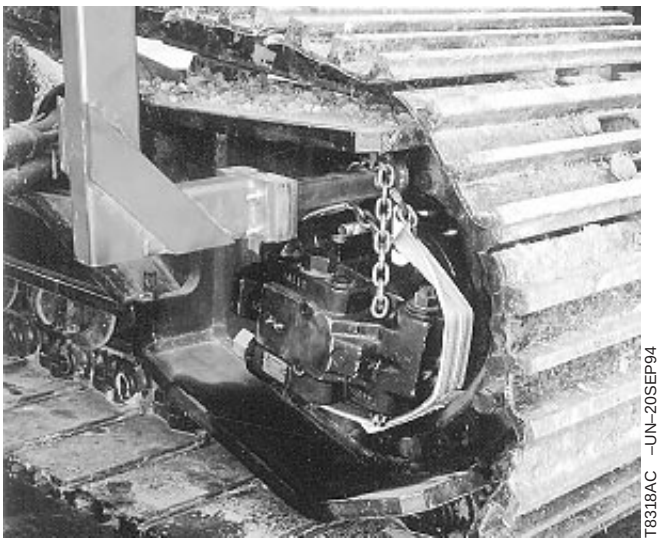
DF1063 Lift Bracket

Tool is the same as used on other machines. Only the lift bracket of the tool is used for this machine with adapter DFT1130.

Lift Bracket is used to remove and install propel motor.

Material required:

- 38.1 mm x 76.2 mm x .48 mm (1-1/2 in. x 3 in. x 3/16 in.) Square Tube
- 1.3 mm (1/2 in.) 1020 Steel Plate
- 1 mm x 38.1 mm (3/8 in. x 1-1/2 in.) Cap Screw with Nut (4 used)



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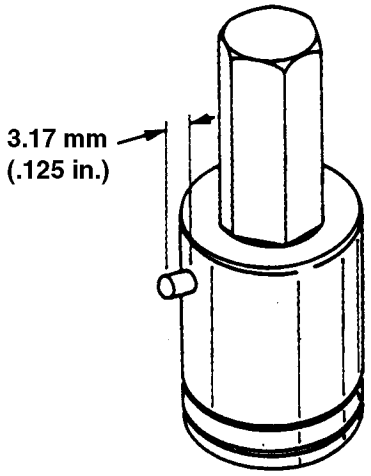
DF1038 Torque Adapter



T6557CH (CV)

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Torque Adapter is used to check rolling drag torque on rotor drive shaft.

- 17 mm (0.125 in.) hex head driver

Material required:

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