200D and 200DLC Excavator Repair

REPAIR TECHNICAL MANUAL

200D and 200DLC Excavator

TM10079 14MAR19 (ENGLISH)

Worldwide Construction And Forestry Division
PRINTED IN U.S.A.

Inspect Machine

Inspect machine carefully each day by walking around it before starting.

Inspect and Clean the Polycarbonate Windows. See Inspect and Clean Polycarbonate Windows. (Section 4-1.)

Keep all guards and shields in good condition and properly installed. Fix damage and replace worn or broken parts immediately. Pay special attention to hydraulic hoses and electrical wiring.

T6607AQ —UN—15APR13

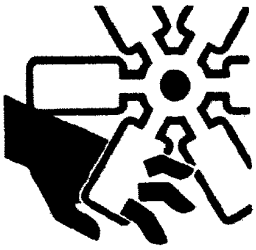
TX03679,0001734 -19-17DEC14-1/1

Stay Clear of Moving Parts

Entanglements in moving parts can cause serious injury.

Stop engine before examining, adjusting or maintaining any part of machine with moving parts.

Keep guards and shields in place. Replace any guard or shield that has been removed for access as soon as service or repair is complete.



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Avoid High-Pressure Fluids

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

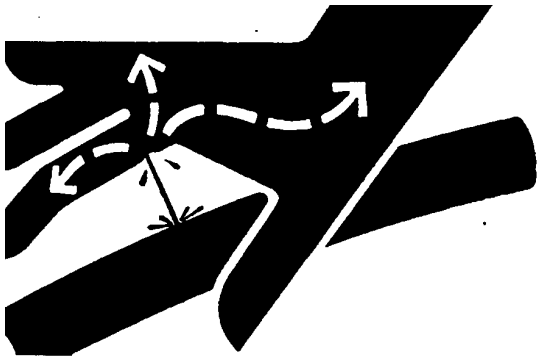
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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 in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

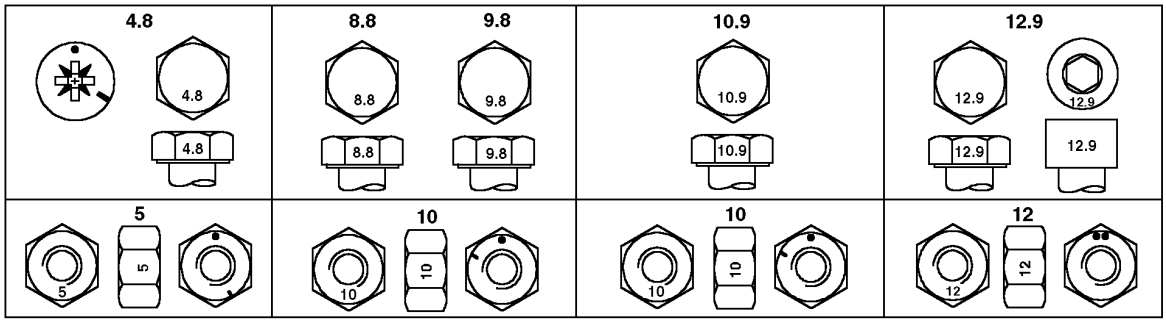


X9811 —UN—23AUG88

DX,FLUID -19-12OCT11-1/1

Metric Bolt and Cap Screw Torque Values

METRIC BOLT AND CAP SCREW TORQUE VALUES—Tolerance is ±10% unless otherwise specified



TORQ2 —UN—15APR13

Top—Property Class and Head Markings; Bottom—Property Class and Nut Markings

	Class 4.8		Class 8.8 or 9.8		Class 10.9		Class 12.9	
Thread Size	Lubricated[a] N·m (lb-ft)	Dry[b] N·m (lb-ft)	Lubricated[a] N·m (lb-ft)	Dry[b] N·m (lb-ft)	Lubricated[a] N·m (lb-ft)	Dry[b] N·m (lb-ft)	Lubricated[a] N·m (lb-ft)	Dry[b] N·m (lb-ft)
M6	4.7 (3.5)	6 (4.4)	9 (6.6)	11.5 (8.5)	13 (9.5)	16.5 (12.2)	15.5 (11.5)	19.5 (14.5)
M8	11.5 (8.5)	14.5 (10.7)	22 (16)	28 (20.5)	32 (23.5)	40 (29.5)	37 (27.5)	47 (35)
M10	23 (17)	29 (21)	43 (32)	55 (40)	63 (46)	80 (59)	75 (55)	95 (70)
M12	40 (29.5)	50 (37)	75 (55)	95 (70)	110 (80)	140 (105)	130 (95)	165 (120)
M14	63 (46)	80 (59)	120 (88)	150 (110)	175 (130)	220 (165)	205 (150)	260 (190)
M16	100 (74)	125 (92)	190 (140)	240 (175)	275 (200)	350 (255)	320 (235)	400 (300)
M18	135 (100)	170 (125)	265 (195)	330 (245)	375 (275)	475 (350)	440 (325)	560 (410)
M20	190 (140)	245 (180)	375 (275)	475 (350)	530 (390)	675 (500)	625 (460)	790 (580)
M22	265 (195)	330 (245)	510 (375)	650 (480)	725 (535)	920 (680)	850 (625)	1080 (800)
M24	330 (245)	425 (315)	650 (480)	820 (600)	920 (680)	1150 (850)	1080 (800)	1350 (1000)
M27	490 (360)	625 (460)	950 (700)	1200 (885)	1350 (1000)	1700 (1250)	1580 (1160)	2000 (1475)
M30	660 (490)	850 (625)	1290 (950)	1630 (1200)	1850 (1350)	2300 (1700)	2140 (1580)	2700 (2000)
M33	900 (665)	1150 (850)	1750 (1300)	2200 (1625)	2500 (1850)	3150 (2325)	2900 (2150)	3700 (2730)
M36	1150 (850)	1450 (1075)	2250 (1650)	2850 (2100)	3200 (2350)	4050 (3000)	3750 (2770)	4750 (3500)

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings.*

[b] *"Dry" means plain or zinc plated without any lubrication.*

CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. Tool may slip and cause injury.

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class.

Fasteners should be replaced with the same or higher property class. If higher property class fasteners are used, these should only be tightened to the strength of the original.

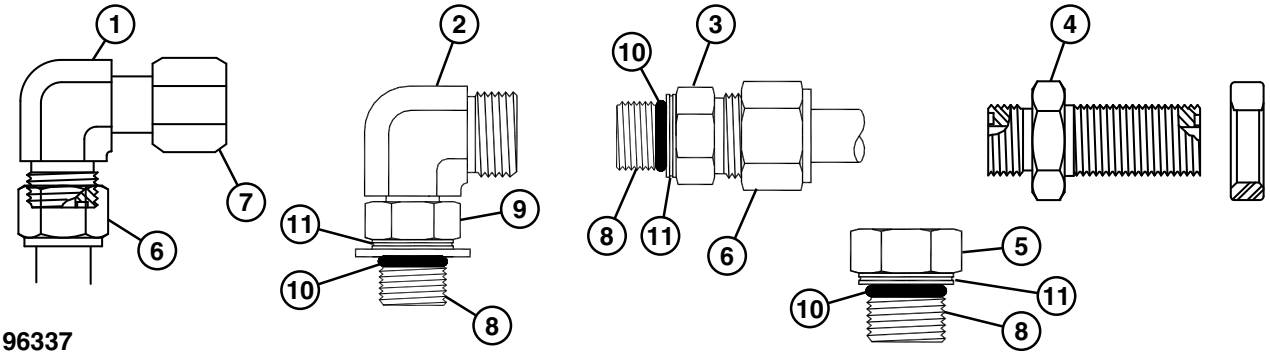
Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

OUT3035,TORQUE2 -19-22MAR06-1/1

O-Ring Face Seal Fittings With Metric Hex Nut And Stud End For Standard Pressure Service Recommendations

O-RING FACE SEAL AND FITTINGS WITH METRIC HEX NUT AND STUD END FOR STANDARD PRESSURE, BELOW 27 600 kPa (275.8 bar) (4,000 psi), TORQUE VALUES—Tolerance is +15 -20% unless otherwise specified



T196337

T196337 —UN—15APR13

1— 90° Swivel Elbow
2— 90° Adjustable Stud Elbow
3— Stud Straight
4— Bulkhead Union and Nut
5— External Hex Stud End Plug
6— Tube Nut
7— Swivel Nut
8— Stud End
9— Hex Nut
10— O-Ring
11— Identification Groove

Nominal Tube OD or Hose ID			O-Ring Face Seal Hose or Tube Swivel Nut			Bulkhead Nut	
Metric Tube OD	Inch Tube OD or Hose ID		Thread Size	Hex Size	Torque	Hex Size	Torque
mm	Dash Size	mm (in.)	in.	mm	Nm (lb-ft)	mm	Nm (lb-ft)
4	-2	3.18 (0.125)	—	—	—	—	—
5	-3	4.78 (0.188)	—	—	—	—	—
6	-4	6.35 (0.250)	9/16-18	17	16 (12)	22	32 (24)
8	-5	7.92 (0.312)	—	—	—	—	—
10	-6	9.53 (0.375)	11/16-16	22	24 (18)	27	42 (31)
12	-8	12.70 (0.500)	13/16-16	24	50 (37)	30	93 (69)
16	-10	15.88 (0.625	1-14	30	69 (51)	36	118 (87)
20	-12	19.05 (0.750)	1-3/16-12	36	102 (75)	41	175 (129)
22	-14	22.23 (0.875)	1-3/16-12	36	102 (75)	41	175 (129)
25	-16	25.40 (1.000)	1-7/16-12	41	142 (105)	46	247 (182)
28	—	—	—	—	—	—	—
32	-20	31.75 (1.250)	1-11/16-12	50	190 (140)	50	328 (242)
38	-24	38.10 (1.500)	2-12	60	217 (160)	60	374 (276)
50	-32	50.80 (2.000)	—	—	—	—	—

O-RING STRAIGHT, ADJUSTABLE, AND EXTERNAL HEX PLUG WITH METRIC STUD END FOR STANDARD PRESSURE, BELOW 27 600 kPa (275.8 bar) (4,000 psi), TORQUE VALUES—Tolerance is +15 -20% unless otherwise specified

Thread Size[a]	Straight Hex Size[b]	Adjustable Nut Hex Size	Steel or Gray Iron Torque	Aluminum or Brass Torque
mm.	mm	mm	Nm (lb-ft)	Nm (lb-ft)
M8 x 1	12	12	8 (6)	5 (4)
M10 x 1	14	14	15 (11)	10 (7)
M12 x 1.5	17	17	25 (18)	17 (12)
M14 x 1.5	19	19	40 (30)	27 (20)
M16 x 1.5	22	22	45 (33)	30 (22)
M18 x 1.5	24	24	50 (37)	33 (25)
M22 x 1.5	27	27	69 (51)	46 (34)
M27 x 2	32	32	100 (74)	67 (49)
M30 x 2	36	36	130 (96)	87 (64)
M33 x 2	41	41	160 (118)	107 (79)
M38 x 2	46	46	176 (130)	117 (87)

Continued on next page

OUT3035,0000366 -19-28MAY09-1/2

Track Roller Remove and Install

1. Swing upperstructure 90° and lower bucket to raise track off ground. Keep angle between boom and arm 90—110° and position round side of bucket on ground.

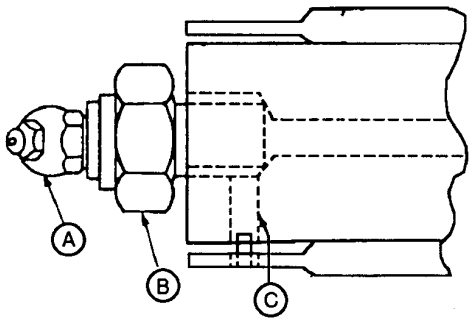
CAUTION: Prevent possible injury from unexpected machine movement. Position shop stands under frame to support machine while removing lower track roller.

2. Put shop stands under machine.

Specification	
200D Excavator—Weight (approximate)	22 000 kg 49 000 lb

Specification	
200DLC Excavator—Weight (approximate)	23 000 kg 50 000 lb

CAUTION: Prevent possible injury from high pressure grease. Do not remove grease fitting (A) from valve (B).



T7396DZ —UN—28NOV90

A—Grease Fitting **C—Bleed Hole**
B—Valve

3. Loosen valve (B) one to two turns to release grease through bleed hole (C).

OUO6046,0002302 -19-27JUN08-1/2

CAUTION: Heavy component; use appropriate lifting device.

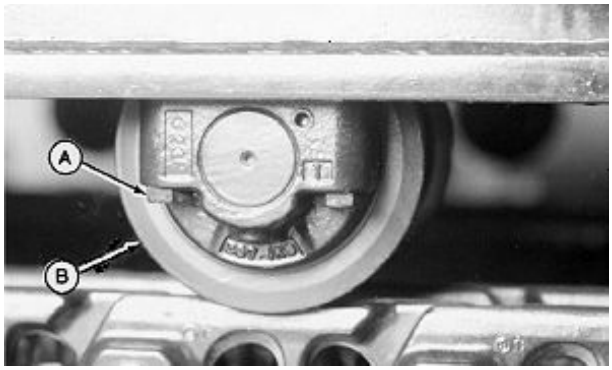
Specification	
Track Roller—Weight	35 kg 77 lb

4. Attach appropriate lifting device to track roller (B). Remove cap screws (A) and track roller (B).
5. Measure track roller tread diameter. See 200D and 200DLC Track Roller Tread Diameter. (SP326 Undercarriage Appraisal Manual.)
6. Repair or replace parts as necessary. See Track Roller Disassemble and Assemble. (Group 0130.)
7. Install track roller and tighten cap screws to specification.

Specification	
Roller-to-Frame Cap Screw—Torque	460 N·m 340 lb-ft

8. If equipped, install track roller guard and tighten cap screws to specification.

Specification	
Track Roller Guard Cap Screw—Torque	460 N·m 340 lb-ft



T6585TN —UN—25OCT88

A—Cap Screw (4 used) **B—Track Roller**

9. Tighten valve on track adjuster to specification.

Specification	
Track Adjuster Valve—Torque	88 N·m 65 lb-ft

10. Check and adjust track sag. See Check and Adjust Track Sag. (Operator's Manual.)

OUO6046,0002302 -19-27JUN08-2/2

1— Track Link (200D, 45 used; 200DLC, 48 used)
2— Master Track Link
3— Pin (200D, 45 used; 200DLC, 48 used)
5— Seal (200D, 90 used; 200DLC, 96 used)
7— Master Pin
8— Spacer (2 used)
9— Snap Ring
10— Cap Screw (200D, 184 used; 200DLC, 196 used)
12— Nut (200D, 184 used; 200DLC, 196 used)
13— Shoe (200D, 46 used; 200DLC, 49 used)
14— Track Link (200D, 45 used; 200DLC, 48 used)
15— Bushing (200D, 45 used; 200DLC, 48 used)
16— Master Bushing
17— Track Chain Without Shoes

1. Measure track components (1—17). See 200D and 200DLC Standard Bushing Outer Diameter. (SP326 Undercarriage Appraisal Manual.)
2. Turn pins (3 and 7) and bushings (15 and 16) as required.
3. Clean any dust or rust from surfaces of track link pin bores, counterbores, and ends of bushings.
4. Apply grease to counterbore in track links, the seals, and ends of bushings.
5. For each joint, fill clearance between pin OD and bushing ID with grease.
6. Install seal (5) so tapered side is toward bushing.

OUO6046,0002309 -19-26JUN08-2/2

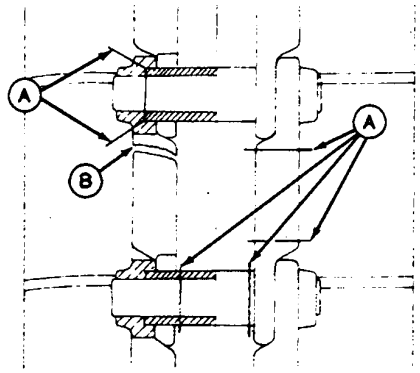
Track Chain Repair

1. Remove track shoes from each side of broken link assembly. See Track Shoe Remove and Install. (Group 0130.)

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).

A—Cut Locations **B—Broken Link**

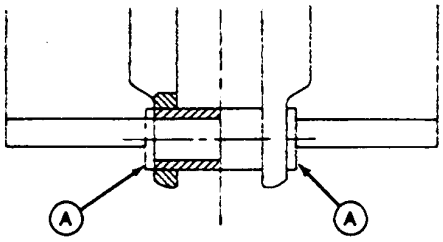


T5821AG —UN—26OCT88

OUO6046,000230A -19-05MAR07-1/4

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

A—Bushing



T5821AH —UN—26OCT88

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Travel Motor and Park Brake Remove and Install

SPECIFICATIONS	
Travel Motor and Gearbox Weight	310 kg 683 lb
Ring Gear Approximate Weight	64 kg 141 lb
Third Stage Planetary Pinion Carrier Approximate Weight	40 kg 88 lb
Drum Approximate Weight	59 kg 130 lb
Bearing Cone Temperature	50—70°C 122—158°F
Bearing Nut Torque	800 N·m 590 lb·ft
Ring Gear-to-Drum Cap Screw Torque	265 N·m 195 lb·ft
Cover-to-Ring Gear Cap Screw Torque	110 N·m 81 lb·ft

ESSENTIAL TOOLS
JT01748 Lifting Brackets

SERVICE EQUIPMENT AND TOOLS
DFT1036A[a] Travel Gearbox Nut Wrench
DFT1109[b] Holding Bar

[a]Fabricated tool, dealer made. (See Group 9900 for instructions to make tool.)
[b]Fabricated too, dealer made. (See Group 9900 for instructions to make tool.)

OTHER MATERIAL
277 Loctite® Rigid Form-in-Plce Gasket
271 Loctite® Thread Lock and Sealer (high strength)
242 Loctite® Thread Lock and Sealer (medium strength).

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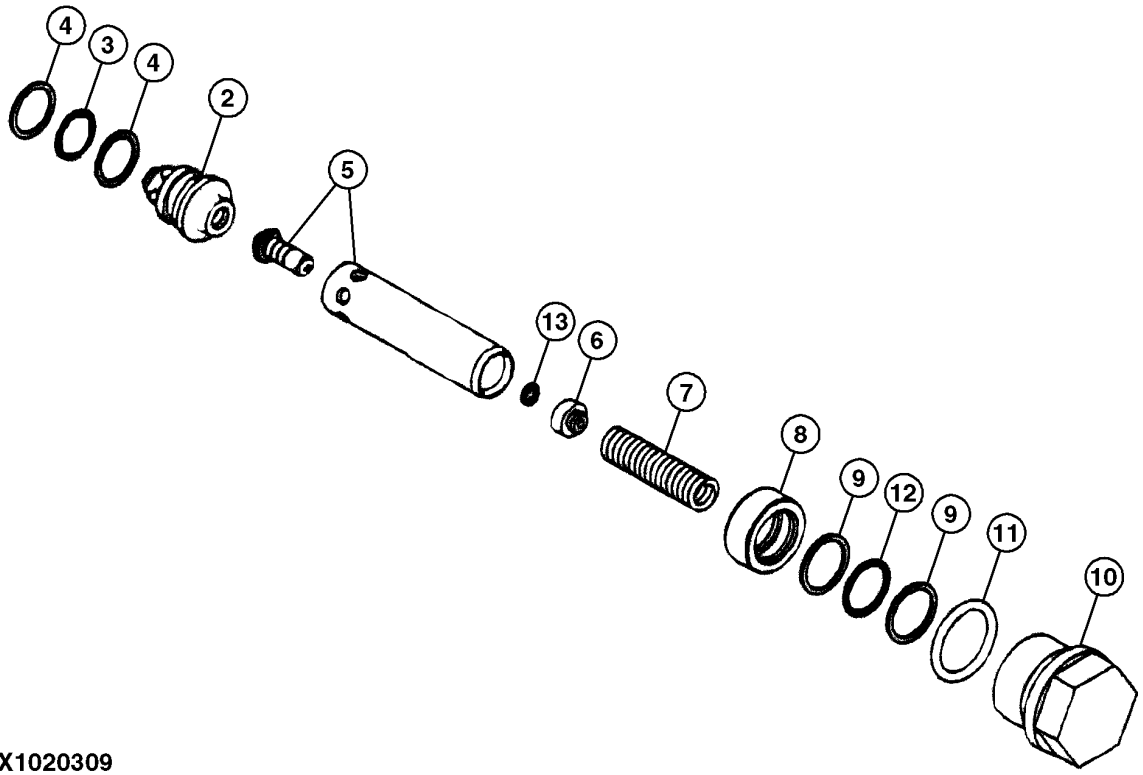


TX1020309 —UN—09MAR07

TX1020309

1— Travel Motor Cover
2— Sleeve (2 used)
3— O-Ring (2 used)
4— Back-Up Ring (4 used)
5— Valve (2 used)
6— Guide (2 used)
7— Spring (2 used)
8— Piston (2 used)
9— Back-Up Ring (4 used)
10— Plug (2 used)
11— O-Ring (2 used)
12— Packing (2 used)
13— Shim (2 used)

IMPORTANT: Disassembly of crossover relief valve will alter the set pressure. Adjust after repairs are made.

6. Disassemble crossover relief valves.
7. Repair or replace parts as needed. Apply a film of clean hydraulic oil to parts before assembly.
8. Assemble crossover relief valves.
9. Install relief valves (10) and tighten to specification.

Specification

Relief Valve—Torque.....450 N·m
332 lb-ft

10. Fill hydraulic oil tank. See Check Hydraulic Tank Oil Level. (Operator's Manual.)

IMPORTANT: Hydraulic pump will be damaged if not filled with oil before starting engine. Procedure must be performed whenever a new pump is installed or oil has been drained from the pump or hydraulic oil tank.

11. Fill pump housing with oil. See Pump 1 and 2 Start-Up Procedure. (Group 3360.)
12. Connect battery ground (negative) cable.
13. Perform travel motor start-up procedure. See Travel Motor and Park Brake Start-Up Procedure. (Group 0260.)
14. Install cover to track frame.

Specification

Track Frame Cover—Torque.....50 N·m
37 lb-ft

15. Perform crossover relief valve test and adjustment. See Travel Motor Crossover Relief Valve Test and Adjustment. (9025-25.)

FS41334,000015E -19-13APR07-3/3

Engine Remove and Install

1. Disconnect battery ground (negative) cable.

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

Shut off engine. Remove filler cap when cool to touch. Slowly loosen filler cap to relieve pressure, then remove.

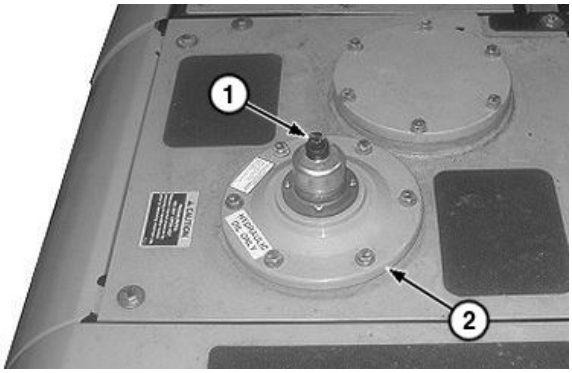
2. Drain coolant from radiator. Approximate capacity is 26 L (6.9 gal).

TS281 —UN—15APR13

OUO6046,0002329 -19-10APR13-1/14

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by pushing pressure release button (1).

3. Push pressure release button (1).
4. Pull a vacuum in hydraulic oil tank using a vacuum pump, or drain tank. See Apply Vacuum to Hydraulic Oil Tank. (Group 3360.)
5. Close fuel supply valve on bottom of fuel tank.



TX1020485A —UN—21MAR07

1— Pressure Release Button **2— Hydraulic Oil Tank Cover**

Continued on next page

OUO6046,0002329 -19-10APR13-2/14

Radiator Remove and Install

CAUTION: Prevent possible injury from hot spraying water. DO NOT remove surge tank cap unless engine is cool. Then remove cap slowly.

TS281 —UN—15APR13

1. Remove surge tank filler cap to relieve pressure.
2. Open drain valve and drain coolant into suitable container.

Specification	
Cooling System—Capacity	26.0 L 6.9 gal

3. Remove batteries. See Battery Remove and Install. (Group 9015-20).
4. Remove fan and fan shroud. See Fan, Fan Guard, and Fan Shroud Remove and Install. (Group 0510.)

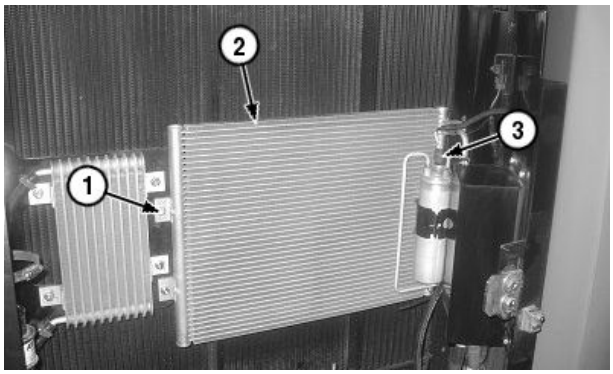
OUO1073,0002115 -19-26AUG10-1/7

NOTE: It is not necessary to discharge air conditioning system.

5. Disconnect wiring harness connector (3) from receiver-dryer.
6. Remove any clamps attaching air conditioning lines to frame or panels.

IMPORTANT: Use caution when repositioning condenser to avoid damaging condenser fins.

7. Remove cap screws (1). Lay condenser (2) aside and secure in place.



TX1020785A —UN—23MAR07

1— Cap Screw (4 used)
2— Condenser
3— Connector

Continued on next page

OUO1073,0002115 -19-26AUG10-2/7

6. Raise engine hood.
7. Remove retaining pin and disconnect hood support rod (1).

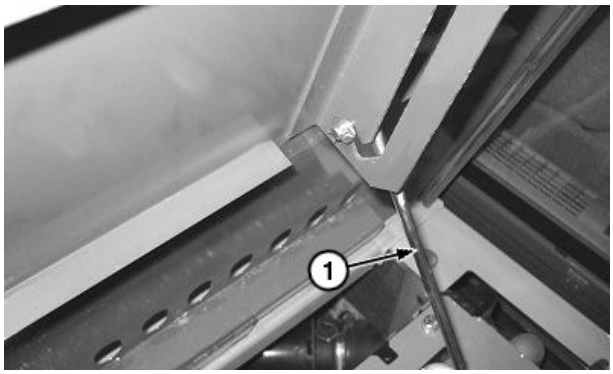
CAUTION: Heavy component; use a hoist.

Specification

Engine Hood—Weight ..... 45 kg
100 lb

8. Attach appropriate lifting device to hood.
9. Remove cap screws (2) and hood (3).

1— Hood Support Rod
2— Cap Screws
3— Hood



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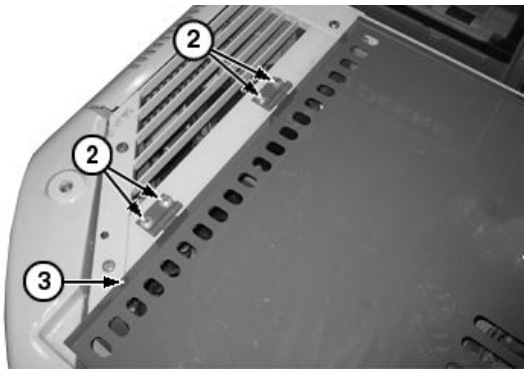
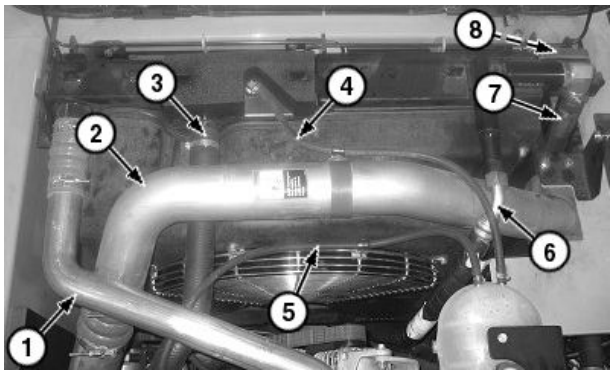


TX1018847A —UN—20FEB07

OUO1073,000211A -19-26AUG10-3/12

10. Loosen clamps and disconnect upper intercooler tube (1) and upper radiator hose (3).
11. Remove turbocharger inlet tube (2).
12. Loosen clamps and disconnect coolant hose (4) from radiator.
13. Remove clamps attaching coolant hose (5) to fan guard.
14. Drain hydraulic oil tank. Approximate oil capacity is 136 L (36 gal).
15. Disconnect hydraulic hoses (6 and 7) to hydraulic oil cooler. Apply caps and plugs to close all openings.
16. Remove cap screws and upper mounting bracket (8).



TX1021424A —UN—03APR07

1— Upper Intercooler Tube
2— Turbocharger Inlet Tube
3— Upper Radiator Hose
4— Coolant Hose
5— Coolant Hose
6— Hydraulic Hose
7— Hydraulic Hose
8— Upper Mounting Bracket

Continued on next page

OUO1073,000211A -19-26AUG10-4/12

Intake System

1— Hose Clamp
2— Hose
3— Hose Clamp
4— Air Filter Restriction Switch
5— Cap Screw (2 used)
6— Washer (2 used)
7— Intake Tube
8— Washer
9— Cap Screw
10— Washer (2 used)
11— Nut (2 used)
12— Cap Screw
13— Washer
14— Mounting Bracket
15— Cap Screw (2 used)
16— Washer (2 used)
17— Intake Tube
18— Tie Band
19— Intake Air Temperature Sensor
20— Hose Clamp
21— Hose
22— Hose Clamp
23— Hose Clamp
24— Hose
25— Hose Clamp
26— Cap Screw (4 used)
27— Washer (4 used)
28— Mounting Bracket
29— Washer (4 used)
30— Cap Screw (4 used)
31— Housing Mounting Clamps
32— Air Filter Housing
33— Safety Element
34— Primary Air Filter Element
35— Cover
36— Air Cleaner Dust Valve

LD30992,000041E -19-05APR07-2/2

Section 17
Frame or Supporting Structure

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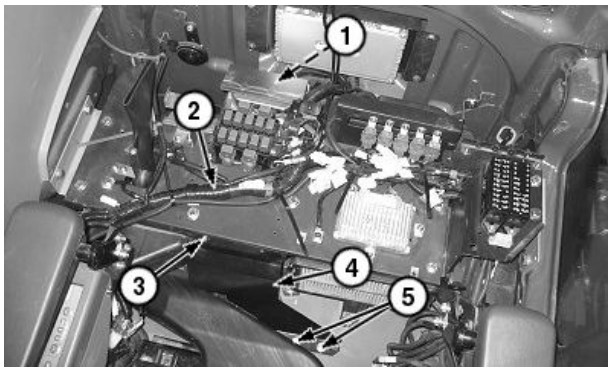
13. Remove cap screw (1) behind 12 volt power converter.
14. Remove cap screw (3), cap screws (5) and bracket (4).
15. Disconnect cab wiring harness (2) from left and right consoles and air conditioning module. See Cab Harness (W1) Component Location. (Group 9015-10).
16. Remove any clamps or tie bands securing cab harness to floor or consoles.

1— Cap Screw
2— Cab Wiring Harness
3— Cap Screw
4— Bracket
5— Cap Screws



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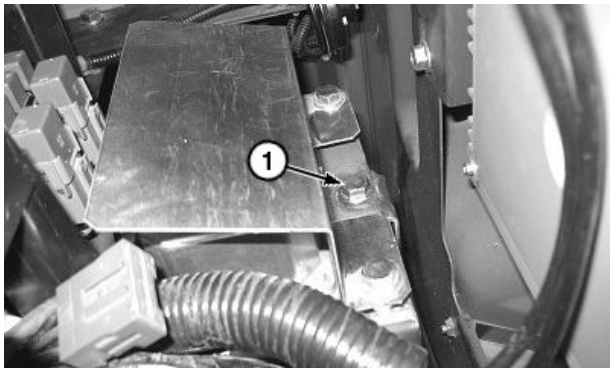

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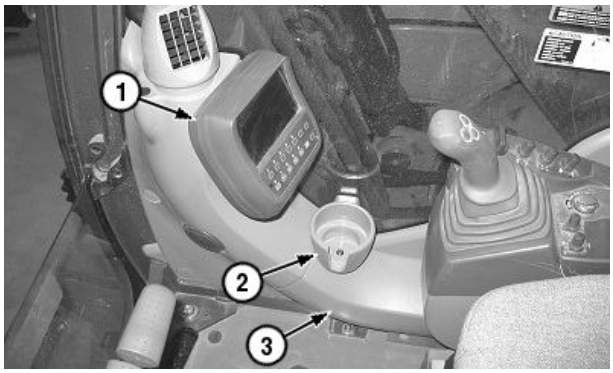
OUO1073,0002107 -19-10APR07-6/10

17. Remove monitor controller (1). See Monitor Controller Remove and Install. (Group 9015-20.)
18. Remove cup holder (2) and panel (3).

1— Monitor Controller
2— Cup Holder
3— Panel



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OUO1073,0002107 -19-10APR07-7/10

Seat Remove and Install

1. Slide seat forward.
2. Remove cap screws (1), lock washers, and lower seat belts from each side of seat.
3. Remove socket head cap screws (2) from rear of seat.
4. Slide seat rearward.
5. Remove socket head cap screws (5) from front of seat.

CAUTION: Heavy component; use a hoist.

Specification

Seat—Weight..... 40 kg
90 lb

6. Remove seat through front window using lifting strap and hoist.
7. Repair or replace parts as necessary.
8. Install seat.
9. Tighten seat mounting hardware to specification.

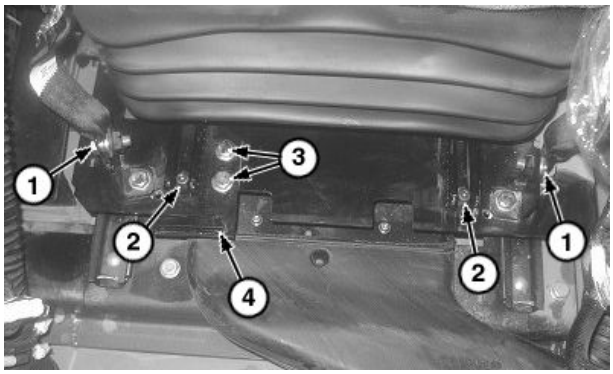
Specification

Seat Mount Socket Head
Cap Screws—Torque.....20 N·m
177 lb-in.

10. Install lower seat belt, lock washer and cap screw on each side of seat. Tighten cap screw to specification.

Specification

Lower Seat Belt Mount
Cap Screws—Torque.....50 N·m
37 lb-ft



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TX1020304A —UN—08MAR07

1— Cap Screw
2— Socket Head Cap Screw
3— Cap Screws
4— Stop
5— Socket Head Cap Screws

OUO1073,00020FF -19-17APR07-1/1

h. Disconnect hose from aeration nozzle to check circuit for solvent. Hold hose close to piece of cardboard; continue purging until cardboard is dry.

10. See flush evaporator, if evaporator requires flushing.

    If system is contaminated with burned refrigerant oil or debris, remove and bench flush evaporator. See following steps to flush evaporator through expansion valve, if oil appears normal.

11. **Flush evaporator:**

    a. Remove evaporator and expansion valve. See Heater and Air Conditioner Remove and Install. (Group 1830.)

    b. Force flushing solvent through evaporator inlet with compressed air.

    c. Purge system until dry.

    d. Install evaporator and then go to step 13.

12. **Flush evaporator through expansion valve:**

    a. Connect flusher outlet hose to connection of receiver/dryer outlet hose using JT03188 adapter.

    b. Fill flusher tank and fasten all connections.

Specification	
Flusher Tank—Capacity	4 L 1 gal

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

Specification	
Air Pressure—Minimum Pressure	620 kpa for flushing and purging. 90 psi for flushing and purging. 6.2 bar for flushing and purging.

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

    d. Attach hose and aerator nozzle to compressor inlet line using JT02101 adapter. Put nozzle in container to collect solvent.

NOTE: Purging evaporator circuit takes 12—15 minutes to thoroughly remove solvent.

13. Disconnect hose from aeration nozzle to check circuit for solvent. Hold hose close to piece of cardboard and continue purging until cardboard is dry.

14. Install new receiver/dryer compatible with R134a refrigerant. Fasten connections and mounting bracket. See Receiver-Dryer Remove and Install. (Group 1830.)

15. Add required oil. See R134a Refrigerant Oil Information. (Group 1830.)

16. Install compressor and connect refrigerant lines to manifold.

17. Connect clutch coil wire and install drive belt.

OUO1073,0002109 -19-10APR07-2/2

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Excavator

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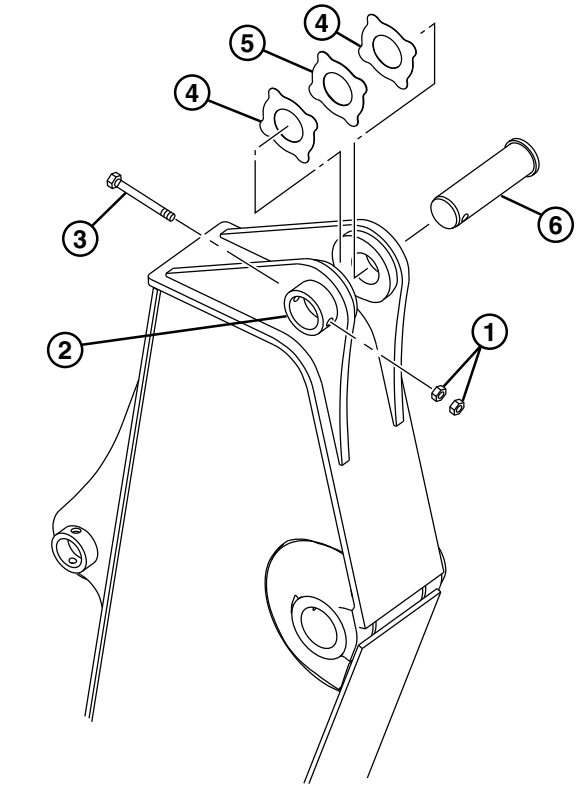
15. Install thrust plates (4 and 12) equally on each side of arm to get minimal amount of clearance between boom and arm.
16. Install boom-to-arm pin (11), block (10), plate (9), washer (8) and cap screw (7).
17. Connect arm cylinder by inserting cylinder pin (6), cap screw (3) and nuts (1).
18. Connect hoses. See Hydraulic System Line Connections. (Group 9025-15.)
19. Apply multi-purpose grease to all lubrication fittings.
20. Install bucket. See Bucket Remove and Install. (Group 3302.)

1— Nut (2 used)
2— Stopper
3— Cap Screw
4— Thrust Plate (2 used)
5— Thrust Plate
6— Cylinder Pin
7— Cap Screw
8— Washer
9— Plate
10— Block
11— Pin
12— Thrust Plate (2 used)
13— Thrust Plate



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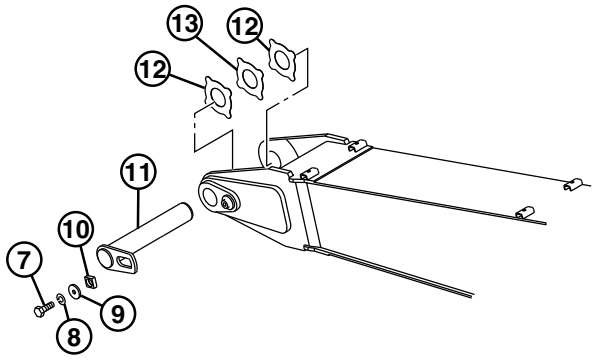

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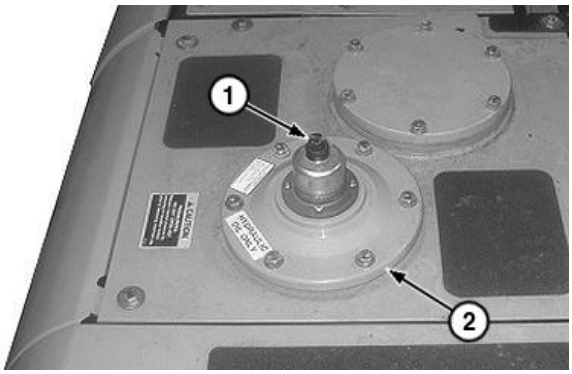
Pump 1 and 2 Remove and Install

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. The hydraulic tank is pressurized. Relieve pressure by pushing pressure release button (1).

1. Push pressure release button (1).
2. Drain hydraulic oil tank. Approximate capacity is 135 L (36 gal).
3. Drain pump drive gearbox. Approximate oil capacity is 1.0 L (1.1 qt).
4. Remove hydraulic compartment cover and rear engine cover.



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1— Pressure Release Button **2— Hydraulic Oil Tank Cover**

FS41334,000016F -19-26AUG10-1/11

5. Remove cap screws (1) and set fuel filters (2 and 3) aside. Protect against damage to hoses and filters.

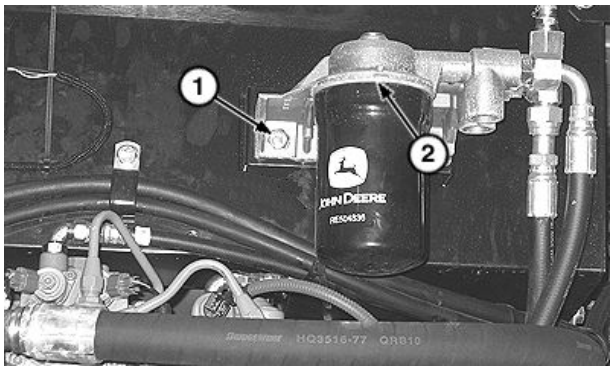
1— Cap Screw (4 used) **3— Primary Fuel Filter**
2— Final Fuel Filter

TX1021817A —UN—11APR07

FS41334,000016F -19-26AUG10-2/11

6. Remove cap screws (1) and set engine oil filter assembly (2) aside. Protect against damage to hoses and filter.

1— Cap Screw (2 used) **2— Oil Filter Assembly**



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NOTE: The gears are not interchangeable. To aid in assembly, install timing marks (84 and 85) on drive shafts and mark (83) on hydraulic pump 2 drive gear (39) and hydraulic pump 1 driven gear (36).

25. Install timing marks (84 and 85) on drive shafts. Install timing marks (83) on hydraulic pump 1 driven gear (36) and hydraulic pump 2 drive gear (39) to aid in assembly.
26. Measure amount of backlash between gears, using specification, to determine limit of use.

Specification

Pump Drive and Driven Gear—Backlash (nominal)	0.68 mm 0.027 in
Limit of Use—Backlash (nominal)	1.50 mm 0.059 in

27. Remove snap rings (35) and remove gears.

CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.

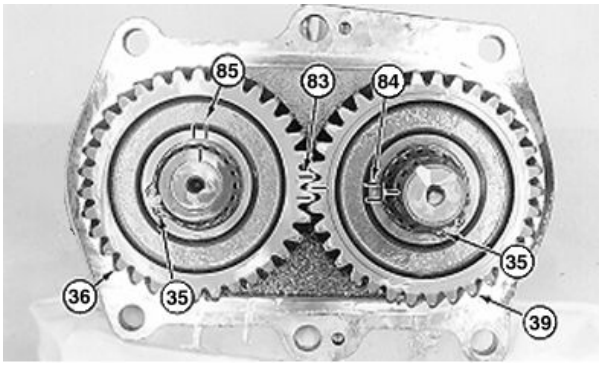
28. Using appropriate lifting device, place pump housing assembly with the cylinder head (cover) surface down.

Specification

Pump Housing Assembly—Weight (approximate)	65 kg 143 lb

29. Remove fitting (30) before removing hydraulic pump 1 drive shaft (19) and hydraulic pump 2 drive shaft (25).

CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.



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Pump Gear Timing Marks

35— Snap Ring (2 used)
36— Hydraulic Pump 1 Driven Gear
39— Hydraulic Pump 2 Drive Gear
83— Driven Gear-to-Drive Gear Timing Mark
84— Pump 2 (rear) Drive Shaft-to-Drive Gear Timing Mark
85— Pump 1 (front) Drive Shaft-to-Drive Gear Timing Mark

30. Using appropriate lifting device, place pump housing assembly on wood block with the pump drive gear case surface down.

Specification

Pump Housing Assembly—Weight (approximate)	65 kg 143 lb

31. Remove hydraulic pump 1 drive shaft and hydraulic pump 2 drive shaft assemblies using ST 1470 and ST 1471 tools.
32. Remove hydraulic pump 2 spacer ring (26) from bore.

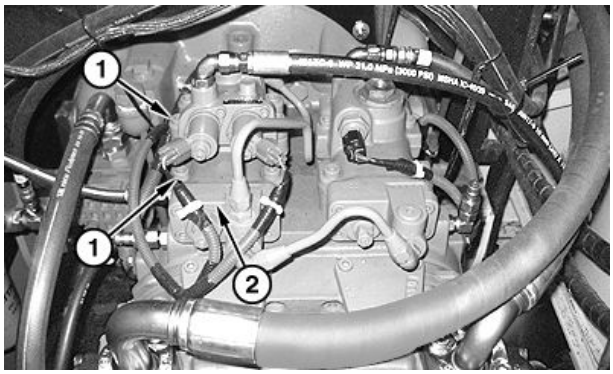
Continued on next page

5. Remove cap screws (1) and regulator (2).
6. Repair or replace parts as necessary.
7. Install regulators making sure groove in remote control sleeve and load sleeve engage dowel pin in feedback link. Check through hole that groove in sleeves engage dowel pin.
8. Tighten cap screws (1) to specification.

Specification	
Pump 1 (Front) and Pump 2 (Rear) Regulator-to-Pump Housing Cap Screw—Torque	49 N·m 36 lb-ft

9. Connect lines. See Pump 1, Pump 2, and Pilot Pump Line Identification. (Group 9025-15.)
10. Connect electrical connectors. See Pump Harness (W8) Component Location. (Group 9015-10.)

IMPORTANT: Hydraulic pump will be damaged if not filled with oil before starting engine. Procedure must be performed whenever a new pump installed or oil has been drained from the pump or hydraulic oil tank.



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1— Cap Screw (8 used)

2— Hydraulic Pump Regulator (2 used)

11. Fill pump housing with oil. See Pump 1 and 2 Start-Up Procedure. (Group 3360.)

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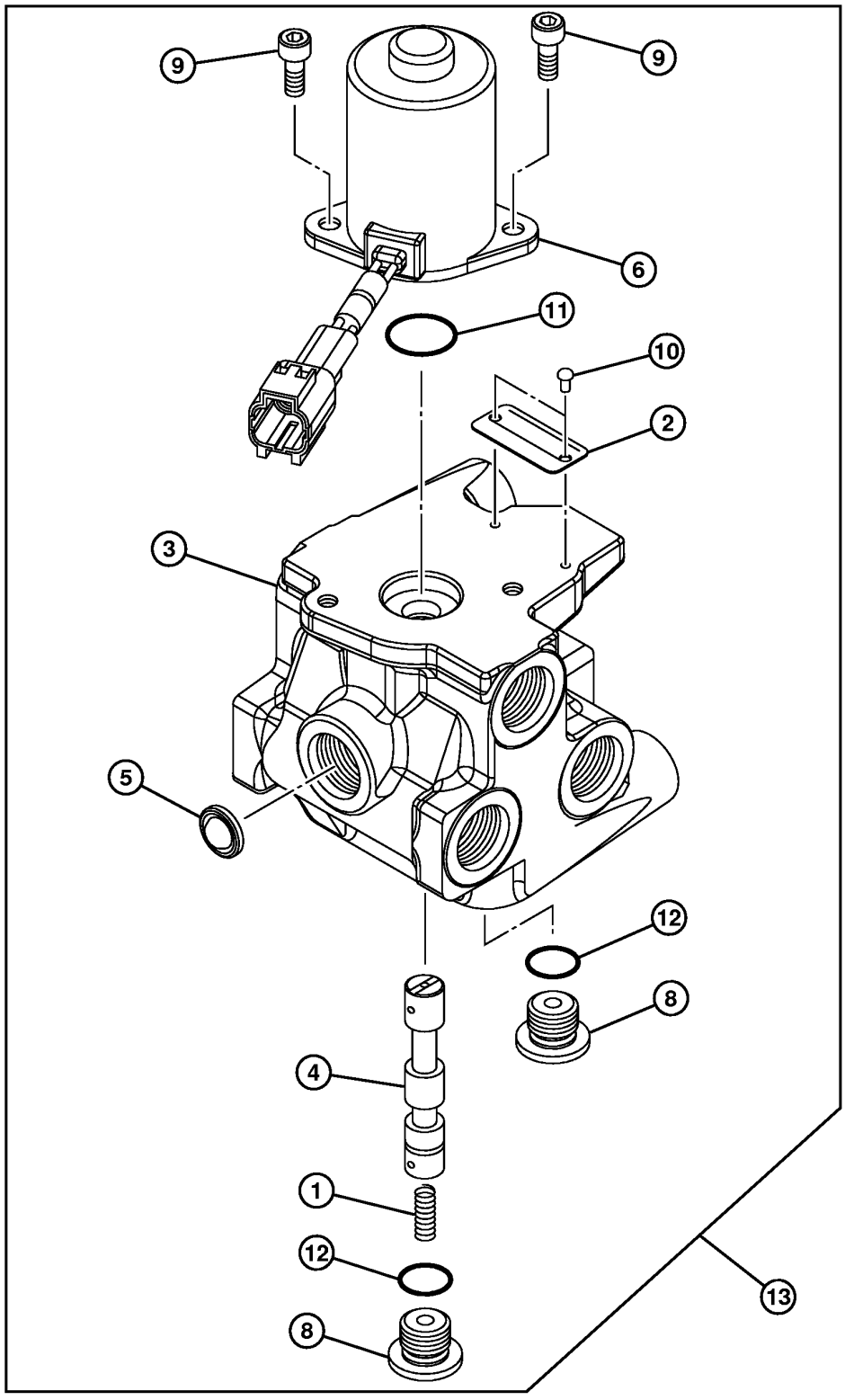
Pilot Shutoff Solenoid Valve Disassemble and Assemble



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TX1000413 —UN—16NOV05

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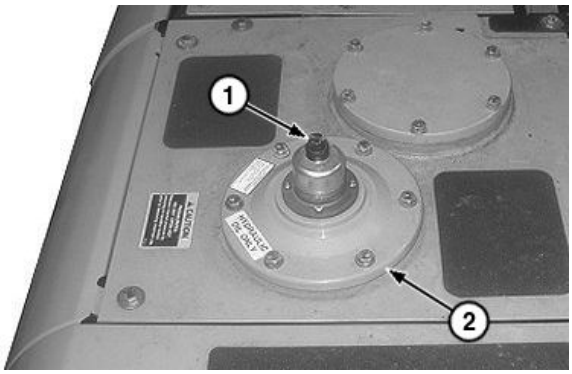
Control Valve Remove and Install

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by pushing pressure release button (1).

1. Push pressure release button (1).
2. Pull a vacuum in hydraulic oil tank using a vacuum pump, or drain tank. See Apply Vacuum to Hydraulic Oil Tank. (Group 3360.) See 200DLC Drain and Refill Capacities. (Operator's Manual.)

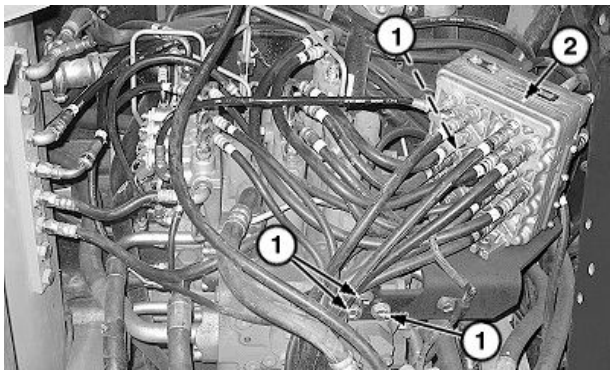


TX1020485A —UN—21MAR07

1— Pressure Release Button **2— Hydraulic Oil Tank Cover**

OUO6046,0002313 -19-10APR07-1/3

3. Tag and disconnect hydraulic lines and hoses. Close all open lines and fittings using caps and plugs.
4. Disconnect electrical connectors.
5. Remove cap screws (1) and washers. Place pilot signal manifold (2) with bracket to side.
6. Attach an appropriate lifting device to control valve using lifting straps.



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1— Cap Screws **2— Pilot Signal Manifold**

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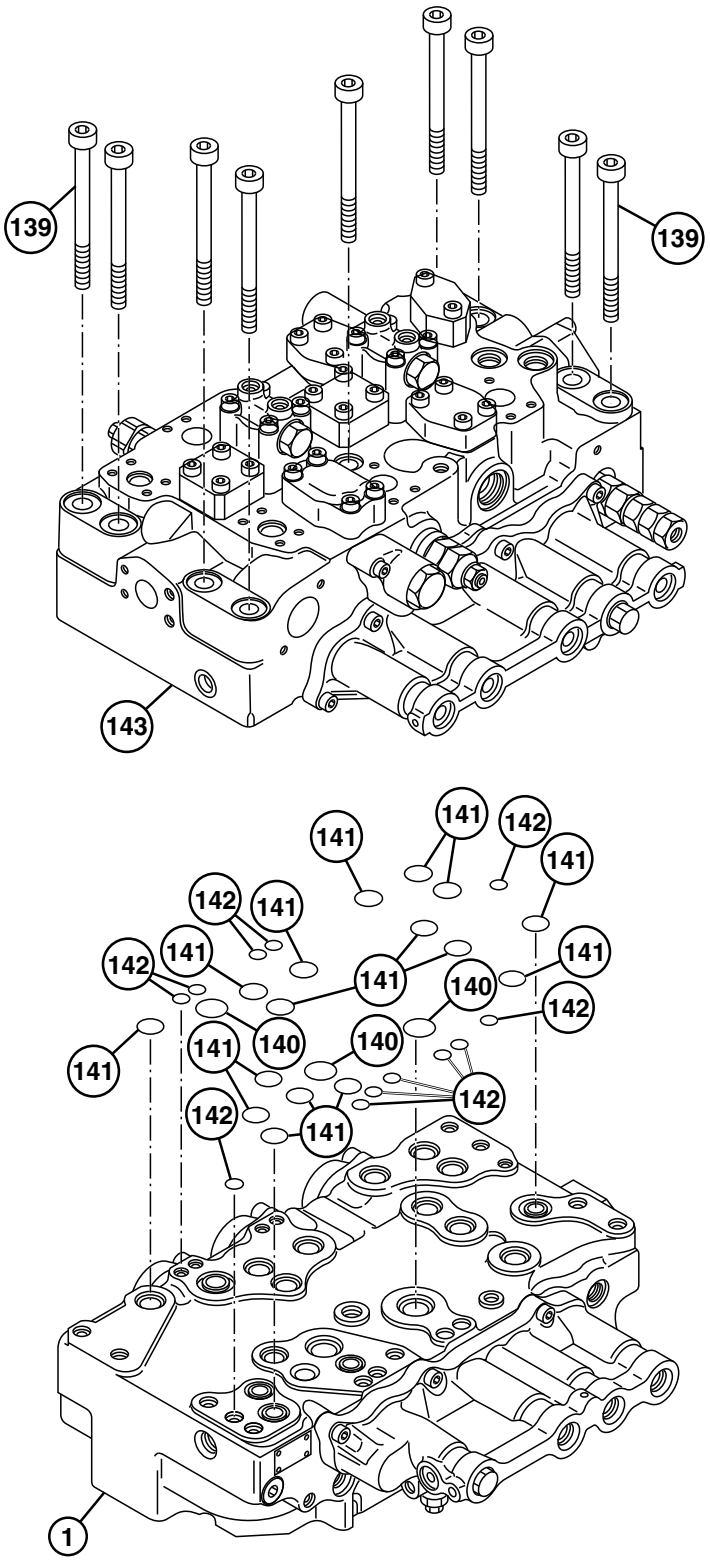
Control Valve (4-Spool) Disassemble and Assemble



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TX1099424 —UN—19OCT11

Control Valve Separate

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1— Cap Screw (4 used)
2— Flange (2 used)
3— Oil Cooler Hose
4— Cap Screw
5— Washer
6— Clamp
7— Coupling
8— Cap Screw (2 used)
9— Washer (2 used)
10— Bracket
11— Return Line
12— O-Ring
13— Restriction Valve
14— Snap Ring

3. Remove clamp (6).
4. Disconnect hose (3) from line (11).
5. Remove snap ring (14) and restriction valve (13).
6. Repair or replace parts as necessary.
7. Install restriction valve (13) and snap ring (14).
8. Connect hose (3) to line (11).

Specification

Return Line Coupling Cap Screws—Torque	90 N·m 66 lb-ft

9. Fill hydraulic oil tank. Approximate oil capacity is 135 L (36 gal).

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.

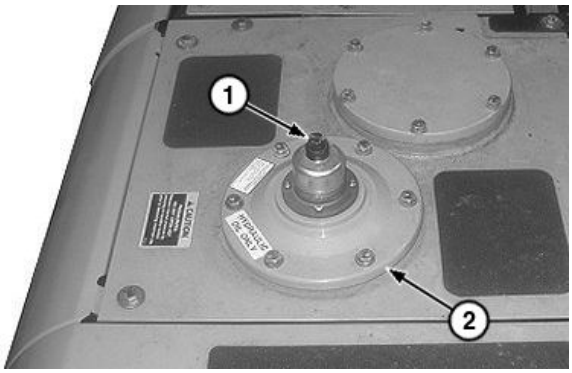
10. Perform pump 1 and 2 start-up procedure. See Pump 1 and 2 Start-Up Procedure. (Group 3360.)

TJ15698,0000167 -19-11APR07-3/3

Hydraulic Oil Cooler Bypass Valve Remove and Install

CAUTION: High pressure release of oil from pressurized system can cause serious burns or penetrating injury. Relieve pressure by pushing pressure release button (1).

1. Push pressure release button (1).
2. Pull a vacuum in hydraulic oil tank using a vacuum pump or drain tank. See Apply Vacuum to Hydraulic Oil Tank. (Group 3360.) Approximate oil capacity is 135 L (36 gal).



TX1020485A —UN—21MAR07

1— Pressure Release Button **2— Hydraulic Oil Tank Cover**

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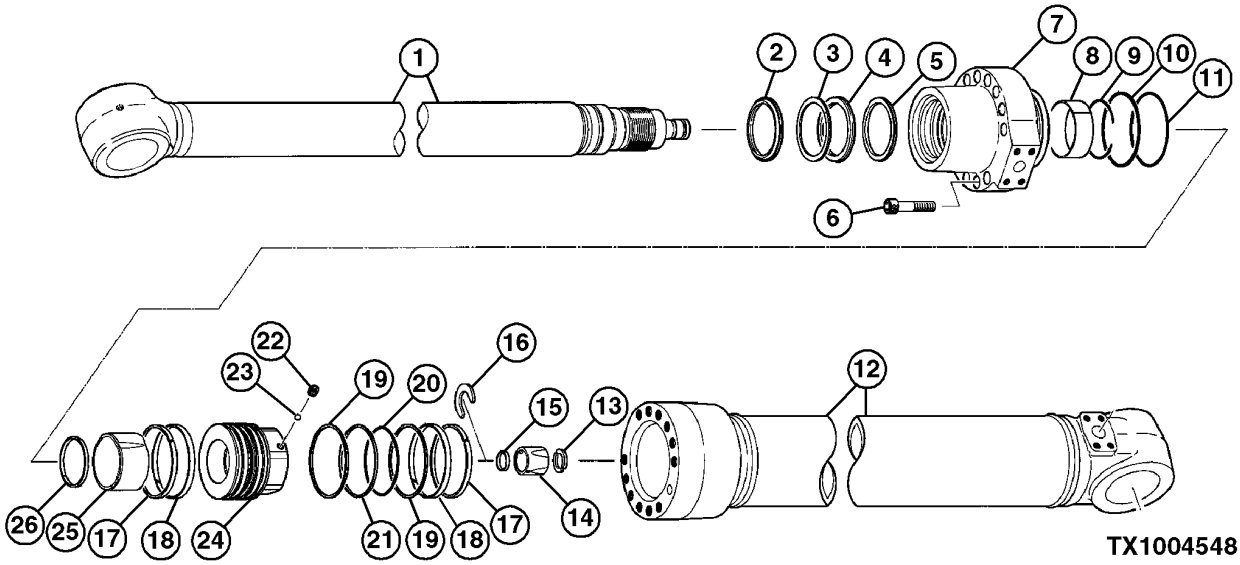
Arm Cylinder Disassemble and Assemble



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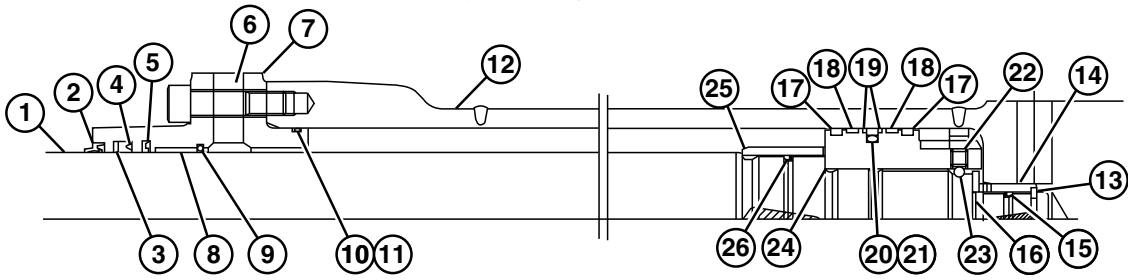
TX1004548 —UN—14MAR06

Arm Cylinder Components



TX1129657

TX1129657 —UN—18JAN13

Seal Identification

1— Rod
2— Dust Wiper
3— Backup Ring
4— U-Ring
5— Buffer Ring
6— Cap Screw (12 used)
7— Cylinder Head
8— Bushing
9— Snap Ring
10— Backup Ring
11— O-Ring
12— Barrel
13— Stopper (2 used)
14— Cushion Bearing
15— Cushion Seal
16— Snap Ring
17— Slide Ring (2 used)
18— Wear Ring (2 used)
19— Backup Ring (2 used)
20— O-Ring
21— Seal Ring
22— Set Screw
23— Steel Ball
24— Piston Nut
25— Cushion Bearing
26— Cushion Seal

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Section 43
Swing or Pivoting System

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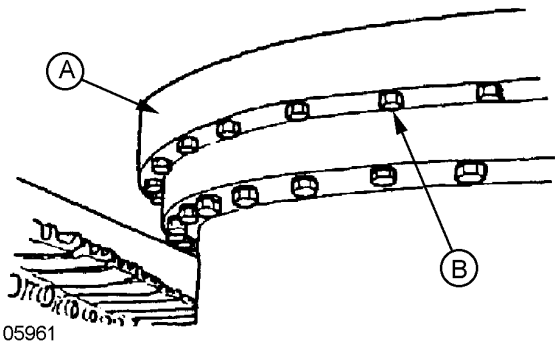
10. Put matching marks on the upperstructure and outer race of the swing bearing to aid in installation. Loosen and remove cap screws (B).

A—Swing Bearing **B—Cap Screw (36 used)**



Swing Bearing

TJ15698,0000182 -19-11APR07-3/4

11. Lift upperstructure from undercarriage using hoist.
12. Repair or replace parts as necessary.

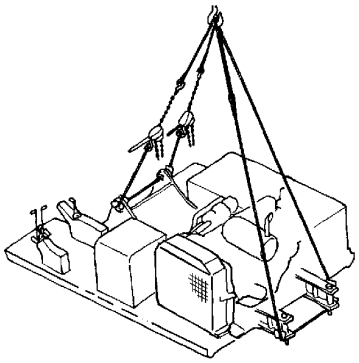
CAUTION: Heavy component; use a hoist.

Specification	
Upperstructure—Weight	4900 kg approximate 10 805 lb approximate

13. Install upperstructure to undercarriage.
14. Align mark on the outer race of swing bearing with mark on upperstructure. Install DFT1144 Guide Pins to help align holes in swing bearing with holes in upperstructure. See DFT1144 Guide Pin. (Group 9900.)
15. Install cap screws (B).
16. Remove chains from upperstructure and tighten cap screws (B).

Specification	
Swing Bearing-to-Upperstructure Cap Screws—Torque	510 N·m 380 lb-ft

17. Connect center joint hydraulic hoses and install stop. See Center Joint Remove and Install. (Group 4360.)
18. Install boom. See Boom Remove and Install. (Group 3340.)



19. Install counterweight. See Counterweight Remove and Install. (Group 1749.)
20. Install cab. See Cab Remove and Install. (Group 1800.)

IMPORTANT: Hydraulic pump will be damaged if not filled with oil before starting engine. Start-up procedure must be performed whenever a new pump is installed or oil has been drained from the pump or hydraulic oil tank.

21. Fill pump housing with oil. See Pump 1 and 2 Start-Up Procedure. (Group 3360.)

TJ15698,0000182 -19-11APR07-4/4

Center Joint Disassemble and Assemble

CAUTION: Heavy component; use appropriate lifting device.

Specification	
Center Joint—Weight	27 kg 60 lb

1. Make alignment marks on spindle assembly (2), housing (7) and cover (11) to aid in assembly.
2. Remove cover (11), snap ring (9), and ring (8).
3. Install puller to housing (7) using cap screws (12). Carefully remove spindle assembly (2) from housing (7).
4. Remove plug (1) from spindle assembly and clean port.

NOTE: Bushing (5) can be removed using built-up weld at 4 places on its inner diameter, then quenching bushing to shrink. Cover seal surfaces to protect from weld spatter.

5. Remove dust seal (3), bushing (5), and oil seals (6).
6. Inspect and repair or replace parts as necessary.
7. Install bushing (5) into housing (7) using a press. Lubricate bushing with grease or molybdenum disulfide.

IMPORTANT: Install dust seal (3) with lip side toward housing (7).

8. Install dust seal (3) onto spindle (2).
9. Install O-ring (4) and oil seals (6) into housing (7).

IMPORTANT: Install spindle assembly (2) slowly into housing (7) so oil seals (6) are not damaged.

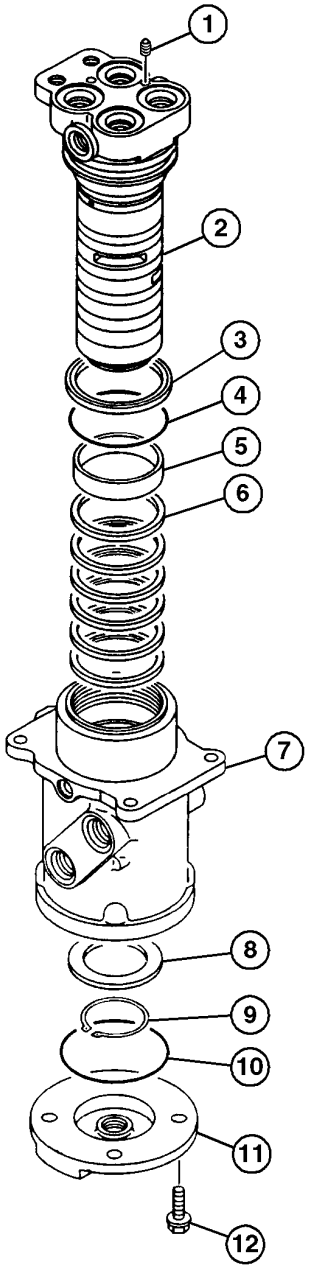
10. Lubricate spindle assembly (2) with hydraulic oil and install into housing (7). Align reference marks made during disassembly.

IMPORTANT: Install ring (8) with chamfered side facing spindle assembly (2).

11. Install parts (8—12), aligning reference marks made during disassembly.
12. Tighten cap screws (12) to specification.

Specification	
Cover-to-Housing Cap Screw—Torque	49 N·m 36 lb-ft

13. Install plug (1).



TX1018875

TX1018875 —UN—12FEB07

1— Plug (Ball)
2— Spindle
3— Dust Seal
4— O-Ring
5— Bushing
6— Oil Seal (6 used)
7— Housing
8— Ring
9— Snap Ring
10— O-Ring
11— Cover
12— Cap Screw (4 used)

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1— Swing Motor Cover
2— Crossover Relief Valve (2 used)
3— Make-Up Check Valve Plug (2 used)
4— O-Ring (2 used)
5— Spring (2 used)
6— Poppet (2 used)
7— Damper Valve (2 used)
8— Backup Ring (2 used)
9— Packing (2 used)
10— Damper Valve Body
11— Cap Screw (4 used)
12— O-Ring
13— Roller Bearing
14— Valve Plate
15— Spring (24 used)
16— Brake Piston
17— O-Ring
18— O-Ring
19— Plates (4 used)
20— Friction Plates (3 used)
21— Cylinder Block
22— Retainer
23— Plate
24— Piston (9 used)
25— Shoe Plate
26— Shaft
27— Roller Bearing
28— Oil Seal
29— Packing
30— Swing Park Brake Release Valve Piston
31— Spring
32— Ball
33— Swing Motor Housing

1. Install ball (32), spring (31), packing (29), and swing park brake release valve piston (30) into swing motor housing (33).

IMPORTANT: Install inner race of roller bearing (27) with flange facing step side of shaft (26).

2. Install inner race of roller bearing (27) onto shaft (26) using a press.
3. Install oil seal (28) to swing motor housing (33).
4. Install outer race of roller bearing (27) to swing motor housing (33).

IMPORTANT: Wind tape onto spline end of shaft (26) to prevent damage to oil seal (28).

5. Install shaft (26) into swing motor housing (33).
6. Install shoe plate (25) to housing (33) with chamfered surface toward housing.
7. Align retainer (22) and plate (23) with notches facing shoe plate (25)..
8. Install retainer (22) and plate (23) to pistons (24)
9. Apply hydraulic oil into piston holes in cylinder block (21).
10. Insert piston assembly into cylinder block (21).
11. Install cylinder block assembly to shaft (26).

IMPORTANT: There are four notches on outer side of plates (73) and four notches on spline teeth side of friction plates (79).

IMPORTANT: Align each notch when installing.

12. Alternately install plates (19) and friction plates (20) to swing motor housing (33).
13. Install O-rings (17, 18) to swing motor housing (33.
14. Align mating marks and install brake piston (16).
15. Install springs (15) to brake piston (16).

NOTE: Do step 15 only if roller bearing (13) was removed.

16. Install roller bearing (13) into swing motor cover (1) using plastic hammer.
17. Install O-ring (12) to swing motor cover (1).
18. Install valve plate (14) to swing motor cover (1) with notch in port facing toward cylinder block (21).
19. Apply grease to valve plate (14) to help retain to swing motor cover (1).
20. Apply grease to roller bearing (13) to ease shaft (26) installation.
21. Align mating marks on swing motor cover (1) and housing (33). Install cap screws (11) and tighten to specification.

Specification

Swing Motor Cover-to-Housing Cap Screw—Torque ..... 431 N·m (318 lb-ft)

22. Install backup rings (8) and packings (9) to damper valves (7).
23. Install damper valve assemblies to damper valve body. Tighten to specification.

Specification

Damper Valve—Torque ..... 70 N·m (51 lb.-ft.)

24. Install poppets (6) and spring (5) to swing motor cover (1).
25. Install o-ring (4) to make-up check valve plug (3).
26. Install make-up check valve assembly to swing motor cover (1). Tighten to specification.

Specification

Make-Up Check Valve Plug—Torque ..... 334 N·m (246 lb-ft)

27. Install crossover relief valves (2) into swing motor cover (1).

Specification

Crossover Relief Valve—Torque ..... 177 N·m (131 lb-ft)

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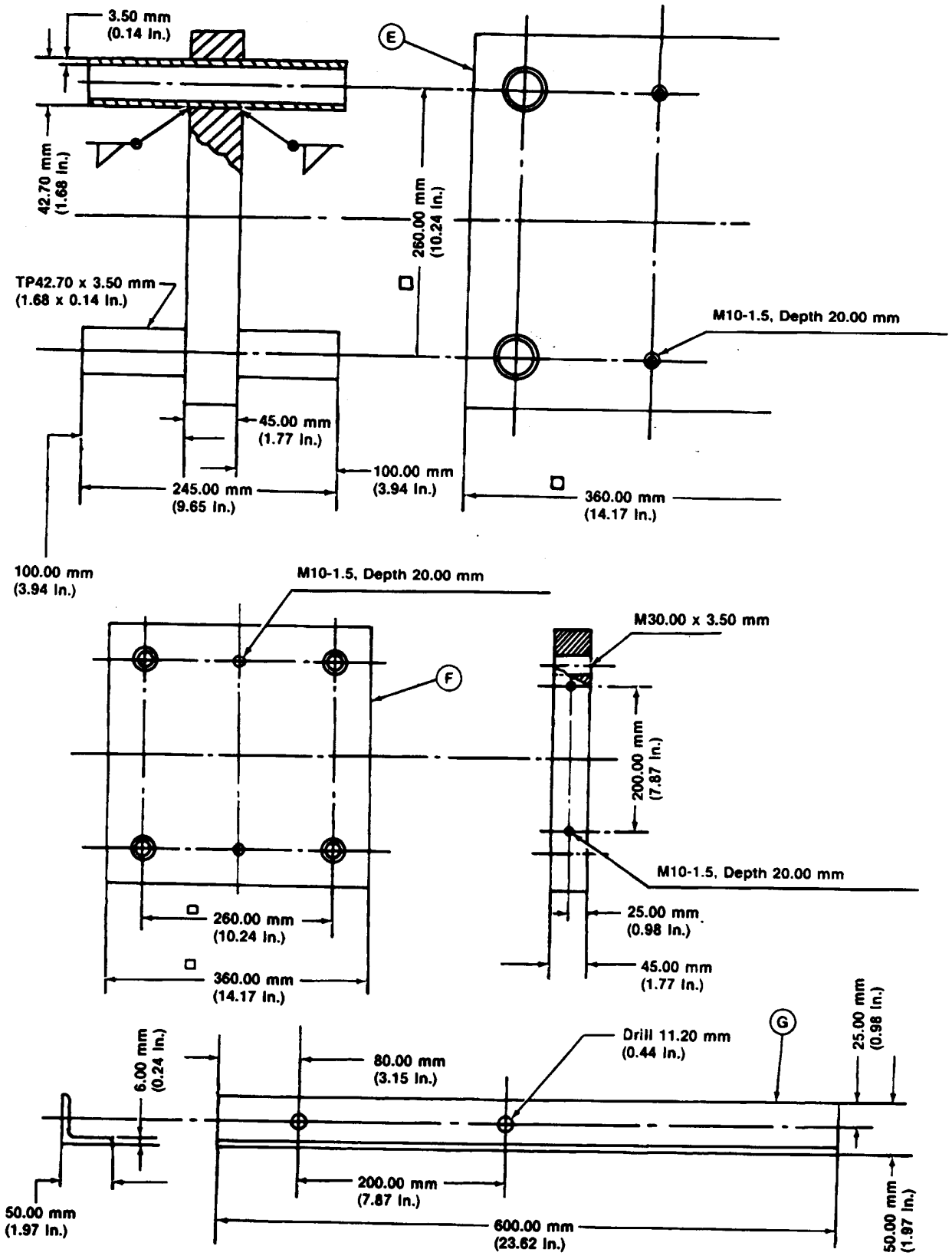

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