655K Crawler Loader Repair

(PIN: 1T0655KX_ _E233169—)

REPAIR TECHNICAL MANUAL

655K Crawler Loader (PIN: 1T0655KX_ _E233169—)

TM12721 24AUG17 (ENGLISH)

For complete service information also see:

655K Crawler Loader Operation and Test	TM12720
655K Crawler Loader Operator's Manual	OMT327049
6068 PowerTech™ OEM Diesel Engines Above 130kW (174 hp) (Interim Tier 4/Stage III B platform)	CTM104619
Hydraulic Cylinders	CTM120519
JDLink™ (MTG) Technical Manual	TM114519
Undercarriage Appraisal Manual	SP326VOL1
Test and Service Specifications	SP458VOL2

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

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.

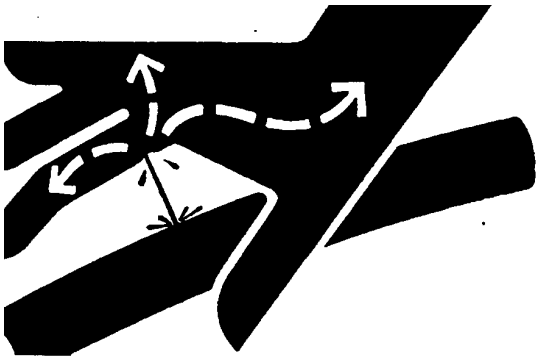
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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

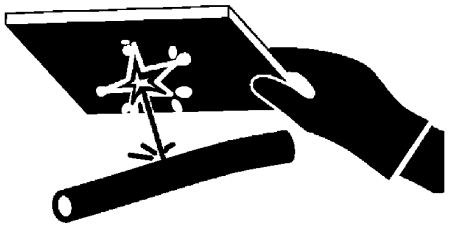
Avoid High-Pressure Oils

This machine uses a high-pressure hydraulic system. Escaping oil under pressure can penetrate the skin causing serious injury.

Never search for leaks with your hands. Protect hands. Use a piece of cardboard to find location of escaping oil. Stop engine and relieve pressure before disconnecting lines or working on hydraulic system.

If hydraulic oil penetrates your skin, see a doctor immediately. Injected oil must be removed surgically within hours or gangrene could result. Contact a knowledgeable medical source or the Deere & Company Medical Department in Moline, Illinois, U.S.A.

T133509 —UN—15APR13



T133840 —UN—20SEP00

TX,HPOILS -19-20JAN11-1/1

Remove Paint Before Welding or Heating

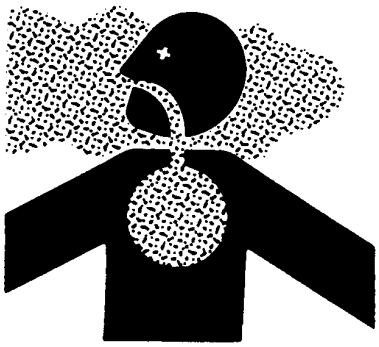
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.



TS220 —UN—15APR13

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

Make Welding Repairs Safely

IMPORTANT: Disable electrical power before welding. Turn off main battery switch and disconnect positive (+) and negative (-) battery cables.

Do not weld or apply heat on any part of a reservoir or tank that has contained oil or fuel. Heat from welding and cutting can cause oil, fuel, or cleaning solution to create gases which are explosive, flammable, or toxic.

Avoid welding or heating near pressurized fluid lines. Flammable spray may result and cause severe burns if pressurized lines malfunction 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.

T133547 —UN—15APR13

Heating Near Pressurized Fluid Lines

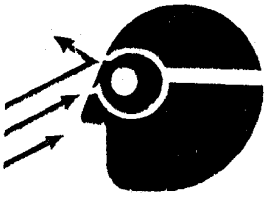
Make sure there is good ventilation. Wear eye protection and protective equipment when welding.

MB60223,0000212 -19-02JUL15-1/1

Drive Metal Pins Safely

Always wear protective goggles or safety glasses and other protective equipment before striking hardened parts. Hammering hardened metal parts such as pins and bucket teeth could dislodge chips at high velocity.

Use a soft hammer or a brass bar between hammer and object to prevent chipping.

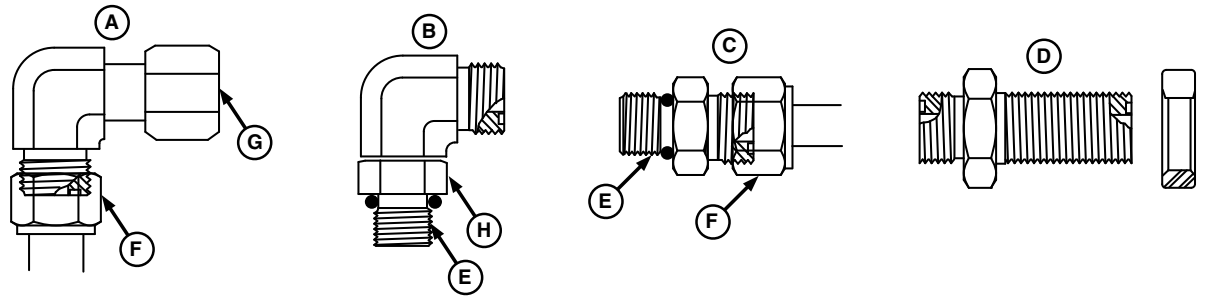


T133738 —UN—15APR13

TX,PINS -19-20JAN11-1/1

O-Ring Face Seal Fittings With SAE Inch Hex Nut And Stud End For High Pressure Service Recommendations

O-RING FACE SEAL FITTINGS WITH SAE INCH HEX NUT AND STUD END FOR HIGH PRESSURE, ABOVE 27 600 kPa (276 bar) (4000 psi), TORQUE VALUES—Tolerance is +15 -20% unless otherwise specified



H70406 —UN—15APR13

A—90° Swivel Elbow and Tube Nut
B—90° Adjustable Stud Elbow
C—Stud Straight and Tube Nut
D—Bulkhead Union and Nut
E—Stud End
F—Tube Nut
G—Swivel Nut
H—Hex Nut

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.	in.	Nm (lb-ft)	in.	Nm (lb-ft)
5	-3	4.78 (0.188)	—	—	—	—	—
6	-4	6.35 (0.250)	9/16-18	11/16	24 (18)	13/16	32 (24)
8	-5	7.92 (0.312)	—	—	—	—	—
10	-6	9.53 (0.375)	11/16-16	13/16	37 (27)	1	42 (31)
12	-8	12.70 (0.500)	13/16-16	15/16	75 (55)	1-1/8	93 (69)
16	-10	15.88 (0.625)	1-14	1-1/8	103 (76)	1-5/16	118 (87)
20	-12	19.05 (0.750)	1-3/16-12	1-3/8	152 (112)	1-1/2	175 (129)
22	-14	22.23 (0.875)	1-3/16-12	—	152 (112)	—	175 (129)
25	-16	25.40 (1.000)	1-7/16-12	1-5/8	214 (158)	1-3/4	247 (182)
32	-20	31.75 (1.250)	1-11/16-12	1-7/8	286 (211)	2	328 (242)
38	-24	38.10 (1.500)	2-12	2-1/4	326 (240)	2-3/8	374 (276)

O-RING STRAIGHT, ADJUSTABLE, AND EXTERNAL HEX PLUG WITH SAE INCH STUD END FOR HIGH PRESSURE, ABOVE 27 600 kPa (276 bar) (4000 psi), TORQUE VALUES—Tolerance is +15 -20% unless otherwise specified

Thread Size	Straight Hex Size[a]	Adjustable Nut Hex Size	Steel or Gray Iron Torque
in.	in.	in.	Nm (lb-ft)
3/8-24	5/8	9/16	18 (13)
7/16-20	5/8	5/8	24 (18)
1/2-20	3/4	11/16	30 (22)
9/16-18	3/4	3/4	37 (27)
3/4-16	7/8	15/16	75 (55)
7/8-14	1-1/16	1-1/16	103 (76)
1-1/16-12	1-1/4	1-3/8	177 (131)
1-3/16-12	1-3/8	1-1/2	231 (170)
1-5/16-12	1-1/2	1-5/8	270 (199)
1-5/8-12	1-3/4	1-7/8	286 (211)
1-7/8-12	2-1/8	2-1/8	326 (240)

[a] Straight hex size applies to fittings only and may not be the same as the corresponding plug of the same thread size.

1. Inspect fitting and connector sealing surfaces and the O-rings. They must be free of dirt, scratches, nicks, and burrs. O-ring must be free of dirt, cuts, cracks, swelling or flatten condition.

Continued on next page

Service Recommendations For O-Ring Boss Fittings With Shoulder

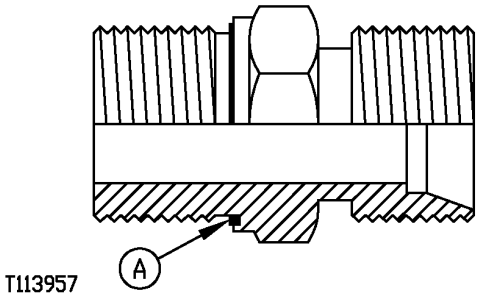
1. Inspect component seal boss seat for dirt or defects.
2. Inspect EOlastic seal (A) for damage. Replace seal or fitting as necessary.

   To replace seal, put electrical tape over threads to protect seal. Slide seal over tape and into seal groove of fitting. Remove tape.
3. Tighten fitting to torque value shown on chart.

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

NOTE: The L in the Tube Fitting OD Size column indicates "light" designed fitting and the S indicates "heavy" designed fitting.

	Torque Value		
Tube Fitting O.D. Size	**Metric Thread**	**N·m**	**lb·ft**
6 L	M10 x 1	20	15
8 L	M12 x 1.5	30	22
10 L	M14 x 1.5	45	33
12 L	M16 x 1.5	60	44
15 L	M18 x 1.5	80	59
18 L	M22 x 1.5	130	96
22 L	M26 x 1.5	190	140
28 L	M33 x 2	300	221
35 L	M42 x 2	600	443
42 L	M48 x 2	800	590
6 S	M12 x 1.5	40	30
8 S	M14 x 1.5	60	44
10 S	M16 x 1.5	80	59
12 S	M18 x 1.5	110	81
14 S	M20 x 1.5	140	103
16 S	M22 x 1.5	170	125
20 S	M27 x 2	250	184
25 S	M33 x 2	450	332
30 S	M42 x 2	600	443
38 S	M48 x 2	800	590



T113957 —UN—06MAR98

O-Ring Boss Fitting With Shoulder

	Torque Value		
Tube Fitting O.D. Size	**Inch Size**	**N·m**	**lb·ft**
6 L	1/8	20	15
8 L	1/4	40	30
10 L	1/4	40	30
12 L	3/8	80	59
15 L	1/2	140	103
18 L	1/2	100	74
22 L	3/4	180	133
28 L	1	300	221
35 L	1-1/4	600	443
42 L	1-1/2	800	590
6 S	1/4	50	37
8 S	1/4	50	37
10 S	3/8	90	66
12 S	3/8	90	66
14 S	1/2	160	118
16 S	1/2	140	103
20 S	3/4	250	184
25 S	1	400	295
30 S	1-1/4	650	479
38 S	1-1/2	800	590

Continued on next page

CED,OUO1002,563 -19-09MAR98-1/2

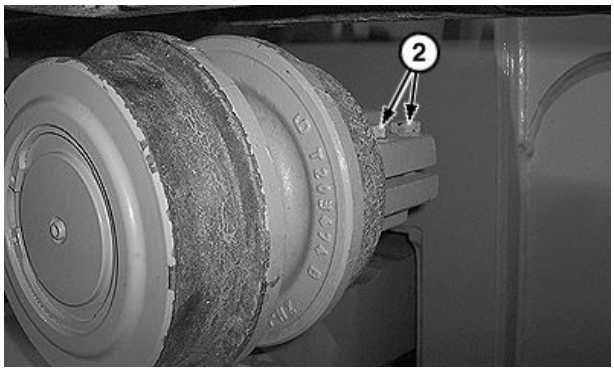
CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.

3. Loosen cap screws (2) and remove carrier roller.

Specification

Carrier Roller—Weight (approximate)..... 29 kg 64 lb.

4. Clean and inspect parts. Repair or replace parts as necessary. See Carrier Roller Disassemble and Assemble. (Group 0130.)
5. Install carrier roller to carrier roller support with existing hardware.
6. Check for proper alignment of carrier roller to track link. If carrier roller is out of alignment, loosen cap screws and adjust as necessary.
7. Adjust track sag. See Track Sag Adjustment. (Group 0130.)



TX1125775A —UN—27NOV12

Carrier Roller Cap Screws

2— Cap Screw (2 used)

PM10405,0000860 -19-20DEC12-2/2

5. Remove and inspect metal face seals. See Metal Face Seal Inspection. (Group 0130.)
6. Remove O-rings (2) from both ends of shaft.
7. Remove cap screws (1) from bushing case at both ends of track roller.

1— Cap Screw 3/8 in. X 1 1/8 in. (12 used)
2— O-Ring (2 used)

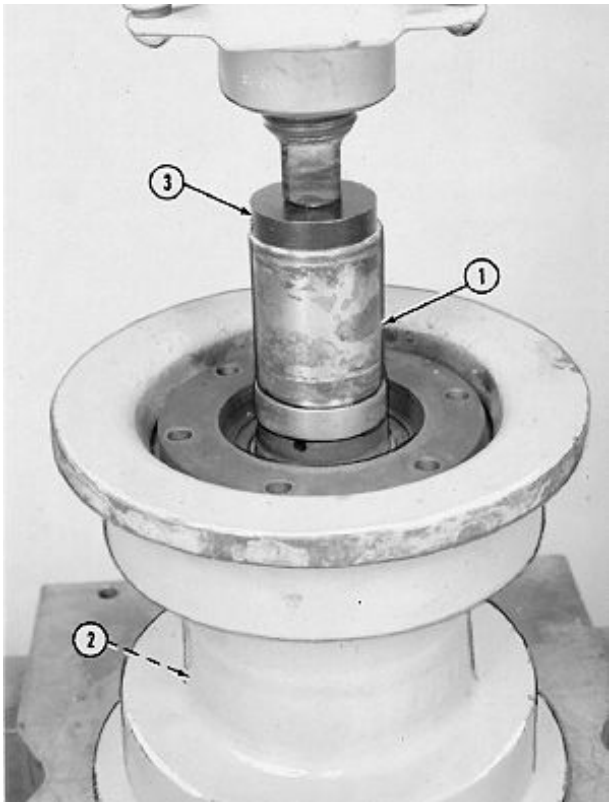
T6018BC —UN—26OCT88

Track Roller Shaft

RM58335,000140C -19-02MAY11-4/16

8. Remove shaft (1) and bushing case (2) using disk (3) and press.
9. Remove shaft from bushing case.
10. Turn roller over. Use a 4 in. disk to remove bushing case from roller housing.
11. Remove O-rings from bushing cases.
12. Inspect bushing in bushing case for excessive wear, pitting or scoring. Replace parts as necessary.
13. Remove plastic and rubber plugs from shaft using twist drill. Flush oil passages in shaft with part cleaner solvent.

1— Shaft
2— Bushing Case
3— Disk 2 3/8 in.



T80432 —UN—26OCT88

Roller Shaft

Continued on next page

RM58335,000140C -19-02MAY11-5/16

Pivot Shaft Remove and Install

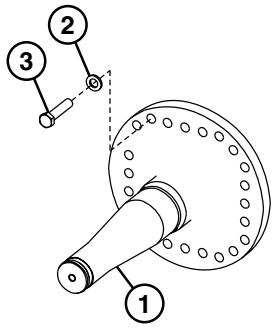
1. Prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Remove track. See Track Chain Remove and Install. (Group 0130.)
3. Remove track frame. See Track Frame Remove and Install. (Group 0130.)

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

4. Attach appropriate lifting device to pivot shaft (1).
5. Remove pivot shaft cap screws (3), washers (2), and pivot shaft.

Specification	
Pivot Shaft—Weight (approximate)	61 kg 135 lb.

6. Apply PM37479 Thread Lock and Sealer (high strength) to pivot shaft mounting cap screws (3).
7. Install pivot shaft to machine frame with existing cap screws and washers. Tighten cap screws to specification.



T209976 —UN—29MAR05

Pivot Shaft

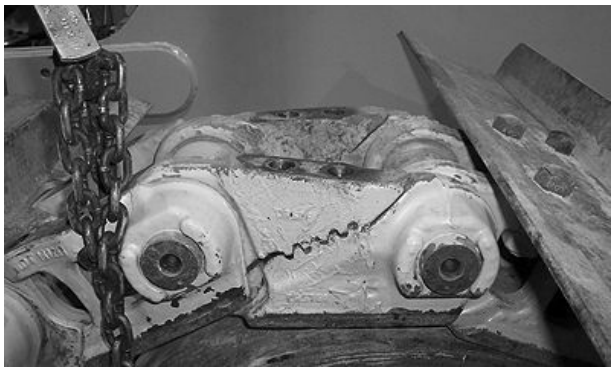
1— Pivot Shaft
2— Washer (21 used)
3— Cap Screw M20 X 90 (21 used)

Specification	
Pivot Shaft Cap Screws—Torque	530 N·m 390 lb.-ft.

WC20922,0004375 -19-10JAN13-1/1

IMPORTANT: Prevent damage to master link hole threads. DO NOT use a pry bar in holes to align split master link.

16. Carefully assemble master links together and align bolt holes.
17. Install track bolts by hand to check alignment.
18. Apply TY24811 Compound Lubricant or an equivalent to cap screw threads and bearing surface under head.



T210052A —UN—31MAR05

Align Master Links

RM58335,0001416 -19-02JAN13-4/6

19. Remove any foreign material from master track shoe and link mounting surfaces.

IMPORTANT: Prevent cross-threading of cap screws. NEVER use an impact wrench to start cap screws.

20. Install master track shoe (5) on master links and start track bolts (4) by hand to avoid cross-threading.

4— Track Bolt (4 used)

5— Master Track Shoe

TX1089346A —UN—15MAR11

Master Track Shoe

Continued on next page

RM58335,0001416 -19-02JAN13-5/6

22. As track chain is being assembled, check to make sure there is some clearance between the overlapping face of links, using a feeler gauge. If links contact each other, check bushing projection.

Specification

Bushing Projection—Height	1.75—2.25 mm 0.069—0.089 in.

23. Add oil (SAE 80W 90) using a No. 61119 Seal Tester and Lubricator for SALT Crawler Equipment. Push nozzle through plug all the way into pin. Depress control lever on the handle enough to draw specified vacuum as indicated on the gauge.

Specification

Lubricated Track Chain Seal Test—Vacuum	68—102 kPa 2—30 in. Hg

24. Release lever. If there is no decrease in vacuum for a minimum of 5 seconds, the joints are sealed. If there is a vacuum decrease, seals are not sealing and the joint must be taken apart and repaired.

25. Add oil by depressing the second lever. Oil pressure (read on the same gauge) must be to specification after both levers are released.

Specification

Lubricated Track Chain Oil—Pressure	140—205 kPa 1.4—2.05 bar 20—30 psi

26. For pins using rubber plug and plastic plug, immediately install plug using JDG190 Plug Installer after adding oil.

    For pins using self-sealing plug, slowly pull nozzle (C) out to allow any compressed air to escape through nozzle from first hole (A) to second hole (B).

    Add oil to each joint after assembling so only one joint would have to be disassembled if a vacuum leak occurs.

27. Repeat for all joints.

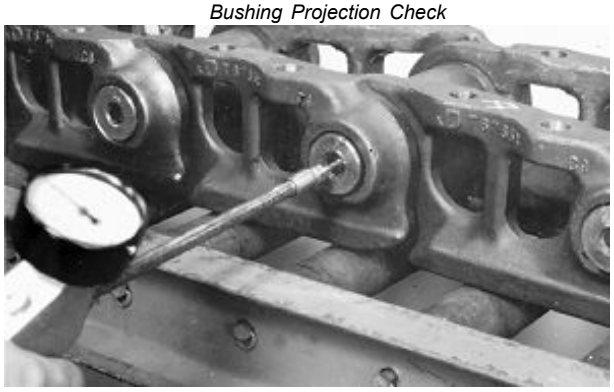
28. Install assembled split links on ram plungers, and advance rams to press split links together.

29. Install track shoes and track chain. See Track Shoe Remove and Install and see Track Chain Remove and Install. (Group 0130.)

A—First Hole
B—Second Hole
C—Nozzle

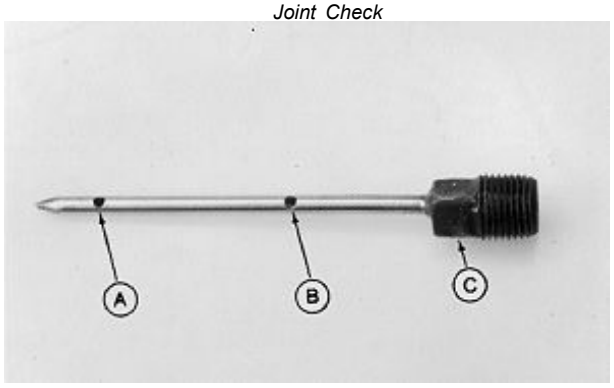
T96286 —UN—27OCT88

Bushing Projection Check



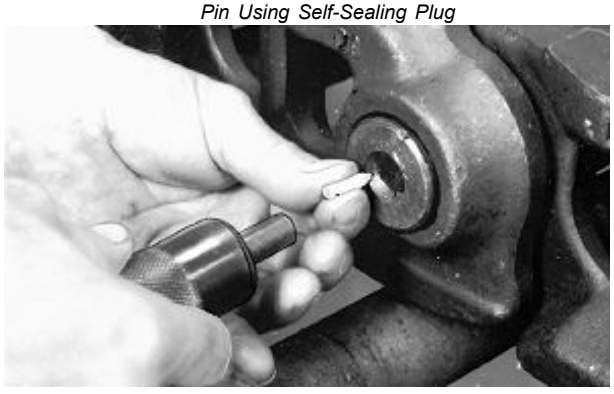
T96287 —UN—01NOV88

Joint Check



T6465AY —UN—01NOV88

Pin Using Self-Sealing Plug



T96288 —UN—27OCT88

Assembled Split Links

PM10405,000086A -19-05APR13-13/13

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

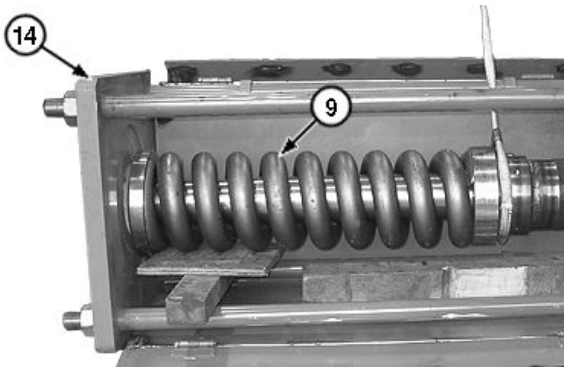
2. Place track adjuster recoil spring (9) assembly into JT07368 Track Recoil Spring Repair Tool so that rod nut is centered in hole of end plate (14).

Specification	
Track Adjuster Cylinder and Recoil Spring—Weight (approximate)	252 kg 556 lb

Specification	
655K Recoil Spring—Free Length	637 mm 25.08 in

Specification	
655K Recoil Spring—Compressed Length	565 mm 22.24 in

Specification	
755 K Recoil Spring—Free Length	682 mm 26.85 in



TX1089420A —UN—15MAR11

Track Adjuster Recoil Spring Removal

9— Track Adjuster Recoil Spring

14— End Plate

Specification	
755K Recoil Spring—Compressed Length	607 mm 23.9 in

3. Place blocks under spring assembly to prevent parts from falling after spring assembly is disassembled.

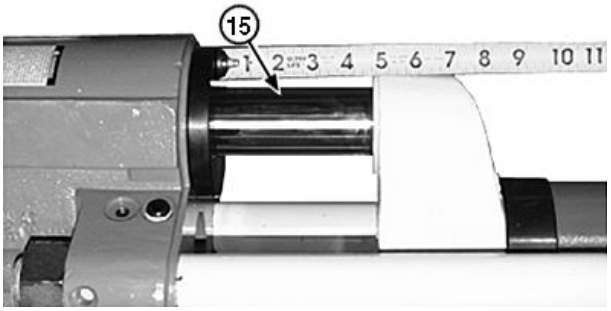
RM58335,000141C -19-07APR17-2/19

CAUTION: Prevent personal injury or damage to track adjuster spring assembly. DO NOT compress spring when extending hydraulic rams to specified position. If spring is compressed, relieve hydraulic pressure and thread adjustment collar away from hydraulic rams.

DO NOT extend hydraulic rams more than 114 mm (4.5 in). Additional travel is required after spring compressor is adjusted with adjustment collar.

4. Extend hydraulic ram (15) 101.6 mm (4 in) as shown.

15— Hydraulic Ram



TX1089445A —UN—15MAR11

Hydraulic Ram

Continued on next page

RM58335,000141C -19-07APR17-3/19

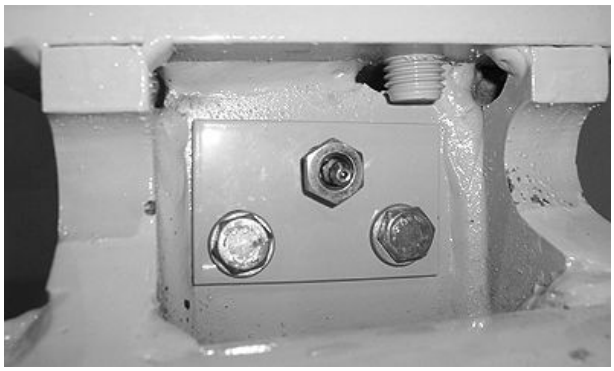
7. Disconnect crossbar lubrication line from track frame.

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

8. Attach an appropriate lifting device to track frame.

Specification

Track Frame Assembly—Weight (approximate)	3906 kg 8611 lb.



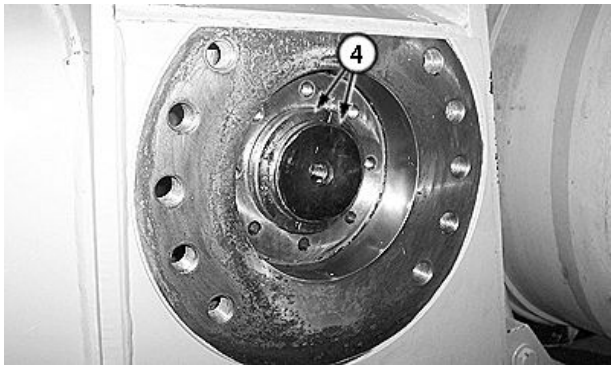
T210010A —UN—31MAR05

Crossbar Lubrication Line

PM10405,0000866 -19-25OCT13-2/8

9. Remove pivot shaft cover and track frame retainers (4).

4— Track Frame Retainer (2 used)



TX1089527A —UN—15MAR11

Track Frame Retainers

PM10405,0000866 -19-25OCT13-3/8

10. Remove crossbar-to-track frame pivot pin.
11. Remove track frame.
12. Clean and inspect pivot shaft for wear or damage. Replace parts as necessary. See Pivot Shaft Remove and Install. (Group 0130.)
13. Clean and inspect track frame bushings and seal for wear or damage. Replace parts as necessary.
14. Clean and inspect crossbar self-aligning bushing for wear or damage. Replace parts as necessary.
    - See Crossbar Remove and Install. (Group 0130.)
    - See Crossbar Bushings and Seals Remove and Install. (Group 0130.)
15. Apply TY24425 Special Purpose HD Water-Resistant Grease to track frame bushings before assembling onto pivot shaft.

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

T210015A —UN—31MAR05

Crossbar-to-Track Frame Pivot Pin

16. Carefully slide track frame onto pivot shaft.

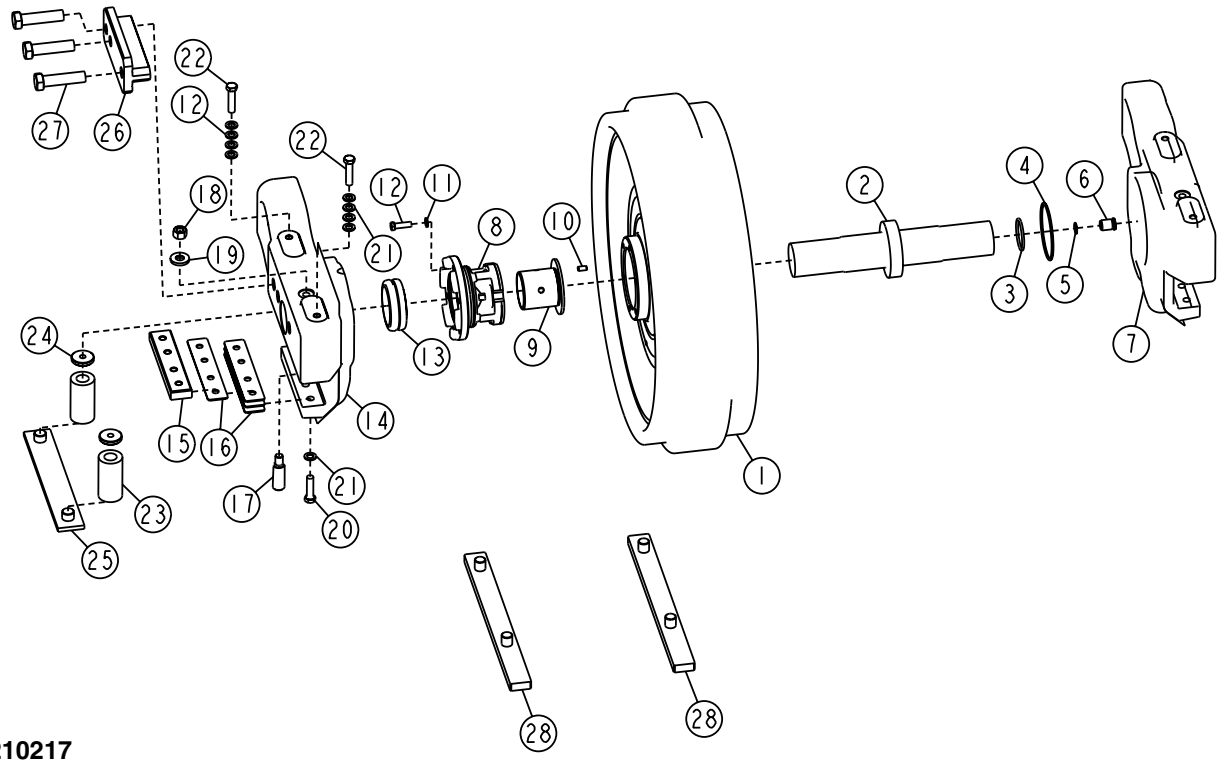
Specification

Track Frame Assembly—Weight (approximate)	3906 kg 8611 lb.

Continued on next page

PM10405,0000866 -19-25OCT13-4/8

Front Idler Assemble



T210217

1— Idler
2— Shaft
3— O-ring (2 used)
4— O-ring (2 used)
5— O-ring
6— Plug
7— Bracket (left)
8— Bushing Cover (2 used)
9— Bushing (2 used)
10— Dowel Pin (2 used)
11— Lock Washer (12 used)
12— Cap Screw (12 used)
13— Metal Face Seal (2 used)
14— Bracket (right)
15— Wear Strip (lower) (2 used)
16— Shim (as required)
17— Lock (2 used)
18— Nut (2 used)
19— Washer (2 used)
20— Cap Screw (2 used)
21— Washer (20 used)
22— Cap Screw (6 used)
23— Bushing (rubber) (4 used)
24— Washer (4 used)
25— Wear Strip (upper) (2 used)
26— Plate (2 used)
27— Bolt (6 used)
28— Wear Strip (middle) (2 used)

Continued on next page

TF44157,0001B04 -19-11JUL11-4/11

Final Drive Remove and Install

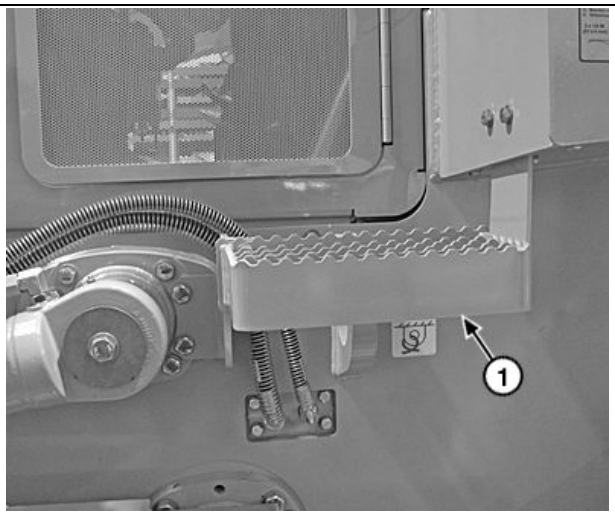
SPECIFICATIONS	
Outer Final Drive Oil Capacity (each side)	15.1 L 4.0 gal
Inner Final Drive Oil Capacity (each side)	9.5 L 2.5 gal
Final Drive and Hydrostatic Motor Weight (approximate)	878 kg 1935 lb
Hydrostatic Motor Mounting Cap Screw Torque	320 N·m 236 lb·ft
Final Drive Mounting Cap Screw Torque	678 N·m 500 lb·ft
Split Flange Cap Screw Torque	108 N·m 79 lb·ft
Outer Final Drive Oil Capacity (each side)	15.1 L 4.0 gal
Inner Final Drive Oil Capacity (each side)	9.5 L 2.5 gal

SERVICE EQUIPMENT AND TOOLS
D01182AA 20-Ton Floor Stands
DFT1260 Final Drive Lifting Fixture
DFT1250 Lifting Bracket

OTHER MATERIAL
PM37509 U.S. Cure Primer
PM37509 Canadian Cure Primer
Loctite® 7649™ Primer N™ Cure Primer
PM38656 U.S. Threadlocker (high strength)
PM38627 Canadian Threadlocker (high strength)
Loctite® 277™ Threadlocker (high strength)

NOTE: This procedure is for the right side final drive and hydrostatic motor. Procedure for left side is similar.

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Remove step (1) from side of machine.



TX1091682A —UN—02MAY11

Step

1— Step

3. Disconnect track chain at rear sprocket. See Track Chain Remove and Install. (Group 0130.)

CAUTION: Prevent possible injury from unexpected track movement. Raise machine off the ground and support with D01182AA 20-Ton Floor Stands. Tracks must be free to rotate in either direction.

4. Raise machine off ground and support with D01182AA 20-Ton Floor Stands. Lower bucket to ground.

Loctite and its related brand marks are trademarks of Henkel Corporation

Continued on next page

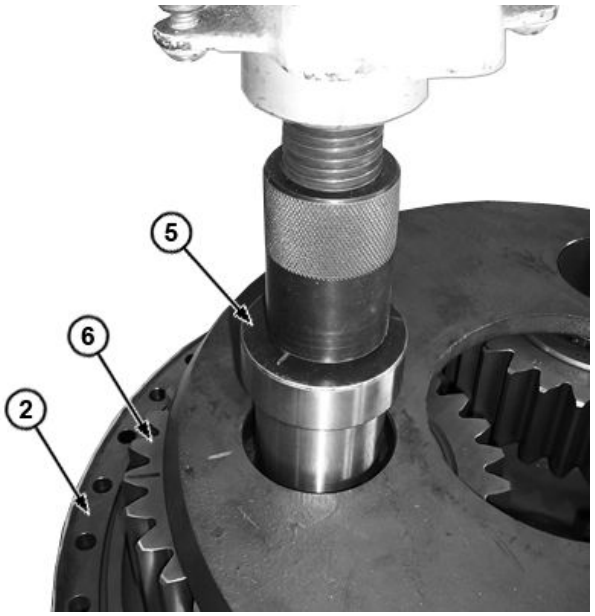
PM10405,0000857 -19-26JUN17-1/8

4. Slide planet pinion assembly into carrier. Using a press, install pinion pin (5).
5. Install cap screw (4) and tighten to specification.

Specification	
Planet Carrier Cover Cap Screws—Torque	319 N·m 235 lb-ft

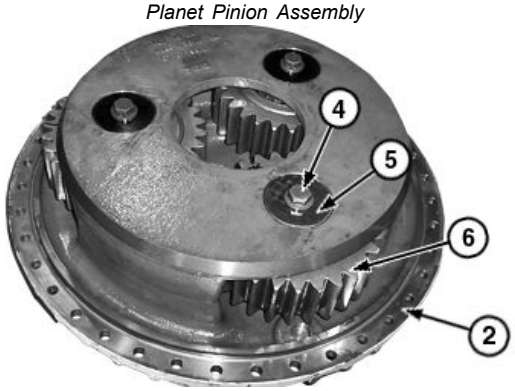
6. Install remaining planet pinions.
7. Rotate planet pinions. Pinions should rotate freely.
8. Install planet carrier. See Planet Carrier Remove and Install. (Group 0250.)

2— Planet Carrier
4— Cap Screw (3 used)
5— Planet Pinion Pin (3 used)
6— Planet Pinion (3 used)



TX1090560A —UN—07APR11

Planet Pinion Assembly



TX1090558A —UN—07APR11

Pinion Carrier

RM58335,0001463 -19-26APR11-9/9

Ring Gear and Hub Remove and Install

Ring gear and hub removal require the replacement of final drive metal face seals. Removal and installation procedures are covered in that repair. See Final Drive Metal Face Seal Remove and Install. (Group 0250.)

RM58335,0001459 -19-03MAY11-1/1

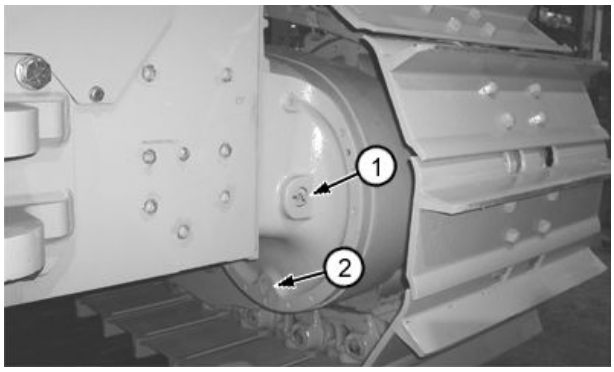
Inner Final Drive Housing Remove and Install

SPECIFICATIONS	
Outer Final Drive Oil Capacity	15.1 L 4.0 gal.
Innerr Final Drive Oil Capacity	9.5 L 2.5 gal.
Inner Final Drive Weight	188 kg 415 lb.
Final Drive Housing Cover Cap Screws Torque	320 N·m 236 lb.-ft.
Final Drive Housing Drain Plug Torque	74 N·m 54 lb.-ft.
Final Drive Housing Fill Plug Torque	74 N·m 54 lb.-ft.

SERVICE EQUIPMENT AND TOOLS
JT01748 Lifting Bracket

OTHER MATERIAL
7649 Loctite® Cure Primer
277 Loctite® Thread Lock and Sealer (high strength)

1. Disconnect track chain. See Track Chain Remove and Install. (Group 0130.)
2. Remove fill plug (1), then remove drain plug (2) to drain inner final drive housing and planet housing. See Drain and Refill Final Drive Housing Oil. (Operator's Manual.)



T206849A —UN—24JAN05

Final Drive Plugs (850K machine shown, 655K machine similar)

1— Fill Plug **2— Drain Plug**

Specification

Outer Final Drive
Oil—Capacity..... 15.1 L
4.0 gal

Inner Final Drive
Oil—Capacity..... 9.5 L
2.5 gal

3. Remove planet carrier and outer final drive planetary housing. See Planet Carrier Remove and Install and see Final Drive Metal Face Seal Remove and Install. (Group 0250.)

Loctite is a trademark of Loctite Corp.

Continued on next page

PM10405,000085A -19-28JAN16-1/3

Hydrostatic Pump and Motor Initial Start-Up Procedure

SPECIFICATIONS	
Machine Weight	20 492 kg 45 178 lb.
Transmission Charge Pressure	345 kPa 3.45 bar 50 psi

SERVICE EQUIPMENT AND TOOLS
D01182AA 20-Ton Floor Stand

This procedure is used to bleed air from the hydrostatic circuit after a major component repair.

CAUTION: Prevent possible injury from unexpected track movement. Raise the machine off the ground and support with appropriate stands. Tracks must be clear of tools and objects before rotating.

1. Raise machine off ground and support with 20-ton floor stands. Lower bucket to ground. Tracks must be free to rotate in either direction.

Specification

Machine—Weight..... 20 492 kg
45 178 lb.

2. Check level of hydrostatic reservoir. See Check Transmission Oil Level. (Operator's Manual.)

   Leave cap off transmission oil reservoir.

3. Disconnect engine harness-to-fuel injector harness 8-pin from injector harness connector (X5000).

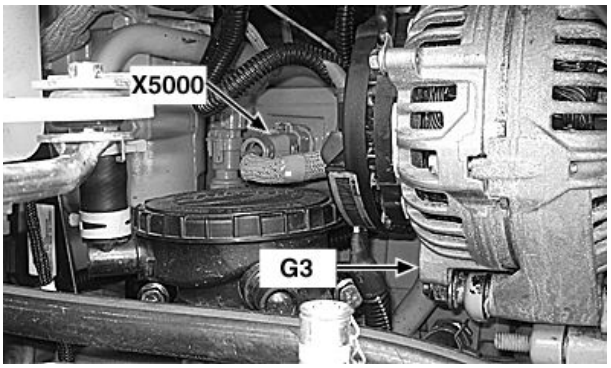
4. Display transmission charge pressure on monitor. See Standard Display Monitor (SDM)—Main Menu—Diagnostics—Live Values—Pressures. (Operator's Manual.)

   a. Access MAIN MENU on monitor.

   b. Select DIAGNOSTICS.

   c. Select LIVE VALUES.

   d. Select PRESSURES.



TX1092486A —UN—19MAY11

Injector Harness Connector

G3—Alternator

X5000—Engine Harness-to-Fuel Injector Harness 8-Pin Connector

   e. Select TRANS CHARGE OIL.

IMPORTANT: Never operate starting motor more than 30 seconds. Allow at least 2 minutes for cooling and battery recovery before operating again. Overheating, caused by excessive operation, will seriously damage starting motor.

5. Crank engine in 30 second intervals until transmission charge pressure reaches specification.

Specification

Transmission
Charge—Pressure..... 345 kPa
3.45 bar
50 psi

6. Connect engine harness-to-fuel injector harness 8-pin from injector harness connector (X5000).

7. Start engine and leave at low idle for 1 minute. Operate machine at low speed in forward, reverse, and counter rotation for several minutes. This will flush the displacement control valve areas.

8. Check hydrostatic reservoir level and install cap.

TF44157,0001AD6 -19-23MAY11-1/1

Decelerator/Brake Pedal Remove and Install

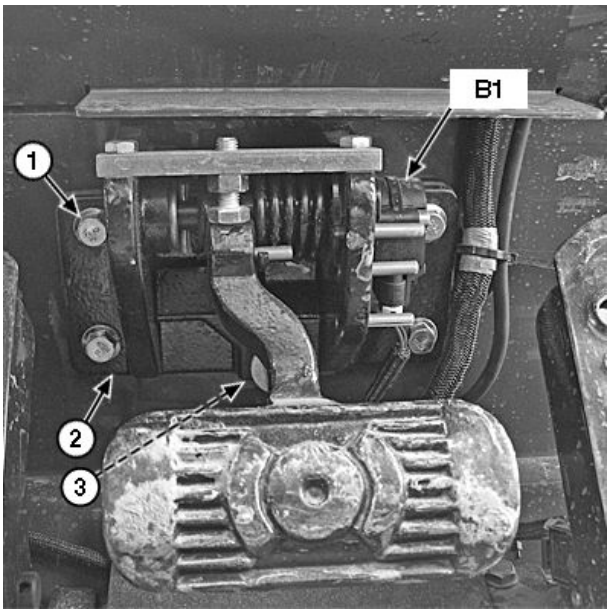
1. Prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Disconnect electrical connector decelerator sensor (B1).
3. Remove cap screws (1) and decelerator/brake pedal assembly.
4. Clean and inspect parts. Replace parts as necessary. See Decelerator/Brake Pedal Disassemble and Assemble. (Group 0315.)

NOTE: When installing decelerator/brake pedal assembly, verify that round dust seal (3) is in place at rear of bracket (2).

5. Install decelerator/brake pedal assembly. Tighten cap screws to specification.

Specification	
Decelerator Bracket Mounting Cap Screws—Torque	73 N·m 54 lb.-ft.

6. Connect electrical connector to decelerator sensor.



TX1089729A —UN—31MAR11

Decelerator/Brake Pedal

1— Cap Screw (4 used)
2— Bracket
3— Dust Seal
B1—Decelerator Sensor

RM58335,00013DE -19-25APR11-1/1

Hydrostatic Pump Disassemble

SPECIFICATIONS	
Feedback Link Cap Screw Torque	54.2 N·m 40 lb.-ft.

OTHER MATERIAL
242 LOCTITE® Thread Lock and Sealer (medium strength)
7649 LOCTITE® Cure Primer
271 LOCTITE® Thread Lock and Sealer (high strength)

IMPORTANT: If only shaft and/or shaft seal are being replaced, major disassembly of pump or removal of speed sensor is not required. Pump must be positioned with the shaft up to prevent damage to sensor or speed ring.

1. Remove cap screws (3) and pressure control pilot (PCP) from pump displacement control valve. PCP is serviced as an assembly. Do not disassemble.

NOTE: Pump displacement control valve can be disassembled for cleaning only. (See procedure in this group.)

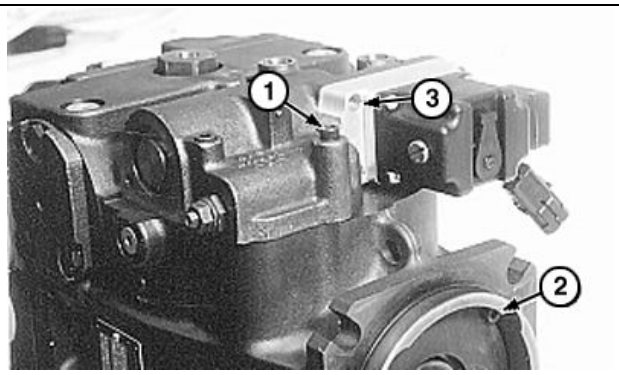
2. Remove cap screws (1) and pump displacement control valve from housing.

NOTE: After the seal carrier is removed, the shaft and bearing assembly are free in housing. Do not remove shaft unless it is positioned with the shaft up. If pump is positioned horizontally when the shaft is removed, the cylinder block will move out of place, making shaft installation difficult.

3. Remove cap screws (2).

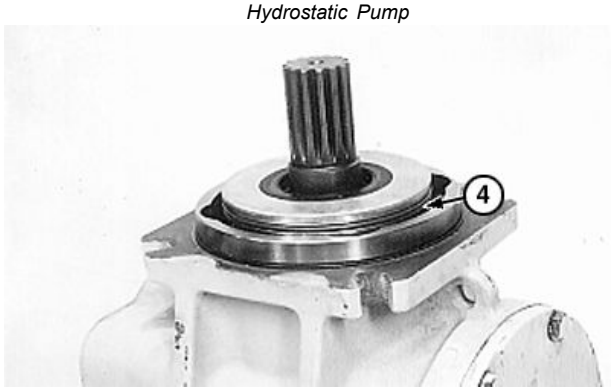
NOTE: A spring inside the rotate group will try to overcome the friction from the O-ring on the seal carrier OD. If seal carrier does not move from its bore, use a rubber hammer and tap on top of shaft. The spring inside rotating group will move seal carrier upward from bore.

LOCTITE is a trademark of Loctite Corp.



T8492AC —UN—05FEB15

Hydrostatic Pump



T100315 —UN—05FEB15

O-Ring

1— Cap Screw (6 used)
2— Cap Screw (4 used)
3— Cap Screw (4 used)
4— O-Ring

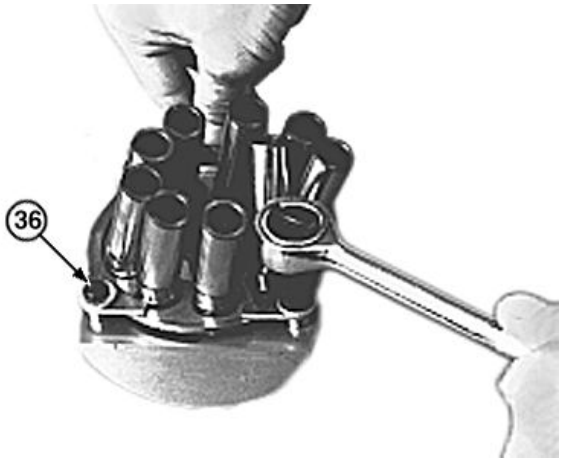
4. Remove retainer plate.
5. Remove O-ring (4) from carrier.
6. Inspect seal carrier and seal for wear or damage.
7. Remove and install seal using a press, apply PM37477 Thread Lock and Sealer (medium strength) to outside diameter of seal prior to installation.

Continued on next page

RM58335,000147F -19-05DEC12-1/21

29. Remove cap screws (36).

36— Cap Screw (4 used)



TX1125267A —UN—28NOV12

Swash Plate

RM58335,000147F -19-05DEC12-16/21

30. Remove the piston assemblies (37) from the slipper guide.
31. Clean, inspect, and repair or replace parts as required. Replace all O-rings, gaskets, and shaft seal.
32. Inspect the end cap journal bearing. If metal backing of the bearing is visible through the plastic bearing material, replace the end cap.

37— Piston Assembly (9 used)

TX1125268A —UN—28NOV12

Piston Assemblies

Continued on next page

RM58335,000147F -19-05DEC12-17/21

Hydrostatic Pump Assemble

SPECIFICATIONS	
Bearing Plate Cap Screws Torque	13.5 N·m 120 lb.-in.
Servo Cylinder Cap Screw Torque	32 N·m 24 lb.-ft.
Pump Guide Post Nut Torque	54 N·m 32 lb.-ft.
Swash Plate Angle Side-to-Side Maximum Depth Difference	0.025 mm 0.001 in.
Swash Plate Cover Cap Screw—Through Hole Torque	50 N·m 37 lb.-ft.
Swash Plate Cover Cap Screw—Blind Hole Torque	64 N·m 47 lb.-ft.
4.5 mm (0.177 in.) Pocket Depth Quantity	One shim each pocket
6 mm (0.24 in.) Pocket Depth Quantity	Add enough shims to get 3.5—4 mm (0.14—0.16 in.) pocket depth.
7 or 7.5 mm (0.28 or 0.29 in.) Pocket Depth Quantity	One shim each pocket
Pump End Cap—Large Cap Screw Torque	298 N·m 220 lb.-ft.
Pump End Cap—Small Cap Screw Torque	38 N·m 28 lb.-ft.
Retaining Plate Cap Screw Torque	35.3 N·m 26 lb.-ft.
PDCV Cap Screw Torque	16 N·m 142 lb.-in.
PCP Cap Screw Torque	4 N·m 35 lb.-in.

ESSENTIAL TOOLS
JDG920-1 Swash Plate Leveling Tool

OTHER MATERIAL
Loctite® 242® Threadlocker (medium strength)

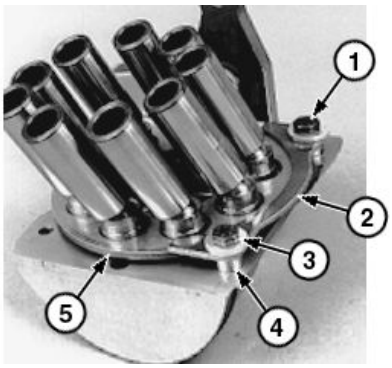
IMPORTANT: Damage to polished surfaces can cause premature pump failure. Be careful when handling parts with polished surfaces to prevent nicks or scratches.

NOTE: Either side of slipper guide can be installed against slippers. Flip slipper guide if excessive wear is on top bearing surface.

1. Inspect slipper guide surface. Install smoothest side away from slippers.

NOTE: Apply clean hydrostatic oil to all internal parts before assembly.

Loctite and its related brand marks are trademarks of Henkel Corporation
TEFLON is a trademark of Du Pont Co.



TX1074902A —UN—30MAR10

First Bearing Plate Installation

1— Cap Screw (2 used)
2— Bearing Plate
3— Flat Washer (2 used)
4— Spacer (2 used)
5— Slipper Guide

2. Install the piston assemblies into the slipper guide.
3. Apply clean hydrostatic oil on slippers. Center the pistons and guide on the swash plate.

IMPORTANT: For correct assembly and to prevent premature wear, slipper guide bearing must be installed as shown.

The split between the slipper guide bearing plates must be located in line with the swash plate arm. The TEFLON® surface side of slipper guide bearing must be installed against the slipper guide.

4. Install bearing plate (2) with TEFLON® surface against the slipper guide (5) as shown.

NOTE: Inspect the flat washers for raised edges or burrs. The smooth side of the flat washers must be installed next to the bearing plates.

IMPORTANT: To prevent premature pump failure, new slipper guide bearing plate cap screws must be installed. Install new cap screws whenever slipper guide bearing plates are removed.

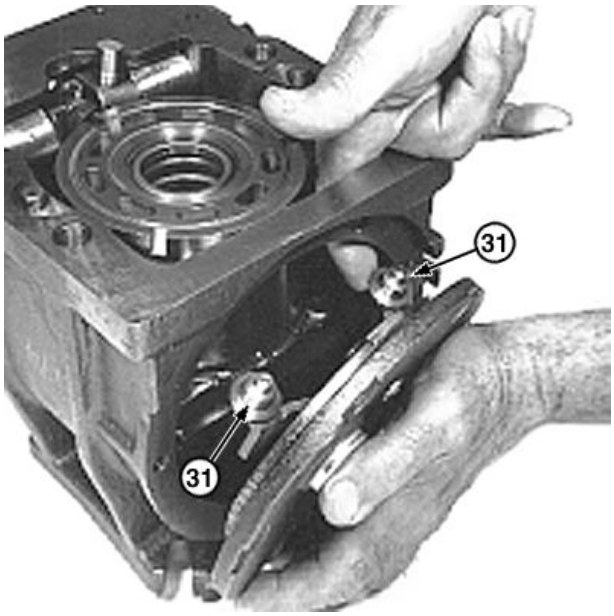
5. Apply Loctite® 242® Threadlocker (medium strength) on cap screw threads. Install new cap screws (1) and flat washers (3) through the slipper guide bearing and spacers (4). Finger tighten the cap screws into the swash plate.

Continued on next page

IMPORTANT: Tabs of T-bar must be positioned on top of swash plate or damage to tabs will occur.

25. Install spring seats (31). Install side cover and swash plate leveler (T-bar). Rotate the side cover to align the marks on the cover and housing that were made at disassembly.

31— Spring Seat (2 used)



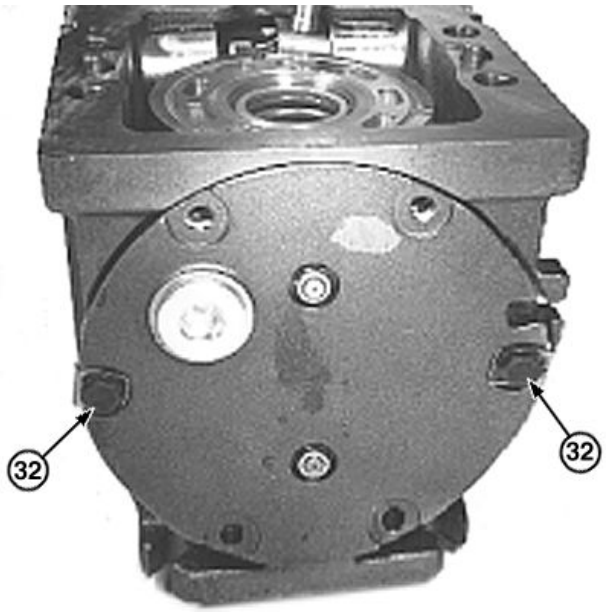
TX1125531A —UN—28NOV12

Leveler Spring Seats

RM58335,0001447 -19-17JUL14-19/31

26. Apply Loctite® 242® Threadlocker (medium strength) to cap screws. Install a cap screw (32) finger tight to each side of swash plate cover while checking the zero angle position.

32— Cap Screw (2 used)



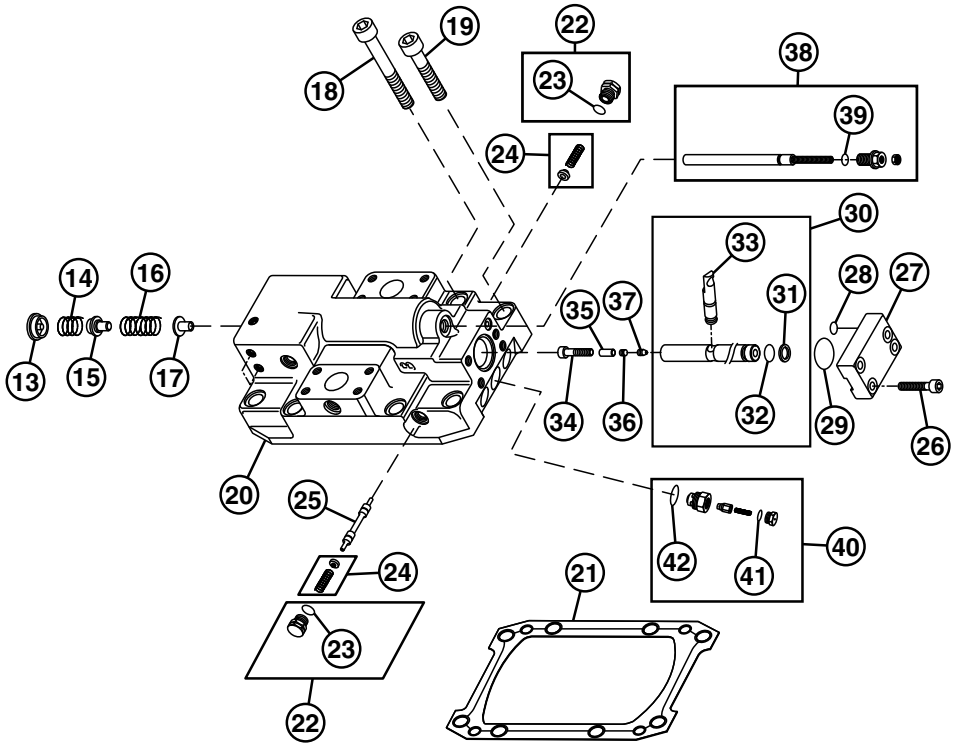
TX1125534A —UN—28NOV12

Swash Plate Cover

Loctite and its related brand marks are trademarks of Henkel Corporation

Continued on next page

RM58335,0001447 -19-17JUL14-20/31



TX1090665

TX1090665 —UN—26APR11

Hydrostatic Motor End Cap Exploded View

13— Spring Seat
14— Spring
15— Spring Retainer
16— Spring
17— Spring Guide
18— Socket Head Cap Screw (M12 x 65) (4 used)
19— Socket Head Cap Screw (M12 x 50) (4 used)
20— End Cap Housing
21— Gasket
22— Plug Fitting (2 used)
23— O-Ring (2 used)
24— Spring and Seat (2 used)
25— Flushing Valve Spool
26— Socket Head Cap Screw (4 used)
27— Cover
28— O-Ring
29— O-Ring
30— Piston Assembly
31— Ring
32— O-Ring
33— Lever
34— Socket Head Cap Screw
35— Spacer
36— Set Screw
37— Set Screw
38— Shaft
39— O-Ring
40— Operating Charge Relief Valve
41— O-Ring
42— O-Ring

10. Disassemble end cap assembly components (13—42) as shown.
11. Clean and inspect components. Replace as required.

Continued on next page

RM58335,000147D -19-26APR11-4/7

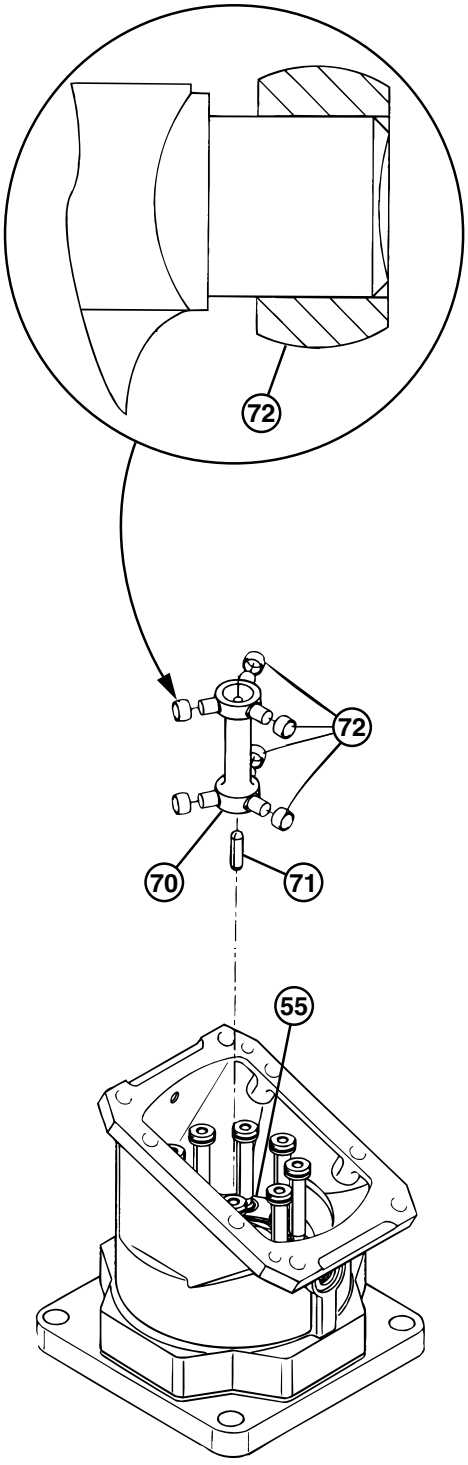
29. Install synchronizing shaft support pin (71) into shaft assembly (55) and retain with petroleum jelly.
30. Install synchronizing shaft rollers (72) on journals of synchronizing shaft and retain with petroleum jelly. Position each roller with its outside edge even with end of synchronizing shaft journal.

IMPORTANT: To prevent damage to hydrostatic motor, ensure synchronizing shaft is installed correctly. Cylinder block end of shaft is larger than shaft assembly end.

31. Install synchronizing shaft and rollers into shaft assembly (55).
32. Rollers must enter races in motor shaft insert, and recess in end of synchronizing shaft must engage support pin.

    Tip and rotate synchronizing shaft in all directions to check for binding. Synchronizing shaft rollers must move freely in races in motor shaft insert.

55— Shaft Assembly
70— Synchronizing Shaft
71— Support Pin
72— Roller (6 used)



Synchronizer Shaft

Continued on next page

RM58335,0001474 -19-26APR11-9/14

Item	Name	Torque Value
17	Hydrostatic Charge Oil Filter Restriction Switch	37 N·m 27 lb.-ft.
19	Neutral Charge Relief Valve	Cartridge: 67.8 N·m Cartridge: 50 lb.-ft.
20	Hand Pump Park Brake Relief Valve	27.1 N·m 20 lb.-ft.
21	Hand Pump	35.3 N·m 26 lb.-ft.
22	Hand Pump Selector Valve 1	25.8 N·m 228 lb.-in.
23	Hand Pump Selector Valve 2	35.3 N·m 26 lb.-ft.
24	Hand Pump Tilt Relief Valve	27.1 N·m 20 lb.-ft.
51	Brake Pressure Sensor	24 N·m 18 lb.-ft.
52	Hydrostatic Charge Pressure Sensor	24 N·m 18 lb.-ft.

Hydraulic Integrated Circuit (HIC) Valve Component Torque Values

The HIC valve contains components for four different hydraulic circuits. For more information on the HIC valve see Hydraulic Integrated Circuit (HIC) Valve Operation. (Group 9026-05.)

For information on the charge oil circuit, see Charge Pump Operation. (Group 9026-05.) Also, see Hydrostatic Charge Oil Filter Operation. (Group 9026-05.)

For information on the hydrostatic oil cooling circuit, see Oil Cooler and Reservoir Bypass Operation. (Group 9026-05.)

For information on the park brake circuit, see Park Brake Valve Operation. (Group 9026-05.)

For information on hand pump operation, see the Operator's Manual.

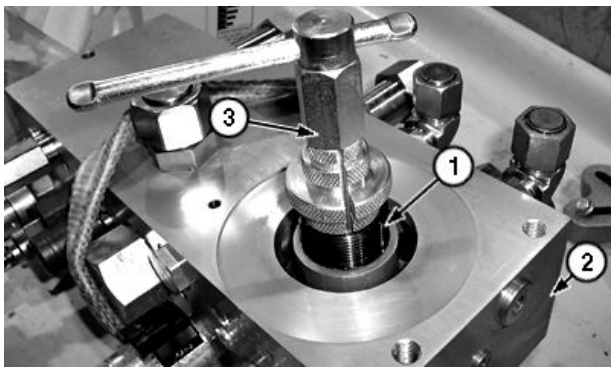
For more HIC valve information see Hydrostatic System Schematic—Neutral (Park Brake On). (Group 9026-15.)

TE14778,00000D2 -19-26APR17-2/4

HIC Valve Threaded Insert Remove and Install

IMPORTANT: If pump vacuum is used to control oil leakage, do not remove cartridge valves with manifold in place. The vacuum can cause O-ring and backup rings to be pulled off cartridge valve and lodge in passages.

1. Remove hydrostatic charge oil filter.
2. Remove threaded insert using JDG10011 Internal Pipe Wrench.
3. Clean HIC valve manifold and threaded insert mating surfaces with PM37509 Cure Primer.
4. Apply a thin continuous line of PM37485 Retaining Compound (Maximum Strength) around bottom third threads.



T212511A —UN—05JUL05

JDG10011 Internal Pipe Wrench

1— Threaded Insert
2— HIC Valve Manifold
3— JDG10011 Internal Pipe Wrench

Continued on next page

TE14778,00000D2 -19-26APR17-3/4

12. Install identification tags and disconnect upper and lower hydrostatic oil cooler hoses (1). Close all openings using caps and plugs.
13. Install identification tags and disconnect fuel line (4) from primary fuel filter (3). Close all openings using caps and plugs.
14. Remove cap screws (2) and remove primary fuel filter (3).
15. Remove lower radiator hose (5). Close all openings using caps and plugs.
16. Disconnect heater hoses. Close all openings using caps and plugs.
17. Install identification tags and disconnect hydraulic fan pump lines. Close all openings using caps and plugs.
18. Disconnect alternator (G3).
19. Remove charge air cooler hose (6). Close all openings using caps and plugs.

Continued on next page

SH03936,00059B8 -19-21JAN13-2/6

Engine Coolant Heater Remove and Install

CAUTION: Prevent possible injury. 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 the pressure, then remove.

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Drain cooling system. See Draining the Engine Cooling System. (Operator's Manual.)

CAUTION: Prevent possible injury, keep electrical connectors clean to prevent arcing. Only plug coolant heater into electrical power if heater element is immersed in coolant. Sheath could burst and result in personal injury.

Use a heavy-duty grounded cord to connect coolant heater to electrical power.

3. Remove power cord (6). Loosen nut (5) and remove heating element (1) from engine block.

NOTE: The heating element cannot be repaired. Replace if damaged.

4. Inspect and replace parts as necessary.
5. Install engine coolant heater into engine block.
6. Hold assembly, using a wrench. Tighten nut (5) to specification.

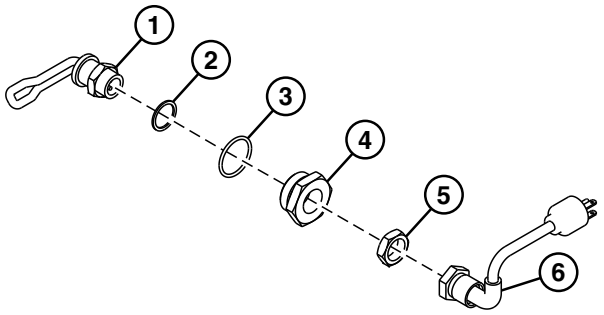
Specification

Engine Coolant Heater
Nut—Torque.....34 N·m
25 lb.-ft.

7. Install power cord (6).
8. Refill cooling system. See Refill Engine Cooling System. (Operator's Manual.)

T6642EK —UN—01NOV88

Coolant May Be Hot



TX1093437 —UN—14JUN11

Engine Coolant Heater

1— Heating Element
2— Washer
3— O-Ring
4— Adapter Fitting
5— Nut
6— Power Cord

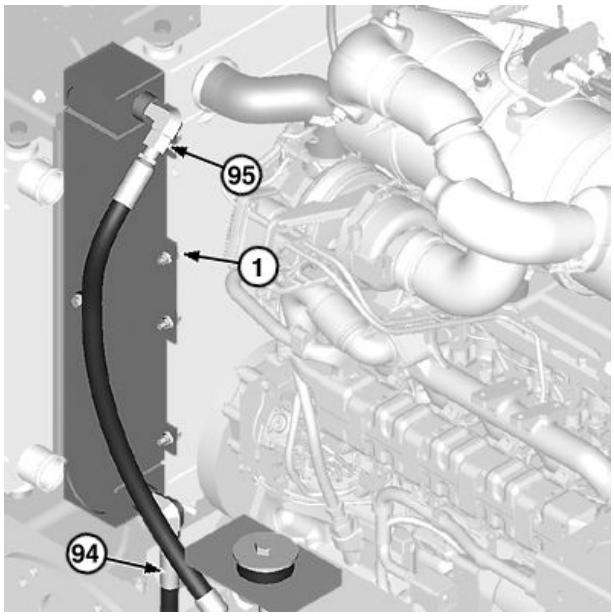
TF44157,0001AF8 -19-21JUN11-1/1

Hydraulic Oil Cooler Remove and Install

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Turn battery disconnect switch to the OFF position. See Battery Disconnect Switch. (Operator's Manual.)
3. Remove right side engine service door assembly. See Engine Side Door Assembly Remove and Install. (Group 1910.)
4. Remove engine hood. See Hood Remove and Install. (Group 1910.)
5. Remove fuel cooler. See Fuel Cooler Remove and Install. (Group 0510.)
6. Drain hydraulic reservoir or apply vacuum. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)

IMPORTANT: Prevent hydraulic system contamination. Absolute cleanliness is essential when working on hydraulic components. Clean component and adjacent areas before removing lines. Close all openings using caps and plugs.

7. Disconnect hydraulic oil cooler lines (94 and 95). Close all openings using caps and plugs.
8. Remove cap screws (1) between radiator and hydraulic oil cooler.



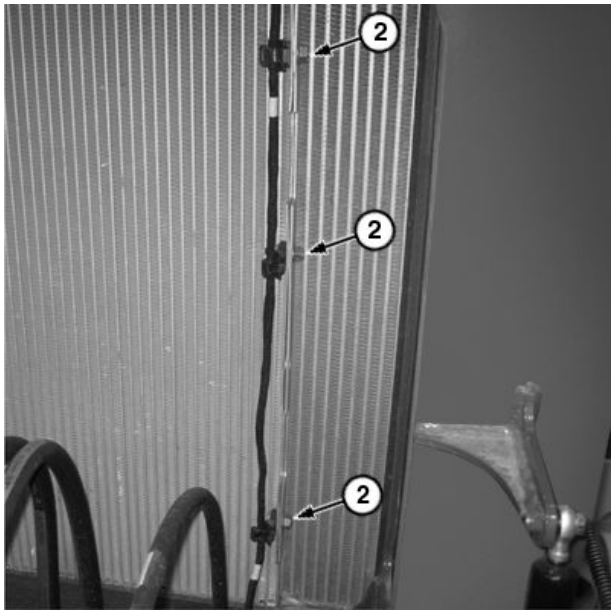
TX1124956A —UN—07NOV12

Hydraulic Oil Cooler (front)

1— Cap Screw (4 used)
94— Thermal Bypass Valve-to-Hydraulic Oil Cooler Line (lower)
95— Hydraulic Oil Cooler-to-Thermal Bypass Valve Line (upper)

SH03936,000599A -19-10JAN13-1/2

9. Remove cap screws (2) between radiator and hydraulic oil cooler.
10. Remove hydraulic oil cooler.
11. Repair or replace hydraulic oil cooler as necessary.
12. Install hydraulic oil cooler.
13. Install cap screws (1 and 2) between radiator and hydraulic oil cooler on front and rear.
14. Connect hydraulic oil cooler lines (94 and 95).
15. Fill hydraulic system to specification. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)
16. Install fuel cooler. See Fuel Cooler Remove and Install. (Group 0510.)
17. Install engine hood. See Hood Remove and Install. (Group 1910.)
18. Install right side engine service door assembly. See Engine Side Door Assembly Remove and Install. (Group 1910.)
19. Turn battery disconnect switch to the ON position.



TX1094056A —UN—01JUL11

Hydraulic Oil Cooler-to-Radiator Mounting (rear)

2— Cap Screw (3 used)

SH03936,000599A -19-10JAN13-2/2

Fuel Tank Remove and Install

SPECIFICATIONS	
Fuel Tank Weight (approximate)	140 kg 308 lb.
Fuel Tank Cap Screw Torque	320 N·m 235 lb.-ft.

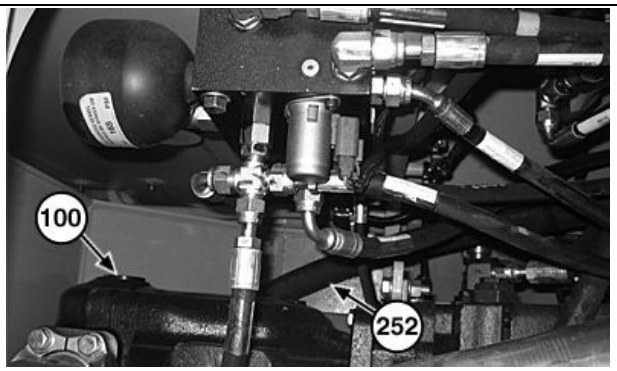
1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Turn battery disconnect switch to the OFF position. See Battery Disconnect Switch. (Operator's Manual.)
3. Raise boom and install boom lock. See Boom Lock. (Operator's Manual.)
4. Tilt cab/ROPS. See Cab or ROPS Tilting Procedure. (Operator's Manual.)

IMPORTANT: Prevent hydraulic system contamination. Absolute cleanliness is essential when working on hydraulic components. Clean component and adjacent areas before removing lines. Close all openings using caps and plugs.

5. Apply vacuum or drain hydraulic reservoir. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)

IMPORTANT: Prevent possible machine damage. Hydraulic line (252) from main hydraulic pump to main control valve needs to be disconnected to allow fuel tank removal and installation without hitting line.

6. Disconnect line (252) at main hydraulic pump (100) for access to fuel tank rear access cap screws. Close all openings using caps and plugs.
7. Remove fuel tank covers. See Fuel Tank Covers Remove and Install. (Group 0560.)



TX1094587A —UN—12JUL11

Main Hydraulic Pump

100— Main Hydraulic Pump

252— Main Hydraulic Pump-to-Main Control Valve (port P) Line

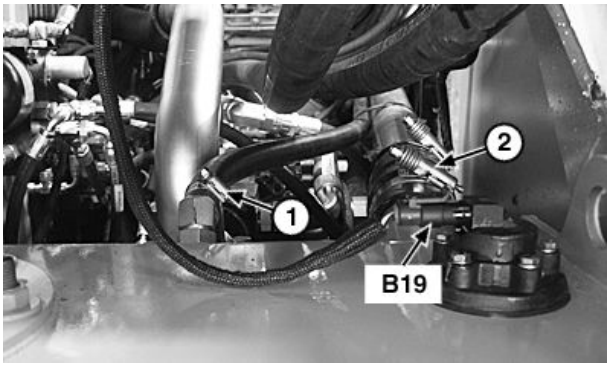
8. Drain fuel tank. See Drain Sediment From Fuel Tank. (Operator's Manual.)

SH03936,00059A1 -19-10JAN13-1/7

9. Disconnect lines (1 and 2). Close all openings using caps and plugs.
10. Disconnect fuel level sensor (B19).

1— Fuel Tank Vent Line
2— Fuel Tank Fill Line

B19— Fuel Level Sensor



TX1094497A —UN—08JUL11

Fuel Level Sensor (view from front of machine)

Continued on next page

SH03936,00059A1 -19-10JAN13-2/7

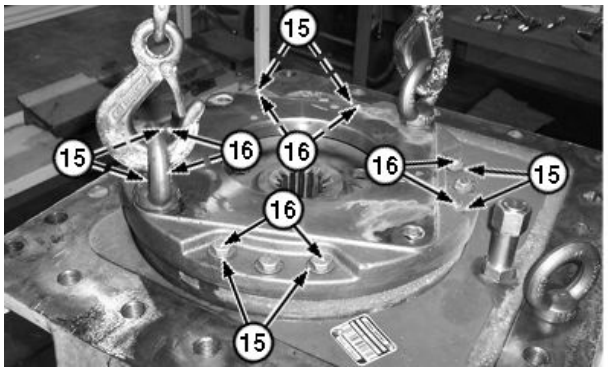
Park Brake Remove and Install

1. Prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Remove final drive. See Final Drive Remove and Install. (Group 0201.)
3. Remove cap screws (16) and washers (15).

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

4. Attach appropriate lifting device to park brake.

Specification	
Park Brake—Weight (approximate)	61 kg (135 lb.)



T211631A —UN—20JUN05

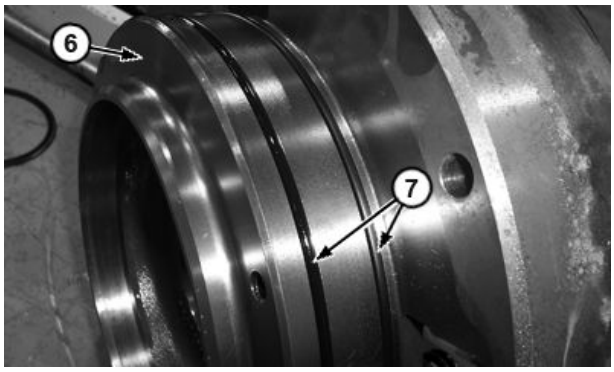
Park Brake

15— Washer (8 used) **16— Cap Screw (8 used)**

RM58335,000148B -19-18MAY11-1/2

5. Remove O-rings (7) from park brake housing (6).
6. Remove gasket from final drive to park brake mating surface.
7. Clean and inspect parts. Repair or replace parts as necessary. See Park Brake Disassemble and Assemble. (Group 1160.)
8. Lubricate O-rings and gasket and install on park brake.
9. Install final drive. See Final Drive Remove and Install. (Group 0201.)

6— Park Brake Housing **7— O-Ring (2 used)**



T211655A —UN—25MAY05

Park Brake O-Rings

RM58335,000148B -19-18MAY11-2/2

15. Install hub (12).

12— Hub

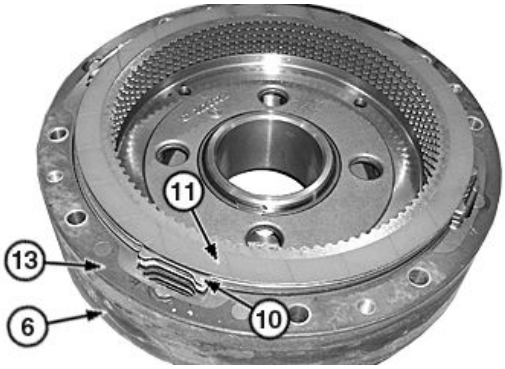
TX1090627A —UN—08APR11

Park Brake Hub

RM58335,0001471 -19-14JUN11-12/15

16. Starting with separator plate (10), alternate installing friction disks (11) and separator plates (10).

6— Housing
10— Separator Plate (6 used)
11— Friction Disk (6 used)
13— Gasket



TX1090628A —UN—08APR11

Friction Disks and Separator Plates

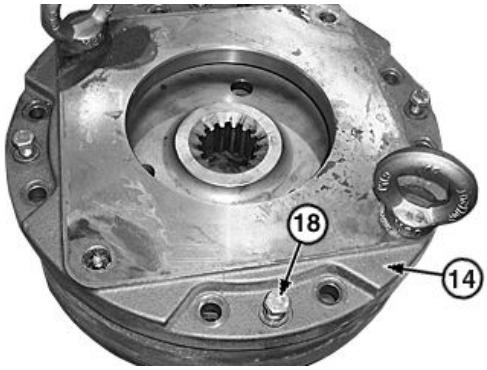
RM58335,0001471 -19-14JUN11-13/15

17. Install gasket (13) and cover (14).

18. Install cap screws (18) to compress compression springs. Carefully tighten cap screws to specification.

Specification	
Park Brake Cover—Torque	66.4—73.2 N·m 49—54 lb.-ft.

14— Cover
18— Cap Screw (4 used)



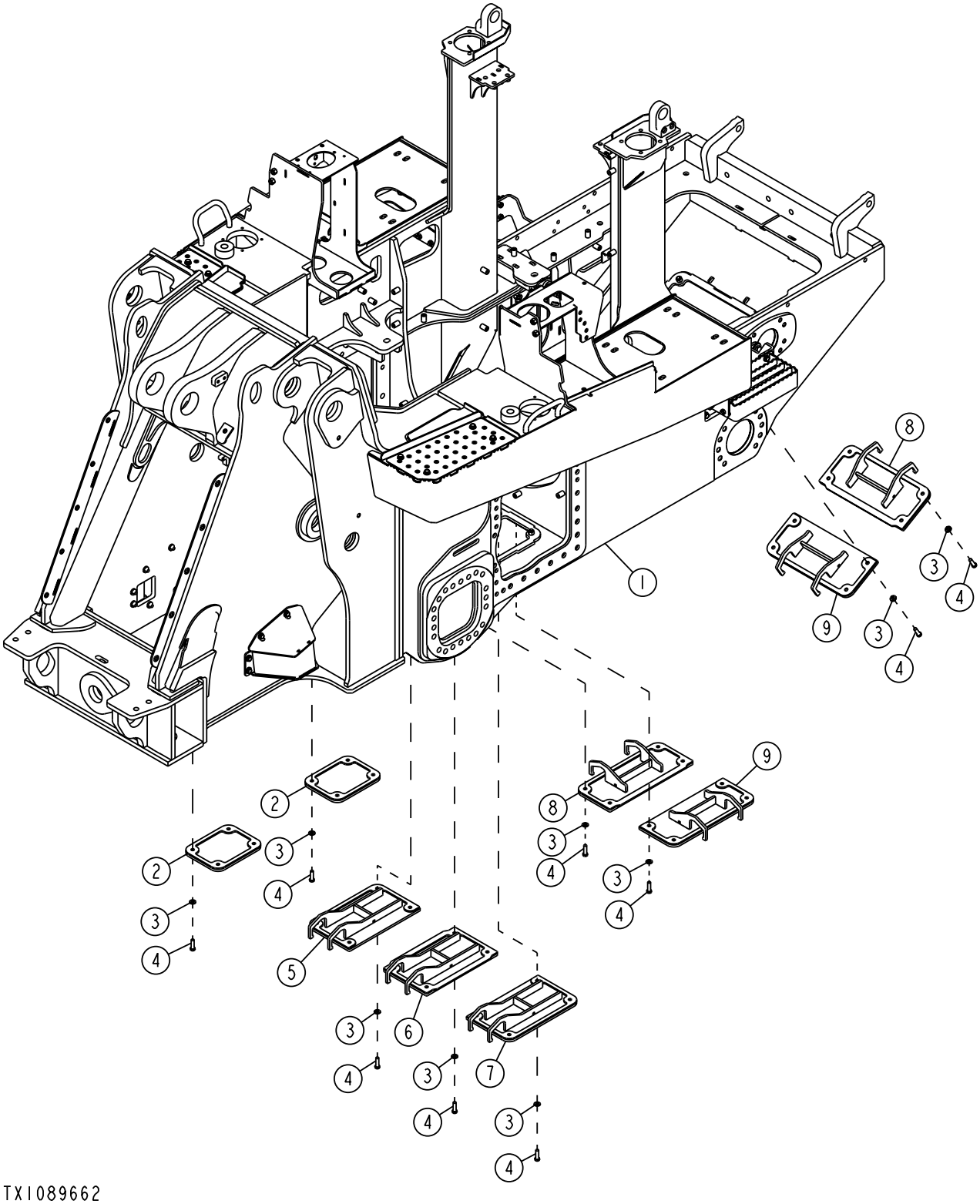
TX1090622A —UN—29JUN11

Park Brake Cover

Continued on next page

RM58335,0001471 -19-14JUN11-14/15

Bottom Guards Remove and Install



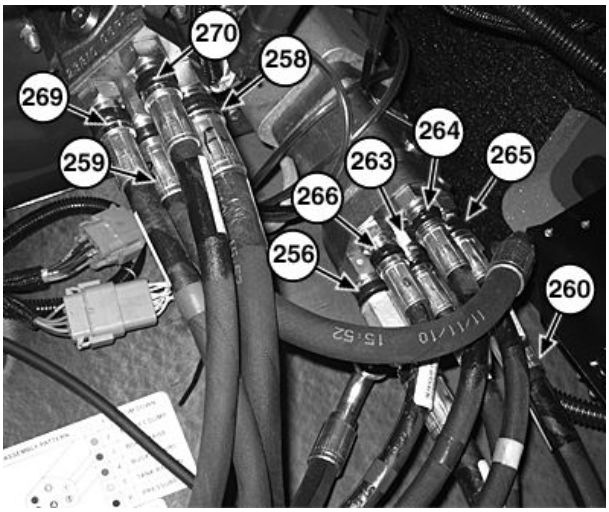
Bottom Guards

TX1089662 —UN—21MAR11

Continued on next page

RM58335,00013B0 -19-27JUN11-1/2

30. Connect pilot control valve lines, as needed (256, 258—260, 263—266, 269, and 270).
31. Lower cab/ROPS. See Cab or ROPS Tilting Procedure. (Operator's Manual.)
32. Remove vacuum or fill hydraulic reservoir. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)
33. Fill cooling system. See Draining the Engine Cooling System. (Operator's Manual.)
34. Evacuate R134a system. See Evacuate R134a System. (Group 1830.)
35. Charge R134a system. See Charge R134a System. (Group 1830.)
36. Turn battery disconnect switch to the ON position. See Battery Disconnect Switch. (Operator's Manual.)



TX1094373A —UN—06JUL11

Pilot Control Valve Lines (single lever control with ripper pilot control valve shown)

256— Pressure Reducing Valve (port LP)-to-Pilot Control Valve (port P) Line
258— Pilot Control Valve (port P)-to-Ripper Pilot Control Valve (port P)
259— Ripper Pilot Control Valve (port T)-to-Pilot Control Valve (port T)
260— Pilot Control Valve (port T)-to-Pressure Reducing Valve (port T) Line
263— Pilot Control Valve (port 3)-to-Main Control Valve (boom raise) Line
264— Pilot Control Valve (port 1)-to-Main Control Valve (boom lower) Line
265— Pilot Control Valve (port 4)-to-Main Control Valve (bucket curl) Line
266— Pilot Control Valve (port 2)-to-Main Control Valve (bucket dump) Line
269— Ripper Pilot Control Valve (port 2)-to-Main Control Valve (ripper raise) Line
270— Ripper Pilot Control Valve (port 1)-to-Main Control Valve (ripper lower) Line

TF44157,0001AF6 -19-10JAN13-5/5

Proper Refrigerant Handling

The U.S. Environmental Protection Agency prohibits discharge of any refrigerant into the atmosphere, and requires that refrigerant be recovered using the approved recovery equipment.

IMPORTANT: Use correct refrigerant recovery, recycling and charging stations. DO NOT use refrigerant, hoses, fittings, components or refrigerant oils intended for use with R12 refrigerant.

Recovery, recycling and charging stations for R12 and R134a refrigerants MUST NOT be interchanged. Systems containing R12 refrigerant use a different oil than systems using R134a. Certain seals are not compatible with both types of refrigerants.

MM16633,00000F9 -19-19JAN07-1/1

R134a Refrigerant Cautions

CAUTION: DO NOT allow liquid refrigerant to contact eyes or skin. Liquid refrigerant will freeze eyes or skin on contact. Wear goggles, gloves and protective clothing.

If liquid refrigerant contacts eyes or skin, DO NOT rub the area. Splash large amounts of COOL water on affected area. Go to a physician or hospital immediately for treatment.

DO NOT allow refrigerant to contact open flames or very hot surfaces such as electric welding arc, electric heating element and lighted smoking materials.

DO NOT heat refrigerant over 52°C (125°F) in a closed container. Heated refrigerant will develop high pressure which can burst the container.

Keep refrigerant containers away from heat sources. Store refrigerant in a cool place.

DO NOT handle damp refrigerant container with your bare hands. Skin may freeze to container. Wear gloves.

If skin freezes to container, pour COOL water over container to free the skin. Go to a physician or hospital immediately for treatment.

CED,OUTX547,172 -19-21OCT98-1/1

R134a Compressor Oil Charge Check

ESSENTIAL TOOLS
JT02045[a] R134a Refrigerant Recovery/Recycling and Charging Station

[a] JT02046 and JT02050 Recovery and Charging Stations can be substituted for the JT02045 Station.

OTHER MATERIAL
TY16134 U.S. R134a Flushing Solvent
TY22025 (8.5 oz) U.S. R134a Compressor Oil

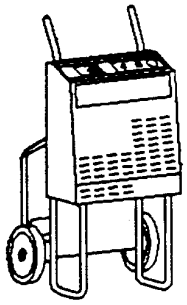
Remove compressor if R134a leakage was detected and repaired. See Compressor Remove and Install. (Group 1830.)

Drain oil from the compressor and record the amount. See R134a Compressor Oil Removal. (Group 1830.)

NOTE: Drain oil and save if this is a new compressor.

If the oil drained from a compressor removed from operation is very black or the amount of oil is less than 6 mL (0.2 fl oz), perform the following:

1. Remove and discard the receiver-dryer.
2. Remove, clean, but do not disassemble the valve.
3. Flush the complete system with TY16134 Air Conditioning Flushing Solvent.

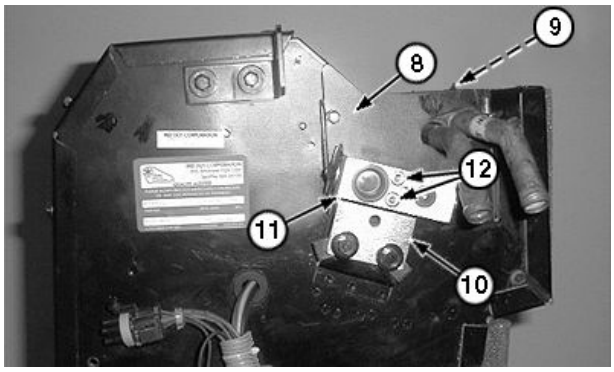


RW21613 —UN—15APR13

4. If the compressor is serviceable, pour flushing solvent in the manifold ports and internally wash out the old oil.
5. Install a new receiver-dryer.
6. Install required amount of TY22025 Refrigerant Oil in the compressor. See R134a Component Oil Charge. (Group 1830.)
7. Connect all components, evacuate and charge the system. See Evacuate R134a System, and see Charge R134a System. (Group 1830.)

MH66O88,0000913 -19-11JUL11-1/1

10. Disconnect lines and bracket from expansion valve (11).
11. Remove cap screws (12) and remove expansion valve.
12. Remove bracket (10).
13. Remove cap screws and remove plate (8).
14. Remove cover (9) and remove evaporator or heater core.
15. Repair or replace as needed.
16. Install evaporator or heater core.
17. Install cover, plate, bracket, and expansion valve.
18. Install air conditioner and heater assembly.
19. Connect electrical connectors.
20. Connect heater hoses.
21. Connect and tighten refrigerant hoses to expansion valve.
22. Install new receiver-dryer. See Receiver-Dryer Remove and Install. (Group 1830.)
23. Install access covers and tighten cap screws.
24. Turn battery disconnect switch to the ON position. See Battery Disconnect Switch. (Operator's Manual.)



TX1094510A —UN—12JUL11

Expansion Valve and Brackets

8— Plate
9— Evaporator/Heater Core Cover
10— Bracket
11— Expansion Valve
12— Cap Screw (2 used)

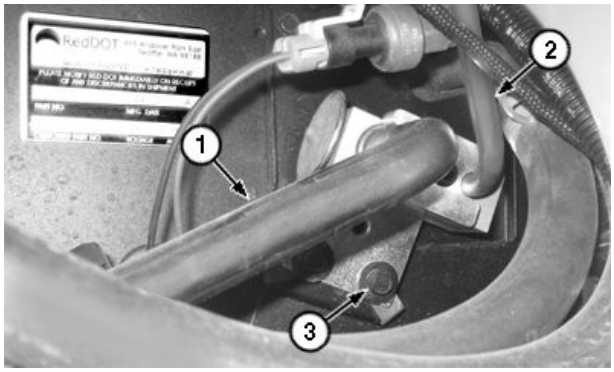
25. Add refrigerant oil. See R134a Component Oil Charge. (Group 1830.)
26. Evacuate and charge the air conditioning system. See Evacuate R134a System and see Charge R134a System. (Group 1830.)

KK70125,000099D -19-14JUL11-2/2

Expansion Valve Remove and Install

NOTE: Anytime air conditioning system is discharged, a new receiver-dryer must be installed.

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Turn battery disconnect switch to OFF. See Battery Disconnect Switch. (Operator's Manual.)
3. Open access cover.
4. Recover R134a refrigerant from air conditioning system. See Recover R134a System. (Group 1830.)
5. Disconnect lines (1 and 2).
6. Remove cap screws (3) and expansion valve.
7. Repair or replace expansion valve as needed.
8. Install valve and cap screws.
9. Connect lines.
10. Install new receiver-dryer. See Receiver-Dryer Remove and Install. (Group 1830.)
11. Add refrigerant oil. See R134a Component Oil Charge. (Group 1830.)



TX1094794A —UN—14JUL11

Expansion Valve

1— Expansion Valve-to-Compressor Line
2— Expansion Valve-to-Receiver-Dryer Line
3— Cap Screw (2 used)

12. Turn battery disconnect switch to ON.
13. Evacuate and charge the air conditioning system. See Evacuate R134a System and see Charge R134a System. (Group 1830.)

KK70125,000099E -19-14JUL11-1/1

Section 19
Sheet Metal

Contents

Section 21
Vehicle Main Hydraulic System

Contents

Hydraulic Fan Pump Remove and Install

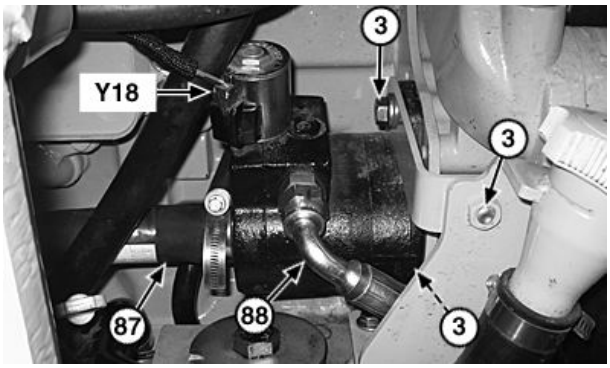
1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)

CAUTION: To avoid injury from escaping fluid under pressure, stop engine and relieve the pressure in the system before disconnecting or connecting hydraulic or other lines. Tighten all connections before applying pressure.

2. Relieve all hydraulic system pressure. See Hydraulic System Pressure and Accumulator Discharge. (Group 9025-25.)
3. Turn battery disconnect switch to the OFF position. See Battery Disconnect Switch. (Operator's Manual.)
4. Remove left engine side door assembly. See Engine Side Door Assembly Remove and Install. (Group 1910.)
5. Apply vacuum or drain hydraulic reservoir. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)
6. Disconnect hydraulic fan unloading solenoid (Y18).

IMPORTANT: Prevent hydraulic system contamination. Absolute cleanliness is essential when working on hydraulic components. Clean component and adjacent areas before removing lines. Close all openings using caps and plugs.

7. Install identification tags and disconnect lines (87 and 88). Close all openings using caps and plugs.



TX1094198A —UN—30JUN11

Hydraulic Fan Pump

3— Cap Screw (3 used)
87— Hydraulic Reservoir-to-Hydraulic Fan Pump Line
88— Hydraulic Fan Pump Pressure Line
Y18— Hydraulic Fan Unloading Solenoid

8. Remove cap screws (3) and hydraulic fan pump.
9. Repair or replace hydraulic fan pump as necessary.
10. Install hydraulic fan pump with cap screws.
11. Connect lines.
12. Connect hydraulic fan unloading solenoid.
13. Remove vacuum or fill hydraulic reservoir.
14. Install left engine side door assembly.
15. Turn battery disconnect switch to the ON position.

SH03936,00059A8 -19-10JAN13-1/1

10. Hand tighten cap screw (2) while prying out on gasket and outer plate as shown to ensure that inner plate stays seated between locator tabs (5 and 6).

IMPORTANT: Prevent damage to cleanout cover assembly. DO NOT use impact gun to tighten cap screw.

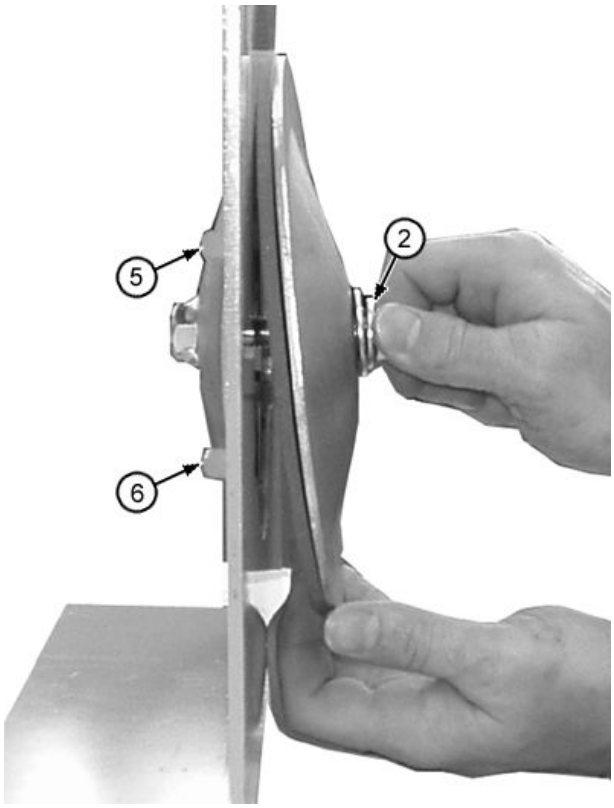
11. Tighten cap screw to specification.

Specification	
Hydraulic Reservoir Cleanout Cover Cap Screw—Torque	47 N·m 35 lb.-ft.

12. Paint affected areas using TY6522 Yellow Spray Paint.

13. Fill hydraulic reservoir. See Drain and Refill Hydraulic System Oil and Replace Filters. (Operator's Manual.)

2— Cap Screw
5— Upper Locator Tab (2 used)
6— Lower Locator Tab (2 used)



T198239B —UN—02MAR04

Tightening Procedure

WC20922,000437D -19-10JAN13-4/4

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

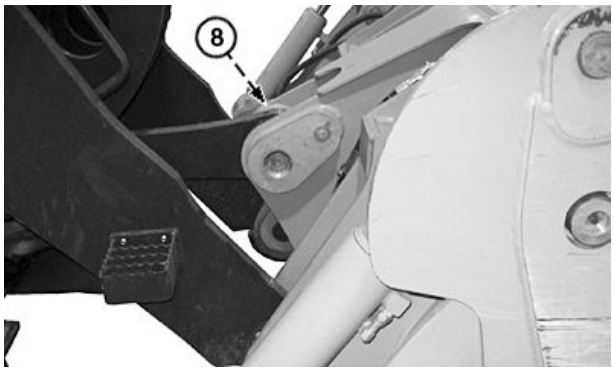
17. Attach appropriate lifting device to bucket link.

Specification	
Bucket Link—Weight (approximate)	79 kg 174 lb.

18. Apply PM37566 Silver-Grade Anti-Seize Lubricant or equivalent lubricant to bucket pin bores.

NOTE: Use a floor jack with blocks to aid in aligning bucket to bucket link.

19. Align bucket link and bucket pin bores.
20. Install bucket to bucket link with existing pin and shims. Ensure shims are installed to location and position noted during removal.
21. Install split seals on bucket link-to-bucket joint.
22. Connect hydraulic lines.
23. Lower equipment to ground.
24. Lubricate bucket link:



TX1126068A —UN—28NOV12

Lubrication Fitting Location

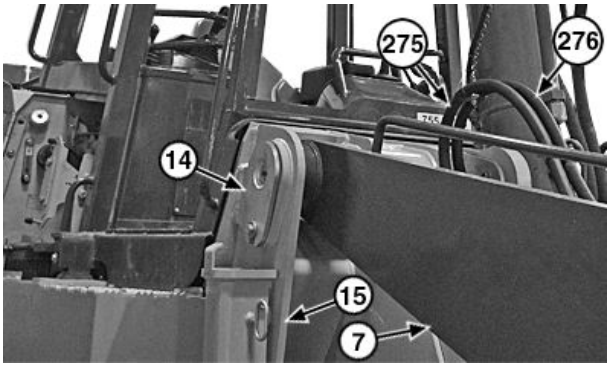
8— Lubrication Fitting

a. Move bucket to full dump position.
b. Lower bucket to ground.
c. Grease lubricate fitting (8) until grease escapes at joints.

SH03936,00059AA -19-22JAN13-7/7

IMPORTANT: Prevent hydraulic system contamination. Close all lines and openings with caps and plugs.

23. Disconnect multi-function bucket lines (275 and 276) at machine frame. Close lines and openings with caps and plugs.
24. Remove boom pins (14) from machine frame (15).
25. Lower boom (7) to ground.
26. Clean and inspect parts. Repair or replace parts as necessary.



TX1127479A —UN—10DEC12

Boom (right side of machine shown)

7— Boom
14— Boom Pin (2 used)
15— Machine Frame
275— Main Control Valve (multipurpose bucket open work port)-to-Multipurpose Bucket Cylinders (rod end) Line
276— Main Control Valve (multipurpose bucket close work port)-to-Multipurpose Bucket Cylinders (head end) Line

SH03936,00059AB -19-15JAN13-5/10

Boom Install

IMPORTANT: Avoid damage to boom-to-bucket joint bushings. No lubrication should be used on any components of boom-to-bucket joint including pin. Lubricating joint components may decrease the life of joint.

IMPORTANT: Shimming is required in all applications. Some joints are more critical and will be specified when required. Alignment of joint is critical to prevent premature wear. Cleanliness is also necessary to note in all joint components. Clean and burr-free pins must be used while replacing.

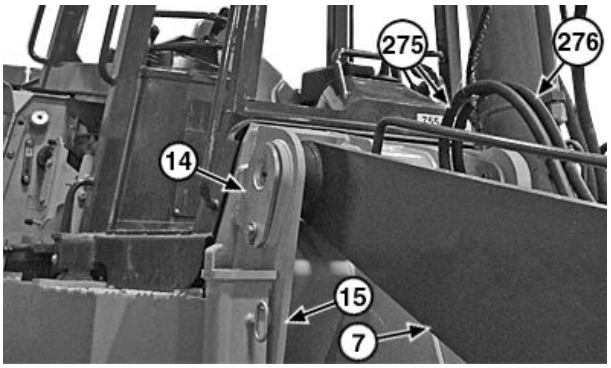
1. For bushings, seals, and pins that require grease, apply PM37617 Silver-Grade Anti-Seize. **DO NOT** Lubricate bushings, seals, or pins at boom-to-bucket joints.

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

2. Attach appropriate lifting device to boom (7).

Specification	
Boom—Weight (approximate)	1442 kg 3180 lb.

3. Align boom (7) to machine frame (15). Install boom with boom pins (14).



TX1127479A —UN—10DEC12

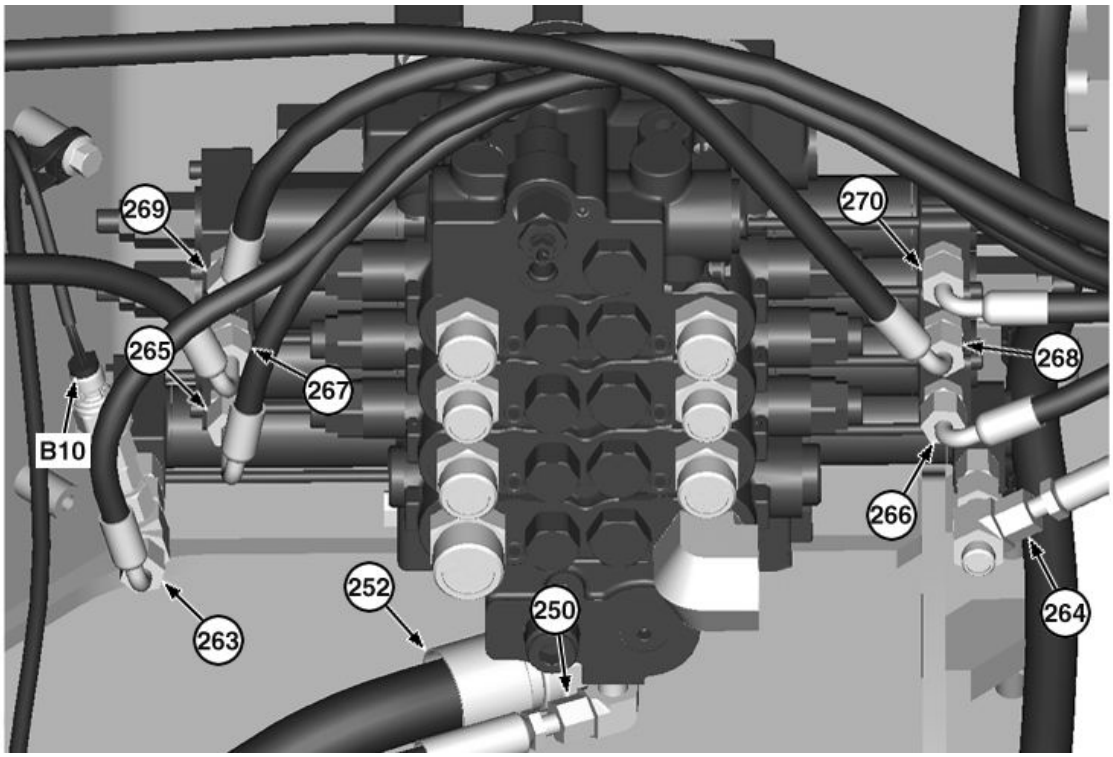
Boom (right side of machine shown)

7— Boom
14— Boom Pin (2 used)
15— Machine Frame
275— Main Control Valve (multipurpose bucket open work port)-to-Multipurpose Bucket Cylinders (rod end) Line
276— Main Control Valve (multipurpose bucket close work port)-to-Multipurpose Bucket Cylinders (head end) Line

4. Support front of boom with D01182AA 20-Ton Floor Stands.
5. Connect multi-function bucket lines at machine frame.

Continued on next page

SH03936,00059AB -19-15JAN13-6/10



TX1127159A —UN—04DEC12

Hydraulic Control Valve

250— Main Control Valve (port P1)-to-Pressure Reducing Valve (port P) Line
252— Main Hydraulic Pump-to-Main Control Valve (port P) Line
263— Pilot Control Valve (port 3)-to-Main Control Valve (boom raise) Line
264— Pilot Control Valve (port 1)-to-Main Control Valve (boom lower) Line
265— Pilot Control Valve (port 4)-to-Main Control Valve (bucket curl) Line
266— Pilot Control Valve (port 2)-to-Main Control Valve (bucket dump) Line
269— Auxiliary Pilot Control Valve (port 2)-to-Main Control Valve (ripper raise) Line
270— Auxiliary Pilot Control Valve (port 1)-to-Main Control Valve (ripper lower) Line
B10— Hydraulic Pressure Sensor

7. Install identification tags and disconnect lines (250, 252, 263—266, 269, and 270). Close all openings using caps and plugs.
8. Disconnect hydraulic pressure sensor (B10).

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

9. Support hydraulic control valve and remove cap screws (1).

Specification

Four Spool Hydraulic Control Valve—Weight (approximate) ..... 47 kg (104 lb.)

Three Spool Hydraulic Control Valve—Weight (approximate) ..... 43 kg (95 lb.)

Two Spool Hydraulic Control Valve—Weight (approximate) ..... 39 kg (86 lb.)

10. Remove hydraulic control valve.
11. Repair or replace hydraulic control valve as necessary. See Hydraulic Control Valve Disassemble and Assemble. (Group 3160.)
12. Install hydraulic control valve and tighten cap screws to specification.

Specification

Hydraulic Control Valve Cap Screw—Torque ..... 130 N·m (95 lb.-ft.)

Continued on next page

SH03936,00059AE -19-15JAN13-3/5

1— Seal Kit
2— Check Assembly (2 used)
3— Check Valve
4— Bucket Dump Circuit Relief Valve
5— Hydraulic Cylinder Cap
6— Cap Screw (4 used)
7— Relief Valve (2 used)
8— Spring Cap (2 used)
9— Cap
10— Stripper Bolt
11— Bucket Curl Circuit Relief Valve

SPECIFICATIONS	
Check Valve Torque	102 N·m 75 lb.-ft.
Bucket Dump Circuit Relief Valve Torque	102 N·m 75 lb.-ft.
Cap Screw Torque	11 N·m 100 lb.-in.
Cap Torque	102 N·m 75 lb.-ft.
Stripper Bolt Torque	20 N·m 175 lb.-in.
Bucket Curl Circuit Relief Valve Torque	102 N·m 75 lb.-ft.
Check Assembly Torque	9 N·m 80 lb.-in.

OTHER MATERIAL
271 Loctite® Thread Lock and Sealer (high strength)

1. Disassemble parts (1—11).
2. Clean and inspect parts. Replace parts as necessary.

IMPORTANT: Avoid O-ring damage or component malfunction. Apply clean hydraulic oil to all internal parts before assembling and apply petroleum jelly to backup rings and O-rings before installation.

3. Apply clean hydraulic oil to all internal parts of valve section.
4. Apply petroleum jelly to O-rings and seals. Install O-rings and seals.
5. Assemble parts (1—11).

IMPORTANT: Avoid machine damage or component malfunction. Clean all threads before applying thread lock and sealer. Any dirt, oil, or other contaminants on threads can reduce cure strength of thread lock and sealer.

6. Clean threads and apply PM37421 Thread Lock and Sealer (high strength) to threads of cap screws (6) and stripper bolt (10) (if removed). Tighten to specification.

Specification	
Check Assembly—Torque	9 N·m 80 lb.-in.
Check Valve—Torque	102 N·m 75 lb.-ft.
Bucket Dump Circuit Relief Valve—Torque	102 N·m 75 lb.-ft.
Cap Screw—Torque	11 N·m 100 lb.-in.
Cap—Torque	102 N·m 75 lb.-ft.
Stripper Bolt—Torque	20 N·m 175 lb.-in.
Bucket Curl Circuit Relief Valve—Torque	102 N·m 75 lb.-ft.

Loctite is a trademark of Henkel Corporation

Continued on next page

SH03936,00059AF -19-13MAR13-8/14

12. Clean and inspect parts. Repair or replace parts as necessary. See Bucket Cylinder Disassemble and Assemble. (Group 3160.)

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

13. Attach appropriate lifting device to bucket cylinder.

Specification	
Bucket Cylinder—Weight (approximate)	155 kg 344 lb.

14. Fill cylinder with clean hydraulic oil.
15. Install bucket cylinder to machine frame with existing pin.
16. Install bucket cylinder to bellcrank with existing pin and shims. Ensure shims are installed to location and position noted during removal.
17. Connect multipurpose bucket lines to machine frame.
18. Connect bucket dump and bucket curl lines to bucket cylinder.
19. Connect return-to-dig harness-to-vehicle harness 6-pin connector (X11) to machine. See Vehicle Harness (W11) Component Location. (Group 9015-10.)
20. Perform hydraulic cylinder bleed procedure. See Loader Start-Up Procedure (Hydraulic Cylinder Bleed Procedure). (Group 3160.)

SH03936,00059B1 -19-08JUL13-2/2

Bucket Cylinder Disassemble and Assemble

To repair 185 Series cylinders see Cylinder Identification. (CTM120519.)

RM58335,0001439 -19-16MAY14-1/1

Auxiliary Control Valve Disassemble and Assemble

For auxiliary control valve disassemble and assemble instructions, see Hydraulic Control Valve Disassemble and Assemble. (Group 3160.)

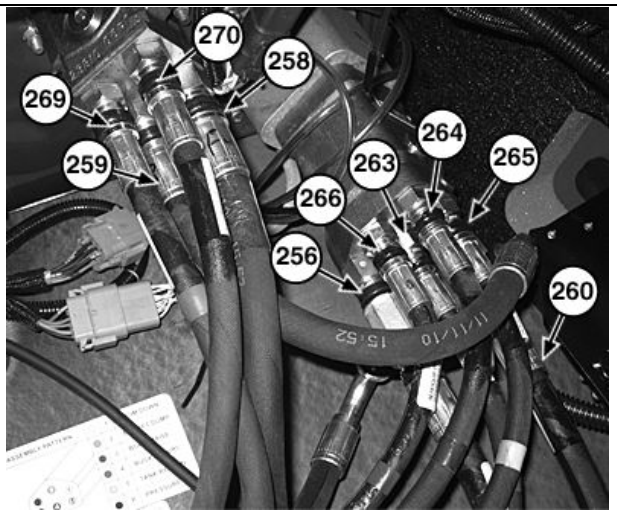
KK70125,00009CD -19-12JUL11-1/1

Ripper Pilot Control Valve Remove and Install

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Turn battery disconnect switch to OFF. See Battery Disconnect Switch. (Operator's Manual.)
3. Tilt cab/ROPS. See Cab or ROPS Tilting Procedure. (Operator's Manual.)

IMPORTANT: Prevent hydraulic system contamination. Absolute cleanliness is essential when working on hydraulic components. Clean component and adjacent areas before removing lines. Cap and plug all hoses, lines and openings.

4. Tag and disconnect ripper pilot control valve lines (258, 259, 269, and 270). Close all openings using caps and plugs.



TX1094373A —UN—06JUL11

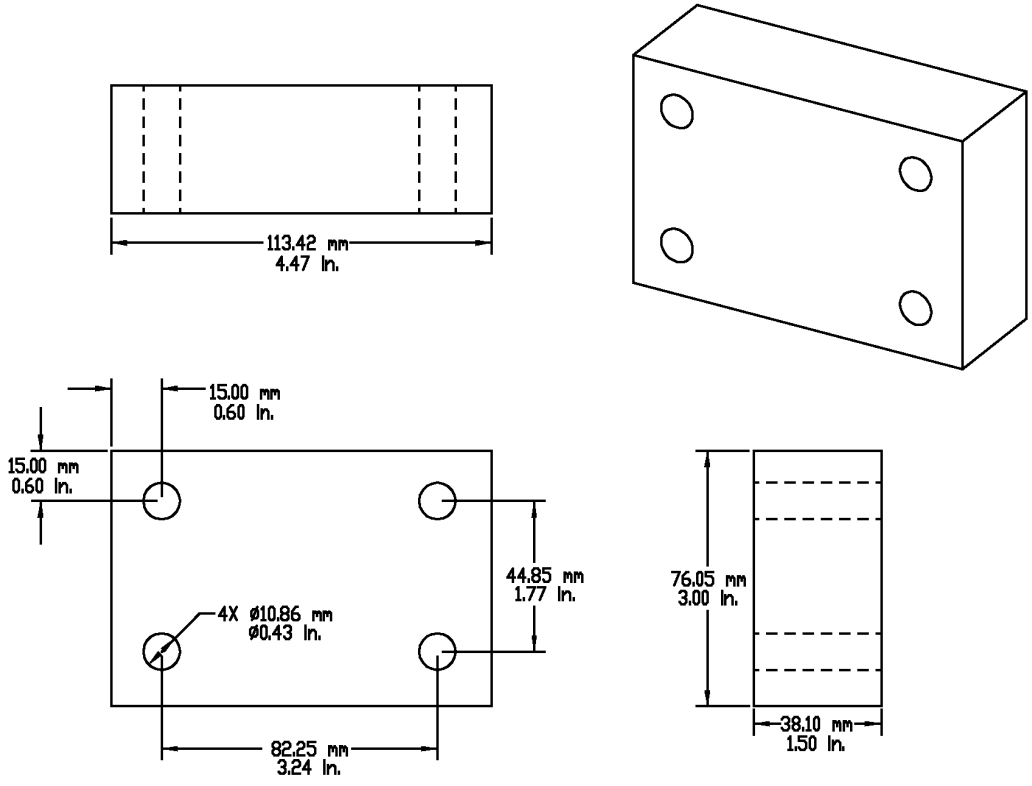
Ripper Pilot Control Valve Lines (single lever control with ripper pilot control valve shown)

256— Pressure Reducing Valve (port LP)-to-Pilot Control Valve (port P) Line
258— Pilot Control Valve (port P)-to-Ripper Pilot Control Valve (port P) Line
259— Ripper Pilot Control Valve (port T)-to-Pilot Control Valve (port T) Line
260— Pilot Control Valve (port T)-to-Pressure Reducing Valve (port T) Line
263— Pilot Control Valve (port 3)-to-Main Control Valve (boom raise) Line
264— Pilot Control Valve (port 1)-to-Main Control Valve (boom lower) Line
265— Pilot Control Valve (port 4)-to-Main Control Valve (bucket curl) Line
266— Pilot Control Valve (port 2)-to-Main Control Valve (bucket dump) Line
269— Ripper Pilot Control Valve (port 2)-to-Main Control Valve (ripper raise) Line
270— Ripper Pilot Control Valve (port 1)-to-Main Control Valve (ripper lower) Line

Continued on next page

KK70125,00009CE -19-18JUL11-1/2

DFT1167 Final Drive Lifting Bracket Adapter Spacer



T118674 —UN—01DEC98

To be used with DFT1166 Final Drive Lifting Bracket Adapter when installing DFT1063 Final Drive lifting Bracket.

Material: 1/2 in. 1020 Steel Plate

CED,TX03399,5085 -19-19APR06-1/1

Continued on next page