644K 4WD Loader Repair

(PIN: 1DW644K_ _ _F658218—)

REPAIR TECHNICAL MANUAL

644K 4WD Loader (PIN: 1DW644K_ _ _F658218—)

TM13053X19 21JUN18 (ENGLISH)

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

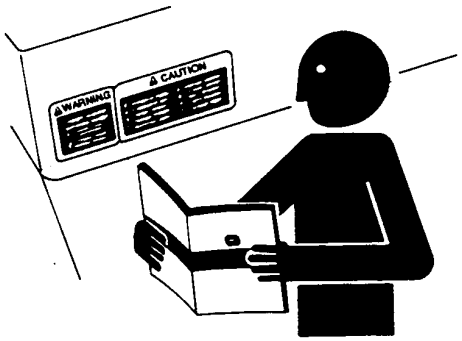
Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Use this operator's manual for correct safety sign placement. Be sure that new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine could impair the function or safety and affect machine life.



TS201 —UN—15APR13

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

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

Operate Only If Qualified

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

Operator should be familiar with the job site and surroundings before operating. Try all controls and machine functions with the machine in an open area before starting to work.

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

TX,QUALIFIED -19-18JAN11-1/1

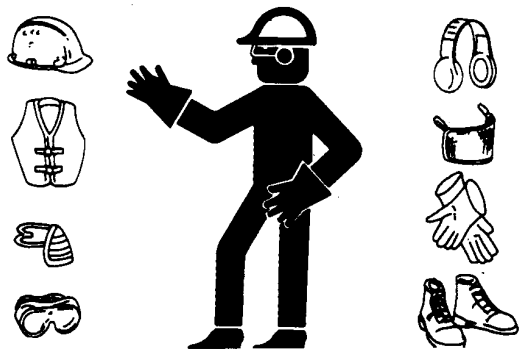
Wear Protective Equipment

Guard against injury from flying pieces of metal or debris; wear goggles or safety glasses.

Wear close fitting clothing and safety equipment appropriate to the job.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises. Radio or music headphones are not suitable to use for hearing protection.



TS206 —UN—15APR13

TX,WEAR,PE -19-22SEP10-1/1

Avoid Work Site Hazards

Avoid contact with gas lines, buried cables, and water lines. Call utility line location services to identify all underground utilities before starting work.

Prepare work site properly. Avoid operating near structures or objects that could fall onto the machine. Clear away debris that could move unexpectedly if run over.

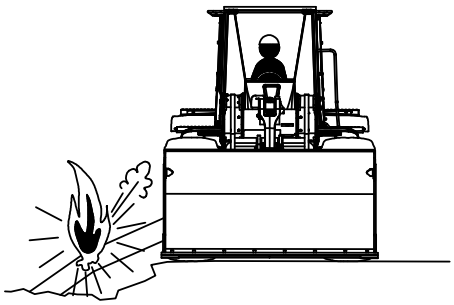
Avoid boom or attachment contact with overhead obstacles or overhead electrical lines. Never move machine closer than 3 m (10 ft.) plus twice the line insulator length to overhead wires.

Keep bystanders clear at all times. Keep bystanders away from raised booms, attachments, and unsupported loads. Avoid swinging or raising booms, attachments, or loads over or near personnel. Use barricades or a signal person to keep vehicles and pedestrians away. Use a signal person if moving machine in congested areas or where visibility is restricted. Always keep signal person in view. Coordinate hand signals before starting machine.

Operate only on solid footing with strength sufficient to support machine. Be especially alert working near embankments or excavations.

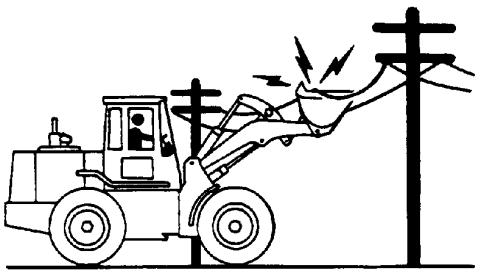
Avoid working under overhanging embankments or stockpiles that could collapse under or on machine.

Reduce machine speed when operating with tool on or near ground when obstacles may be hidden (e.g., during snow removal or clearing mud, dirt, etc.). At high speeds hitting obstacles (rocks, uneven concrete, or manholes) can cause a sudden stop. Always wear your seat belt.



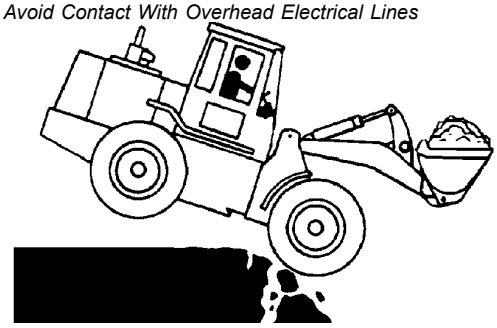
T141894 —UN—15APR13

Avoid Contact With Gas Line



T141670 —UN—24APR01

Avoid Contact With Overhead Electrical Lines



T141672 —UN—04MAY01

Operate Only on Solid Footing

DP99999,0000113 -19-23FEB15-1/1

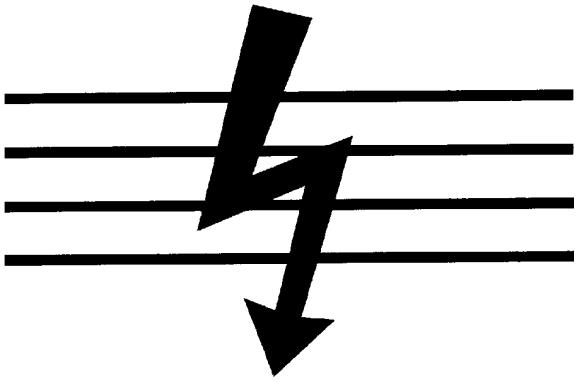
Avoid Power Lines

⚠ CAUTION: Power lines carrying more than 50 000 volts require a safety distance of 10 ft (3 m) plus 1/2 in (13 mm) for each additional 1000 volts above the 50 000 volt level.

Approach with caution areas where overhanging telephone or electric power lines are present. Serious injury or death by electrocution can result if the machine or any of its attachments are not kept a safe distance from high-voltage electric power lines.

Maintain a distance of 10 ft (3 m) between the machine, boom, stick, and any power line carrying up to 50 000 volts or less.

If state/province, local, or job site regulations require even greater safety distances than stated above, adhere strictly to these regulations for personal protection.



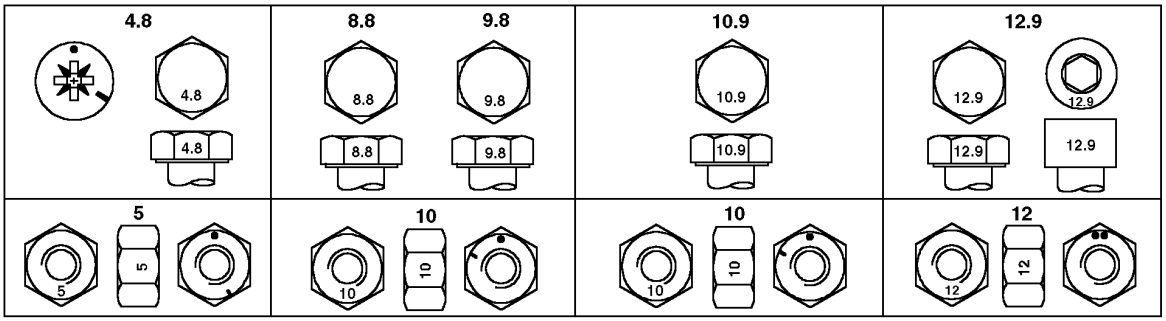
T147350 —UN—24OCT01

Avoid Power Lines

KR46761,00011B9 -19-28JUN16-1/1

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 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)**
M42 x 2	50	50	210 (155)	140 (103)
M48 x 2	55	55	260 (192)	173 (128)
M60 x 2	65	65	315 (232)	210 (155)
[a] Stud end threads are identified as metric by an identification groove in the hex nut next to the O-ring.				
[b] 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.
2. Back the stud end hex nut off as far as possible. Push backup washer towards the nut to fully expose the turn down section. Washer must fit turned down section and not be too loose
3. Lubricate O-rings using a thin film of clean hydraulic oil or as needed, petroleum jelly to hold O-ring in place.

   Install O-ring into groove making sure it is seated at the bottom. Excess petroleum jelly will prevent seating of O-ring and cause it to pop out.

   To protect an O-ring from threads, wrap electrical tape over the threads. Slide O-ring over the tape into the turned down section. Remove the tape.
4. Turn fitting into the boss by hand until face of nut or washer squeezes the O-ring into the seat and contacts face of boss. Loosen adjustable fittings no more than one turn for alignment.

   Hold connections together while tightening nut to ensure O-ring remains in place.
5. Tighten fitting or nut to torque value shown. Use a second wrench to hold the fitting in position or to keep hose from twisting while tightening nut.

OUT3035,0000366 -19-04MAY09-2/2

Section 01
Wheels

Contents

9. Tag and disconnect lines (1—7).

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

10. Install JT01642A Low-Lift Transmission Jack under axle assembly.

Specification	
Axle and Differential with Oscillating Supports—Weight (approximate)	1133 kg 2500 lb

11. Remove axle and differential mounting cap screws (8 and 9) from oscillating supports.
12. Lower rear axle assembly.
13. Clean and inspect parts. Repair or replace axle or differential as necessary. See TEAMMATE™ V 1400 Series Inboard Planetary Axles. (CTM143819.) Also see Axle Oscillating Supports Disassemble and Assemble. (Group 0200.)
14. Clean mating surfaces on oscillating supports and machine frame.

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

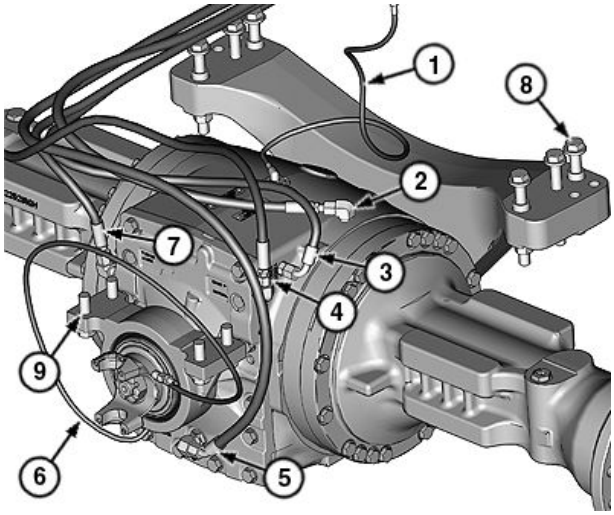
15. Install axle assembly to machine frame with existing hardware.

Specification	
Axle and Differential with Oscillating Supports—Weight (approximate)	1133 kg 2500 lb

16. Tighten axle and differential mounting cap screws (8 and 9) to specification.

Specification	
Axle and Differential Mounting Cap Screw (8 and 9)—Torque	532 N·m 392 lb·ft

17. Connect lines to rear axle.



TX1151319A —UN—17JAN14

Rear Axle

1— Breather Line
2— Rear Axle-to-Rear Axle Differential Lock Valve Return Line (if equipped)
3— Rear Axle Differential Lock Valve-to-Rear Axle Line (if equipped)
4— Service Brake Valve-to-Rear Axle Line
5— Rear Axle-to-Rear Axle Circulation Pump Return Line
6— Lubrication Line
7— Axle Oil Cooler-to-Rear Axle Line
8— Cap Screw (6 used)
9— Cap Screw (4 used)

IMPORTANT: Do not reuse drive shaft universal joint cap screws. Install new cap screws to avoid machine damage.

18. Connect drive shaft to rear axle. See Universal Joint and Drive Shaft Remove and Install. (Group 0225.)
19. Install wheels. See Wheel Remove and Install. (Group 0110.)
20. Remove 12-1/2-ton floor stands.
21. Fill rear axle. See Drain and Refill Front and Rear Axle Oil. (Operator's Manual.)
22. Bleed service brakes. See Service Brake Bleeding Procedure. (Group 9020-20.)

JK05397,0000054 -19-05JUN17-2/2

Differential Lock Solenoid Valve Remove and Install

SPECIFICATIONS	
Differential Lock Solenoid Valve Torque	34 N·m 25 lb.-ft.
Coil Retaining Nut Torque	7 N·m 60 lb.-in.

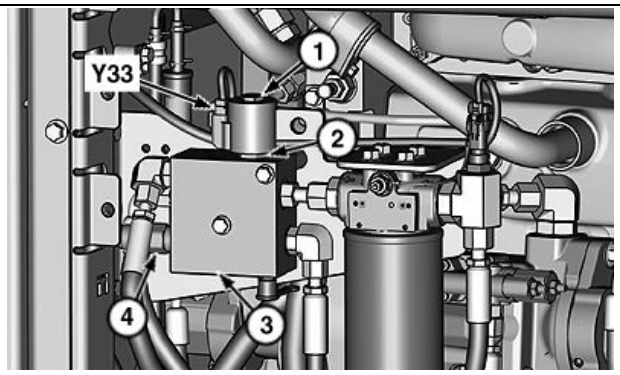
NOTE: This story applies to front differential lock solenoid valve and rear differential lock solenoid valve (if equipped).

1. Park and prepare machine for service safely. See Park and Prepare for Service Safely. (Group 0001.)
2. Disconnect rear differential lock solenoid (Y33) electrical connector.
3. Remove differential lock solenoid valve (2). Close all openings with cap and plugs.
4. Clean and inspect parts for damage. Repair or replace parts as necessary.
5. Install differential lock solenoid valve to differential lock valve. Tighten to specification.

Specification

Differential Lock Solenoid Valve—Torque.....34 N·m
25 lb.-ft.

6. Install nut (1). Tighten to specification.



TX1151628A —UN—21JAN14

Differential Lock Valve (rear differential lock solenoid valve shown)

Y33— Rear Differential Lock Solenoid
1— Nut
2— Differential Lock Solenoid Valve
3— Differential Lock Valve
4— Pressure Relief Valve

Specification

Coil Retaining Nut—Torque.....7 N·m
60 lb.-in.

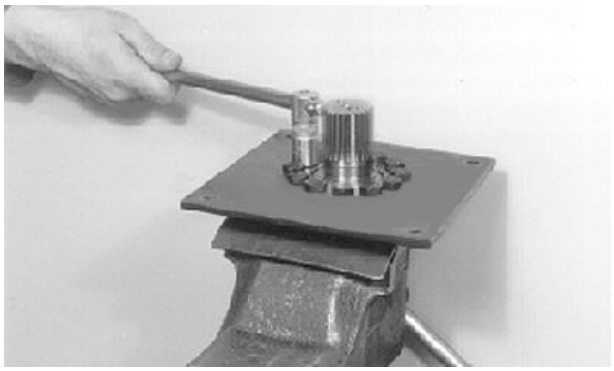
7. Connect rear differential lock solenoid (Y33) electrical connector.

JK05397,000005D -19-28JAN14-1/1

2. Assemble the input shaft to drive plate. Tighten to specification.

Specification

Input Shaft-to-Drive Plate Cap Screw—Torque	115 N·m 85 lb·ft



T112415 —UN—15APR13

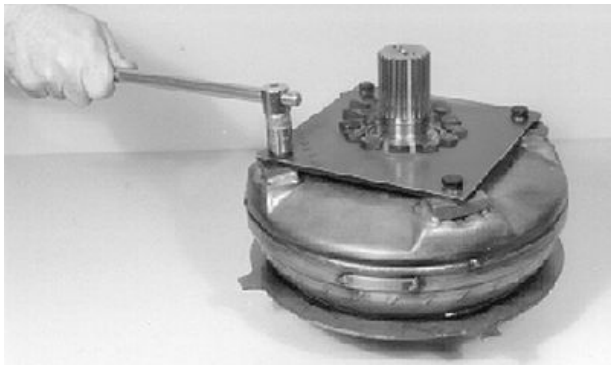
Input Shaft-to-Converter Hex Head Screws

BE7856,0001D1F -19-21FEB17-2/8

3. Install input shaft drive plate assembly to torque converter. Apply PM38654 High Strength Thread Lock and Sealer to cap screws. Install washer and cap screws. Tighten to specification.

Specification

Input Shaft Drive Plate-to-Torque Converter Cap Screw—Torque	115 N·m 85 lb·ft



T112416 —UN—15APR13

Drive Plate-to-Converter Cap Screw

Continued on next page

BE7856,0001D1F -19-21FEB17-3/8

3. Install forth speed forward clutch.

TX1029592A —UN—15APR13

Clutch K4 Installation

BE7856,0001D21 -19-21FEB17-3/28

4. Install third speed clutch.

T109007 —UN—15APR13

Clutch K3 Installation

BE7856,0001D21 -19-21FEB17-4/28

5. Install second speed clutch.

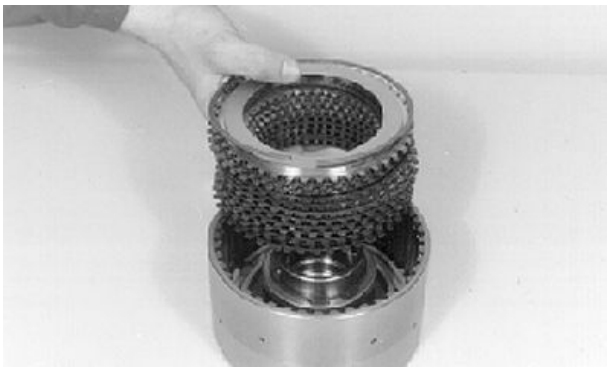
T112554B —UN—15APR13

Clutch K2 Installation

Continued on next page

BE7856,0001D21 -19-21FEB17-5/28

5. Remove snap ring, clutch pack plates, and discs from carrier.



T108795 —UN—15APR13

Clutch Plates

TX04577,0000032 -19-21FEB17-5/11

6. Preload compression spring with JDG10910 Assembly Aid (spring compressor) in a press.

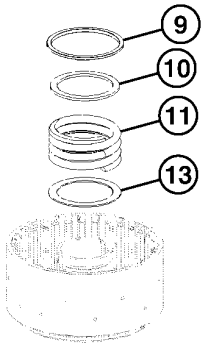
T108761 —UN—15APR13

Preload Compression Spring

TX04577,0000032 -19-21FEB17-6/11

7. Remove L-ring (9), support shim (10), spring (11), and washer (13).
8. Remove piston from carrier.

9— L-Ring
10— Support Shim
11— Spring
13— Washer



TX1155777 —UN—06MAR14

Removal of Piston Retention Parts

Continued on next page

TX04577,0000032 -19-21FEB17-7/11

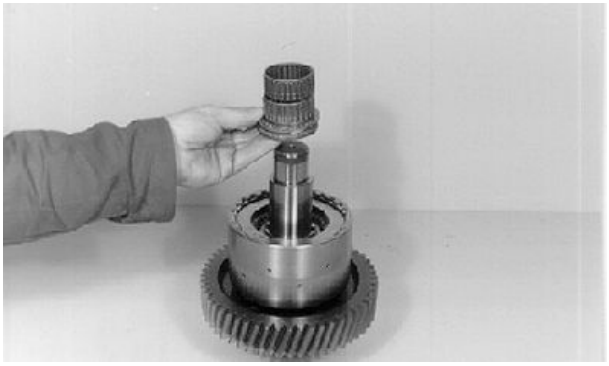
4. Remove idler gear.

T108766 —UN—15APR13

Remove Idler Gear

TX04577,0000033 -19-21FEB17-4/11

5. Remove both needle bearings as well as axial bearing.



T108767 —UN—15APR13

Remove Needle and Axial Bearing

TX04577,0000033 -19-21FEB17-5/11

6. Remove snap ring, plates, and discs from carrier.

T108760 —UN—15APR13

Remove Snap Ring, Plates, and Discs

Continued on next page

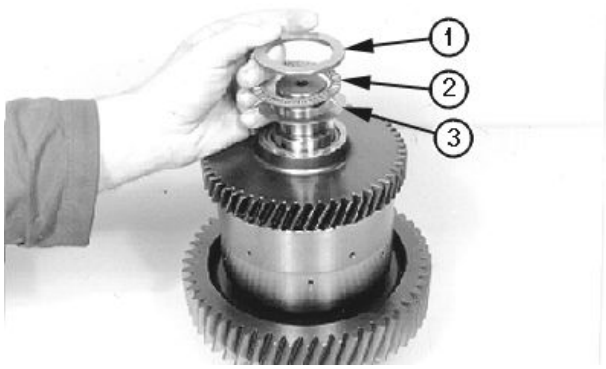
TX04577,0000033 -19-21FEB17-6/11

22. Install thrust washer (3), thrust bearing (2), and thrust disc (1).

NOTE: Install disc (1) with chamfer facing the thrust bearing.

23. To ensure proper assembly, top surface of thrust disc must be flush with shaft step.

1— Thrust Disc
2— Thrust Bearing
3— Thrust Washer



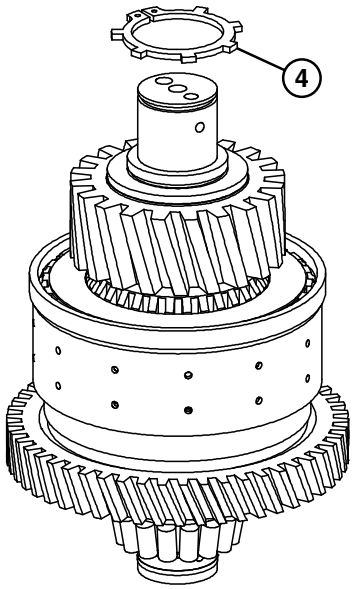
T108744 —UN—15APR13

Thrust Washer, Bearing, and Disc

TX04577,0000035 -19-21FEB17-19/22

24. Install snap ring (4) for (K1 and K2).

4— Snap Ring

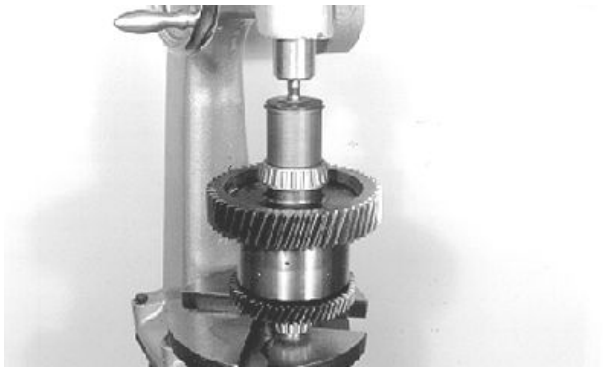


TX1042857 —UN—15APR13

Snap Ring Install (K1 and K2)

TX04577,0000035 -19-21FEB17-20/22

25. Press tapered roller bearing against shoulder.



T108746 —UN—15APR13

Tapered Roller Bearing Press

Continued on next page

TX04577,0000035 -19-21FEB17-21/22

21. Install snap ring to retain plate.

T108994 —UN—15APR13

Snap Ring Installation

TX04577,0000037 -19-21FEB17-18/20

22. Press tapered roller bearing against shoulder. Install opposite tapered roller bearing.

T108995 —UN—14APR97

Tapered Roller Bearing Installation

TX04577,0000037 -19-21FEB17-19/20

CAUTION: Prevent possible injury from flying debris. Reduce compressed air pressure to less than 210 kPa (2 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying chips, and wear personal protection equipment including eye protection.

NOTE: Make sure that clutch pack components are correctly installed, apply compressed air as shown, and listen for movement of the clutch pack. The clutch pack will move freely when installed correctly.

23. Check function of clutch by means of compressed air.

T108996 —UN—15APR13

Function Check With Compressed Air

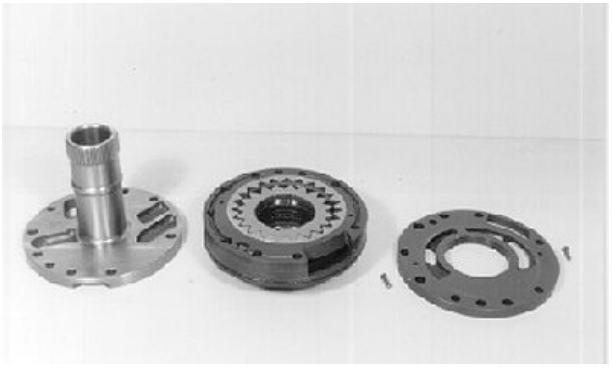
TX04577,0000037 -19-21FEB17-20/20

IMPORTANT: Avoid transmission damage. If signs of wear are noticed within the pump housing or the cam disk, the complete pump must be replaced.

3. Remove transmission pump from stator.

RE59955,0000CBB -19-19DEC12-4/15

4. Remove cam plate from pump. Observe drive gear spline location and two small dowel pins.

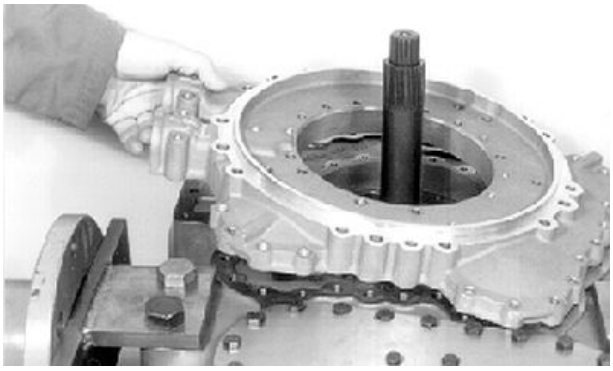


T108732 —UN—15APR13

Transmission Pump Components

RE59955,0000CBB -19-19DEC12-5/15

5. Loosen cap screws and remove oil feed housing.
6. Remove flat gasket.
7. Inspect and replace parts as required.
8. Install cam disk and retain it by means of grooved pins (2 used).



T108725 —UN—15APR13

Remove Oil Feed Housing

RE59955,0000CBB -19-19DEC12-6/15

9. Install alignment studs (1) and install flat gasket.

1— Alignment Stud (2 used)

TX1028774A —UN—15APR13

Install Oil Feed Housing

Continued on next page

RE59955,0000CBB -19-19DEC12-7/15

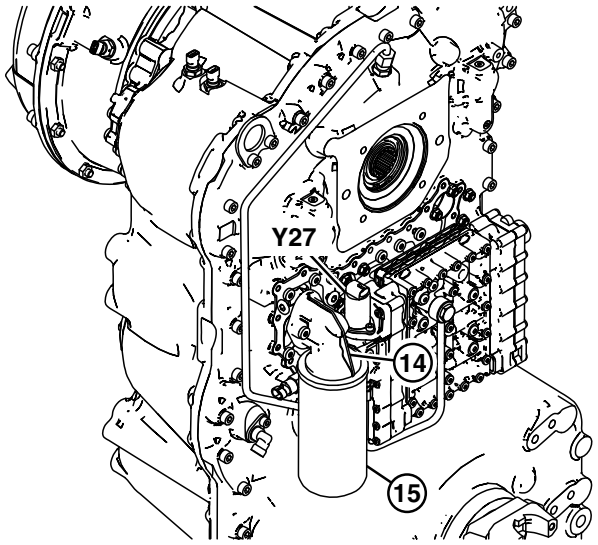
21. Install transmission oil filter manifold and O-rings with cap screws. Tighten to specification.

Specification	
Transmission Oil Filter Manifold Cap Screw—Torque	35 N·m 25 lb-ft

NOTE: Apply oil to seal. Tighten until seal contacts manifold, then tighten by hand an additional one-third to one-half rotation.

22. Install transmission oil filter.
23. Connect electrical connector to torque converter lockup solenoid valve (if equipped).
24. Install main hydraulic pump. See Main Hydraulic Pump Remove and Install. (Group 3160.)

14— Transmission Oil Filter Manifold
15— Transmission Oil Filter
Y27— Torque Converter Lockup Solenoid



TX1086370 —UN—15APR13

TX1086370

Transmission Oil Filter

RM58335,000121A -19-10JAN11-10/10

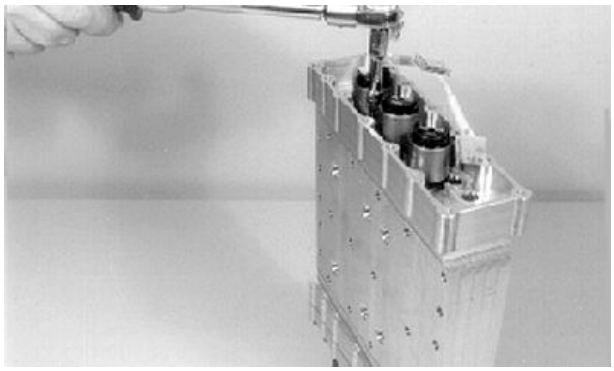
NOTE: Install retaining plate with the claw facing the housing bottom.

43. Install three solenoid valves (6) with O-rings (7). Fasten with retaining plate (9) and cap screw (8). Tighten to specification.

Specification

Retaining Plate Cap Screw—Torque.....5 N·m
44 lb-in.

44. Connect wiring harness to solenoid valves.



T108698 —UN—15APR13

Solenoid Valves Tightening

RM58335,000121C -19-03JAN11-23/29

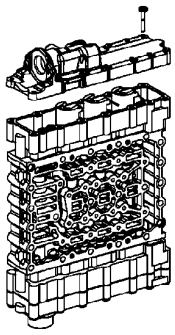
NOTE: Observe position of cover and lockup solenoid control valve during installation.

45. Install two alignment studs in housing. Install gasket (24).

Install cover (25) and cap screws (1) and remove alignment studs. Tighten to specification.

Specification

Solenoid Cover-to-Housing Cap Screw—Torque.....5 N·m
44 lb-in.



TX1049103 —UN—15APR13

Lockup Solenoid Control Valve Cover (if equipped)

RM58335,000121C -19-03JAN11-24/29

46. Install union fittings and O-rings. Tighten to specification.

Specification

Union Fitting—Torque.....25 N·m
221 lb-in.

47. Install lockup solenoid control valve with cap screws. Tighten to specification.

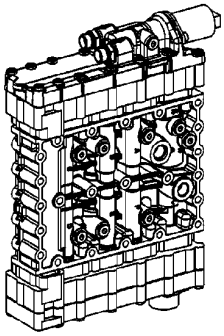
Specification

Lockup Solenoid Control Valve Cap Screw—Torque.....10 N·m
88 lb-in.

48. Install plug and O-ring in cover, if removed. Tighten to specification.

Specification

Plug—Torque.....10 N·m
88 lb-in.



TX1049104 —UN—15APR13

Lockup Solenoid Control Valve

Continued on next page

RM58335,000121C -19-03JAN11-25/29

John Deere Engine

For additional information on John Deere PowerTech™ PSS engine and components for engine model 6090HDW19, see the following component technical manual (CTM):

9.0 L OEM Diesel Engines—Final Tier 4/Stage IV Platform. (CTM117719.)

PowerTech is a trademark of Deere & Company

SP66632,000495F -19-14APR14-1/1

Engine Remove and Install

SPECIFICATIONS	
Engine Weight (approximate)	1186 kg 2615 lb
Engine Mount Cap Screw Torque	532 N·m 392 lb·ft
Engine Support Bracket Cap Screw Torque	320 N·m 236 lb·ft

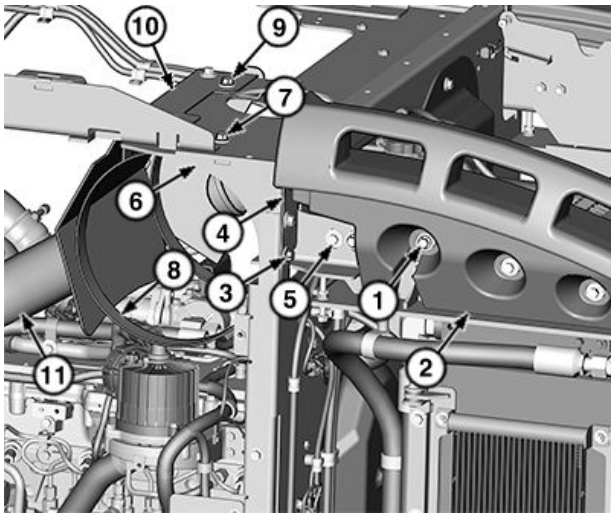
ESSENTIAL TOOLS
JDG11252 Lifting Bracket
JDG11258 Lifting Bracket
JDG23 Lifting Sling

MACHINE PREPARATION

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.
3. Drain cooling system. See Drain Cooling System. (Operator's Manual.)
4. Recover refrigerant from air conditioning system. See Recover R134a Refrigerant. (Group 1830.)
5. Remove hood. See Hood Remove and Install. (Group 1910.)
6. Remove engine side shields. See Engine Side Shields Remove and Install. (Group 1910.)
7. Remove cooling package access doors. See Cooling Package Access Doors Remove and Install. (Group 1910.)
8. Remove exhaust gas aftertreatment system. See Exhaust Gas Aftertreatment System Remove and Install. (Group 0530.)
9. Remove air cleaner. See Air Cleaner Remove and Install. (Group 0520.)

REMOVAL

1. Remove cap screws (1, 3, 7, and 9), handrails (2), bulkhead plates (4), band clamps (8), and heat shield bracket (10).



TX1158215A —UN—25APR14

Main Structure Support and Handrail

1— Cap Screw (6 used)
2— Handrail (2 used)
3— Cap Screw (4 used)
4— Bulkhead Plate (2 used)
5— Cap Screw (4 used)
6— Main Structure Support
7— Cap Screw (4 used)
8— Band Clamp (2 used)
9— Cap Screw (3 used)
10— Heat Shield Bracket
11— Air Intake Tube

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

2. Remove cap screws (5) and main structure support (6).
3. Remove air intake tube (11). Close all openings using caps and plugs.

Continued on next page

NR81152,00014D9 -19-29MAR18-1/11

Charge Air Cooler Remove and Install

SPECIFICATIONS	
Charge Air Cooler Weight (approximate)	25 kg 55 lb.

Machine Preparation

- Prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
- Open right cooling package access door.

Removal

CAUTION: Prevent possible injury from hot charge air cooler. Allow charge air cooler to cool before removing.

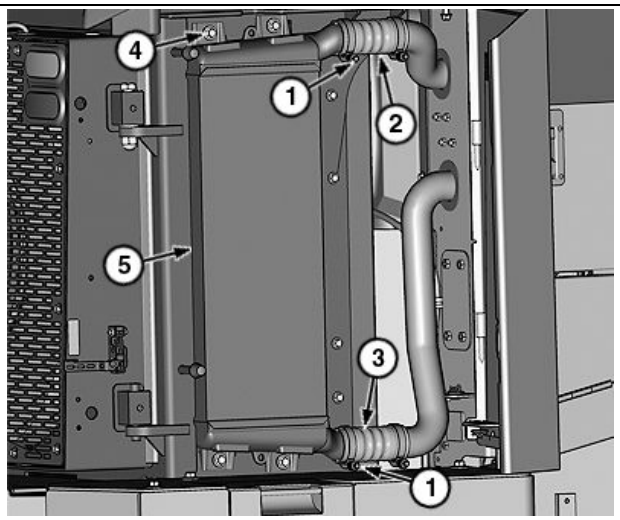
1. Loosen clamps (1) and disconnect upper and lower charge air cooler tubes (2 and 3) from charge air cooler (5). Close all openings using caps and plugs.

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

2. Remove cap screws (4) and remove charge air cooler.

Installation

Installation is reverse of removal procedure.



TX1150974A —UN—31MAR14

Charge Air Cooler

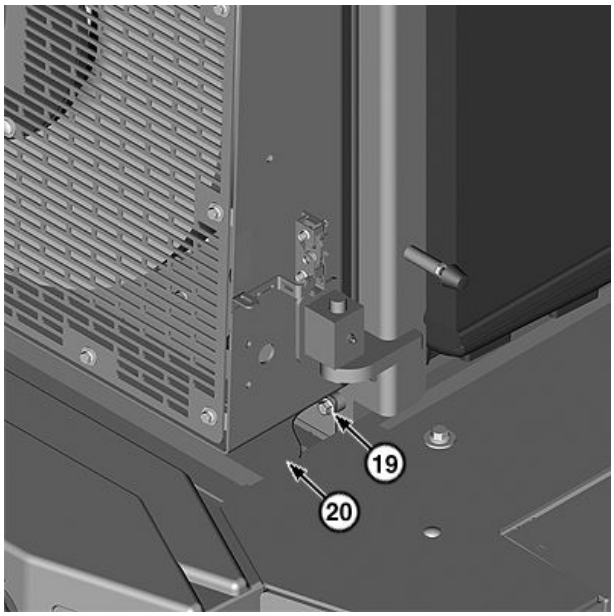
1— Clamp (4 used)
2— Upper Charge Air Cooler Tube
3— Lower Charge Air Cooler Tube
4— Cap Screw (4 used)
5— Charge Air Cooler

SP66632,0004954 -19-28MAR14-1/1

9. Remove cap screws (19) and cooling package plenum access cover (20).
10. If equipped with radar object detection, disconnect load center harness-to-radar object detection harness 6-pin electrical connector (X101) and radar object detection harness-to-load center harness 3-pin CAN electrical connector (X38). Remove harness from engine frame. See Radar Object Detection (ROD) Harness (W21) Component Location. (Group 9015-10.)

19— Cap Screws (4 used)

20— Cooling Package Plenum Access Cover



TX1155041A —UN—18MAR14

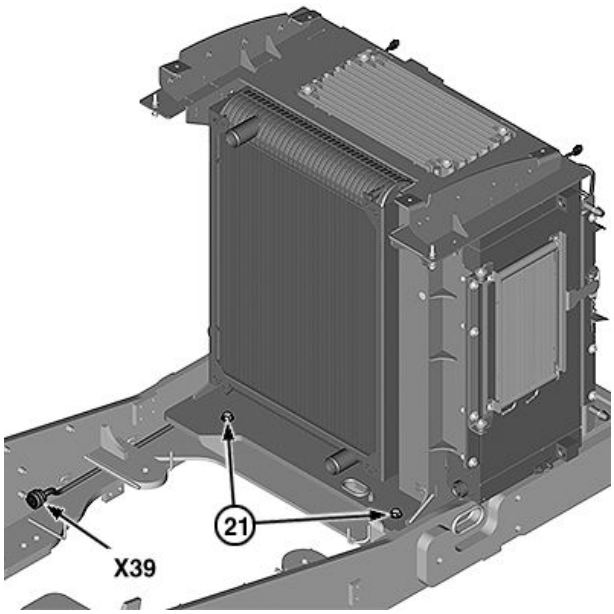
Cooling Package Plenum Access Cover

SP66632,0004973 -19-13DEC16-4/6

11. Tag and disconnect engine frame harness-to-rear frame harness 23-pin electrical connector (X39). Remove harness from engine frame. See Rear Frame Harness (W13) Component Location. (Group 9015-10.)
12. Remove cap screws (21).

21— Cap Screw (4 used)

X39— Engine Frame Harness-to-Rear Frame Harness 23-Pin Connector



TX1156204A —UN—18MAR14

Cooling Package Plenum

Continued on next page

SP66632,0004973 -19-13DEC16-5/6

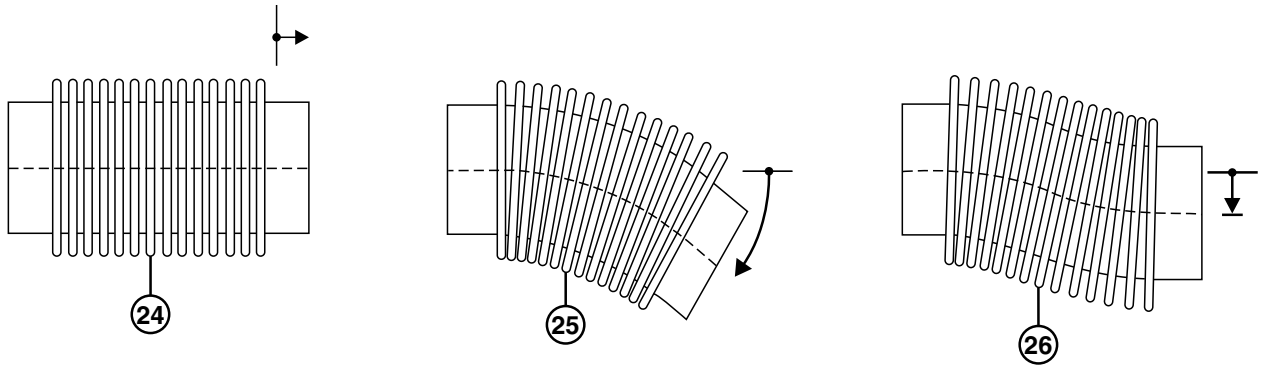
Exhaust Bellows Alignment Procedure (S.N. —675480)

SPECIFICATIONS	
Exhaust Bellows Length	297.1—309.9 mm 11.7—12.2 in
Exhaust Filter-to-Exhaust Bellows Clamp Nut Torque	20 N·m 177 lb·in

ESSENTIAL TOOLS
JDG11335 Exhaust Bellows Alignment Fixture

IMPORTANT: The life of the exhaust bellows is dependant on being properly aligned. If not aligned correctly, the life of the exhaust bellows will significantly decrease and may risk unfiltered exhaust into the atmosphere.

NOTE: Graphic is for reference only.



TX1080155 —UN—26JUL10

TX1080155

Axial, Angular, and Lateral Specifications

24— Axial **25— Angular** **26— Lateral**

This procedure is to be performed whenever the exhaust tube or exhaust bellows is disconnected. The JDG11335 Exhaust Bellows Alignment Fixture is used to hold the exhaust bellows at nominal alignment. While the exhaust bellows is held at nominal alignment, it allows the technician to visually see and measure to verify that the exhaust bellows is in alignment with the exhaust filter. The life of the bellows depends on how well the exhaust bellows is aligned axially (24), angularly (25), and laterally (26). Axial tolerance is ±6.4 mm (±0.252 in), angular tolerance is 2°, and lateral tolerance is ±8.5 mm (±0.335 in). Use the adjustable frame with the adjustment points to align the exhaust bellows with the exhaust filter inlet.

1. Assemble JDG11335 Bellows Alignment Fixture. See JDG11335 Bellows Alignment Fixture. (Group 0530.)

Continued on next page

REMOVAL

1. Remove SCR temperature sensors (2 and 3) and aftertreatment outlet NOx sensor (B5503).

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

2. Attach appropriate lifting device to SCR (1).

Specification	
Selective Catalyst Reduction (SCR) (approximate)—Weight	52 kg 115 lb

3. Remove exhaust clamp (4), mounting bands (5), and remove SCR (1).

INSTALLATION

Installation is reverse of removal procedure.

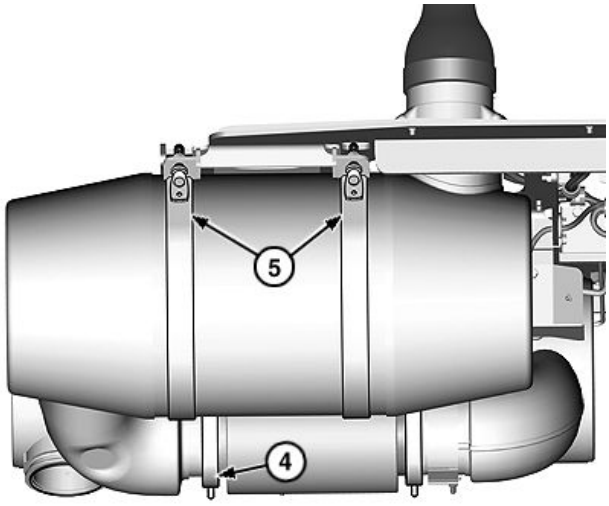
IMPORTANT: Do not use nickel-based anti-seize lubricants. Using nickel-based lubricants may cause damage to the sensors.

- Apply NEVER-SEEZ® Anti-Seize lubricant to threads of SCR temperature sensors.

IMPORTANT: If using a pneumatic impact wrench to tighten the mounting bands, do not exceed 100 rpm or galling of the stainless steel threads will occur.

- Tighten SCR sensors, exhaust clamp, and mounting bands to specification.

Specification	
SCR Inlet Temperature Sensor—Torque	35 N·m 25 lb·ft



TX1155446A —UN—06MAR14

SCR Mounting

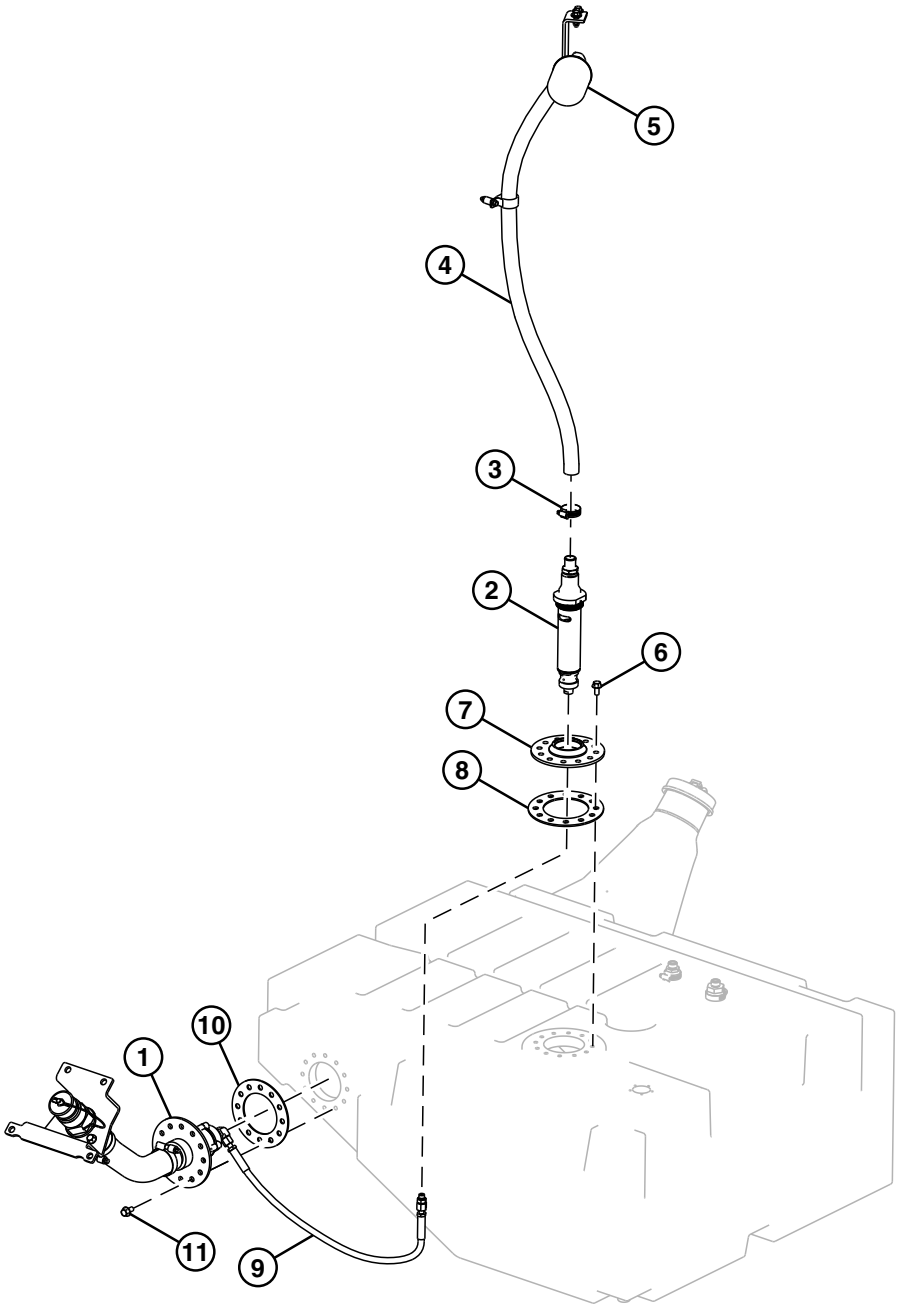
4— Exhaust Clamp **5— Mounting Band (2 used)**

SCR Outlet Temperature Sensor—Torque	35 N·m 25 lb·ft
Exhaust Clamp—Torque	20 N·m 177 lb·in
Mounting Band—Torque	42 N·m 31 lb·ft

- For machines with (S.N. —675480), align exhaust bellows. See Exhaust Bellows Alignment Procedure (S.N. —675480). (Group 0530.)

NR81152,00014DA -19-05MAY16-2/2

Fast Fill Fuel System Disassemble and Assemble



TX1085374

TX1085374 —UN—07DEC10

Fast Fill Fuel System

1— Filler Valve Assembly
2— Breather Valve Assembly
3— Clamp
4— Breather Hose
5— Breather Filter
6— Cap Screw (12 used)
7— Plate
8— Gasket
9— Signal Line
10— Gasket
11— Cap Screw (12 used)

SPECIFICATIONS	
Filler Valve Assembly Cap Screw Torque	31 N·m 23 lb-ft
Breather Valve Assembly Cap Screw Torque	31 N·m 23 lb-ft

1. Remove cap screws (6).
2. Remove plate (7) and breather valve assembly (2).
3. Disconnect signal line (9).
4. Disassemble and replace parts (1—11) as necessary.
5. Install filler valve assembly (1) with signal line (9).

Continued on next page

BS13840,0000163 -19-08FEB13-1/2

Orbital Steering Valve Remove and Install

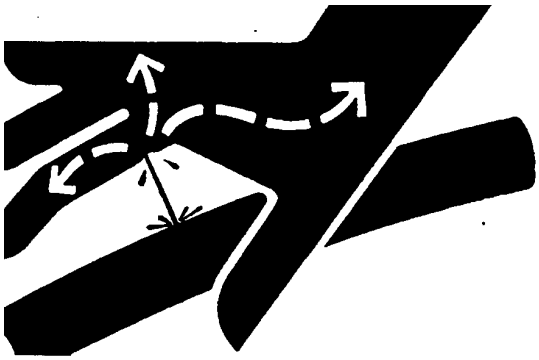
SPECIFICATIONS	
Orbital Steering Valve Socket Head Cap Screw Torque	28 N·m 21 lb-ft

CAUTION: Prevent possible injury from unexpected machine movement. Install articulation lock bar before working in frame hinge area.

1. Install frame articulation lock bar.

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

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



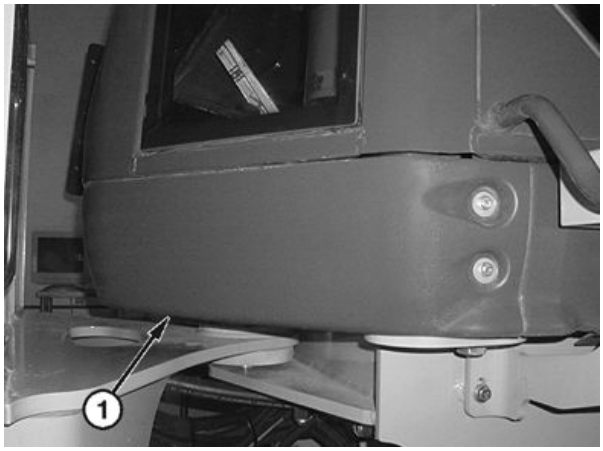
X9811 —UN—23AUG88

2. Stop engine and relieve hydraulic pressure. Perform Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)
3. Turn battery disconnect switch to the OFF position.

MH66O88,000070A -19-18JAN11-1/4

4. Remove front cab panel (1).
5. Remove cover from steering column.
6. Apply vacuum or drain hydraulic reservoir. If draining hydraulic reservoir, see Drain and Refill Capacities. (Operator's Manual.)

1— Front Cab Panel



TX1022021A —UN—15APR13

Front Cab Panel

Continued on next page

MH66O88,000070A -19-18JAN11-2/4

NeverGrease is a trademark of Deere & Company

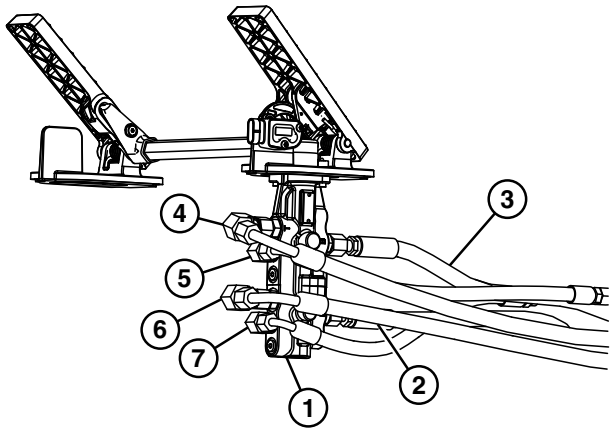
RM58335,0001221 -19-11APR14-2/2

Service Brake Valve Remove and Install

1. 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 hydraulic system pressure. See Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)
3. Remove front trim panel.
4. Apply vacuum or drain hydraulic reservoir. See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)
5. Tag and disconnect hydraulic lines (2—7) from service brake valve. See Power Train Component Location (Group 9020-10.) Close all openings with caps and plugs.
6. Support service brake valve and remove two socket head cap screws under service brake pedal.
7. Remove service brake valve (1).
8. Clean and inspect parts. Repair or replace parts as necessary.
9. Install service brake valve.
10. Connect hydraulic lines.
11. Remove vacuum or fill hydraulic reservoir. See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)



TX1154128 —UN—18MAR14

Service Brake Valve

1— Service Brake Valve
2— Service Brake Valve-to-Front Axle Brake Line
3— Service Brake Valve-to-Rear Axle Brake Line
4— Service Brake Valve-to-Hydraulic Reservoir Line
5— Rear Service Brake Accumulator-to-Service Brake Valve Line
6— Service Brake Valve-to-Hydraulic Reservoir Line
7— Front Service Brake Accumulator-to-Service Brake Valve Line

12. Remove frame articulation lock bar.

RK40399,0001124 -19-08DEC16-1/1

Active Elements

IMPORTANT: Avoid machine damage. Do not reuse drive shaft universal joint cap screws.

40. Install park brake on machine. See Park Brake Remove and Install. (Group 1111.)

NS73742,0000009 -19-24OCT17-5/5

1— Nut (2 used)
2— BHKO/RTC Position Sensor
3— Cap Screw
4— Cap Screw (2 used)
5— BHKO/RTC Position Sensor Bracket
6— Nut (5 used)
7— Washer (2 used)
8— Bushing
9— Spring
10— Actuator Arm
11— Washer (5 used)
12— BHKO/RTC Actuator Arm Bracket
13— Bushing
14— O-Ring (3 used)
15— Nut
16— Cam Follower
17— Cap Screw (2 used)
18— Retaining Clip
19— BHKO/RTC Position Sensor Support
20— O-Ring (2 used)

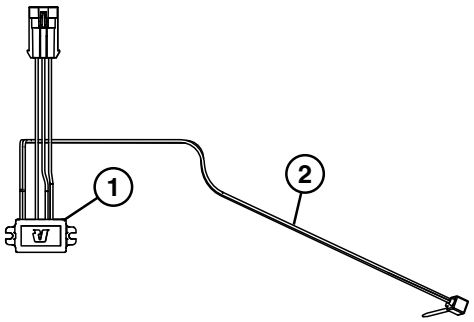
CAUTION: Prevent damage to BHKO/RTC position sensor when disassembling or assembling BHKO/RTC assembly. Do not over rotate BHKO/RTC position sensor.

1. Remove boom height kickout/return-to-carry assembly from machine. See Boom Height Kickout/Return-to-Carry (BHKO/RTC) Position Sensor Remove and Install. (Group 1600.)
2. Disassemble parts as shown.
3. Inspect parts and replace if necessary.

WS68074,0001BE4 -19-31JUL08-2/2

Freeze Control Switch Remove and Install

1. Remove heater/evaporator coil top cover. See Heater/Evaporator Coil Remove and Install. (Group 1830.)
2. Remove probe (2) of freeze control switch (1) from heater/evaporator coil.
3. Disconnect wire leads from freeze control switch and remove switch from cover.
4. Test freeze control switch. See Freeze Control Switch Test. (Group 9031-25.)
5. Attach freeze control switch to heater/evaporator coil top cover.
6. Connect wire leads to freeze control switch.
7. Insert freeze control switch probe into heater/evaporator coil.



TX1029277 —UN—11SEP07

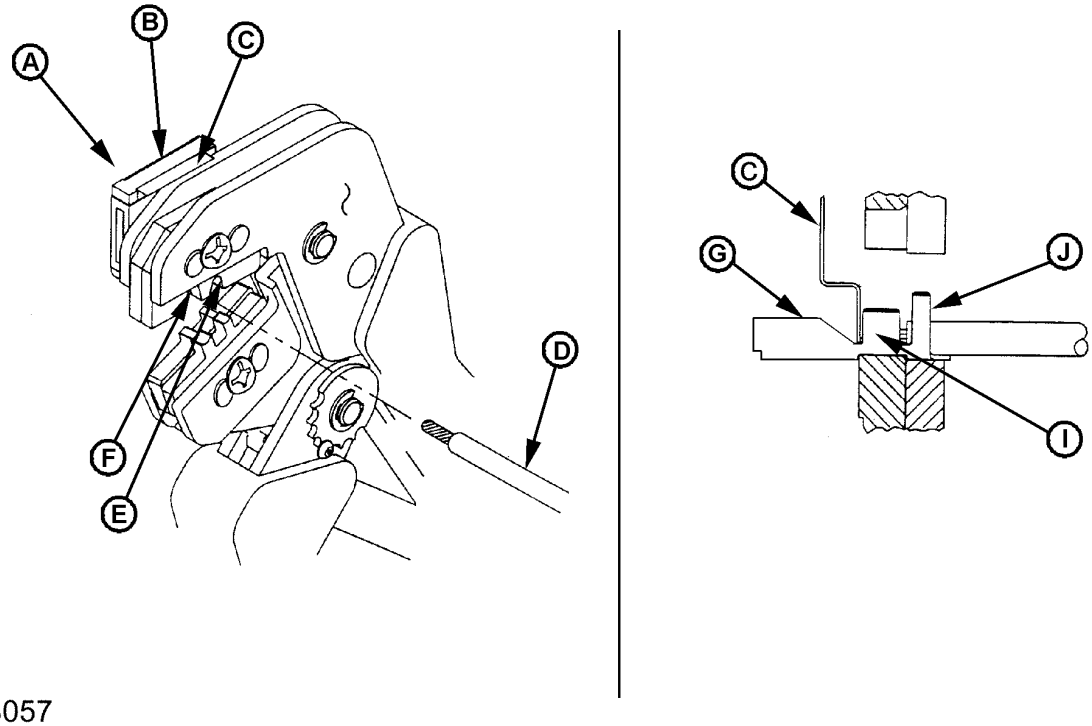
1— Freeze Control Switch **2— Probe**

8. Install heater/evaporator coil top cover. See Heater/Evaporator Coil Remove and Install. (Group 1830.)

TK40086,0000853 -19-12JAN11-1/1

Install Cinch™ Contact

ESSENTIAL TOOLS
JDG708 AMP® Crimper



T138057

T138057 —UN—14FEB01

Tool Position for Insertion

A—Top of Tool
B—Contact Support
C—Locator
D—Wire
E—Micro Timer Slot
F—Junior Timer Slot
G—Contact
I— Wire Tab
J— Insulation Tab

1. Hold JDG708 AMP® Crimper so that the tool is positioned as shown (left side of graphic). Squeeze crimper handles together and allow them to open fully.

IMPORTANT: Avoid damage to electrical connector and contacts. Do not attempt to crimp an improperly positioned contact. Make sure that both sides of the insulation barrel are started evenly into the crimping section.

2. Position the Cinch™ contact so that the mating end of the contact (G) is on the locator (C) side of the tool. Wire and insulation tabs (I and J) point to top of tool (A). Push wire tab (I) against the movable locator.
3. Hold the contact in position and squeeze crimper handles together until ratchet engages sufficiently to hold the contact in position. Do not deform wire and insulation tabs (I and J).
4. Insert stripped wire into contact insulation and wire tabs until it is against locator (C).
5. Hold the wire in place. Squeeze crimper handles together until ratchet releases. Allow crimper handles to open and remove crimped contact.
6. Install contact into connector. See Replace Cinch™ Connectors. (Group 1600.)

AMP is a trademark of Tyco Electronics
Cinch is a trademark of Cinch Inc.

TX,CINCH_INSTALL -19-11AUG16-1/1

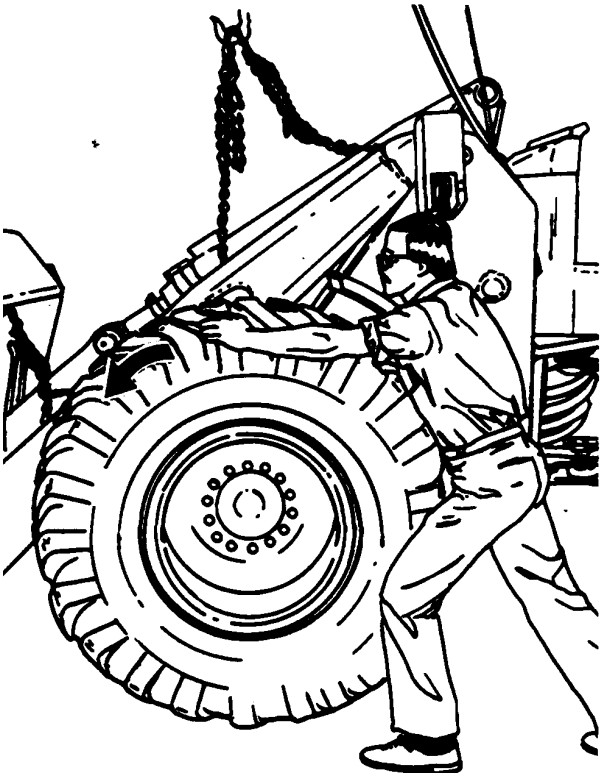
16. Slowly roll front loader frame, service jack, and overhead hoist forward and away from engine frame (6).
17. Inspect and replace parts as necessary.
18. Attach front loader frame to engine frame. Install upper pivot pin.
19. Install bushing and lower pivot pin.
20. Connect all hydraulic lines. For hydraulic line routing:
    - See Loader and Hydraulic Cooling Circuit Component Location. (Group 9025-105.)
    - See Ride Control, Pin Disconnect, and Hydraulic Filter Circuit Component Location. (Group 9025-10.)
    - See Service Brake, Park Brake, Differential Lock, and Axle Cooling Circuit Component Location. (Group 9025-10.)
21. Connect load center harness-to-loader frame harness 31-pin connector (X67). See Loader Frame Harness (W2) Component Location. (Group 9015-10.)

IMPORTANT: Avoid machine damage. Do not reuse drive shaft universal joint cap screws.

22. Install new drive shaft universal joint cap screws.

Specification	
Universal Joint Cap Screw—Torque	175 N·m 130 lb.-ft.

23. Connect steering cylinders. Install maximum number of washers between loader frame and steering cylinder rod end. Install equal number above and below rod end.
24. Remove vacuum or fill hydraulic reservoir. See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)



T777721 —UN—15APR13

Front Loader Frame

25. Turn battery disconnect switch to the ON position or install battery negative (-) cable.
26. Bleed service brakes. See Service Brake Bleeding Procedure. (Group 9020-20.)
27. Perform loader start-up procedure. See Loader Start-Up Procedure. (Group 3160.)

RK40399,0001109 -19-22APR14-2/2

Counterweights Remove and Install

SPECIFICATIONS	
Counterweight Housing Cover Weight (approximate)	23 kg 51 lb
Counterweight (3 and 6) Weight (approximate)	77 kg 170 lb
Counterweight (9) Weight (approximate)	405 kg 893 lb
Counterweight Cap Screw Torque	130 N·m 95 lb·ft

ESSENTIAL TOOLS
JT01748 Lifting Bracket

MACHINE PREPARATION

CAUTION: Avoid possible injury or death from machine roll over or tipping.

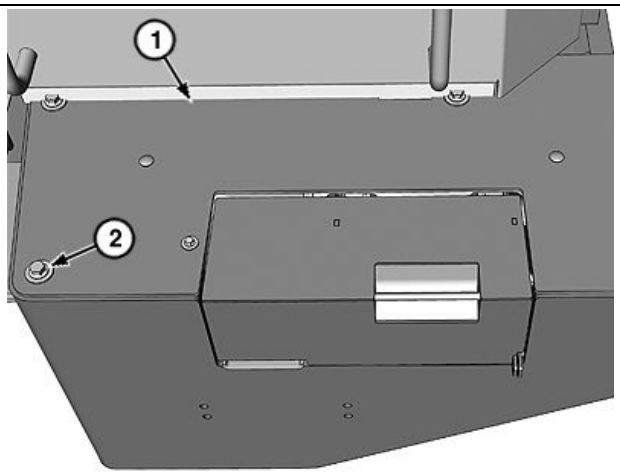
Loader is unbalanced without counterweight. If travel of loader is necessary, make sure the bucket is as close to the ground as possible, and never load the bucket when counterweights are removed.

1. Park and prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
2. Remove cooling package access doors. See Cooling Package Access Doors Remove and Install. (Group 1910.)
3. Remove fuel filler access door.
4. Remove right side counterweight housing access door.

REMOVAL

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

1. Attach appropriate lifting device to counterweight housing cover (1). Remove cap screws (2) and housing cover.



TX1152372A —UN—03FEB14

Counterweight Housing Cover (left side shown)

1— Counterweight Housing Cover
2— Cap Screw (5 used)

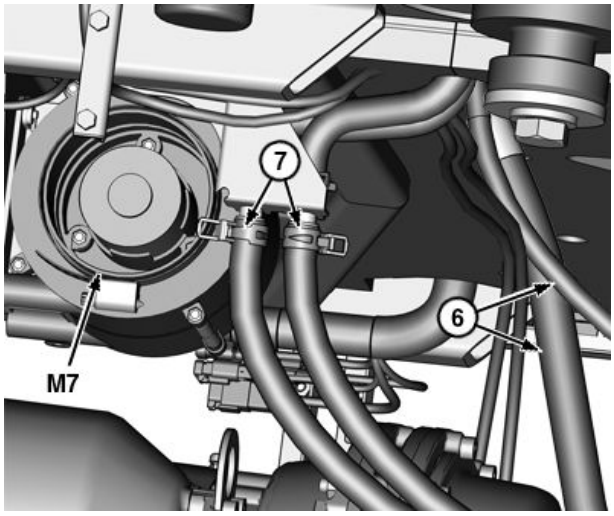
Specification	
Counterweight Housing Cover—Weight (approximate)	23 kg 51 lb

Continued on next page

SP66632,00054A2 -19-13MAY16-1/3

10. Disconnect air conditioning system lines (6).
11. Clamp off and disconnect heater hoses (7).
12. Disconnect precleaner blower motor (if equipped) (M7).

6— Air Conditioning System Line (2 used)
7— Heater Hose (2 used)
M7—Precleaner Blower Motor (if equipped)



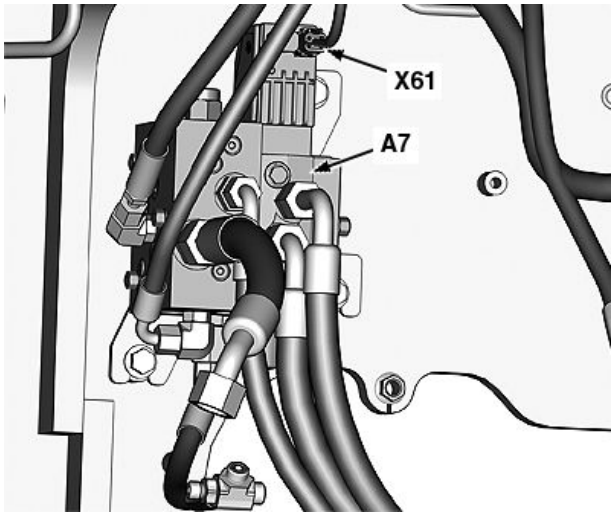
TX1151877A —UN—18MAR14

Left Side of Cab

SP66632,0004BD5 -19-12MAY16-6/9

13. Disconnect joystick steering valve (JSV) 4-pin connector (X61) from JSV (if equipped) (A7).
14. Disconnect front window washer hose from left front of cab.
15. Disconnect rear window washer hose from left rear of cab.

A7—Joystick Steering Valve (JSV) (if equipped)
X61— Joystick Steering Valve (JSV) 4-Pin Connector



TX1151878A —UN—31JAN14

Joystick Steering Valve (if equipped)

SP66632,0004BD5 -19-12MAY16-7/9

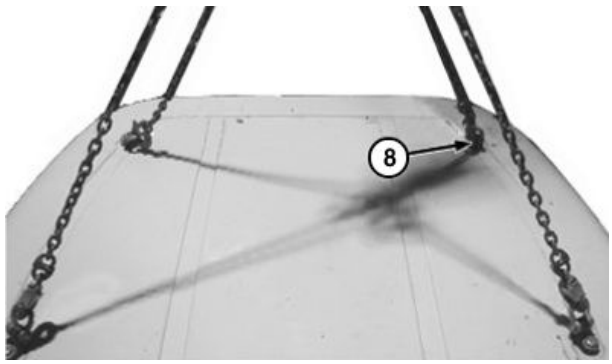
⚠ CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.

16. Attach appropriate lifting device to lifting brackets (8) on cab roof.

Specification

Cab—Weight (approximate)..... 875 kg 1930 lb

8— Lifting Bracket (4 used)



TX1154956A —UN—18MAR14

Cab Removal

Continued on next page

SP66632,0004BD5 -19-12MAY16-8/9

Steering Joystick Disassemble and Assemble

SPECIFICATIONS	
Hand Grip Cap Screw Torque	3.5 N·m 31 lb.-in.
Hand Grip Cap Screw Torque	3.5 N·m 31 lb.-in.
Three-Button Cap Screw Torque	0.5 N·m 4.40 lb.-in.

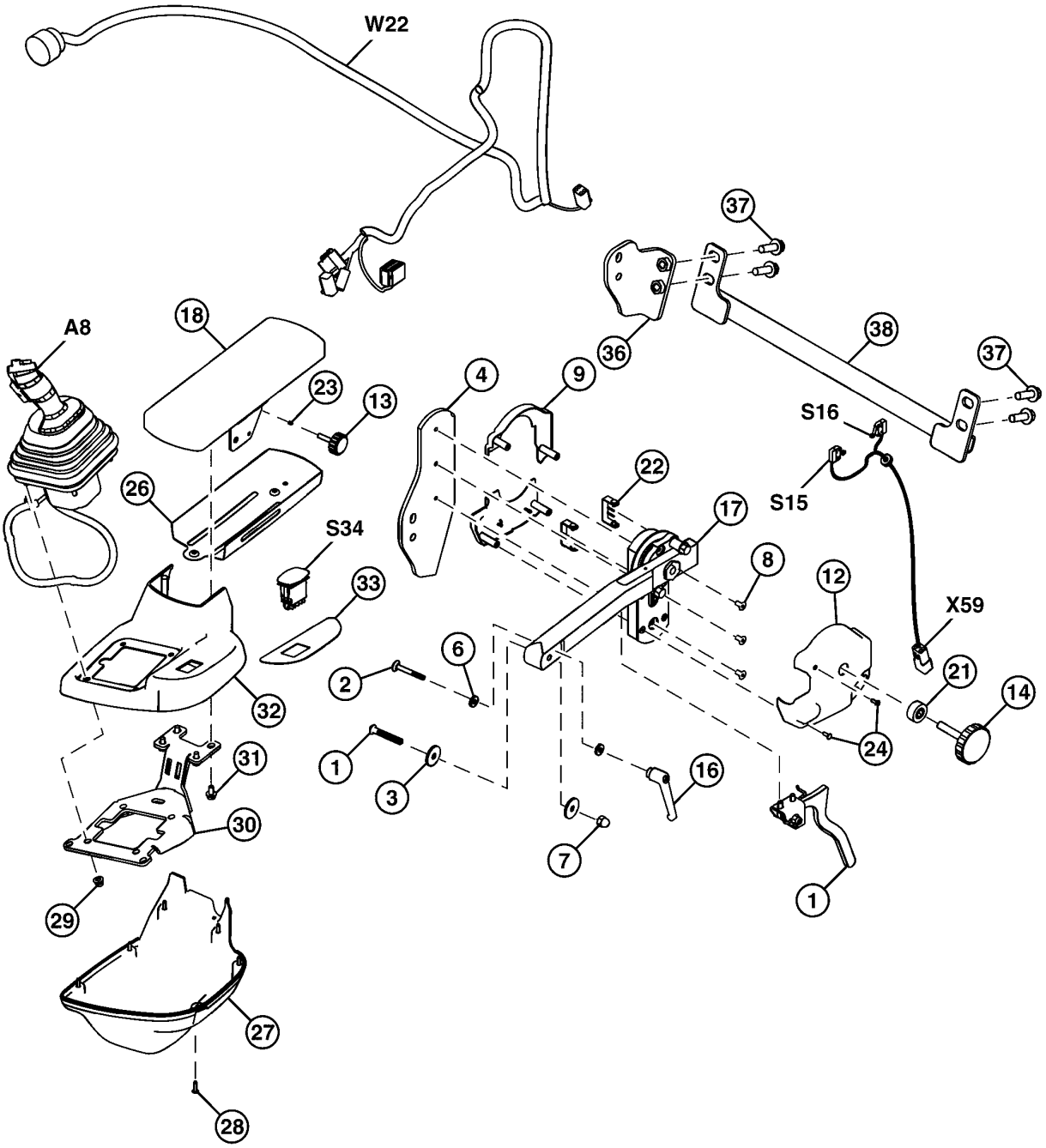
SERVICE EQUIPMENT AND TOOLS
JDG1383 DEUTSCH® Terminal Tool

OTHER MATERIAL
242 Loctite® Thread Lock and Sealer (Medium Strength)
7649 Loctite® Cure Primer

NOTE: The joystick controller is serviceable as individual components and parts. Hand grips, forward, neutral, and reverse (FNR) shifter switch, harness, three-button cap, three-button switch, and adaptor can be replaced as components. The joystick controller shown in this procedure has the FNR shifter switch and the electrohydraulic control unit.

Continued on next page

RK40399,0001154 -19-10APR14-1/17



TX1113418

Joystick Steering Armrest

TX1113418 —UN—08OCT14

Continued on next page

DI77374,0000E72 -19-08FEB16-2/3

R134a Refrigerant Recovery, Recycling, and Charging Station Installation Procedure

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

1. Handle refrigerant carefully. See Refrigerant Cautions and Proper Handling. (Group 1830.)
2. Park and prepare machine for service safely. See Park and Prepare for Service Safely. (Group 0001.)

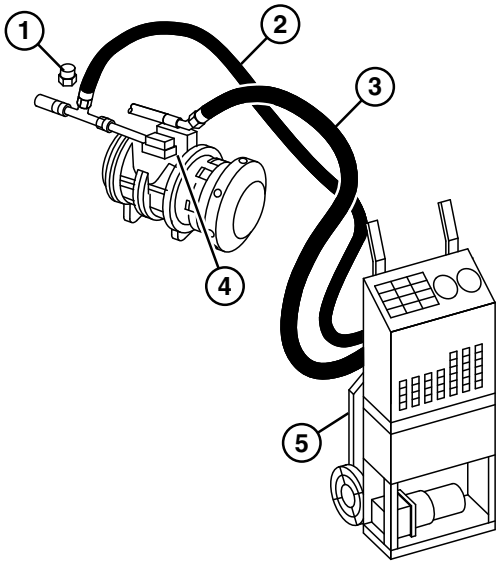
CAUTION: Prevent possible crushing injury from unexpected machine movement. Install articulation locking pin when machine is raised or when working in articulation joint area.

3. Install articulation locking pin. See Frame Locking Bar. (Operator's Manual.)

IMPORTANT: Prevent possible air conditioning system contamination. Use correct refrigerant recovery, recycling, and charging station. Do not mix refrigerant, hoses, fittings, components, or refrigerant oils.

CAUTION: Avoid possible injury. Do not remove high-pressure relief valve. Air conditioning system will discharge.

4. Close both high and low-pressure valves on refrigerant recovery, recycling, and charging station (5).
5. Remove caps (1) from test ports.



TX1153908 —UN—18FEB14

Refrigerant Recovery, Recycling, and Charging Station

1— Cap (2 used)
2— Low-Side Pressure (blue) Hose
3— High-Side Pressure (red) Hose
4— Air Conditioner Compressor
5— Refrigerant Recovery, Recycling, and Charging Station

6. Connect low-side pressure (blue) hose (2) from refrigerant recovery, recycling, and charging station to low-pressure test port on compressor.
7. Connect high-side pressure (red) hose (3) to high-pressure test port on compressor.
8. Follow manufacturer's instructions when using refrigerant recovery, recycling, and charging station.

TF19527,0002015 -19-16MAY16-1/1

Recover R134a Refrigerant

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

1. Handle refrigerant carefully. See R134a Refrigerant Cautions and Proper Handling. (Group 1830.)
2. Park and prepare machine for service safely. See Park and Prepare for Service Safely. (Group 0001.)
3. Run air conditioning system for 3 minutes to help in recovery process.
4. Turn air conditioning system off before proceeding with recovery steps.

CAUTION: Avoid possible injury from air conditioning system refrigerant. Do not remove high-pressure relief valve. Air conditioning system will discharge rapidly.

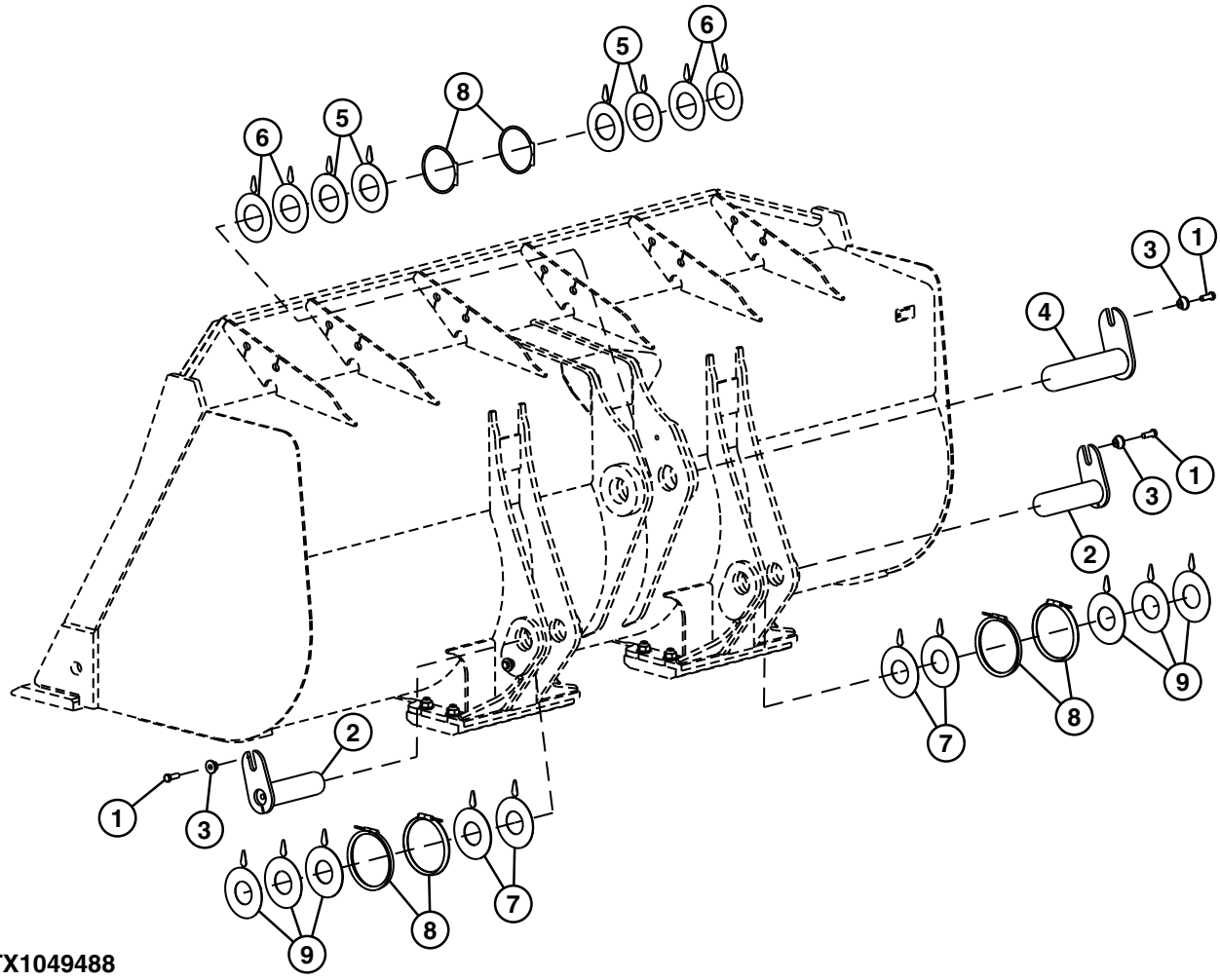
IMPORTANT: Prevent possible air conditioning system damage. Use correct refrigerant recovery, recycling, and charging stations. Do not mix refrigerant, hoses, fittings, components, or refrigerant oils.

5. With engine OFF, connect refrigerant recovery, recycling, and charging station. See R134a Refrigerant Recovery, Recycling, and Charging Station Installation Procedure. (Group 1830.)
6. Follow manufacturer's instructions when using refrigerant recovery, recycling, and charging station.

AS79221,0000598 -19-08DEC16-1/1

Section 19
Sheet Metal and Styling

Contents



Bucket with NeverGrease Pin Joint

1— Cap Screw (3 used)
2— Boom Pin (2 used)
3— Bushing (3 used)
4— Bucket Link Pin
5— Shims
6— Shims
7— Shims
8— Split Seal (6 used)
9— Shims

Bucket with NeverGrease ™ Pin Joints

IMPORTANT: NeverGrease™ Pin Joints have servicing requirements to follow to maintain a long life. Shimming is required in some applications. Some joints are more critical and will be specified when required. Alignment in the joint is critical to prevent premature wear. Cleanliness is also necessary for all joint components. Clean and burr free pins must be used when replacing. See NeverGrease™ Pin Joints. (Group 3140.)

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

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

NOTE: Keep shims in order during bucket removal to aid in installation procedure.

2. Remove cap screws (1), boom pins (2), and bucket link pin (4).

3. Align boom ends with bucket by centering in opening. Install equal shims (5, 6, and 9) on both outside clearances first. Then fill inside clearance with shims on both sides as required to meet specification. Use smaller (1 mm) shim to use as a gauge for checking maximum clearance specification. See NeverGrease™ Pin Joints. (Group 3140.)

Specification	
Boom End-to-Bucket—Clearance	1 mm (maximum) 0.04 in. (maximum)

NOTE: **DO NOT** *lubricate any joint components with NeverGrease™ Pin Joints.*

4. Install clean and burr free boom pins and tighten cap screws.

Continued on next page
RM58335,00012A5 -19-10JAN11-3/4

1— Cap Screw (2 used)
2— Pin (2 used)
3— Bucket Link
4— Bushing (2 used)
5— Bellcrank
6— Bushing (2 used)
7— Lubrication Fitting (3 used)
8— Bushing (2 used)
9— Shim (4 used)
10— Seal (2 used)
11— Seal (4 used)

SPECIFICATIONS	
Bucket Linkage Bushing Distance (below surface)	6.4 mm 0.25 in.
Bellcrank-to-Bucket Link Clearance (maximum)	3 mm 0.12 in.
Bellcrank-to-Bucket Clearance (maximum)	2 mm 0.08 in.
Bellcrank-to-Loader Boom Clearance (maximum)	3 mm 0.12 in.

SERVICE EQUIPMENT AND TOOLS
D01072AA Bushing, Bearing, and Seal Driver Set
D01013AA (100 Ton) Hydraulic Press
D01044AA Bushing, Bearing and Seal Driver Set

OTHER MATERIAL
PM37566 U.S. Silver-Grade Anti-SeizeNEVER-SEEZ® Lubricant

Bucket Tilt Linkage with Standard Bushing

1. Prepare machine for service. Park and Prepare for Service Safely. (Group 0001.)
2. Remove bushings (6 and 4) and seals (10 and 11) in bucket link (3) and bellcrank (5) using D01072AA Bushing, Bearing, and Seal Driver Set.
3. Clean and inspect parts. Replace parts as necessary.
4. Apply PM37566 Silver-Grade Anti-Seize Lubricant or equivalent to new bushings and bushing bores.
5. Install bellcrank and bucket link bushings below surface.

Specification

Bucket Linkage Bushing—Distance (below surface)..... 6.4 mm
0.25 in.

6. Install seals into bores against bushings.
7. Install shims (9) between bellcrank and bucket link to obtain maximum clearance.

Specification

Bellcrank-to-Bucket Link—Clearance (maximum)..... 3 mm
0.12 in.

8. Install shims between bellcrank and bucket to obtain maximum clearance.

Specification

Bellcrank-to-Bucket—Clearance (maximum)..... 2 mm
0.08 in.

9. Install shims between bellcrank and loader boom to obtain maximum clearance.

Specification

Bellcrank-to-Loader Boom—Clearance (maximum)..... 3 mm
0.12 in.

NEVER-SEEZ is a trademark of Bostik Findley, Inc.

Continued on next page

1— Cap Screw (5 used)
2— Cap Screw (6 used)
3— Shim (4 used)
4— Bucket Link
5— Bushing (2 used)
6— Bushing
7— Leveling Link
8— Bushing
9— Bushing (2 used)
10— Bellcrank
11— Pin (2 used)
12— Pin
13— Lubrication Fitting (4 used)
14— Retainer (2 used)
15— Pin (2 used)
16— Nut
17— 90° Elbow Fitting
18— Lubrication Fitting
20— Shim (10 used)
21— Bushing (5 used)
22— Safety Decal (2 used)
23— Hydraulic Hose
24— Guide Link (2 used)
25— Seal (2 used)
26— Seal (6 used)
27— Seal (4 used)
28— Shim (8 used)
29— Cap Screw (3 used)
30— Washer (3 used)
31— Retainer

SPECIFICATIONS	
Leveling Link Weight (approximate)	245 kg 540 lb
Powerllel™ Bucket Cylinder Weight	197 kg 434 lb.
Powerllel™ Bellcrank Weight (approximate)	162 kg 357 lb
Bellcrank-to-Bucket Link Clearance (maximum)	3 mm 0.12 in.
Bellcrank-to-Bucket Cylinder Clearance (maximum)	3 mm 0.12 in.
Bellcrank-to-Leveling Link Clearance (maximum)	3 mm 0.12 in.

OTHER MATERIAL
PM37566 U.S. Silver-Grade Anti-SeizeNEVER-SEEZ® Lubricant

Powerllel is a trademark of Deere & Company
NEVER-SEEZ is a trademark of Bostik Findley, Inc.

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

JH38101,0001CB7 -19-28MAR11-2/5

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

2. Support boom with 10-ton shop stands. Roll bucket forward until touching ground. If bucket is not attached to coupler, roll coupler forward and support with 10-ton shop stand.

T201101A —UN—15APR13

Boom Support

Continued on next page

JH38101,0001CB7 -19-28MAR11-3/5

Powerllel™ Bucket Link Remove and Install

SPECIFICATIONS	
Boom Raise Height	1041 mm 41 in.
Bellcrank Weight (approximate)	162 kg 357 lb
Powerllel™ Bucket Link Weight (approximate)	133 kg 294 lb
Powerllel™ Bucket Link Bushing Distance below outer face of link	9—11 mm 0.355—0.433 in.
Powerllel™ Bucket Link-to-Guide Links Clearance (maximum)	3 mm 0.12 in.
Powerllel™ Bucket Link-to-Coupler Clearance (maximum)	3 mm 0.12 in.
Powerllel™ Bucket Link-to-Bellcrank Clearance (maximum)	3 mm 0.12 in.

SERVICE EQUIPMENT AND TOOLS
Bushing, Bearing and Seal Driver Set

OTHER MATERIAL
PM37566 U.S. Silver-Grade Anti-SeizeNEVER-SEEZ® Lubricant
PM37566 U.S. Silver-Grade Anti-SeizeNEVER-SEEZ® Lubricant

Continued on next page

TF19527,0001BF7 -19-19APR12-1/5

6. Mark and record location and position of shims (20) between guide links (24), bucket link, and retainers (14).

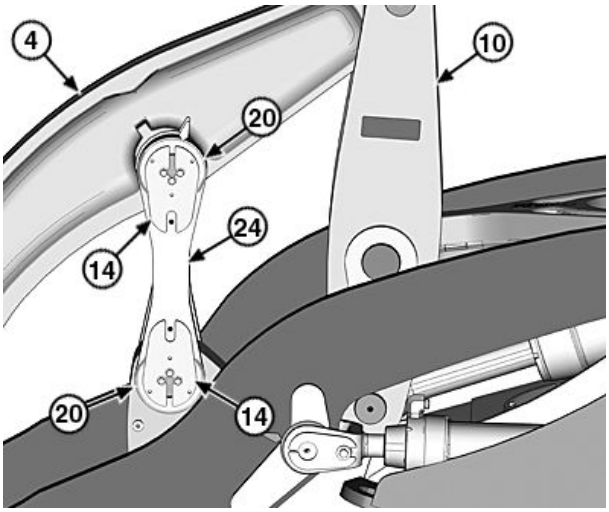
⚠ CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.

7. Support guide links with appropriate lifting device.

Specification	
Powerllel Guide Link—Weight (approximate)	49 kg 108 lb

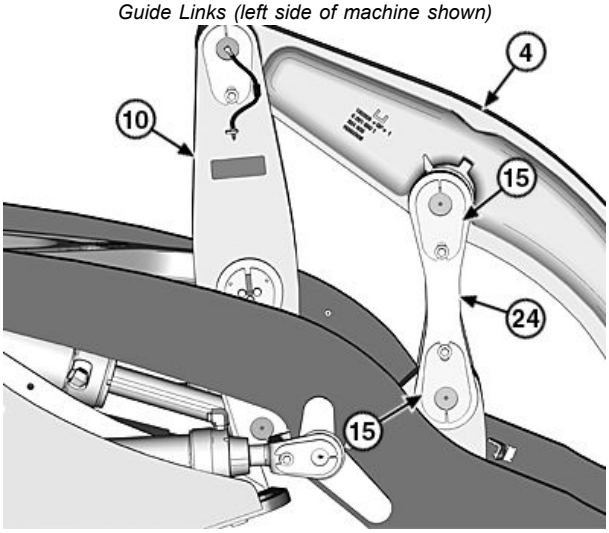
8. Remove retainers, pins (15) and guide links (24).
9. Apply PM37566 Silver-Grade Anti-Seize lubricant or an equivalent to bores of bucket link, loader boom, guide links, and corresponding pivot pins.

4— Bucket Link
10— Bellcrank
14— Retainer (2 used)
15— Pin (2 used)
20— Shims (as needed)
24— Guide Link (2 used)



TX1087214A —UN—21JAN11

Guide Links (left side of machine shown)

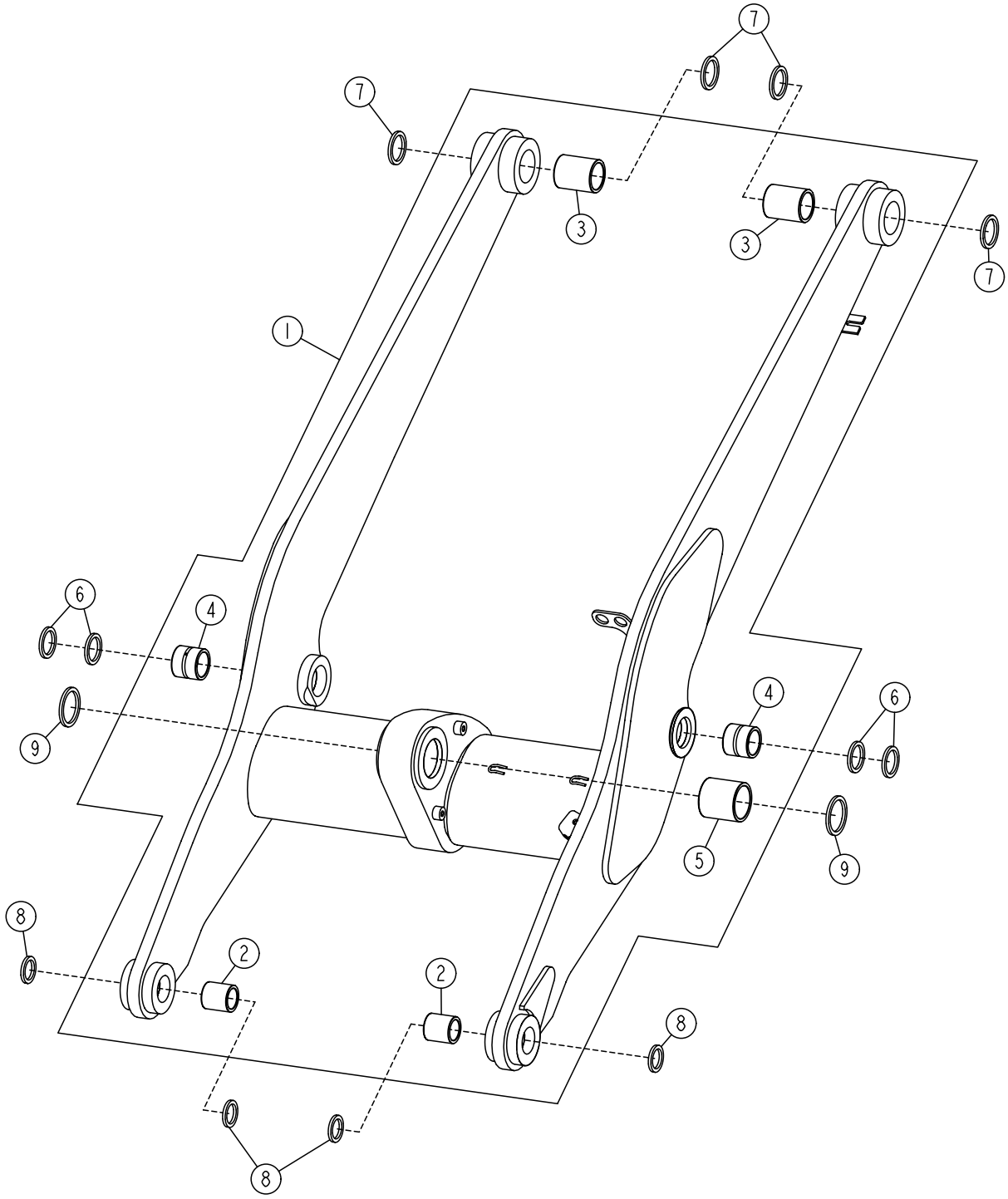


TX1087215A —UN—21JAN11

Guide Links (right side of machine shown)

Continued on next page

JH38101,0001CBB -19-24MAR11-7/8



T202014 —UN—03AUG04

T202014

Powerllel™ Loader Boom

1— Powerllel™ Loader Boom
2— Bushing
3— Bushing
4— Bushing
5— Bushing
6— Seal
7— Seal
8— Seal
9— Seal

Continued on next page

JH38101,0001CBD -19-29MAR11-4/5

Main Hydraulic Pump Remove and Install

SPECIFICATIONS	
Main Hydraulic Pump Weight (approximate)	91 kg 200 lb.
Mounting Cap Screw Torque	250 N·m 185 lb.-ft.

NOTE: Check main hydraulic pump flow before removing main hydraulic pump for repair. See Main Hydraulic Pump Flow Test. (Group 9025-25.) If main hydraulic pump does not meet test specifications it must be removed. Internal components of the main hydraulic pump rotating group are not serviceable individually. Entire rotating group must be serviced as an assembly.

Machine Preparation

- Prepare machine for service. See Park and Prepare for Service Safely. (Group 0001.)
- Turn battery disconnect switch to the OFF position.

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.

- Relieve hydraulic system pressure. See Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)
- Apply vacuum or drain hydraulic reservoir. See Vacuum Pump Installation. (Group 9025-25.) See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)
- Remove cab. See Cab Remove and Install. (Group 1800.)

Removal

1. Tag and disconnect hydraulic lines (1—5) from main hydraulic pump (6).

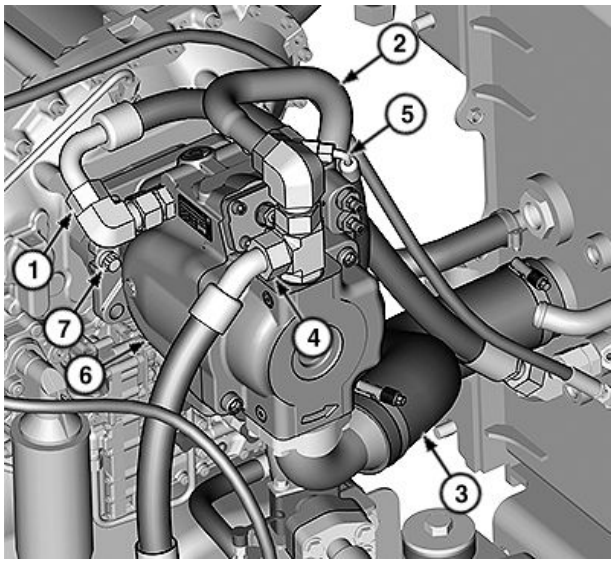
CAUTION: Prevent possible crushing injury due to heavy component. Use appropriate lifting device.

2. Remove cap screws (7) and main hydraulic pump.

Specification	
Main Hydraulic Pump—Weight (approximate)	91 kg 200 lb.

NOTE: Internal components of the main hydraulic pump rotating group are not serviceable individually. Entire rotating group must be serviced as an assembly.

3. Clean and inspect parts. Replace parts as necessary. See Main Hydraulic Pump Disassemble and Assemble. (Group 3160.)



TX1157926A —UN—15APR14

Main Hydraulic Pump

1— Main Hydraulic Pump-to-Hydraulic Reservoir Case Drain Line
2— Main Hydraulic Pump-to-Loader Control Valve Pressure Line
3— Hydraulic Reservoir-to-Main Hydraulic Pump Suction Line
4— Main Hydraulic Pump-to-Hydraulic Pump Manifold Line
5— Main Hydraulic Pump-to-Hydraulic Pump Manifold Load Sense Line
6— Main Hydraulic Pump
7— Cap Screw (4 used)

Installation

Installation is reverse of removal procedure.

- Tighten main hydraulic pump mounting cap screws to specification.

Specification	
Mounting Cap Screw—Torque	250 N·m 185 lb.-ft.

IMPORTANT: Prevent possible pump damage. Apply petroleum jelly to O-rings before installation.

- Install new O-rings.
- Perform loader start-up procedure. See Loader Start-Up Procedure. (Group 3160.)
- Perform main hydraulic pump control valve test and adjustment. See Main Hydraulic Pump Control Valve Test and Adjustment. (Group 9025-25.) See Load Sense Relief Valve Pressure Test and Adjustment. (Group 9025-25.)

JK05397,0000095 -19-15APR14-1/1

NOTE: Spool stroke adjusters are different lengths. Adjuster installed on port A side is longer.

7. Assemble and install spool stroke adjusters. Tighten spool stroke adjuster housings (11) to specification.

Specification

Spool Stroke Adjuster Housing—Torque ..... 19.8 N·m (175 lb·in)

NOTE: Spool stroke adjusters are factory set to full flow.

8. Loosen lock nuts and turn spool stroke adjuster screws (6) fully counterclockwise to set stroke adjusters to full flow. If setting other than full flow is required for auxiliary implement, stroke adjustment procedure has to be performed when machine is operational. See Auxiliary Valve Section—Stroke Adjustment. (Group 9025-20.)
9. Tighten spool stroke adjuster lock nuts to specification.

Specification

Spool Stroke Adjuster Lock Nut—Torque ..... 19.8 N·m (175 lb·in)

10. Install circuit relief with anticavitation valves (1 and 4) and tighten to specification.

Specification

Circuit Relief With Anticavitation Valve—Torque ..... 102 N·m (75 lb·ft)

11. Assemble and install load sense shuttle check valve (C1) (7). Tighten plug and load sense shuttle check valve (C1) housing (10) to specification.

Specification

Load Sense Shuttle Check Valve (C1) Plug—Torque ..... 5.1 N·m (45 lb·in)

Load Sense Shuttle Check Valve (C1) Housing —Torque ..... 102 N·m (75 lb·ft)

12. Install load sense shuttle check valve (C3) (2) and tighten to specification.

Specification

Load Sense Shuttle Check Valve (C3)—Torque ..... 4.0 N·m (35 lb·in)

13. Install pressure compensator (3) and tighten to specification.

Specification

Pressure Compensator—Torque ..... 102 N·m (75 lb·ft)

14. Install plugs.
15. Assemble loader control valve. See Loader Control Valve Disassemble and Assemble. (Group 3160.)

TF19527,0001C18 -19-20MAR17-2/2

Hydraulic Reservoir Remove and Install

SPECIFICATIONS	
Hydraulic Reservoir Capacity	105.2 L 27.8 gal.
Left Side Steps Weight (approximate)	41 kg 90 lb.
Hydraulic Tank Guard Weight (approximate)	59 kg 130 lb.
Hydraulic Reservoir Weight (approximate)	172 kg 380 lb.

Machine Preparation

- Prepare machine for service. 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.

- Relieve hydraulic system pressure. See Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)

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

- Remove left side steps and hydraulic reservoir guard (1, 2).

Specification

Left Side Steps—Weight (approximate)..... 41 kg
90 lb.

TX1156289A —UN—18MAR14

Steps and Hydraulic Reservoir Guard

1— Left Side Steps **2— Hydraulic Reservoir Guard**

Hydraulic Tank Guard—Weight (approximate)..... 59 kg
130 lb.

- Drain hydraulic reservoir. See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)

Specification

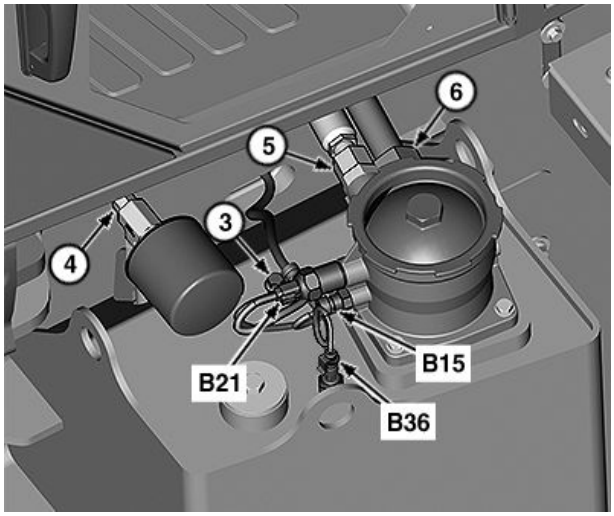
Hydraulic Reservoir—Capacity..... 105.2 L
27.8 gal.

JK05397,0000082 -19-02APR14-1/4

Removal

1. Remove cap screw (3) and disconnect sensors (B15, B21, B36).
2. Disconnect hydraulic lines (4—6). Close all openings using caps and plugs.

3— Cap Screw
4— Charge Air Cooler Tube-to-Hydraulic Reservoir Line
5— Hydraulic Cooler-to-Return Filter Line
6— Hydraulic Oil Return Line
B15— Hydraulic Oil Temperature Sensor
B21— Hydraulic Oil Filter Restriction Switch
B36— Hydraulic Reservoir Pressure Sensor



TX1156087A —UN—14MAR14

Hydraulic Reservoir Plumbing and Engine Frame Harness

Continued on next page

JK05397,0000082 -19-02APR14-2/4

Pilot Accumulator Remove and Install

Machine Preparation

- 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.

- Relieve hydraulic system pressure. Perform Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)
- Turn battery disconnect switch to the OFF position.

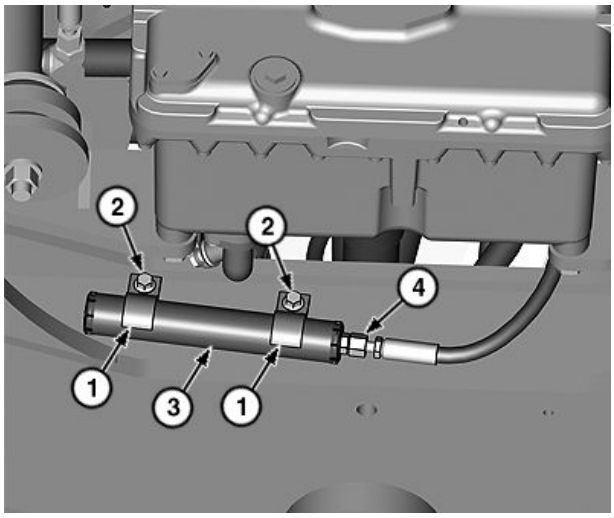
Removal

1. Remove bottom transmission guard.
2. Disconnect hydraulic line (4) from pilot accumulator (3). Close all openings using caps and plugs.
3. Remove cap screws (2), clamps (1), and pilot accumulator.

Installation

Installation is reverse of removal procedure.

NOTE: Accumulator (original equipment) is not serviceable. Replacement accumulator is shipped flat and precharged in the field. See Pilot Accumulator Gas Precharge Test. (Group 9025-25.)



TX1156661A —UN—24MAR14

Pilot Accumulator

1— Clamp (2 used)
2— Cap Screw (2 used)
3— Pilot Accumulator
4— Hydraulic Line

JK05397,000008F -19-22APR14-1/1

Hydraulic Fan Pump Remove and Install

SPECIFICATIONS	
Hydraulic Fan Pump Mounting Cap Screw Torque	88 N·m 65 lb.-ft.
Front Axle Circulation Pump Mounting Cap Screw Torque	88 N·m 65 lb.-ft.

Machine Preparation

- 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.

- Relieve hydraulic system pressure. See Hydraulic System Pressure and Accumulators Discharge. (Group 9025-25.)
- Turn battery disconnect switch to the OFF position.
- Apply vacuum or drain hydraulic reservoir. See Vacuum Pump Installation. (Group 9025-25.) See Drain, Flush, and Refill Hydraulic System Oil. (Operator's Manual.)

Removal

1. Remove cap screws (1 and 3) and remove mounting bracket (4) and front axle circulation pump (2).
2. Disconnect lines (5—8) from hydraulic fan pump (10). Close all openings using caps and plugs.
3. Remove cap screws (9) and hydraulic fan pump.
4. Repair or replace parts as necessary.

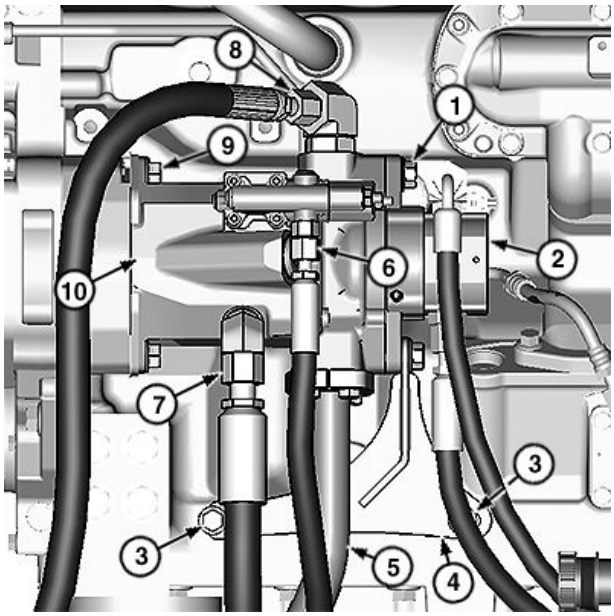
Installation

Installation is reverse of removal procedure.

- Tighten hydraulic fan pump mounting cap screws to specification.

Specification

Hydraulic Fan Pump Mounting Cap Screw—Torque.....88 N·m
65 lb.-ft.



TX1157693A —UN—15APR14

Front Axle Circulation Pump and Hydraulic Fan Pump

1— Cap Screw (2 used)
2— Front Axle Circulation Pump
3— Cap Screw (2 used)
4— Mounting Bracket
5— Hydraulic Fan Pump-to-Hydraulic Reservoir Line
6— Standard Fan Valve-to-Hydraulic Fan Pump Load Sense Line
7— Hydraulic Fan Pump Case Drain-to-Hydraulic Reservoir Line
8— Hydraulic Fan Pump-to-Standard Fan Valve Line
9— Cap Screw (2 used)
10— Hydraulic Fan Pump

- Tighten front axle circulation pump mounting cap screws to specification.

Specification

Front Axle Circulation Pump Mounting Cap Screw—Torque.....88 N·m
65 lb.-ft.

JK05397,0000097 -19-21APR14-1/1