

318D, 319D, 320D and 323D Skid Steer Loader Repair (EH Controls)

TECHNICAL MANUAL 318D, 319D, 320D and 323D Skid Steer Loader Repair (EH Controls)

TM11407 25APR12 (ENGLISH)

For complete service information also see:

318D and 320D Skid Steer Loader Operation and Test (EH Controls).....	TM11406
319D and 323D Skid Steer Loader Operation and Test (EH Controls).....	TM11422
318D and 320D Skid Steer Loader Operation and Test (Manual Controls)	TM11398
319D and 323D Skid Steer Loader Operation and Test (Manual Controls)	TM11414
318D, 319D, 320D and 323D Skid Steer Loader Repair (Manual Controls).....	TM11399
318D and 320D Skid Steer Loader Operator's Manual	OMT253020
319D and 323D Skid Steer Loader Operator's Manual	OMT253019
PowerTech E™ 2.4L and 3.0L Diesel Engines Component Technical Manual.....	CTM101019
120 Series Hydraulic Cylinders	CTM114319
Specifications Manual.....	SP458

**Worldwide Construction
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Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



DX,SPARKS -19-03MAR93-1/1

TS204—UN—23AUG88

Handle Chemical Products Safely

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)



DX,MSDS,NA -19-03MAR93-1/1

TS1132—UN—26NOV90

Dispose of Waste Properly

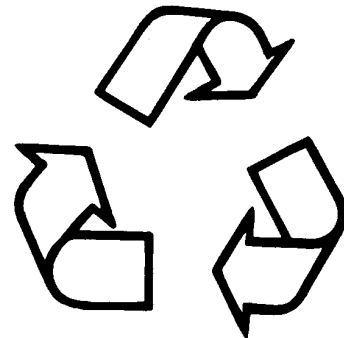
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



DX,DRAIN -19-03MAR93-1/1

TS1133—UN—26NOV90

Additional Metric Cap Screw Torque Values

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

Check tightness of cap screws periodically. Torque values listed are for general use only. Do not use these values if a different torque value or tightening procedure is listed for a specific application.

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

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

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

Tighten cap screws having lock nuts to approximately 50 percent of amount shown in chart.

METRIC CAP SCREW TORQUE VALUES ^a						
Nominal Dia	T-Bolt		H-Bolt		M-Bolt	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
8	29	21	20	15	10	7
10	63	46	45	33	20	15
12	108	80	88	65	34	25
14	176	130	137	101	54	40
16	265	195	206	152	78	58
18	392	289	294	217	118	87
20	539	398	392	289	167	125
22	735	542	539	398	216	159
24	931	687	686	506	274	202
27	1372	1012	1029	759	392	289
30	1911	1410	1421	1049	539	398
33	2548	1890	1911	1410	735	542
36	3136	2314	2401	1772	931	687

^aTorque tolerance is ±10%.

T6873AA



T6873AB



T6873AC



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T6873AB—UN—18OCT88

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Section 01 Wheels or Tracks

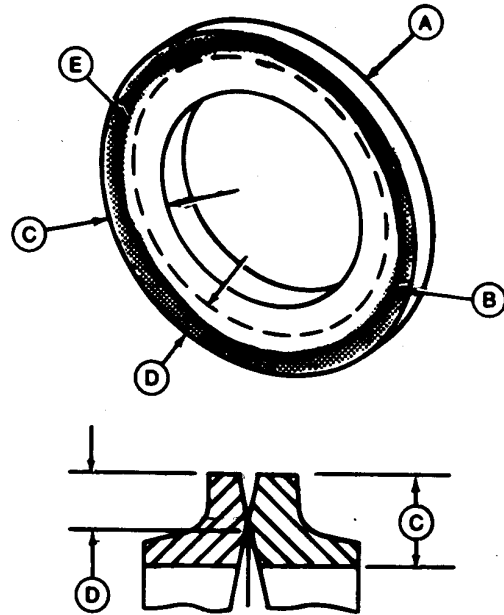
Contents

	Page
Group 0110—Powered Wheels and Fastenings	
Wheel Remove and Install.....	01-0110-1
Tire Remove and Install.....	01-0110-2
Group 0130—Track System	
Measure Rubber Track Height	01-0130-1
Track Remove and Install.....	01-0130-1
Track Roller Remove and Install	01-0130-3
Track Roller Disassemble and Assemble.....	01-0130-4
Test Track Roller for Leakage.....	01-0130-6
Inspect Metal Face Seals	01-0130-7
Drive Sprocket Remove and Install	01-0130-8
Front or Rear Idler Remove and Install	01-0130-9
Front or Rear Idler Disassemble and Assemble	01-0130-10
Test Front or Rear Idler for Leakage.....	01-0130-11
Front Idler Yoke Assembly Remove and Install (S.N. —192141)	01-0130-12
Front Idler Yoke Assembly Remove and Install (S.N. 192142—)	01-0130-13
Track Adjuster and Recoil Spring Assembly Remove and Install	01-0130-15
Track Adjuster Recoil Spring Remove and Install.....	01-0130-16
Track Adjuster Cylinder Disassemble and Assemble	01-0130-19

Inspect Metal Face Seals

- Inspect to see if seal ring (A) meets following conditions:
 - Narrow, highly polished sealing area (E) must be in outer half of seal ring face (D).
 - Sealing area must be uniform and concentric with ID and OD of seal ring (A).
 - Sealing area must not be chipped, nicked, or scratched.

A—Seal Ring
 B—Worn Area (shaded area)
 C—Seal Ring Face
 D—Outer Half of Seal Ring Face
 E—Sealing Area (dark line)

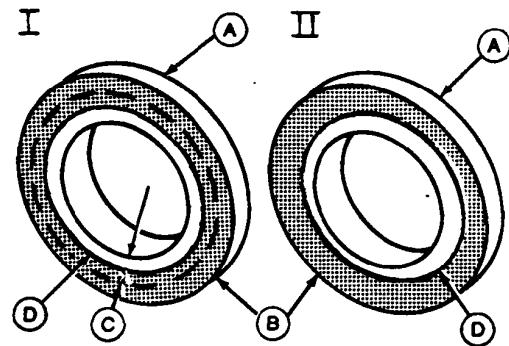


Seal Ring

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- Illustration shows examples of worn seal rings (A).
 - I—Sealing area (D) is in inner half of seal ring face (C).
 - II—Sealing area (D) is not concentric with ID and OD of seal ring.
- Clean reusable seals by removing all foreign material from seal rings, except seal face, using a scraper or a stiff bristled fiber brush.
- Wash seal rings and O-rings using a volatile, non-petroleum base solvent to remove all oil. Thoroughly dry parts using a lint-free tissue.
- Apply a thin film of oil to seal ring face. Put face of seal rings together and hold with tape.



Worn Seal Rings

A—Seal Ring
 B—Worn Area (shaded area)
 C—Inner Half of Seal Ring Face
 D—Sealing Area (dark line)

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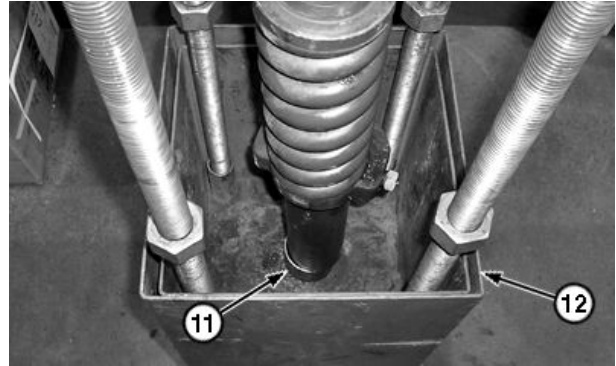
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Track System

- Place track adjuster and recoil spring assembly into ST4920 Track Recoil Spring Tool with cylinder end on spacer (11).
- Install DFT1087 Track Recoil Spring Disassembly and Assembly Guard Tool (12) to ST4920 Track Recoil Spring Tool. See DFT1087 Track Recoil Spring Disassembly and Assembly Guard Tool for instructions to make tool. (Group 9900.)

11— Spacer

12— DFT1087 Track Recoil
Spring Disassembly and
Assembly Guard Tool



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Group 0250

Axle Shaft, Bearings, and Reduction Gears

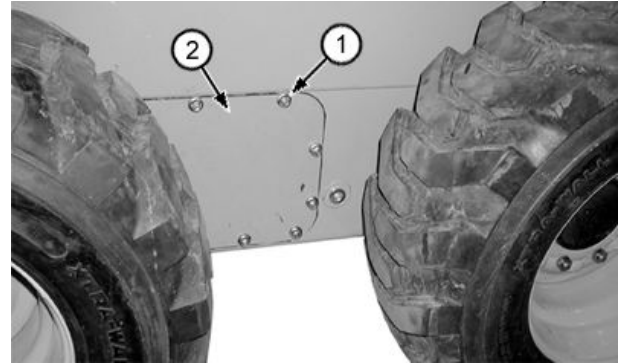
Chain Case Access Plate Remove and Install

1. Remove front attachment and park machine on flat level surface.
2. Drain chain case oil. [See Change Chain Case Oil.](#) (Operator's Manual.)
3. Remove access plate (2).
4. Clean and inspect parts.
5. Install access plate with gasket.

Specification

Chain Case Access Plate	
Nut—Torque.....	45 N·m 33 lb-ft

6. Fill chain case with oil. [See Change Chain Case Oil.](#) (Operator's Manual.)



Chain Case Access Plate

1— Nut (12 used)

2— Access Plate

T198871A —UN—11MAY04

TF44157,0000EA4 -19-04FEB10-1/1

Drive Chain and Sprocket Remove and Install

1. Remove front attachment and park machine on flat level surface.
2. Raise and block machine. [See Raising and Blocking Machine.](#) (Group 1740.)
3. Drain chain case oil. [See Change Chain Case Oil.](#) (Operator's Manual.)
4. Remove chain case access plate. [See Chain Case Access Plate Remove and Install.](#) (Group 0250.)
5. Remove axle housing for each drive chain being serviced. [See Axle Housing Remove and Install.](#) (Group 0201.)

NOTE: Remove rear axle housing and rear drive chain from drive sprocket before removing front drive chain.

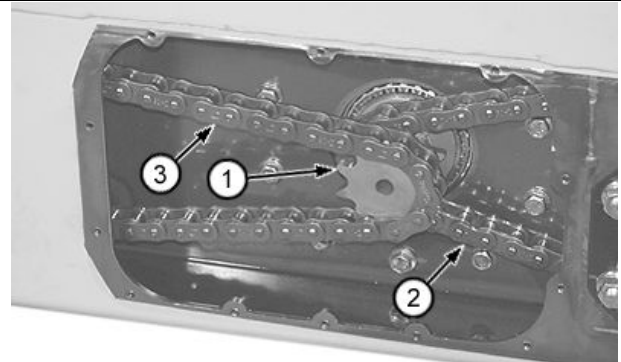
6. Slide rear axle sprocket forward. Remove rear drive chain (3) from drive sprocket (1) and rear axle sprocket.

NOTE: To remove rear axle sprocket, lift sprocket to top of chain case and pull bottom of sprocket out over lip of chain case.

7. Remove rear axle sprocket.
8. Slide front axle sprocket rearward. Remove front drive chain (2) from drive sprocket and front axle sprocket.

NOTE: If removal of front axle sprocket is necessary, hydrostatic motor must be removed. [See Hydrostatic Motor and Park Brake Remove and Install.](#) (Group 0360.)

9. Remove front axle sprocket.



Chain Case

1— Drive Sprocket
2— Front Drive Chain

3— Rear Drive Chain

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10. Clean and inspect parts. Repair or replace parts as necessary.

11. If removed, install front axle sprocket.

12. Install front drive chain.

13. Install rear axle sprocket and rear drive chain.

14. Install axle housing. [See Axle Housing Remove and Install.](#) (Group 0201.)

15. Install chain case access plate. [See Chain Case Access Plate Remove and Install.](#) (Group 0250.)

16. Fill chain case with oil. [See Change Chain Case Oil.](#) (Operator's Manual.)

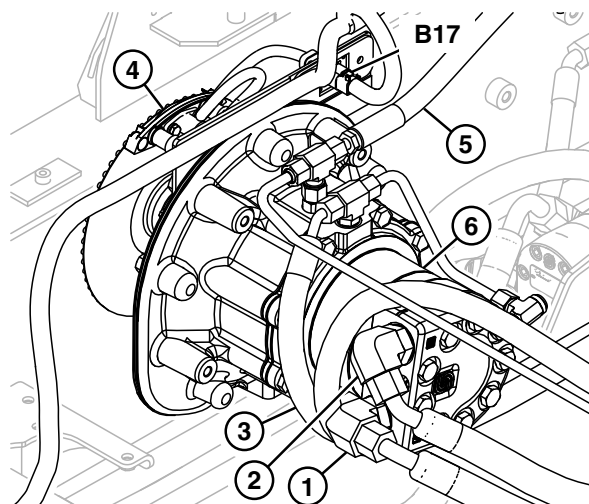
17. Lower machine to ground.

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Hydrostatic Motor and Park Brake Remove and Install

This procedure is used for wheeled machines.

1. Remove front attachment and park machine on flat level surface.
 2. Raise and block machine. See Raising and Blocking Machine. (Group 1740.)
 3. Raise operator's station. See Raising Operator's Station. (Group 1810.)
 4. Remove footwell. See Footwell Remove and Install. (Group 1910.)
 5. Tag and disconnect lines (1—3 and 5) from hydrostatic motor (6). Cap or plug all openings.
 6. Disconnect right motor speed sensor (B17).
 7. Remove wheels from side being serviced. See Wheel Remove and Install. Group 0110.)
 8. Drain chain case. See Change Chain Case Oil. (Operator's Manual.)
 9. Remove chain case access plate. See Chain Case Access Plate Remove and Install. (Group 0250.)
 10. Remove motor speed sensor. See Motor Speed Sensor Remove and Install. (Group 9015-20.)
- CAUTION: Prevent possible crushing injury from heavy component. Use appropriate lifting device.**
11. Remove front and rear axle housing with appropriate lifting device. See Axle Housing Remove and Install. (Group 0201.)



Hydrostatic Motor Lines

- | | |
|-----------------------------|-------------------------------|
| 1— Forward Hydrostatic Line | 5— Park Brake Release Line |
| 2— Reverse Hydrostatic Line | 6— Hydrostatic Motor |
| 3— Case Drain Line | B17— Right Motor Speed Sensor |
| 4— Motor Speed Sensor Disk | |

Specification

Axle Housing Assembly—Weight (approximate).....	33 kg
	72 lbs

Continued on next page

TF44157,0000EB9 -19-15SEP10-1/2

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50. Measure brake disks (1) and spacer plates (2) for thickness and flatness. Check brake disks for discoloration. If not to specification, replace with new.

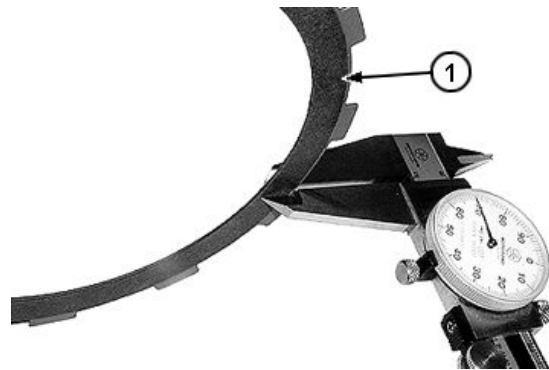
Specification

Brake Disk—Thickness	
(minimum).....	1.60 mm
	0.063 in.
Flatness (maximum).....	0.20 mm
	0.008 in.
Spacer Plate—Thickness	
(minimum).....	1.50 mm
	0.059 in.
Flatness (maximum).....	0.20 mm
	0.008 in.

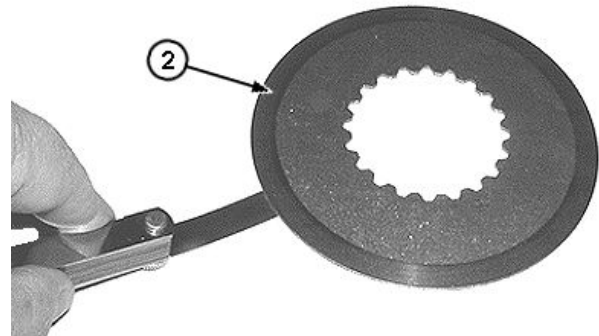
51. Apply petroleum jelly to seal lip. Install shaft seal into brake housing with lip facing brake pack.

1— Brake Disk

2— Spacer Plate



Measure Brake Disk



Measure Spacer Plate

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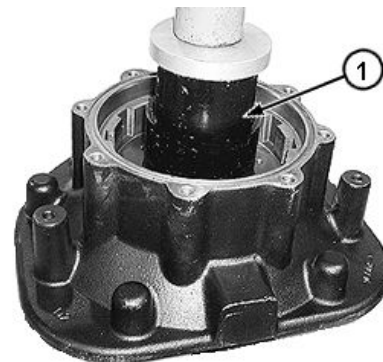
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T199214A —UN—15APR04

IMPORTANT: Press outer race of bearing assembly only. Pressing inner race of bearing or shaft damages bearing assembly.

52. Install drive shaft and bearing assembly (1) using a press.

1— Drive Shaft and Bearing Assembly



Install Drive Shaft Assembly

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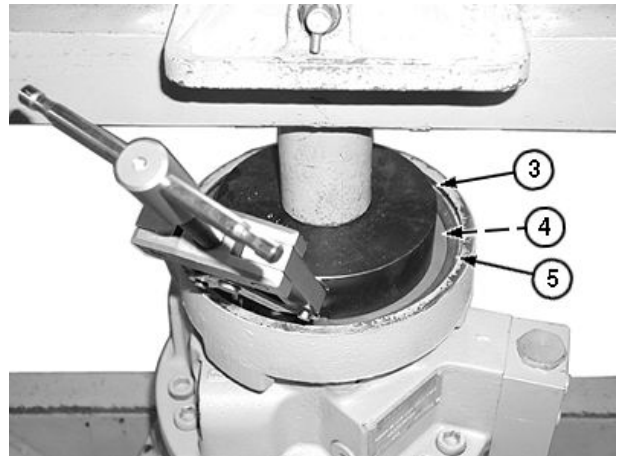
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Hydraulic System

- Using JDG1358 Spring Compressor (3), compress spring washer (4) until snap ring (5) can be removed.
- Remove snap ring.
- Note orientation of spring washer and remove from park brake housing.

3— JDG1358 Spring
Compressor
4— Spring Washer

5— Snap Ring



Park Brake Disassemble

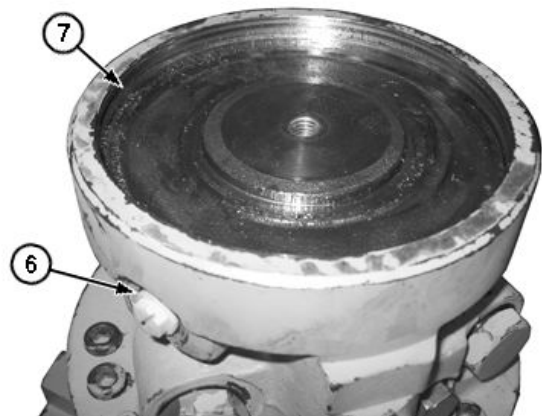
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TX1087648A —UN—09FEB11

- Remove plug from park brake port X (6) on hydrostatic motor and park brake assembly. Apply approximately 30 kPa (3 bar) (40 psi) air pressure to park brake port to remove piston (7).

6— Port X

7— Piston



Park Brake Disassemble

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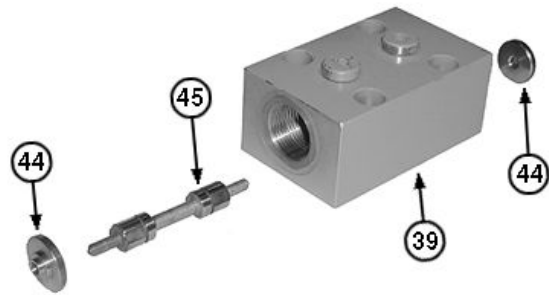
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TX1089368A —UN—11MAR11

Hydraulic System

- Place spool (45) in shuttle valve block (39). Install disks (44) with smooth sides facing spool.

39— Shuttle Valve Block 45— Spool
44— Disk (2 used)



Hydrostatic Motor Assemble

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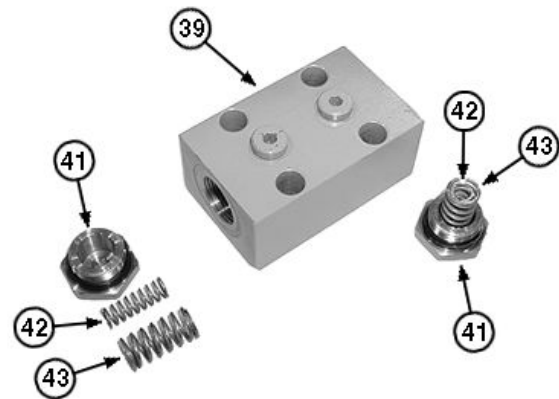
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- Install one spring (small diameter) (42) and one spring (large diameter) (43) in each end of shuttle valve block.
- Install plugs (41) with new seals and tighten to specification.

Specification

Shuttle Valve Block
Plug—Torque.....45 N·m
33 lb.-ft.

39— Shuttle Valve Block 42— Spring (small diameter) (2 used)
41— Plug (2 used) 43— Spring (large diameter) (2 used)



Hydrostatic Motor Assemble

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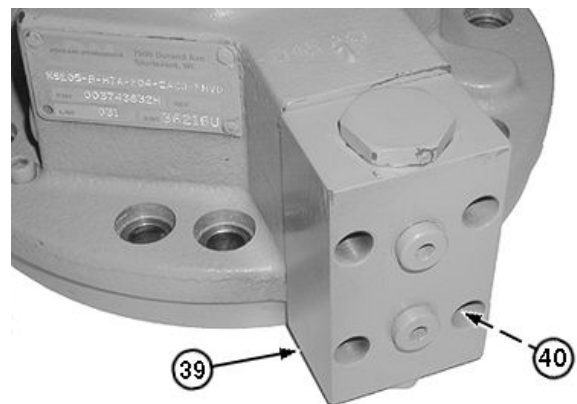
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- Install new O-rings to shuttle valve block and install block to distribution housing. Tighten cap screws (40) to specification.

Specification

Shuttle Valve Block Cap
Screws—Torque.....10 N·m
90 lb.-in.

39— Shuttle Valve Block 40— Cap Screw (4 used)



Hydrostatic Motor Assemble

Continued on next page

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TX1088322A—UN—18FEB11

Measuring Park Brake Piston Movement—Two Speed

This procedure is for wheeled machines with two speed motors.

1. Connect JT07192 Electric/Hydraulic Pump or other source of hydraulic pressure to port X (6) on the park brake housing.
2. Set up dial indicator to measure piston movement.
3. Apply pressure within specification to park brake housing.

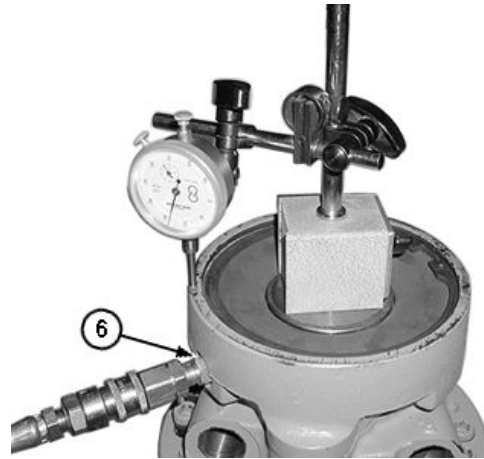
Specification

Park Brake Housing—Test Pressure.....	1700—3000 kPa 17—30 bar 246—435 psi
---------------------------------------	---

4. Measure piston movement and compare to specification.

Specification

Park Brake Piston Movement—Distance.....	0.62—1.32 mm 0.024—0.052 in.
--	---------------------------------



Measuring Park Brake Piston Movement

6— Port X

5. If piston movement is outside of specification, add or remove shims between piston and brake disks to achieve correct amount of movement.

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Hydrostatic Motor, Park Brake and Gearbox Repair

For tracked machines (S.N. —192141):

- See [Hydrostatic Motor, Park Brake and Gearbox Remove and Install \(S.N. —192141\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Disassemble \(S.N. —192141\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Assemble \(S.N. —192141\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Disassemble—Two Speed \(S.N. —192141\)](#). (Group 0360.)

- See [Hydrostatic Motor, Park Brake and Gearbox Assemble—Two Speed \(S.N. —192141\)](#). (Group 0360.)

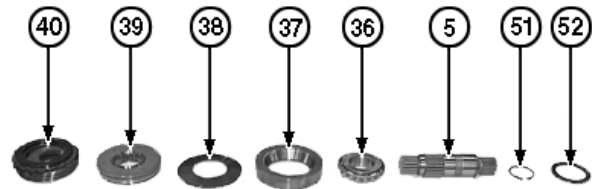
For tracked machines (S.N. 192142—):

- See [Hydrostatic Motor, Park Brake and Gearbox Remove and Install \(S.N. 192142—\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Disassemble \(S.N. 192142—\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Inspection \(S.N. 192142—\)](#). (Group 0360.)
- See [Hydrostatic Motor, Park Brake and Gearbox Assemble \(S.N. 192142—\)](#). (Group 0360.)

KK70125,0000761 -19-22OCT10-1/1

8. Install brake disc stack (40) into park brake housing.

IMPORTANT: Align brake disc splines with park brake drive shaft and sun gear with planet gears to prevent misalignment during assembly. Do not damage shaft seal when installing park brake drive shaft. Splines on shaft can damage seal during installation.



9. Install drive shaft (5) and align brake disc splines.

10. Install sun gear on drive shaft to align sun gear with planet gears.

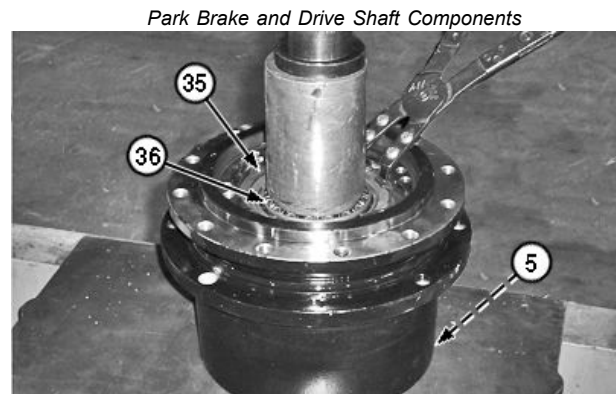
11. Install brake piston assembly (39) in park brake housing.

12. Install disc spring (38) concave side up.

13. Install bearing support ring (37). Gently tap in place with rubber hammer.

14. Install bearing (36) on drive shaft.

IMPORTANT: Apply only 2—4 tons of pressure to install snap ring. Applying more pressure can damage bearing.



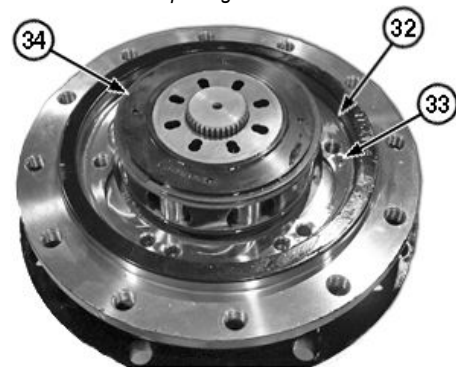
Park Brake and Drive Shaft Components

Snap Ring Installation

15. Using a press, seat bearing and install snap ring (35). Press on bearing with appropriate press disc to compress park brake assembly for snap ring installation.

16. Install bearing retainer snap ring (51) on drive shaft.

CAUTION: Avoid possible crushing or pinching injury. Support gearbox housing to prevent hydrostatic motor, park brake and gearbox from tipping over when filling with lubricant and installing gearbox end cover.



Cylinder Block

17. Set motor, park brake and gearbox on bench with gearbox up.

18. Fill gearbox with appropriate oil. See Hydrostatic Planetary Gearbox Oil. (Operator's Manual.)

19. Install gearbox end cover, snap ring and plugs.

20. Turn motor, park brake and gearbox back over (with gearbox end cover facing downward).

21. Install O-rings (32 and 33) in park brake housing.

22. Install cylinder block spacer (52) on bearing.

23. Install cylinder block (34) on drive shaft with timing face up.

- | | |
|--------------------|---------------------------|
| 5— Drive Shaft | 37— Bearing Support Ring |
| 32— O-Ring | 38— Disc Spring |
| 33— O-Ring | 39— Brake Piston Assembly |
| 34— Cylinder Block | 40— Brake Disc Stack |
| 35— Snap Ring | 51— Snap Ring |
| 36— Bearing | 52— Cylinder Block Spacer |

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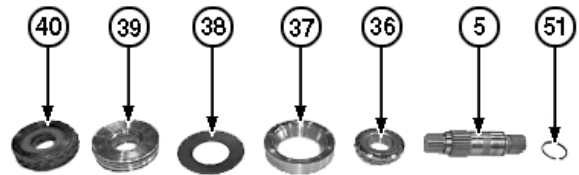
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T213788A—UN—30AUG05

T213791A—UN—30AUG05

8. Install brake disk stack (40) into park brake housing.

IMPORTANT: Align brake disk splines with park brake drive shaft and sun gear with planet gears to prevent misalignment during assembly. Do not damage shaft seal when installing park brake drive shaft. Splines on shaft can damage seal during installation.



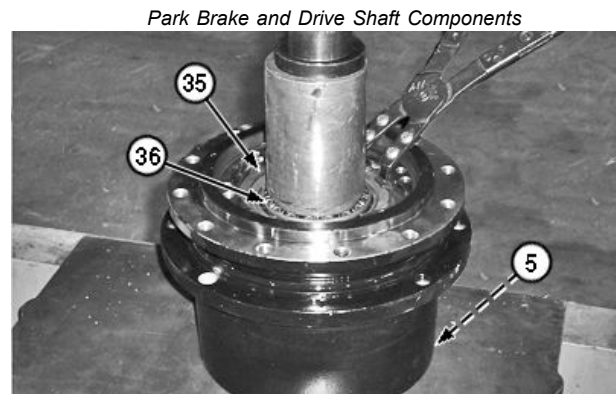
- 9. Install drive shaft (5) and align brake disk splines.
- 10. Install sun gear on drive shaft to align gear with planet gears.
- 11. Install brake piston assembly (39) in park brake housing.
- 12. Install disk spring (38) concave side up.
- 13. Install bearing support ring (37). Gently tap in place with rubber hammer.
- 14. Install bearing (36) on drive shaft.

IMPORTANT: Apply only 2—4 tons of pressure to install snap ring. Applying more pressure can damage bearing.

- 15. Using a press, seat bearing and install snap ring (35). Press on bearing with appropriate press disk to compress park brake assembly for snap ring installation.
- 16. Install bearing retainer snap ring (51) on drive shaft.

CAUTION: Avoid possible crushing or pinching injury. Support gearbox housing to prevent hydrostatic motor, park brake and gearbox from tipping over when filling with lubricant and installing gearbox end cover.

17. Set motor, park brake and gearbox on bench with gearbox up.



Park Brake and Drive Shaft Components

Snap Ring Installation

- | | |
|--------------------------|---------------------------|
| 5— Drive Shaft | 38— Disc Spring |
| 35— Snap Ring | 39— Brake Piston Assembly |
| 36— Bearing | 40— Brake Disk Stack |
| 37— Bearing Support Ring | 51— Snap Ring |

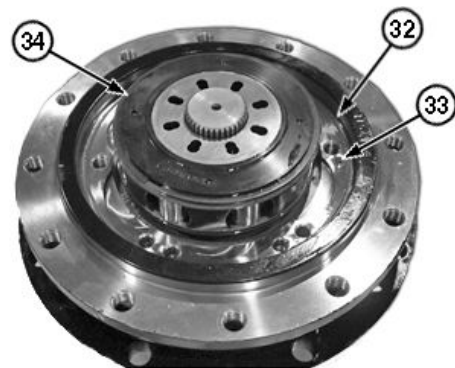
- 18. Fill gearbox with appropriate oil. [See Hydrostatic Planetary Gearbox Oil.](#) (Operator's Manual.)
- 19. Install gearbox end cover, snap ring and plugs.
- 20. Turn motor, park brake and gearbox back over (with gearbox end cover facing downward).

KK70125,0000766 -19-25OCT10-5/13

21. Install O-rings (32 and 33) in park brake housing.

22. Install cylinder block (34) on drive shaft with timing face up.

- | | |
|------------|--------------------|
| 32— O-Ring | 34— Cylinder Block |
| 33— O-Ring | |



Cylinder Block

Continued on next page

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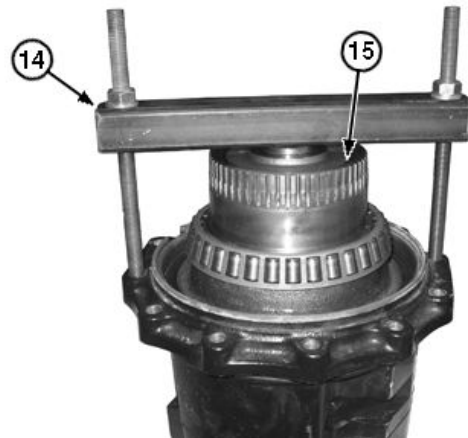
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Park Brake Disassemble

1. Remove gearbox housing and components as detailed in previous procedure.
2. Install DFT1335 Park Brake Spring Compressor (14) to motor spindle assembly. See [DFT1335 Park Brake Spring Compressor](#) for instructions on making this tool. (Group 9900.)
3. Tighten nuts on DFT1335 to compress park brake springs enough to remove snap ring (15).

14— DFT1335 Park Brake Spring Compressor

15— Snap Ring



Park Brake Disassemble

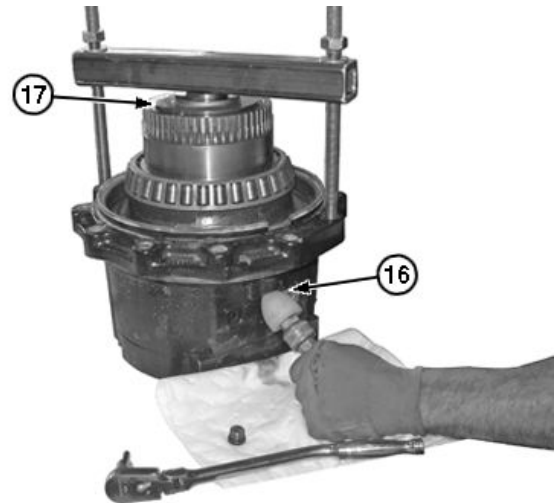
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4. Loosen nuts on DFT1335 and release spring tension, but do not remove tool from motor spindle assembly.
5. Remove plug from park brake port XB (16) on hydrostatic motor. Apply approximately 30 kPa (3 bar) (40 psi) air pressure to park brake port to remove spring retainer (17).

16— Park Brake Port XB

17— Spring Retainer



Park Brake Disassemble

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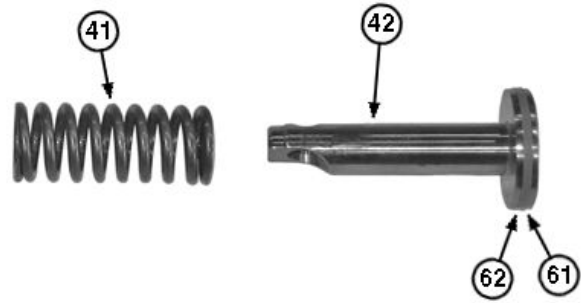
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Hydrostatic Motor, Park Brake and Gearbox Assemble (S.N. 192142—)

This procedure is used for tracked machines.

Hydrostatic Motor Assemble

1. Coat all parts with clean hydraulic oil prior to assembly.
2. Install new seal (61) and backup ring (62) on bias piston (42).
3. Lay motor spindle assembly on its side with access to both ends of assembly.



Bias Piston and Bias Spring

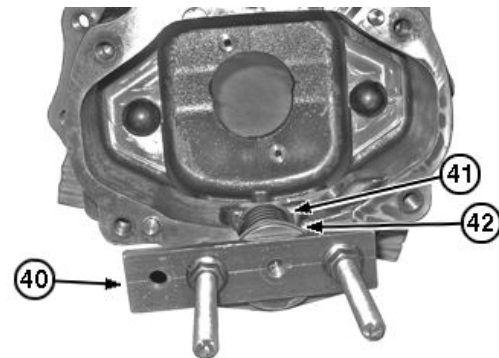
41— Bias Spring
42— Bias Piston

61— Seal
62— Backup Ring

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4. Install bias piston (42) and bias spring (41) in motor housing.
5. Install DFT1336 Bias Spring Compressor (40). See [DFT1336 Bias Spring Compressor](#) for instructions on making this tool. (Group 9900.)
6. Tighten nuts on DFT1336 to compress bias piston and bias spring. Compress bias spring approximately 8 mm (0.32 in.), or enough to allow installation of swash plate.



Hydrostatic Motor Assemble

40— DFT1336 Bias Spring Compressor
41— Bias Spring

42— Bias Piston

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Continued on next page

KK70125,0000769 -19-25OCT10-2/23

20. Rotate gearbox components using DFT1334 Gearbox Turning Tool (64). See [DFT1334 Gearbox Turning Tool](#) for instructions on making this tool. (Group 9900.)

Rotate gearbox in both directions. Gearbox components must rotate at a consistent speed without binding.

64— DFT1334 Gearbox Turning Tool



Rotate Gearbox

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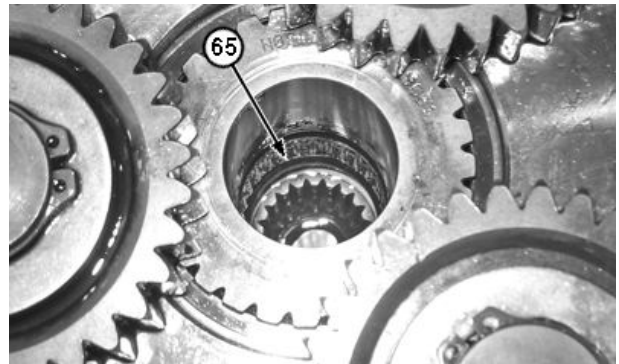
21. Lubricate shaft seal (65) in spring retainer in park brake housing.

IMPORTANT: Avoid damage to seal. Use care when installing input shaft in gearbox so shaft splines do not damage seal.

22. Carefully install input shaft (5) in gearbox, making sure to not damage shaft seal.
 23. Apply grease to thrust washer (28) and install on end cover (4).
 24. Install new O-ring (27) to end cover.

NOTE: Make sure at least one plug (1) is removed from gearbox housing to allow end cover to be installed. Otherwise, trapped air pressure in gearbox housing will prevent end cover from being installed.

25. Install end cover in gearbox housing. Install snap ring (2).
 26. Pressure test the gearbox housing to test for seal leakage. See [Gearbox Leakage Test \(S.N. 192142—\)](#). (Group 0360.)
 27. Fill gearbox housing with correct type and amount of oil. See [Hydrostatic Planetary Gear Case Oil](#). (Operator's Manual.)



Lubricate Shaft Seal

65— Shaft Seal

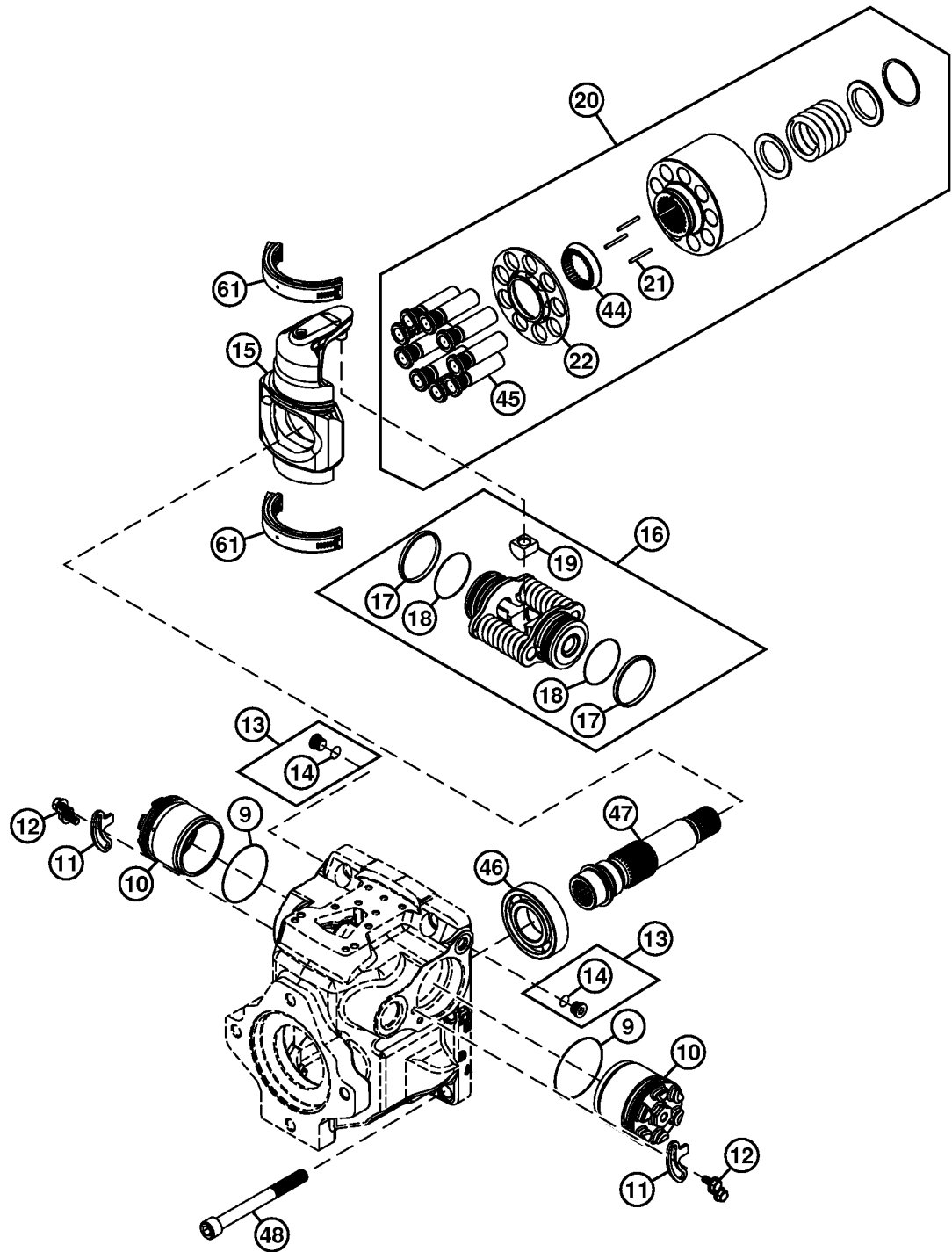
Specification

Gearbox	
Housing—Capacity.....	0.79 L 27.0 oz.

28. Install hydrostatic motor, park brake and gearbox in machine. See [Hydrostatic Motor, Park Brake and Gearbox Remove and Install \(S.N. 192142—\)](#). (Group 0360.)

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TX1034355

Hydrostatic Pump Section (right side pump shown)

Continued on next page

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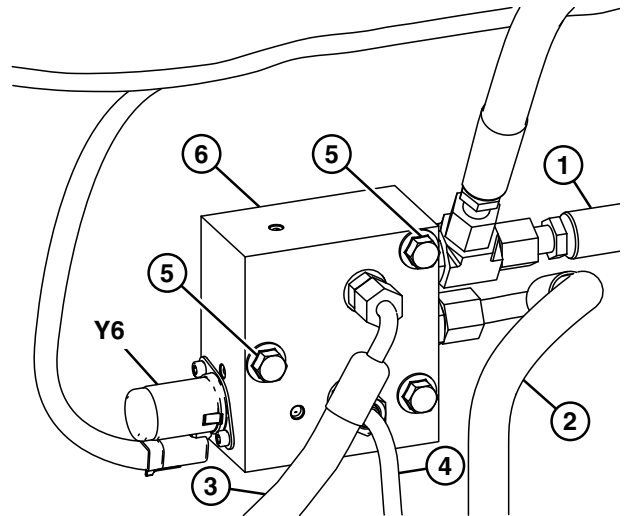
- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

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Hydrostatic Control Valve Remove and Install

The hydrostatic control valve is only used on the two speed option.

1. Remove front attachment and park machine on flat level surface.
2. Raise operator's station. See Raising Operator's Station. (Group 1810.)
3. Remove footwell. See Footwell Remove and Install. (Group 1910.)
4. Disconnect two speed solenoid (Y6).
5. Tag and disconnect lines (1—4). Cap or plug all openings.
6. Remove cap screws (5) and remove hydrostatic control valve (6).
7. Clean and inspect parts. Repair or replace parts as necessary.
8. Install hydrostatic control valve.
9. Connect lines.
10. Connect two speed solenoid.
11. Install footwell. See Footwell Remove and Install. (Group 1910.)



323D Hydrostatic Control Valve—Two Speed Shown

- | | |
|-------------------------|------------------------------|
| 1— Charge Pressure Line | 5— Cap Screw (2 used) |
| 2— Return Line | 6— Hydrostatic Control Valve |
| 3— Accumulator Line | Y6— Two Speed Solenoid |
| 4— Two Speed Line | |

12. Lower operator's station. See Raising Operator's Station. (Group 1810.)

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**Section 05
Engine Auxiliary System**

Contents

Page

Group 0510—Cooling Systems

Fan Remove and Install..... 05-0510-1
Charge Air Cooler Remove and
Install 05-0510-1
Radiator Remove and Install 05-0510-2
Cooling Package Remove and
Install 05-0510-3
Thermostat and Diffuser/Flow
Divider Remove and Install..... 05-0510-6

Group 0520—Intake System

Air Cleaner Remove and Install..... 05-0520-1

Group 0530—External Exhaust Systems

Muffler Remove and Install 05-0530-1

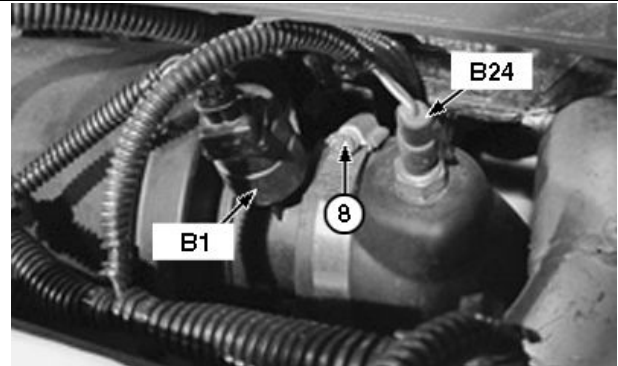
Group 0560—External Fuel Supply Systems

Fuel Tank Remove and Install 05-0560-1

Group 0520 Intake System

Air Cleaner Remove and Install

1. Remove front attachment and park machine on flat level surface.
2. Raise boom and engage boom lock.
3. Raise engine cover and remove side panels. See Side Panel Remove and Install. (Group 1910.)
4. Disconnect electrical connector from air filter restriction switch (B1) and ambient air temperature sensor (B24).
5. Unscrew and remove air filter restriction switch (B1).
6. Loosen hose clamp (8).



Air Cleaner Electrical Connectors

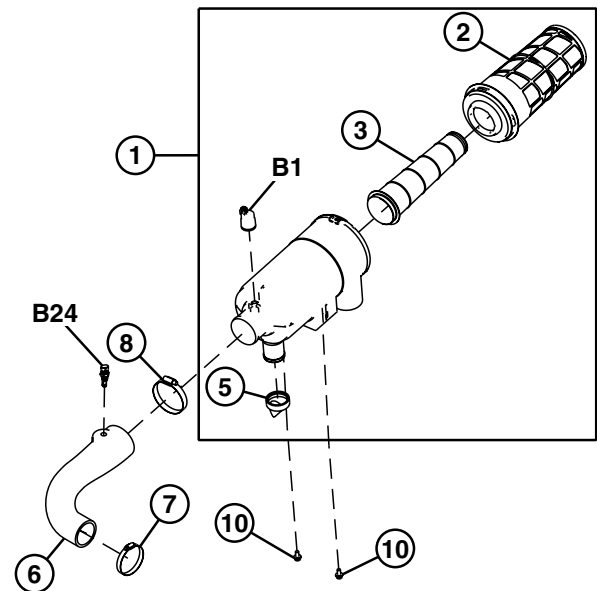
8— Hose Clamp
B1—Air Filter Restriction
Switch

B24— Ambient Air
Temperature Sensor

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7. Remove flange nuts (10) from underside of air cleaner.
8. Remove air cleaner (1).
9. Repair or replace as necessary.
10. Install air cleaner.
11. Install flange nuts.
12. Tighten hose clamp.
13. Install air filter restriction switch.
14. Connect air filter restriction switch electrical connector and ambient air temperature sensor electrical connector to harness.
15. Install side panels. See Side Panel Remove and Install. (Group 1910.) Lower engine cover.
16. Release boom lock and lower boom to ground.



Air Cleaner Assembly

1— Air Cleaner
2— Air Filter
3— Air Filter
5— Dust Cap
6— Hose

7— Clamp
8— Hose Clamp
10— Flange Nut (2 used)
B1— Air Filter Restriction
Switch
B24— Ambient Air
Temperature Sensor

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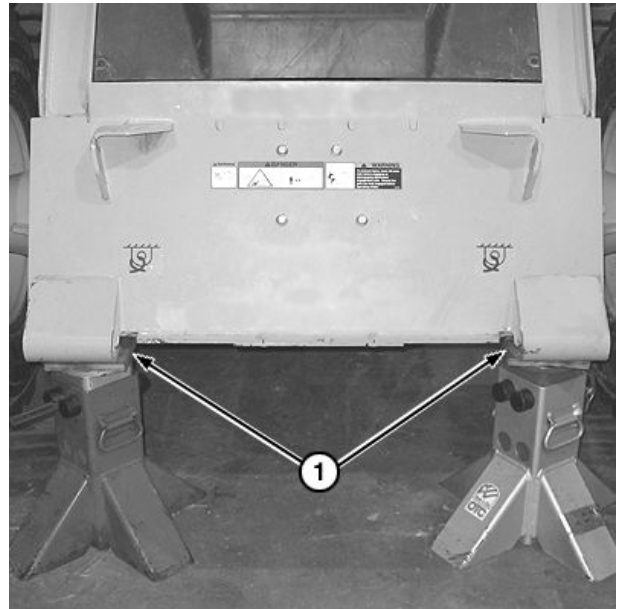
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Raising and Blocking Machine

1. Park machine.
2. Place safe lifting device under the front center of machine base and raise machine.
3. Place blocks/stands under the front corners (1) of machine base.
4. Lower machine onto blocks/stands.
5. Place safe lifting device under the rear center of machine base and raise machine.
6. Place blocks/stands under the rear corners (2) of machine base.
7. Lower machine onto blocks/stands.

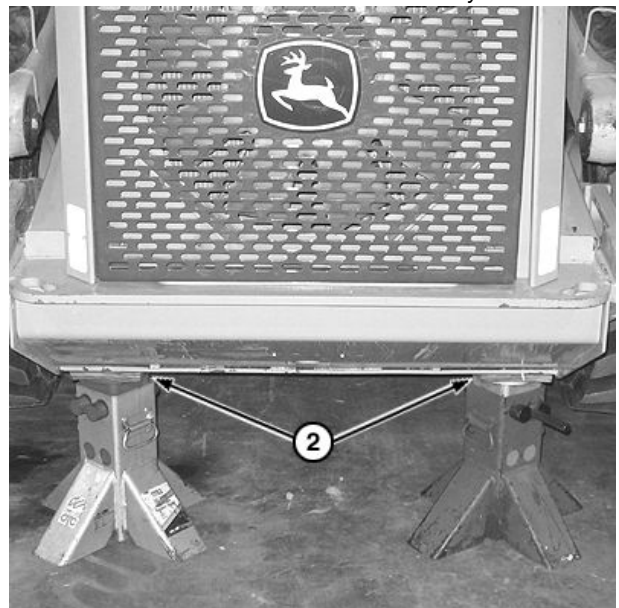
1— Front Corner

2— Rear Corner



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Boom Raised for Picture Clarity



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Top Window Remove and Install

Removable Top Window

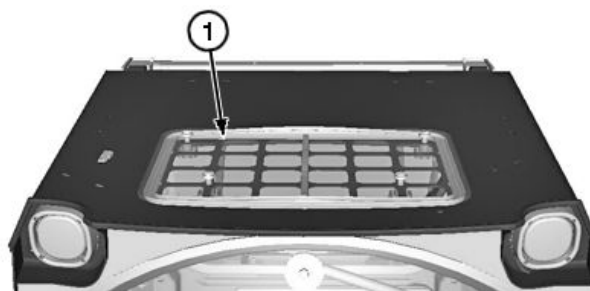
1. Remove knobs (2) from inside the cab.
2. Lift off top window (1) and gasket from outside the cab.
3. Repair or replace as necessary.
4. Apply 6 mm (1/4 in.) bead of silicone adhesive to gasket mounting surface on machine.
5. Install gasket and top window onto cab.
6. Install knobs and tighten.

1— Top Window

2— Knob (4 used)



Removable Top Window (view from inside)



Removable Top Window (view from outside)

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Seat Air Spring Remove and Install

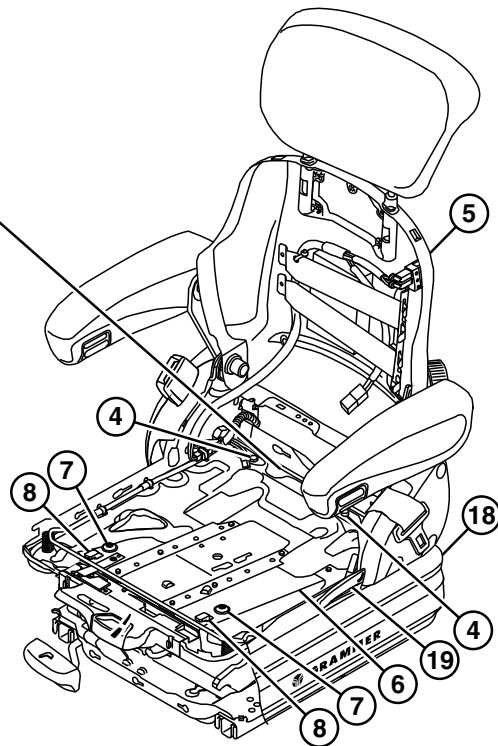
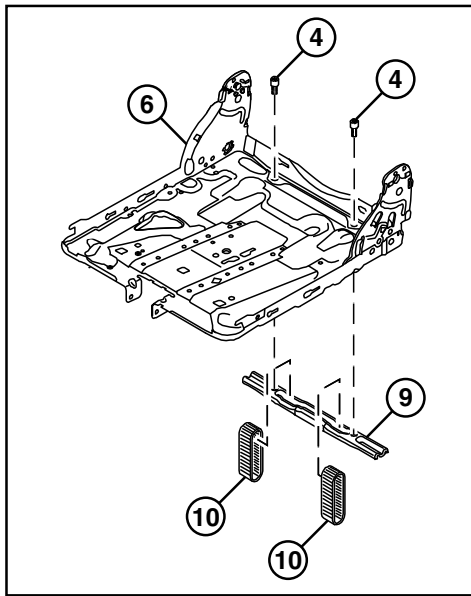
CAUTION: Prevent possible crushing injury from unexpected seat movement. Lower seat to lowest position before performing repair work.

CAUTION: Prevent possible injury from pressure in pneumatic system. Vent air from air spring before performing repair work.

1. Lower seat to lowest position to vent air from air spring.
2. Remove seat from machine. See Seat Remove and Install. (Group 1821.)

CAUTION: Prevent possible injury from unexpected backrest frame movement. When backrest cushion has been removed, the backrest frame must be supported before the backrest adjustment handle is operated.

3. Remove backrest cushion. Support backrest before removing seat cushion.
4. Remove seat cushion.



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Seat Assembly

- | | | |
|------------------------------|----------------------------|-------------------------------|
| 4—Socket Head Screw (2 used) | 7—Torx Head Screw (2 used) | 10—Strap (2 used) |
| 5—Backrest Frame | 8—Swivel Mount (2 used) | 18—Boot |
| 6—Seat Base Assembly | 9—Bracket | 19—Backrest Adjustment Handle |

5. Remove plastic fasteners from top of boot (18).
6. Push boot down and secure to lower part of seat suspension.
7. Remove weight indicator linkage rod from lower part of suspension.
8. On machines with short straps (10), remove socket head screws (4) and bracket (9).
9. Remove TORX® head screws (7).
10. Tilt seat base assembly (6) with backrest frame (5) backwards and lay assembly on floor.

TORX is a trademark of Camcar/Textron

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Evacuate R134a System

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

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

See Refrigerant Cautions and Proper Handling. (Group 1830.)

Do not remove high pressure relief valve (F). Air conditioning system will discharge rapidly causing possible injury.

IMPORTANT: Use correct refrigerant recovery, recycling and charging stations. **DO NOT** mix refrigerant, hoses, fittings, components or refrigerant oils.

Do not run compressor while evacuating.

1. Connect refrigerant recovery system. See R134a Refrigerant Recovery, Recycling and Charging Station Installation Procedure. (Group 1830.)
2. Open low and high pressure valves on refrigerant recovery, recycling and charging station.
3. Follow manufacturers' instructions and evacuate system.

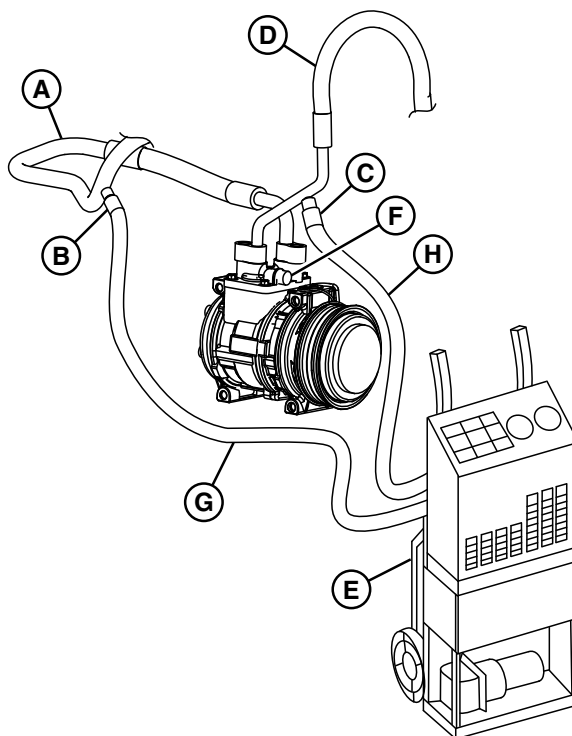
NOTE: The vacuum specifications listed are for sea level conditions. Subtract 3.4 kPa (34 mbar) (1 in. Hg) from 98 kPa (980 mbar) (29 in. Hg) for each 300 m (1000 ft) elevation above sea level.

4. Evacuate system until low pressure gauge registers specified vacuum.

If above specification vacuum cannot be obtained in 15 minutes, test the system for leaks.

- For wheeled machines, see Refrigerant Leak Testing. (Group 9031-25.)
- For tracked machines, see Refrigerant Leak Testing. (Group 9031-25.)

	Specification
Vacuum—Pressure at Sea Level.....	98 kPa 980 kPa 29 in. Hg
Vacuum—Pressure Above Sea Level.....	Subtract 3.4 kPa from 98 kPa for each 300 m elevation above sea level Subtract 34 mbar from 980 mbar for each 300 m elevation above seal level Subtract 1 in. Hg from 29 in. Hg for each 1000 ft elevation above sea level



R134a Refrigerant Recovery, Recycling and Charging Station

- | | |
|---------------------------------|---|
| A—Low Pressure Line | E—R134a Refrigerant Recovery/Recycling and Charging Station |
| B—Low Pressure Diagnostic Port | F—High Pressure Relief Valve |
| C—High Pressure Diagnostic Port | G—Blue Hose |
| D—High Pressure Line | H—Red Hose |

5. When vacuum reaches specified level, close low and high pressure valves. Turn vacuum pump off.
6. If vacuum decreases more than specified amount in 5 minutes, there is a leak in system.

Specification

Evacuate System—Vacuum.....	3.4 kPa 34 mbar 1 in. Hg
-----------------------------	--------------------------------

7. Repair leak.
8. Start to evacuate.
9. Open low and high pressure valves.
10. Evacuate system for 30 minutes after initial specified vacuum is reached.
11. Close low and high pressure valves. Stop evacuation.
12. See Charge R134a System. (Group 1830.)

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Section 19
Sheet Metal and Styling

Contents

Page

Group 1910—Hood or Engine Enclosure

Footwell Remove and Install	19-1910-1
Side Panel Remove and Install	19-1910-1
Engine Cover Remove and Install.....	19-1910-3

Section 21 Main Hydraulic System

Contents

	Page
Group 2160—Hydraulic System	
General Oil Cleanup Procedure	21-2160-1
Hydraulic/Hydrostatic Component Failure Cleanup Procedure.....	21-2160-4
Fan Drive Motor Remove and Install	21-2160-7
Fan Bypass Valve Remove and Install	21-2160-8
Hydraulic Oil Cooler Remove and Install	21-2160-9
Hydraulic Oil Reservoir Remove and Install	21-2160-10
Hydraulic Pump Remove and Install	21-2160-12
Hydraulic Pump Disassemble and Assemble	21-2160-13
High Flow Hydraulic Pump Remove and Install	21-2160-19
High Flow Valve Remove and Install	21-2160-21
High Flow Valve Disassemble and Assemble	21-2160-22

Hydraulic Oil Cooler Remove and Install

1. Remove front attachment and park machine on flat level surface.
2. Raise boom and engage boom lock.
3. Raise engine cover and remove right side panel. See Side Panel Remove and Install. (Group 1910.)
4. Remove cap screws (1) and move hydraulic oil filter assembly (3) out of way.
5. Pull vacuum on or drain hydraulic reservoir.
 - For 318D and 320D, see 318D and 320D Drain and Refill Capacities. (Operator's Manual.)
 - For 319D and 323D, see 319D and 323D Drain and Refill Capacities. (Operator's Manual.)

1— Cap Screw (2 used)
2— Bracket

3— Hydraulic Oil Filter
Assembly



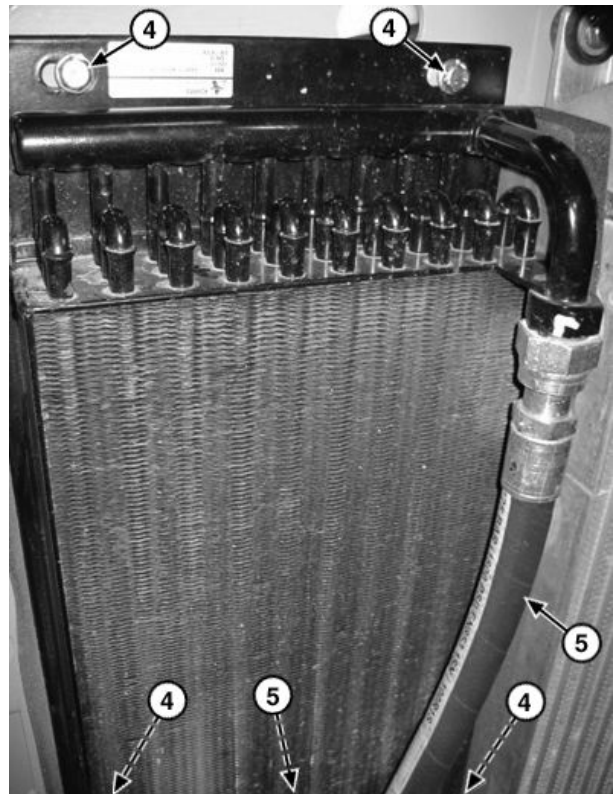
Hydraulic Oil Cooler

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IMPORTANT: Prevent hydraulic system contamination. Cap and plug port openings and hose ends.

6. Disconnect hydraulic hoses (5) from top and bottom of hydraulic oil cooler. Cap and plug all hoses and openings.
7. Remove cap screws (4) and hydraulic oil cooler from machine frame.
8. Repair or replace parts as necessary.
9. Install hydraulic oil cooler to machine frame.
10. Connect hydraulic hoses to hydraulic oil cooler.
11. Remove vacuum or fill hydraulic reservoir.
 - For 318D and 320D, see 318D and 320D Drain and Refill Capacities. (Operator's Manual.)
 - For 319D and 323D, see 319D and 323D Drain and Refill Capacities. (Operator's Manual.)
12. Install hydraulic oil filter assembly to machine frame.
13. Lower engine cover and install right side panel. See Side Panel Remove and Install. (Group 1910.)
14. Lower boom.
15. Check hydraulic oil level. For wheeled machines, see Check Hydraulic Reservoir Oil Level or for tracked machines, see Check Hydraulic Reservoir Oil Level. (Operator's Manual.)



Hydraulic Oil Cooler

4— Cap Screw (4 used)

5— Hydraulic Hose (2 used)

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High Flow Hydraulic Pump Remove and Install

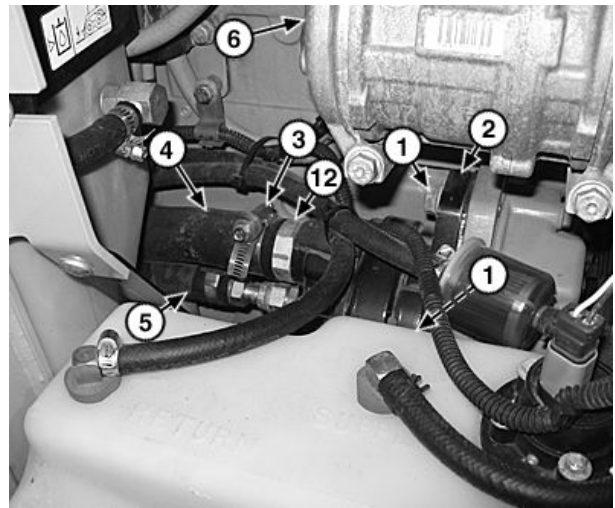
1. Park machine on flat level surface.
2. Raise boom and engage boom lock.

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.

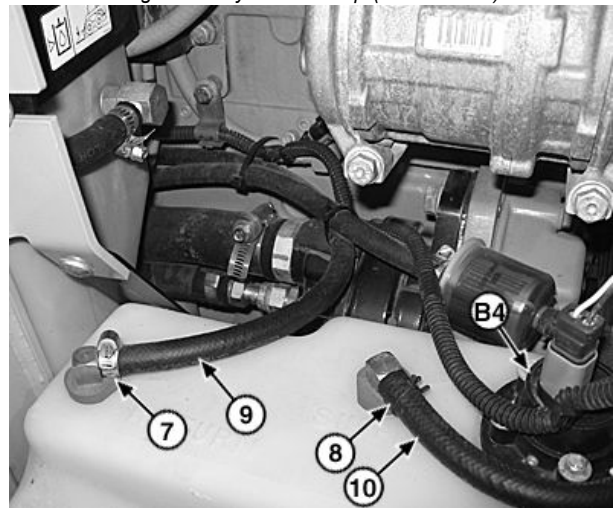
3. Relieve hydraulic system pressure. See [Hydraulic System Pressure Release](#). (Group 9025-25.)
4. Raise engine cover and remove left side panel. See [Side Panel Remove and Install](#). (Group 1910.)

NOTE: Air conditioning compressor lines **do not** need to be disconnected to remove high flow hydraulic pump.

5. Remove air conditioning compressor from mounting bracket, and move out of way.
6. Drain hydraulic reservoir below high flow suction hose (4). See [318D and 320D Drain and Refill Capacities](#). (Operator's Manual.) See [319D and 323D Drain and Refill Capacities](#). (Operator's Manual.)
7. Clamp fuel hoses (9 and 10) to prevent fuel leakage during removal.
8. Loosen hose clamps (7 and 8) and disconnect fuel hoses from 90° elbow fittings on fuel tank.
9. Disconnect wiring harness from fuel level sensor (B4).
10. Disconnect high flow suction hose from straight fitting (12) in high flow hydraulic pump (2).
11. Remove straight fitting from high flow hydraulic pump.
12. Disconnect high flow pressure hose (5) from straight fitting in high flow hydraulic pump. Cap and plug all hoses and openings.
13. Remove cap screws (1), high flow hydraulic pump, gaskets and gasket plate from engine auxiliary drive.



High Flow Hydraulic Pump (332D shown)



Fuel Tank (332D shown)

- | | |
|--------------------------------|-----------------------|
| 1— Cap Screw (2 used) | 7— Hose Clamp |
| 2— High Flow Hydraulic Pump | 8— Hose Clamp |
| 3— Hose Clamp | 9— Fuel Hose |
| 4— High Flow Suction Hose | 10— Fuel Hose |
| 5— High Flow Pressure Hose | 12— Straight Fitting |
| 6— Air Conditioning Compressor | B4— Fuel Level Sensor |

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Upper Boom Link Remove and Install

1. Remove front attachment and park machine on level surface.

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

2. Operate hydraulic controls to relieve system pressure. See Hydraulic System Pressure Release. (Group 9025-25.)
3. Support rear of boom with shop stands (3).

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

4. Attach lifting device to upper boom link crossmember.

Specification

Upper Boom	
Link—Weight.....	57 kg
	125 lb.



Rear Boom Support

3— Shop Stand (2 used)

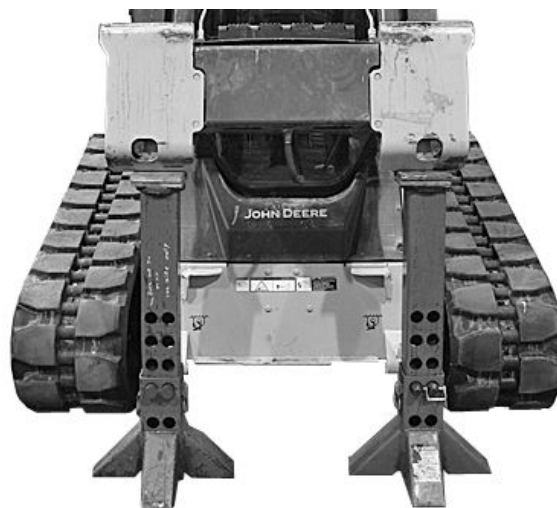
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Frame

20. Place shop stands under front of boom and lower boom onto front and rear shop stands.



Front Boom Support

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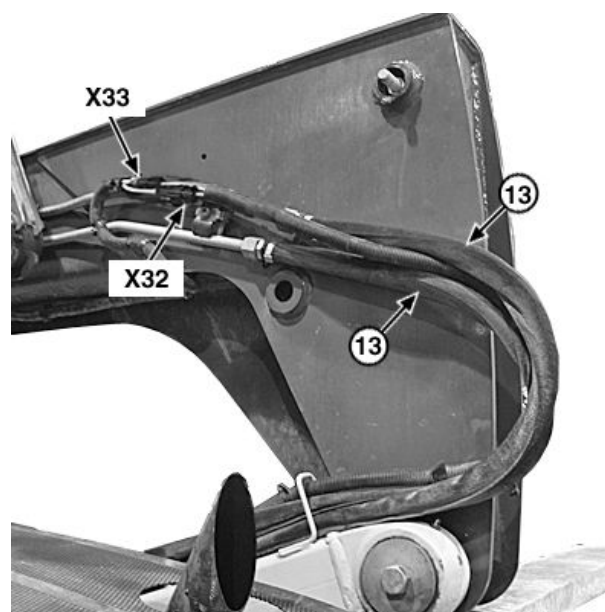
21. Clean area around hydraulic lines at rear of boom.
22. Cut tie bands and disconnect Quik-Tatch™ 1-pin connectors (X32 and X33) (if equipped) from rear of boom.

IMPORTANT: Prevent machine damage. Cap and plug all lines and openings to prevent hydraulic system contamination.

23. Mark and disconnect hydraulic lines (13) from both sides of boom. Cap and plug lines.
24. Remove lower boom link pin and cap screw from both sides of machine. [See Lower Boom Link Remove and Install.](#) (Group 3140.)

NOTE: Leave shop stands in place to aid in boom installation.

25. Carefully remove boom from machine.
26. Clean and inspect parts. Repair or replace parts as necessary.
27. Move boom into place and support boom on shop stands high enough to insert rear lower link pins and cap screws.
28. Install lower boom link with existing cap screws and pins. [See Lower Boom Link Remove and Install.](#) (Group 3140.)
29. Connect hydraulic lines to both sides of boom.
30. Connect Quik-Tatch™ 1-pin connectors (X32 and X33) (if equipped) to wiring harness connectors at rear of boom. Tie band wiring harness as necessary.



Rear of Boom (right side of machine shown)

13— Hydraulic Line (2 used)
X32— Quik-Tatch™ 1-Pin
Connector

X33— Quik-Tatch™ 1-Pin
Connector

31. Raise boom and remove shop stands and wood plank from front and rear of machine.

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RM58335.00006FD -19-01MAR10-9/10

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

22. Remove cap screws (18) and control valve from control valve mounting bracket (19).

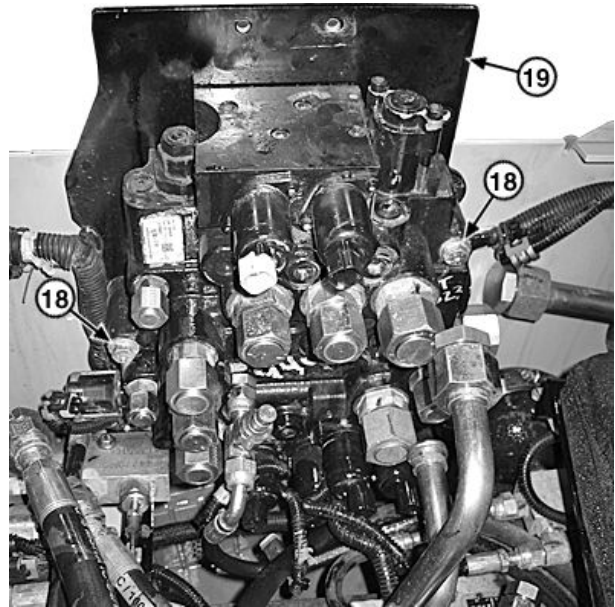
Specification

Control Valve—Weight
 (approximate)..... 29.5 kg
 65 lb.

23. Clean and inspect parts. Repair or replace parts as necessary. See Control Valve Disassemble and Assemble. (Group 3160.)

24. Install control valve to control valve mounting bracket.

18— Cap Screw (2 used) 19— Control Valve Mounting Bracket



Control Valve

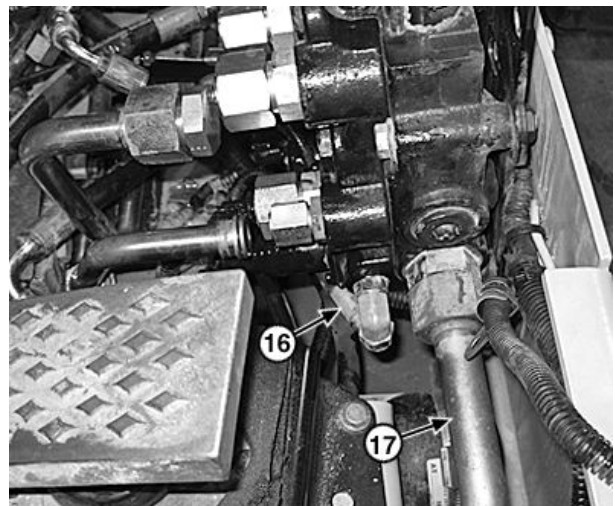
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25. Connect line (16) to 90° elbow fitting on control valve.

26. Connect line (17) to fitting on control valve.

16— Charge Oil Pilot Control Line 17— Hydraulic Oil Cooler Return Line



Control Valve

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NOTE: Plug (42) is under spring tension. Hold tension against plug during removal.

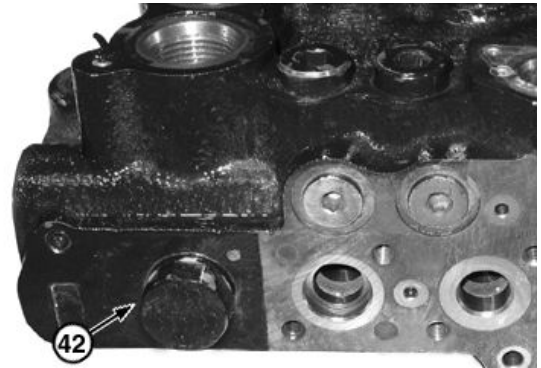
14. Remove plug from control valve.

NOTE: Close tolerances between control valve body and spool (44) may prevent easy removal of spool from plug end. Spool may be removed from control valve body after removing system relief valve (46) and plug (55). Remove spring (45) and gently tap on spool end to remove.

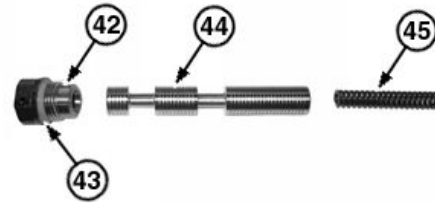
15. Remove spool and spring from control valve body.

42— Plug
43— O-Ring

44— Spool
45— Spring



Port Lock Spool Assembly



Port Lock Spool Assembly

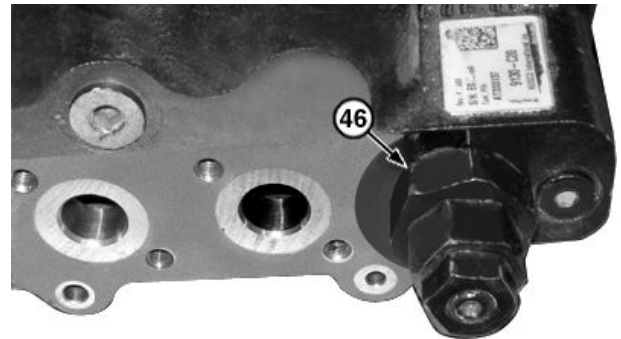
RM58335.0000680 -19-23FEB10-11/30

TX1037789A—UN—03MAR08

TX1037792A—UN—03MAR08

16. Remove system relief valve (46).

46— System Relief Valve



System Relief Valve

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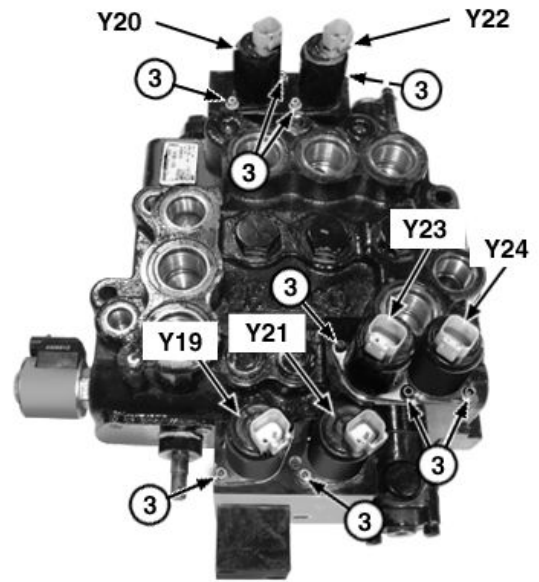
Hydraulic System

52. Install new O-rings on pilot solenoids (Y19—Y24).
53. Install pilot solenoids (Y19—Y24) to control valve.
Tighten pilot solenoids to specification.

Specification

Socket Head Cap
Screw—Torque.....2 N·m
18 lb-in.

- | | |
|------------------------------------|---------------------------------------|
| 3— Socket Head Cap Screw (12 used) | Y22— Bucket Dump Solenoid |
| Y19— Boom Up Solenoid | Y23— Auxiliary Port Solenoid (male) |
| Y20— Boom Down Solenoid | Y24— Auxiliary Port Solenoid (female) |
| Y21— Bucket Curl Solenoid | |



Control Valve

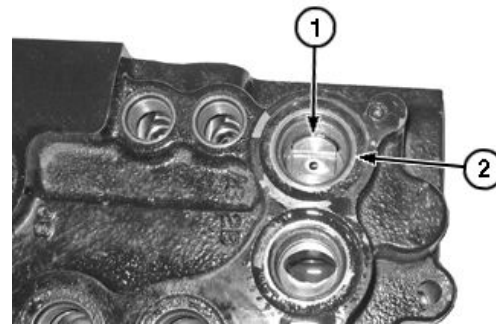
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NOTE: Boom up port (2) has an orifice (1) installed under hydraulic fitting.

54. Install orifice in boom up port.
55. Install work port fittings as necessary.

- | | |
|------------|-----------------|
| 1— Orifice | 2— Boom Up Port |
|------------|-----------------|



Control Valve Ports

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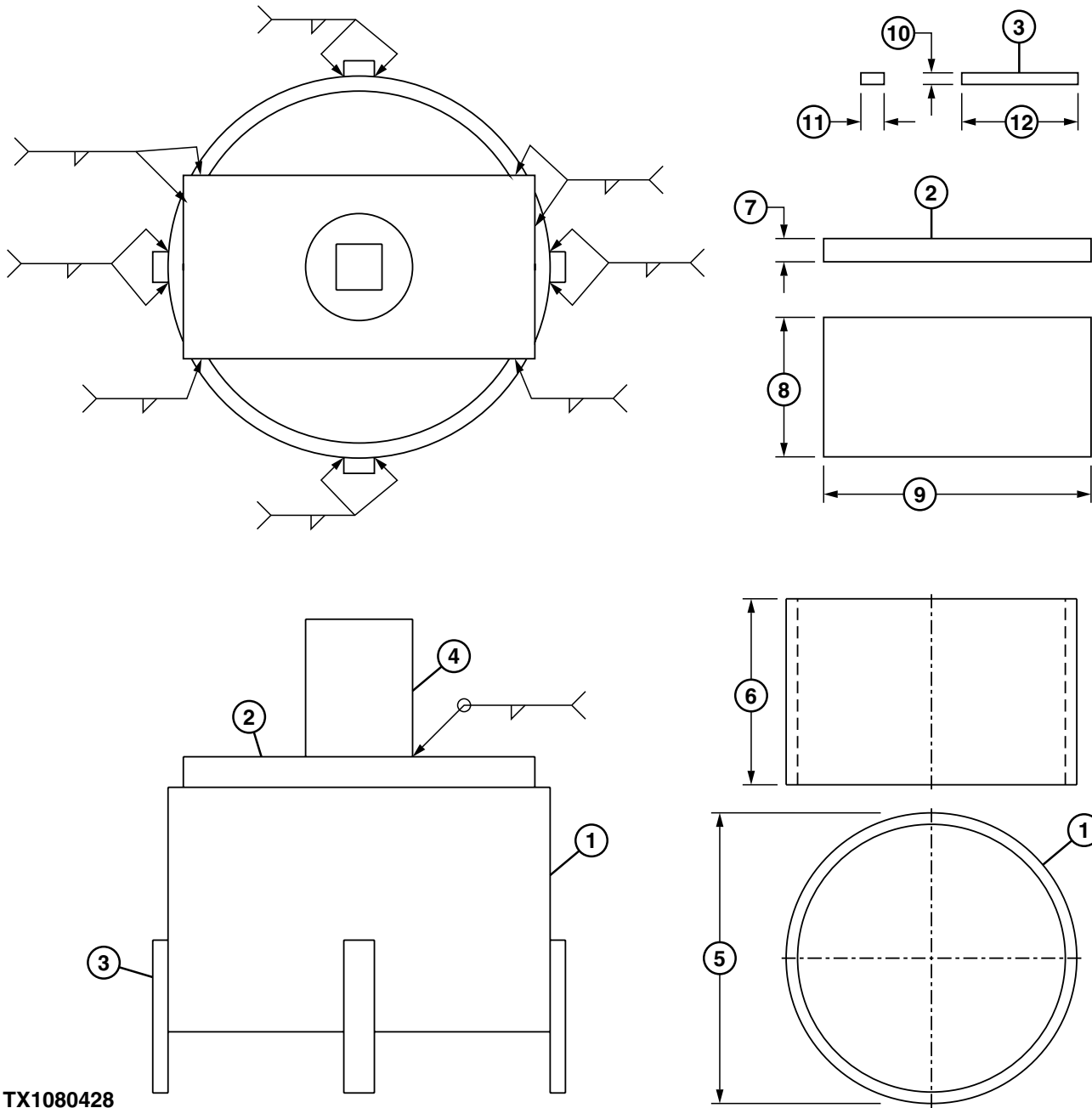
TX1030610A —UN—24OCT07

Section 99 Dealer Fabricated Tools

Contents

	Page
Group 9900—Dealer Fabricated Tools	
DFT1101 Boom Lifting Bracket.....	99-9900-1
DFT1323 Engine Lifting Bracket.....	99-9900-2
ST4920 Track Recoil Spring Disassembly and Assembly Tool	99-9900-3
DFT1087 Track Recoil Spring Disassembly and Assembly Guard Tool	99-9900-7
DFT1325 Solenoid Power Harness	99-9900-8
DFT1333 Lock Nut Wrench	99-9900-9
DFT1334 Gearbox Turning Tool	99-9900-10
DFT1335 Park Brake Spring Compressor	99-9900-11
DFT1336 Bias Spring Compressor	99-9900-12

DFT1333 Lock Nut Wrench



TX1080428

DFT1333 Lock Nut Wrench

- | | | | |
|---|-------------------------------|----------------------|---------------------|
| 1— Tube, 7 mm (0.25 in.) Wall Thickness | 4— 3/4 in. Drive Socket | 7— 13 mm (0.5 in.) | 10— 7 mm (0.25 in.) |
| 2— Plate | 5— 159 mm (6.25 in.) Diameter | 8— 76 mm (3.0 in.) | 11— 13 mm (0.5 in.) |
| 3— Bar (4 used) | 6— 102 mm (4.0 in.) | 9— 146 mm (5.75 in.) | 12— 64 mm (2.5 in.) |

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TX1080428 —UN—24AUG10

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