313 and 315 Skid Steer Loader CT315 Compact Track Loader Repair

TECHNICAL MANUAL

313 and 315 Skid Steer Loader CT315 Compact Track Loader

TM10608 11APR16 (ENGLISH)

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For complete service information also see:

313 and 315 Skid Steer Loader and CT315 Compact Track Loader Operation and Test	TM10605
313 and 315 Skid Steer Operator's Manual	OMT235575
POWERTECH™ 2.4 L & 3.0 L Diesel Engines ..	CTM301
100, 120, 125, 185, 225 Series Hydraulic Cylinders	CTM120519
Undercarriage Appraisal Manual	SP326VOL1
Specifications Manual.....	SP458VOL2

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

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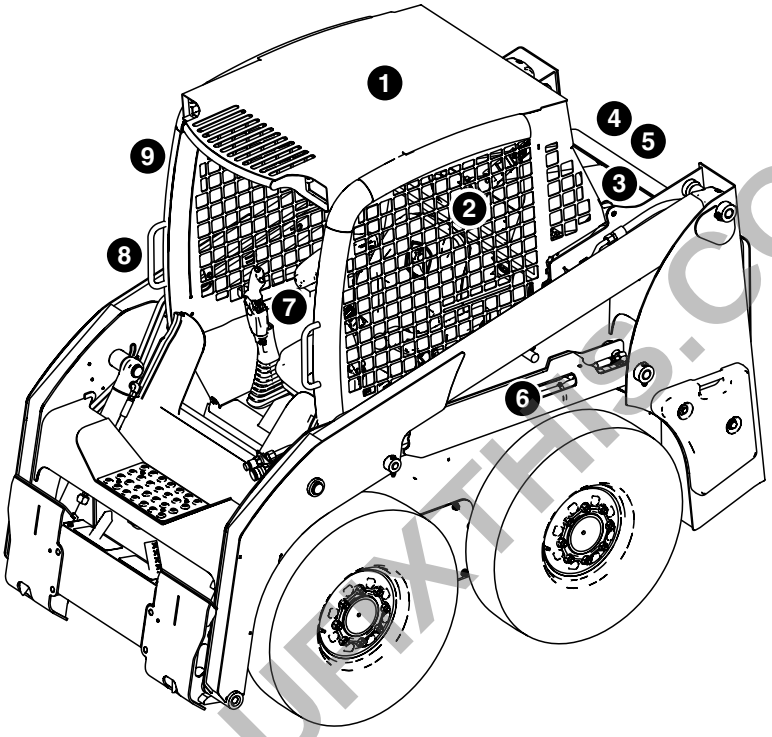
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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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Safety and Operator Convenience Features



TX1026966

TX1026966 —UN—09AUG07

Safety and Operator Conveniences (skid steer loader shown)

Please remember that the operator is the key to preventing accidents.

1. ROPS/FOPS Protection. Structures designed to help protect the operator are certified to ISO and OSHA. Enclosure also deflects sun and rain.

2. Window Guarding. Side screens prevent contact with a moving boom.

3. Secondary Exit. The rear window provides an exit path if the front door is blocked.

4. Bypass Start Protection. Shielding over the starter terminals helps prevent dangerous bypass starting.

5. Engine Fan Guard. A secondary fan guard inside engine compartment helps prevent contact with rotating fan blades.

6. Loader Boom Service Lock. A mechanical lock is provided for working on or around this machine with the boom raised.

7. Seat Belt With Automatic Retractor. Retractor helps protect the operator and keeps the belt and operator's station clean. A convenient integrated seat and shoulder belt system is also available.

8. Handholds. Conveniently placed handholds make it easy to enter or exit the operator's station.

9. Independent Parking Brake. Is electrically controlled and engages whenever the engine is stopped.

10. (Not Shown) Cab with Integrated Shoulder Harness, Heater, and Defroster. Options are available.

11. (Not Shown) Rearview Mirror. For operator convenience, a rearview mirror is available.

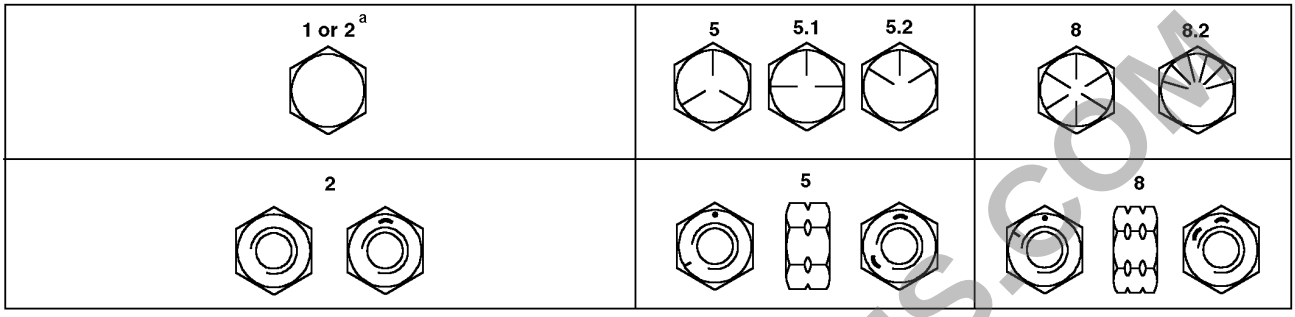
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Unified Inch Bolt and Cap Screw Torque Values

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



TORQ1A —UN—15APR13

Top—SAE Grade and Head Markings; Bottom—SAE Grade and Nut Markings

	Grade 1 (No Mark)		Grade 2[a] (No Mark)		Grade 5, 5.1 or 5.2		Grade 8 or 8.2	
Thread Size	Lubricated[b] N·m (lb-ft)	Dry[c] N·m (lb-ft)	Lubricated[b] N·m (lb-ft)	Dry[c] N·m (lb-ft)	Lubricated[b] N·m (lb-ft)	Dry[c] N·m (lb-ft)	Lubricated[b] N·m (lb-ft)	Dry[c] N·m (lb-ft)
1/4	3.8 (2.8)	4.7 (3.5)	6 (4.4)	7.5 (5.5)	9.5 (7)	12 (9)	13.5 (10)	17 (12.5)
5/16	7.7 (5.7)	9.8 (7.2)	12 (9)	15.5 (11.5)	19.5 (14.5)	25 (18.5)	28 (20.5)	35 (26)
3/8	13.5 (10)	17.5 (13)	22 (16)	27.5 (20)	35 (26)	44 (32.5)	49 (36)	63 (46)
7/16	22 (16)	28 (20.5)	35 (26)	44 (32.5)	56 (41)	70 (52)	80 (59)	100 (74)
1/2	34 (25)	42 (31)	53 (39)	67 (49)	85 (63)	110 (80)	120 (88)	155 (115)
9/16	48 (35.5)	60 (45)	76 (56)	95 (70)	125 (92)	155 (115)	175 (130)	220 (165)
5/8	67 (49)	85 (63)	105 (77)	135 (100)	170 (125)	215 (160)	240 (175)	305 (225)
3/4	120 (88)	150 (110)	190 (140)	240 (175)	300 (220)	380 (280)	425 (315)	540 (400)
7/8	190 (140)	240 (175)	190 (140)	240 (175)	490 (360)	615 (455)	690 (510)	870 (640)
1	285 (210)	360 (265)	285 (210)	360 (265)	730 (540)	920 (680)	1030 (760)	1300 (960)
1-1/8	400 (300)	510 (375)	400 (300)	510 (375)	910 (670)	1150 (850)	1450 (1075)	1850 (1350)
1-1/4	570 (420)	725 (535)	570 (420)	725 (535)	1280 (945)	1630 (1200)	2050 (1500)	2600 (1920)
1-3/8	750 (550)	950 (700)	750 (550)	950 (700)	1700 (1250)	2140 (1580)	2700 (2000)	3400 (2500)
1-1/2	990 (730)	1250 (930)	990 (730)	1250 (930)	2250 (1650)	2850 (2100)	3600 (2650)	4550 (3350)

[a] Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

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

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

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 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 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,TORQUE1 -19-14JAN04-1/1

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Wheel Remove and Install

1. Park machine on flat level surface.
2. Raise and block machine. See Raising and Blocking Machine. (Operator's Manual.)
3. Remove nuts (1) and washers (2) to remove wheel (3).

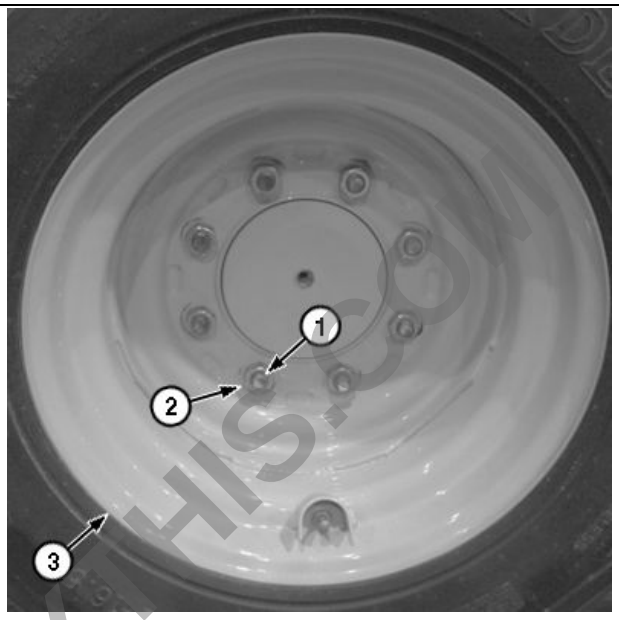
IMPORTANT: Avoid damage to wheel or wheel cap screws. Install washer with tapered end towards rim. Install nut with flat side against washer.

4. Clean mounting surface on wheel and axle flange. Install wheel, washers, and nuts. Tighten nuts to specification.

Specification

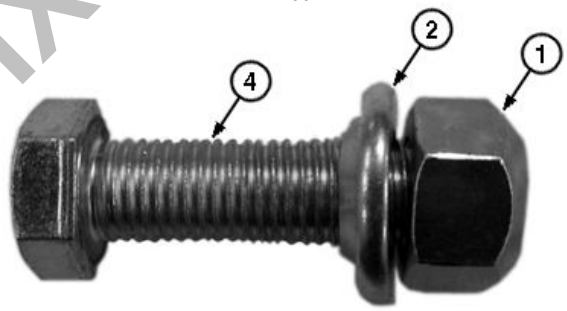
Nut—Torque.....237 N·m
175 lb.-ft.

1— Nut (8 used)
2— Washer (8 used)
3— Wheel
4— Cap Screw



TX1108512A —UN—21FEB12

Wheel



TX1109111A —UN—27FEB12

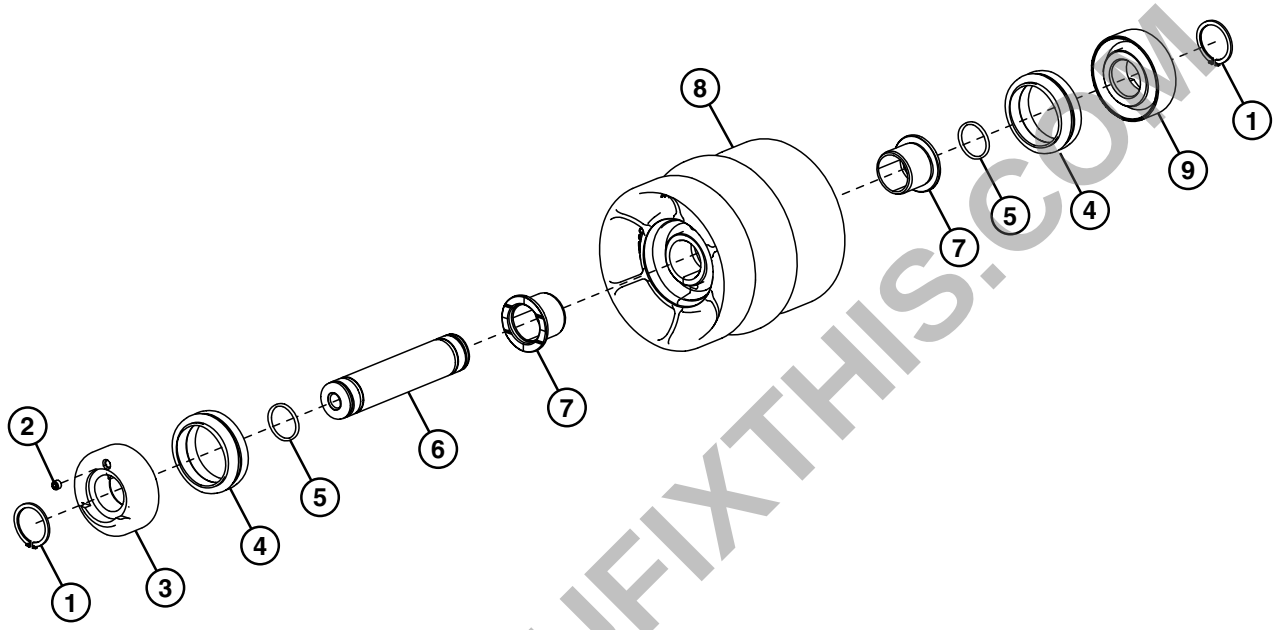
Cap Screw, Washer, and Nut

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Track Roller Disassemble and Assemble



T210900 —UN—11AUG05

T210900

Track Roller

1— Snap Ring (2 used)
2— Plug
3— Collar (with plug hole)
4— Metal Face Seal (2 used)
5— O-Ring (2 used)
6— Axle Shaft
7— Bushing (2 used)
8— Track Roller
9— Collar

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

Specification	
Track Roller—Weight (approximate)	26 kg 58 lb.

1. Remove plug (2) and drain oil from track roller.
2. Remove snap rings (1) from both ends of axle shaft (6).
3. Press axle shaft from track roller (8).
4. Press remaining collar (9) from axle shaft.

NOTE: If bushings (7) are worn or damaged complete roller must be replaced.

5. Inspect track roller bushings (7) and axle shaft. Replace track roller if bushings or axle shaft are worn or damaged.

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

6. Remove metal face seal (4) from roller and collar. Keep seal rings together as a matched set with seal ring faces together to protect surfaces.
7. Inspect metal face seals. See Inspect Metal Face Seals. (Group 0130.) For seals that will be reused, put a piece of cardboard between seal rings to protect seal face.
8. Remove O-rings (5) from axle shaft.
9. Install new O-rings on axle shaft.
10. Install snap ring on one end of axle shaft.
11. Tap axle shaft into collar (9).

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

12. Thoroughly clean O-ring and seat surfaces using volatile, non-petroleum base solvent and lint-free tissues.
13. Wipe finger prints and foreign material off seal ring face using clean oil and lint-free tissues.
14. Apply a thin film of oil to each seal ring face.

Continued on next page

RH60123,0000707 -19-09MAR09-1/3

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15. Install metal face seals in collars and roller. Apply equal pressure with fingers at four equally spaced points on seal face. Seal must “pop” down into place so O-ring is tight against seal bore. A volatile, non-petroleum base solvent or talcum powder may be used as a lubricant.
16. Tap axle shaft into roller.
17. Install collar (3) on axle shaft.

RH60123,0000707 -19-09MAR09-2/3

18. Support axle shaft and press on collar (3) to install snap ring.
19. Fill track roller with 225 mL (7.6 oz) of SAE 80W-90 gear oil meeting API Service GL-5. Use graduated beaker or syringe to fill roller housing.

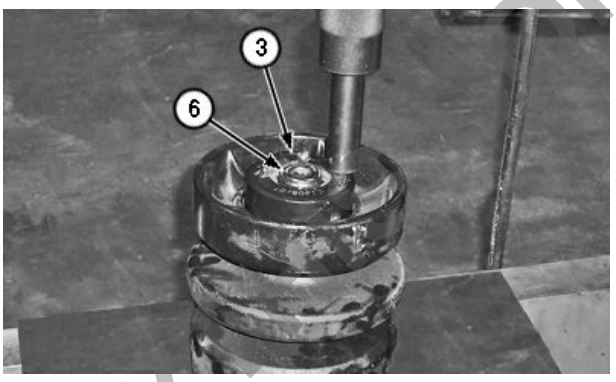
Track Roller—Specification

Track Roller Gear Oil—Capacity	225 mL 7.6 oz.

20. Clean threads of plug. Apply cure primer.
21. Apply pipe sealant to plug threads. Install and tighten plug.

Track Roller—Specification

Plug—Torque	24 N·m 17 lb-ft



T213179A —UN—04AUG05

Snap Ring Installation

3— Collar
6— Axle Shaft

RH60123,0000707 -19-09MAR09-3/3

Test Track Roller for Leakage

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

Specification

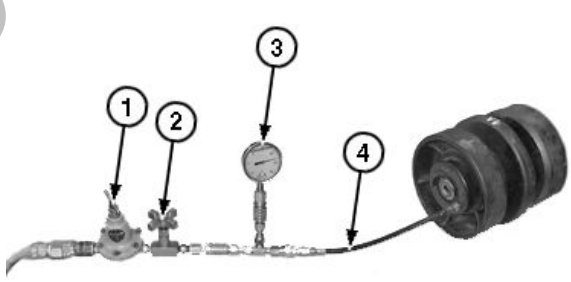
Track Roller—Weight (approximate)	26.3 kg 58 lb.

1. Hold the axle assembly and rotate track roller several turns to seat metal face seals.
2. Remove the plug.
3. Install parts (1—4).
4. Slowly pressurize oil cavity using air.

Track Roller—Specification

Oil Cavity Air Test—Pressure	160 kPa 1.6 bar 23 psi.

5. Close valve and wait for a minimum of 30 seconds. Check for oil leakage. Check gauge to see if air pressure has decreased.
6. If there is leakage, disassemble track roller and replace parts as necessary. See Track Roller Disassemble and Assemble. (Group 0130.)



T213172A —UN—04AUG05

Track Roller Leakage Test Components

1— Air Pressure Regulator
2— Snubber (needle) Valve
3— Pressure Gauge
4— Hose and Adapter Fittings-to-Track Roller

7. Clean threads of plug. Apply cure primer.
8. Apply pipe sealant to threads. Install plug.

Track Roller—Specification

Plug—Torque	24 N·m 17 lb-ft

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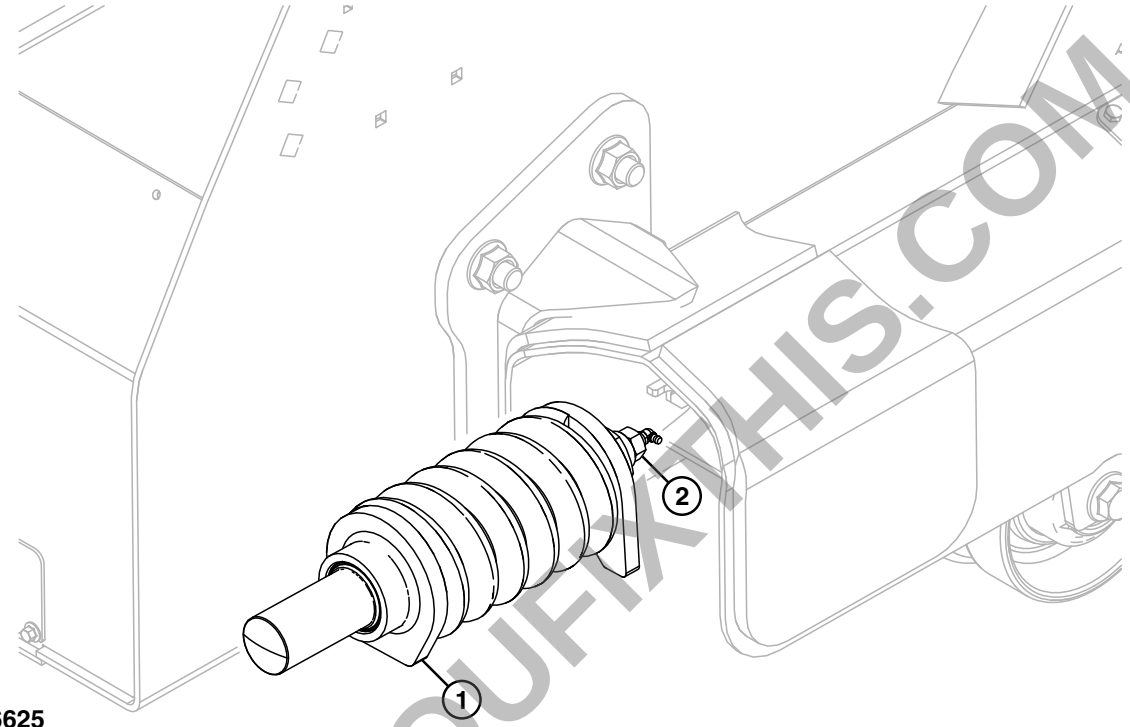
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Track Adjuster and Recoil Spring Assembly Remove and Install



TX1056625

TX1056625 —UN—03MAR09

Track Adjuster and Recoil Spring

1— Track Adjuster and Recoil Spring Assembly
2— Track Adjuster Valve

1. Park machine on a flat level surface.
2. Raise and block compact track loader. See Raising and Blocking Machine. (Operator's Manual.)
3. Remove rubber track. See Rubber Track Remove and Install. (Group 0130.)
4. Remove front idler yoke assembly. See Front Idler Yoke Assembly Remove and Install. (Group 0130.)

CAUTION: Spring or rod may break if dropped while handling, transporting or disassembling. Nicks or weld craters in spring and rod assembly can cause stress concentration resulting in a weak spot. Weak spots may result in immediate or eventual failure creating a risk of personal injury. Put a heavy protective covering around spring assembly when handling, transporting, or disassembling.

5. Slide track adjuster and recoil spring assembly (1) out of track frame.
6. Inspect and repair as necessary. See Track Adjuster Recoil Spring Remove and Install. (Group 0130.) and See Track Adjuster Cylinder Disassemble and Assemble. (Group 0130.)
7. Slide track adjuster and recoil spring assembly into track frame and push into place until track adjuster valve (2) is centered in access hole in track frame.
8. Install front idler yoke assembly. See Front Idler Yoke Assembly Remove and Install. (Group 0130.)
9. Install rubber track. See Rubber Track Remove and Install. (Group 0130.)
10. Adjust track sag. See Check and Adjust Track Sag. (Group 9020-25.)
11. Raise machine and remove blocking. See Raising and Blocking Machine. (Operator's Manual.)

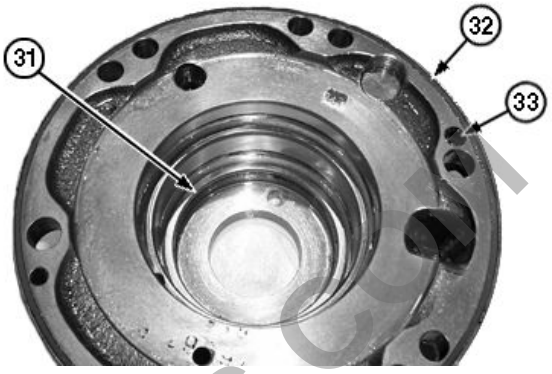
RH60123,000072A -19-09MAR09-1/1

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21. Remove seal (31) and O-rings (32 and 33) from distributor housing.

31— Seal
32— O-Ring
33— O-Ring



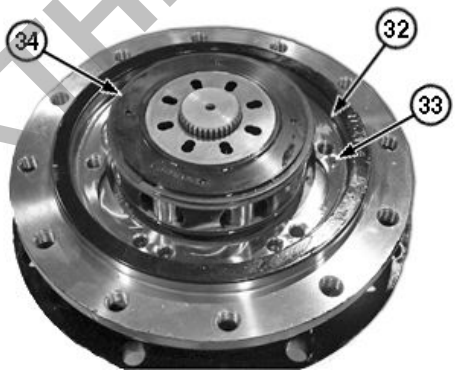
T213142A —UN—29AUG05

Distributor Housing

RH60123,000070E -19-30NOV12-9/15

22. Remove cylinder block (34).
23. Remove O-rings (32 and 33) from park brake housing.

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



T213791A —UN—30AUG05

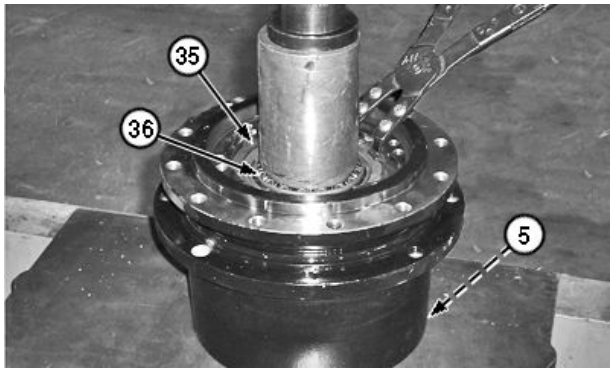
Cylinder Block

RH60123,000070E -19-30NOV12-10/15

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

24. Using a press, remove large snap ring (35) from park brake housing. Support drive shaft from below and press on bearing.
25. Gently tap drive shaft out of park brake housing.
26. Remove bearing retainer snap ring from drive shaft.
27. Press bearing off of drive shaft.
28. Remove brake piston needle bearing from drive shaft.

5— Drive Shaft (supported)
35— Snap Ring
36— Bearing



T213788A —UN—30AUG05

Snap Ring Removal

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RH60123,000070E -19-30NOV12-11/15

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Section 18
Operator's Station

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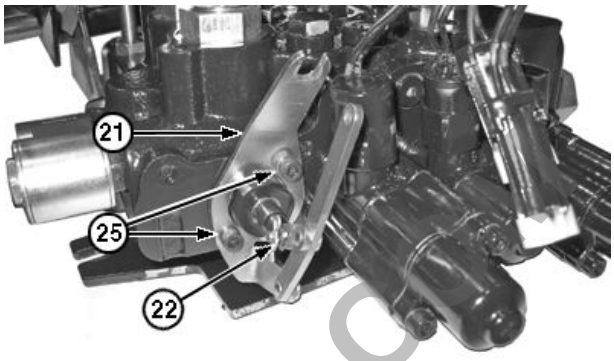
Group 1830—Heating
Heater Remove and Install 18-1830-1

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24. Remove pressure release cable bracket (20) from control valve.
    a. Remove clevis pin (21) from plunger.
    b. Remove two cap screws (25) and remove pressure release cable bracket from control valve.

21— Pressure Release Cable Bracket
22— Clevis Pin
25— Cap Screw (2 used)



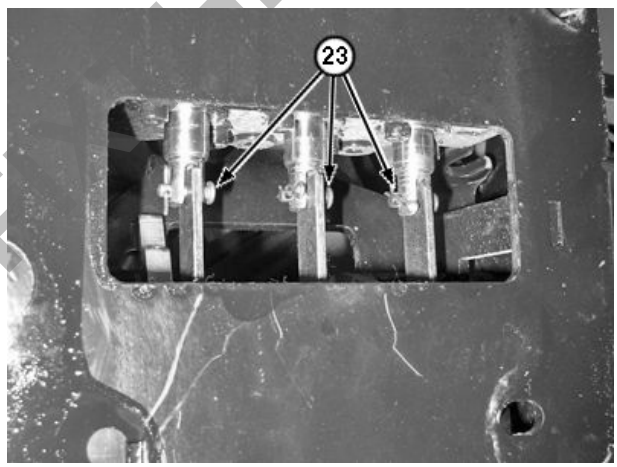
TX1031004A —UN—25OCT07

Pressure Release Cable Bracket

KK70125,0000B90 -19-30OCT07-10/17

25. Stand control valve and pedal assembly on pedal end to gain access to clevis pins (23). Remove clevis pin to disconnect link from each valve spool.

23— Clevis Pin (3 used)



TX1025085A —UN—19JUN07

Valve Spool Linkage

KK70125,0000B90 -19-30OCT07-11/17

26. Set assembly flat and remove cap screws (24). Remove control valve from pedal assembly.
27. Clean and inspect parts. See Control Valve Disassemble and Assemble. (Group 3160.) See Pedal Assembly Disassemble and Assemble. (Group 3115.)
28. Install control valve to pedal assembly using cap screws (24).
29. Stand control valve and pedal assembly on pedal end to gain access to clevis pins (23). Connect clevis pin to connect link to each valve spool.
30. Install pressure release cable bracket (21) to control valve.
    - Install cap screws (25).
    - Install clevis pin (22) in plunger.
31. Install control valve and pedal assembly in machine and secure with cap screws (20).



TX1025087A —UN—19JUN07

Control Valve and Pedal Assembly

24— Cap Screw (2 used)

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KK70125,0000B90 -19-30OCT07-12/17

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