317 and 320 Skid Steer Loader CT322 Compact Track Loader Repair

TECHNICAL MANUAL

317 and 320 Skid Steer Loader CT322 Compact Track Loader Repair

TM2152 28APR11 (ENGLISH)

For complete service information also see:

317 and 320 Skid Steer Loader and CT322 Compact Track Loader Operation and Test	TM2151
317 and 320 Skid Steer Operator's Manual.....	OMT205050
CT322 and CT332 Compact Track Loader Operator's Manual.....	OMT215996
POWERTECH™ 2.4 L & 3.0 L Diesel Engines ..	CTM301
120 Series Hydraulic Cylinders.....	CTM114319
Undercarriage Appraisal Manual Volume 1.....	SP326VOL1
Specifications Manual.....	SP458

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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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Recognize Safety Information

This is the safety alert symbol. When you see this symbol on your machine or in this manual, be alert for the potential of personal injury.

Follow the precautions and safe operating practices highlighted by this symbol.

A signal word — DANGER, WARNING, or CAUTION — is used with the safety alert symbol. DANGER identifies the most serious hazards.

On your machine, DANGER signs are red in color, WARNING signs are orange, and CAUTION signs are yellow. DANGER and WARNING signs are located near specific hazards. General precautions are on CAUTION labels.



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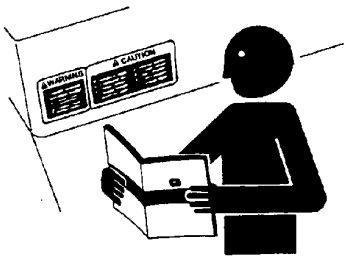
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MX10672,0000059 -19-09FEB04-1/1

Follow Safety Instructions

Read the safety messages in this manual and on the machine. Follow these warnings and instructions carefully. Review them frequently.

Be sure all operators of this machine understand every safety message. Replace operator's manual and safety labels immediately if missing or damaged.



T133556 —UN—24AUG00

TX03679,00016F9 -19-03JAN07-1/1

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.

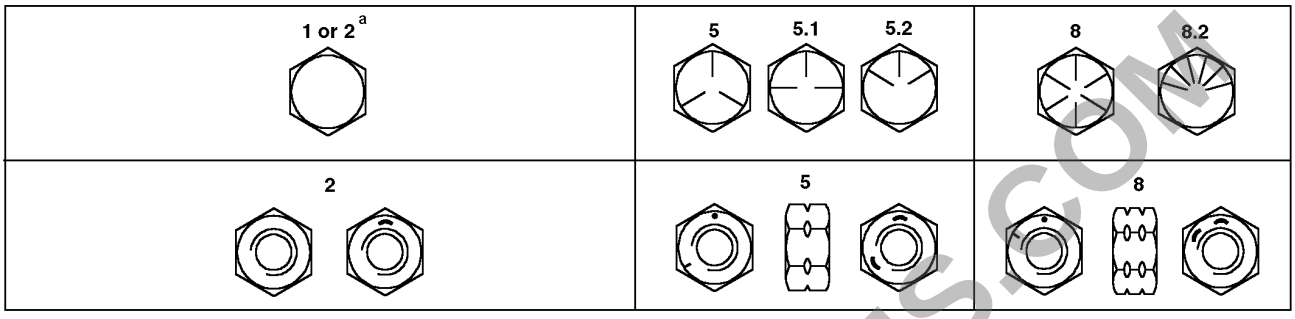
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Unified Inch Bolt and Cap Screw Torque Values

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



TORQ1A —UN—27SEP99

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.

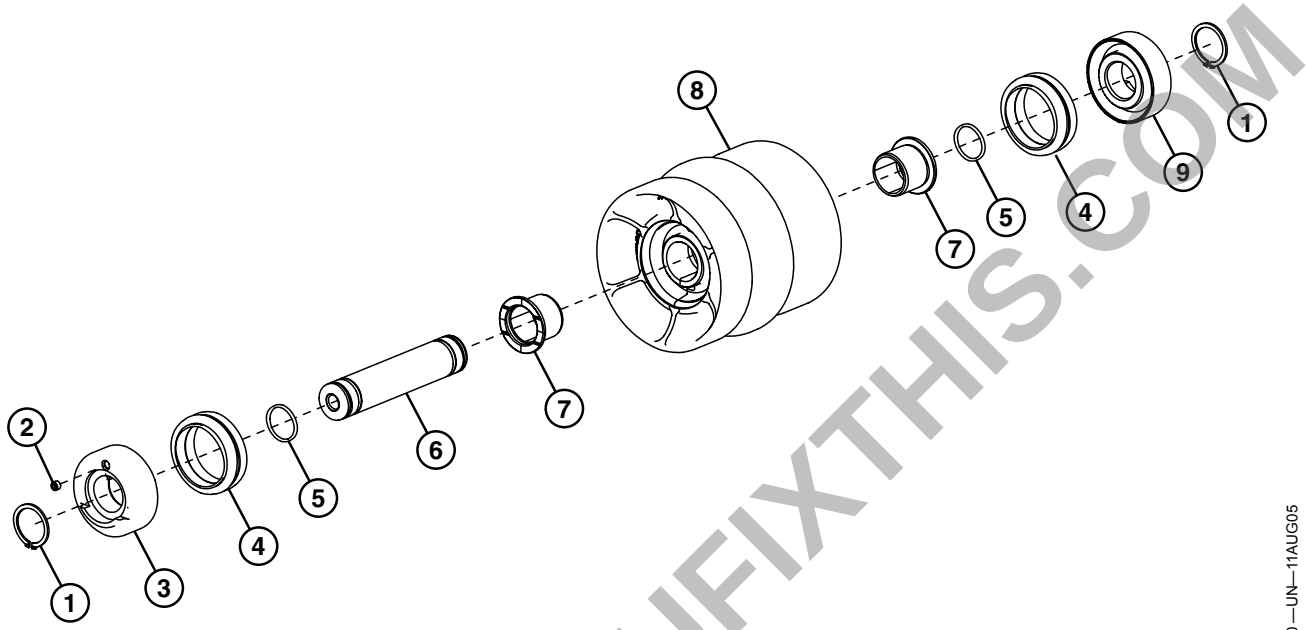
Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

OUT3035,TORQUE1 -19-14JAN04-1/1

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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: Heavy component; use a hoist.

Specification

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

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

KK70125,0000098 -19-08FEB08-1/3

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Track Roller Remove and Install

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.)

CAUTION: Heavy component; use a hoist.

Specification

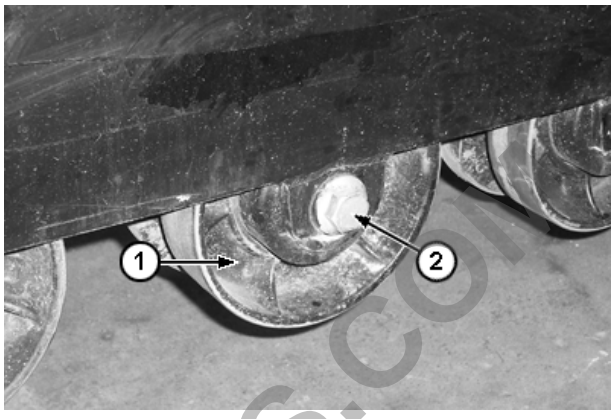
Track Roller—Weight..... 26.3 kg (58 lb) approximate

CAUTION: Support track roller before removing cap screws. Track roller will drop once cap screws have been removed.

4. Remove cap screws (2) and track roller (1).
5. Repair or replace parts as necessary. See Track Roller Disassemble and Assemble. (Group 0130.)
6. Apply threadlock and sealer (medium strength) to threads of cap screws.
7. Install track roller and tighten cap screws.

Track Roller—Specification

Track Roller-to-Frame
Cap Screw—Torque..... 592—696 N·m (437—513 lb-ft)



T212208A —UN—14JUN05

CTL Track Roller

1— Track Roller **2— Cap Screw (2 used)**

8. Install rubber track. See Rubber Track Remove and Install. (Group 0130.)
9. Adjust track sag. See Check and Adjust Track Sag. (Group 9020-25.)
10. Raise machine and remove blocking. See Raising and Blocking Machine. (Operator's Manual.)

KK70125,0000097 -19-06NOV08-1/1

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Measure Rubber Track Lugs

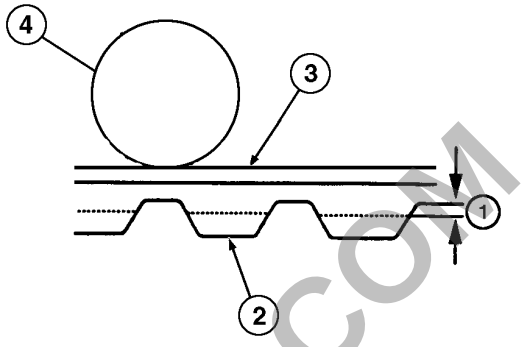
NOTE: For additional information on rubber track lug wear see CT322 and CT332 Lug Height—Rubber Track in SP326 Undercarriage Appraisal Manual.

Measure lug height (1) where indicated.

Replace rubber track if measurement is less than specification.

Rubber Track—Specification

Rubber Track Lug—Height	5 mm (0.2 in.) minimum



T213966 —UN—09SEP05

Track Lug Measurement

1— Lug Height
2— Lug
3— Rubber Track
4— Track Roller

KK70125,0000095 -19-12SEP05-1/1

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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.

KK70125,0000098 -19-08FEB08-2/3

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.

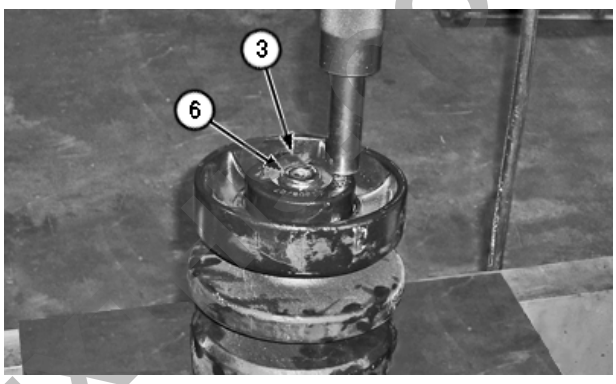
Track Roller—Specification

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 ..... 21—26 N·m (16—19 lb-ft.)



T213179A —UN—04AUG05

Snap Ring Installation

3— Collar
6— Axle Shaft

KK70125,0000098 -19-08FEB08-3/3

Test Track Roller for Leakage

⚠ CAUTION: Heavy component; use a hoist.

Specification

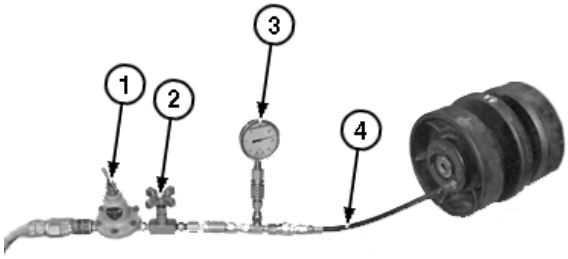
Track Roller—Weight ..... 26.3 kg (58 lb) approximate

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.)
7. Clean threads of plug. Apply cure primer.



T213172A —UN—04AUG05

Track Roller Leakage Test Components

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

8. Apply pipe sealant to threads. Install plug.

Track Roller—Specification

Plug—Torque ..... 21—26 N·m (16—19 lb-ft.)

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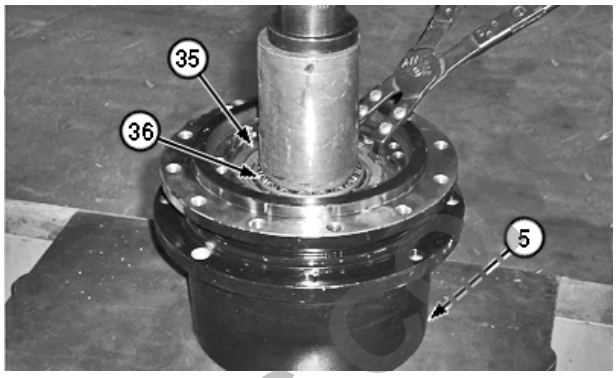
IMPORTANT: Apply only 2—4 tons of pressure to install snap ring. Applying more pressure can damage bearing.

15. Using a press, seat bearing and install snap ring (35). Press on bearing with appropriate press 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.

17. Set motor, park brake and gearbox on bench with gearbox up.
18. Fill gearbox with lubrication oil meeting API Service Classification GL-5.

Specification	
Gearbox Lubrication Oil—Volume	0.55 L 0.58 qt



T213788A —UN—30AUG05

Snap Ring Installation

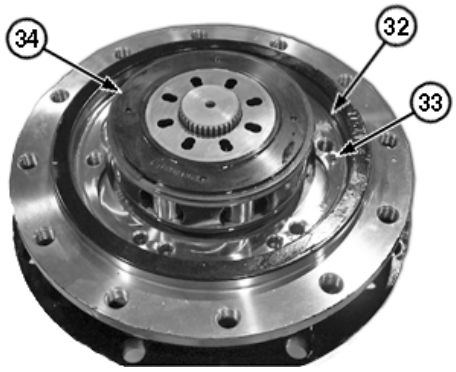
5— Drive Shaft (supported)
35— Snap Ring
36— Bearing

19. Install gearbox end cover, snap ring and plugs.
20. Turn motor, park brake and gearbox back over (with gearbox end cover facing downward).

MR50960,0000174 -19-21NOV06-6/13

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.

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



T213791A —UN—30AUG05

Cylinder Block

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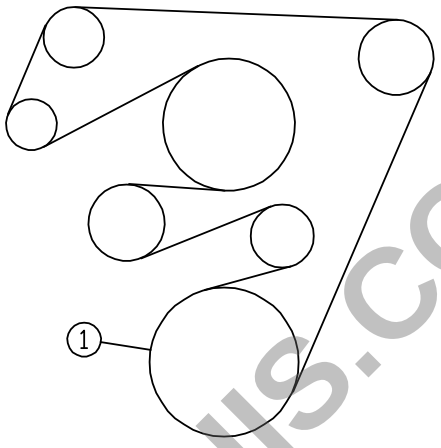
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Fan Belt Remove and Install

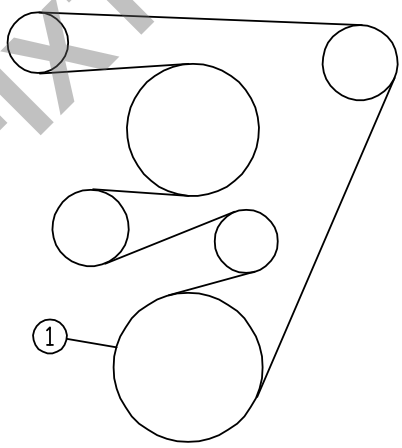
1. Release belt auto tensioner.
2. Replace parts as necessary. See Checking Belt Tensioner Spring Tension and Belt Wear (Automatic Tensioner) to check tensioner tension. (CTM301.)
3. Install belt as shown.

1— Crank Pulley



T199065 —UN—07APR04

Fan Belt Routing With Air Conditioning



T199066 —UN—07APR04

Fan Belt Routing Without Air Conditioning

LD30992,0000058 -19-08FEB08-1/1

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Section 05
Engine Auxiliary Systems

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