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NOTE: Case Corporation reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

Section 1001

STANDARD TORQUE SPECIFICATIONS

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TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs



Size	Pound-Inches	Newton metres
1/4 inch	108 to 132	12 to 15
5/16 inch	204 to 252	23 to 28
3/8 inch	420 to 504	48 to 57
Size	Pound-Feet	Newton metres
7/16 inch	54 to 64	73 to 87
1/2 inch	80 to 96	109 to 130
9/16 inch	110 to 132	149 to 179
5/8 inch	150 to 180	203 to 244
3/4 inch	270 to 324	366 to 439
7/8 inch	400 to 480	542 to 651
1.0 inch	580 to 696	787 to 944
1-1/8 inch	800 to 880	1085 to 1193
1-1/4 inch	1120 to 1240	1519 to 1681
1-3/8 inch	1460 to 1680	1980 to 2278
1-1/2 inch	1940 to 2200	2631 to 2983

Grade 8 Bolts, Nuts, and Studs



Size	Pound-Inches	Newton metres
1/4 inch	144 to 180	16 to 20
5/16 inch	288 to 348	33 to 39
3/8 inch	540 to 648	61 to 73
Size	Pound-Feet	Newton metres
7/16 inch	70 to 84	95 to 114
1/2 inch	110 to 132	149 to 179
9/16 inch	160 to 192	217 to 260
5/8 inch	220 to 264	298 to 358
3/4 inch	380 to 456	515 to 618
7/8 inch	600 to 720	814 to 976
1.0 inch	900 to 1080	1220 to 1465
1-1/8 inch	1280 to 1440	1736 to 1953
1-1/4 inch	1820 to 2000	2468 to 2712
1-3/8 inch	2380 to 2720	3227 to 3688
1-1/2 inch	3160 to 3560	4285 to 4827

NOTE: *Use thick nuts with Grade 8 bolts.*

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TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

Grade 8.8 Bolts, Nuts, and Studs



Size	Pound-Inches	Newton metres
M4	24 to 36	3 to 4
M5	60 to 72	7 to 8
M6	96 to 108	11 to 12
M8	228 to 276	26 to 31
M10	456 to 540	52 to 61
Size	**Pound-Feet**	**Newton metres**
M12	66 to 79	90 to 107
M14	106 to 127	144 to 172
M16	160 to 200	217 to 271
M20	320 to 380	434 to 515
M24	500 to 600	675 to 815
M30	920 to 1100	1250 to 1500
M36	1600 to 1950	2175 to 2600

Grade 10.9 Bolts, Nuts, and Studs



Size	Pound-Inches	Newton metres
M4	36 to 48	4 to 5
M5	84 to 96	9 to 11
M6	132 to 156	15 to 18
M8	324 to 384	37 to 43
Size	**Pound-Feet**	**Newton metres**
M10	54 to 64	73 to 87
M12	93 to 112	125 to 150
M14	149 to 179	200 to 245
M16	230 to 280	310 to 380
M20	450 to 540	610 to 730
M24	780 to 940	1050 to 1275
M30	1470 to 1770	2000 to 2400
M36	2580 to 3090	3500 to 4200

Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
37 Degree Flare Fitting			
1/4 inch 6.4 mm	7/16-20	72 to 144	8 to 16
5/16 inch 7.9 mm	1/2-20	96 to 192	11 to 22
3/8 inch 9.5 mm	9/16-18	120 to 300	14 to 34
1/2 inch 12.7 mm	3/4-16	180 to 504	20 to 57
5/8 inch 15.9 mm	7/8-14	300 to 696	34 to 79
Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
3/4 inch 19.0 mm	1-1/16-12	40 to 80	54 to 108
7/8 inch 22.2 mm	1-3/16-12	60 to 100	81 to 135
1.0 inch 25.4 mm	1-5/16-12	75 to 117	102 to 158
1-1/4 inch 31.8 mm	1-5/8-12	125 to 165	169 to 223
1-1/2 inch 38.1 mm	1-7/8-12	210 to 250	285 to 338

Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
Straight Threads with O-ring			
1/4 inch 6.4 mm	7/16-20	144 to 228	16 to 26
5/16 inch 7.9 mm	1/2-20	192 to 300	22 to 34
3/8 inch 9.5 mm	9/16-18	300 to 480	34 to 54
1/2 inch 12.7 mm	3/4-16	540 to 804	57 to 91
Tube OD Hose ID	Thread Size	Pound-Inches	Newton metres
5/8 inch 15.9 mm	7/8-14	58 to 92	79 to 124
3/4 inch 19.0 mm	1-1/16-12	80 to 128	108 to 174
7/8 inch 22.2 mm	1-3/16-12	100 to 160	136 to 216
1.0 inch 25.4 mm	1-5/16-12	117 to 187	159 to 253
1-1/4 inch 31.8 mm	1-5/8-12	165 to 264	224 to 357
1-1/2 inch 38.1 mm	1-7/8-12	250 to 400	339 to 542

Split Flange Mounting Bolts		
Size	Pound-Inches	Newton metres
5/16-18	180 to 240	20 to 27
3/8-16	240 to 300	27 to 34
7/16-14	420 to 540	47 to 61
Size	Pound-Feet	Newton metres
1/2-13	55 to 65	74 to 88
5/8-11	140 to 150	190 to 203

ENGINE

Removal

1. Park the machine on a level surface and lower the loader bucket to the floor. Stop the engine and apply the parking brake.

2. Let the engine cool. Loosen and remove the radiator cap. Drain the cooling system. The drain valve is located at the right front side of the radiator. The cooling system holds 26.5 litres (28 U.S. quarts) of coolant.

3. Open the access door on each side of the engine compartment.

4. Turn the battery disconnect switch to the OFF position.

5. Open the grille.

6. Loosen and remove the precleaner. If the air cleaner is equipped with a cap, loosen the clamp and remove the cap.

7. Remove the plugs and loosen and remove the cap screws, lock washers, and flat washers that fasten the hood.

8. Connect suitable lifting equipment to the hood and remove the hood.

9. Loosen and remove the nuts, lock washers, flat washers, and carriage bolts that fasten the lower side panels. Remove both lower side panels.

10. Disconnect the ground cable from the batteries.

11. Disconnect the positive cable from the batteries.

12. If equipped with a backup alarm, disconnect the wires from the backup alarm.

13. Loosen and remove the nut, lock washer, and bolt that fasten the clamp for the wire harness to the top right side of the radiator shroud.

14. Cut the tie strap that fastens the wire harness for the lamps at the right side of the radiator shroud. Disconnect both connectors.

15. Repeat Steps 13 and 14 for the left side of the radiator shroud.

16. If equipped with ether injection, disconnect the wire harness and disconnect the tube from the valve assembly.

17. Cut the tie strap that fastens the hoses and wire harness.

18. Loosen and remove the nuts and lock washers that fasten the clamps for the wire harness and hose to the left side of the radiator shroud.

19. Disconnect the hose from the bottom of the coolant reservoir and drain the coolant reservoir.

20. Loosen and remove the hardware that fastens the rear of each side of the radiator shroud to the frame.

21. Loosen and remove the nuts, lock washers, and flat washers that fasten each side of the baffle for the battery compartment to the frame.

22. Loosen and remove the nut, lock washer, flat washer, and bolt that fasten the right side of the battery cover to the support. Remove the support.

23. Loosen and remove the self-locking nut, flat washers, and bolt that fasten the brace to the left side of the battery cover. Loosen and remove the remaining hardware that fastens the support to the left side of the battery cover. Remove the support.

24. Loosen and remove the cap screws, lock washers, and flat washers that fasten the battery cover to the baffle. Remove the battery cover.

25. Remove the baffle. If necessary, loosen the J-bolts for the clamp on the front battery and move the front battery toward the rear to remove the baffle.

26. Disconnect the hose from each side of the bottom of the radiator. Install a plug in each hose and a cap on each fitting.

27. Loosen and remove the thumb screws and flat washers at the right side of the hydraulic oil cooler.

28. Loosen and remove the cap screws, lock washers, and flat washers that fasten the clamp for the hose and the hinge for the hydraulic oil cooler to the radiator.

29. Lower the hydraulic oil cooler.

30. Loosen and remove the nuts, lock washers, and flat washers that fasten the bracket for the battery disconnect switch to the radiator shroud. Lower the bracket out of the way.

31. Loosen and remove the cap screws, lock washers, and flat washers that fasten the clamps for the hose and the guard to the fan shroud.

32. Remove the guard.

33. Disconnect the bottom radiator hose from the water pump.

34. Disconnect the top radiator hose from the radiator.

35. Disconnect the low coolant indicator wire and the radiator frame ground wire.

36. Loosen and remove the hardware that fastens the front of each side of the radiator shroud to the frame.

37. Connect suitable lifting equipment to the radiator shroud.

38. Make sure that the hydraulic oil cooler, the hoses, and the wire harness are free of the radiator shroud. Raise the radiator shroud until the radiator shroud is free of the frame and remove the radiator shroud from the machine.

39. Lower the radiator shroud so that the radiator touches the bench. Put blocks under each side of the radiator shroud to hold the radiator shroud in place.

40. Loosen the nut on the bolt for the muffler clamp.

41. Loosen and remove the nuts, lock washers, flat washers, and bolts that fasten the bracket for the muffler to the bracket on the engine.

42. Remove the muffler. Cover the opening in the exhaust elbow.

43. Disconnect the wires from the switch for the air cleaner indicator.

44. Disconnect the hose from the air cleaner.

45. Loosen and remove the nuts and bolts that fasten the straps for the air cleaner.

46. Remove the air cleaner from the bracket.

47. Loosen and remove the cap screw that fastens the clamp for the wire harness.

48. Disconnect the heater hose. Install a plug in the hose.

49. Loosen and remove the cap screw, lock washer, and external tooth washer that fasten the ground cable to the engine.

50. Loosen and remove the nut and lock washer that fasten the wire to the battery terminal on the alternator. Remove the wire.

51. Loosen and remove the nut and lock washer that fasten the small wire to the alternator. Remove the small wire.

52. Loosen and remove the cap screw that fastens the clamp for the heater hose to the engine.

53. Disconnect the wire from the switch terminal of the starter solenoid.

54. Disconnect the cables from the battery terminal of the starter solenoid.

55. Loosen and remove the copper nut and copper flat washer that fasten the wires to the stud in the left side of the flywheel housing. Remove the wires. Loosen and remove the cap screw and lock washer that fasten the clamp for the wire harness to the side of the flywheel housing.

56. Disconnect the wire from the temperature sender.

NOTE: *If the machine is equipped with air conditioning, do Steps 57 through 62. If the machine is not equipped with air conditioning, go to Step 63.*

57. Make a mark on one of the connectors for correct assembly.

58. Disconnect the connectors for the compressor and cut the tie strap that fastens the wire harness to the fuel line.

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