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1001

SAFETY RULES, SERVICE MANUAL INTRODUCTION, AND TORQUE SPECIFICATIONS

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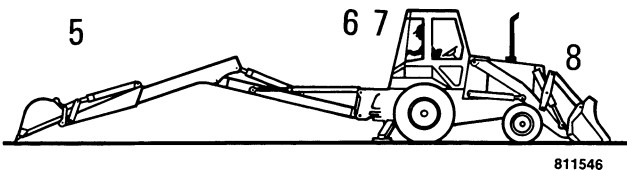
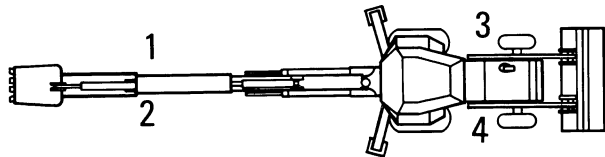
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SERVICE MANUAL INTRODUCTION

This service manual has been prepared with the latest service information available. Troubleshooting, removal, disassembly, inspection and installation procedures, and complete specifications and tightening references can be found in most sections. Some sections have drawings but no written procedure because the job is so easily done. This service manual is one of the most important tools available to the service technician.

Right, Left, Front, and Rear

The terms right-hand and left-hand and front and rear as used in this manual indicate the right and left sides, and front and rear of the machine as seen from the operator's seat for correct operation of the machine or attachment.



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- | | |
|------------------------------|-------------------------|
| 1. <i>Right Side-Backhoe</i> | 5. <i>Front-Backhoe</i> |
| 2. <i>Left Side-Backhoe</i> | 6. <i>Rear-Backhoe</i> |
| 3. <i>Left Side-Machine</i> | 7. <i>Rear-Machine</i> |
| 4. <i>Right Side-Machine</i> | 8. <i>Front-Machine</i> |

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A Table of Contents is in the front of this manual. The Table of Contents shows the main divisions and the sections that are in each division. The individual sections also have a Table of Contents.

Page Numbers

All page numbers are made of two numbers separated by a dash, such as 4002-9. The number before the dash is the section number. The number following the dash is the page number in that section. Page numbers will be found at the upper right or left of each page.

Illustrations

Illustrations are put as near as possible to the text and are to be used as part of the text.

Clear and Simple English

This manual is written in C.A.S.E. (Clear and Simple English). C.A.S.E. is easier to read than "regular" English because C.A.S.E. uses a small number of common words and has special rules for writing.

All sections written in C.A.S.E. are indicated by the symbol below.

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Simple
English*

Special Tools

Special tools are needed to remove and install, disassemble and assemble, check and adjust some component parts of this machine. Some special tools can be easily made locally and the necessary information to make the tool is in this service manual. Other special tools are more difficult to make locally and are available from Service Tools in the U.S. and from Jobborn Manufacturing in Canada. Use these tools according to the instructions in this service manual for your personal safety and to do the job correctly.


Order special tools from either of the following companies.


Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

Jobborn Manufacturing Co.
97 Frid Street
Hamilton, Ontario L8P 4M3
Canada

TORQUE SPECIFICATIONS - U.S. 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 graphites, moly-disulfide greases, or other extreme pressure lubricants are used.


Grade 5 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	9-11	12-15	1.2-1.5
5/16 in 7.9 mm	17-21	23-28	2.4-2.9
3/8 in 9.5 mm	35-42	48-57	4.8-5.8
7/16 in 11.1 mm	54-64	73-87	7.5-8.8
1/2 in 12.7 mm	80-96	109-130	11.1-13.3
9/16 in 14.3 mm	110-132	149-179	15.2-18.2
5/8 in 15.9 mm	150-180	203-244	20.8-24.9
3/4 in 19.0 mm	270-324	366-439	37.3-44.8
7/8 in 22.2 mm	400-480	542-651	55.3-66.4
1.0 in 25.4 mm	580-696	787-944	80.2-96.2
1-1/8 in 28.6 mm	800-880	1085-1193	111-122
1-1/4 in 31.8 mm	1120-1240	1519-1681	155-171
1-3/8 in 34.9 mm	1460-1680	1980-2278	202-232
1-1/2 in 38.1 mm	1940-2200	2631-2983	268-304


Grade 8 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	12-15	16-20	1.7-2.1
5/16 in 7.9 mm	24-29	33-39	3.3-4.0
3/8 in 9.5 mm	45-54	61-73	6.2-7.5
7/16 in 11.1 mm	70-84	95-114	9.7-11.6
1/2 in 12.7 mm	110-132	149-179	15.2-18.2
9/16 in 14.3 mm	160-192	217-260	22.1-26.5
5/8 in 15.9 mm	220-264	298-358	30.4-36.5
3/4 in 19.0 mm	380-456	515-618	52.5-63.0
7/8 in 22.2 mm	600-720	814-976	83.0-99.5
1.0 in 25.4 mm	900-1080	1220-1465	124-149
1-1/8 in 28.6 mm	1280-1440	1736-1953	177-199
1-1/4 in 31.8 mm	1820-2000	2468-2712	252-277
1-3/8 in 34.9 mm	2380-2720	3227-3688	329-376
1-1/2 in 38.1 mm	3160-3560	4285-4827	437-492

TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when special torques 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 moly-disulfide grease or oil is used.

Grade 8.8 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
M4 0.15 in	2-3	3-4	0.3-0.4
M5 0.19 in	5-6	6.5-8	0.7-0.8
M6 0.23 in	8-9	10.5-12	1.1-1.2
M8 0.31 in	19-23	26-31	2.6-3.2
M10 0.39 in	38-45	52-61	5.3-6.2
M12 0.46 in	66-79	90-107	9.1-10.9
M14 0.55 in	106-127	144-172	14.7-17.6
M16 0.62 in	160-200	217-271	22.1-27.7
M20 0.78 in	320-380	434-515	44.2-52.5
M24 0.94 in	500-600	675-815	69.1-83.0
M30 1.17 in	920-1100	1250-1500	127-152
M36 1.40 in	1600-1950	2175-2600	221-270

Grade 10.9 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
M4 0.15 in	3-4	4-5	0.4-0.5
M5 0.19 in	7-8	9.5-11	1.0-1.1
M6 0.23 in	11-13	15-17.5	1.5-1.8
M8 0.31 in	27-32	37-43	3.7-4.4
M10 0.39 in	54-64	73-87	7.5-8.8
M12 0.46 in	93-112	125-150	12.9-15.5
M14 0.55 in	149-179	200-245	20.6-24.7
M16 0.62 in	230-280	310-380	31.8-38.7
M20 0.78 in	450-540	610-730	62.2-74.7
M24 0.94 in	780-940	1050-1275	108-130
M30 1.17 in	1470-1770	2000-2400	203-245
M36 1.40 in	2580-3090	3500-4200	357-427

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- Feet	Newton metres	Kilogram metres
37 Degree Flare Fittings				
1/4 in 6.4 mm	7/16-20	6-12	8-16	0.8-1.7
5/16 in 7.9 mm	1/2-20	8-16	11-21	1.1-2.2
3/8 in 9.5 mm	9/16-18	10-25	14-33	1.4-3.5
1/2 in 12.7 mm	3/4-16	15-42	20-56	2.1-5.8
5/8 in 15.9 mm	7/8-14	25-58	34-78	3.5-8.0
3/4 in 19.0 mm	1-1/16-12	40-80	54-108	5.5-11.1
7/8 in 22.2 mm	1-3/16-12	60-100	81-135	8.3-13.9
1.0 in 25.4 mm	1-5/16-12	75-117	102-158	10.4-16.2
1-1/4 in 31.8 mm	1-5/8-12	125-165	169-223	17.3-22.8
1-1/2 in 38.1 mm	1-7/8-12	210-250	285-338	29.0-34.6

Tube OD Hose ID	Thread Size	Pound- Feet	Newton metres	Kilogram metres
Straight Threads with O-ring				
1/4 in 6.4 mm	7/16-20	12-19	16-25	1.7-2.6
5/16 in 7.9 mm	1/2-20	16-25	22-33	2.2-3.5
3/8 in 9.5 mm	9/16-18	25-40	34-54	3.5-5.5
1/2 in 12.7 mm	3/4-16	42-67	57-90	5.8-9.3
5/8 in 15.9 mm	7/8-14	58-92	79-124	8.0-12.7
3/4 in 19.0 mm	1-1/16-12	80-128	108-174	11.1-17.8
7/8 in 22.2 mm	1-3/16-12	100-160	136-216	13.8-22.1
1.0 in 25.4 mm	1-5/16-12	117-187	159-253	16.2-25.9
1-1/4 in 31.8 mm	1-5/8-12	165-264	224-357	22.8-36.5
1-1/2 in 38.1 mm	1-7/8-12	250-400	339-542	34.6-55.3

Split Flange Mounting Bolts			
Size	Pound- Feet	Newton metres	Kilogram metres
5/16-18	15-20	20-27	2.1-2.8
3/8-16	20-25	26-33	2.8-3.5
7/16-14	35-45	47-61	4.7-6.2
1/2-13	55-65	74-88	7.6-9.0
5/8-11	140-150	190-203	19.4-20.7

2000

ENGINE AND RADIATOR REMOVAL AND INSTALLATION

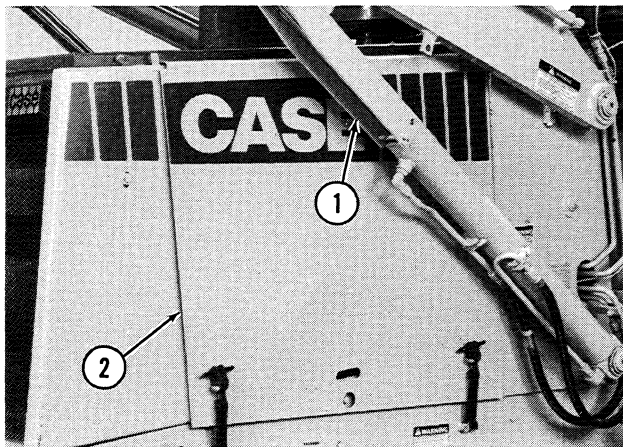
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ENGINE REMOVAL

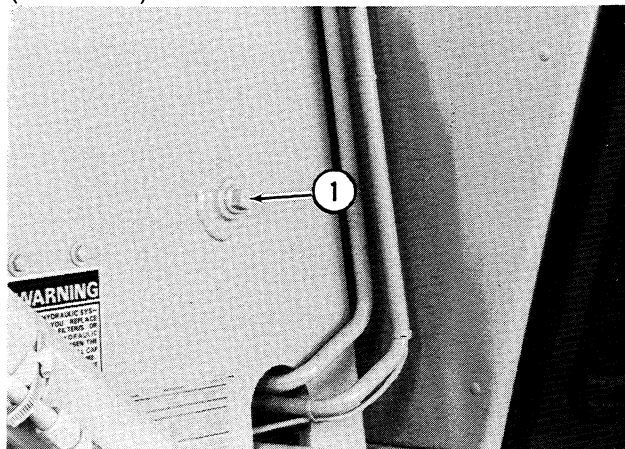
1. Park the machine on a level surface and apply the parking brake.
2. Remove the pin that holds the strut in place and lower the strut onto the lift cylinder.
3. Raise the loader frame until the strut is against the end of the lift cylinder. See photo below.
4. Stop the engine.
5. Install the pin in the strut.
6. Remove both side panels for the engine compartment.



1. *Strut*
2. *Side Panel*

508702

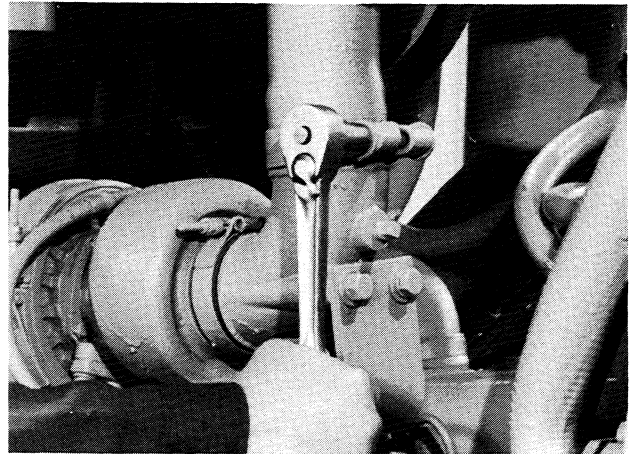
7. Drain the cooling system. The drain valve is located near the center on the bottom tank of the radiator. The cooling system contains approximately 6.75 U.S. gallons (25.6 litres) of coolant.
8. Loosen the fill cap for the reservoir to remove the air pressure.
9. Drain or use a pump to remove the oil from the reservoir. The reservoir contains 18.9 U.S. gallons (71.5 litres) of oil.



1. *Plug*

508706

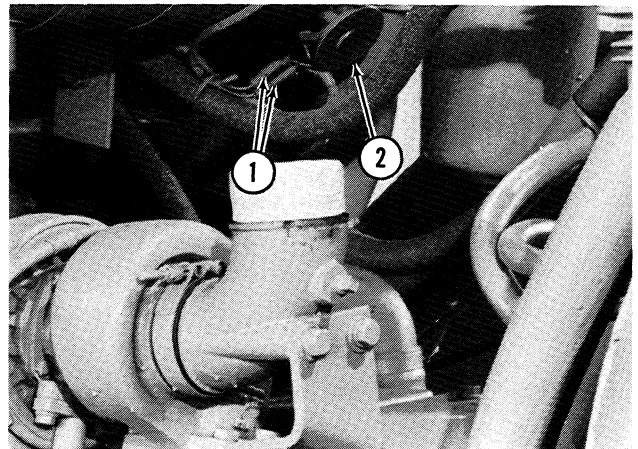
10. Loosen the clamp for the muffler and remove the muffler.



510405

11. Cover or close the opening in the exhaust elbow. See photo below.

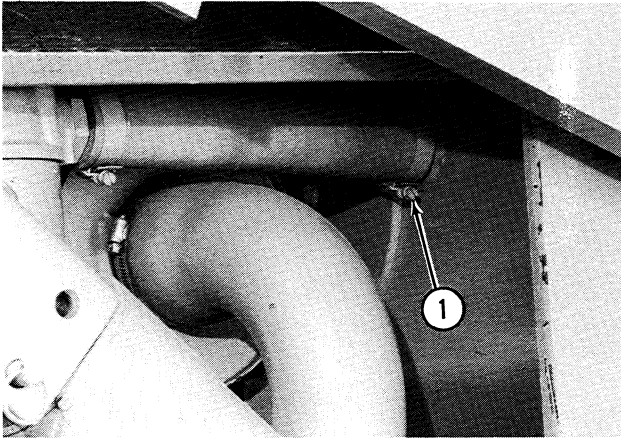
12. Disconnect the terminals from the wire for the hydraulic oil filter, and disconnect the wire harness from the air restriction indicator.



1. *Terminal*
2. *Air Restriction Indicator*

510407

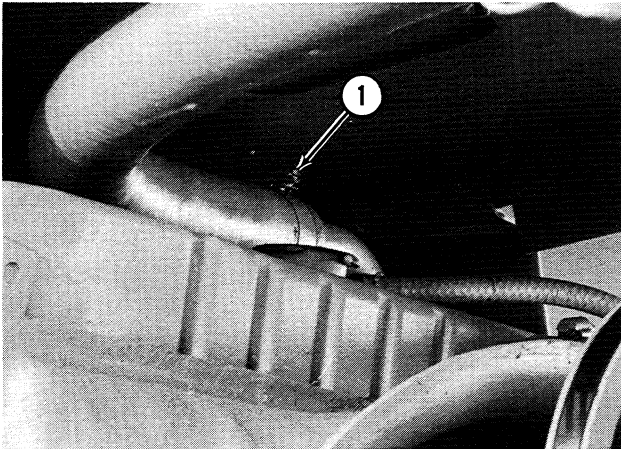
13. Loosen the clamp that connects the hose from the hydraulic oil filter to the reservoir.



1. Clamp

508711

14. Loosen the clamp that connects the hose for the hydraulic oil filter to the oil cooler. Disconnect the hose.

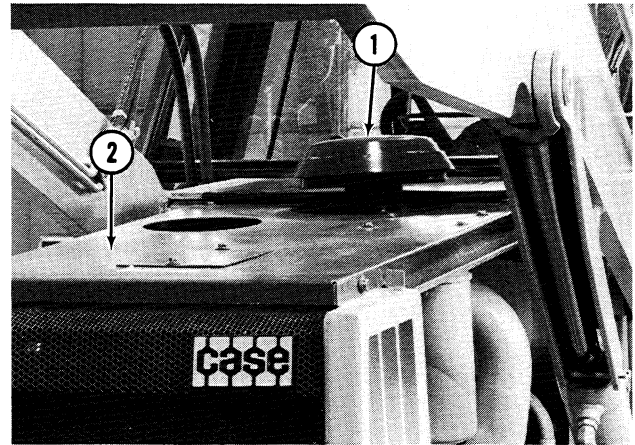


1. Clamp

508713

15. Install a plug in the hose and a cap on the fitting.

16. Remove the cap for the air cleaner and remove the hood. Lift the hood and pull the hood forward to disconnect the hose for the hydraulic oil filter from the reservoir.

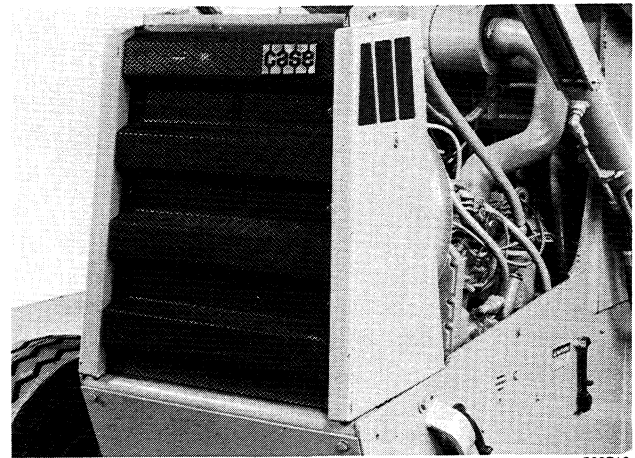


1. Cap
2. Hood

508716

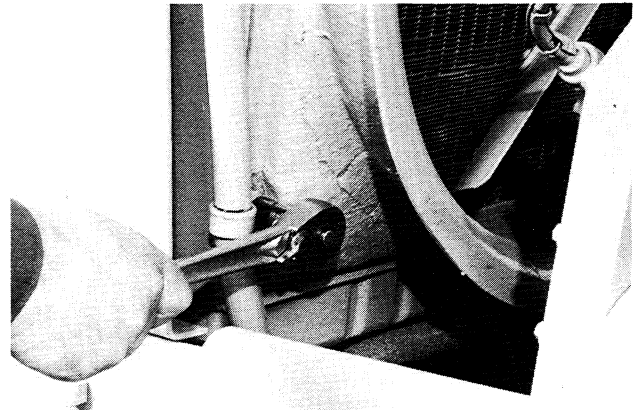
17. Install a plug in the hose and a cap on the fitting.

18. Remove the grille from the radiator shroud.



508718

19. Loosen and remove the cap screws, lock washers, and flat washers that hold the clamps for the hose and the fan shroud to the radiator.

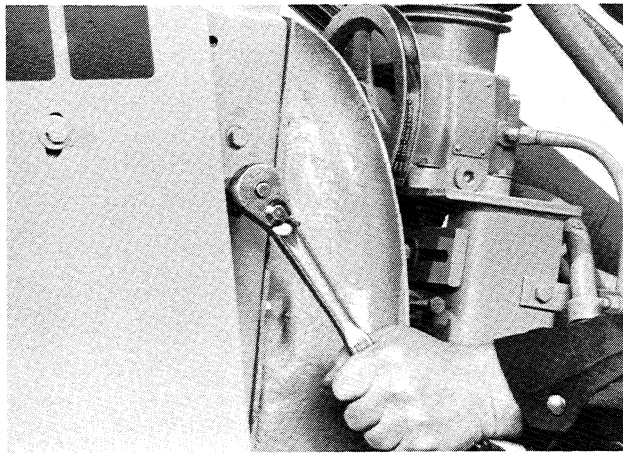


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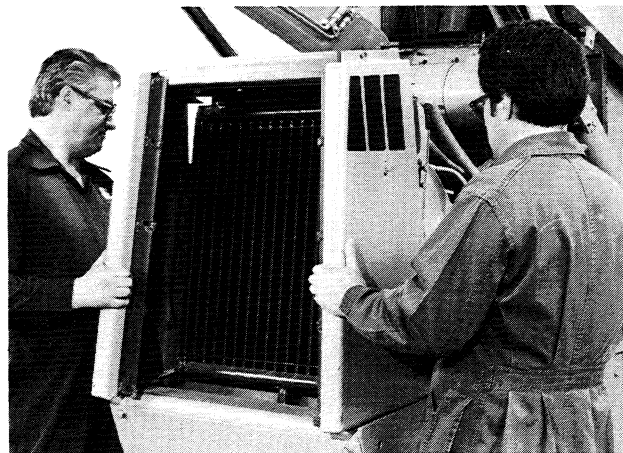
20. Loosen and remove the nuts, lock washers, flat washers, and bolts that hold the radiator shroud to the frame.



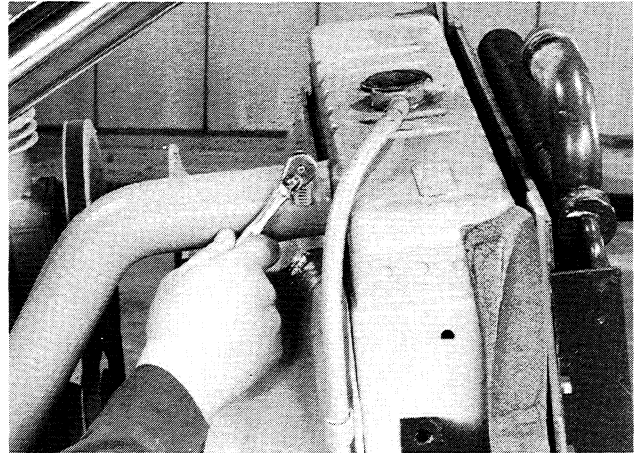
21. Loosen and remove the cap screws, lock washers, and flat washers that hold both mounting straps to the radiator.



22. Remove the radiator shroud.



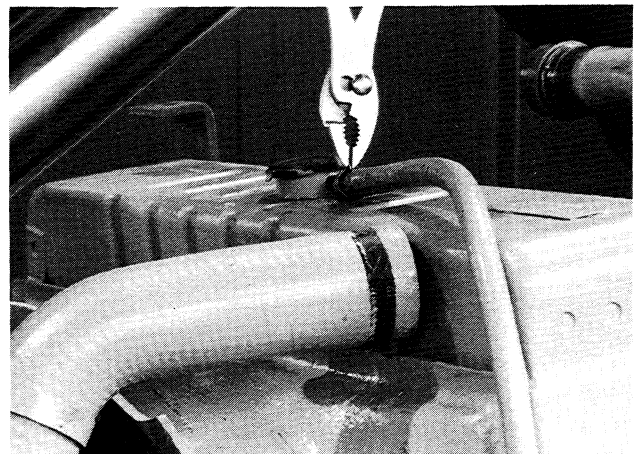
23. Loosen the clamp on the top radiator hose. Disconnect the hose.



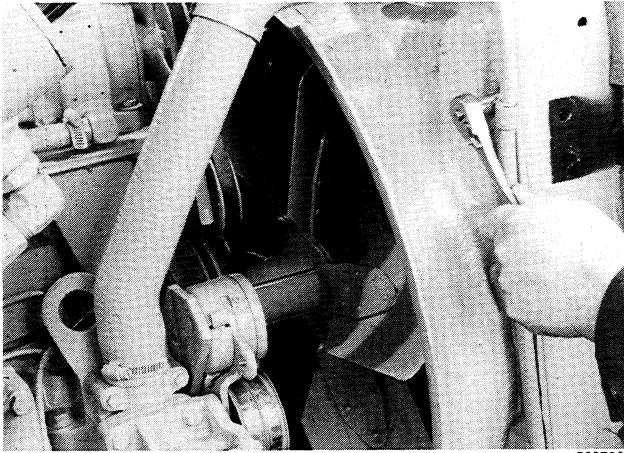
24. Loosen the clamp on the bottom radiator hose. Disconnect the hose.



25. Disconnect the overflow hose.



26. Loosen and remove the cap screws, lock washers, and flat washers that hold the clamps for the overflow hose and the fan shroud to the radiator.

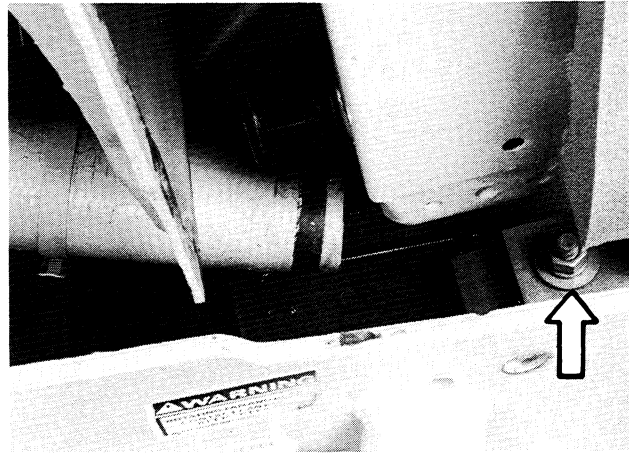


27. Move the fan shroud toward the engine and put the overflow hose out of the way.

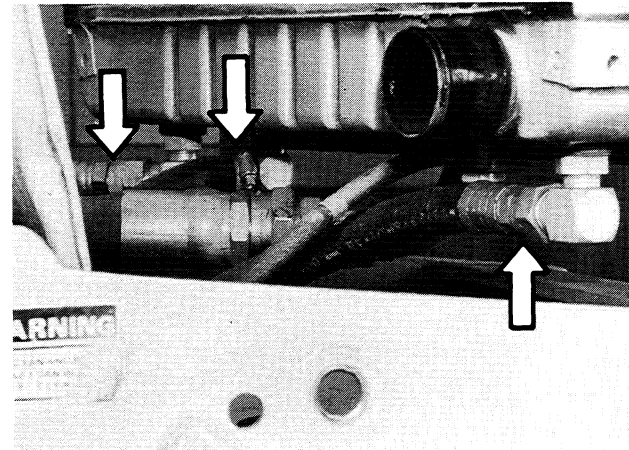
28. If the machine is equipped with air conditioning:

- a. Discharge the air conditioning system according to instructions in Section 9003.
- b. Disconnect the condenser hose from the top of the compressor.
- c. Install a plug in the hose and a cap on the fitting.
- d. Loosen and remove the nut, lock washer, clamp, and bolt that hold the top condenser hose to the support for the radiator.
- e. Disconnect the hose from the bottom of the condenser.
- f. Install a plug in the hose and a cap on the fitting.

29. Loosen and remove the nuts, lock washers, and flat washers that hold the support for the radiator and oil cooler. If equipped with air conditioning, remove the clamp for the bottom condenser hose.

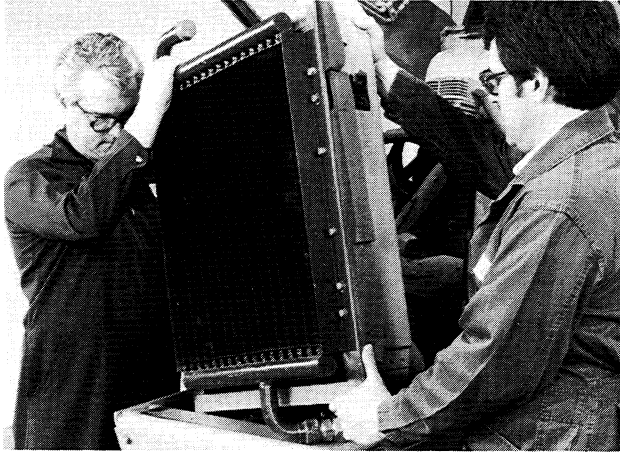


30. Disconnect the hoses from the bottom of the radiator and the oil cooler.



31. Install plugs in the hoses and caps on the fittings.

32. Remove the radiator and oil cooler, and condenser if equipped, from the machine.

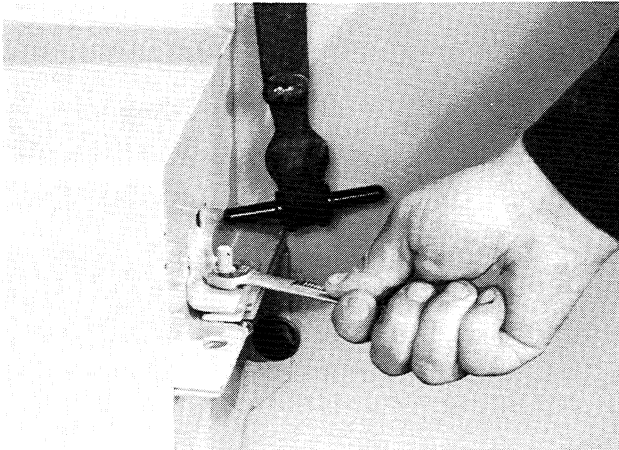


508804

33. If the radiator is being removed for repair or cleaning:

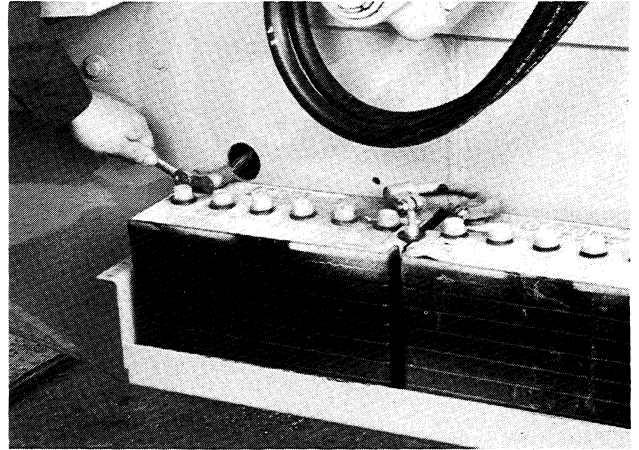
- a. Loosen and remove the cap screws, lock washers, and flat washers that hold the condenser if equipped, and the oil cooler and support to the radiator.
- b. Remove the condenser if equipped, and the oil cooler and support.
- c. Carefully remove the baffles from the radiator.

34. Loosen the nuts that hold the cover for the batteries in place. Remove the cover.



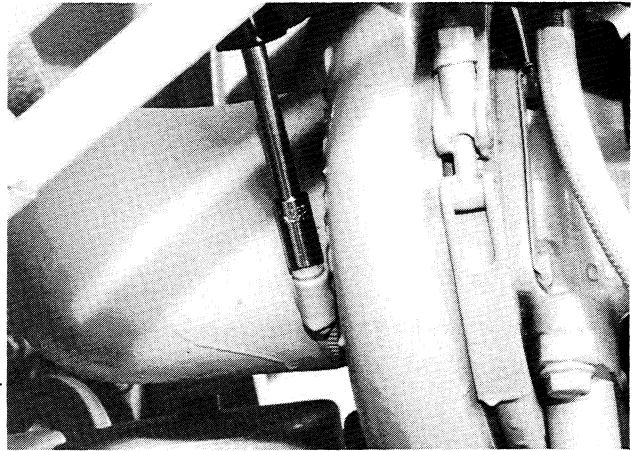
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35. Disconnect the ground cable from the battery.



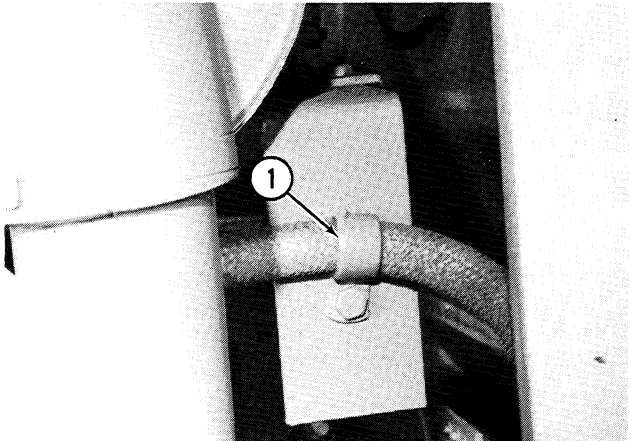
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36. Loosen the clamp on the intake hose for the air cleaner at the turbocharger. Disconnect the hose.



510416

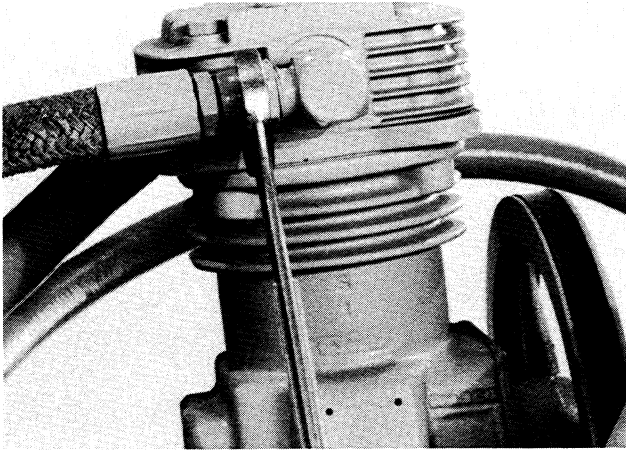
37. Loosen and remove the nut, lock washer, and bolt that hold the clamp for the compressor hose.



1. *Clamp*

510428

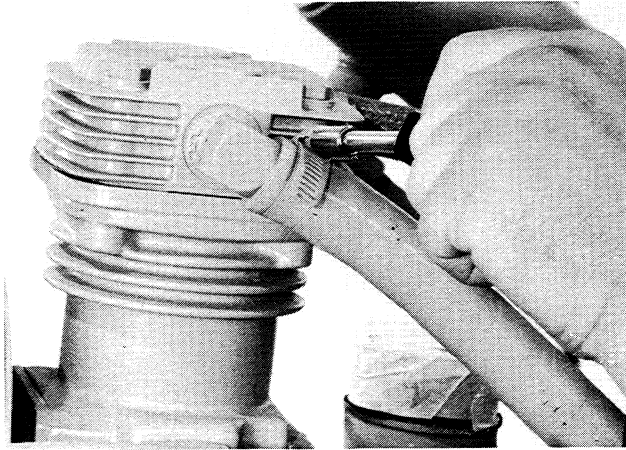
38. Disconnect the hose at the top right side of the compressor.



510409

39. Install a plug in the hose and a cap on the fitting.

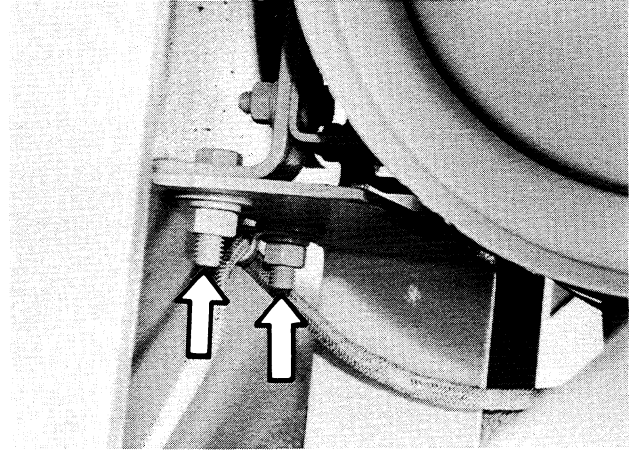
40. Loosen the clamp and disconnect the hose at the top left side of the compressor.



510418

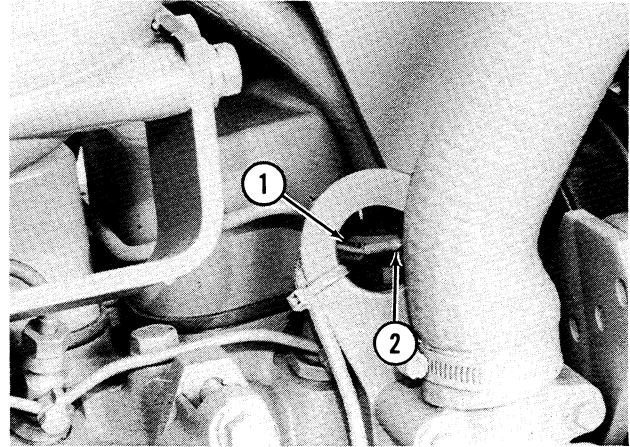
41. Install a plug in the hose and a cap on the fitting.

42. Loosen and remove the nuts, lock washers, and bolts that hold the clamp for the wire harness, bracket, and air cleaner to the reservoir. Remove the air cleaner and bracket.



510512

43. Loosen the clamp on the bypass hose at the top of the engine, and disconnect the hose. Install a plug in the hose and a cap on the fitting. Disconnect the wire from the temperature switch. Cut and remove the tie strap from the wire.



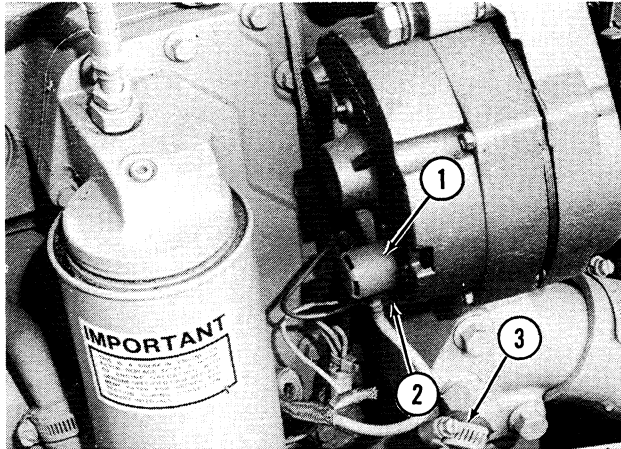
510411

1. Bypass Hose
2. Wire

44. If equipped with air conditioning:

- a. Cut and remove the tie straps that fasten the wire for the clutch to the wire harness.
- b. Disconnect the wire from the clutch, and put the wire out of the way.
- c. Disconnect the wire harness from the receiver-drier.

45. Remove the plastic cap and disconnect the wires and the plug from the alternator. Loosen the clamp on the heater hose below the alternator, and disconnect the hose.



1. Plastic Cap
2. Plug
3. Clamp

510414

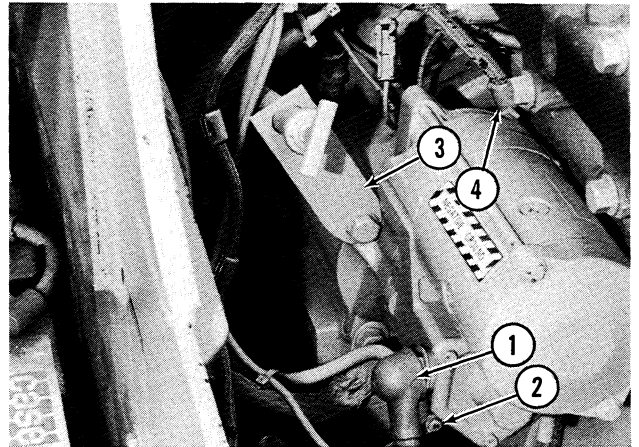
46. Install a plug in the hose and a cap on the fitting.

47. Loosen and remove the cap screws and lock washers that hold the clamps for the wire harness to the engine.



508824

48. Remove the boot and disconnect the cables from the battery terminal on the starter. Disconnect the small wire from the start terminal on the starter. Loosen and remove the cap screw and lock washer that hold the brace for the dipstick to the starter. Loosen and remove the cap screw and lock washer that hold the clamp for the wire harness to the rear of the engine.

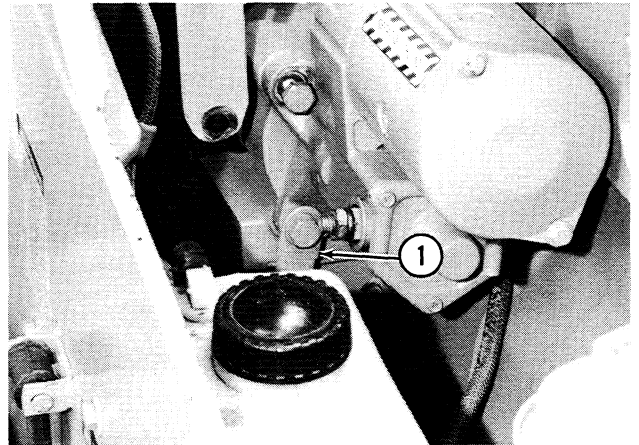


1. Boot
2. Small Wire
3. Brace
4. Clamp

508828

49. Move the wire harness out of the way.

50. Loosen and remove the cap screw and lock washer that hold the ground strap to the alternator.



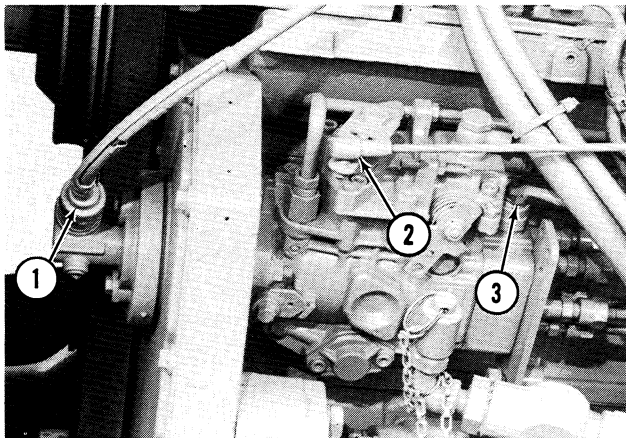
1. Ground Strap

508830

51. If the machine is equipped with ether injection:

- a. Disconnect the tube from the intake manifold.
- b. Cut the two tie straps that fasten the tube and the wire for the ether injection to the tachometer drive cable.
- c. Cut the tie strap that fastens the other wire for the ether injection to the hose at the bottom of the reservoir.
- d. Disconnect both wires for the ether injection.
- e. Loosen and remove the cap screws and flat washers that hold the bracket for the ether injection to the frame.
- f. Remove the ether injection from the engine and frame.

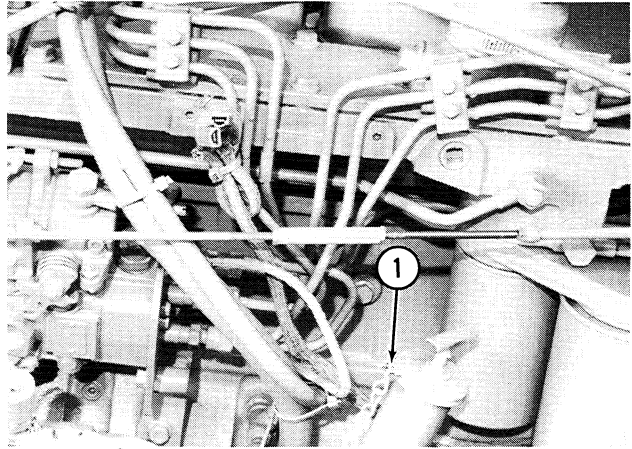
52. Disconnect and remove the tachometer drive cable from the engine. Disconnect the throttle cable from the arm on the fuel injection pump. Disconnect the wire harness from the terminal for the fuel injection solenoid on the fuel injection pump.



- 1. Tachometer Drive Cable
- 2. Throttle Cable
- 3. Terminal

510422

53. Disconnect the chain from the dipstick.



- 1. Chain

510424

54. Disconnect the wire harness from the oil pressure switch.

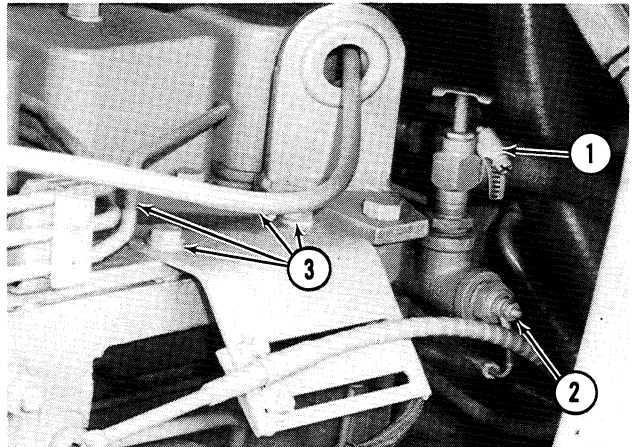
55. Disconnect the top hose from the hydraulic pump.

56. Install a plug in the hose and a cap on the fitting.

57. Disconnect the bottom hose from the hydraulic pump.

58. Install a plug in the hose and a cap on the fitting.

59. Loosen and remove the cap screws that fasten the bracket for the throttle cable to the engine. Disconnect the wire for the heater temperature switch. Loosen the clamp on the heater hose and disconnect the hose.



- 1. Clamp
- 2. Wire
- 3. Cap Screws

510426

60. Install a plug in the hose and a cap on the fitting.

61. Close the shutoff valve for the fuel line at the bottom of the fuel tank.

62. Disconnect the fuel supply line from the hand primer pump. Install a plug in the hose and a cap on the fitting.

63. Loosen the clamp on the hose for the fuel return line, and disconnect the hose. Install a plug in the hose and a cap on the fuel return line.

64. There are eight cap screws with lock washers that fasten the flex plates to the flywheel. The engine must be rotated to align each cap screw with the access hole in the flywheel housing at the LH side of the engine. Do the following steps to remove the eight cap screws.

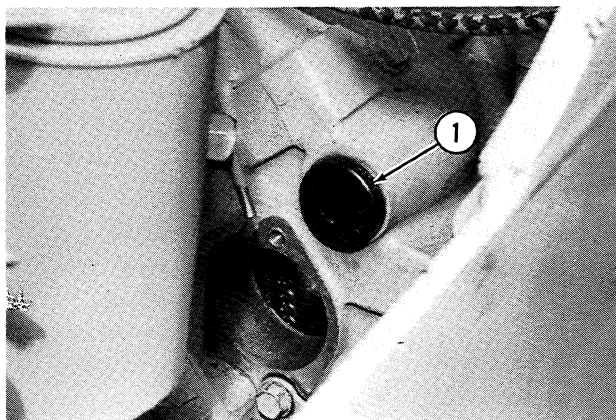
a. Remove the plastic plug from the flywheel housing.

b. Install the CAS-1690 tool shown below to turn the flywheel.



430842

c. Remove the cover and gasket from the access hole for the cap screws.

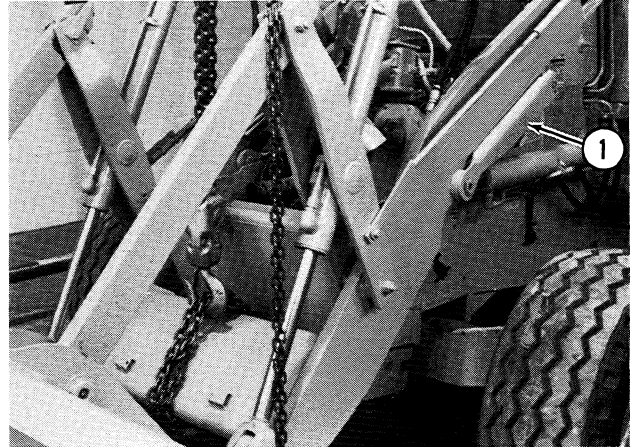


1. CAS-1690 Tool

508606

d. Loosen and remove all eight cap screws and lock washers that fasten the flex plates to the flywheel.

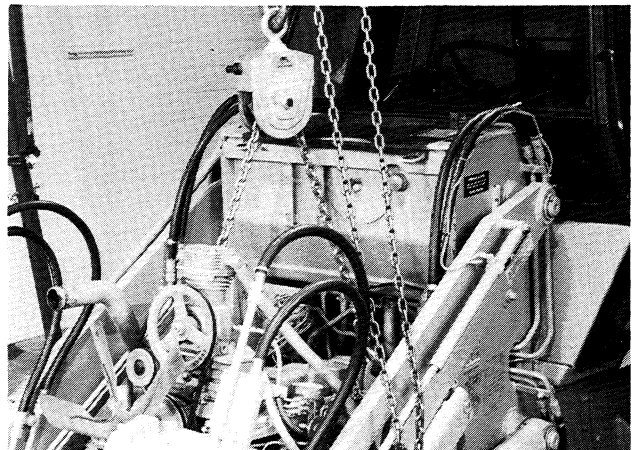
65. Connect a chain and chain hoist to the loader frame. Put the loader control lever in the FLOAT position. Use the chain hoist to lift the loader frame a small amount so that the strut can be put in place on the loader frame. Install the strut in place and lower the loader frame all the way to the floor.



1. Strut

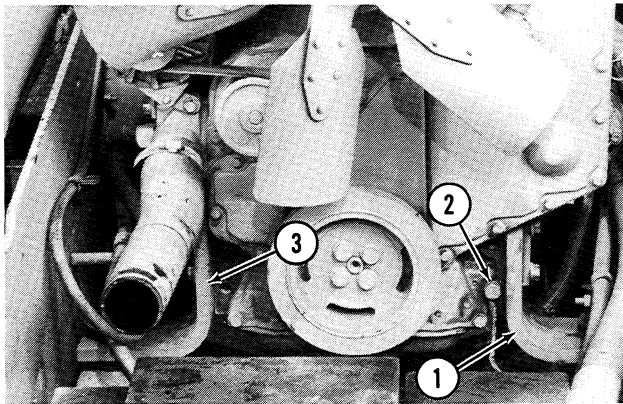
508609R

66. Connect an adjustable lifting sling to the lifting eyes on the engine. Connect a chain hoist to the adjustable lifting sling.



508627

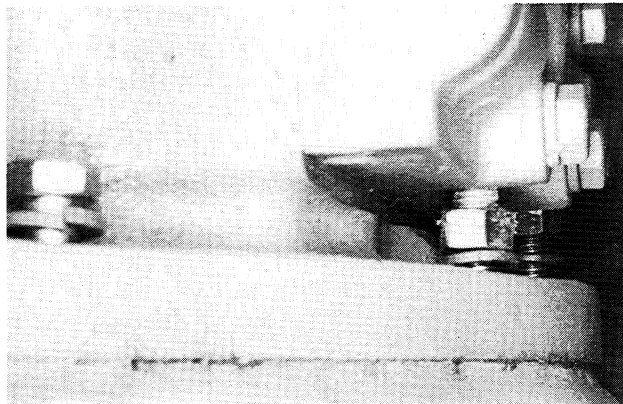
67. Loosen and remove the cap screws and flat washers that hold the LH engine mounting bracket to the engine. Disconnect the ground wire from the LH front side of the engine. Loosen and remove the cap screws and flat washers that hold the RH engine mounting bracket to the engine. Loosen and remove the self-locking nut, flat washers, and bolt that hold the RH engine mounting bracket to the frame. Remove the RH engine mounting bracket.



- 1. LH Engine Mounting Bracket
- 2. Ground Wire
- 3. RH Engine Mounting Bracket

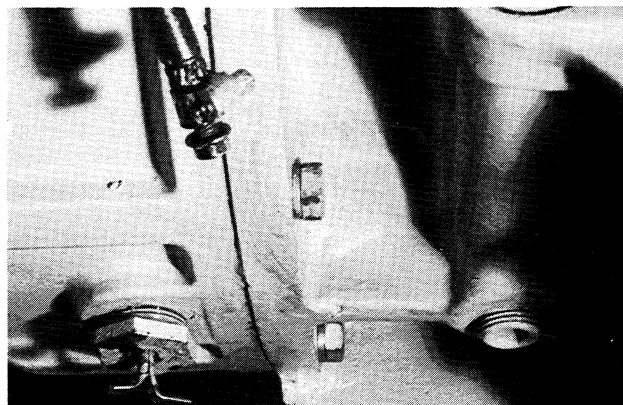
508615

68. Loosen the nuts on the two studs. The two studs are located on the right side of the flywheel housing next to the transmission control valve.



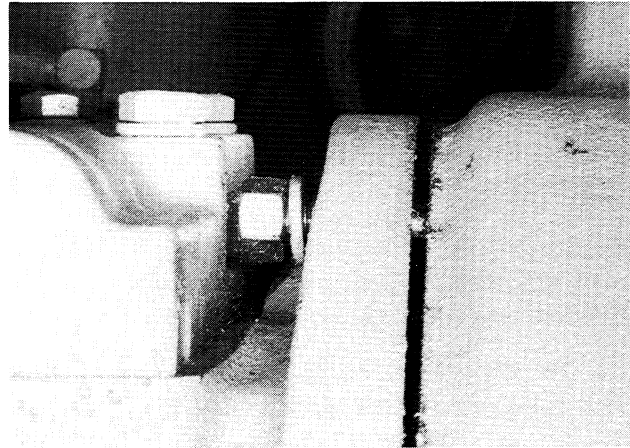
125733

69. Loosen and remove the cap screws and lock washers that hold the engine to the flywheel housing.



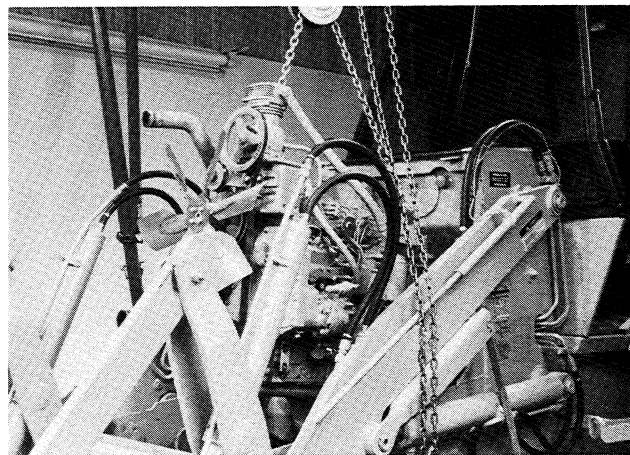
508617

70. Move the engine forward and remove the nuts and lock washers from the two studs.



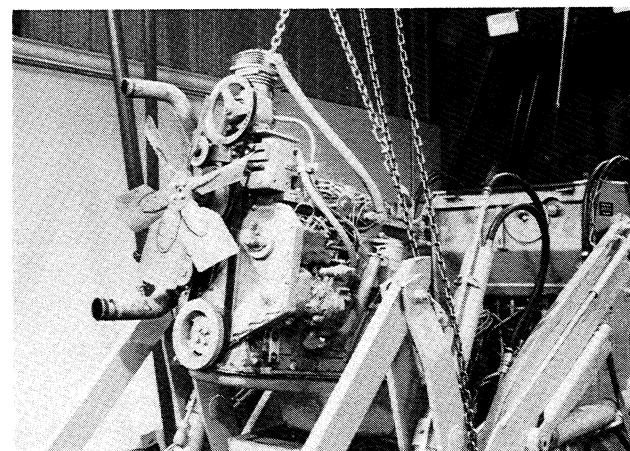
125737

71. Raise the front of the engine.



508619R

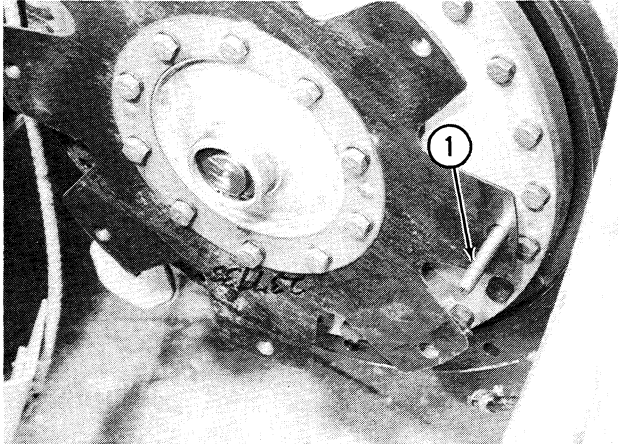
72. Move the engine forward while raising the engine at the same time. Remove the engine from the machine.



508623R

ENGINE INSTALLATION

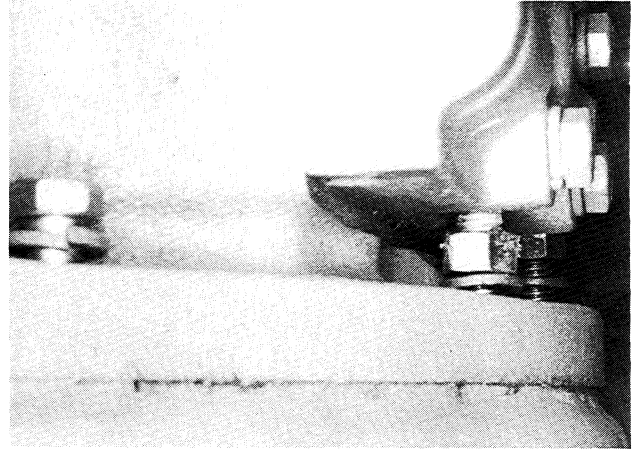
1. Install a stud 2-3/4 inches (70 mm) long with 3/8 NF threads in one of the holes in the flex plates. Turn the flex plates so that the stud is to the left side as shown. Make sure that the flex plates are not bent or damaged. Turn the crankshaft to align one of the holes in the flywheel with the stud.



1. Stud

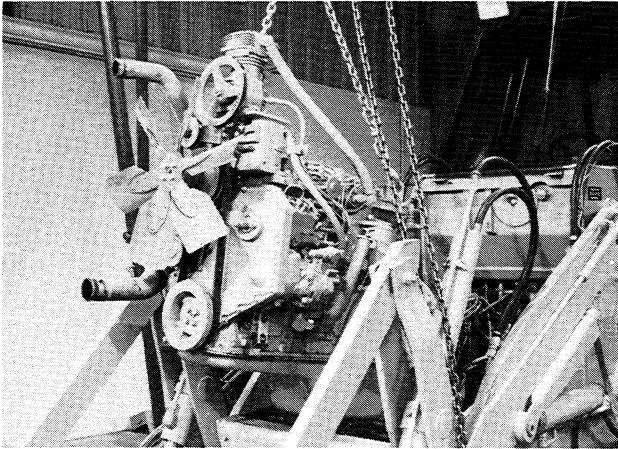
508621

4. Install the lock washers and nuts on the two studs. The two studs are located on the right side of the flywheel housing next to the transmission control valve.



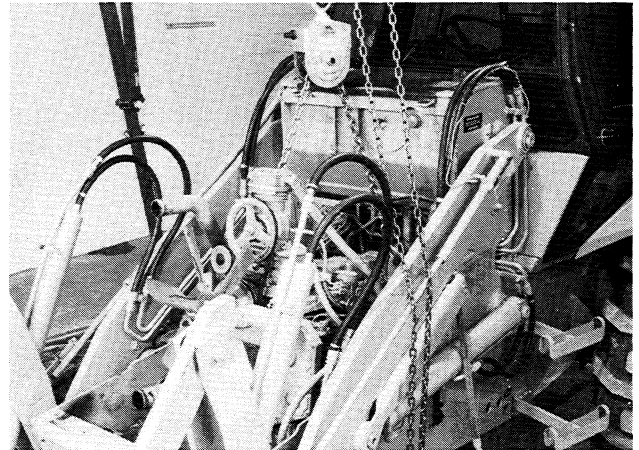
125733

2. Install the engine over the frame.



508623R

5. Push the engine to the rear.



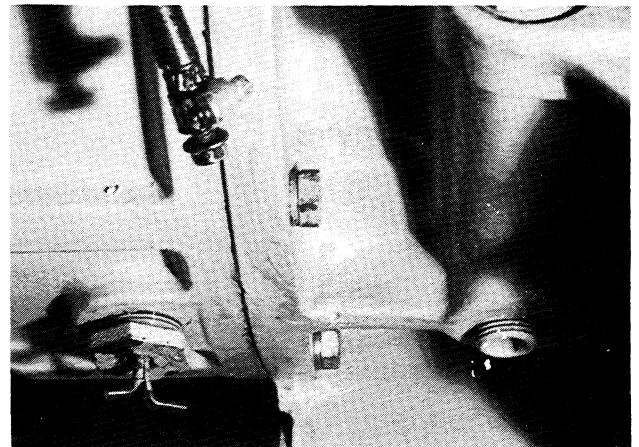
508625R

3. Move the engine toward the rear and lower the engine. Have another person align the stud in the flex plates with the hole in the flywheel.



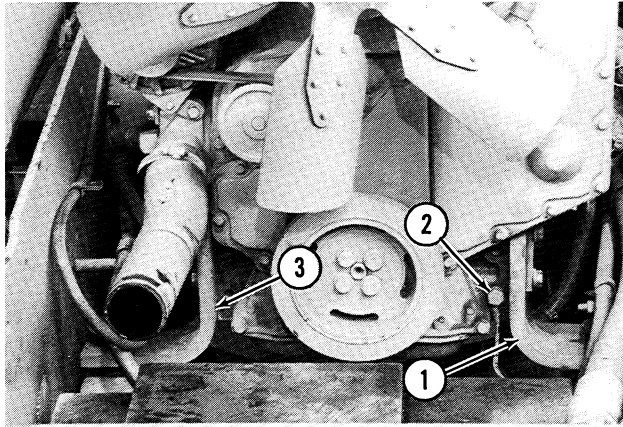
508619R

6. Install and tighten the cap screws and lock washers that hold the engine to the flywheel housing. Tighten the nuts on the two studs.



508617

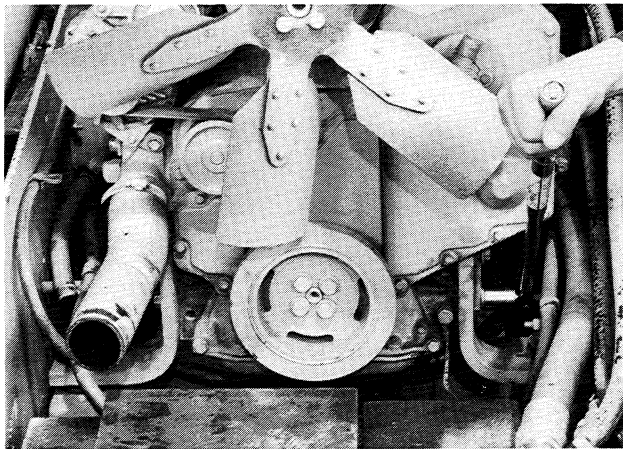
7. Install the RH engine mounting bracket. Install the bolt, flat washers, and self-locking nut that hold the RH engine mounting bracket to the frame. Install the cap screws and flat washers that hold the RH engine mounting bracket to the frame. Connect the ground wire to the LH front side of the engine. Install the cap screws and flat washers that hold the LH engine mounting bracket to the engine.



1. LH Engine Mounting Bracket
2. Ground Wire
3. RH Engine Mounting Bracket

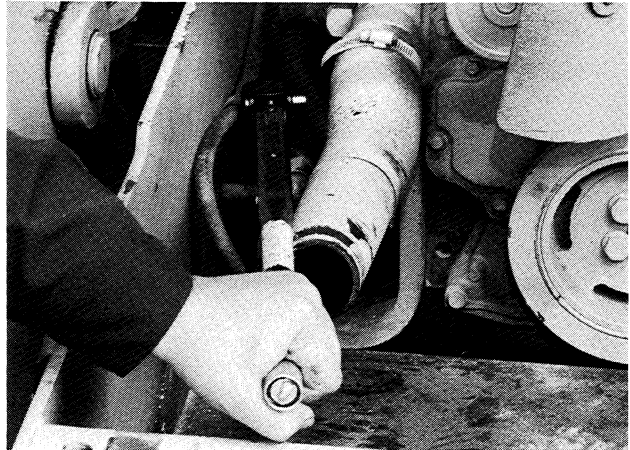
508615

8. Tighten the cap screws and flat washers that hold both engine mounting brackets to the engine to 66 to 79 pound-feet (89 to 107 N m, 9.1 to 10.9 kg/m).



508611

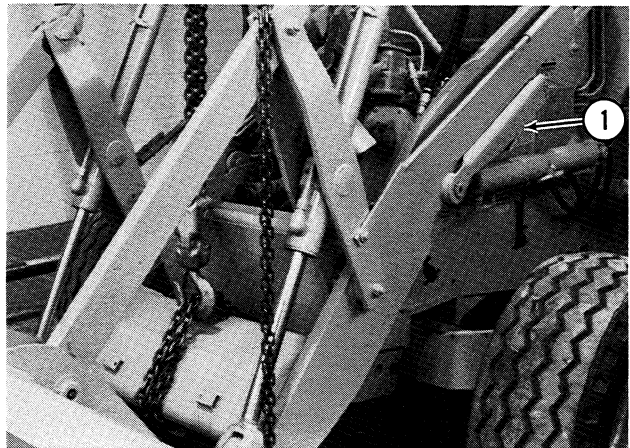
9. Tighten the bolt that holds the RH engine mounting bracket to the frame to 150 to 160 pound-feet (203 to 216 N m, 20.7 to 22.1 kg/m).



508613

10. Disconnect and remove the lifting equipment from the engine.

11. Connect a chain and chain hoist to the loader frame. Put the loader control lever in the FLOAT position. Remove the pin that holds the strut in place and lower the strut onto the lift cylinder. Use the chain hoist to raise the loader frame until the strut is against the end of the lift cylinder. Install the pin in the strut.



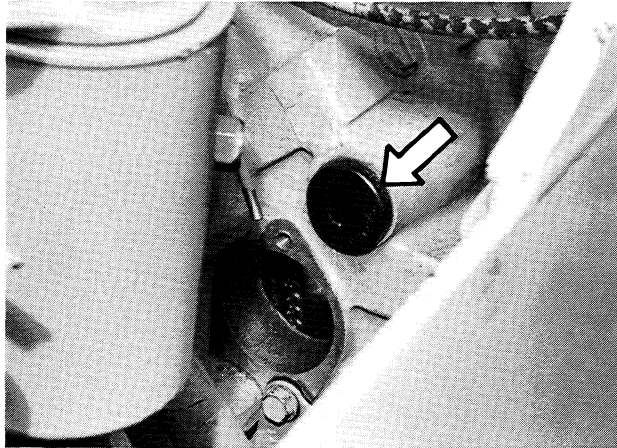
1. Strut

508609R

12. Remove the stud from the flex plates.

13. Install a cap screw and lock washer.

14. Install the CAS-1690 tool shown below to turn the flywheel.



508606

15. Install the remainder of the cap screws and lock washers.

16. Tighten the cap screws to 25 to 30 pound-feet (34 to 40 N m, 3 to 4 kg/m).

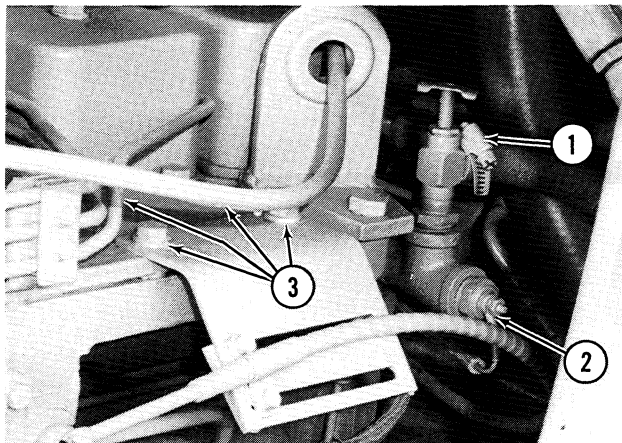
17. If necessary, install a new gasket on the cover for the access hole in the flywheel housing. Install the cover.

18. Remove the CAS-1690 tool and install the plastic plug.

19. Connect the fuel supply line to the hand primer pump. Connect the hose for the fuel return line and tighten the clamp.

20. Open the shutoff valve for the fuel line at the bottom of the fuel tank.

21. Connect the heater hose and tighten the clamp. Connect the wire for the water temperature switch. Install the bracket for the throttle cable to the engine. Install and tighten the cap screws that fasten the bracket.



510426

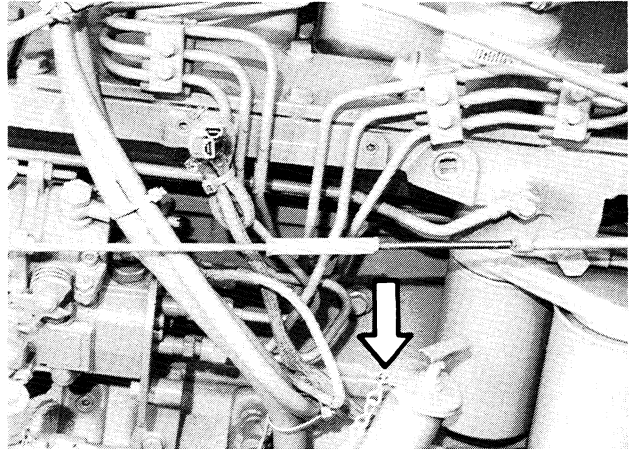
1. Clamp
2. Wire
3. Cap Screws

22. Connect the bottom hose to the hydraulic pump and tighten the clamp.

23. Connect the top hose to the hydraulic pump.

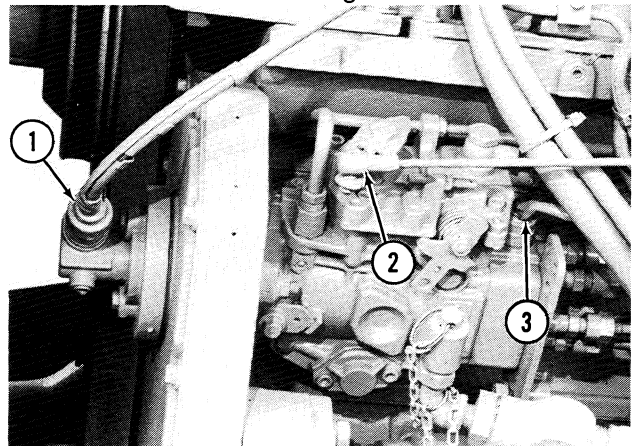
24. Connect the wire harness to the oil pressure switch.

25. Connect the chain to the dipstick.



510424

26. Connect the wire harness to the terminal for the fuel injection solenoid on the fuel injection pump. Connect the throttle cable to the arm on the fuel injection pump. Install and connect the tachometer drive cable to the engine.



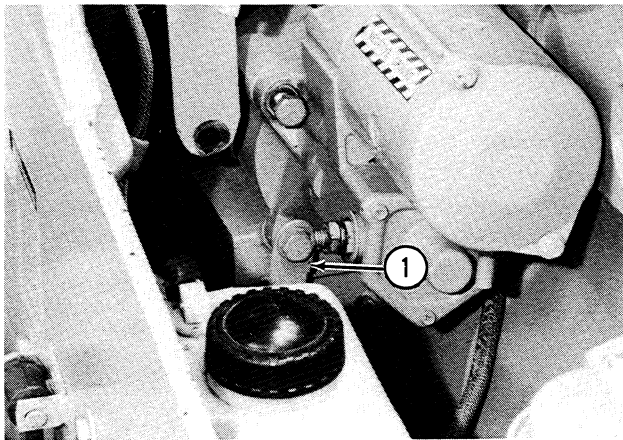
510422

1. Tachometer Drive Cable
2. Throttle Cable
3. Terminal

27. If the machine is equipped with ether injection:

- a. Hold the bracket for the ether injection in position on the frame, and install the cap screws and flat washers.
- b. Tighten the cap screws.
- c. Connect both wires for the ether injection.
- d. Install a new tie strap to fasten the wire for the ether injection to the hose at the bottom of the reservoir.
- e. Install two new tie straps to fasten the tube and the other wire for the ether injection to the tachometer drive cable.
- f. Connect the tube to the intake manifold.

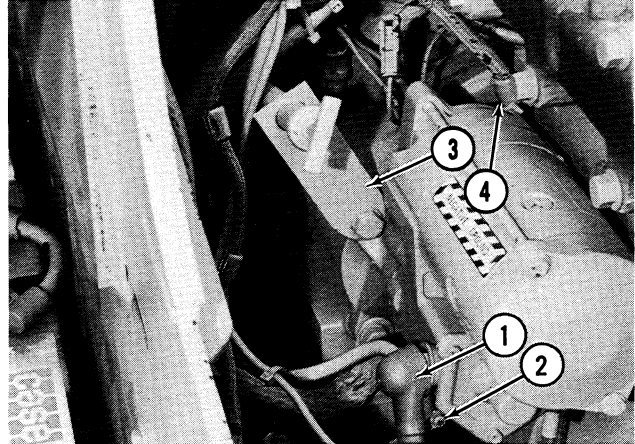
28. Install and tighten the cap screw and lock washer that hold the ground strap to the alternator.



1. Ground Strap

508830

29. Install and tighten the cap screw and lock washer that hold the clamp for the wire harness to the rear of the engine. Install and tighten the cap screw and lock washer that hold the brace for the dipstick to the starter. Connect the small wire to the start terminal on the starter. Connect the cables to the battery terminal on the starter and install the boot.



1. Boot
2. Small Wire
3. Brace
4. Clamp

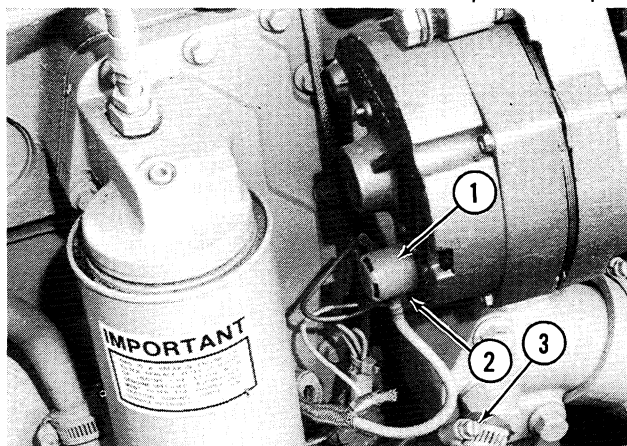
508828

30. Install and tighten the cap screws and lock washers that hold the clamps for the wire harness to the engine.



508824

31. Connect the heater hose below the alternator and tighten the clamp. Connect the plug and the wires to the alternator and install the plastic cap.



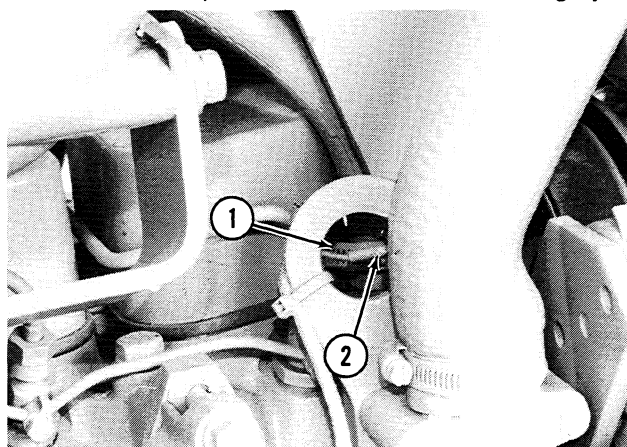
1. Plastic Cap
2. Plug
3. Clamp

510414

32. If equipped with air conditioning:

- a. Connect the wire harness to the receiver-drier.
- b. Connect the wire to the clutch.
- c. Install new tie straps to fasten the wire for the clutch to the wire harness.

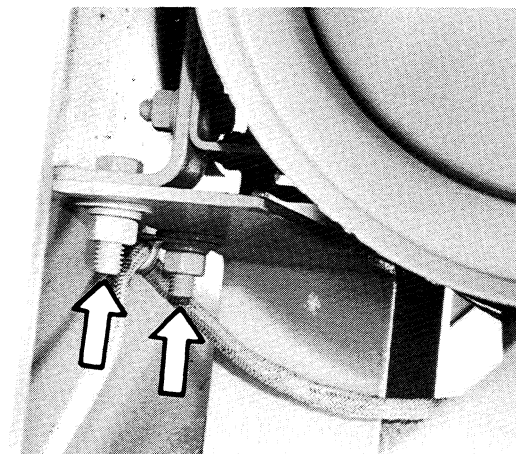
33. Connect the wire to the temperature switch. Connect the bypass hose to the top of the engine and tighten the clamp. Install a new tie strap to the wire for the temperature switch and the lifting eye.



1. Bypass Hose
2. Wire

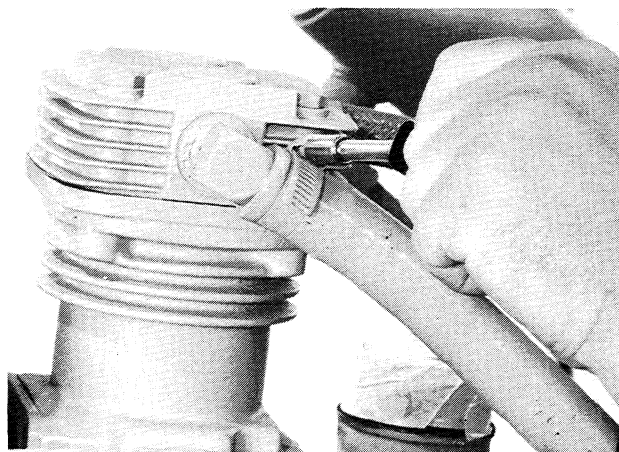
510411

34. Install the air cleaner to the brackets on the reservoir. Hold the air cleaner in place and install the bolts, flat washers, lock washers, and nuts. Install the bolts, flat washers, bracket, clamp for the wire harness, and lock washers and nuts. Tighten all of the nuts and bolts.



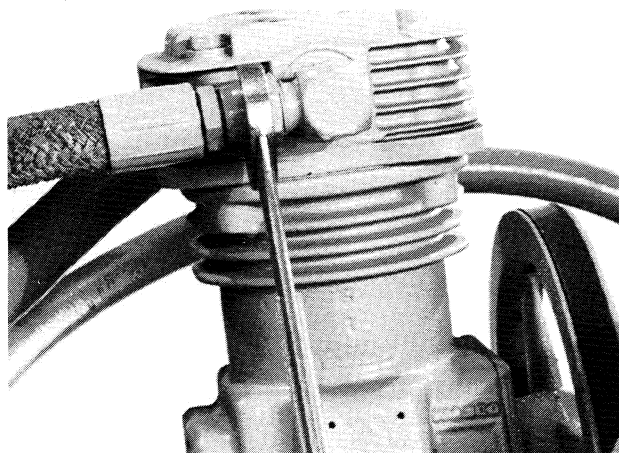
510512

35. Connect the hose to the top left side of the compressor and tighten the clamp.



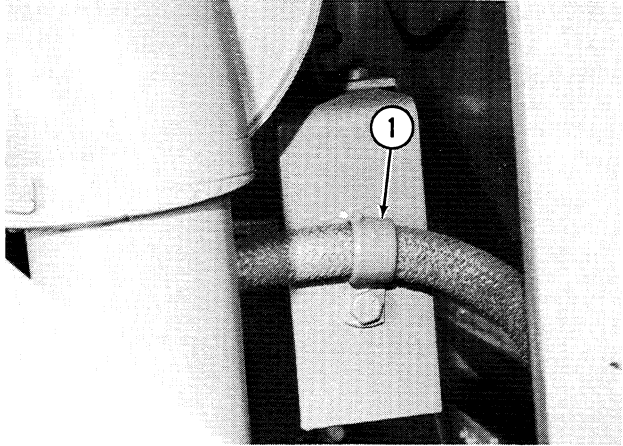
510418

36. Connect the hose to the top right side of the compressor.



510409

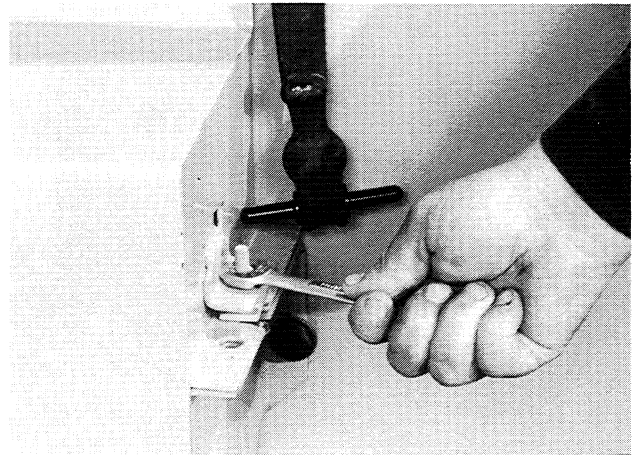
37. Install the bolt, clamp, lock washer, and nut that hold the compressor hose.



1. Clamp

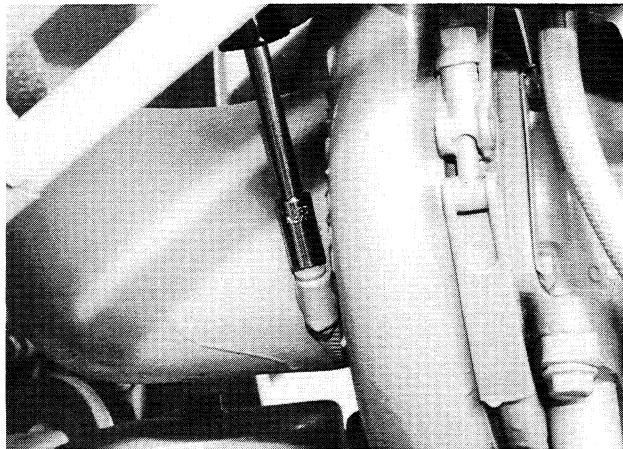
510428

40. Install the cover for the batteries and tighten the nuts that hold the cover in place.



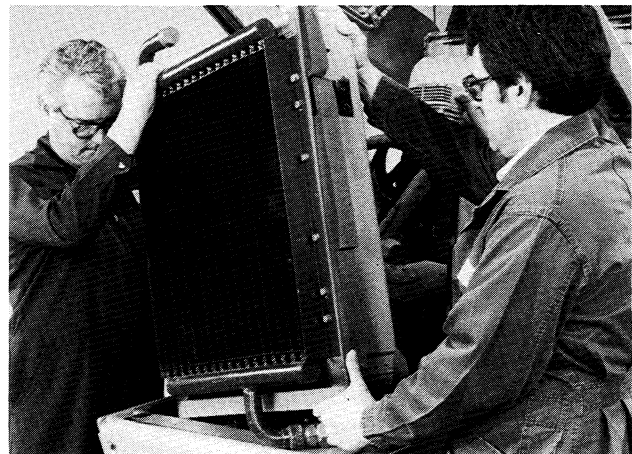
508806

38. Connect the intake hose for the air cleaner to the turbocharger. Tighten the clamp.



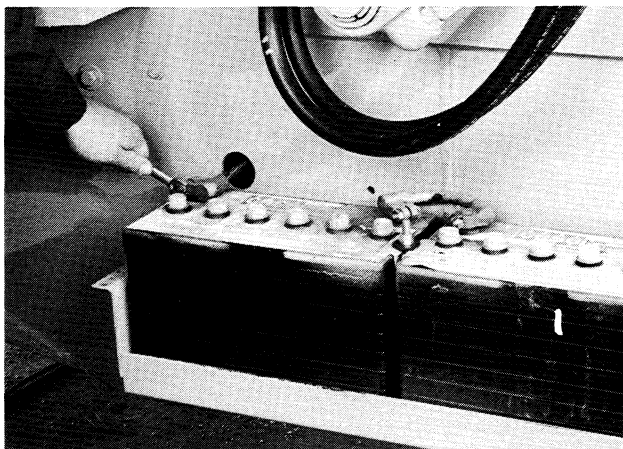
510416

41. Have another person help you install the radiator and oil cooler, and condenser if equipped, on the front of the machine.



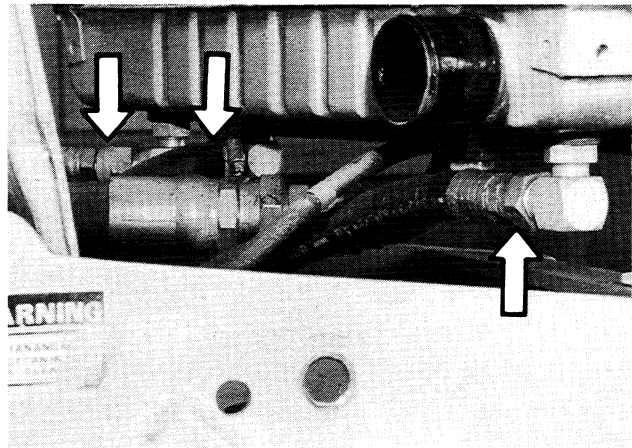
508804

39. Connect the ground cable to the battery.



508808

42. Connect the hoses to the bottom of the oil cooler and the radiator.



508736



Suggest:

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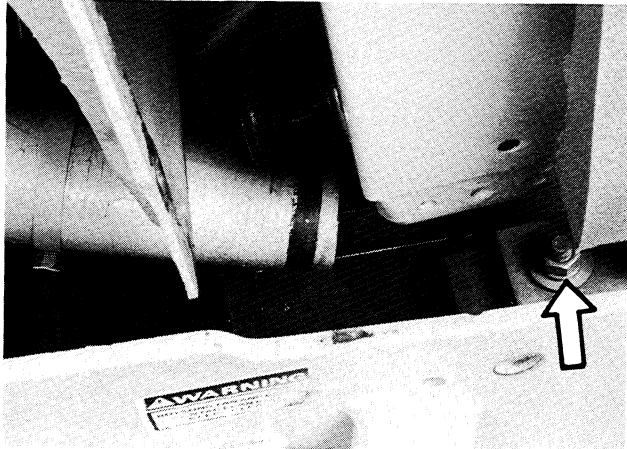
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Thank you so much for reading

43. Install the flat washers, lock washers, clamp for the condenser hose if equipped with air conditioning, and nuts that hold the support for the radiator, oil cooler, and condenser if equipped.



508734

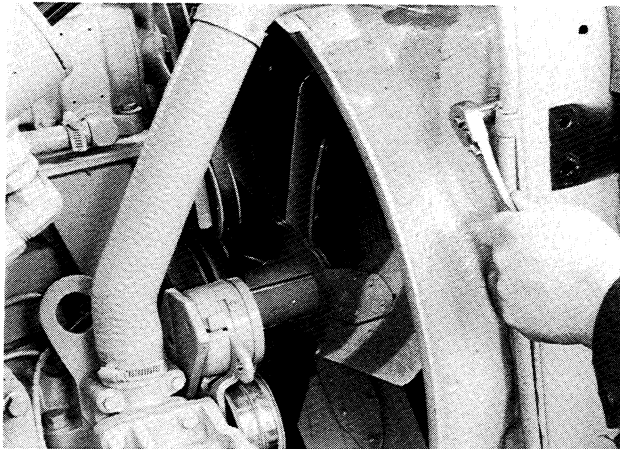
44. Tighten the nuts.

45. If the machine is equipped with air conditioning:

- a. Connect the hose to the bottom of the condenser.
- b. Install the clamp, bolt, lock washer, and nut that hold the top condenser hose to the support for the radiator. Tighten the nut.
- c. Connect the condenser hose to the compressor.

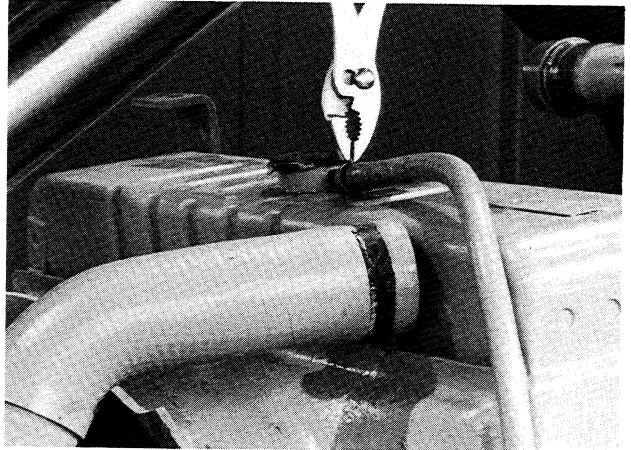
46. Install the fan shroud against the radiator and put the overflow hose and clamps in place.

47. Install the cap screws, lock washers, and flat washers that hold the clamps for the overflow hose and the fan shroud to the radiator. Tighten the cap screws.



508732

48. Connect the overflow hose.



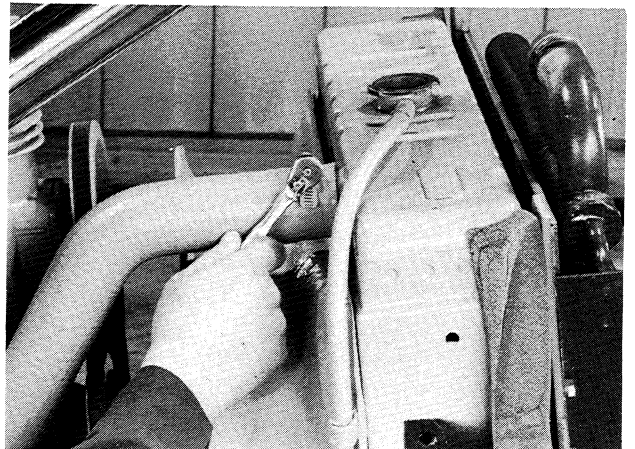
508730

49. Connect the bottom hose to the radiator and tighten the clamp.



508728

50. Connect the top hose to the radiator and tighten the clamp.



508726

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