



INSTRUCTION BULLETIN

No. 9012828
Machine: M20 / T20
(Gas / LPG only)
Published: 10-2014
Rev. 00

NOTE: DO NOT DISCARD the Parts List from the Instruction Bulletin. Place the Parts List in the appropriate place in the machine manual for future reference. Retaining the Parts List will make it easier to reorder individual parts and will save the cost of ordering an entire kit.

NOTE: Numbers in parenthesis () are reference numbers for parts listed in Bill of Materials.

Installation instructions for **kit number 9012811**

SYNOPSIS:

This kit contains the parts needed to install a radiator screen kit on M20 / T20 machines.
(Gas / LPG machines only).

Tennant NA: M20 (Serial Numbers 000000-003038), T20 (Serial Numbers 000000-002092)

Tennant CE: M20 (Serial Numbers 0000-0195), T20 (Serial Numbers 0000-0188)

SPECIAL TOOLS / CONSIDERATIONS: NONE

(Estimated time to complete: 8 hours)

When assembling / disassembling hydraulic components:

1. Thoroughly clean outside of hydraulic components **before** disconnecting hydraulic hoses or fittings and flush hoses and fittings with air, solvent, or hydraulic fluid and cap disconnected hoses or open ports to prevent contaminants from entering system.
2. Mark hydraulic hoses with locations of where they are attached. Markings make it easier to reconnect hoses to proper locations.
3. Discard all hydraulic fluid drained from the system. Use only new approved hydraulic fluid to replenish hydraulic reservoir. Hydraulic fluid is potentially dangerous to the environment. Obey all federal, state, and local laws/regulations governing the disposal of environmentally hazardous materials when disposing hydraulic fluid.



PROTECT THE ENVIRONMENT

Please dispose of packaging materials, used machine components such as batteries and fluids in an environmentally safe way according to local waste disposal regulations.

Always remember to recycle.

PREPARATION:

1. Park the machine on a clean level surface, turn off the machine, set the parking brake, and remove the key.

FOR SAFETY: Before leaving or servicing machine, stop on level surface, turn off machine, set parking brake, and remove key.

2. Open the engine cover and remove the front shroud from the machine. Set the front shroud and all hardware aside.
3. Remove the engine access panel from the operator compartment. Set the access panel and hardware aside. Refer to Fig. 1.

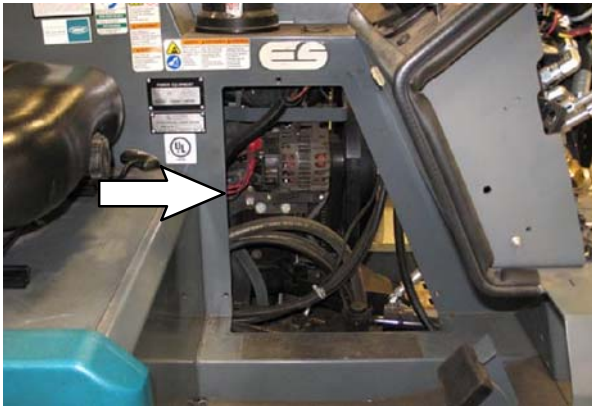


FIG. 1

4. Remove the radiator cap from the radiator. Discard the radiator cap.

FOR SAFETY: When servicing machine, avoid contact with hot engine coolant, do not remove cap from radiator when engine is hot, and allow engine to cool.

5. Position a 3 gal (11.3 L) or larger container beneath the machine and drain the antifreeze from the engine coolant system into the container. Discard the drained antifreeze.

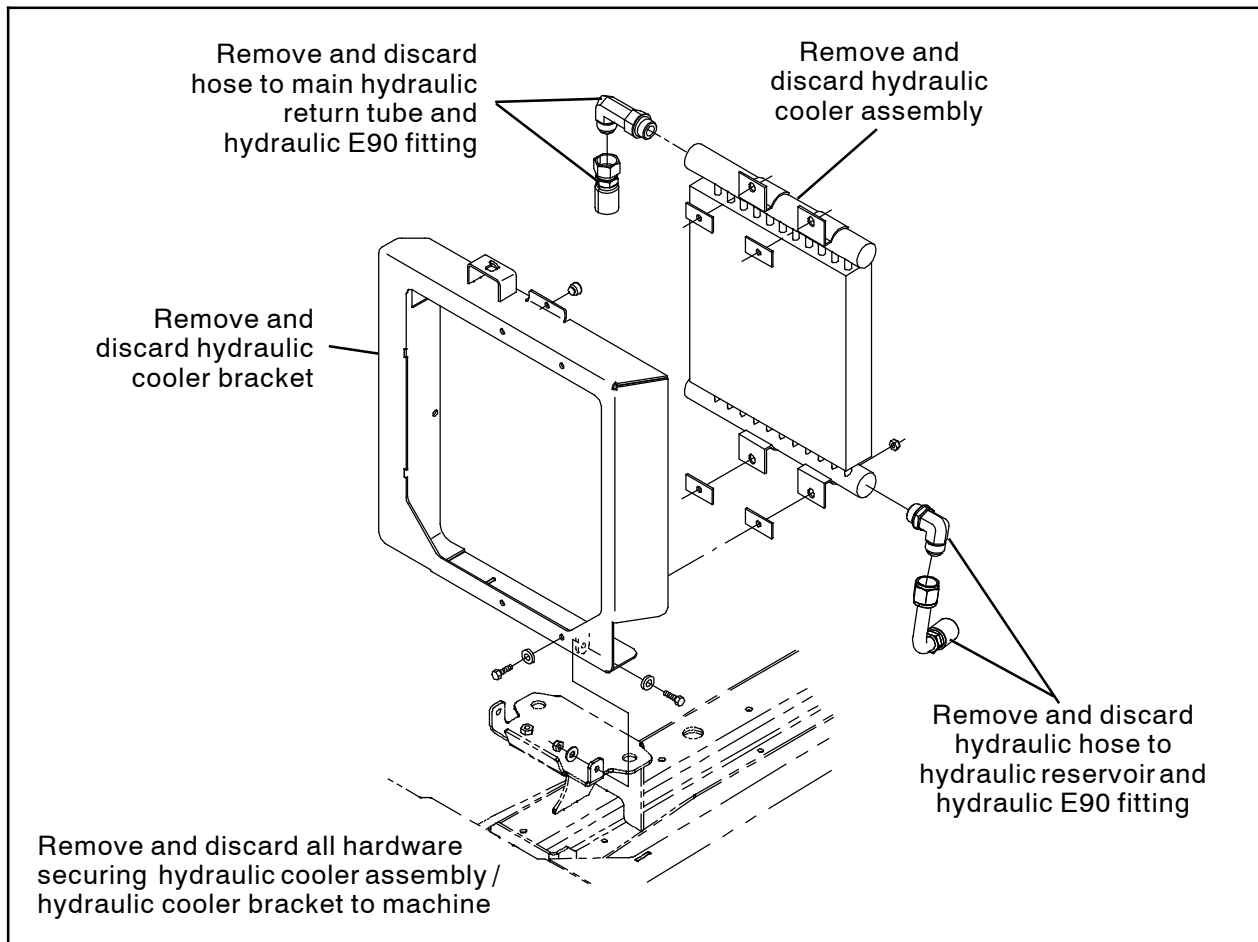


FIG. 2

6. Disconnect the hydraulic reservoir hose and the main hydraulic return tube hose from the hydraulic cooler. (Fig. 2)
7. Remove the hydraulic cooler assembly from the machine. Discard the hydraulic cooler assembly. (Fig. 2)
8. Remove both hydraulic hoses disconnected from the hydraulic cooler from the machine. Discard both removed hydraulic hoses. (Fig. 2)
9. Disconnect all hoses from the radiator. (Fig. 3)
10. Remove the radiator and all hoses, hose clamps, fittings, and hardware connected to the radiator from the machine. Discard the radiator. (Fig. 3)

INSTALLATION:

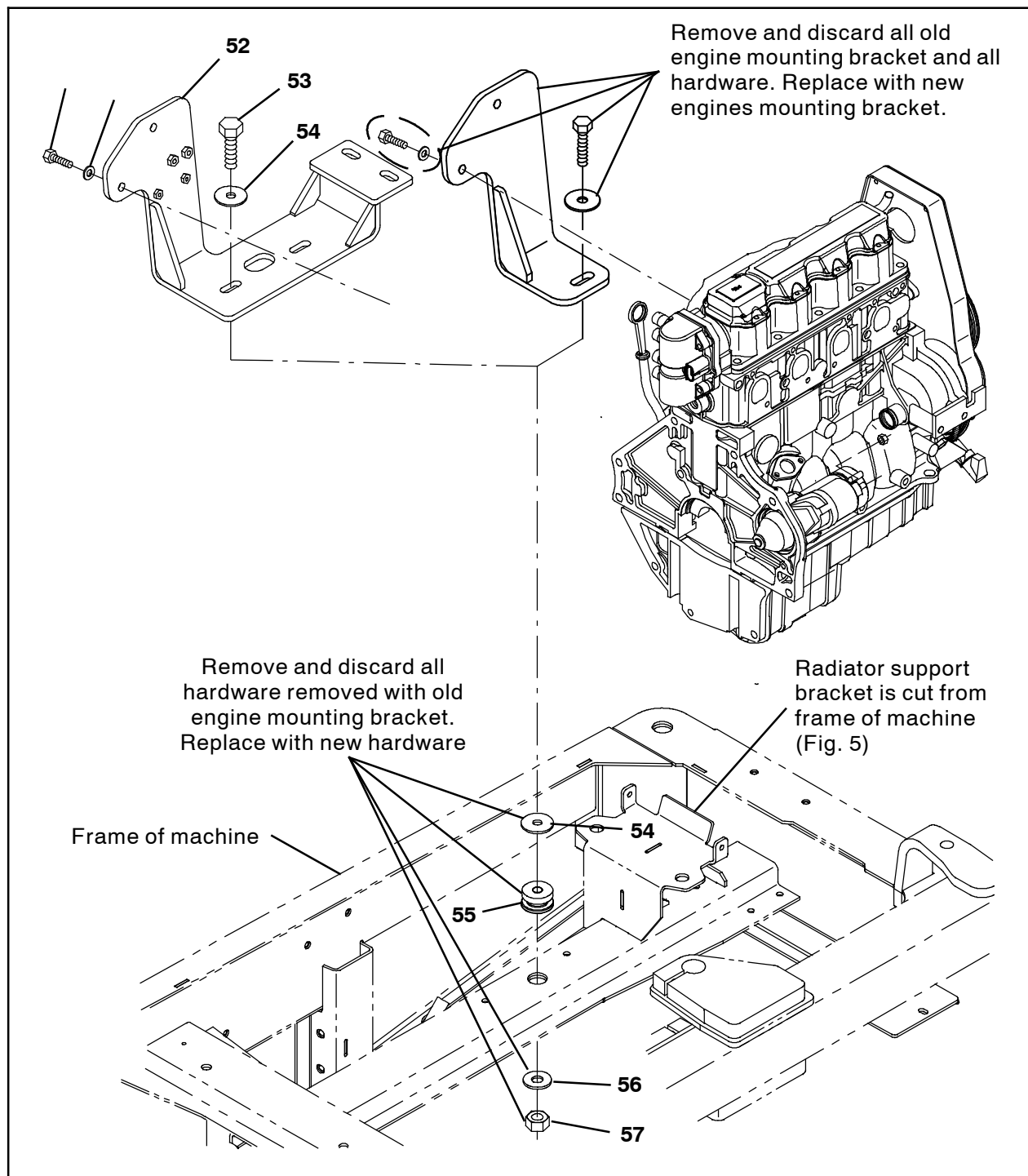


FIG. 4

1. Loosen necessary engine mounting hardware to make it possible to lift the front of the engine enough to remove the engine mounting bracket. (Fig. 4)
2. Lift the engine from the engine mounting bracket. (Fig. 4)
3. Remove the old engine mounting bracket from the machine. Discard the removed engine mounting bracket and all hardware. (Fig. 4)

4. Cut the radiator support bracket from the frame of the machine. (Fig. 5)
5. Use two M12 hex screws (53), four flat washers (54), two vibration isolators (55), two flat washers (56), and two M12 hex nuts to install the new engine mounting bracket (52) onto the frame of the machine. (Fig. 4)
6. Lower the engine onto the new engine mounting bracket and the frame of the machine and install / tighten hardware to secure the engine to the engine mounting bracket / frame of the machine. (Fig. 4)

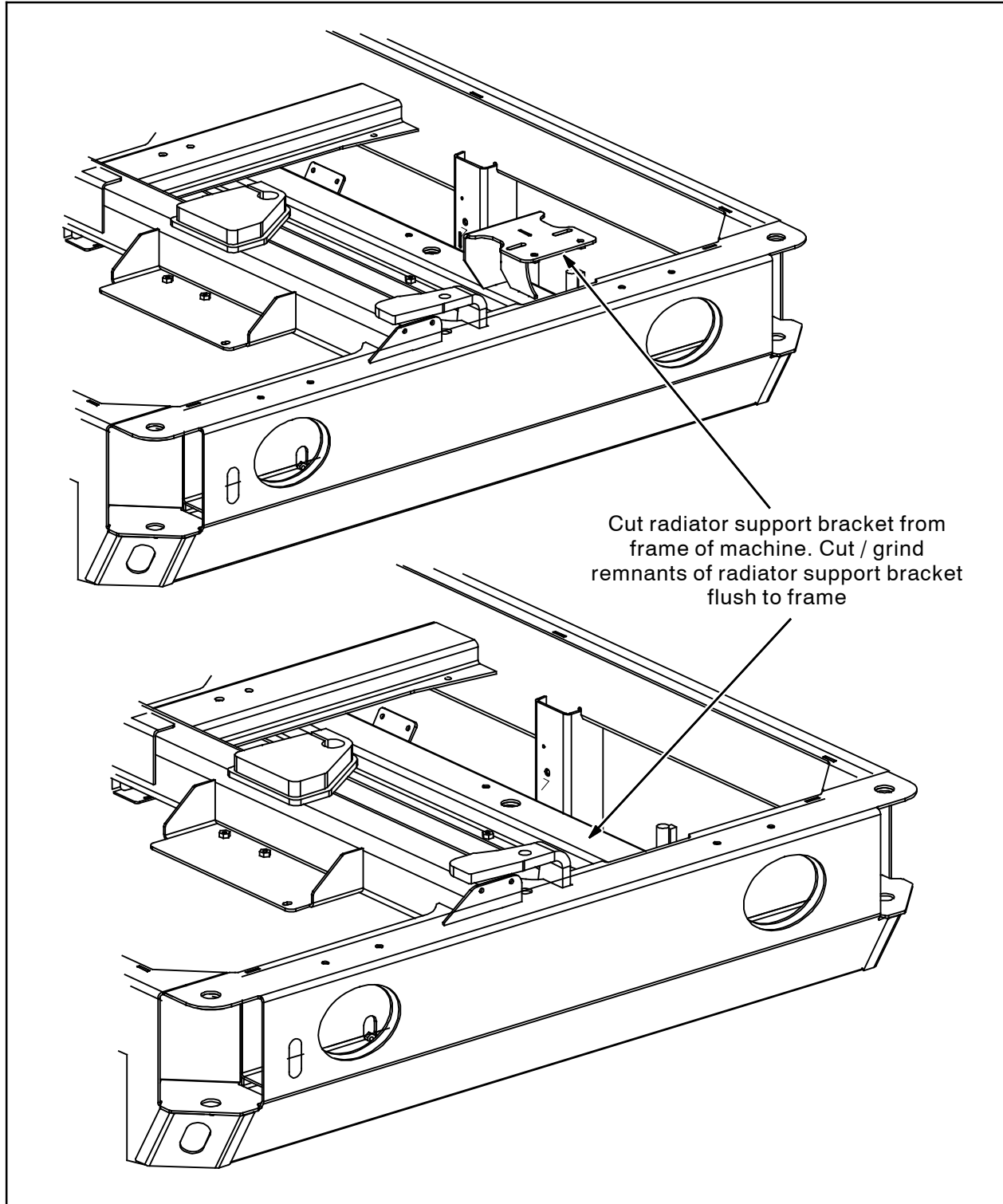


FIG. 5

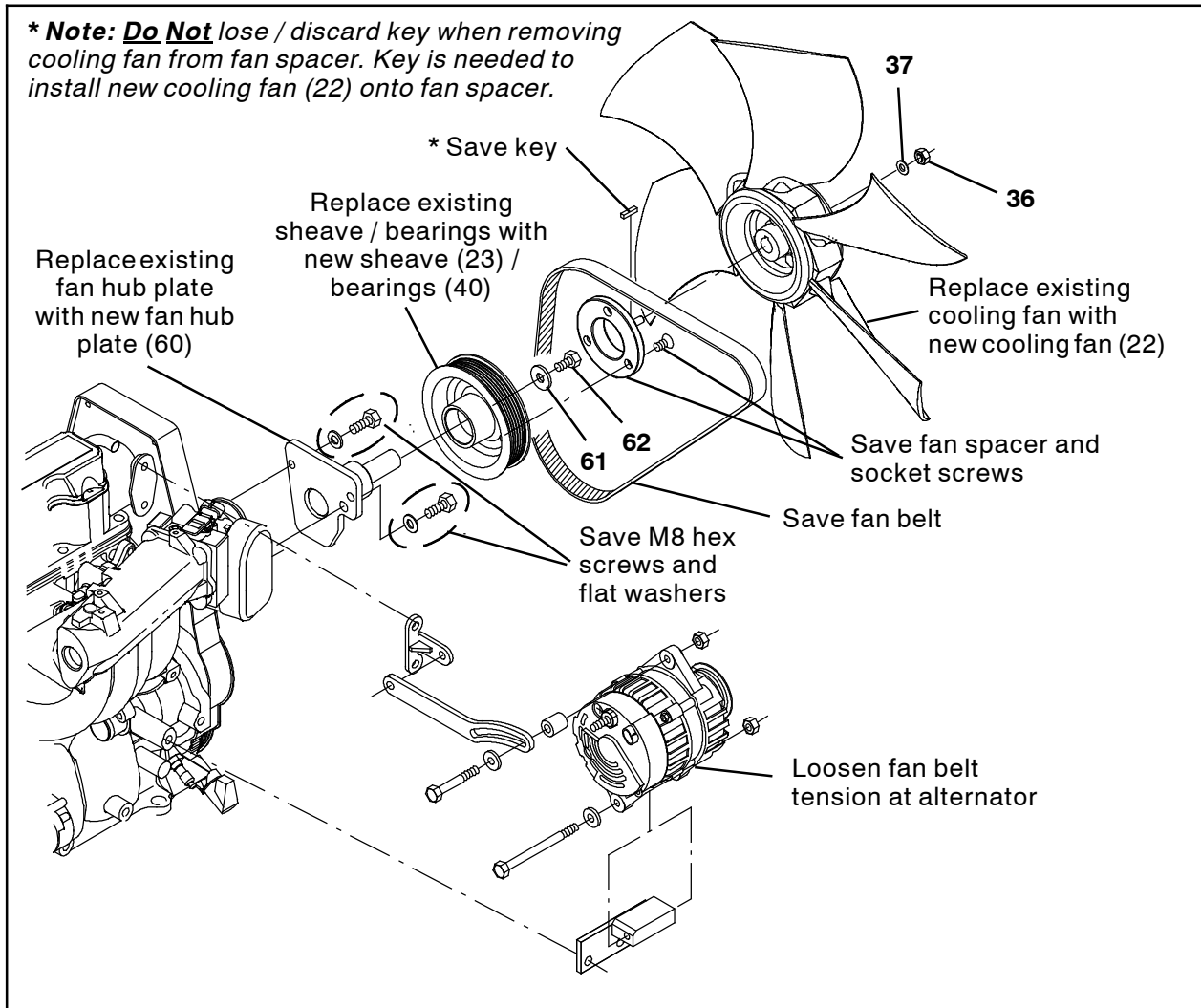


FIG. 6

7. Loosen the belt tension at the alternator and remove the fan belt from the machine. Set the fan belt aside. (Fig. 6)

8. Remove the cooling fan from the machine. Set the M8 hex nut, key, and flat washer aside. Discard the cooling fan. (Fig. 6)

NOTE: Do Not lose / discard the key when removing the cooling fan from the fan spacer. The key is needed to install the new cooling fan (22) onto the fan spacer.

9. Remove the fan spacer from the machine. Set the fan spacer and socket screws aside. (Fig. 6)

10. Remove the sheave from the machine. Discard the sheave / bearings and hardware. (Fig. 6)

11. Remove the existing fan hub plate from the engine. Discard the removed fan hub plate. (Fig. 6)

12. Use two M8 hex screws and two flat washers to install the new fan hub plate (60) onto the engine. (Fig. 6)

13. Use the hex screw (62) and flat washer (61) to install the new sheave (23) onto the engine. (Fig. 6)

14. Use the saved socket screws to install the fan spacer onto the sheave (6). (Fig. 6)

15. Reinstall the cooling fan belt onto the engine and tighten to the proper tension. (Fig. 6)

16. Insert the saved key into the notch in the fan spacer and use the saved M8 hex screw and flat washer to install the new cooling fan (22) onto the fan spacer. (Fig. 6)

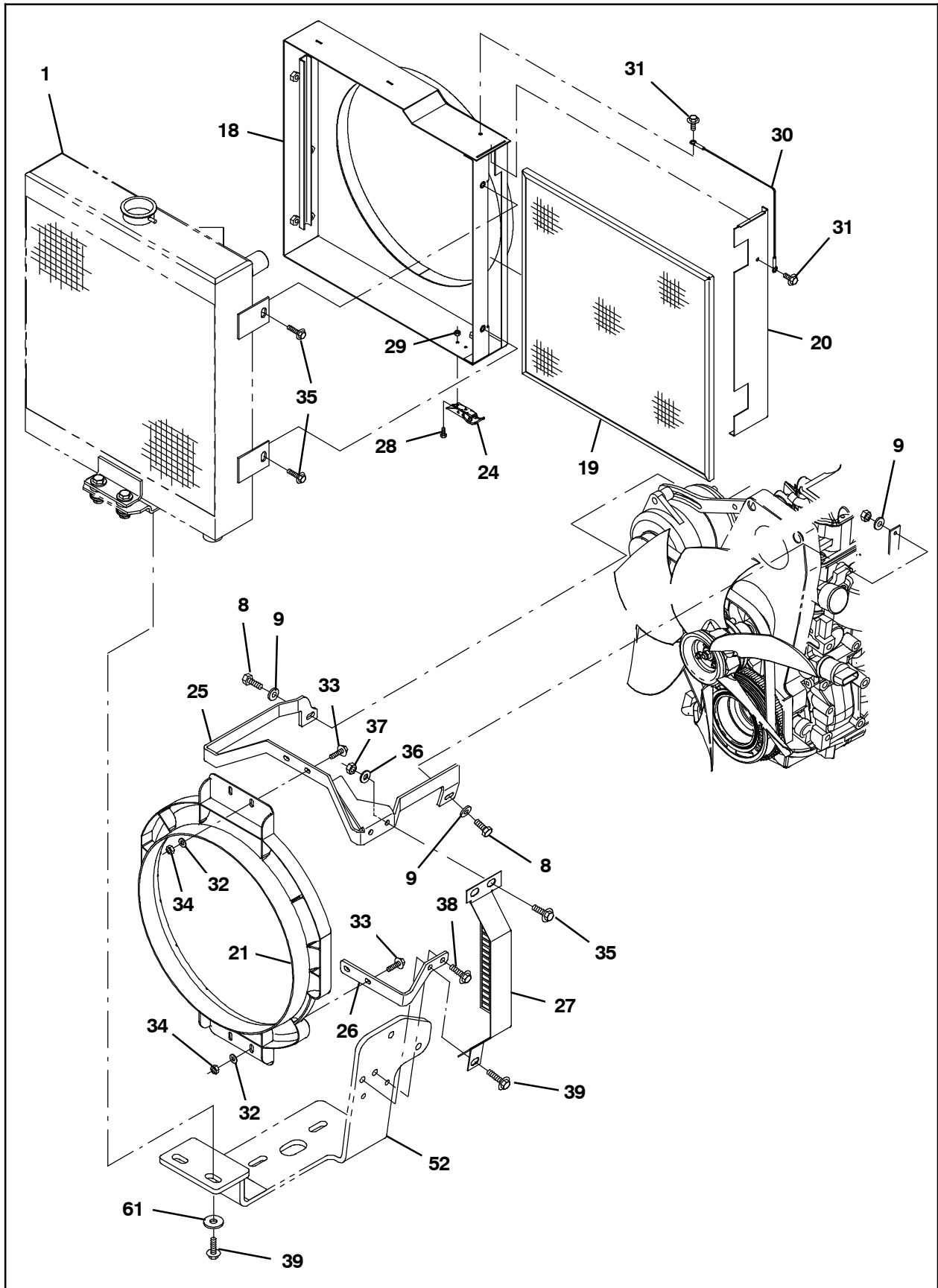


FIG. 7

NOTE: Do not completely tighten hardware used to install parts in Step 17 through Step 20 until after ensuring the cooling fan (22) blades do not touch the fan shroud (21).

17. Use two M8 hex screws (8) and two flat washers (9) to install the upper fan shroud bracket (25) onto the engine. (Fig. 7)

18. Use one SEMS M8 hex screw (38) to install the lower fan shroud bracket (26) onto the engine mounting bracket (52). (Fig. 7)

NOTE: The fan shroud (4) must be positioned on the machine as shown in Fig. 7.

19. Use two SEMS M6 hex screws (33), two flat washers (32), and two M6 hex nuts (34) to install the fan shroud (21) onto the upper fan shroud bracket (25). (Fig. 7)

20. Use two SEMS M6 hex screws (33), two flat washers (32), and two M6 hex nuts (34) to install the fan shroud (21) onto the lower fan shroud bracket (26). (Fig. 7)

21. Check the spacing of the cooling fan (22) blades to the fan shroud (21). The cooling fan blades **must not** touch the fan shroud. Adjust the positioning of the fan shroud as necessary so fan blades are not touching the shroud (Fig. 8)

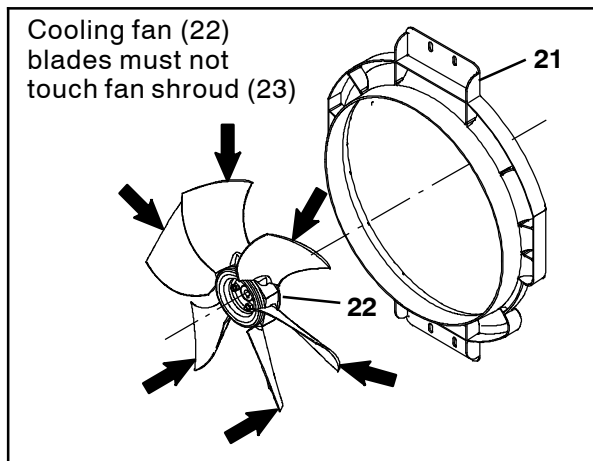


FIG. 8

22. Tighten the hardware installed in Step 18 through Step 21. (Fig. 7)

23. Reinstall the engine access panel into the operator compartment.

24. Use two SEMS M8 hex screws (35), two flat washers (36), and two M8 hex nuts (37) to install the radiator shroud bracket (27) onto the upper fan shroud bracket (25). (Fig. 7)

25. Use one SEMS M8 hex screw (39) to install the radiator shroud bracket (27) onto the lower fan shroud bracket (26) / engine mounting bracket (52). (Fig. 7)

26. Use two M4 hex screws (28) and two M4 hex nuts (29) to install the latch (24) onto the radiator fan bracket (18). (Fig. 7)

27. Use three M8 hex screws (35) to install the radiator fan bracket (18) onto the radiator (1). (Fig. 7)

28. Install the seal (63) onto the radiator fan bracket (18). (Fig. 9)



FIG. 9

29. Use one M6 hex screw (31) to install the cable (30) onto the radiator fan bracket (18). (Fig. 7)

30. Use another M6 hex screw (31) to install the cable (30) onto the screen cover plate (20). (Fig. 7)

31. Install the screen cover plate (20) onto the radiator fan bracket (18). (Fig. 7)

32. Apply a light coat of oil onto the seal (63). (Fig. 10)

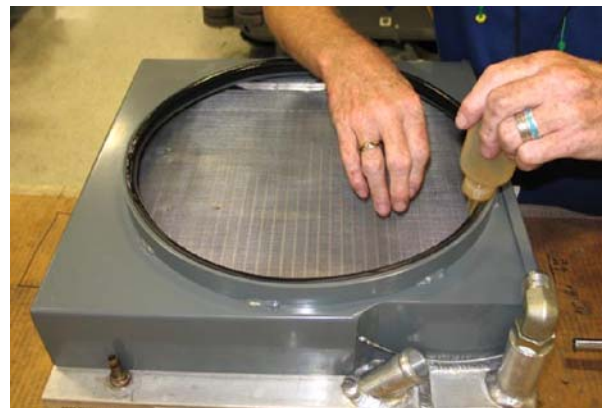


FIG. 10

- 33. Install hydraulic fitting (65) and hydraulic fitting (66) onto the radiator (1). (Fig. 11)
- 34. Use four SEMS M8 hex screws (13), four flat washers (6), eight flat washers, four vibration isolators (5), and eight flat washers to install the radiator (1) onto the radiator mounting bracket (3). (Fig. 11)

- 35. Use two SEMS M8 hex screws (13) and two flat washers (6) to install the radiator assembly onto the machine. (Fig. 11)
- 36. Install the skirt bracket (10) and fan skirt (11) onto the machine. (Fig. 11)
- 37. Use a SEMS M8 hex screw (35) to install the loose radiator bracket onto the radiator assembly. Secure the radiator bracket to the machine. (Fig. 11)

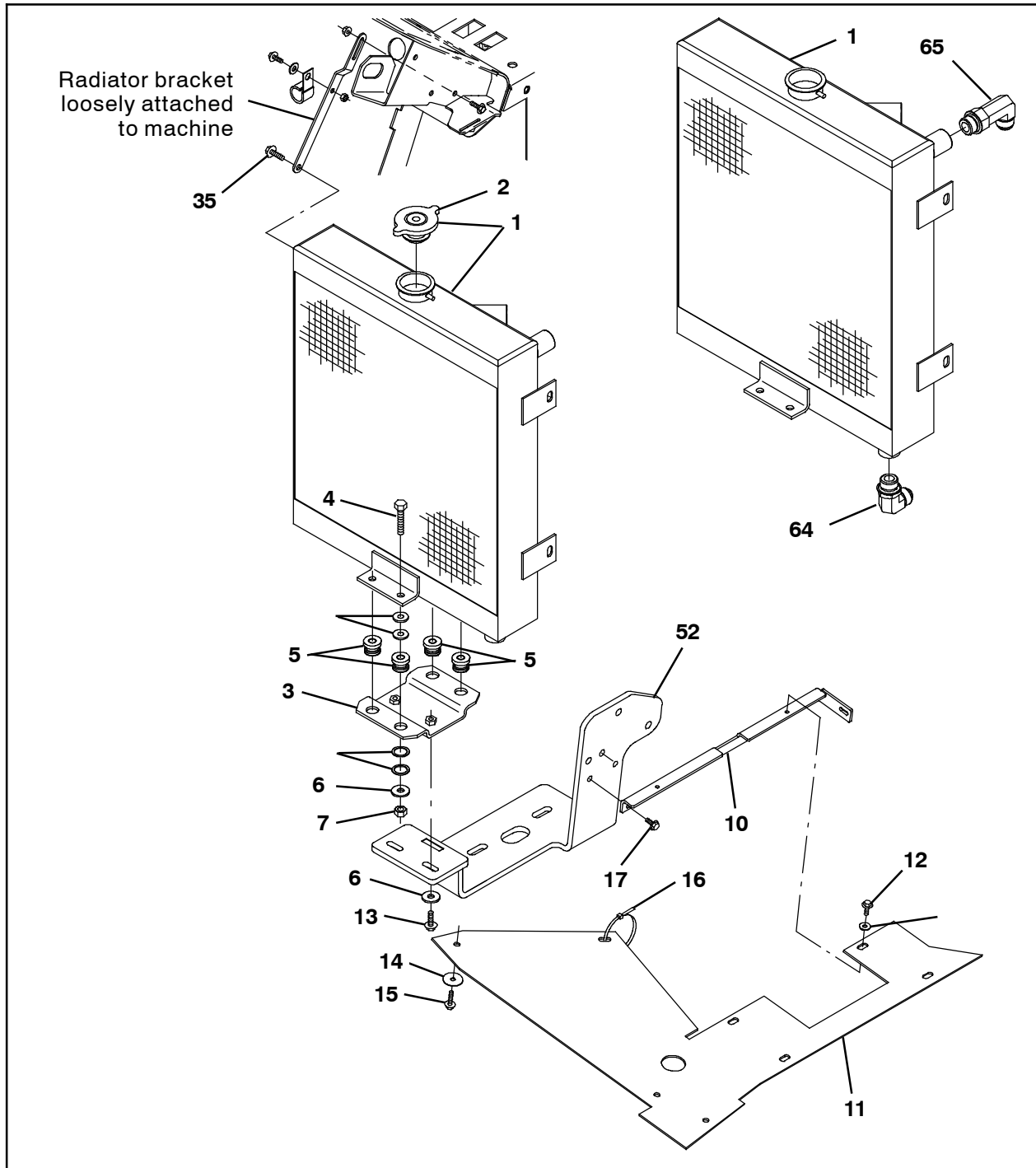


FIG. 11

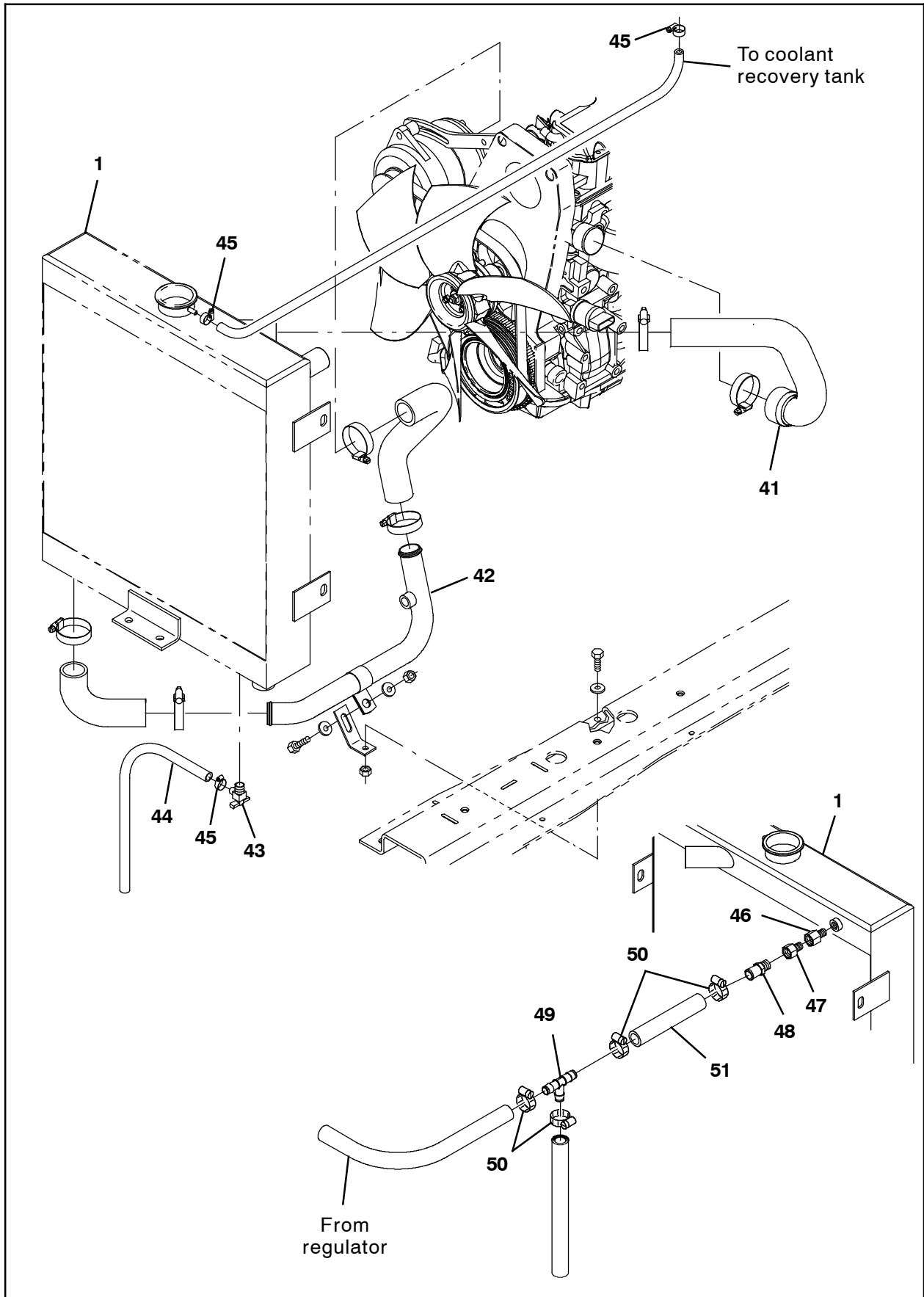


FIG. 12

38. Remove the screen cover plate (20) from the radiator assembly and install the radiator screen (19) into the radiator assembly. (Fig. 13 / Fig. 7)

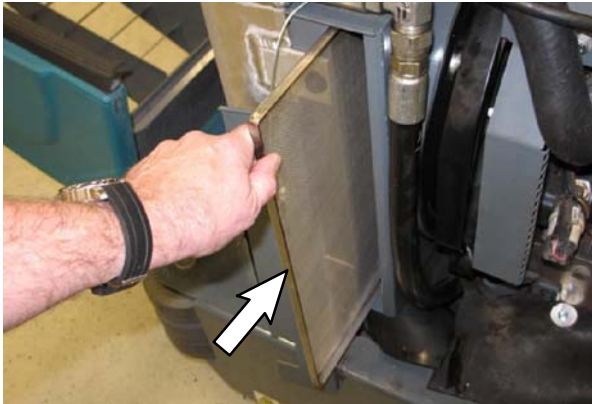


FIG. 13

39. Reinstall the screen cover plate (20) onto the radiator assembly. (Fig. 5)
40. Connect the 46 in. hydraulic hose (59) to the hydraulic reservoir. (Fig. 14)

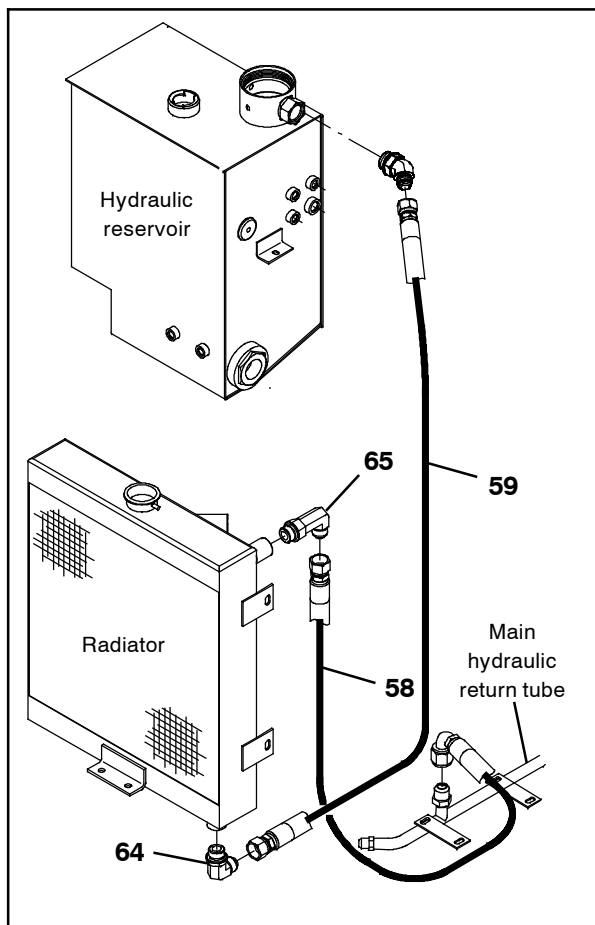


FIG. 14

41. Route the 46 in. hydraulic hose (59) to the radiator (1) and connect the 46 in. hydraulic hose to the hydraulic fitting located on the bottom of the radiator. (Fig. 14)
42. Connect the 29 in. hydraulic hose (58) to the main hydraulic return tube. (Fig. 14).
43. Route the 26 in. hydraulic hose (58) to the radiator (1) and connect the 29 in. hydraulic hose to the hydraulic fitting located near the top of the radiator. (Fig. 14)
44. Connect all coolant hoses to the radiator (1).
45. Install the radiator cap (2) onto the radiator.
46. If necessary, add hydraulic fluid to the hydraulic system. Refer to Maintenance Section of Operator Manual for additional information.
47. Refill the engine coolant system with fresh antifreeze.
48. Observe the radiator / engine coolant system hoses and the hydraulic hoses / fittings for leaks.
49. Start machine and allow it to run for approximately 1 minute. Check the coolant level in reservoir. Add antifreeze as necessary.
50. Reinstall the front shroud onto the machine.
51. Check the radiator screen (20) daily for damage and obstructions. Clear all dirt and obstructions from the screen. Replace the screen if it is damaged.

Bill Of Materials For Rad W/Screen Kit, Replmt [M20/T20 G/LP] - 9012811

Ref.	Tennant Part No.	Description	Qty.
1	1045940	Radiator, W/ Hyd Cooler [Side X Side]	1
2	1045764	Cap, Radiator, 14PSI [Stant]	1
3	1046962	Bracket, Mtg, Radiator	1
4	06962	Screw, Hex, M10 X 1.50 X 45, 8.8	2
5	54274	Isolator, Vib, Bshg, 1.1d 0.6l .4b 0.78h	4
6	1014563	Washer, Flat, 0.40b 1.12d .12, SS	16
7	41430	Nut, Hex, Lock, M10 X 1.5, NI	4
8	39277	Screw, Hex, M8 X 1.25 X 25, 8.8	2
9	32491	Washer, Flat, 0.31, Std	2
10	1043897	Bracket, Skirt, Rbr	1
11	1052170	Skirt, Eng Fan, Gas / Lp	1
12	361339	Screw, Hex, M6 X 1.00 X 16, Fmg	2
13	1037355	Screw, Hex, M8 X 1.25 X , 9.8, SEMS	2
14	41178	Washer, Flat, 0.25, Fendr	3
15	1036892	Screw, Hex, M6 X 1.00 X 25, 9.8 SEMS	3
16	49266	Tie, Cable, Nyl, 07.3l .19w 1.8 Max D	1
17	1040467	Screw, Hex, M6 X 1.00 X 20, 9.8, SEMS	2
18	1071041	Bracket Wldt, Radiator, Fan, Gas/LPG	1
19	1071033	Frame Wldt, Screen, Rad	1
20	1071047	Plate, Cover, Screen	1
21	1054428	Shroud, Fan	1
22	1031566	Fan, Cooling, 14.1d, 6 Blade, 0.5b Taper	1
23	1072505	Sheave, Mach [Gm1.6l 2615rpm Fan]	1
24	1051534	Concept, Latch	1
25	1058777	Bracket, Shrd, Fan, Upper, Sppt, Gas/Lpg	1
26	1058753	Bracket, Shrd, Fan, Lower, Gas/Lpg	1
27	1064443	Bracket, Shrd, Radiator, Gas/Lpg, CE	1
28	1020234	Screw, Hex, M4 X 0.70 X 10, SS	2
29	02850	Nut, Hex, Lock, M4 X 0.70, NI	2
30	57702	Cable, Glv .06d 012.0l .26eye /.26eye	1
31	361339	Screw, Hex, M6 X 1.00 X 16, Fmg	2
32	32483	Washer, Flat, 0.25, SAE	4
33	1036892	Screw, Hex, M6 X 1.00 X 25, 9.8, SEMS	4
34	08708	Nut, Hex, Lock, M6 X 1.00, NI	4
35	1037346	Screw, Hex, M8 X 1.25 X 25, 9.8, SEMS	2
36	32491	Washer, Flat, 0.31, Std	2
37	08709	Nut, Hex, Lock, M8 X 1.25, NI	2
38	1037354	Screw, Hex, M8 X 1.25 X 30, 9.8, SEMS	3
39	1037355	Screw, Hex, M8 X 1.25 X 35, 9.8, SEMS	1
40	1055377	Bearing, Ball, 20mm B 42mm D 12mm W	2
41	1014747	Hose, Coolant, Mold, 1.25id To 1.62id	1
42	1043322	Tube, Coolant, 1.3d, Lower	1
43	51305	Fitting, Draincock, E90, .25npt	1
44	73471	Hose, PVC, Clr, 0.38id 0.56od 022.0l	1
45	43844	Clamp, Hose, Wormdrive, 0.25- 0.62d, .31w	1

Ref.	Tennant Part No.	Description	Qty.
46	1042772	Fitting, Brs, Str, Pf06/Pm04	1
47	1015547	Fitting, Adapter, Orifice, Pf06/Pm06	1
48	27767	Fitting, Brs, Str, Em10/Pm06	1
49	1062116	Fitting, Plstc, Tee, Bm10/Bm10/Bm10, Nyl	1
50	63810	Clamp, Hose, Wormdrive, 0.56- 1.06d, .56w	4
51	1016561	Hose, Afmkt, Rbr, Heater, 0.62id, 08ft	1
52	1046022	Bracket Wldt, Mtg, Eng	1
53	06972	Screw, Hex, M12 X 1.75 X 60, 8.8	2
54	04414	Washer, Flat, 0.53b 1.88d .12, Stl, Pl	4
55	51176	Isolator, Vib, .50d	2
56	32493	Washer, Flat, 0.50, Std	6
57	08711	Nut, Hex, Lock, M12 X 1.75, NI	2
58	1050436	Hose, Hyd, Med12, Jf12e90/Jf12str, 029.0	1
59	1052835	Hose, Hyd, Med12, Jf12str/Jf12str, 046.0	1
60	1055381	Plate Wldt, Fan, Hub [GM 1.6L]	1
61	1014563	Washer, Flat, 0.40b 1.12d .12, SS	1
62	21195	Screw, Hex, .38- 16 X 0.75, G5	1
63	1048166	Seal, Afmkt, Bulb, Str, 0.58d 08 ft	1
64	46481	Fitting, Hyd, E90, Jm12/Om12	1
65	62471	Fitting, Hyd, E90, Jm12/Om12, Long	1

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