



INSTRUCTION BULLETIN

No. 9010950
Machine: T12
Published: 03-2013
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.

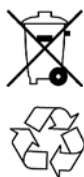
Installation instructions for **kit number 9009840 - machines without optional side brush / 9009841 - machines with optional side brush**

SYNOPSIS:

This kit contains the parts needed to install the ec- H₂O system on T12 scrubbers.
Please follow step-by-step instructions.

SPECIAL TOOLS / CONSIDERATIONS: NONE

(Estimated time to complete: 5 hours)



PROTECT THE ENVIRONMENT

Please dispose of packaging materials, old machine components, and hazardous fluids in an environmentally safe manner according to local waste disposal regulations.

Always remember to recycle.

PREPARATION: ALL MACHINES

1. Completely drain the solution and recovery tanks.
2. Carefully clean all remaining cleaning solution residue from inside the solution tank. Cleaning solution left inside the solution tank could cause the ec- H₂O system to not function properly. Refer to the Operator Manual for instructions how to clean the solution tank.
3. Park the machine on a clean level surface and turn off the machine.
4. Remove the brushes from the main scrub head. Set the brushes aside.
5. **Machines with cylindrical scrub heads only:** Remove the debris trough from the back of the main scrub head. Set the debris trough aside.
6. **Machines with optional side brush assembly only:** Remove the brush from the side brush assembly. Set the brush aside.

7. Remove the rear squeegee assembly from the machine. Set the rear squeegee assembly aside.
8. Turn on the machine and completely lower the scrub head.
9. Turn off the machine and remove the key.

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

10. Lift operator seat open and lock seat into open position.
11. Disconnect the battery cable from the machine.



WARNING: Always disconnect battery cable from machine before working on electrical components.

INSTALLATION: (Machines without optional Side Brush Assembly)

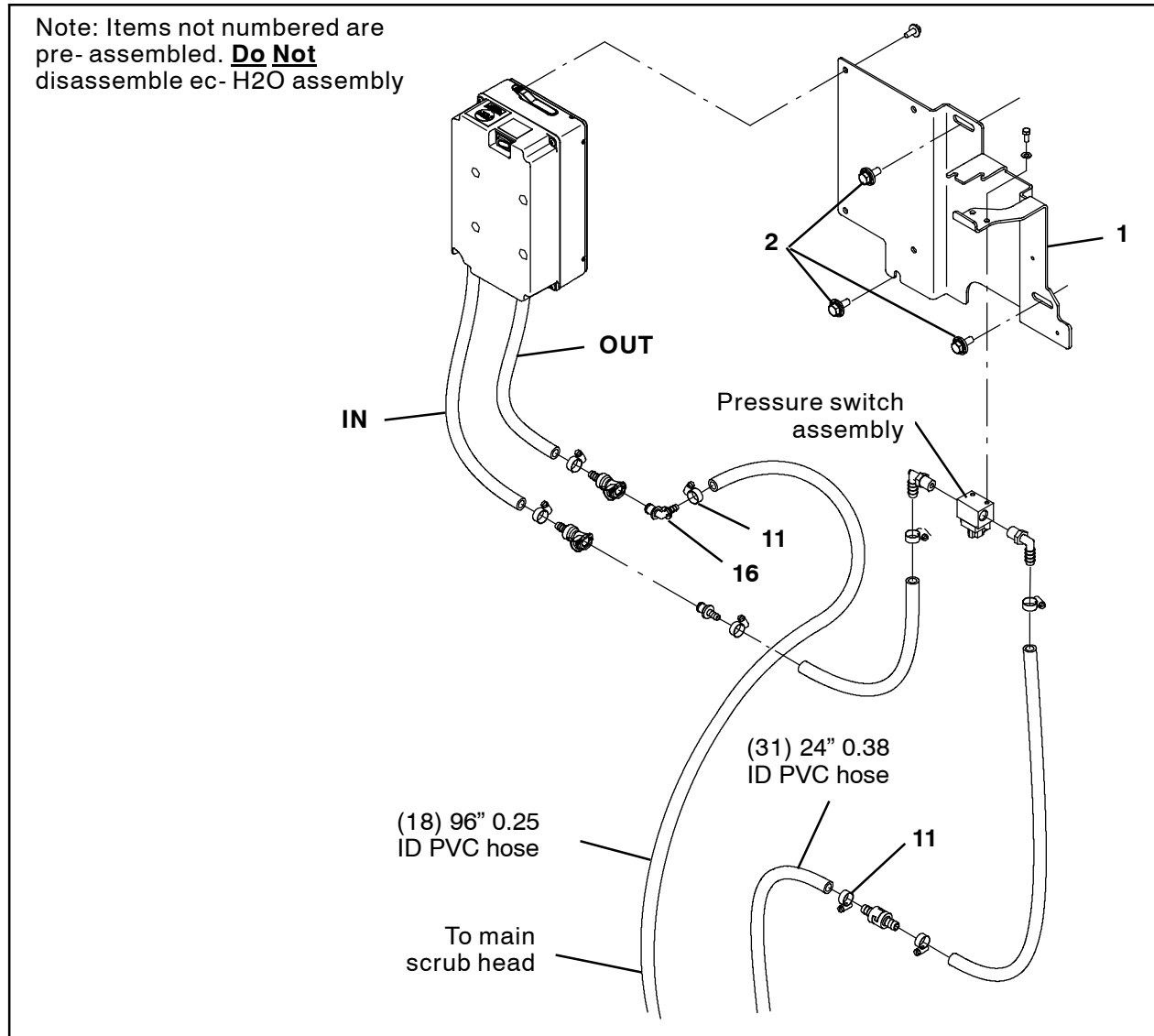


FIG. 1

1. Use three SEMS M8 hex screws to install the ec- H2O assembly to the machine. (Fig. 1)
2. Connect the main wire harness to the ec- H2O assembly. (Fig. 18 / Fig. 20 / Fig. 21)
3. Use a hose clamp (11) to install a 90° plastic fitting (16) onto one end of the 96" 0.25 ID PVC hose (18). (Fig. 1)
4. Connect the hose assembly assembled in the previous step to hose from the OUT port of the ec- H2O assembly. (Fig. 1)
5. Use a hose clamp (11) to connect the 24" 0.38 ID PVC hose (31) to the hose connected to the pressure switch assembly. (Fig. 1)
6. Label the unconnected hose ends with where the hoses are connected on the ec- H2O module. Labelling will make it easier to determine where hoses need to be connected after they are routed through the machine.

- Route all hoses connected to the ec-H2O assembly down through the recess in the solution tank, between the solution tank and recovery tank, and down to the floor. (Fig. 2)

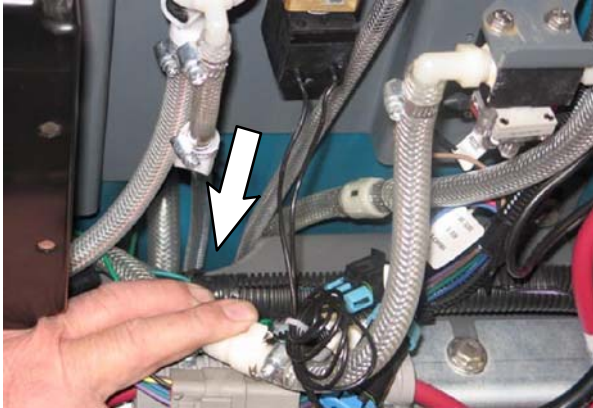


FIG. 2

- Install plastic straight fitting (25) and a 90° plastic fitting (24) into the solution pump (23). (Fig. 4)
- Use a hose clamp (22) to install the solution pump bracket (20) onto the solution pump (23). (Fig. 4)
- Connect the main wire harness to the solution pump (23). (Fig. 19 / Fig. 21)
- Connect the capacitor (37) to the main wire harness. (Fig. 19 / Fig. 21)

- Insert solution pump bracket (20) tab into square hole in frame of machine and use one SEMS M8 hex screw (21) to secure the solution pump bracket / solution pump (23) onto the frame of the machine. (Fig. 3 / Fig. 4)

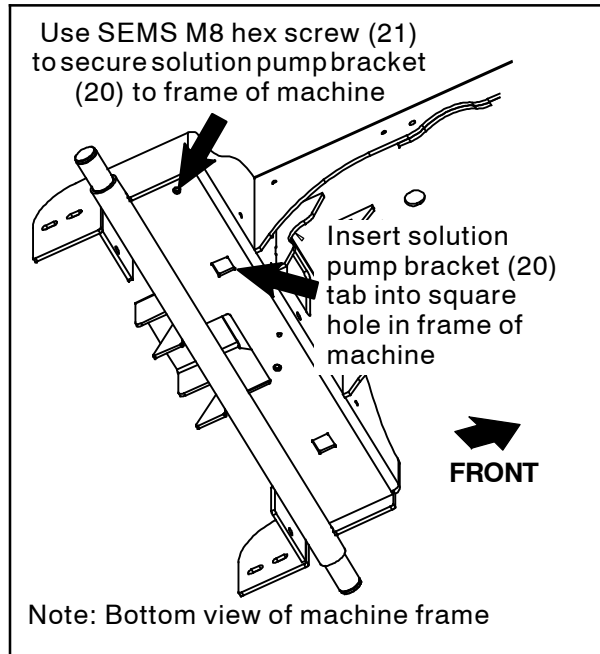


FIG. 3

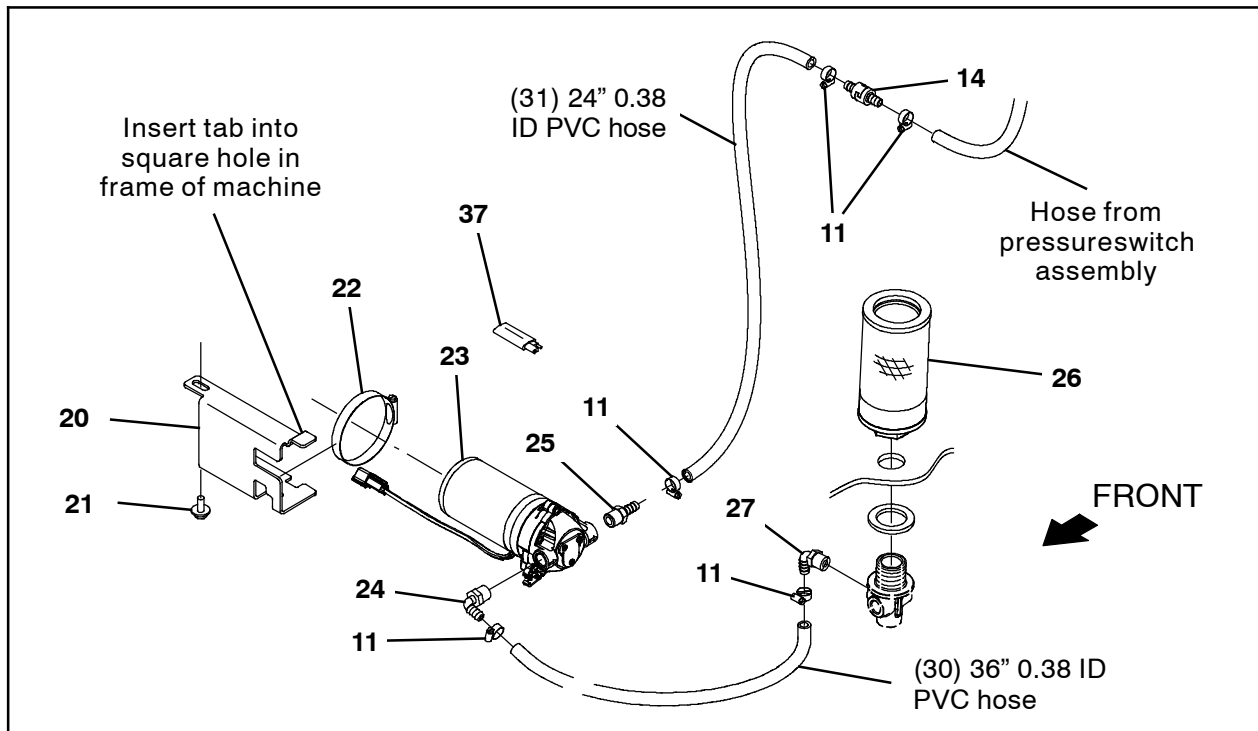


FIG. 4

- Remove filter screen located inside the solution tank from the solution fitting. Discard the filter screen. (Fig. 5)

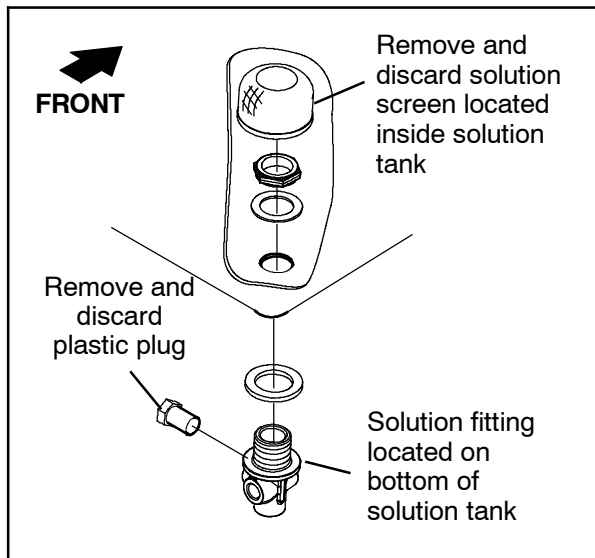


FIG. 5

- Remove the solution fitting from the bottom of the solution tank. (Fig. 5)
- Remove the plastic plug from the solution fitting. Discard the plastic plug. (Fig. 5)
- Install the 90° plastic fitting (27) onto the solution fitting. (Fig. 4)
- Reinstall the solution fitting onto the bottom of the solution tank. (Fig. 4 / Fig. 5)
- Install the new filter screen (26) into the solution tank. (Fig. 4)
- Use a hose clamp (11) to connect the 36" 0.38 ID PVC hose (30) to the 90° plastic fitting (27) on the solution fitting. (Fig. 4)

- Route the 36" 0.38 ID PVC hose (30) along the back axle and to the solution pump (23).

- Use a hose clamp (11) to connect the 36" 0.38 ID PVC hose (30) to the plastic straight fitting (25) on the solution pump (23). (Fig. 4)

- Route the 24" 0.38 ID PVC hose (31) connected to the pressure switch assembly to the solution pump (23). (Fig. 4)

- Use a hose clamp (11) to connect the 24" 0.38 ID PVC hose (31) to the straight fitting (25) on the solution pump (23). (Fig. 4)

- Route the 96" 0.25 ID PVC hose (18) through the hole in the frame of the machine and to the scrub head. (Fig. 6)

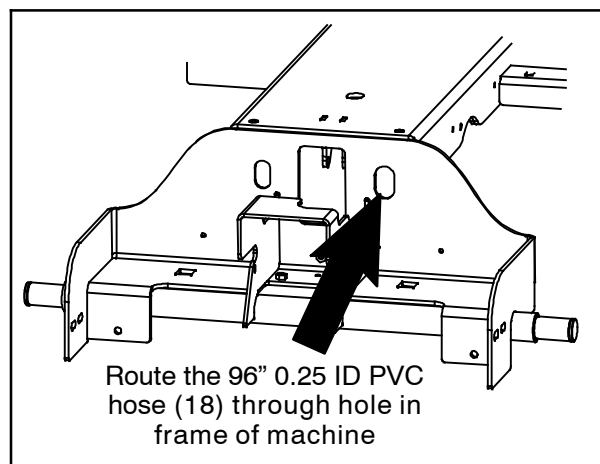


FIG. 6

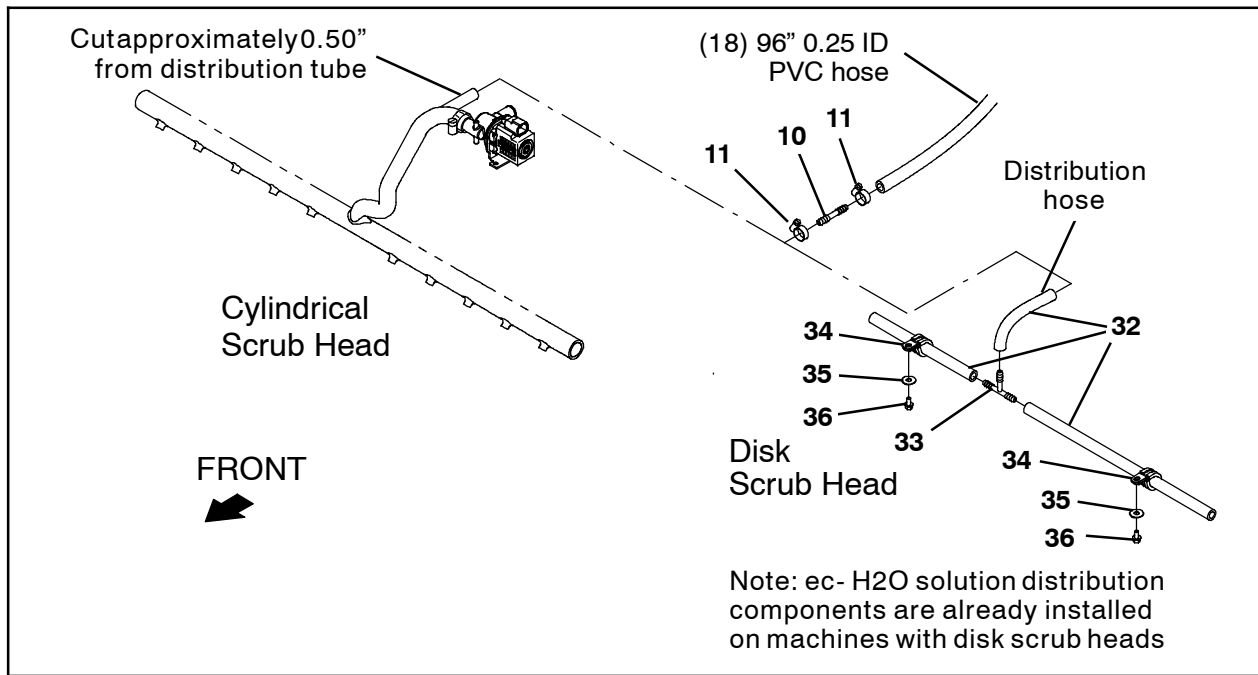


FIG. 7

25. **Machines with disk scrub heads only:** Insert the barbed plastic straight fitting (10) into the distribution hose and use a hose clamp (11) to secure the straight fitting inside the distribution hose. (Fig. 7)
26. **Machines with disk scrub heads only:** Use a hose clamp (11) to connect the 96" 0.25 ID PVC hose (18) to the straight fitting (10) installed in the distribution hose. (Fig. 7)
27. **Machines with cylindrical scrub heads only:** Cut approximately 0.50" from the tip of the distribution tube. (Fig. 7)
28. **Machines with cylindrical scrub heads only:** Insert the barbed plastic straight fitting (10) into the distribution tube and use a hose clamp (11) to secure the straight fitting inside the distribution tube. (Fig. 7)
29. **Machines with cylindrical scrub heads only:** Use a hose clamp (11) to connect the 96" 0.25 ID PVC hose (18) to the straight fitting (510) installed in the distribution tube. (Fig. 7)
30. Remove the top SEMS M8 hex screw securing the electrical panel to the recovery tank. Set the SEMS M8 hex screw aside. (Fig. 8)

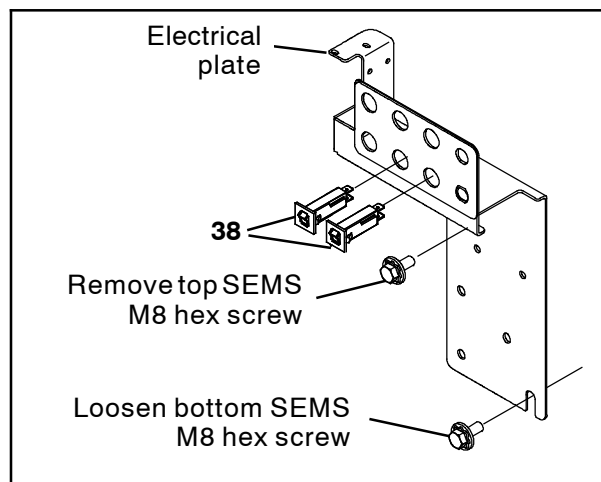


FIG. 8

31. Loosen the bottom SEMS M8 hex screw securing the electrical panel to the recovery tank. (Fig. 8)
32. Carefully pull the electrical panel far enough away from the recovery tank to access the portion of the main wire harness located behind the electrical plate. Do not break any wire cable connections when moving the electrical panel. (Fig. 8)
33. Insert a 2.5A circuit breaker (38) into electrical panel circuit breaker locations CB6 and CB7. (Fig. 8)

34. Connect the main wire harness to both 2.5A circuit breakers. (Fig. 8 / Fig. 20 / Fig. 21)
35. Reinstall / tighten the EMS M8 hex screws securing the electrical panel to the recovery tank. (Fig. 8)
36. Use cable ties to secure the ec- H2O hoses into the machine and away from any moving parts.
37. Reconnect the battery cable to the machine.
38. Reinstall the brushes, rear squeegee, and debris trough onto the machine.
39. Configure the machine for ec- H2O. Refer to Service Manual for instructions how to access / change configuration settings.
40. Start and test the machine. Fill the solution tank with water. Start the machine. Activate the ec- H2O system. Ensure ec- H2O system is functioning. Watch LCD panel for error codes. Refer to Operator Manual for ec- H2O error code information and instructions how to operate the ec- H2O system.

INSTALLATION: (Machines with optional Side Brush Assembly)

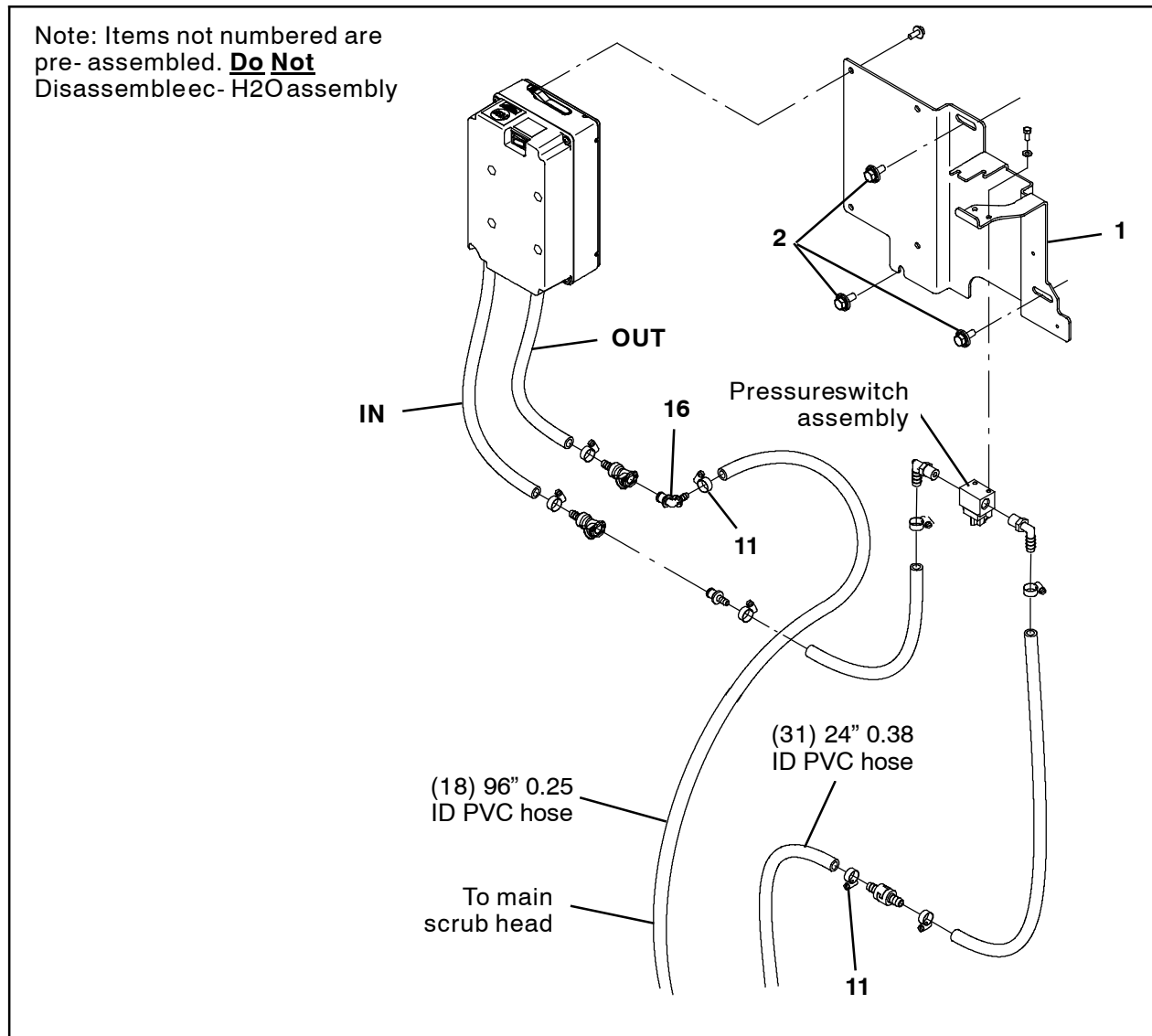


FIG. 9

1. Use three SEMS M8 hex screws to install the ec-H2O assembly to the machine. (Fig. 9)
2. Connect the main wire harness to the ec-H2O assembly. (Fig. 17 / Fig. 20 / Fig. 21)
3. Use a hose clamp (11) to install a 90° plastic fitting (16) onto one end of the 96" 0.25 ID PVC hose (18). (Fig. 9)
4. Connect the hose assembly assembled in the previous step to the hose from the OUT port of the ec-H2O assembly. (Fig. 9)
5. Use a hose clamp (11) to connect the 24" 0.38 ID PVC hose (31) to the hose from the pressure switch assembly. (Fig. 9)

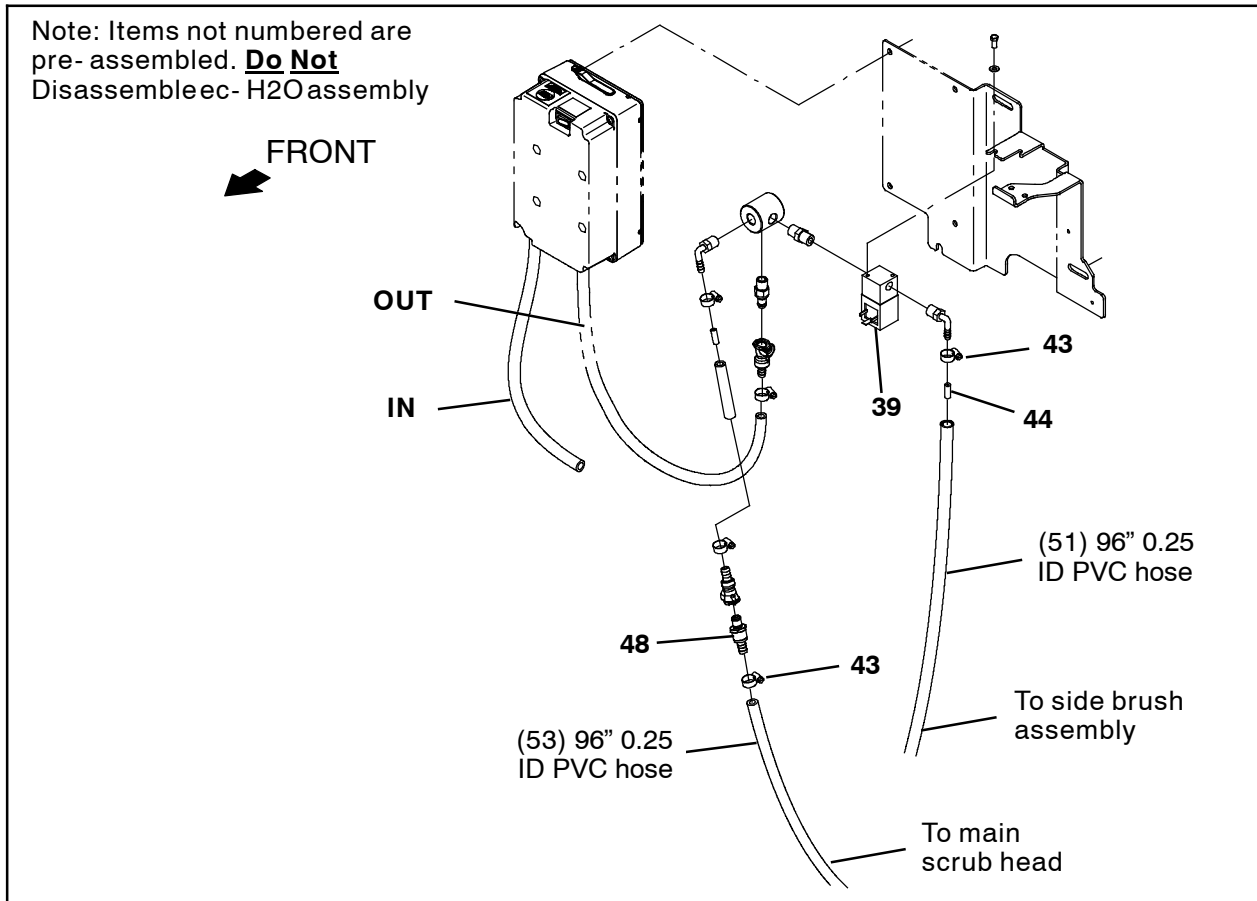


FIG. 10

6. Use a hose clamp (43) to install a plastic straight fitting (48) onto one end of the 96" 0.25" diameter PVC hose (53). (Fig. 10)
7. Connect the 96" 0.25" diameter PVC hose (53) assembly assembled in the previous step to the ec-H2O assembly. (Fig. 10)
8. Insert a plastic restrictor fitting (44) into one end of another 96" 0.25" diameter PVC hose (51). (Fig. 10)
9. Use a hose clamp (43) to connect the end of the 96" 0.25" diameter PVC hose (51) with the restrictor fitting (44) to the water solenoid valve (38). (Fig. 10)
10. Label the unconnected hose ends with where the hoses are connected on the ec-H2O module. Labelling will make it easier to determine where hoses need to be connected after they are routed through the machine.
11. Route all hoses connected to the ec-H2O assembly down through the recess in the solution tank, between the solution tank and recovery tank. (Fig. 11)

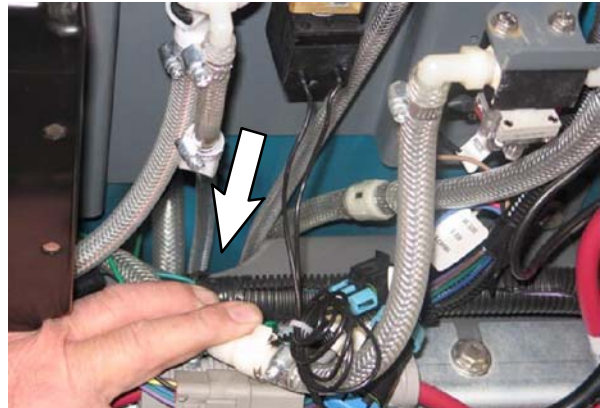


FIG. 11

12. Install a plastic straight fitting (25) and 90° plastic fitting (24) into the solution pump (23). (Fig. 13)
13. Use a hose clamp (22) to install the solution pump bracket (20) onto the solution pump (23). (Fig. 13)
14. Connect the main wire harness to the solution pump (23). (Fig. 19 / Fig. 21)
15. Connect the capacitor (37) to the main wire harness. (Fig. 19 / Fig. 21)

16. Insert solution pump bracket (20) tab into square hole in frame of machine and use one SEMS M8 hex screw (21) to secure the solution pump bracket / solution pump (23) onto the frame of the machine. (Fig. 12 / Fig. 13)

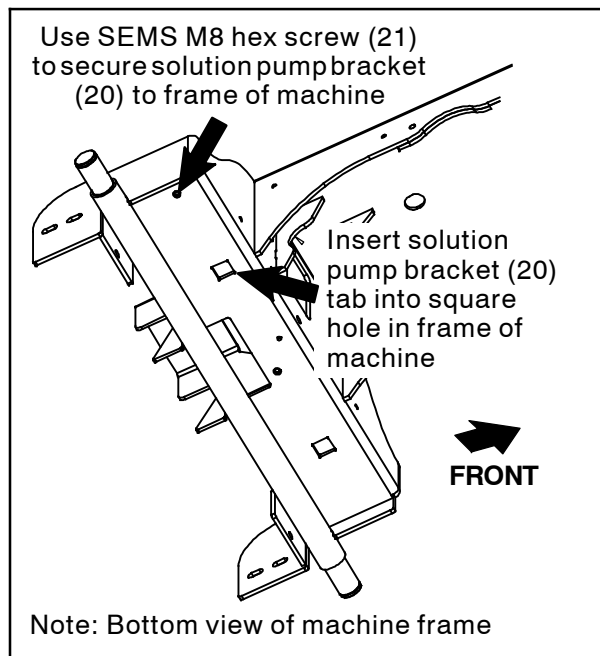


FIG. 12

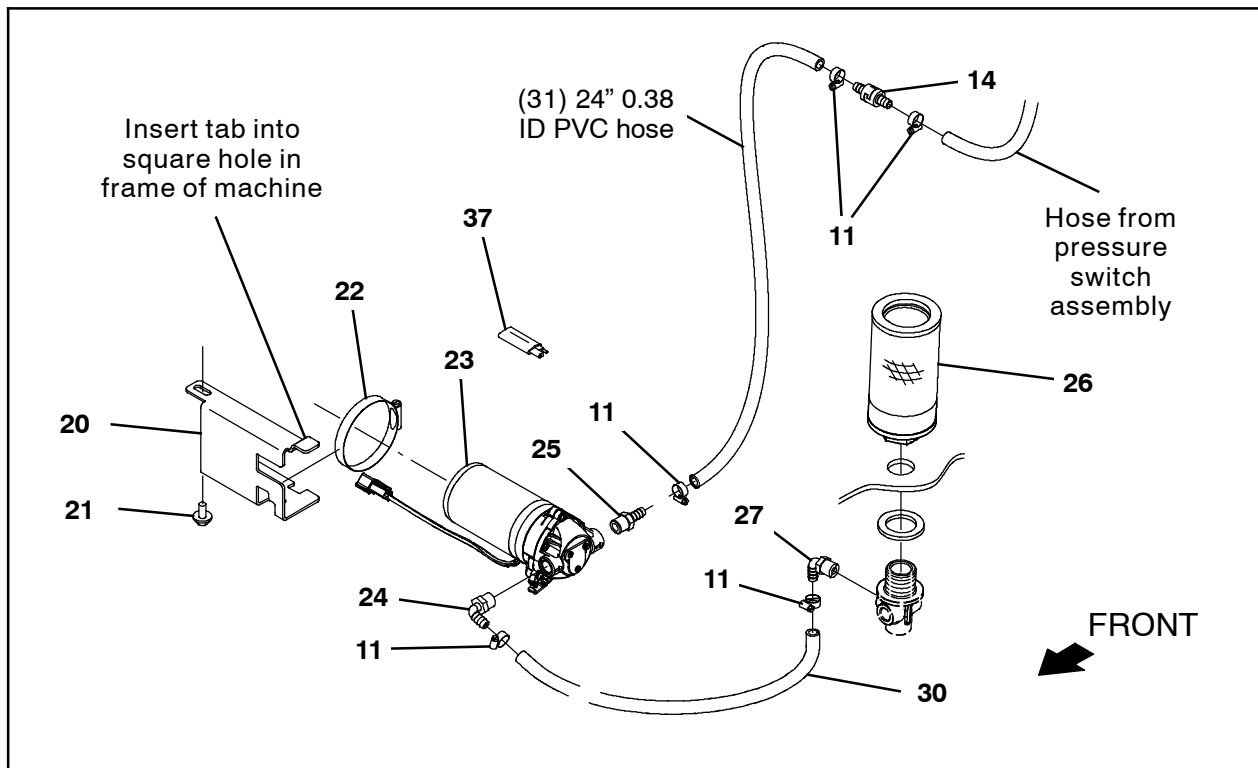


FIG. 13

- Remove filter screen located inside the solution tank from the solution fitting. Discard the filter screen. (Fig. 14)

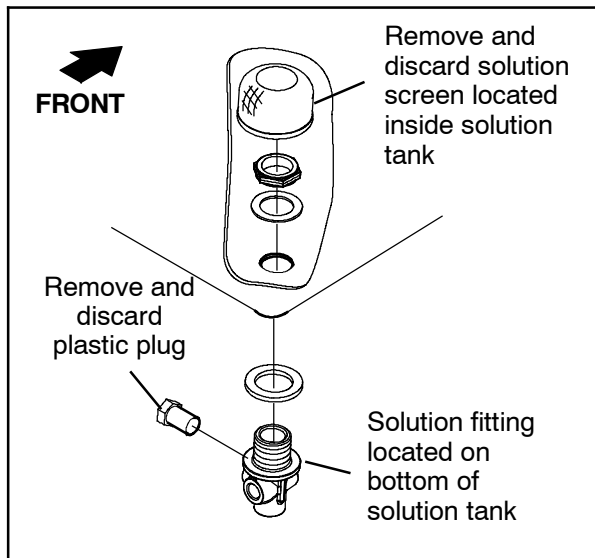


FIG. 14

- Remove the solution fitting from the bottom of the solution tank. (Fig. 14)
- Remove the plastic plug from the solution fitting. Discard the plastic plug. (Fig. 14)
- Install the 90° plastic fitting (27) onto the solution fitting. (Fig. 13)
- Install the solution fitting onto the bottom of the solution tank. (Fig. 13)
- Install the new filter screen (26) inside the solution tank. (Fig. 13)
- Use a hose clamp (11) to connect the 36" 0.38 ID PVC hose (30) to the 90° plastic fitting (27) on the solution fitting. (Fig. 13)

- Route the 36" 0.38 ID PVC hose (30) along the back axle and to the solution pump (23). (Fig. 13)

- Use a hose clamp (11) to connect the 36" PVC hose (30) to the plastic straight fitting (25) installed in the solution pump (23). (Fig. 13)

- Route the 24" 0.38 ID PVC hose (31) connected to the pressure switch assembly to the solution pump (23). (Fig. 13)

- Use a hose clamp (11) to connect the 24" 0.38 ID PVC hose (31) to the straight fitting (25) installed on the solution pump (23). (Fig. 13)

- Route the 96" 0.25 ID PVC hose (53) and 96" 0.25 ID PVC hose (51) through the hole in the frame of the machine. (Fig. 15)

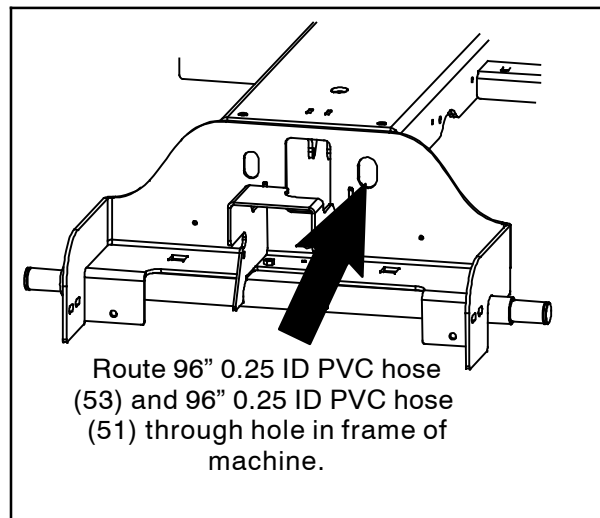


FIG. 15

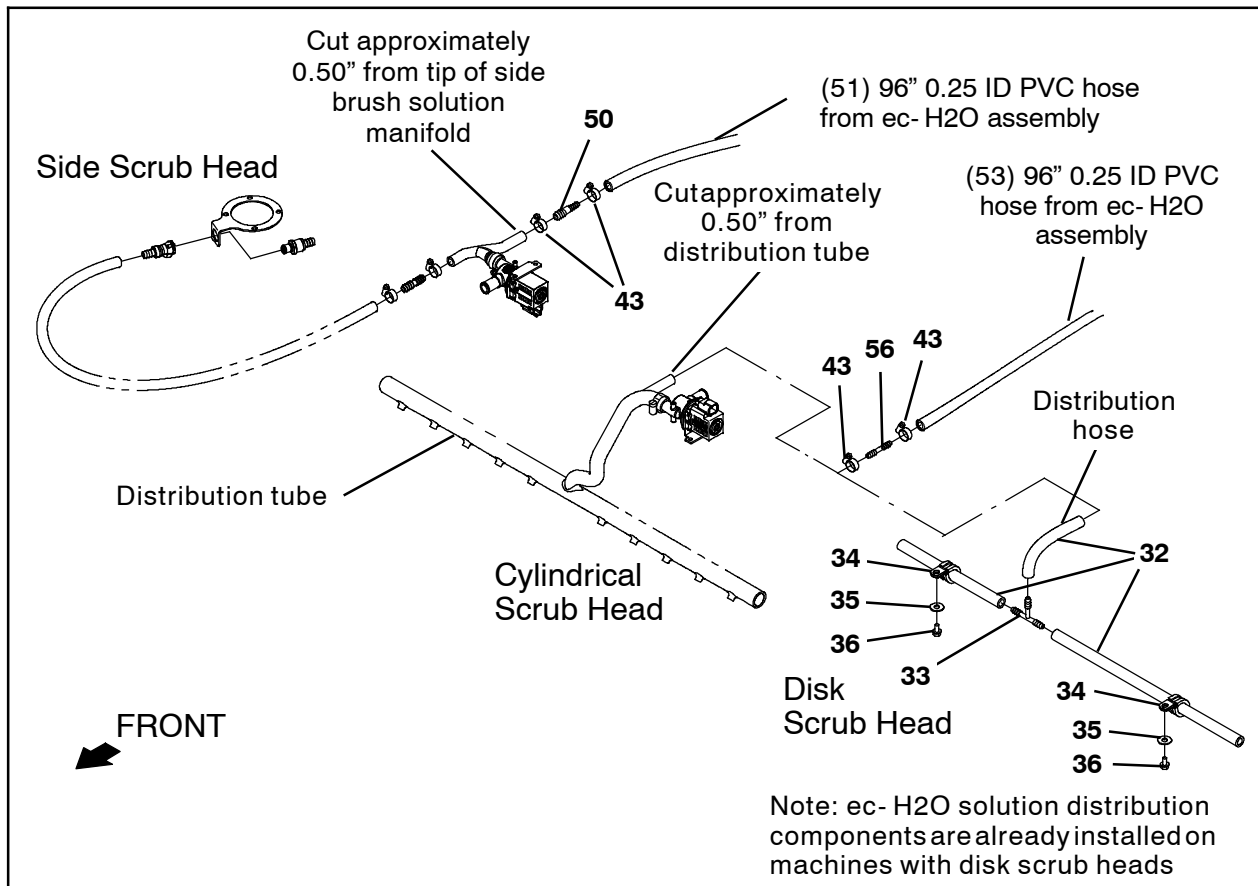


FIG. 16

29. Route the 96" 0.25 ID PVC hose (53) to the main scrub head. (Fig. 16)
30. **Machines with disk scrub heads only:** Insert the barbed plastic straight fitting (56) into the hose and use a hose clamp (43) to secure the straight fitting inside the distribution hose. (Fig. 16)
31. **Machines with disk scrub heads only:** Use a hose clamp (43) to connect the 96" 0.25 ID PVC hose (53) to the straight fitting (56) installed in the distribution hose. (Fig. 16)
32. **Machines with cylindrical scrub heads only:** Cut approximately 0.50" from the tip of the distribution tube. (Fig. 16)
33. **Machines with cylindrical scrub heads only:** Insert the barbed plastic straight fitting (56) into the distribution tube and use a hose clamp (43) to secure the straight fitting inside the distribution tube. (Fig. 16)
34. **Machines with cylindrical scrub heads only:** Use a hose clamp (43) to connect the 96" 0.25 ID PVC hose (53) to the straight fitting (56) installed in the distribution tube. (Fig. 16)
35. Route the 96" 0.25 ID PVC hose (51) to side brush assembly. (Fig. 16)
36. Cut approximately 0.50" from the tip of the side brush solution manifold. (Fig. 16)
37. Insert the barbed plastic straight fitting (50) into the side brush solution manifold and use a hose clamp (43) to secure the straight fitting inside the side brush solution manifold. (Fig. 16)
38. Use a hose clamp (43) to connect the 96" 0.25 ID PVC hose (51) to the straight fitting (50) installed in the side brush solution manifold. (Fig. 16)

39. Remove the top SEMS M8 hex screw securing the electrical panel to the recovery tank. Set the SEMS M8 hex screw aside. (Fig. 17)

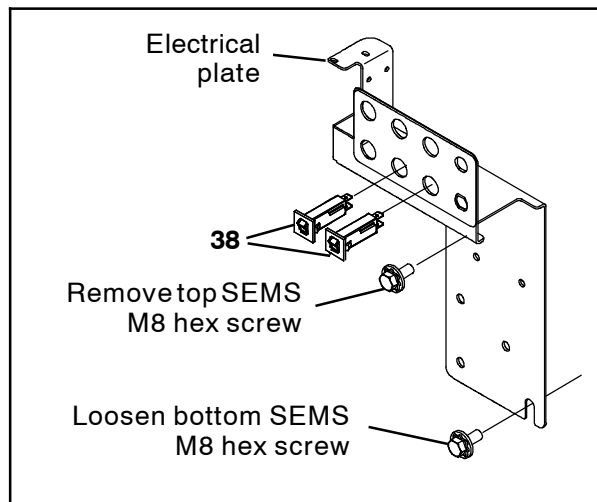


FIG. 17

40. Loosen the bottom SEMS M8 hex screw securing the electrical panel to the recovery tank. (Fig. 8)
41. Carefully pull the electrical panel far enough away from the recovery tank to access the portion of the main wire harness located behind the electrical plate. Do not break any wire cable connections when moving the electrical panel. (Fig. 17)

42. Insert a 2.5A circuit breaker (38) into electrical panel circuit breaker locations CB6 and CB7. (Fig. 17)

43. Connect the main wire harness to both 2.5A circuit breakers. (Fig. 17 / Fig. 20 / Fig. 21)

44. Reinstall / tighten the EMS M8 hex screws securing the electrical panel to the recovery tank. (Fig. 17)

45. Use cable ties to secure the ec- H2O hoses into the machine and away from any moving parts.

46. Reconnect the battery cable to the machine.

47. Reinstall the brushes, rear squeegee, and debris trough onto the machine.

48. Configure the machine for ec- H2O. Refer to Service Manual for instructions how to access / change configuration settings.

49. Start and test the machine. Fill the solution tank with water. Start the machine. Activate the ec- H2O system. Ensure ec- H2O system is functioning. Watch LCD panel for error codes. Refer to Operator Manual for ec- H2O error code information and instructions how to operate the ec- H2O system.

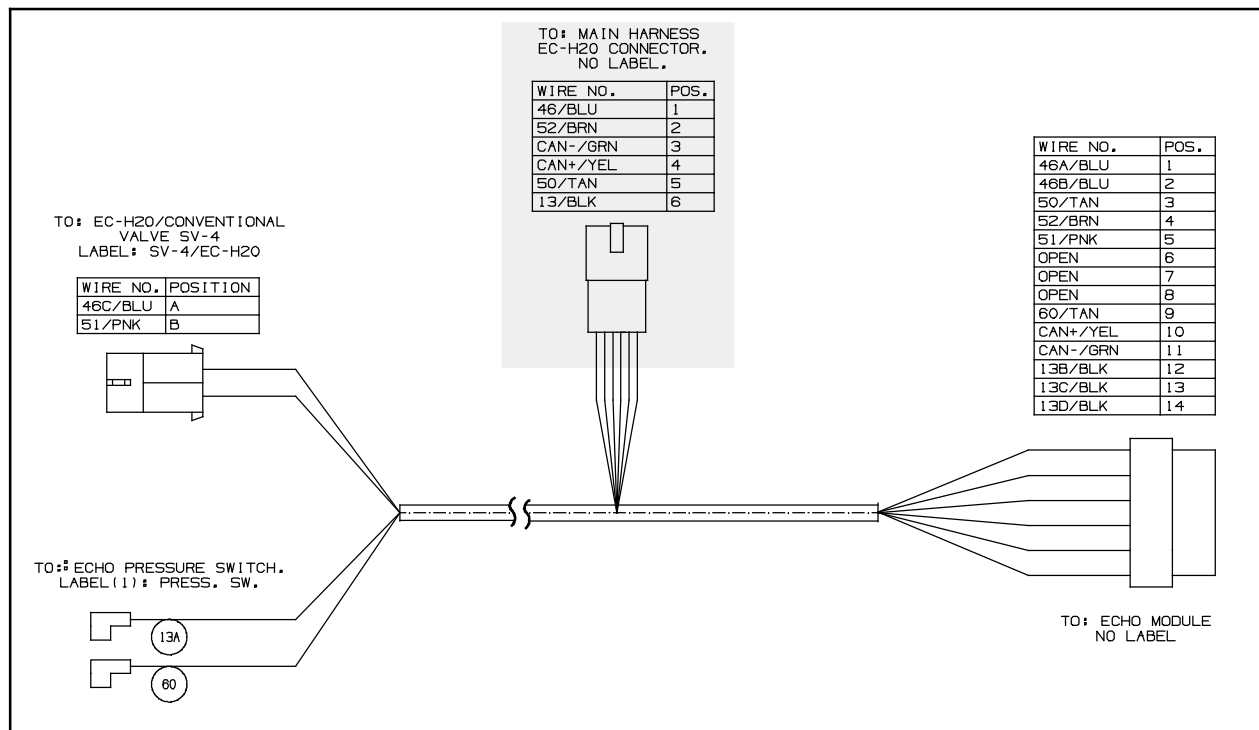


FIG. 18

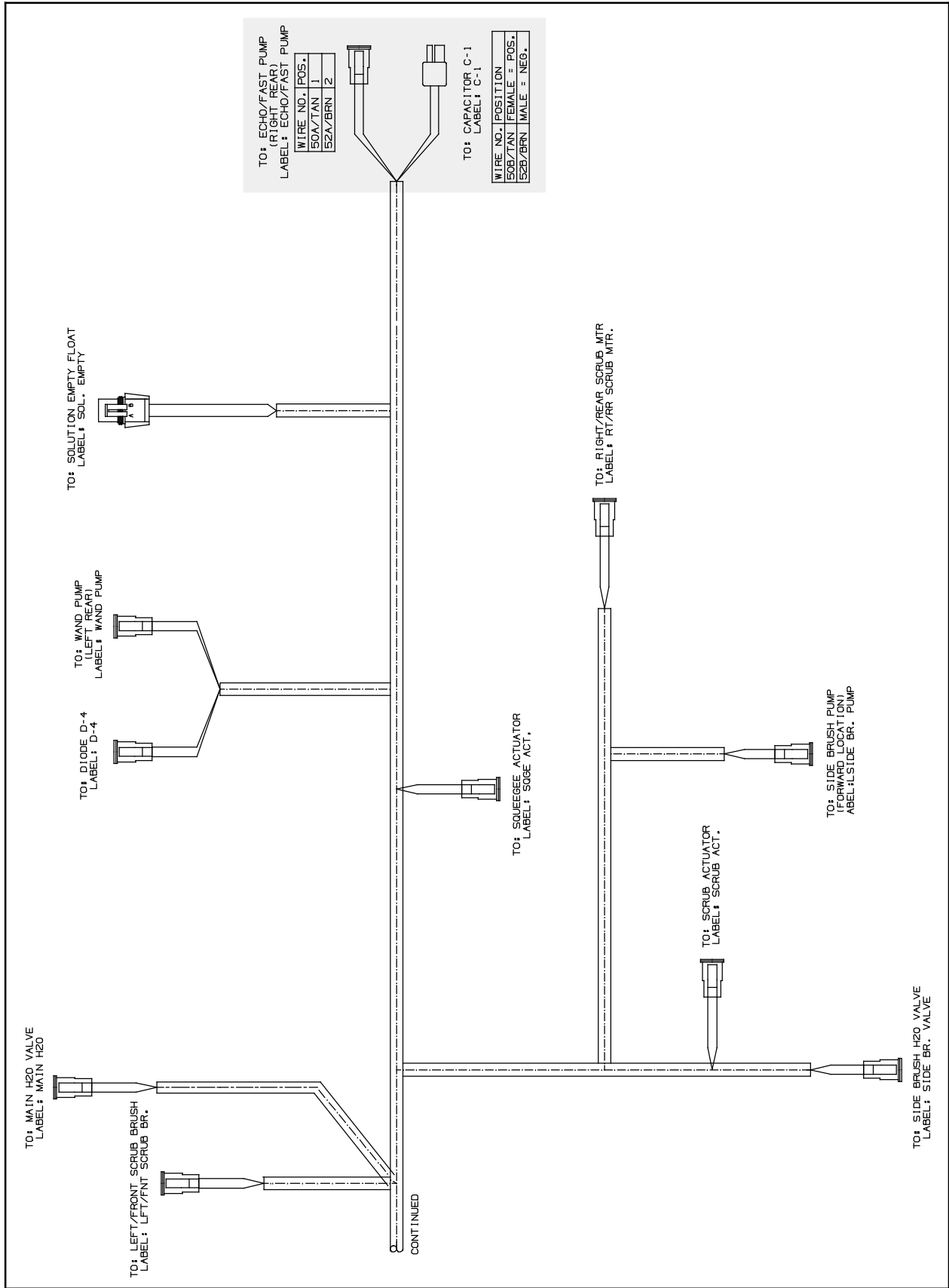


FIG. 19

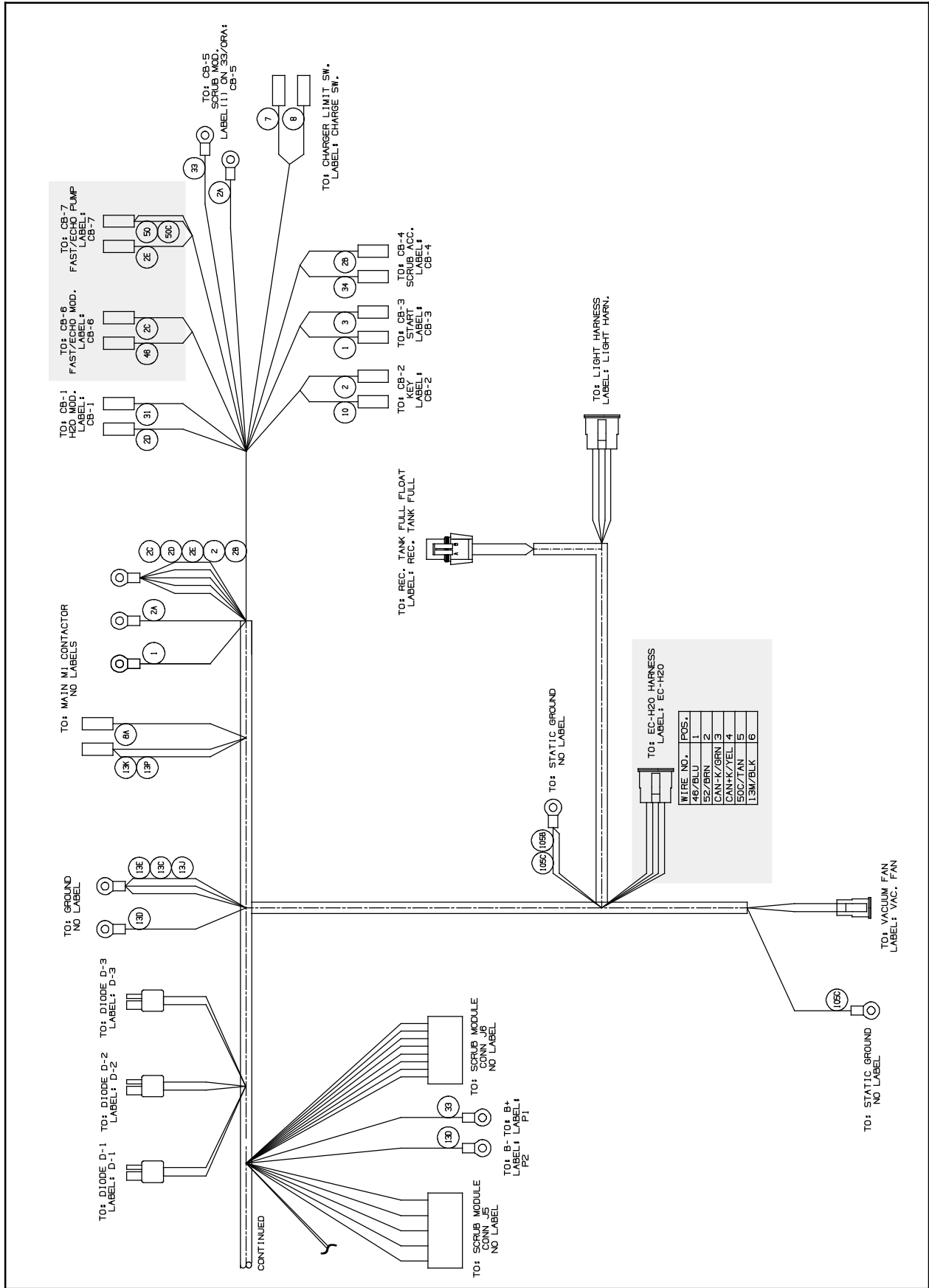


FIG. 20

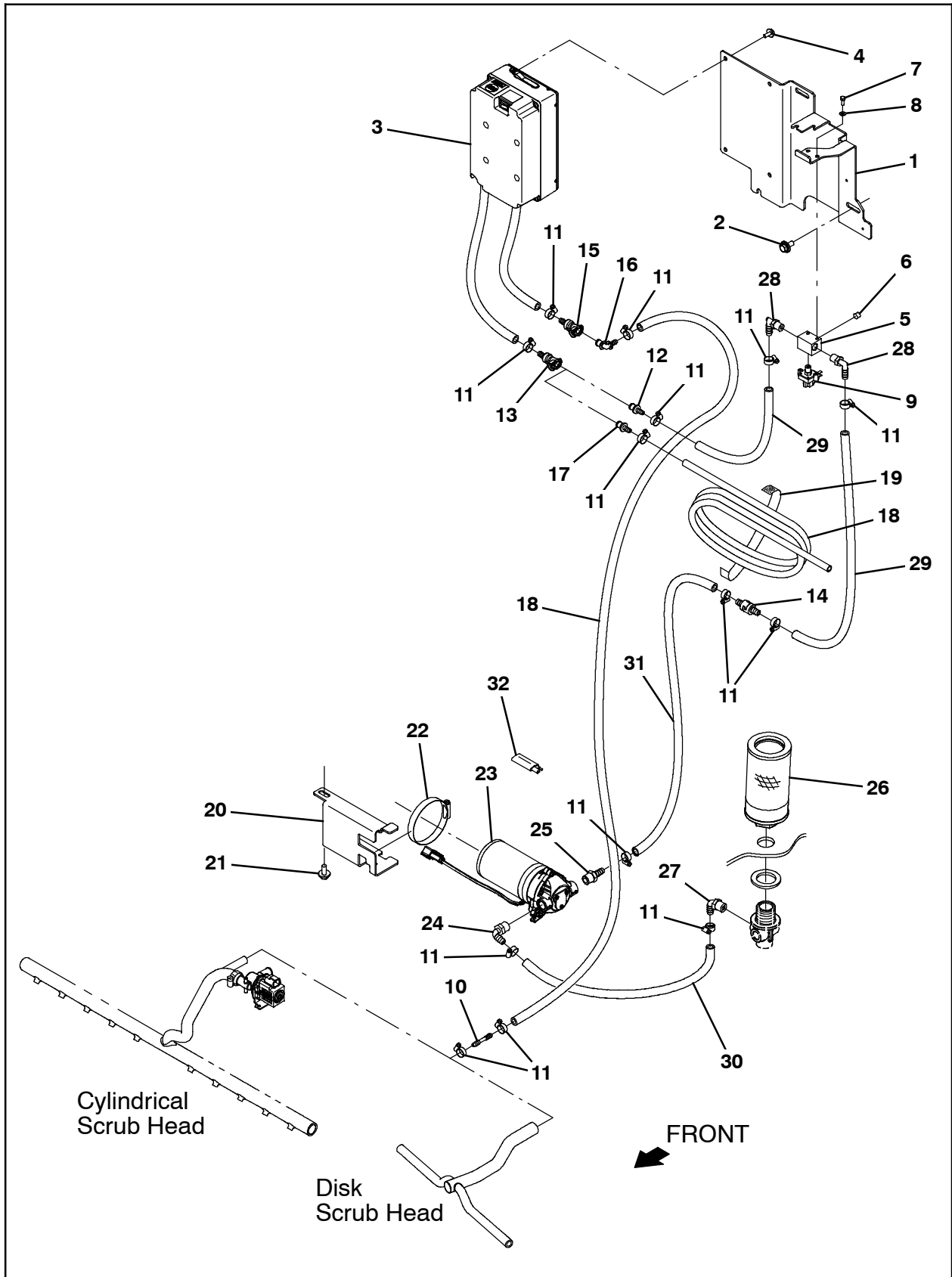


FIG. 22

Bill Of Materials For ec- H2O Kit, DI [T12] - 9009840 (For all machines - both with and without optional side brush assembly)

	Ref.	Tennant Part No.	Description	Qty.
▽		9009840	ec- H2O Kit, DI [T12]	
▲	1	1200161	Bracket, Soltn [Ec- H2o]	1
▲	2	1020341	Screw, Hex, M8 X 1.25 X 20, Ss, Sems	3
▲	3	9010933	Ech20 Module, Afmkt [T12]	1
▲	4	1034731	Screw, Hex, M6 X 1.00 X 16, Ss, Sems	4
▲	5	1059231	Fitting, Stl, Pm04/Pm02/Pm04/Pm02, Spcl	1
▲	6	150208	Fitting, Brs, Str, Pm02, Plug [Skhd]	1
▲	7	09738	Screw, Hex, M5 X 0.80 X 12, Ss	2
▲	8	140011	Washer, Flat, 0.21b 0.45d .03, Ss	2
▲	9	1044415	Switch, Press, 20psi, Pm02	1
▲	10	1052705	Fitting, Plstc, Str, Bm04/Bm04	2
▲	11	43844	Clamp, Hose, Wormdrive, 0.25- 0.62d, .31w	14
▲	12	1203814	Fitting, Plstc, Str, Bm06, Cplg, Male	1
▲	13	1203454	Fitting, Plstc, Str, Bm06, Cplg, Fem	1
▲	14	1015455	Valve, Check, 0005psi Bm06/Bm06	1
▲	15	1203996	Fitting, Plstc, Str, Bm05, Cplg, Fem	1
▲	16	1204024	Fitting, Plstc, E90, Bm04 Cplg Male	1
▲	17	1204338	Fitting, Plstc, Str, Bm04, Cplg, Male	1
▲	18	1206779	Hose, Afmkt, Pvc, Brd, 0.25Id, 08Ft	2
▲	19	1059534	Fastener, 09.00l [Hook & Loop]	1
▲	20	1201310	Bracket, Pump, Soltn	1
▲	21	1020341	Screw, Hex, M8 X 1.25 X 20, Ss, Sems	1
▲	22	43555	Clamp, Hose, Wormdrive, 2.62- 3.50d	1
▲	23	1200328	Pump, Soltn, Ele, 36vdc, 60psi	1
▲	24	1005630	Fitting, Plstc, E90, Bm06/Pm06, Nyl	1
▲	25	150538	Fitting, Plstc, Str, Bm06/Pm06	1
▲	26	1201379	Filter, Soltn, 080 Mesh, Pm12 3.2d 6.0l	1
▲	27	1005630	Fitting, Plstc, E90, Bm06/Pm06, Nyl	1
▲	28	57248	Fitting, Plstc, E90, Bm06/Pm04, Nyl	2
▲	29	1014971	Hose, Afmkt, Pvc, Brd, 0.38id, 01ft, Clr	2
▲	30	1006400	Hose, Afmkt, Pvc, Brd, 0.38id, 03ft, Clr	1
▲	31	1014974	Hose, Afmkt, Pvc, Brd, 0.38id, 02ft, Clr	1
▲	32	1206778	Hose, Afmkt, Pvc, Brd, 0.25Id, 03Ft	1
▲	33	150713	Fitting, Plstc, Tee, Bm04/Bm04/Bm04	1
▲	34	1016354	Clamp, Cable, Ss, 0.50D X 0.50W [Insul]	2
▲	35	01684	Washer, Flat, 0.27B 0.69D .05, Ss	2
▲	36	223198	Screw, Hex, M5 X 0.80 X 10, Fmg	2
▲	37	1040868	Capacitor, Plug [.01 Uf, 200V]	1
▲	38	1064184	Circuit Breaker 02.5S, Resettable	2

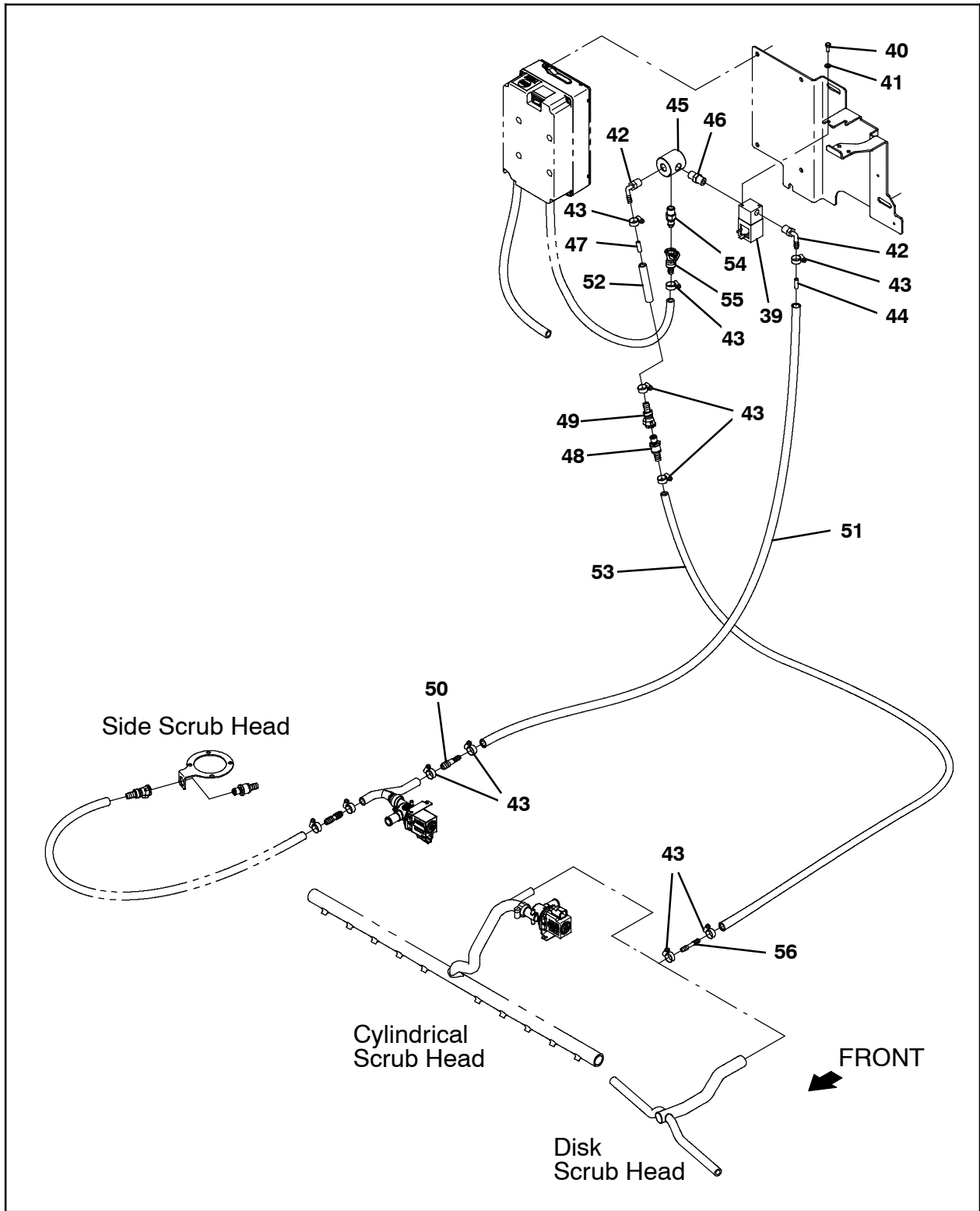


FIG. 23

Bill Of Materials For ec-H2O Kit, W/SBA, DI [T12] - 9009841 (For Machines equipped with optional side brush assembly only)

NOTE: The complete Bill of Materials for ec-H2O Kit, W/SBA, DI [T12] - 9009841 also includes all items from ec-H2O Kit, DI [T12] - 9009840.

	Ref.	Tennant Part No.	Description	Qty.
▽		9009841	ec- H2O Kit, W/SBA, DI [T12]	
▲	39	1028581	Valve, Water, Solenoid, 36vdc 6.0mm Pf04	1
▲	40	09738	Screw, Hex, M5 X 0.80 X 12, Ss	2
▲	41	140011	Washer, Flat, 0.21b 0.45d .03, Ss	2
▲	42	1011170	Fitting, Plstc, E90, Bm04/Pm04, Nyl	2
▲	43	43844	Clamp, Hose, Wormdrive, 0.25- 0.62d, .31w	9
▲	44	1200467	Fitting, Plstc, Rst	1
▲	45	1200998	Fitting, Plstc, Pf04/Pf04/Pf04	1
▲	46	1052010	Fitting, Plstc, Str, Pm04/Pm04	1
▲	47	1201441	Fitting, Plstc, Rst, Main Head	1
▲	48	1204338	Fitting, Plstc, Str, Bm04, Cplg, Male	1
▲	49	1002898	Fitting, Plstc, Str, Bm04, Cplg, Fem[Tco]	1
▲	50	1039557	Fitting, Plstc, Str, Bm04/Bm06	1
▲	51	1206796	Hose, Afmkt, Pvc, Brd, 0.25ld, 08Ft	1
▲	52	1206776	Hose, Afmkt, Pvc, Brd, 0.25ld, 01Ft	1
▲	53	1206779	Hose, Afmkt, Pvc, Brd, 0.25ld, 08Ft	1
▲	54	1002899	Fitting, Plstc, Str, Pm04, Cplg, Mal[Tco]	1
▲	55	1203996	Fitting, Plstc, Str, Bm05, Cplg, Fem	1
▲	56	1052705	Fitting, Plstc, Str, Bm04/Bm04	1

TENNANT COMPANY
P. O. Box 1452
Minneapolis, MN 55440-1452