



# INSTRUCTION BULLETIN

No. 9021933  
Machine: T380AMR,  
T7AMR, T16AMR  
Published: 09-2022  
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 9052003**

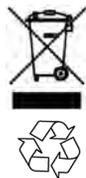
Kit installation must be performed by TennantTrue<sup>®</sup> service or an authorized service provider.

## SYNOPSIS:

This kit contains the parts needed to replace the lithium battery system communication board on T380AMR, T7AMR, and T16AMR scrubbers equipped with lithium batteries. Please follow step-by-step instructions.

## SPECIAL TOOLS/CONSIDERATIONS: NONE

(Estimated time to complete: 1.5 - 2 hours)



### 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: T380AMR

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

1. Completely empty the recovery tank.

**NOTE: Do Not empty the solution tank before replacing the communication board (1). The solution tank must be full so the machine does not tip over.**

2. Press and hold the power button on one of the lithium batteries for 20 seconds to turn the entire battery pack off. All batteries must be OFF prior to replacing the communication board. (Fig. 1)

Quickly press the power button on each lithium battery and observe the indicator bars near the button. None of the indicator bars should illuminate, indicating the battery is off.



FIG. 1

3. Disconnect the battery cable from the machine.



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

4. Set the recovery tank into the service position.  
(Fig. 2)

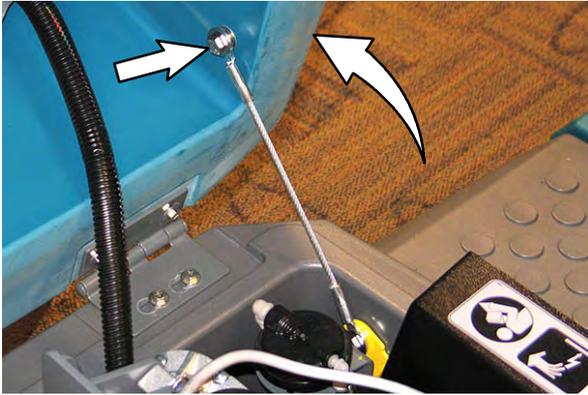


FIG. 2

5. If necessary, remove the battery closest to where the communication board is installed to allow easier access to the communication board and allow for easier disassembly.

#### INSTALLATION: T380AMR

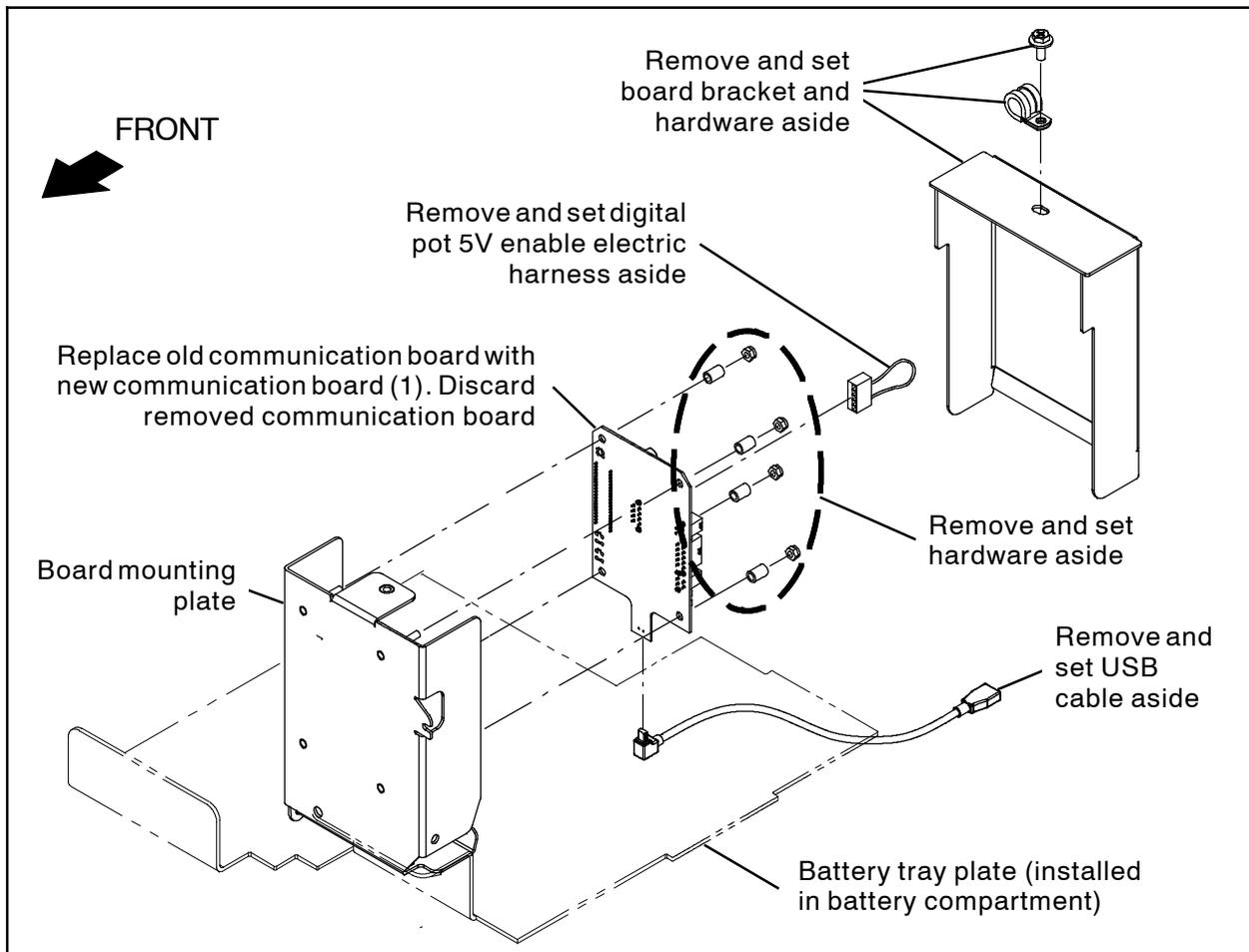
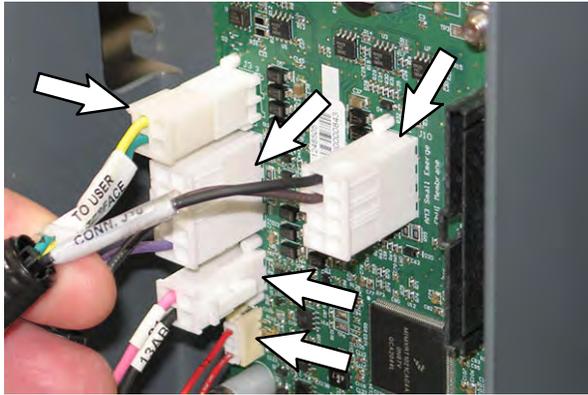


FIG. 3

1. Remove the board bracket from the board mounting plate. Set the hardware and cable clamp aside. (Fig. 3)
2. Disconnect all harnesses/cables from the communication board. Set the digital pot 5V enable electric harness aside. Leave the other end of the USB cable secured to the machine. (Fig. 4/Fig. 3/Fig. 5)
7. If a battery was removed from the machine for easier access to the communication board, reinstall the battery.
8. Update firmware/configure the communication board (1). See UPDATE FIRMWARE/CONFIGURE THE COMMUNICATION BOARD for updating/configuration procedure.



**FIG. 4**



**FIG. 5**

3. Remove the communication board from the board mounting plate. Set all hardware aside. Discard the removed communication board. (Fig. 3)
4. Install the new communication board (1) onto the board mounting plate. (Fig. 3)
5. Connect all harnesses/cables previously disconnected from the removed communication board to the new communication board (1). (Fig. 4/Fig. 3)
6. Reinstall the board bracket onto the board mounting plate. (Fig. 3)

**PREPARATION: T7AMR**

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

1. Completely empty the recovery tank.
2. Tilt the recovery tank back. Ensure the recovery tank is empty before tilting. (Fig. 6)



**FIG. 6**

3. Disconnect the main wire harness from the operator seat switch harness and remove the operator seat/seat plate from the machine. Set seat/seat plate aside. (Fig. 7)



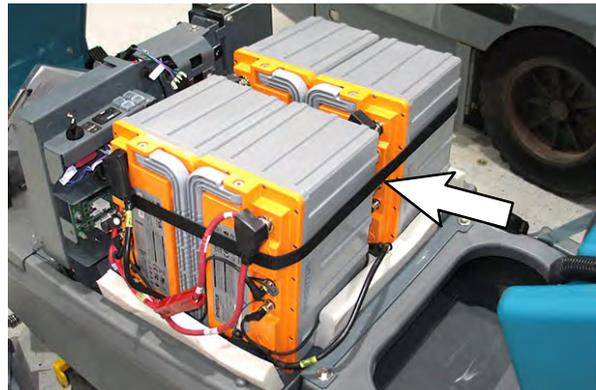
**FIG. 7**

4. Remove the battery box cover from the machine. Set the battery box cover aside. (Fig. 8)



**FIG. 8**

5. Loosen the strap from around the four lithium batteries to allow easier access to where the communication board is located. (Fig. 9)



**FIG. 9**

6. If necessary, remove the foam spacers to allow additional access to where the communication board is located. Set the foam spacers aside. (Fig. 9)

7. Press and hold the power button on one of the lithium batteries for 20 seconds to turn the entire battery pack off. All batteries must be OFF prior to replacing the communication board. (Fig. 10)

Quickly press the power button on each lithium battery and observe the indicator bars near the button. None of the indicator bars should illuminate, indicating the battery is off.

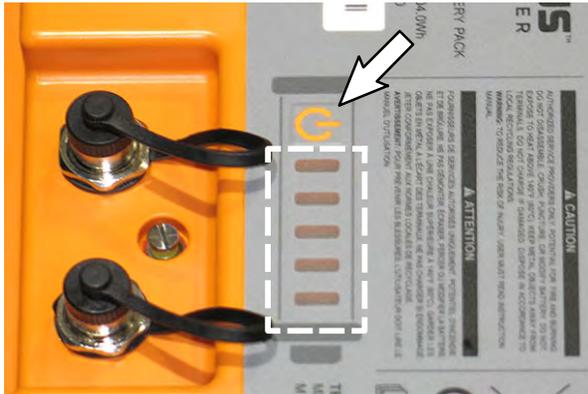
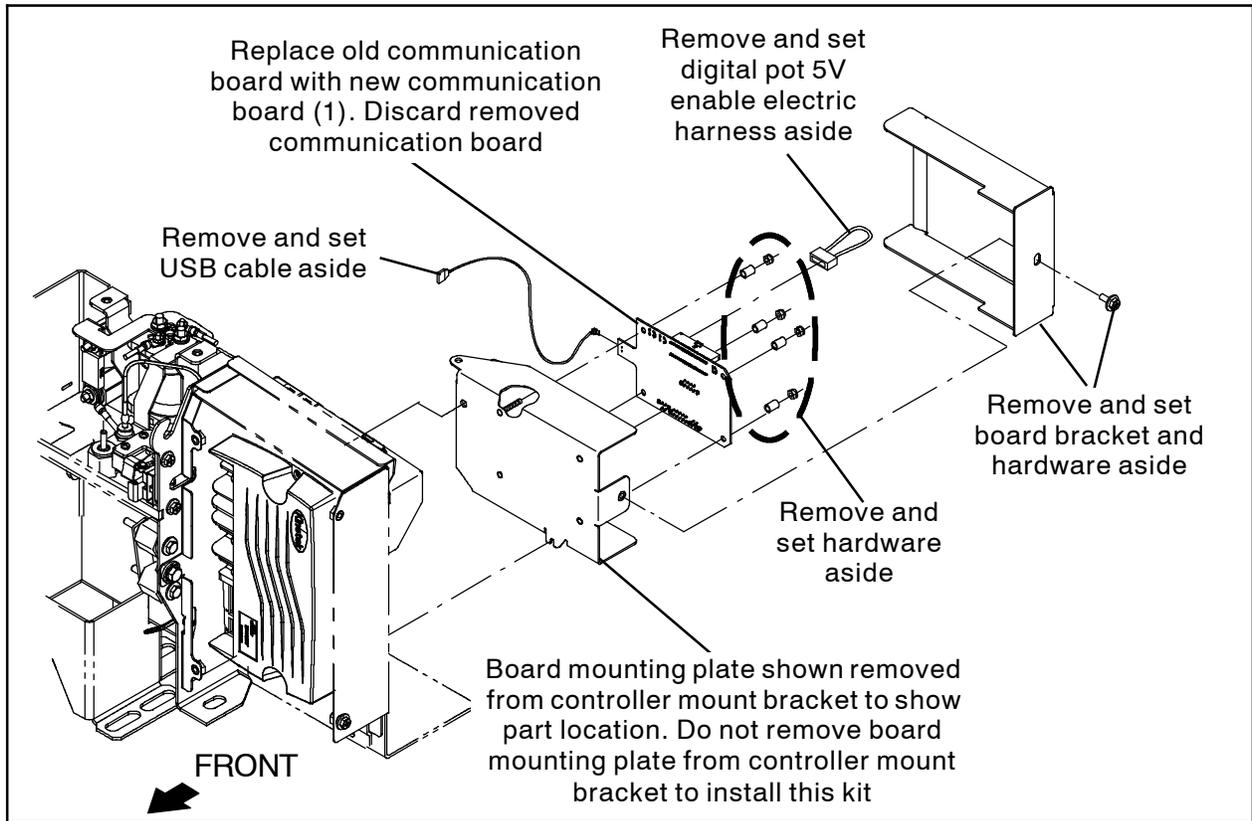


FIG. 10

8. Disconnect the battery cable from the machine.

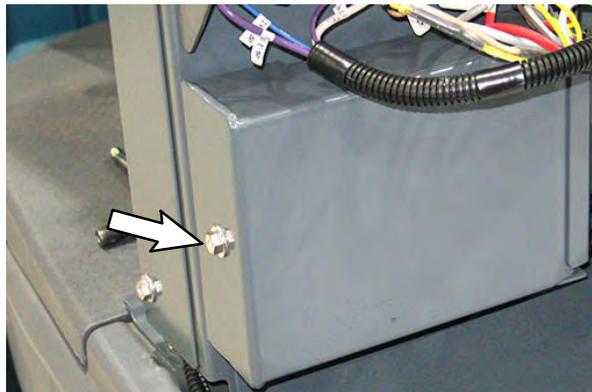
**WARNING:** Always disconnect battery cables from machine before working on electrical components.

**INSTALLATION: T7AMR**



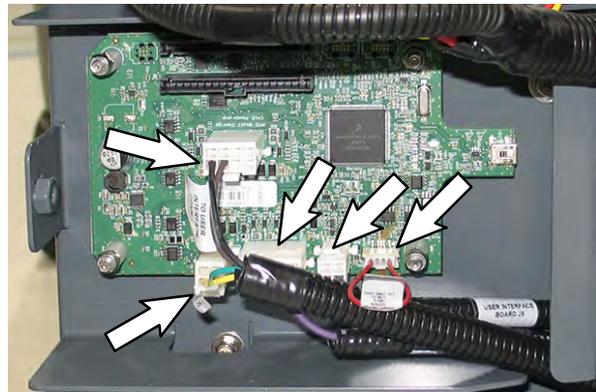
**FIG. 11**

1. Remove the board cover from the board mounting plate. Set the board cover and mounting hardware aside. (Fig. 11/Fig. 12)

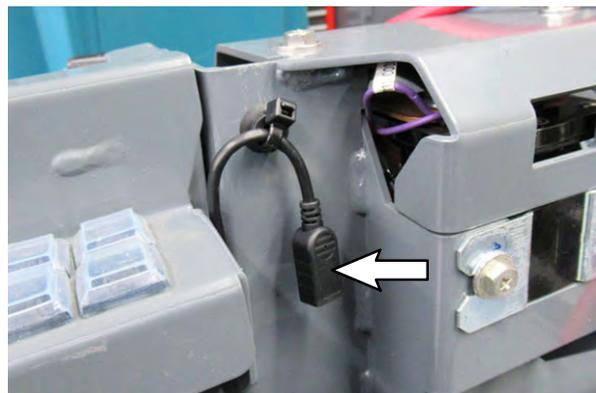


**FIG. 12**

2. Disconnect all harnesses/cables from the communication board. Set the digital pot 5V enable electric harness aside. Leave the other end of the USB cable secured to the machine. (Fig. 13/Fig. 14)



**FIG. 13**



**FIG. 14**

3. Remove the communication board from the board mounting plate. Set all hardware aside. Discard the removed communication board. (Fig. 11)
4. Install the new communication board (1) onto the board mounting plate. (Fig. 11)
5. Connect all harnesses/cables previously disconnected from the removed communication board to the new communication board (1). (Fig. 13)
6. Reinstall the board bracket onto the board mounting plate. (Fig. 11)
7. If a battery was removed from the machine for easier access to the communication board, reinstall the battery.
8. Reinstall the foam spacer(s) if removed to allow easier access to the lithium battery terminal where the UI to BMS electrical harness is connected.
9. Tighten the strap around the four lithium batteries to secure them into place in the battery compartment.
10. Reinstall the battery box cover onto the machine.
11. Reinstall the operator seat/seat plate onto the machine and connect the main wire harness from the operator seat switch harness.
12. Update firmware/configure the communication board (1). See UPDATE FIRMWARE/CONFIGURE THE COMMUNICATION BOARD for updating/configuration procedure.

## PREPARATION: T16AMR

1. Press and hold the power button on one of the lithium batteries for 20 seconds to turn the entire battery pack off. All batteries must be OFF prior to replacing the communication board. (Fig. 15)

Quickly press the power button on each lithium battery and observe the indicator bars near the button. None of the indicator bars should illuminate, indicating the battery is off.

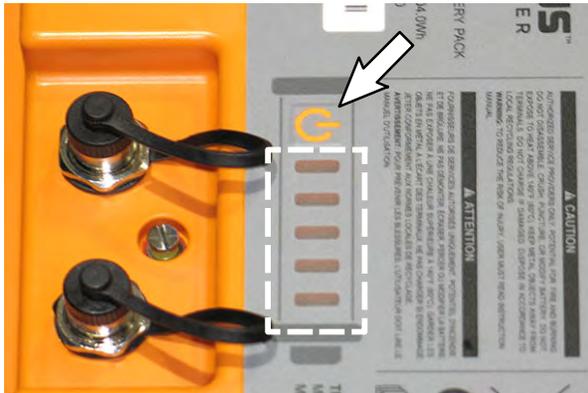


FIG. 15

2. Disconnect the battery cable from the machine.

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

3. Disconnect the wire harness from the seat switch and lift the seat/seat plate from the machine. Set the seat/seat plate aside. (Fig. 16)

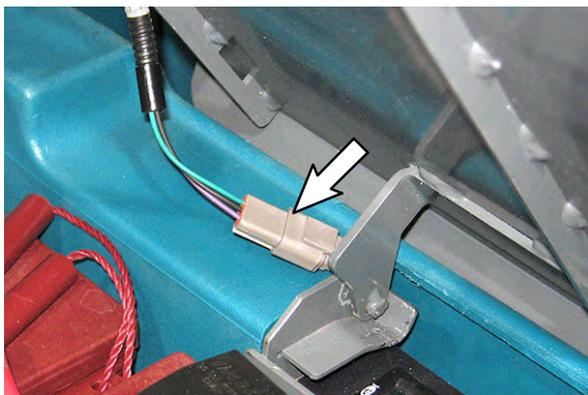


FIG. 16

4. Remove the hardware securing the seat shroud cover to the machine and lift the seat shroud cover from the machine. Set the seat shroud cover and hardware aside. (Fig. 17)

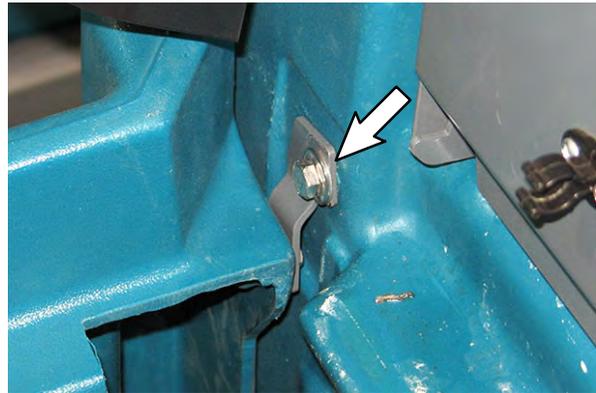
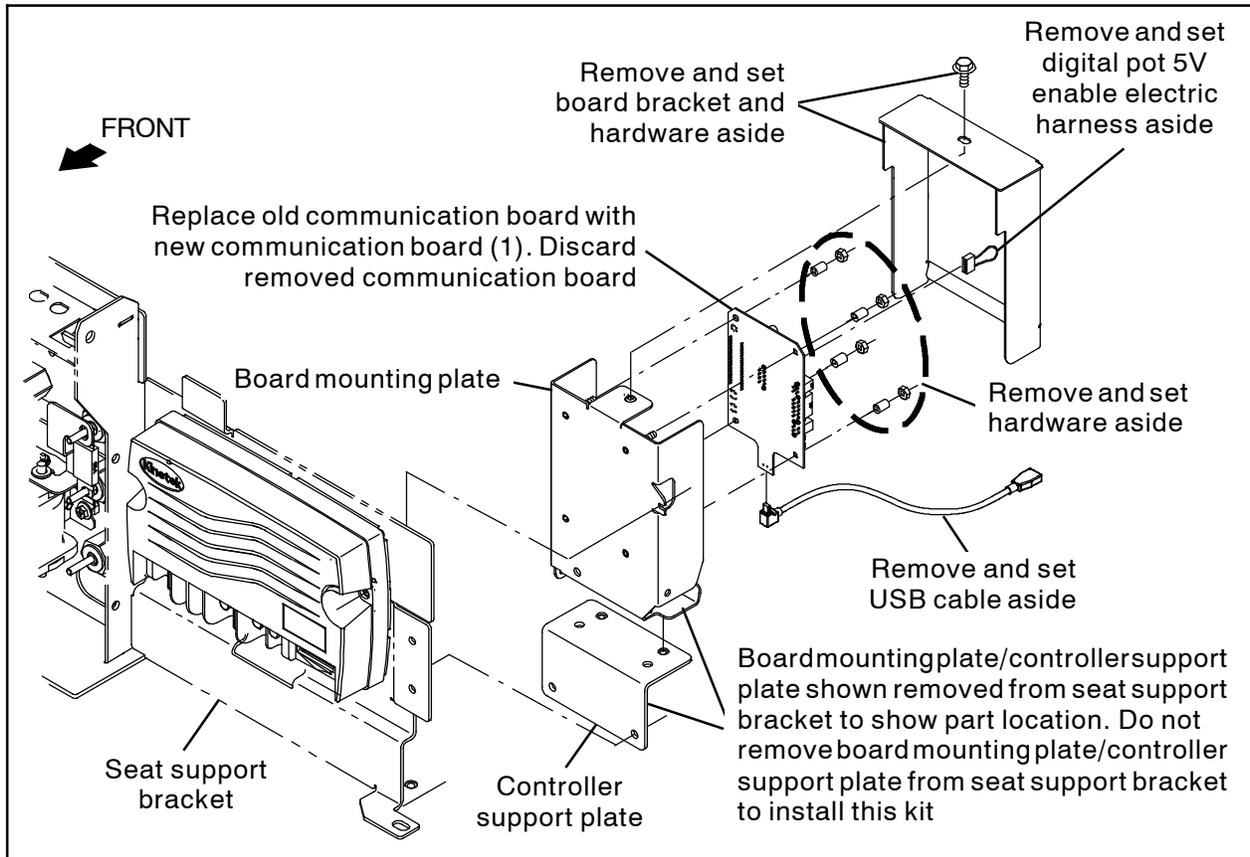


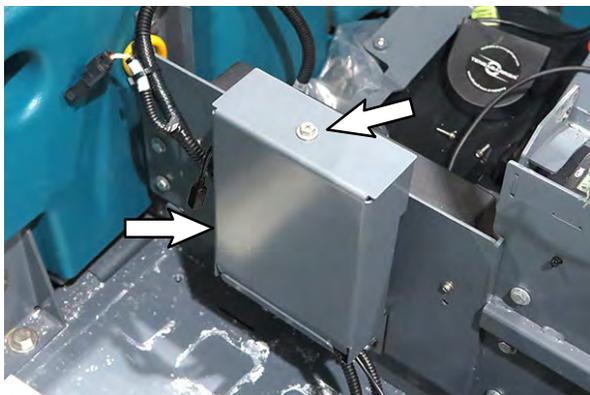
FIG. 17

**INSTALLATION: T16AMR**

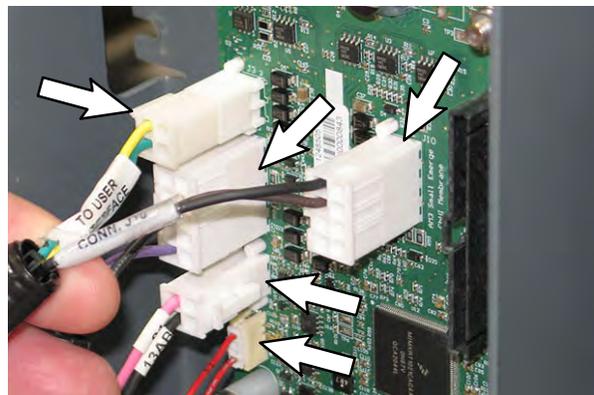


**FIG. 18**

1. Remove the board mounting bracket from the board mounting plate. Set the board mounting bracket and mounting hardware aside. (Fig. 19/Fig. 18)
2. Disconnect all harnesses/cables from the communication board. Set the USB cable and digital pot 5V enable electric harness aside. (Fig. 20)



**FIG. 19**



**FIG. 20**

3. Remove the communication board from the board mounting plate. Set all hardware aside. Discard the removed communication board. (Fig. 18)
4. Install the new communication board (1) onto the board mounting plate. (Fig. 18)

5. Connect all harnesses/cables previously disconnected from the removed communication board to the new communication board (1). (Fig. 20)
6. Route the USB harness under the signals UI to BMS electrical harness and communication board, through the board mounting plate and orient connector end so the connector is pointing down. (Fig. 21)



**FIG. 21**

7. Reinstall the board bracket onto the board mounting plate. (Fig. 18/Fig. 19)
8. Reinstall the seat shroud cover onto the machine.
9. Reinstall the seat/seat plate onto the machine and reconnect the wire harness to the seat switch.
10. Update firmware/configure the communication board (1). See UPDATE FIRMWARE/CONFIGURE THE COMMUNICATION BOARD for updating/configuration procedure.

## UPDATE FIRMWARE/CONFIGURE THE COMMUNICATION BOARD: ALL MACHINES

1. Reconnect the battery cable to the machine.
2. Turn on the batteries. Hold the power button on each lithium battery for 5 seconds to turn on the battery.
3. Quickly press the power button again and observe the indicator lights near the button. The indicator lights should be illuminated.
4. Repeat previous two steps to turn on the remaining batteries.
5. Connect a USB cable to the service device.

**ATTENTION:** Never allow the metallic tip on the loose end of the service USB cable to touch a lithium battery positive (+) terminal when connecting the USB cable to the service device/ USB cable connected to the lithium battery control board. USB cables, service device, and/or lithium battery control board could be damaged if loose metallic end of the service USB cable touches a lithium battery positive (+) terminal.

6. Connect the other end of the USB cable connected to the service device in the previous step to the USB cable installed on the lithium battery communication board.
7. Turn the key switch ON.
8. Double click the Service Diagnostics desktop shortcut or find the software in All Programs to launch the software.
9. Allow Service Diagnostics tool to connect to the lithium battery network. (Fig. 22)

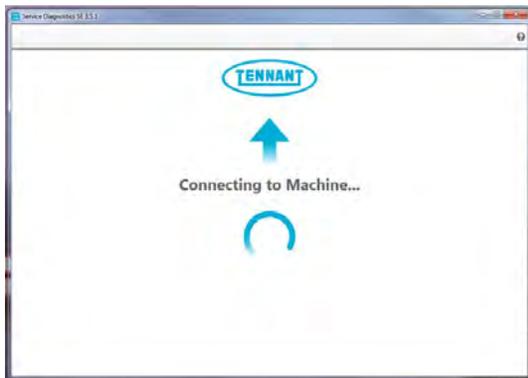


FIG. 22

10. The Service Diagnostics tool automatically detects a new communication board was installed. A Service Diagnostic window with text “A new board has been installed in this machine and must be properly configured. This wizard will guide you through the process.” appears on the screen. (Fig. 23)

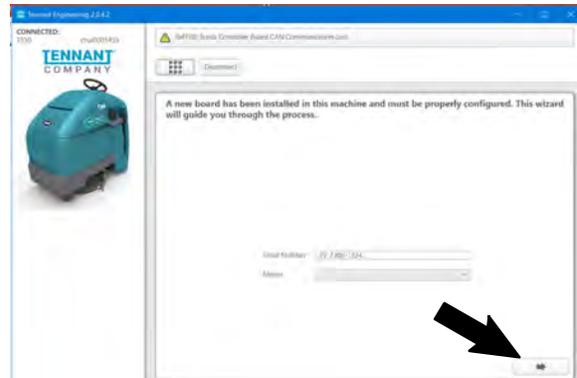


FIG. 23

Enter serial number and select model from the pull down menu, and click the arrow button to proceed with reconfiguring the machine. (Fig. 24)

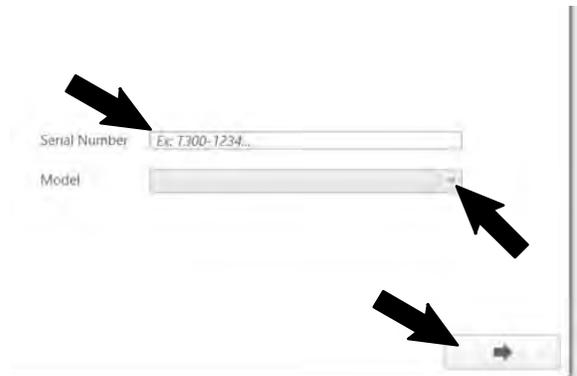


FIG. 24

11. The firmware update screen appears and will begin programming the machine for the new communication board. The process status indicator and firmware update status box appear on the left side of the screen. (Fig. 25)

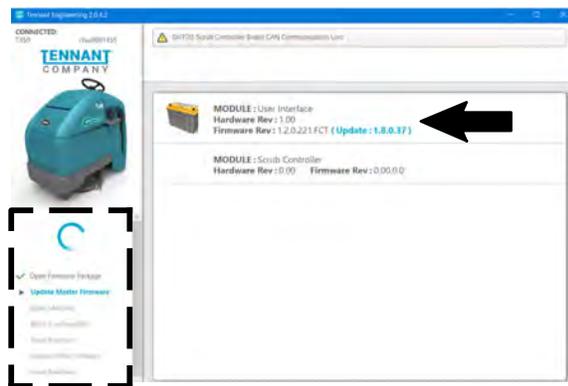


FIG. 25

Allow the communication board firmware update to proceed. A process status indicator with a percent status of the update also appears next to the selected firmware update. Firmware update process typically takes 2 or 3 minutes. (Fig. 26)

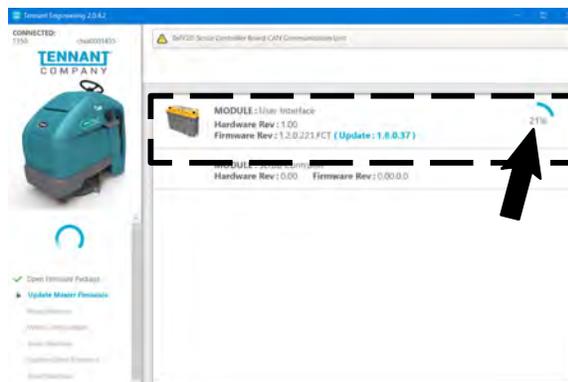


FIG. 26

12. A check appears where the process status indicator with the percent status was previously located when the firmware update is complete. (Fig. 27)

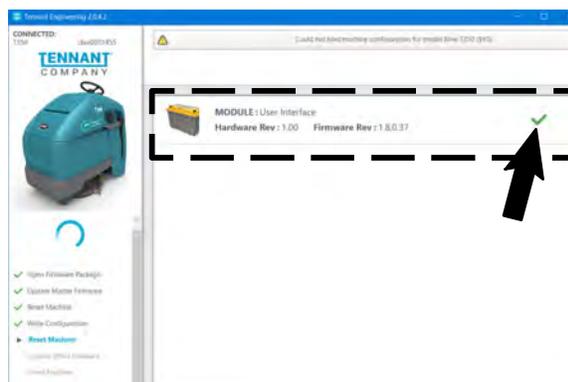


FIG. 27

13. A text box with “Press OK, then Key cycle machine.” appears. Select the OK button and then key cycle the machine to complete the firmware update. (Fig. 28)

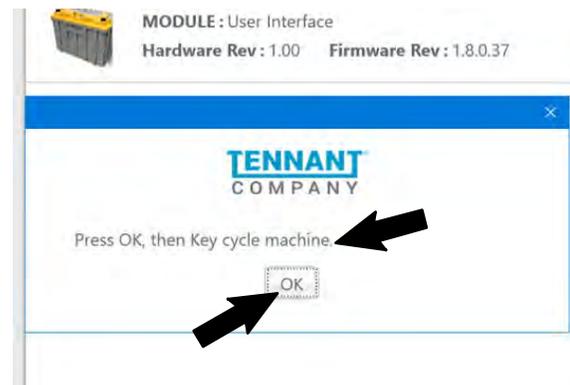


FIG. 28

NOTE: Firmware update status box on left side of the screen will be at “Reset Machine” when text box to key cycle machine appears. All previous listed items are checked/completed. (Fig. 29)

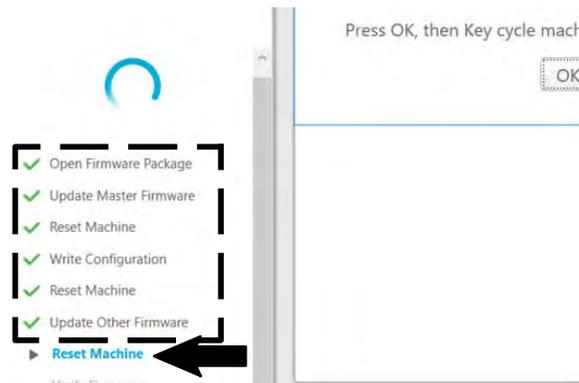


FIG. 29

14. A screen with “Machine Setup Complete” appears when the firmware update is complete. (Fig. 30)

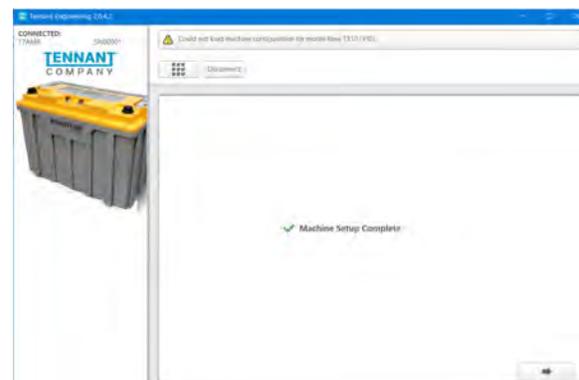
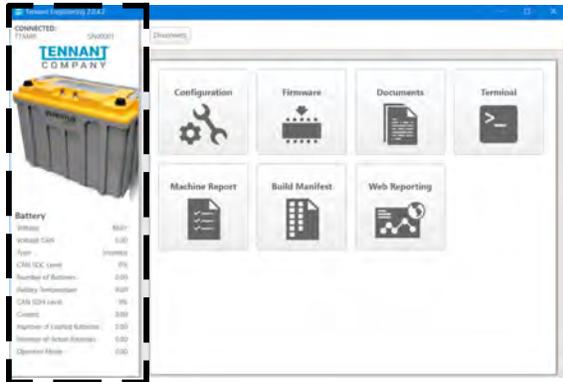


FIG. 30

15. Use the Service Diagnostics tool to access the lithium battery screen. (Fig. 31)



**FIG. 31**

16. Observe the lithium battery information pane on the left side of the screen. Both the “Number of Batteries” and “Number of Active Batteries” should reflect the number of lithium batteries (either four (4.00) or two (2.00)), and the number of “Number of Faulted Batteries” should be zero (0.00). (Fig. 32)

<b>Battery</b>	
Voltage	36.34
Voltage CAN	36.02
Type	Inventus
CAN SOC Level	47%
Number of Batteries	4.00
Battery Temperature	20.00
CAN SOH Level	100%
Current	-2.30
Number of Faulted Batteries	0.00
Number of Active Batteries	4.00
Operator Mode	5.00

**FIG. 32**

17. Disconnect the USB cable from the service device and the USB harness (18).

*NOTE: Ensure communication board USB cable end is again oriented down when finished updating firmware/configuring the communication board and disconnecting the communication board USB cable from the service device.*

18. Turn the key switch OFF.

**Bill Of Materials For Circuit Board, Interface, Battery, Li-Ion - 9052003**

Ref.	Tennant Part No.	Description	Qty.
1	1248505	Circuit Board [UI, RTOS]	1

TENNANT COMPANY  
10400 Clean Street  
Eden Prairie, MN 55344- 2650