FLEETWATCH®
by SA SYSTEMS, INC.

Fleetwatch JX Vehicle Module Troubleshooting Checklist

JX VEHICLE MODULE with Y-harness and TX55 Transmitter

REVISED: 25 July 2017

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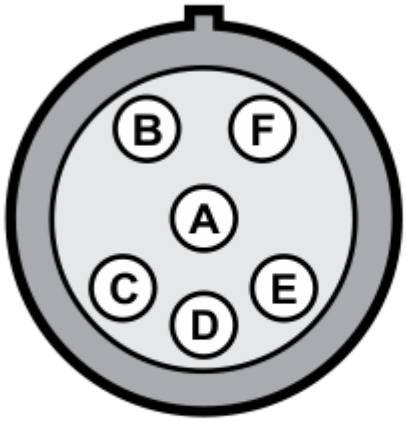
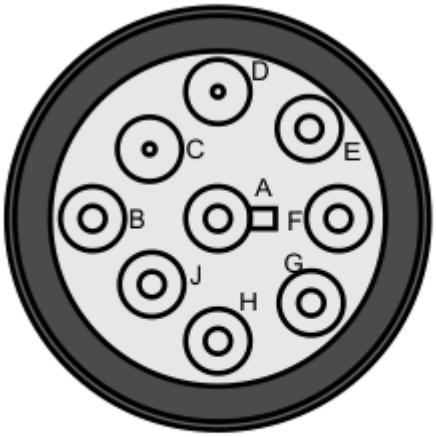
6 Pin Connector



View into J1708 Connector
Deutsch Part # HD16-6-12S-B010
(mates to Deutsch
Part# HD10-6-12P)

Function	Color	Pin
Data A (+)	Brown	A
Data B (-)	White	B
Ground	Black	E
V + (9-32 volts)	Red	C
No standard function	Green	D
No standard function	Blue	F

9 Pin Connector

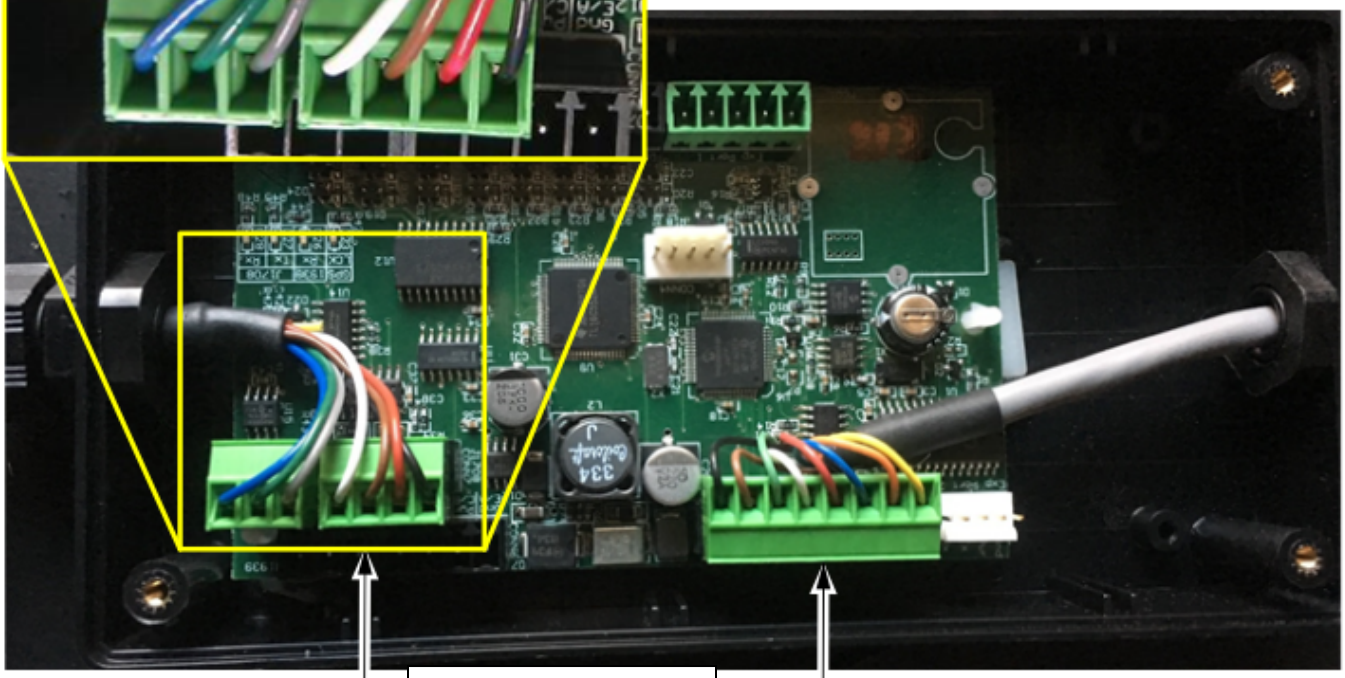


View into 1939 CAN Connector
Deutsch Part # HD16-9-1939S
(mates to Deutsch
Part# HD10-9-1939P)

Function	Wire Color	Pin
Battery (-) GND	Black	1/A
Battery (+)	Red	2/B
CAN_H	Green	3/C
CAN_L	Blue	4/D
CAN_SHLD	Gray	5/E
J1708 (+) Data (A)	Brown	6/F
J1708 (-) Data (B)	White	7/G
Proprietary	N/C	8/H
Proprietary	N/C	9/J

1. The sum of the J1708 Data A (+) & Data B (-) is designed not to exceed 5.0 VDC. Voltages shown above are nominal but can vary.
2. CAN_SHLD will either be a Gray or Bare wire.
3. When the CAN bus is in idle mode, both of these lines carry 2.5V but when data bits are being transmitted, the CAN high line can go to 3.75V and the CAN low can drop to 1.25V

Ensure the colored wires that are in the green plugs on the circuit board from Right to Left are in the correct order. This is the pin config for J1939 termination inside the JX55 Box



CAN_SHLD will either be a Gray or Bare wire.

1939 CAN Plug Wiring

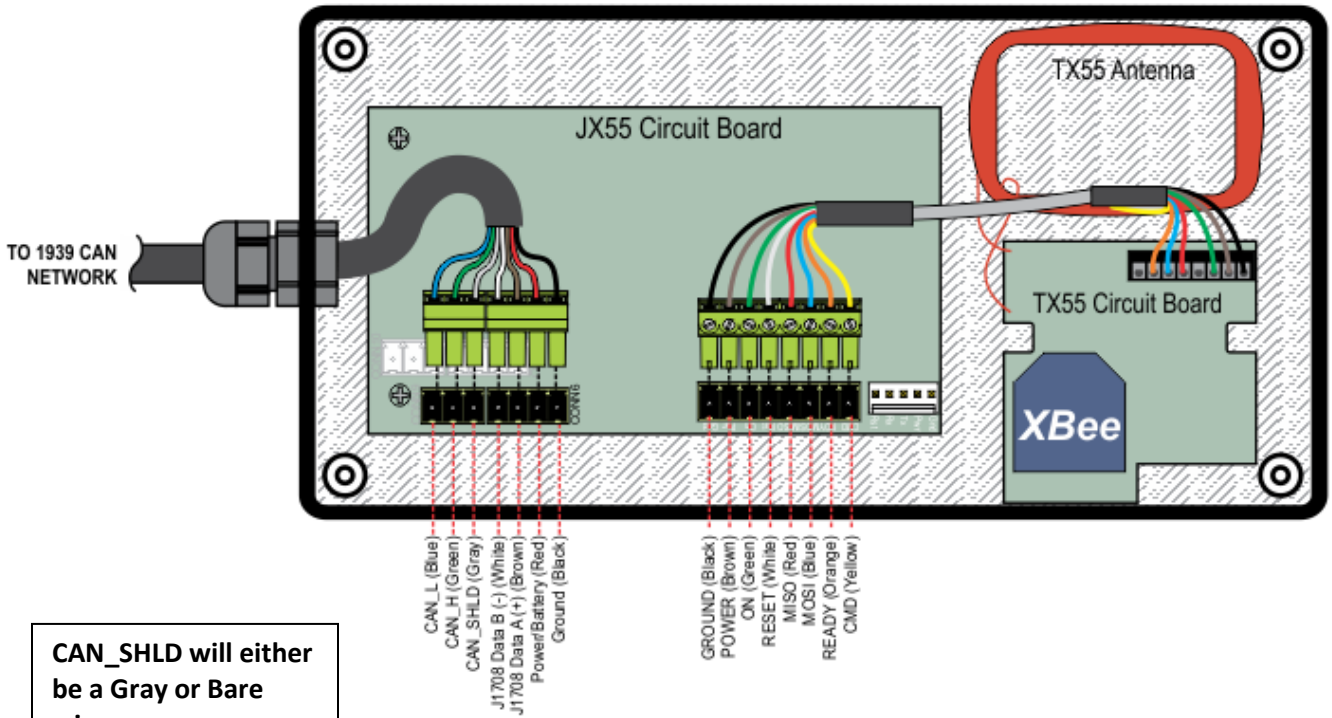
Function	Wire Color	Pin	Position
Battery (-) GND	Black	A	7
Battery (+)	Red	B	6
CAN_H	Green	C	2
CAN_L	Blue	D	1
CAN_SHLD	Gray	E	3
J1708 (+) Data (A)	Brown	F	5
J1708 (-) Data (B)	White	G	4
Proprietary	Yellow	H	NC
Proprietary	Orange	J	NC

TX55 Plug Wiring

Function	Wire Color	Pin
RESET	White	4
READY	Orange	7
POWER	Brown	2
ON	Green	3
GROUND	Black	1
MOSI	Blue	6
CMD	Yellow	8
MISO	Red	5

Figure 1: JX VEHICLE MODULE-1939, lid removed, showing wiring from ECM and to TX55

JX VEHICLE MODULE and TX55 Wire Color Diagram



CAN_SHLD will either be a Gray or Bare wire.

1939 CAN Plug Wiring

Function	Wire Color
Battery (-) GND	Black
Battery (+)	Red
CAN_H	Green
CAN_L	Blue
CAN_SHLD	Gray
J1708 (+) Data (A)	Brown
J1708 (-) Data (B)	White

TX55 Plug Wiring

Function	Wire Color
RESET	White
READY	Orange
POWER	Brown
ON	Green
GROUND	Black
MOSI	Blue
CMD	Yellow
MISO	Red

Figure 2: Overview schematic of JX VEHICLE MODULE-1939

JX VEHICLE MODULE Troubleshooting Checklist

JX VEHICLE MODULE – Cannot Read with MR55, Unit shows as No Longer Responding to Queries on Reports

Step 1. Move the bus out of the fuel lane and into a maintenance bay or parking area because the FR55 in the service lane will intefere with the MR55.

Step 2. Turn the bus ignition switch on. Attempt to read the JX VEHICLE MODULE by holding the MR55 reader within 2 feet of the TX55 transceiver. If you cannot read the module, either try a new MR55, or proceed to step 3.

Step 3. Ensure the JX VEHICLE MODULE harness is plugged into the bus J1708 or J1939 connector. The JX VEHICLE MODULE receives power and data from the bus connector. If it is not connected, plug in and try to read the module again. If it is connected proceed to step 4.

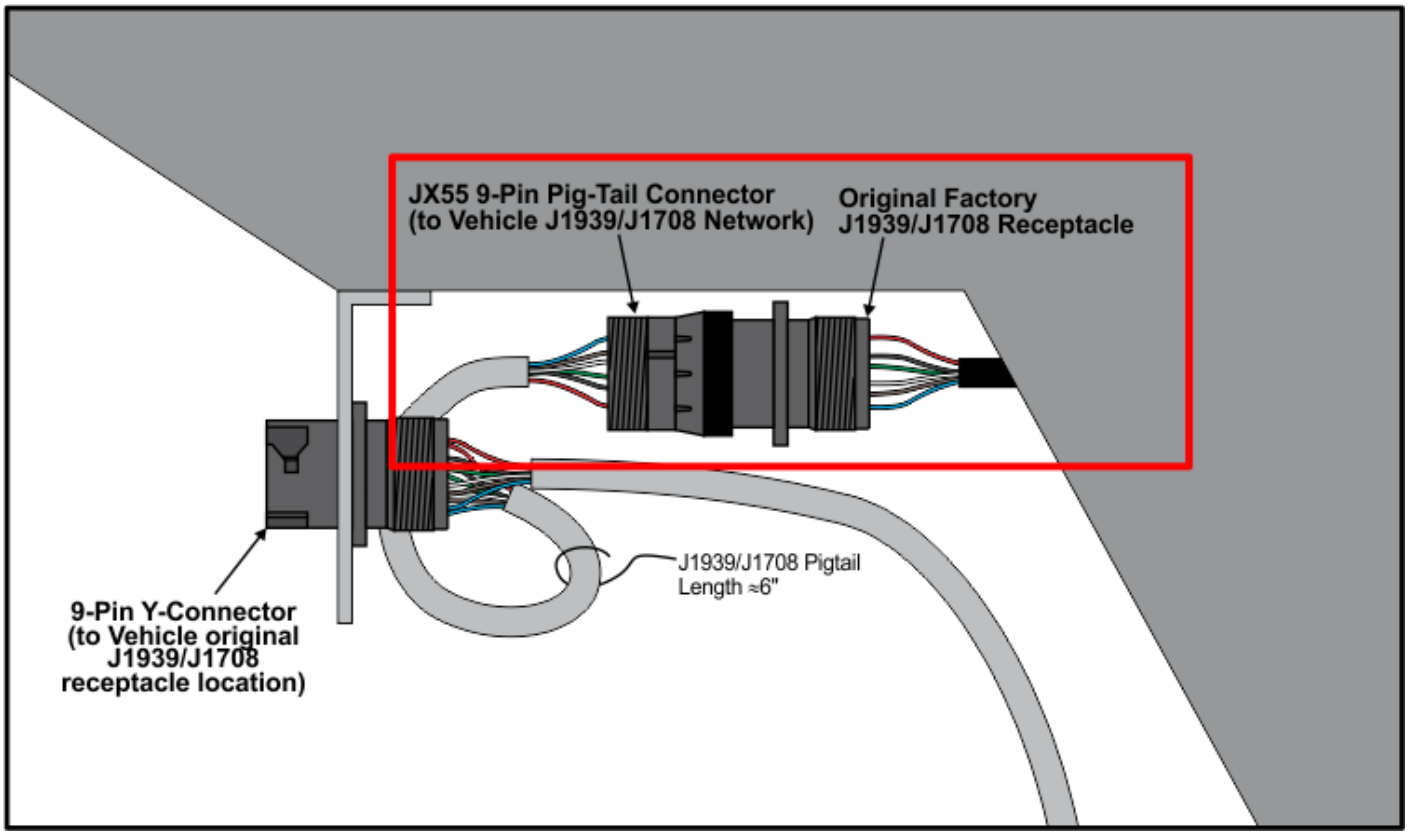


Figure 3: Typical Y-harness connection to bus

Step 4. Check the connector between the JX VEHICLE MODULE data logger and the TX55 transceiver. If it is not connected, make the connection and try to read the module again. If it is plugged in, proceed to step 5.

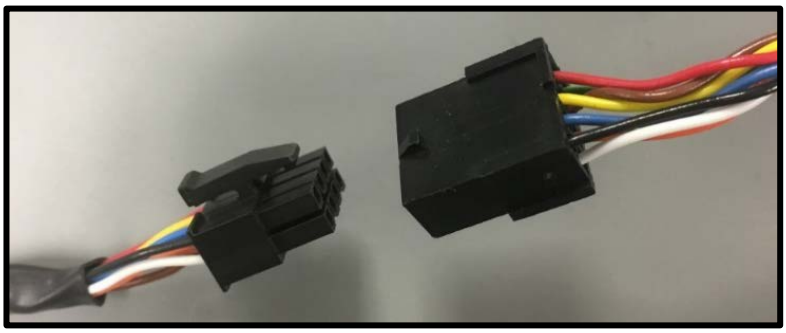


Figure 4: Connector between JX VEHICLE MODULE and TX55 disconnected

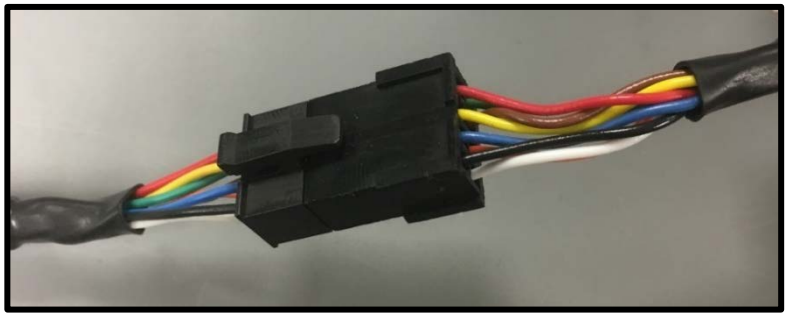


Figure 5: Connector plugged in between JX VEHICLE MODULE and TX55, normal operating mode

Step 5. At this stage, you can try plugging a new JX VEHICLE MODULE module into the bus connector and attempting another reading with the MR55, or proceed with more in-depth troubleshooting by proceeding to step 6. If another JX VEHICLE MODULE cannot be read with the MR55, and you have a known good MR55, check the bus power to the J1708 or J1939 connector for proper wire termination, blown fuses, disconnects between engine ECU and connector.

To continue troubleshooting the installed JX VEHICLE MODULE, remove the cover from the JX VEHICLE MODULE.

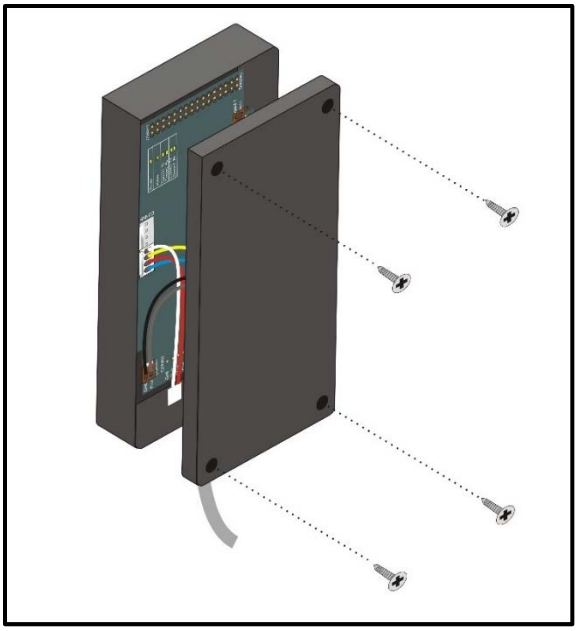


Figure 6: Remove lid to access inside JX VEHICLE MODULE data logger

Step 6. If any LEDs are on, then the module has power. Plug a new TX55 into the JX VEHICLE MODULE, or proceed to step 8. If there are no LEDs lit on the JX VEHICLE MODULE board proceed to step 7.

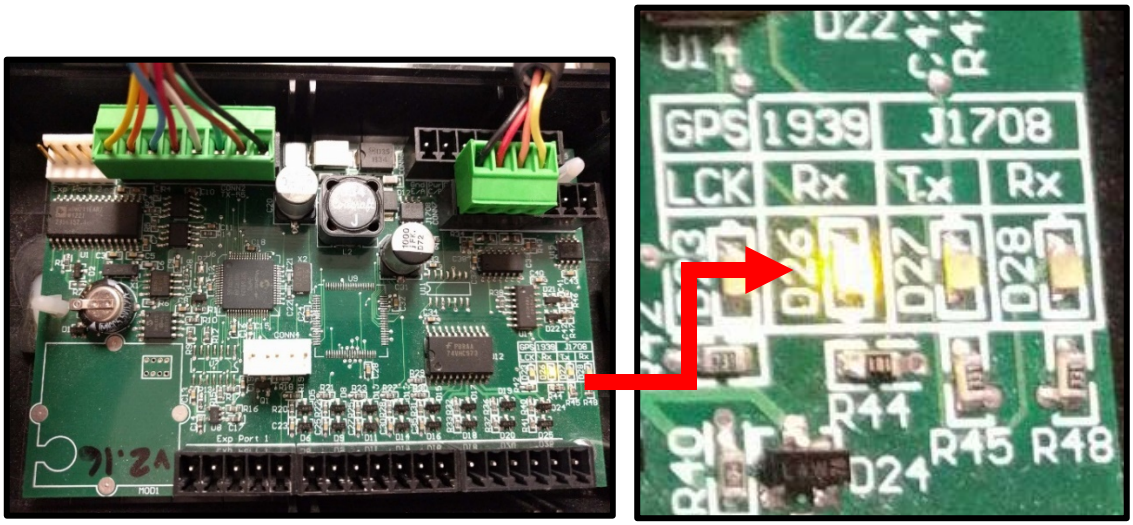


Figure 7: LED lit when JX VEHICLE MODULE receiving power from bus

Step 7. If you DO NOT have the yellow light on the JX VEHICLE MODULE board, check DC voltage on the power connector.

1. Ensure the wiring is terminated properly per the image below. Black ground wire on the right, red +12 VDC wire to the left of the black wire.

CAN_SHLD will either be a Gray or Bare wire.

Figure 8: Close-up of power and data lines. Note the orientation of the wires, and correct any deviations.

2. Set your voltmeter to DC voltage.
3. Put the black lead from the meter on the screw for the black ground wire on the green connector.
4. Put the red lead from the meter on the screw for the red +12V wire on the green connector.
5. You should measure 12-32 VDC.
6. If you DO NOT see voltage, remove the connector from the board and measure again.
7. If you see voltage now, replace the JX VEHICLE MODULE board. If you still see less than 12VDC, the problem is with the bus connector. Either the bus connector pin-out is incorrect, or something on the bus is disconnected.
8. If the JX VEHICLE MODULE is plugged into the bus connector, the JX VEHICLE MODULE has power and the yellow light is on, the JX VEHICLE MODULE is connected to the TX55, but you still cannot read the TX55, check the the TX55 wiring from JX to TX, or connect another TX55 to the JX VEHICLE MODULE and see if you can read the module.
9. If multiple JX VEHICLE MODULEs and MR55 combinations don't work, proceed to verifying the bus is supplying power to the JX VEHICLE MODULE.

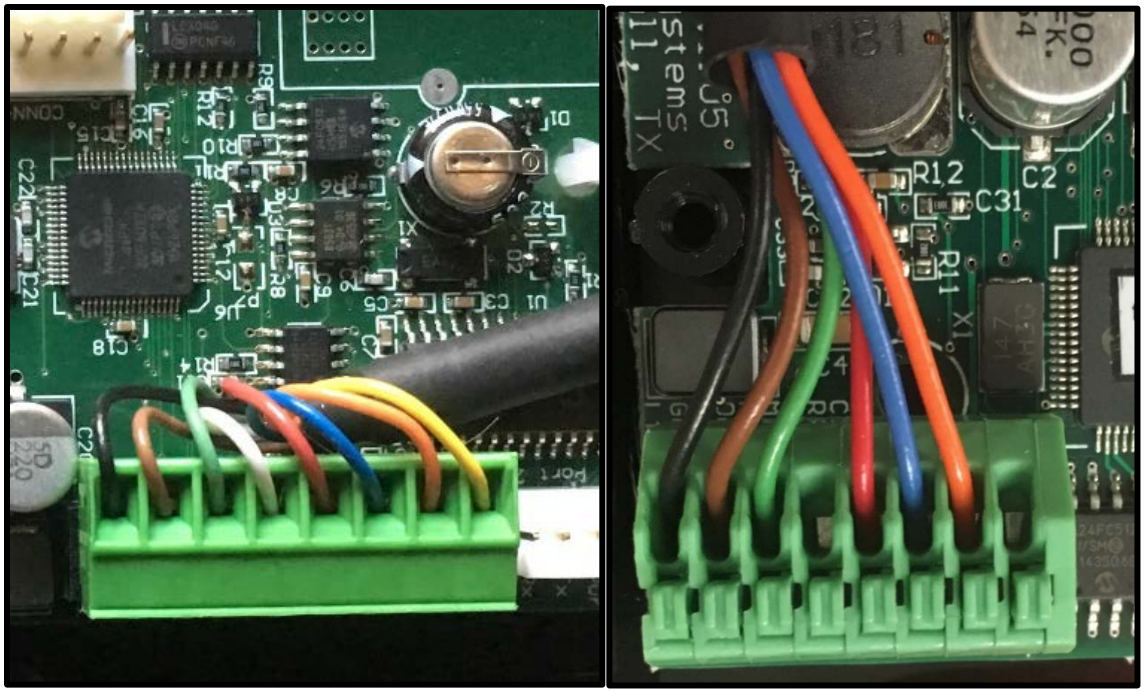
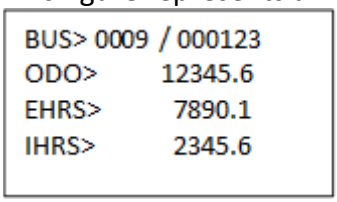


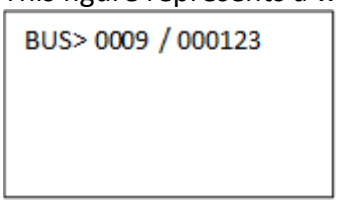
Figure 9: On left, TX55 connector inside JX VEHICLE MODULE and on right, wiring from JX VEHICLE MODULE inside the TX55.

Step 1. Read the TX55 with the MR55. If only the Bus number shows up, and the screen is otherwise blank, the TX55 is responding, but the JX VEHICLE MODULE is not. Troubleshoot the JX VEHICLE MODULE terminations, or replace the JX VEHICLE MODULE data logger circuit board, or replace the JX VEHICLE MODULE system including box, data/power pigtail, and TX55 pigtail.

This figure represents a normal, working TX55 and JX VEHICLE MODULE.



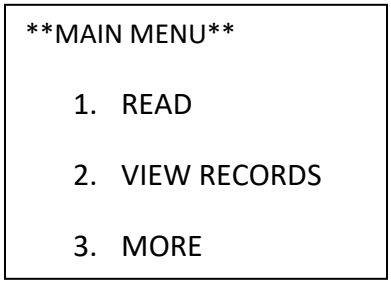
This figure represents a working TX55 but non-responsive JX VEHICLE MODULE data logger.



Step 2. Check the configuration byte with the MR55. For J1939 the module should be set to 17, 161, or 673. For J1708 the module should be set to 0, 97, or 1121. (Note: Configurations 673 & 1121 can only be set by the FR55 when the bus is in the Fuel Lane.)

SET ODOMETER SOURCE FOR J1708 OR J1939

Setting Configuration Value



- Press 1 on the keypad to read the module. (The unit must be read before the configuration can be programmed.)
- Press CLEAR on the keypad from the READ RESULTS pane after reading the module.

1. RF PARAMETERS
2. SET BUS#
3. INITIAL VALUES
4. GPS SETTINGS

- Press DEF 3 to access INITIAL VALUES.

1. INITIAL ODO
2. ODO SOURCE
3. ENGINE HOURS
4. MORE

- Press ABC 2 to set the ODO SOURCE.

ODO SOURCE Options: J1939

- Enter your Value and press SEND

Displayed Value (config)	**Description**	**Notes**
17	SPN 245 Vehicle Total Distance	**Recommended setting. Reads and displays the ECM Odometer reading.**
161	SPN 245, allows setting the INITIAL ODO	**Does not support hours data only odometer.**
673	SPN 245, allows setting the INITIAL ODO and displays hours	**Can set with MR55 by entering "929", or use Data Tools**

ODO SOURCE Options: J1708

- Enter your Value and press SEND

Displayed Value (config)	Description	Notes
0 or 1	PID 245 Vehicle Total Distance	**Recommended setting. Reads and displays the ECM Odometer reading.**
97	PID 245, allows setting the INITIAL ODO	**Does not support hours data only odometer.**
1121	SPN 245, allows setting the INITIAL ODO and displays hours	**Can set with MR55 by entering "1377", or use Data Tools.***

- Press CLEAR on the keypad to return to the Options Menu, or
- Press RESET to return to the Main Menu, and then press ID, NO, YES to enter tech mode.

Step 2. Check the wire colors for proper termination on the JX VEHICLE MODULE.

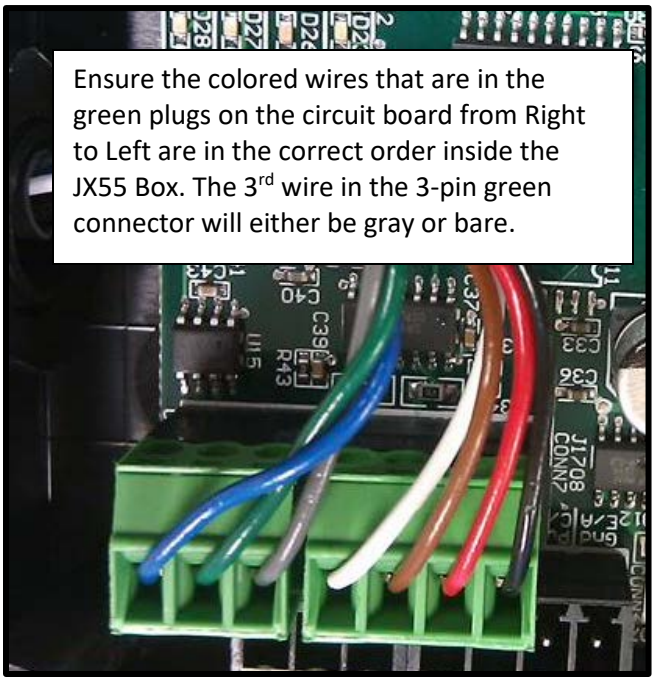


Figure 10: JX VEHICLE MODULE power and data lines inside JX VEHICLE MODULE box. Note proper orientation of wires and correct any deviations.

Step 3. Check the wire colors for proper termination on the bus connector. The bus connector data lines must be correct for the JX VEHICLE MODULE to work properly. Backwards data lines on the bus's connector can cause stuck odometer problems.

Diagnostic Module Hardware Problem

Step 1. If you see only the vehicle number with the MR55, check the connector between the JX VEHICLE MODULE and TX55 boxes for loose or incorrectly pinned wires. A loose wire, or crossed wire, can cause this problem.

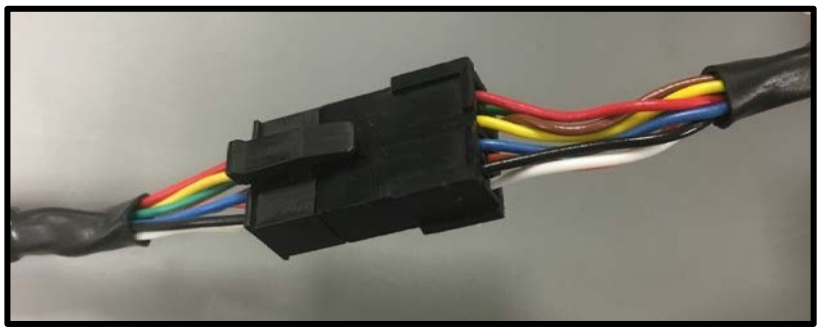


Figure 11 Check connector and wiring between JX VEHICLE MODULE and TX55

Step 2. If the connection is good, try a new JX VEHICLE MODULE board or new JX VEHICLE MODULE data logger. The TX55 can be typically be reused in this case. (See section ***Replacing the JX VEHICLE MODULE Hardware***)

JX VEHICLE MODULE is Flagged with a Low Read Rate

Step 1. Ensure TX55 is mounted to fiberglass, plastic, or glass only. The TX transceiver must not be mounted to metal or other surface that blocks radio waves. There should also not be any metal between the TX and the FR55 Receiver location during servicing.

Also, double check the orientation of the TX55 transceiver to ensure the flat side of the module is facing the FR55 receiver when the vehicle is in servicing position. (see Figure 13 below for proper orientation and placement details)

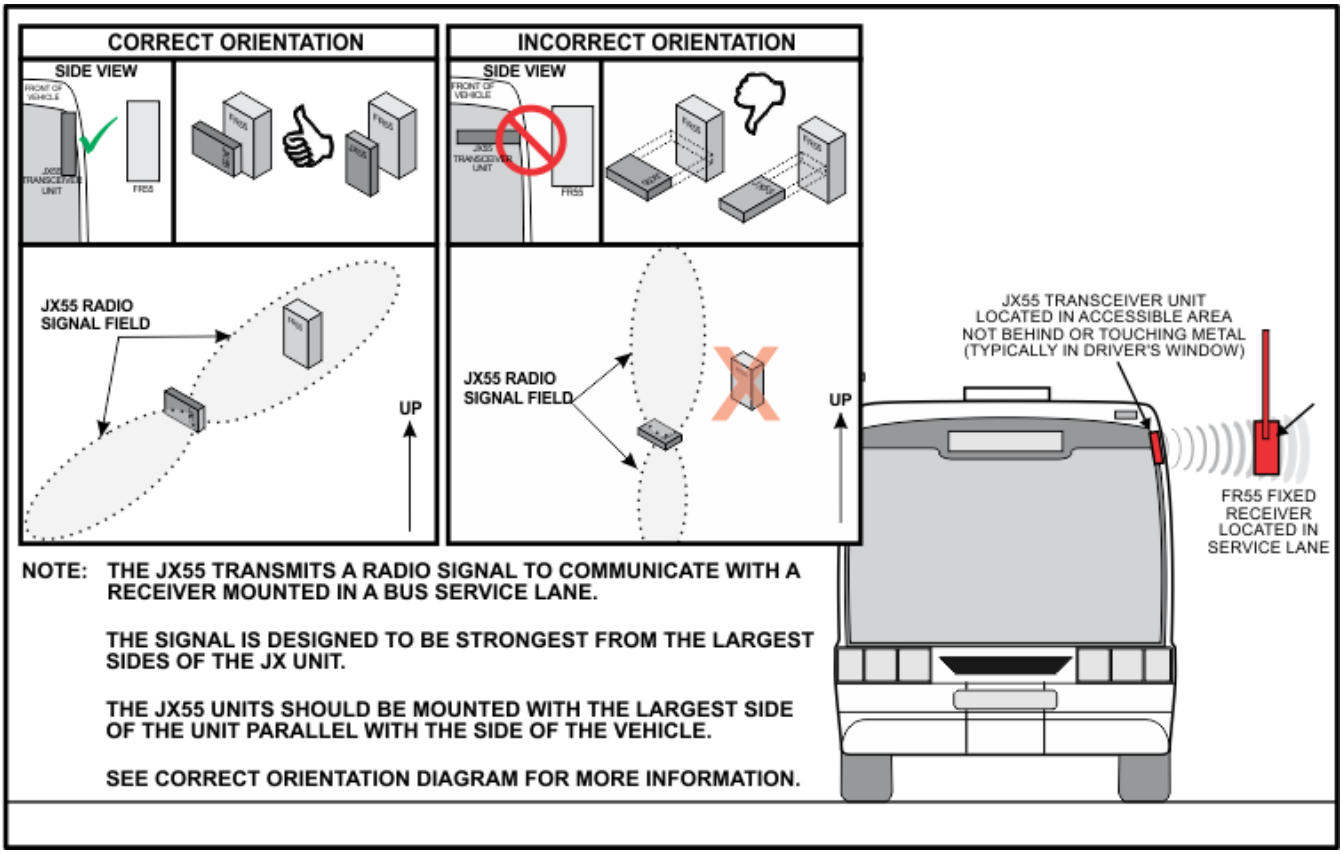


Figure 12: Note proper placement of TX55. Avoid installing TX55 on metal surfaces. TX55 must pass FR55 receiver in fuel lane. Proper placement required.

Step 2. Ensure TX55 is mounted where the module passes by or stops in front of the FR55 in the service lanes when the bus comes to a stop.

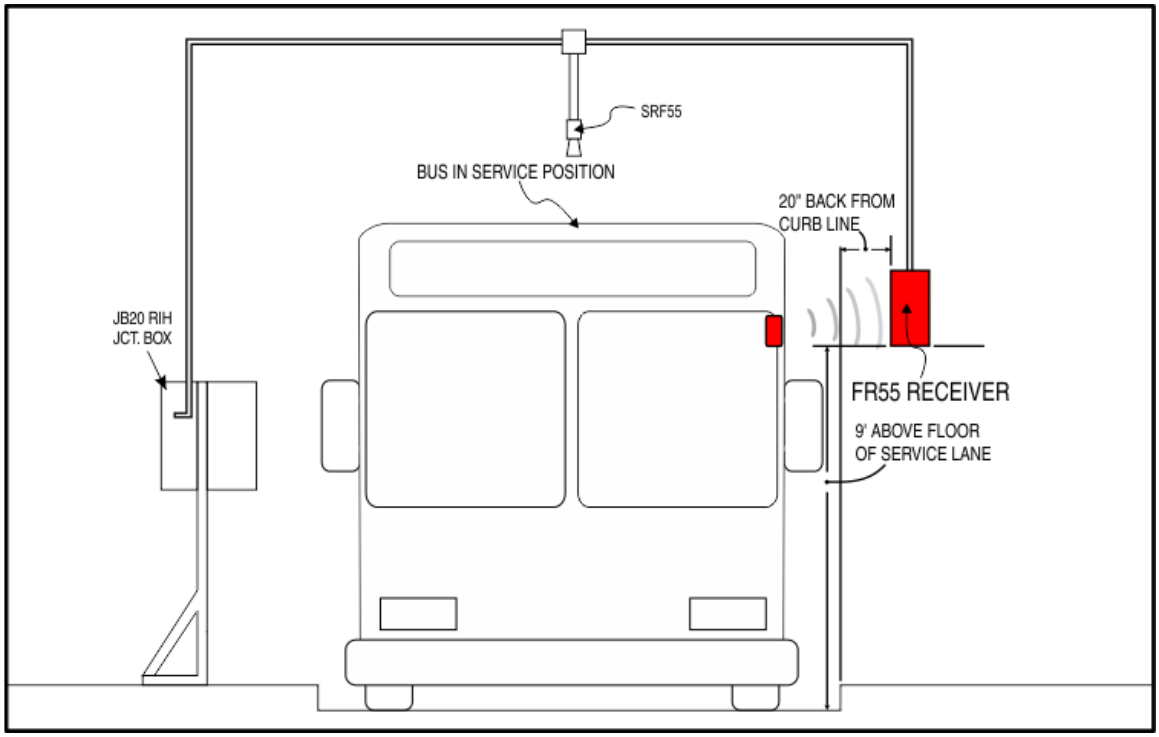


Figure 13: Ensure the module doesn't stop short of the FR55 receiver.

Step 3. Check tuning value of TX55:

CAUTION: Do not use the TUNE or SENSITIVITY options unless instructed by FLEETWATCH personnel. Doing so can have adverse effects and, in some cases, void warranties.

To Auto Tune the TX55, press **1** set RF PARAMETERS.

1. **RF PARAMETERS**
2. SET BUS #
3. INITIAL VALUES
4. GPS SETTINGS

Hold the MR55 very still, approximately 2 feet from the TX55, and press **1** to AUTO TUNE.

```
1. AUTO TUNE
2. TUNE
3. SENSITIVITY
```

Current Auto Tune Results

- In general, any number between 1-62 are valid, no Auto Tune needs to occur.
- In this example, the current setting is valid, and you can press **NO**.

```
DO YOU WANT TO RE-
TUNE? (Y/N)

CURRENT: 57
```

A value of 0 or 63 is invalid, an Auto Tune is necessary. Press **YES** to tune.

```
DO YOU WANT TO RE-
TUNE? (Y/N)

CURRENT: 63
```

This example shows an Auto Tune result of 05. Although lower than 63, this is between 1-62 and is a valid tune result. Try again if the results contain more than 2 zeroes.

```
AUTOTUNE RESULTS:

AX@05R03F4
```

Further Reading on Auto Tune:

AX@aaRssss

The two digits following the AX@ indicate the result of your auto tune effort. 01-62 are valid, acceptable values. 00 or 3F (63) are not valid, and tuning is required. Note, results may be in Hex format

The value in ssss is the strength of the signal received. A value well in excess of 0100 would normally be considered valid.

Replacing the JX VEHICLE MODULE Hardware

Use the following steps to replace the JX VEHICLE MODULE hardware:

- Remove the four screws holding the cover in place (if the cover has not already been removed during an earlier troubleshooting step)

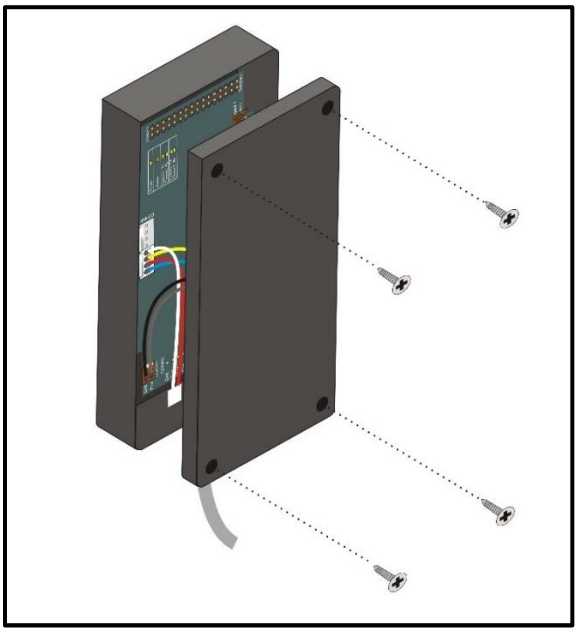


Figure 14: Remove lid to access inside JX VEHICLE MODULE data logger

- Unplug the J1939 network connector and the TX55 transceiver connector from the JX board

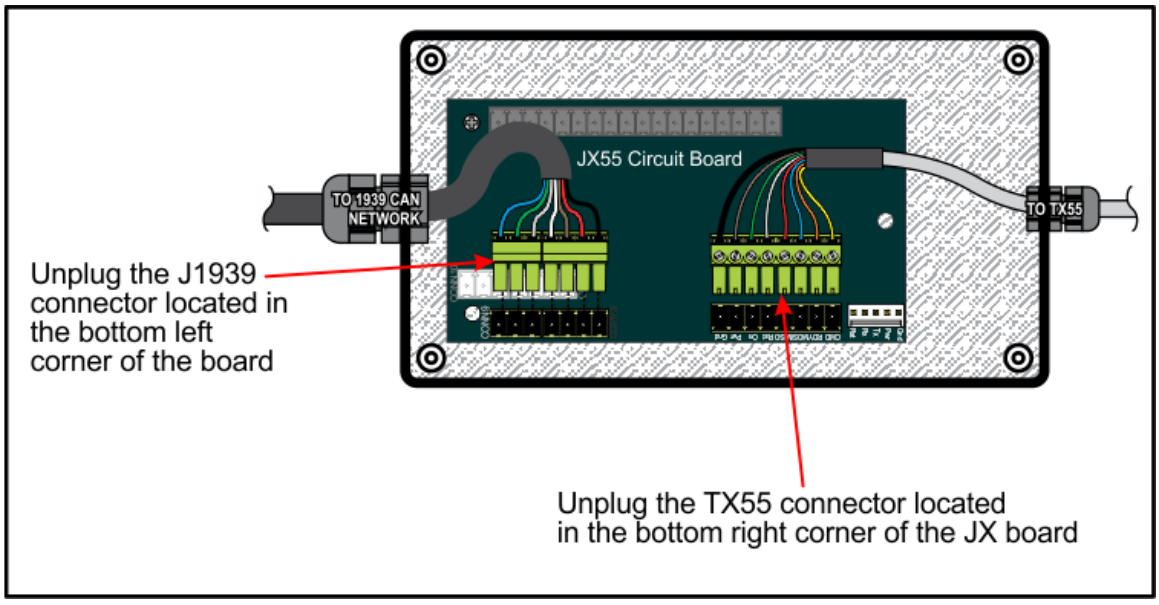


Figure 15: Remove J1939 and TX55 connectors

- Remove the Phillip's head screw and compress the stand-offs securing the JX board to the enclosure until it comes free

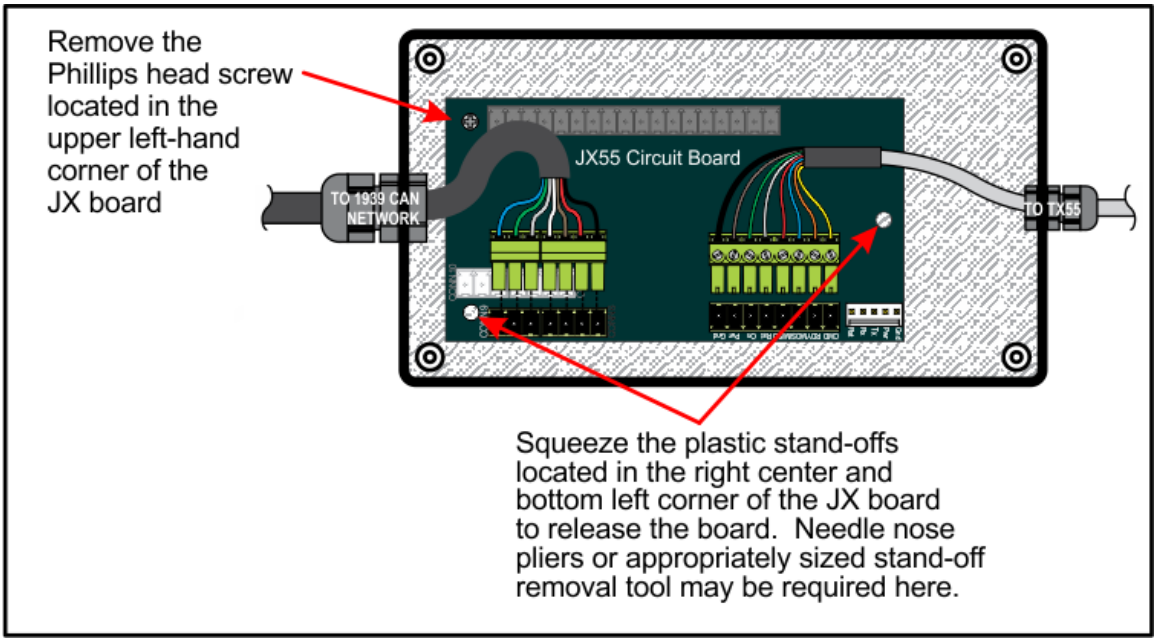


Figure 16: Remove mounting screw and release board from stand-offs

- Replace the old board with a new known good JX board and reverse the above procedure to secure and reconnect the new JX board

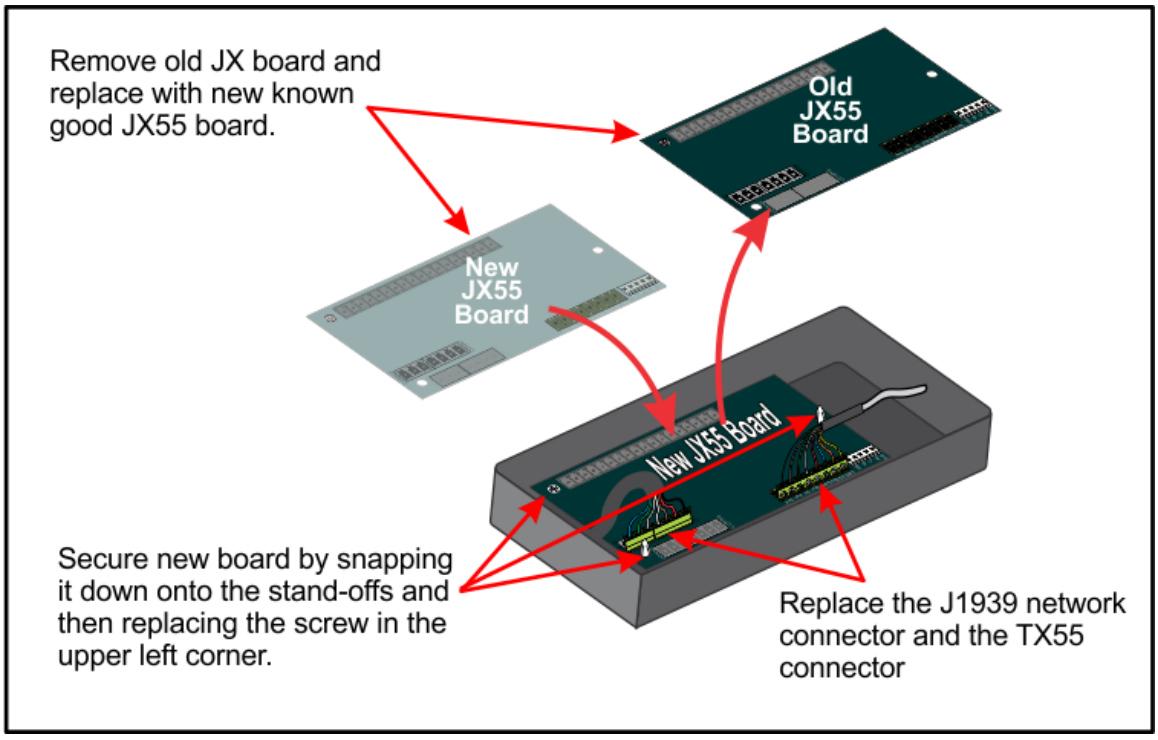
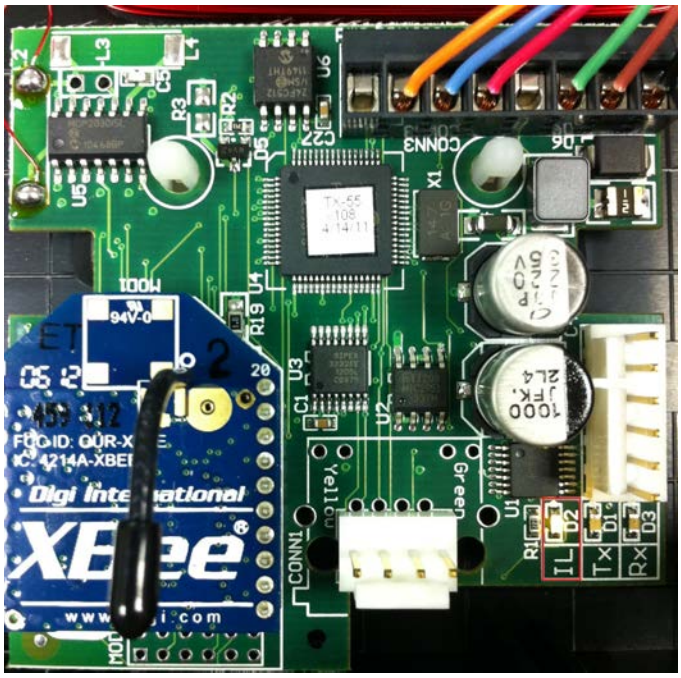


Figure 17: Replace JX board, secure, and reconnect

Diagnosing failures with the X-BEE Chip

Use the following steps to diagnose the X-BEE Chip:

- If the MR55 is not reading the vehicle, open the TX55 transceiver box and look at the board
- The “IL” light will illuminate or flash when the TX55 senses connection to the Red Inductive Antenna. If you observe this condition and the MR55 will not read the X-BEE chip is not functioning properly and needs to be replaced.



- Remove the X-BEE Chip by gently pulling the chip evenly out of the board.
- Insert a new X-Bee Chip and ensure it is seated firmly against the board.
- Re-test reading the TX-55 board by using the MR55. Note that if the JX board has been replaced, the unit will default to “000000” as the bus number, in which case the JX board will need be re-programmed using the MR55.
- If the MR55 is still unable to read the TX55, replace the entire TX55 box with a new one or replace the board by
    - Removing power to the TX55 board by removing all wired connections
    - Removing all screws. Note that one screw requires removal of the XBEE chip to fully unseat the TX board.
    - Unsoldering the red antenna leads from the board
    - Put in new board, put screw back in under X-Bee, install X-Bee, terminate wires, and solder the red inductive antenna to the board.

Customer-Specific: Updating RF Callback Channel (DO NOT USE unless instructed by Fleetwatch Technician)

1. Press [1] on the keypad to read the module. (The unit must be read before the callback channel can be programmed.)

```
**MAIN MENU**
    1. READ
    2. VIEW RECORDS
    3. MORE
```

2. Press [CLEAR] on the keypad from the READ RESULTS pane after reading the module.

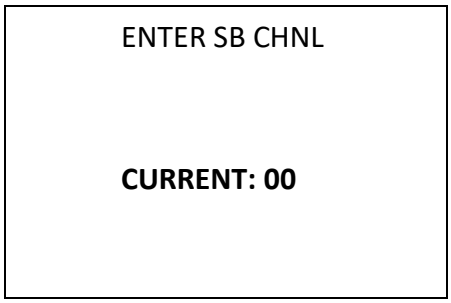
3. Press [1] set RF PARAMETERS.

```
    1. RF PARAMETERS
    2. SET BUS #
    3. INITIAL VALUES
    4. GPS SETTINGS
```

4. Press [GHI 4] to read REMOTE SB CHNL

```
    1. AUTO TUNE
    2. TUNE
    3. SENSITIVITY
    4. REMOTE SB CHNL
```

5. If you see CURRENT: 00, press [GHI 4] again and press the [SEND] button to set the new SB CNHL to 4.



6. Go through the steps again and you should see CURRENT:04 now.