Teletrac Navman TM470 ELD Installation Guide
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ELD Installation Parts Outline

The Teletrac Navman ELD Certified solution is built on the TM470, Garmin, vehicle diagnostics hardware platform. Established installation process for these units must be applied. The information in this guide will provide a hardware overview and ELD specific information. For questions, please contact Teletrac Navman Field Service team at US.FieldManagers@teletracnavman.com

Parts required for ELD installation
- TM470 – antenna, power harness
- Garmin 670– cradle and cable
- Jbus or OBDII Diagnostics– Always required for ELD compliance
- Product Documentation – Left in each vehicle
TM470 Overview

TM470 main GPS

DB9 – Connection to Garmin670
DB15 – Connection for vehicle diagnostics
A  GPS/GPRS Dual Antenna  
B  (5 amp) Fuse/holder  
C  TM470  
D  VLU Power Harness  
E  Red Wire - Power Voltage input “+”  
F  White Wire - Ignition Voltage input "+"  
G  Ground Wire Voltage input “-”  
H  Blue Wire - Output 1 "-"  
   Grey Wire - Input 1 "-"  
   Orange Wire - Input 3 "+"  
Twisted Yellow, Black and White - FIL L Display connection (DB9)  
Q  OBDII ext. cable, O B&B Box Y OBDII y Cable  
S  3 Pin Power Harness  
P  Vehicles Data Connection DB15 connection Connect Jbus Y Cable or OBDII Cable  
W  Jbus 9 pin
A  GPS/GPRS Dual Antenna
B  (5 amp) Fuse/holder
C  TM470
D  VLU Power Harness
E  Red Wire - Power Voltage input “+”
F  White Wire - Ignition Voltage input “+”
G  Black Wire - Ground “-”
H  Blue Wire - Output 1 “-”
I  Grey Wire - Input 1 “-”
J  Orange Wire - Input 3 “+”
K  Twisted Yellow, Black and White Wire - FIL “-”
L  Display connection (DB9)
M  S 3 Pin Power Harness
N  P  Vehicles Data Connection DB15 connection Connect Jbus Y Cable
O  W Jbus 9 pin
TM470 Installation Location

- The TM470 should be installed in a covert location
  - TM470 hardware is not water proof and must be installed inside the vehicle
  - Avoid locations that as subject to excessive heat
  - Choose a location that will not interfere with normal operation of the vehicle
  - Avoid locations that are accessed for normal vehicle maintenance
  - Mount the device with screws or wire ties
- Spare antenna cable and power harness should be neatly bundled and secured
Power connections - Explained

The system is designed to receive power and ground via the JBUS connector. Only the Ignition wire is to be connected to a source of power. Attach one end of fuse holder to the Ignition run source that will rest at ground while ignition is off (verify with suitable Multi-meter). Recommended locations are behind the ignition cylinder or behind fuse box. To test for ignition, use a multi-meter to find a wire that has +12volts while the engine is being cranked and turns off when the key is turned off.

The power and diagnostics connections for the 2013+ Mack and 2013+ Volvo are special circumstances. Please reference those sections of this installation guide for the correct method on those vehicles.

**Note1:** If the vehicle has a master battery disconnect switch, TM470 must be connected on the battery (hot) side of that switch.

<table>
<thead>
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<th>IGNITION KEY CYLINDER POSITIONS</th>
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</thead>
<tbody>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>POWER</td>
</tr>
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</table>

**Typical Ignition Key Cylinder**
Power Connections JBus vehicles continued

Some vehicles the JBus connector does not supply the required constant and ground needed for the TM470. In these cases the installer will be required to make an alternate power connections.

- All connections must either be soldered (preferred) or poke and wrapped. Scotch-Loc, or T-Tap connections may not be used, if they are discovered during a QC inspection they will be corrected and installer will be billed for repairs.
- Use of supplied provided fuse holders is mandatory, their placement should be as close to the connection point in the vehicle as possible. These fuses are provided to protect the vehicle not the TM470.

Identifying correct wires
- Remove any interior trim as necessary to gain access to the vehicles wiring as well as any areas where interconnecting wire harnesses may be located.
- Attach fuse holders to the Constant and Ignition wires of the TM470 power harness.
- It is always recommended the installer locate the constant and ignition wires at the ignition switch. *(This is not a given acceptable location for connection. There may be extreme difficulties accessing the ignition switch wires, the wires may be low amperage control wires not acceptable to power the TM470. In these cases the installers experience and knowledge will allow connections in other appropriate locations.)*
- Always use a multimeter in identifying the appropriate wires following the guidelines on the next page.
Power Connections JBus vehicles Alternate Power Input

It is always a good practice to verify that you are getting a good constant and ground connection through the JBus connector. There are numerous situations where there will not be power or ground provided from the connector. In these situations an alternate power input is required to be sourced. You will use a 3-pin power connector to make the power connections. This is the same 3-pin connector used for OBDII installations, connection method will be identical to the OBDII installation.

Standard connection using the JBus VD connection to power the VLU.

Connection using provided 3-pin harness needed when alternate power connection is required.
Antenna

The antenna is an all-in-one antenna with both the GPS and cellular in one piece. The antenna must be mounted in a location that provides a clear view of the sky with no metal above it. The antenna can be mounted to the inside of the windshield or covertly under the dash as long as the primary requirement of no metal blocking the view of the sky is observed. The antenna will be mounted with the side marked “sky side up” facing up using the attached double sided tape.

Antenna placement requirements:
• Installed inside the vehicle (antenna is not waterproof)
• Locate antenna up/out following identifier “sky side”
• Antenna should be in a location not obstructed by metal
• Antenna should not be mounted closer than 12-inches to other antennas/receivers (FM radio, CB Radio)
Garmin670

Garmin670 will be installed in a location that allows the driver easy access to use the display, but one that will not interfere with any functions of the vehicle or the drivers visibility of the road and mirrors.

When the location is determined the Garmin670 must be mounted using the correct screws or nuts & bolts (not provided). Run the Garmin670 cable to TM470, care must be taken that the cable is routed in a manner that will not cause damage to the cable.

Note: Always review the Garmin Installation location with the customer prior to mounting the device.
Assembling the Garmin Ram Mount

1. Connect the Garmin power cable to the DB9 of the TM470.
2. Take the magnetic holder and snap it onto the top of stand mounting ball.
3. Plug the Garmin power cable into the side of the magnetic holder. Do not attempt to plug the power cable directly into the Garmin display as they are not compatible.
4. The display will now attach to the mount magnetically. You will note the display will only attach in one orientation because of the magnetic mount.
Vehicle Diagnostics Interface Cables

One of the following vehicle diagnostics interface cables must be used. This is an ELD requirement and failure to properly install these interfaces will negate compliance.

**Note** The OBD or JBUS Port must have good power and ground on the correct PINs for the diagnostic function to work. These power sources can be lost due to blown fuses. Always verify at time of installation.
Vehicle Diagnostics Interface - JBUS

Vehicle diagnostics will be interfaced using one of the available cables. The cable will be installed to the factory diagnostics connector.

1. Locate the diagnostic connector (usually found on the driver side of the dash) and determine whether it is a 6 or 9 pin.
2. Run the y-cable from the dash to the TM470.
3. Disconnect the factory diagnostic connector from the dash.
4. Replace the factory male connector with JBus 6 or 9 pin male deutsch connector dongle.
5. Connect the factory male connector to the Vehicle’s Management female connector.
6. Connect the Vehicle Management Cable to the Main Cable’s red connector. Tighten the barrel connector and wrap the connection in electrical tape.
7. Secure the y-cable with zip ties
Correct connection for constant, ignition and ground for OBDII

• The installer is required to change the connection method when installing the TM470V8 into an OBDII vehicle. It is important that this is followed correctly or the customer will experience issues with the installation, specifically battery life of the vehicle.

• The installer must disconnect the 3-pin power harness from its connection point as shipped, the included 3-pin harness will be plugged into its place and all power connections will be completed as normal at the ignition switch or other approved location. See Page 10 for unit overview

• Remove the factory OBDII connection and connect the OBDII Y-adaptor to the factory connection.

• Replace the factory OBDII connection with the OBDII Y-cable.

• Next place the other end of the OBDII adaptor into the vehicle connection of the B&B box and plug the host extension cable into the host connection of the B&B box.

• The other end of the extension cable plugs into DB15 of the TM470 Harness.
Vehicle Diagnostics Interface – Mack 2013+

Power and diagnostics connections for the 2013+ Mack is made using the special harness. After you have connected the harness into the Mack truck you will connect to the TM470 VLU using the DB15 connection. You will be required to connect the white ignition wire separately as it does not run through the DB15 connector.

The connection strip in the Mack truck is labeled for easy connection by the installer. The connection are as follows –
- Red – Constant battery power
- White – Ignition
- Grey – Serial A – for VD
- Blue – Serial B – for VD
- Black - Ground
Power and diagnostics connections for the 2013+ Volvo is made using the special harness. After you have connected the harness into the Volvo truck you will connect to the TM470 VLU using the DB15 connection. You will be required to connect the white ignition wire separately as it does not run through the DB15 connector.

Plug the Power and Ground connection into B2 on the Fuse Box, Plug Ignition into B4.
If you have no power for the ignition plug make sure there is a fuse in F31/F32 fuse.
Kenworth and Peterbilt trucks (2007+) utilize a unique mounting system for the 9 PIN diagnostic connection. To support the OEM port replacement, TTNM have designed a ring adaptor that will secure port in place on the dashboard.

1. Remove the OEM port by unscrewing the mounting nut.

2. From the inside of the dashboard, fit the replacement port into the OEM location.

3. From the front of the dashboard, fit the ring adaptor legs through the hole.

4. Inside the dashboard, pinch the ring adaptor legs to secure the replacement port in place.

• **Note:** Screw the OEM mounting nut onto the factory port so it is available to restore the vehicle to OEM spec at time of DE-Installation.
ELD Documents - In vehicle

• Each installation kits has a ELD DRIVE user manual (66 pages)

• User manual and ELD sticker must be placed in the vehicle

• IMPORTANT: Per FMCSA 49 PARTS 385, 386, 390, and 395, this guide must be kept in the vehicle at all times
Installation Verification – Live Test (RIMU)

Power the system up and follow the standard RIMU installation verification process to test TM470 and Messaging functionality.

After completing RIMU verification the installer should also check the ELD Indicator (when functioning properly the Icon should be green) by selecting the Icon and looking at the line items checking for any warnings, malfunction messages for the following:

- Data recording compliance
- Data transfer compliance
- Engine synchronization compliance
- Positioning compliance
- Power compliance
- Timing compliance
- Data transfer data
- Engine synchronization data
- Missing required data elements data
- Power data
- Unidentified records data

Upon inspection of the Diagnostics screen each line item should read “OK” in green text under the < State > column as shown below when functioning properly. If warning should read “warning” in yellow text; If malfunction should read “malfunction” in red text.

Any failures must be called into the Verification department for live troubleshooting.
ELD Verification

RIMU URL - https://onlineavl2sup-us.navmanwireless.com/AVL3WebSysadmin/Account/Login

Enter Username and Password and select the “Log In” button

If you have DIRECTOR access this will be the same login credentials.

Username will be your email address. Please enter your password.
ELD Verification

Once logged in select the Device Installer button at the top.

Then select Test Device

You are not authorized to access this content
ELD Verification

Now select Any Device

You will then enter the min number of the device twice, once in the Qube box and the other for the M-Nav box. The min number will be the OCxxxxxx to the right of the IP.
Now you will follow the on-screen prompts to guide you through all testing. Tests that are completed will be –

*Device verification*

*Ignition – On/Off*

*Messaging – both send and receive*

You will also need to enter all relevant vehicle information when asked –

*Vehicle number*

*Make, model, year*

*Mileage, odometer or both*
Progress and Test Results

After all tests have been completed you will be shown a list that details in green or red which tests were completed/passed (Green) and which failed (Red).

Any failed tests can be retested by selecting the Red text to go back and redo that portion.

Once all tests are completed you will be given a self-test code that you need to document.
Installation worksheet and Verification

Prior to calling Teletrac Navman make sure you have the following fields filled out.

Work Order Number_________ Case Number_________ Date___________

Customer Name ____________________________

Installed By (tech name) _____________ Installation Company_________________

Vehicle Number_______ VIN Number___________________ Odometer_______

Year__ Make & Model _______________________ License Plate_________________

Options Installed (JBUS, OBDII, PTO, Display, etc.) _______________

**Numbers to call**

Activation and Testing (714) 934 8770 or expanded support (847)832-6987

**Pass Code** (Given by Teletrac Navman Verification after testing) _______________
Before calling in for verification please be sure you have completed at least 2 ignition cycles of the installed TM470 so the unit has pinged the Teletrac Navman servers and will speed up the verification process.
DE/RE Installation Special Instructions

When all equipment is swapped during de-installs and re-installs, the expectation is the values are reset in the Garmin:

Delete only old ELD data, but leave the Garmin configured for ELD use in a different vehicle. This is the standard DE/RE installation process:

1. Swipe up from the bottom of the Garmin > scroll to the App screen from Device & System > Select the TTNW Drive App

2. Select and Quit the Teletrac Navman Drive app (use force stop if necessary on an earlier version that does not quit smoothly) (Figure 1)

3. Use the “OI File Manager” (Figure 2)

4. Delete the “nw\data\eld.db” folder (this is located at \sdcard\nw) (Figure 3)
Removing the ELD App from the Garmin (convert to non-ELD configuration)

When all equipment is swapped during de-installs and re-installs, the expectation is the values are reset in the Garmin:

Full “Reset ” option – clears all configuration, logs, and history. This is the process if a customer moves a system from an ELD vehicle to another vehicle that doesn’t require ELD:

1. Swipe up from the bottom of the Garmin > scroll to the App screen from Device & System > Select the TTNW Drive App

2. Select and Quit the Teletrac Navman Drive app (use force stop if necessary on an earlier version that does not quit smoothly) (Figure 1)

3. Use the “OI File Manager” (Figure 2)

4. Delete the “nw” folder (this is located at \sdcard\nw) (Figure 3)
TROUBLESHOOTING
Troubleshooting using LEDs

If for some reason you are unable to reach verifications at the completion of the installation you can quickly verify basic functionality by observing the TM470 VLU LED lights. This is not a viable alternative to speaking with verifications especially when installing VD or HOS products but can help to identify obvious issues related to the TM470 installation before calling.

<table>
<thead>
<tr>
<th>Status</th>
<th>Orange</th>
<th>Yellow</th>
<th>Green</th>
<th>Orange</th>
<th>Diagnostic Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unregistered with GPS &amp; ignition on</td>
<td>Solid</td>
<td>Solid</td>
<td>2 Blinks</td>
<td>Solid</td>
<td>Diagnostic Data=Fuel &amp; Odometer</td>
</tr>
<tr>
<td>Unregistered with no GPS &amp; Ignition on</td>
<td>Solid</td>
<td>1 Blink</td>
<td>1 Blink</td>
<td>1 Blink</td>
<td>Diagnostic Data=No Odometer</td>
</tr>
<tr>
<td>Registered with GPS &amp; ignition on</td>
<td>Solid</td>
<td>Solid</td>
<td>Solid</td>
<td>2 Blinks</td>
<td>Diagnostic Data=No Fuel</td>
</tr>
<tr>
<td>Registered with no GPS &amp; ignition on</td>
<td>Solid</td>
<td>2 Blinks</td>
<td>Solid</td>
<td>3 Blinks</td>
<td>Diagnostic Data= No Data</td>
</tr>
</tbody>
</table>

Diagnostics Disabled
VLU Troubleshooting

- **No Power or Ignition to the Unit** - Check the TM470 Power & Ignition fuses. Replace if needed. (Always replace fuses with the same amperage fuse.)
  
  a. Check the Power connection point and confirm that connection is solid. Fix the connection as needed.
  
  b. Check the Ground connection point and confirm that the connection is solid and free from rust or corrosion. Fix the connection as needed.
  
  c. Check the vehicle fuse for that power source. Replace as necessary.
  
  d. Fix any cut or broken wires and connections. *** Most installs will have 1 (JBus) to 3 (Tracking only) connections wires. Power, Ignition & Ground***

- **No GPS**
  
  a. Remove antenna connectors and make both connectors don’t have any bent pins on the inside of the connectors.
  
  a. Make sure antenna hasn’t fallen down and the antenna has the correct side facing the windshield of the vehicle.
  
  a. The correct side should say sky side. Make sure antenna isn’t blocked by metal and is only covered by plastic if antenna is hidden under dash.

- **Display is Not Working: No power to Tablet no red light, Tablet stuck on loading stage**
  
  a. Remove the Tablet and check for broken or stuck cradle Pins
  
  b. Check and make sure that DB9 is connected to TM450/470 power harness
  
  c. Check for bend or brakes in the CTO cable.
  
  d. Try swapping out CTO cradle
  
  e. Try swapping out CTO

- **Android will not pair or doesn’t see Bluetooth** - Disconnect power to the unit then unplug Bluetooth. Reconnect Bluetooth then reconnect power to the unit: make sure Bluetooth is secured and not hanging down loose. Try swapping out Bluetooth or Android if the steps above do not work.

- **Android restart/reboot when it has a route.** Request a replacement from your account rep. Tablet probably needs firmware updated

- **Android app keeps crashing.** Request a replacement from your account rep. Tablet probably needs firmware updated

- **No Diagnostics**
  
  a. Check and make sure JBus or OBDII cable is connected.
  
  b. Check and make sure OBDII y cable is plugged directly to the Factory OBDII cable and not through a 3rd cable.
  
  c. Check for blown fuse on vehicle. ** should be a 10amp fuse on fuse box for Ford & Freightliners, 20amp fuse marked LTR for Chevy vehicles**

- **Unit will not register:**
  
  a. Unplug Power harness wait 10 seconds then reconnect unit.
  
  b. Check and make sure the purple antenna is securely connected to the unit and pins are not bent.
  
  c. Disconnect power then remove SD card: to make sure sim card holder isn’t broken, try cleaning the SD card and put back into unit. Reconnect power to unit.
Disclaimer

Although Navman Wireless’s goods, services, and software can be useful as a part of a logistics and/or property management program, Navman Wireless makes no warranty whatsoever that its goods, services, or software will prevent or mitigate any theft, misappropriation, injury, delay, or other adverse condition. Navman Wireless's goods, services, and software are not designed, intended, authorized, or warranted to be suitable for use or resale as control equipment in, or for other applications related to, hazardous or critical environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communications systems, air traffic control, life support, weapons systems, or other application in which the failure of a product could lead to death, personal injury, or physical or environmental damage.