Instructions

G-EV0553-AP

2022-2023 Ford Transit (With Push to Start Ignition)
Patent Pending
Contact InterMotive for specific engine applications.

Introduction

The G-EV0553-AP is an engine start/stop system designed for the Ford Transit chassis. It will automatically start and stop the vehicle's engine (when enabled) to charge the OEM 12V battery and/or an auxiliary battery system. It allows unattended (key out) operation for enhanced security. The product has several field programmable parameters which can be modified to user specifications.

G-EV0553-AP interfaces with the vehicle through the use of "plug and play" connectors that plug directly into the factory OEM connectors. This method of installation reduces the installation time and improves connection reliability.

The module provides internal safeguards as well as functional preconditions to ensure the safe operation of the vehicle. In addition, there are diagnostic functions that allow for rapid troubleshooting.

IMPORTANT — READ BEFORE INSTALLATION

It is the installer's responsibility to route and secure all wiring harnesses where they cannot be damaged by sharp objects, mechanical moving parts and high heat sources. Failure to do so could result in damage to the system or vehicle and create possible safety concerns for the operator and passengers.
Avoid placing the module where it could encounter strong magnetic fields from high current cabling connected to motors, solenoids, etc. Avoid radio frequency energy from antennas or inverters next to the module. Avoid high voltage spikes in vehicle wiring by always using diode clamped relays and solenoids when installing upfitter circuits.

CAUTION

All electronic products are susceptible to damage from Electrostatic Discharge or ESD. Ground yourself before handling or working with the module and harnessing by first touching chassis ground, such as the barrel of the cigarette lighter.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.

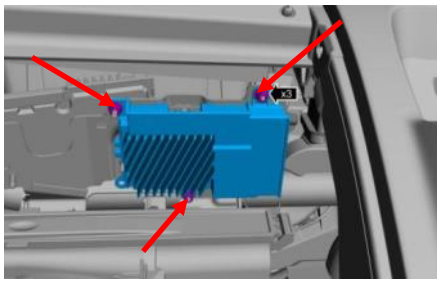
G-EV0553-AP Module

Remove the lower dash panel below the steering column and find a suitable location to mount the module. Locate the module in an area away from excessive heat sources (engine, heater ducts, etc.). Ensure when routing harnesses that the tilt steering column does not contact them in the full down position. When installing the harnesses, leave several inches of take-out so the module can be removed if necessary. Do not mount module until all wire harnesses are routed and secure. The last step of the installation is to mount the module.

Instructions

Gateway Plug and Play Harness

1. Locate the vehicles Gateway Module. It will be mounted behind the glove compartment.
2. Press the tabs inward on the sides of the glove compartment and fully lower it.
3. Remove the three nuts securing the Gateway module to the vehicle.
4. Remove the 26-pin connector from the side of the Gateway module and plug into the mating connector on the G-EVO553-AP harness.
5. Plug the male 26-pin connector from the G-EVO553-AP harness into the Gateway module.
6. Reinstall the Gateway module and the glove compartment.
7. Plug the free end of the Data Link harness into the mating connector on the G-EVO553-AP module.



Key Fob

1. Remove the key from the fob.

2. Remove the battery cover from the fob using a small flat head screwdriver.

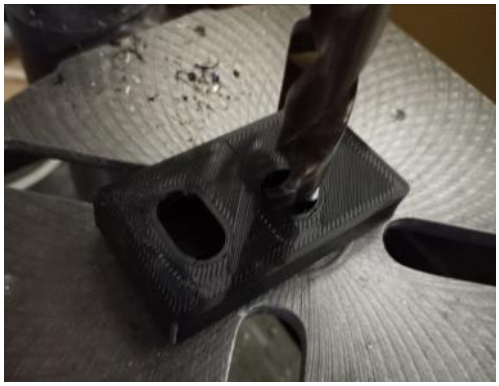
Instructions

Key Fob (Continued)

3. Remove the battery from the fob using a small flat head screwdriver.

4. Remove the Ford Logo overlay from the back of the battery holder and place in the jig as shown.

5. Flip the jig over and drill a hole through the battery holder using a 1/2" drill bit.



Instructions

Key Fob (Continued)

6. Place the InterMotive battery board in the key fob as shown.

7. Place the drilled battery holder back onto the key fob and plug the InterMotive harness into the connector.

8. Place the key fob in the included enclosure as shown.

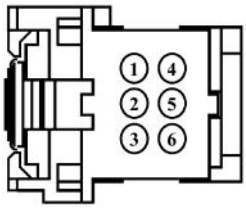
Instructions

Key Fob (Continued)

9. Place the cover over the bottom part of the enclosure with the key fob and install the four screws.

Ignition Switch Connections

1. Remove the lower steering column trim cover. Locate the ignition switch connector (C2195) and disconnect it from the ignition switch.
2. Locate the Green/White wire in position 1 of connector 2195 and attach the Blue/White wire from pin 1 of the 4-pin connector (J5) of the InterMotive harness using the included Posi-Tap*.
3. Locate the Yellow/Orange wire in position 6 of connector 2195 and attach the Violet wire from pin 2 of the 4-pin connector (J8) of the InterMotive harness using the included Posi-Tap*.



C2195
Front of
Connector

*Unscrew the Gray cap on the Posi-Tap connector and install it on the appropriate wire. Screw the rest of the connector onto the cap to secure it being careful not to over tighten.

Unscrew the other end of the Posi-Tap connector and insert the appropriate wire from the InterMotive harness through the loose piece so the wire end is even with the other opening. Hold the wire so it doesn't push back out of the Posi-Tap, and screw it back into the main Posi-Tap body. Holding the main Posi-Tap body, gently pull on the wire to make sure it is secure. Afterward, wrap the Posi-Tap in tape.

Shift Lock Connection

There are multiple cup holder options for the Ford Transit. Please follow the appropriate instructions.

Option 1

- Remove the cup holder.

Instructions

- Locate connector 2810 (12-pin connector). Remove the OEM connector and plug it into the mating 12-pin connector T-harness supplied with the G-EVO553-AP. Plug the remaining male connector into the OEM cavity.

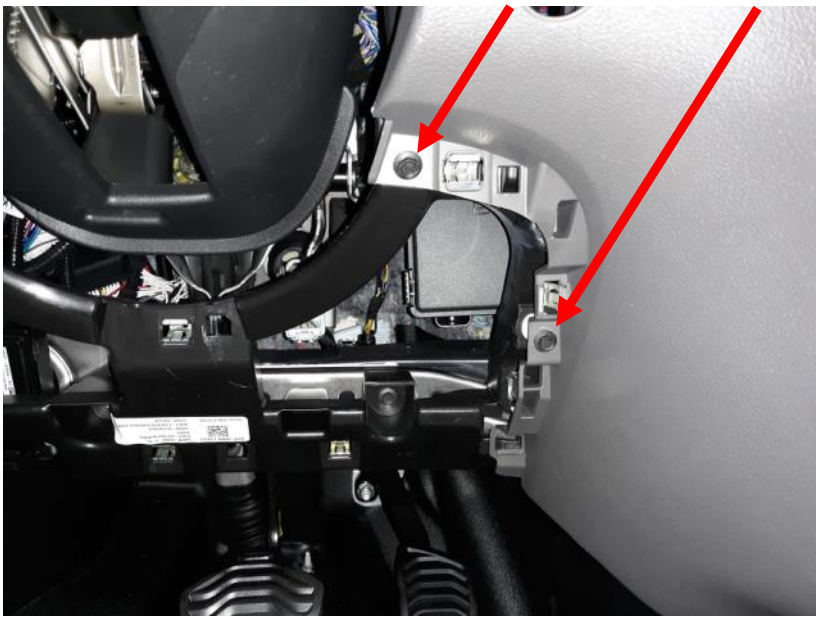
Option 2

- Remove the under dash panel by firmly grasping it and pulling it towards the rear of the vehicle.

Instructions

Shift Lock Connection (Continued)

- Remove the two screws as seen in the photo.



- Remove the trim panel on the passengers side (see photo) by using a plastic trim removal tool.

Instructions

Shift Lock Connection (Continued)

- Open the glove box and remove the screw as shown in the photo.

- Remove the gear shifter trim panel using a plastic trim removal tool.

Instructions

Shift Lock Connection (Continued)

- Remove the small trim piece shown in photo.

- Remove the center under dash panel by firmly grasping it and pulling it towards the rear of the vehicle.

Instructions

Shift Lock Connection (Continued)

- Locate connector 2810 (12-pin connector). Remove the OEM connector and plug it into the mating 12-pin connector T-harness. Plug the remaining male connector into the OEM mating connector.

Service Brake Connector

1. Locate the 4-pin connector under the dash as shown.
2. Remove the 4-pin connector and plug it into the InterMotive mating 4-pin connector T-harness. Plug the remaining male connector into the OEM mating connector.

EVO553 Monitor Mode Switch and LED (S-H84KX)

A switch with LED is provided in the kit which illuminates when Monitor Mode is active.

1. Drill a 16mm (0.630”) hole in the desired mounting location.
2. Route the harness through the hole to mount the switch in the hole:
   - A. Remove lock nut from switch
   - B. Do not dis-assemble the switch to install
   - C. Pull the harness through the hole
3. Slide the lock nut onto the harness and snug it down onto the back of the switch.
4. Plug in the 4 pin (Black) connector of the S-H84KX harness into the mating connector on the EVO553 main harness.

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Final Steps

Verify that the following connections and installations have been made:

1. The Data Link Connector has been installed.
2. The Service Brake plug and play connector has been connected.
3. The key fob key has been removed, the fob has been inserted into the key fob box, and the key fob box has been mounted. The 3-Pin Molex connector has been plugged into the key fob harness.
4. The Ignition Switch Posi-Taps have been attached to the correct ignition switch wires and the G-EVO553-AP main harness.
5. The Shift Lock harness has been plugged into the Shift Lock connector (connector 2195).
6. The Monitor Mode button has been mounted and has been plugged into the G-EVO553-AP main harness.

Make the following connections from the G-EVO553-AP main harness to the G-EVO553-AP module:

Plug the 4-Pin connector into J8 of the G-EVO553-AP module.

Plug the 4-Pin Molex connector into J5 of the G-EVO553-AP module.

Plug the 8-Pin Molex connector into J4 of the G-EVO553-AP module.

Plug the 16-Pin Molex connector into J7 of the G-EVO553-AP module.

Make the following connection from the key fob harness to the G-EVO553-AP module:

Plug the 3-Pin Molex connector into J13 of the G-EVO553-AP module.

Make the following connections to the G-EVO553-AP harness:

Connect the 2-pin Molex connector from the auxiliary battery system to the connector on the G-EVO553-AP main harness.

Note: The Violet wire senses the auxiliary battery system's start/stop output. The Orange wire provides +12V.

Reconnect vehicle battery

With the key in run, plug the free end of the G-EVO553-AP Data Link harness into J11 of the G-EVO553-AP module.

Once all connections have been made, installation is complete. Prior to re-installing panels on the vehicle, be sure to conduct all post installation checks and verify correct operation of the module.

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MODULE OPERATION

When activated, the G-EVO553-AP module will start a vehicle under certain conditions allowing the alternator(s) to keep both the OEM and auxiliary batteries charged properly.

The module initiates the auto-start functions based on any of these three events:

1. The OEM battery voltage is monitored directly on the module, and if it falls below a preset point, the module will start the engine. While the engine is running, the module continues to monitor the battery voltage, and when it increases to a preset level, a timer (configurable) is started. The engine continues to run until the time interval has elapsed at which point the module will stop the engine.
2. The auxiliary battery voltage is monitored directly on the module, and if it falls below a preset point, the module will start the engine. While engine is running, the module continues to monitor the battery voltage, and when it increases to a preset level, the module will stop the engine.
3. If configured to do so, G-EVO553-AP can work with a Battery Management System and receive a 12V start trigger. When the 12V start trigger is received, the module will start the engine. When this 12V trigger is removed, the module will stop the engine.

NOTE: The module is configured to monitor EITHER event 2 or event 3, but NOT BOTH. Both OEM and auxiliary battery sources are required to be fully charged in order to stop the engine. “Fully charged” for event 2 means that the module has measured auxiliary voltage to be at or above the preset level. “Fully charged” for event 3 means that the 12V trigger has been removed.

Fast Idle:

After an auto-start, the engine is commanded to run at a higher RPM (preset) to facilitate optimal charging time. The engine speed is typically set to 1600 RPMs (default) but can be modified within limits. As long as the engine coolant temperature (ECT) is within its safe operating range (-10° C—110° C or 14° F—230° F), the vehicle can run at a Fast Idle speed.

Fast Idle is an independent feature controlled by certain preconditions some of which are common to the auto-start/stop feature. The following are required for the Fast Idle to be enabled:

- Vehicle in Park
- Vehicle engine speed between 350 RPM and 2800 RPM
- ECT as stated above

VIN Scroll:

Upon a hard boot, the G-EVO553-AP module receives VIN information from the vehicle in order to verify that the module is connected to the vehicle that it is designed for. If power is provided to the module (data link harness is plugged in) without ignition on/engine off, the module will VIN scroll (LEDs blink in ascending, then descending order) for a few seconds before going to sleep. Setting ignition to on with engine off will allow the module to verify VIN information and operate as intended.

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Monitor Mode:

For the G-EVO553-AP to control engine start/stop, it must first be in "Monitor Mode." If the preconditions below are met, this mode can be entered by pushing and holding the Monitor Mode button for a preset amount of time, or by pushing the FOB "Lock" button 3 times. Preconditions for entering Monitor Mode are the following:

- Vehicle in Park
- Service Brake released
- Parking Brake applied
- Hood Closed
- Fuel Level above configured value
- Ignition on/engine off (if using the push button to enter Monitor Mode)
- ECT (engine coolant temp.) is below "shutdown ECT" configured value

If preconditions are met and Monitor Mode is entered, the Monitor Mode button LED turns ON as a visual indication. If Monitor Mode is entered using the key fob, the car horn will chirp twice and the parking lights will blink twice as confirmation that Monitor Mode was successfully activated. As long as Monitor Mode is active, the LED remains ON continuously.

Upon entering Monitor Mode, the instrument cluster will turn on, a 10-second timer will start, and the module will monitor the OEM and auxiliary battery voltages. If both battery voltages are above their respective low battery thresholds and the 10-second timer expires, the system will turn the dash lights off and continue to monitor the battery voltages with the dash lights off. Once the battery voltages drop below their trip-points or the module receives a 12V start trigger, the system will turn on the dash lights and start/Fast Idle the engine as normal.

Monitor Mode (Continued)

There is a configurable engine-run timeout that will start each time the system auto-starts. The engine will run until both the OEM and auxiliary batteries are fully charged, or until the engine timeout timer expires, whichever comes first.

A continuous LED on the Monitor Mode button indicates normal operation. If the LED is blinking, either an error has occurred or an unwanted state has been entered. Four states are defined:

- Engine failed to start after 3 tries
- Engine failed to stop after 3 tries
- Engine prematurely stopped
- Service brake is applied while in Monitor Mode

The fourth state is an anti-theft precaution. In this case, auto-start/stop is again disabled for a period of time (configurable) before automatically returning to normal Monitor Mode operation. In addition to the control LED blinking, each of these states will also cause a *module* LED to light up as a way to visually identify the state. Module LEDs 1-4 are assigned to the above states respectively. Error states can be exited by toggling the push-to-start button. For each of these cases, auto-start/stop function is disabled until Monitor Mode is reset (exiting then reentering).

Exiting Monitor Mode is accomplished either by pushing and holding the Monitor Mode button or by pressing the 2 FOB “unlock” buttons alternately (3 pushes total). If the engine is running, the G-EVO553-AP will shut it OFF and then exit Monitor Mode (Monitor Mode button LED turns OFF).

Battery Forced Charge:

An additional feature in Monitor Mode allows the user to start the engine and Fast Idle in order to “top-off” the charge on the auxiliary battery. If the module is in Monitor Mode, the user can press the Monitor Mode button three times within a 3-second window. The engine will then start and go to Fast Idle. Once the auxiliary battery system is fully charged, the G-EVO553-AP will shut off the engine.

Note that Fast Idle charging will also terminate if the engine run timer expires, or the fuel level drops below the configured low-fuel threshold level.

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Configuration:

The operational aspects of the G-EVO553-AP are defined/controlled with the use of several parameters. Each has a preset value stored in non-volatile memory. Any of these values can be modified in the field with the use of an InterMotive download cable and a laptop running a terminal emulator application. This laptop/download cable combination is also used to update firmware in the field. Contact InterMotive to order a download cable if required.

The following parameters are available for modification:

- **OEM low voltage trip point** - Engine auto-starts when OEM battery falls to this level. Default value is 11.8V. Range is 8V to 15V.
- **OEM charge restore point** - When voltage level is reached, module will start an extended timer. Default value is 13.5V. Range is low limit to 15V.
- **Extended charge time** - How long engine continues to run after OEM restore point is reached. Default value is 1200 seconds. Range is between 10 and 3600 seconds.
- **Fast Idle engine speed** - Default value is 1600 RPM. Range is between 950 RPM and 2000 RPM.
- **Engine OverRev** - Special output goes active when this value is exceeded. Default value is 3700 RPM. Range is between 2000 and 4500 RPM.
- **Monitor Mode lockdown time** - When in Monitor Mode, a temporary lockout occurs if service brake is applied, disabling auto-start/stop. This lockdown time setting determines how long before the module reverts back to normal Monitor Mode with auto-start/stop functions restored. The Default value is set at 300 seconds. Range is between 10 and 600 seconds.
- **Push Button Latency** - Button must be held at least this long before it takes effect. Default value is 2 seconds. Range is between 2 and 10 seconds.
- **Shutdown ECT** - Maximum coolant temperature beyond which the engine will shut down (if already running) and the module will exit monitor mode. Default value is 110° C (230° F).
- **Maximum ECT** - Maximum coolant temperature beyond which Fast Idle ceases to operate. Default value is 104° C (219° F). Range is between 65° C and 110° C (149° F to 230° F).
- **Minimum ECT** - Coolant temperature must be at least this value before Fast Idle will operate. Default value is –10° C (14° F). Range is –10° C to 15° C (14° F — 59° F).
- **Toggle Crank feature ON/OFF** - If enabled, the OverRev output will be active during crank.
- **Auxiliary Battery low voltage trip point** - Engine auto starts when auxiliary battery falls to this level. Default value is 49.9V. Range is between 40V and 60V.
- **Auxiliary Battery charge restore point** - When voltage level is reached, module will stop the engine. Default value is 57V. Range is between low limit (as set above) and 60V.
- **Low Fuel Level threshold value** - If fuel level on vehicle is below this value, system will not enter monitor mode. Default value is 25% of full tank. Range is between 0% and 100%.
- **Engine-Run Timeout Value** - Maximum allowable time engine will run on a single auto-start event. Default time is 60 minutes. Range is between 50 and 120 minutes.

  Using a laptop and download cable, a configuration menu is available and can be used to make changes to any of the previous parameters. Contact InterMotive for further instructions on how to set this up.

Diagnostics

The G-EVO553-AP module is equipped with diagnostic features which can facilitate troubleshooting. Diagnostic functions use module LEDs as well as the red test button to assist the user.

There are four sets of red LEDs tied to fuses F1 - F4. When lit, they indicate the adjacent fuse is blown. Five other LEDs labeled 1 - 4 and "ST" are used to display status information depending on the diagnostic page that is selected. The "ST" LED will "blink out" the current diagnostic page. For example, it will blink once if on page 1, then delay and blink once again. If on page 2, it will blink twice then delay, then twice again, etc. There are 7 pages currently defined. If the "ST" LED is OFF, the other 4 LEDs will identify a Monitor Mode error if one should occur.

Pages are sequentially selected by pushing the red Test button. The next page's data is displayed after each push. One can proceed either forward (1->7) with Park Brake applied or reverse (7->1) with Park Brake released.

Pages 1-6 will display status information as follows:

	PAGE1 module inputs 1-4	PAGE2 module inputs 5-7	PAGE3 Outputs
LED1	Monitor Mode Button	Start/Stop Trig Type	PTS Signal 1
LED2	12V Trigger Start Req	Aux Battery Low Request	—
LED3	Hood Closed	PTS Pressed	—
LED4	PTS Pressed	Monitor Mode LED	—

	PAGE4 Relay 1-4	PAGE5 Internal Use Only	PAGE6 Internal Use Only
LED1	Relay1	—	—
LED2	Relay2	—	—
LED3	Relay3	—	—
LED4	Relay4	—	—

Page 7 is a special mode that modifies some operational parameters to help make testing the module easier. These changes are only temporary, and the parameter values return to normal the next time the module is powered up:

- Extended charge time is set to 15 seconds.
- Engine OverRev value set to 1700 RPM.
- Monitor Mode lockdown time is set to 10 seconds (after pressing Service Brake while in Monitor Mode).
- Engine-Run Timeout value is set to 1 minute.

Post Installation Checks

With all connections properly made to the module, ignition switch, hood latch, and auxiliary battery system, verify that engine will start/stop using the OEM key and the vehicle drives properly.

Monitor Mode:

Begin with vehicle stopped, in PARK, ignition on and engine off, hood closed, parking brake applied, and service brake released.

1. Push and hold the Monitor Mode button for at least 2 seconds (depending on the button latency setting). The button LED will light up indicating the vehicle is now in Monitor Mode. The module is now monitoring both the OEM battery voltage as well as either the auxiliary battery voltage or the 12V start input.
2. Push and hold the Monitor Mode button again and verify LED turns OFF, taking module out of Monitor Mode.

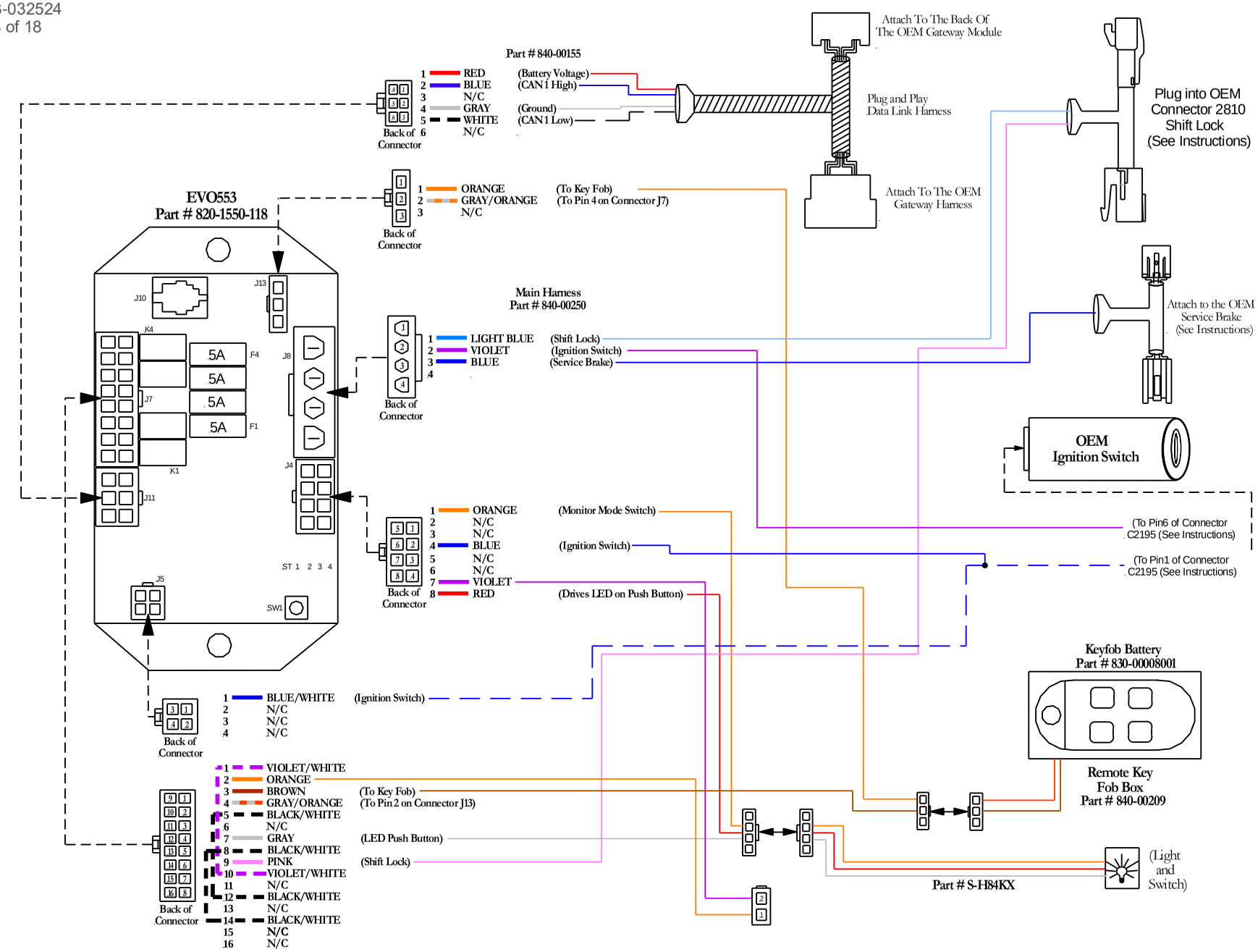
Instructions

Post Installation Checks (continued)

3. Apply the Parking Brake and put the vehicle in some gear other than PARK. Push and hold the Monitor Mode button again and verify module **does not** go into Monitor Mode. Release button
4. Put the vehicle back into PARK, apply and hold the Service Brake, and again verify the module **does not** go into Monitor Mode. Release button.
5. Release the Service Brake, open the hood, and again verify the module **does not** go into Monitor Mode. Release button.
6. Close the hood and repeat STEP 1 with the key in the RUN position. Module should go into Monitor Mode.
7. Turn off the ignition and remove main fob from inside the vehicle.
8. Press red button on G-EVO553-AP module slowly **7 times** to enter special test mode described in the previous page. This mode sets the OEM battery low threshold to 100% to force the module to start the engine.
9. With the engine running, verify Fast Idle (programmed speed) is enabled after a couple seconds. The engine RPM should increase to the preset point and stabilize until the module stops the engine.
10. Verify engine runs for the appropriate amount of time and then stops automatically. **NOTE**: Since test mode was entered in STEP 8, engine will run for 15 seconds and then stop automatically.
11. After a few seconds, engine will restart. Once engine is running at Fast Idle, apply the Service Brake and verify the following: Fast Idle is disabled, engine stops, and Monitor Mode button LED starts blinking.
12. Verify button LED continues to blink for a time, (programmable; **10 seconds in special test mode**) then returns to continuous ON status. **NOTE**: While blinking, the auto-start/stop feature is disabled.
13. After 10 seconds, the module will restart the engine. Wait another 15 seconds for the engine to stop and then press red button on G-EVO553-AP module once to exit test mode.
14. In Monitor Mode with the engine OFF, cause the auxiliary battery system to make an “engine start” request. Verify engine starts and runs at Fast Idle as long as the request is active, then shuts OFF when request goes inactive.
15. Push and hold the Monitor Mode button again and verify LED turns OFF. In this state, auto-start/stop is deactivated. Verify this by pressing the red button on the G-EVO553-AP module 7 times and observing that the engine has not started despite being in test mode.
16. Verify alternate activation of Monitor Mode by pressing the Fob “lock” button 3 times. In test mode with **only one fob—the fob in the box—**present inside the vehicle, ensure the module automatically starts the engine.
17. Verify alternate deactivation of Monitor Mode by pressing the Fob “unlock” button 3 times. Ensure the module shuts down the engine.

If the module fails any step in the checklist, review the installation instructions and check all connections. If necessary, call InterMotive Technical Support at (530) 823-1048.

Submit product registration at www.intermotive.net



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If the G-EVO553-AP fails any step in the Post Installation Check List, review the installation instructions and check all connections. If necessary, call InterMotive Technical Support at (530) 823-1048.