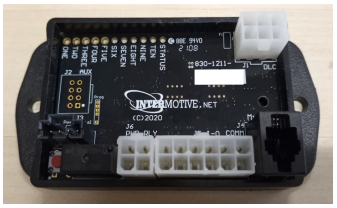
C-HL753-AD Fast Idle, Lift Interlock

2022 RAM ProMaster



Introduction

The HL753 is a wheelchair lift safety interlock which will only work with the ignition on. It will enable the lift when certain vehicle safety conditions are met, and will lock the transmission shifter in Park when the lift door is open and/or the Park Brake is applied. The HL753 also has the Fast Idle feature. The Advanced Fast Idle System (AFIS) elevates engine idle speed in response to a number of triggers in order to assist electrical or mechanical systems on the vehicle.

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, or 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 when installing upfitter circuits.

Installation Instructions

Disconnect vehicle battery before proceeding with installation.

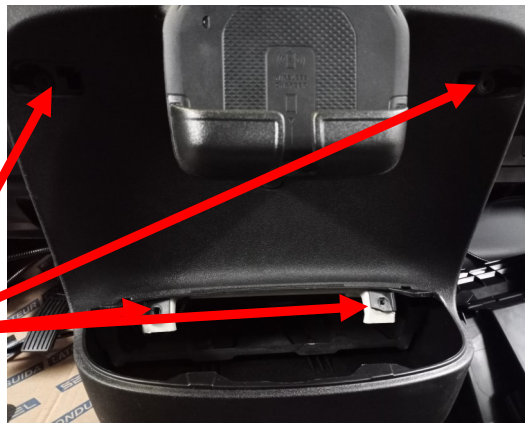
WARNING
Disconnect the battery to prevent setting a check engine light.

HL753 Module

Locate a suitable location to mount the module on the passenger side of the vehicle. Attempt to position the module for the ability to view the Diagnostic LEDs during testing. Place the module in an area away from any high external heat sources (engine heat, heater ducts, etc.). Do not mount the module until all wire harnesses are routed and secured. The last step of the installation is to mount the module.

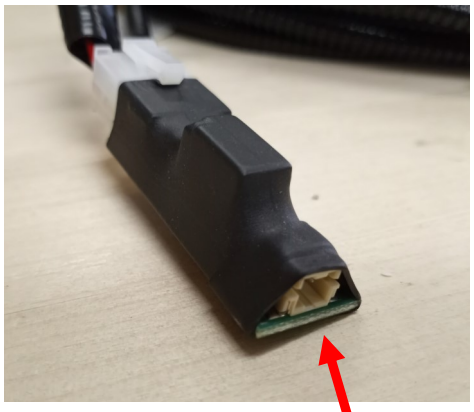
Shift Lock Solenoid T-Harness

1. Remove the four screws from the lower center panel below the shifter. It will be necessary to remove the cup holder to access the lower 2 screws.
2. Remove the lower center panel by firmly grasping the panel and pulling toward the rear of the vehicle.
3. The HL753 kit provides a "T" Shift Lock harness which must be installed between the OEM harness and the shifter PCB. Locate the OEM 2-pin shift lock solenoid connector (located on the underside of the shifter). <u>There is a layer of foam that will need to be repositioned to locate the connector and it may be necessary to cut an OEM zip tie.</u> Pinch the connector tab, unplug it, and insert it into the HL753 mating connector. Plug the HL753 male connector into the OEM shift lock solenoid connector on the PCB.



View from floor looking up at underside of transmission shifter PCB. Arrow points to the 2 pin Shift Lock Harness.

4. Route the shift lock harness 12-pin connector over to where the module will be installed and plug the white 12-pin connector into the module.

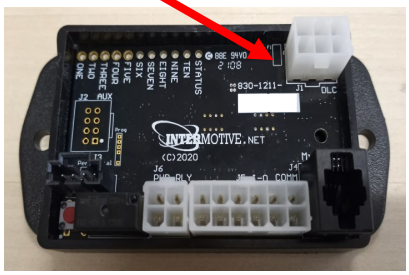


Plug OEM 2-Pin connector here

Data Link Harness — 6 pin connector

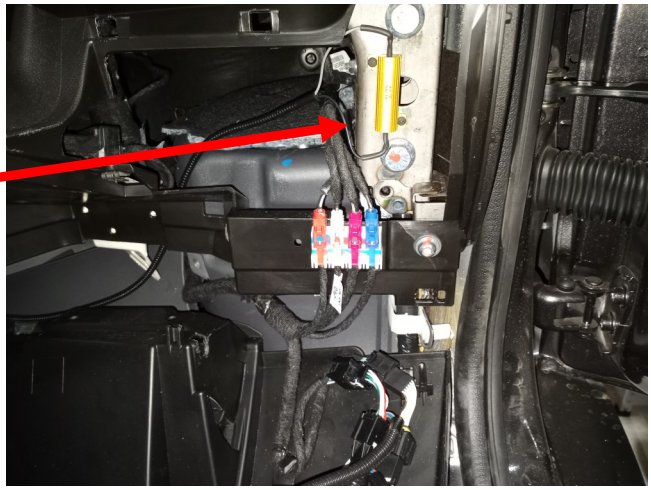
The Promaster has an OEM Gateway module located behind the glovebox. Follow the steps below to access it:

1. Open the glovebox door.
2. Locate the 2 release tabs on the inside of the glovebox (one on the left and one on the right) and drop the door into the full down position.
3. Locate the two fasteners securing the glovebox assembly to the vehicle and remove them.
4. Locate the 4 fasteners on the outside of the glovebox assembly and remove them.
5. Remove the glove box assembly.
6. The Gateway module is located behind the glove box assembly as shown in the picture.
7. Remove the 12-pin and 8-pin connectors from the Gateway module and plug in the 12-pin and 8-pin connectors from the Intermotive HL753 Data Link harness. Plug the OEM 12-pin and 8-pin connectors into the mating connectors on the HL753 Data-Link harness.
8. Plug the free end of the Data Link harness into the mating 6-pin connector on the HL753.



Power Resistor Installation

1. Locate the piece of exposed metal above the Gateway module from the instructions above.
2. Install the power resistor to the exposed metal using the included screws. It will be necessary to pre-drill the holes first using a #39 drill bit.



LED Display Panel Mounting

Locate a suitable position on the dashboard within view of the driver, to mount the LED Display Panel. Ensure there is open space behind the dash where the panel is mounted. The harness is 40" in length, which is the maximum distance the display can be from the module.

1. Drill a 5/8" hole in the dash where the center of the panel will be located, being careful not to damage anything behind the dashboard.
2. Attach the Black 4-pin connector of the LED display panel harness to the HL753 module.
3. Route the other end of the harness behind the dash and out through the 5/8" hole. Secure harness leaving enough takeout to prevent strain on the connectors.
4. Plug the harness into the back of the LED Display Panel.
5. Ensure the panel is level and secure using supplied screws.

Selecting the Lift door

Connecting a discrete lift door sense wire is not required; however, the module will then need to be assigned a lift door, if different from the default. The module comes with the passenger side slider door set as the default lift door. If this is the door being used for the lift, nothing further needs to be done. If the lift is installed using the rear doors, the following procedure must be done to tell the module to use the rear door.

1. To change to the rear door, make sure the Rear and Slider doors are closed.
2. Sitting at the wheel, make sure the vehicle is in Park with the Park Brake set.
3. The vehicle ignition switch must be in the ON position.
4. Enter the module's Diagnostic Mode by pressing the Red test button. The Status LED will begin flashing. Press the Service Brake 6 times within 5 seconds. The Status LED will begin to flash rapidly. Open the Rear door within 1 minute to select it as the Lift door. The module will exit Diagnostic Mode after it senses the door opened.
5. To revert back to the side slider door as the lift door, perform the steps above starting at step 2 and open the slider during step 4.

Connecting a Lift Door Input (Optional)

If a non-OEM door is used as the lift door, a discrete Lift Door input must be made to the module. Connect Pin 5 from the 12 pin connector to the non-OEM door switch that will provide a ground when the Lift door is Open.

Control Inputs/Outputs (J5 - 12 Pin Connector)

The 12-pin connector only has three 3 wires populated. To use any of the optional inputs, properly crimp a connector terminal provided to the installer supplied wire using the correct crimping tool (Molex Part# 11-01-0197), and insert into the correct connector pin housing. Ensure the terminals are fully seated in the connector. The largest wire that can be used with these terminals is 16 AWG. Snap this connector into the HL752 module's 12-pin connector.

Lift Inhibit (Optional Input) - Pin-2 of J5 - Grounding the Lift Inhibit pin will prevent HL753 from supplying power on its Wheelchair Lift Output pin.

Shift Lock Trigger (Optional Input) - Pin 4 of J5 - Grounding this pin will lock the transmission shifter, if the vehicle is in Park. This can be used to prevent the vehicle from driving when equipment has not been properly stowed or an emergency door is open, etc. This can be connected to any number of grounding switches (connected in parallel) which can effectively "lock the vehicle down."

Lift Door - (Optional Input) - Pin-5 of J5 - If a non-OEM door is used as the lift door, a discrete Lift Door input must be made to the module. Connect Pin 5 from the 12 pin connector to the non-OEM door switch that will provide a ground when the Lift door is Open.

See page 4 for instructions on how to install.

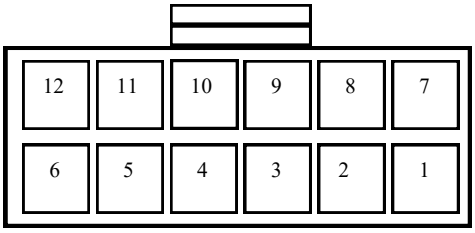
Shift Lock Output - Yellow (Output) - Pin #8 of J5 - This wire is connected to the Shift Lock Solenoid T-Harness.

See page 2 for instructions on how to install.

Fast Idle Input - Gray (Optional Input) - Pin 10 of J5 - Attach Pin 10 to any equipment that provides a ground signal when the fast idle needs to be engaged. (PTO, pump, etc.)

Aux Door - Dark Green (Optional input) - Pin-11 of J5 - Only use to indicate a non-lift door(s) is ajar. This does not affect lift operation and does not lock the shifter. This pre-crimped Green wire is included in the Door Ajar dash panel bag. Insert the terminated end of this wire into Pin #11 of the 12-pin connector with the terminal tabs oriented towards the connector housing tab. You should feel it click into place. Improperly oriented terminals will back out and cause problems. Extend this wire as needed and connect to desired door switch(es) which provide ground when the door is open.

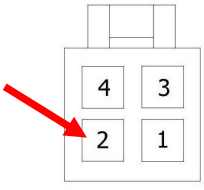
Pin #1 - N/C
Pin #2 - Lift Inhibit (Optional)
Pin #3 - N/C
Pin #4 - WHITE (Shift Lock Trigger (Optional)
Pin #5 - Lift Door (Optional)
Pin #6 - N/C
Pin #7 - N/C
Pin #8 - YELLOW (Shift Lock Output)
Pin #9 - PURPLE (N/C)
Pin #10 - GRAY (Fast Idle Input - Ground)
Pin #11 - DARK GREEN (Aux Door Input (Optional)
Pin #12 - N/C



Back of Connector

Vehicle Secure - Orange (output) - Pin-2 of **J6** - This output provides 12V @ 1 Amp when it is safe to operate the lift. The lift should not operate unless this output is asserted (12V). Connect this wire to a diode clamped relay (Digikey # 2449-A2F1CSQ12VDC1.6D-ND) and install an 8 Amp fuse. See schematics for wiring Ricon & Braun lifts.

Connect the 4 and 12-Pin connectors to the module and dress out harnesses appropriately.



Back of Connector

HL753 Module Mounting

Ensure all the harnesses are properly connected, routed, and are not hanging below the dash area. Mount the HL753 module as described on page one. Secure using screws or doubled sided tape.

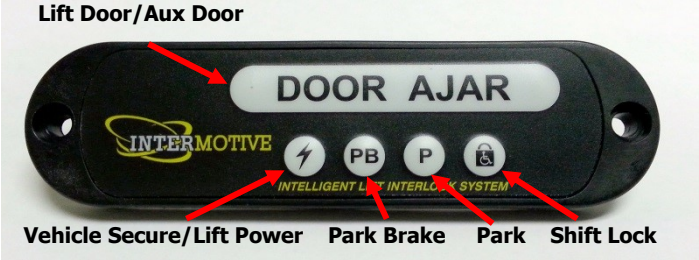
Reconnect the vehicle battery

Post Installation / Check List

The following checks must be made after installation of the system, to ensure correct and safe operation of the lift. If any of the checks do not pass, do not deliver the vehicle. Recheck all connections as per the installation instructions.

Begin the checklist with the vehicle in the following state:

- Lift stowed
- All vehicle doors closed
- Park Brake set (PB)
- Transmission in Park (P)
- Ignition off (Key off). Wait until the module goes into 'Sleep' mode (all panel LEDs OFF) which takes approximately 5 minutes.



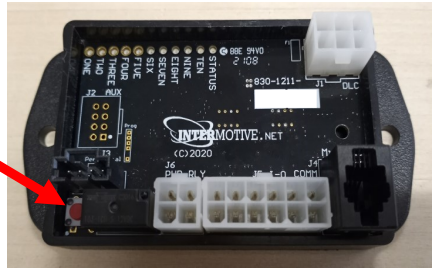
1. Turn ignition key to the Run position, verify the module wakes up and all LEDs illuminate for approximately 2 seconds. Verify that the Park, Park Brake, and Shift Lock LEDs remain illuminated. Verify that the Door Ajar and Vehicle Secure indicators are off.
2. Attempt to deploy the lift. The lift must not deploy with the lift door closed.
3. Open the lift door and all LEDs should be illuminated. Attempt to deploy the lift. Verify the lift deploys, then stow the lift, leaving the lift door open.
4. Release Park Brake. Verify that the Park Brake (PB) and Vehicle Secure LEDs go out. Attempt to deploy the lift. Verify the lift does not deploy with Park Brake released.
5. Close the lift door. Press Service Brake and attempt to shift vehicle out of Park. Verify transmission will not shift out of Park (due to Park Brake being set - prevents inadvertent driving with Park Brake on).
6. Release Park Brake, press Service Brake and verify transmission will shift out of Park.
7. Open lift door, press Service Brake and verify transmission shifter is locked.
8. If Aux Door input has been connected to a door switch, open door. Door Ajar indicator will flash.

If the system fails any of the above tests, do not release the vehicle into service. Perform the diagnostic tests on the next page.

Post Installation / Checklist (continued)

Lift Interlock Diagnostic Mode Testing

Enabling Diagnostic Mode allows a visual indication of system status and is a good troubleshooting tool used in conjunction with the previous tests. The module is fully functional in this mode. Enter Diagnostic Mode by the following steps:



1. Place transmission in Park, Park Brake set, and turn the ignition switch to the Run position.
2. Press the Red test button to enter Diagnostic Mode. The Status LED will initially flash twice, then will repeatedly flash two sequences. The second sequence can be counted, and the table below used to indicate the system status.

Example: After the initial Status LED flashes twice: the Status LED flashes once, a brief pause, flashes 10 times, and repeats. This would signify that the Lift Door is open and the module is currently in Page 1 of Diagnostics.

LED #	Description
Status	Page #
10	Lift Door Open
9	PB Applied
8	TR = Park
7	SL = On

Fast Idle

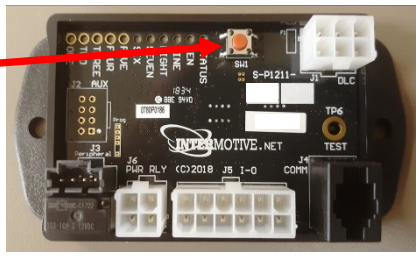
The Fast Idle option has several "auto triggers" that will increase engine RPM. These include low battery voltage, air conditioner on, and external switch input on pin #10 of the 12 Pin connector.

1. Press the Service Brake for 1 second. Fast idle will temporarily disengage anytime the brake pedal is pushed, but will automatically reengage after approximately 2 seconds once the Service Brake pedal is released.
2. Shut down the engine and verify that all LEDs turn off, which may take a few minutes. Do not activate any vehicle controls during this time (windows, mirrors, doors, etc.).

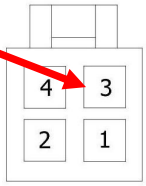
Setting Fast Idle RPM Speeds (900 RPM - 2000 RPM)

The HL753 has a configurable RPM setting. The default setting is triggered by low battery voltage, air conditioner On, or external switch inputs. The setting is changed by doing the following procedure:

Default Configuration



1. Momentarily press the Red Test button on the module **THREE** times. The status LED on the module will flash a 3-3 code (three short flashes, a pause, and three more short flashes).
2. The vehicle RPM will increase to the currently configured setting.
3. To raise the RPM by 50, momentarily ground pin 3 on the 4-pin connector until the desired RPM is set.
4. Press the Red Test button **ONE** more time until no LEDs are lit on the module.

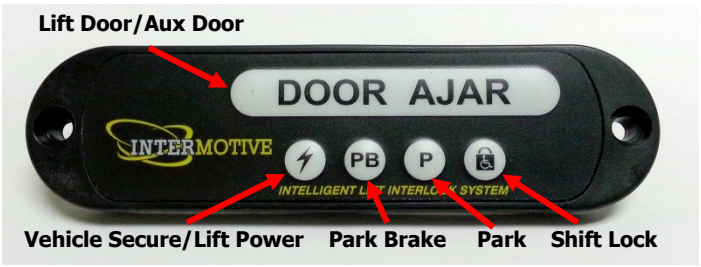


Leave in vehicle
C-HL753-AD Wheel Chair Lift Interlock Operating Instructions
2022 Ram ProMaster

The HL753 is a wheelchair lift safety interlock which will only work with the ignition on. It will enable the lift when certain vehicle safety conditions are met, and will lock the transmission shifter in Park when the lift door is open and/or the Park Brake is applied. The HL753 also has the Fast Idle feature. The Advanced Fast Idle System (AFIS) elevates engine idle speed in response to a number of triggers in order to assist electrical or mechanical systems on the vehicle.

Key On function

- When the vehicle is in Park the (P) LED will be illuminated.
- When the Park Brake is applied, the (PB) LED will be illuminated.
- When the Lift door is open, the Door Ajar LED will be illuminated.
- When the Park Brake is applied or the Lift door is open, the Shift Lock LED will be illuminated, and the vehicle cannot be shifted out of Park.



- With the vehicle in Park, Park Brake applied and Lift door open, the Vehicle Secure LED will be illuminated and the lift will be operational. At this point **all** LEDs will be illuminated.

Aux Door Ajar indication: When the lift door is open, the Door Ajar LED will light solid. If the lift door is closed and any other door is open, the Door Ajar LED will flash.

Do not leave the lift door open when the vehicle is not in use. This will cause a draw on the vehicle's electrical system and may result in a dead battery.

Operating Instructions (Continued)

Advanced Fast Idle Operation

The Advanced Fast-Idle System (AFIS) option of the HL753 includes Charge-Protect and Manual engage modes. Charge-Protect is a feature that maintains vehicle charging system voltage by increasing and controlling vehicle idle speed when necessary. Whenever charging system voltage falls below a minimum voltage of 12.5V, this AFIS feature will increase idle speed and maintain fast idle until one of the safety conditions is no longer met, the user cycles the shift lever or the user manually disengages fast idle. The Charge-Protect and Manual engage modes also require that all safety conditions are met.

Safety conditions that must be met to engage or maintain Fast Idle operation
Vehicle NOT moving (speed = 0 MPH).
Service Brake NOT pressed.
Vehicle Transmission Range in Park
RPM inside of safe operating range.
Transmission Fluid Temperature below 250° F.
Engine Coolant Temperature below 230° F.

Fast Idle may be initiated by either a manual or automatic Fast Idle trigger. The AFIS strategy can only command elevated idle when certain safety conditions are met (see above section). Fast Idle operation can be terminated by a safety condition violation. If a Fast Idle operation terminates due to a safety condition violation, automatic Fast Idle is unavailable until Park is de-asserted and re-asserted. (Shift out of Park and back into Park). The base Fast Idle RPM level is determined by the type of engine (Gas or Diesel) in the vehicle. For Gas engine vehicles, the idle speed is 1500 RPM and Diesel applications remain fixed at 1200 RPM.

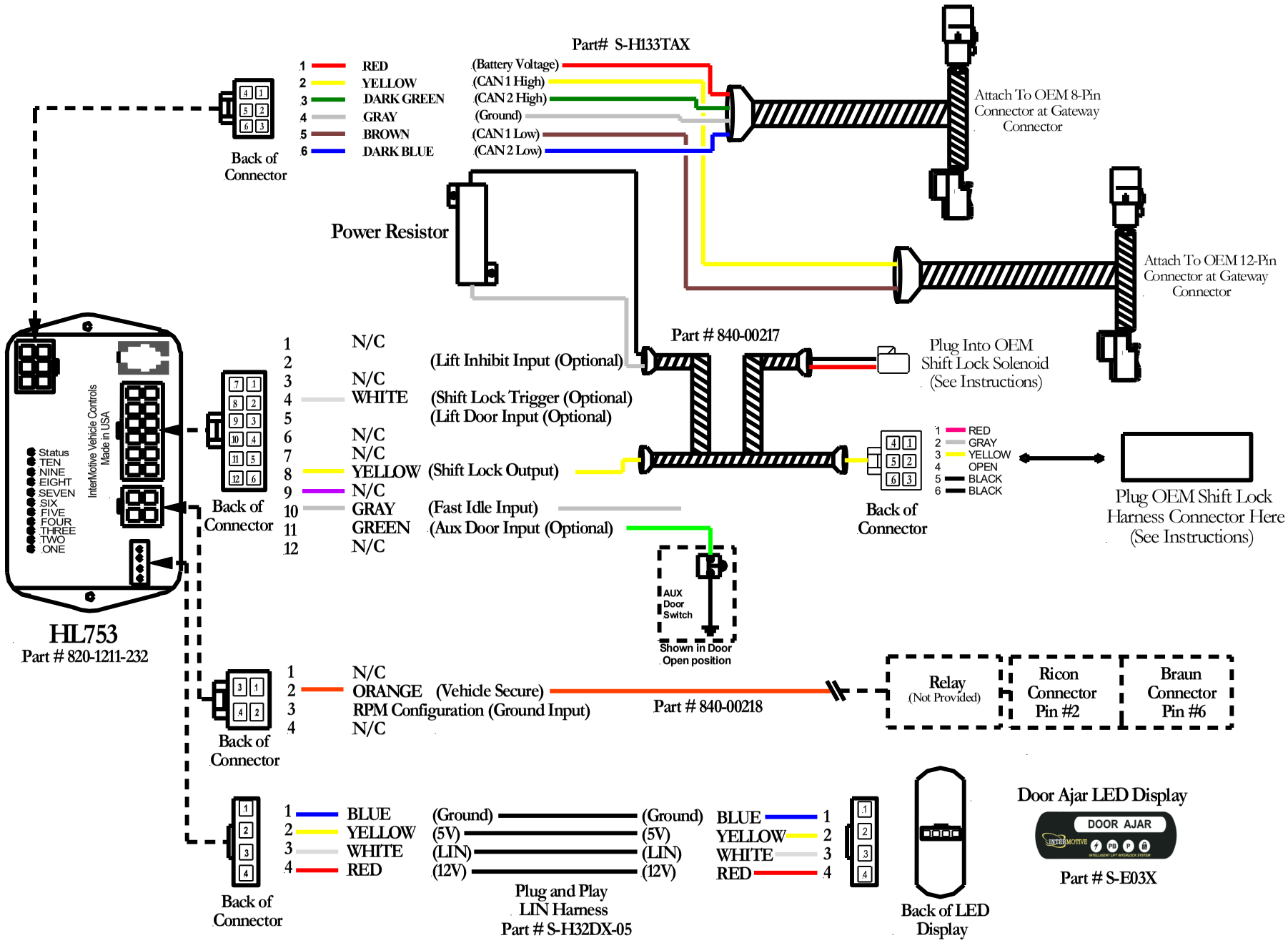
Manual Fast Idle Start Trigger
Fast Idle Input – ground applied to 12 Pin connector Pin #10 of the HL753 Module, such as an input from Coach AC.

Automatic Fast Idle Start Trigger
Charge Protection - Battery voltage less than 12.5V.

Fast Idle Disengagement Triggers
Safety Condition Violation.
Engine Coolant Temperature > 230° F.
Open or battery voltage on 12 Pin connector Pin #10 while in Fast Idle caused by 12 Pin connector Pin #10 fast idle input.
Transmission Fluid Temperature above 250° F.

Note: Fast idle will temporarily stop anytime the brake pedal is depressed, but will automatically reengage after approximately 2 seconds once the brake pedal is released.

When additional electrical or A/C loads are in use, engine RPM may drop. The AFIS feature will then raise the RPM back up to the fast idle speed. When the load is removed, engine RPM will increase. AFIS will then lower the RPM back to the fast idle speed.



If the HL753 fails any step in the Post Installation Test, review the installation instructions and check all connections.
If necessary, call InterMotive Technical Support at (530) 823-1048.