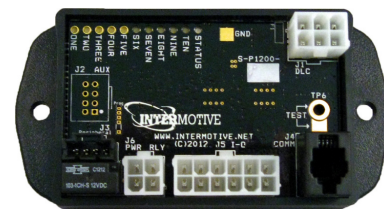


HL515, HL516* Fast Idle, Lift Interlock 2015 - 2019 Ford Transit



Introduction

The HighLock 515 and 516 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 HighLock also has the Fast Idle option. 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.

*HL515 vs 516

- HL515 is typically used on buses with a single main passenger door, and HL516 is usually used on vans, where the Door Ajar panel will flash when **any** door is ajar.

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 when installing upfitter circuits.

Installation Instructions

Disconnect vehicle battery before proceeding with installation



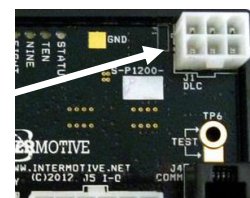
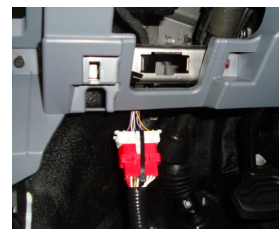
WARNING
Disconnect the battery to prevent setting a check engine light.

HL515/516 Module

Remove the lower dash panel below the steering column area and find a suitable location to mount the HL515/516 module. Locate the module in an area away from any external heat sources (engine heat, heater ducts, etc.). Do not mount the module until all wire harnesses are routed and secure. The last step of installation is to mount the module.

Data Link Harness Installation

1. Locate the vehicle OBDII Data Link Connector, mounted below the lower left dash panel.
2. Remove the mounting screws for the OBDII connector. Plug the Red connector from the HL515/516 Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.
3. Mount the White pass through connector from the HL515/516 Data Link Harness in the former location of the vehicle's OBDII connector.
4. Secure the HL515/516 Data Link harness so that it does not hang below the lower dash panel.
5. Plug the free end of the Data Link harness into the mating 6-pin connector on the HL515/516 module.



LED Display Panel Mounting—Black 4-pin connector

1. 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.
2. Drill a 5/8" hole in the dash where the center of the display will be located.
3. Attach the Black 4-pin connector of the LED Display Panel Harness to the module. Run the other end of the harness under the dash and out through the 5/8" hole.
4. Attach the end to the LED Display Panel.
5. Ensure the panel is level and secure using supplied screws.

Control Inputs, Output and Lift Inhibit Connections

12-pin I/O connector

The HL515/516 provides three ground side inputs and one ground side output.

Lift Inhibit pin-2: Grounding this input will prevent the module from supplying power on its Wheel Chair Lift Output pin.

Door Ajar pin-5: (Optional input), connect this wire only if the optional Door Ajar panel is used and an additional door connection is desired. Insert the green wire (provided with panel) into the connector and lengthen as needed, using solder, heat shrink and tape. Connect to the door switch so that a ground is supplied when the door is open.

Transmission=Park pin-9: This output can be used to control upfitter circuits, by providing a ground signal when the transmission is in Park. Maximum current draw is 1/2 amp.

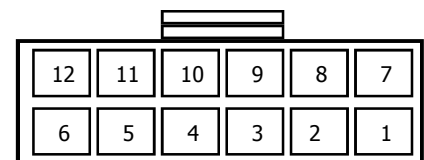
Fast Idle— Engage pin-10: This input pin can be connected to a ground side switch to activate Fast Idle.

A 12-pin mating connector is provided along with 5 terminals (two extra). To use any of these inputs/output, 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.

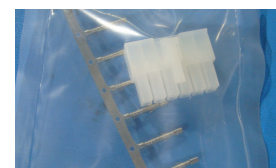
Ensure the terminals are fully seated in the connector. The largest wire that can be used with these terminals is 16 AWG. Snap this connector into the HL515/516 module's 12-pin connector.

12-pin connector pin out definition

- Pin #1 - Not Used
- Pin #2 - Inhibit input - (GND) to Inhibit Lift
- Pin #3 - Not Used
- Pin #4 - Not Used
- Pin #5 - GREEN Wire (Door Ajar Input) * Optional
- Pin #6 - Not Used
- Pin #7 - Not Used
- Pin #8 - Not Used
- Pin #9 - Transmission=PARK (output (GND))
- Pin #10 - Fast Idle- Engage
- Pin #11 - Not Used
- Pin #12 - Not Used



Back of Connector



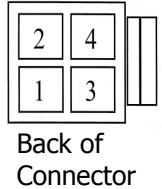
Mating 12 pin I/O
Connector provided

Control Inputs, Output and Lift Inhibit Connections (continued)

Lift Connector 4-pin

The HL515/516 module provides a 4-pin connector to enable wheelchair lift operation. The pins are defined as follows:

- Pin #1 - RPM Adjust
- Pin #2 - Lift power/Vehicle Secure output (Orange wire), connect to Wheel Chair Lift to enable operation.
- Pin #3 - Lift door input (Gray wire), connect to Lift Door switch, grounded when door open.
- Pin #4 - Lift power input (Yellow wire), connect this to a 12V fused ignition source, hot in run and crank.



HL515/516 Module Mounting

Ensure all harnesses are properly connected and routed, and are not hanging below the dash area. Mount the HL515/516 module using screws or double sided tape and reinstall all removed panels.

Reconnect vehicle battery

Lift Door Identification

The module comes from the factory with the discrete lift door input identified as the lift door. If the side door or rear door happens to be the lift door, the module needs to know which of the two possible doors (side or rear) is defined to be the lift door; perform the following procedure to accomplish this:

1. Assure Side and Rear Doors are closed
2. Vehicle is in PARK with Key in the RUN position and engine OFF
3. Park Brake is applied
4. Put the module in diagnostic page 4 by momentarily shorting the two "test" pads together **FOUR** times- verify the status LED is flashing code 4-4.
5. Pump the Service Brake pedal (4 times within 5 sec) till you see module LEDs 8-10 stay on solid. You will have one minute to choose which door will be used for the lift.
6. Now go and open the lift door; LED 8-10 will turn off and the LED associated with the Lift door will turn on. See table
7. Verify the lift door is "known" by opening and closing it while watching the "Lift Door Open" LED on the display panel.

Status LED	4-4
LED5	Discrete Input
LED6	Slide Door
LED7	Rear Door

Post Installation Testing

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.

Lift Interlock System Testing

Begin the checklist with the vehicle in the following state:

- Lift stowed
- Lift Door 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



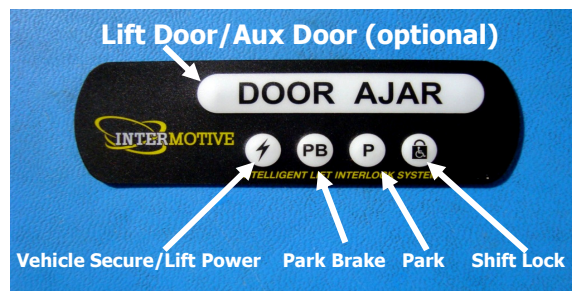
1. Turn ignition key On (to "Run"), verify the module wakes up and all 5 LEDs illuminate for approximately 2 seconds. The lower icon LEDs are backlit and should remain illuminated whenever the module is awake.
2. Verify that the Park LED, the Park Brake LED, and the Shift Lock LED remain illuminated.
3. Attempt to deploy the lift. Verify the lift does not deploy with the Lift Door closed.
4. With key on, Lift Door open, Park Brake set and transmission in Park, all 5 LEDs will be illuminated. Attempt to deploy the lift. Verify the lift deploys. Stow the lift.
5. With key on, Lift Door open, transmission in Park, 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.
6. With key on, Lift Door closed, Park Brake set, attempt to shift the transmission out of Park. Verify the transmission will not shift out of Park.
7. With key on, Lift Door open, Park Brake released, attempt to shift the transmission out of Park. Verify the transmission will not shift out of Park.
8. With key on, Lift Door closed, Park Brake released and the Service Brake applied, verify the transmission lever will shift out of Park.

Door Ajar LED panel (optional)

Perform the same checks as above

If equipped with a connection for an additional door (Aux Door) the Door Ajar LED will blink on the display panel until the door is closed. The **HL516** will flash the Door Ajar LED when any of the doors are opened. If the **Lift Door** is open, the Door Ajar LED will stay on steady, taking priority over the additional door input.

Note: All LEDs are active and there is no display backlighting.



Post Installation (continued)

Fast Idle

The Fast Idle option has several "auto triggers" that will increase engine RPM. These include low battery voltage, air conditioner on, engine cold, and external switch input on pin #10 of the 12 Pin connector (I/O 4).

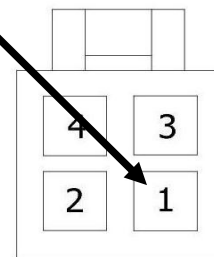
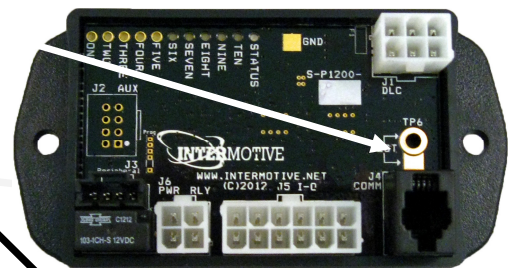
1. Press the Service Brake for 1 second. Fast idle will temporarily disengage anytime the brake pedal is pushed, but will automatically reengage after approximately 2 seconds once the Service Brake pedal is released.
2. Shut down the engine and verify that all LED's turn off, which may take a few minutes.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

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

The HL515 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 short the two "test" pads together **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 1 on the 4-pin connector until the desired RPM is set.
4. Short the "test" pads **TWO** more times until no LED's are lit on the module.



Back of Connector

**Leave in Vehicle
Operating Instructions HL515/516
Fast Idle, Lift Interlock
2015 - 2019 Ford Transit**

Advanced Fast Idle Operation

The Advanced Fast-Idle System (AFIS) option of the HL515/516 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 the charging system voltage falls below a minimum voltage of 12.5V, the 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 HL515/516 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 raise the RPM back up to the fast idle speed. When the load is removed, engine RPM will Increase. AFIS will lower the RPM back to the fast idle speed.

Operating Instructions (continued)

Lift Operation

The Intelligent Lift Interlock System of the HL515/516 is a microprocessor driven system for controlling wheelchair lift operation. Lift operation will only be allowed when all of the following conditions are met:

- The vehicle is in "Park".
- The parking brake is applied.
- The vehicle ignition is on.
- The lift door is open.
- Lift inhibit is not activated.

The HL515/516 will not allow the vehicle to be shifted out of park if the lift door is open. As an added feature, it also will not allow the vehicle to be shifted out of park when the parking brake is applied. This feature eliminates excessive parking brake wear due to driving with the parking brake applied.

If the vehicle has Daytime Running Lights, they will be activated when the Lift Door is Open and/or the Park Brake is On and the Ignition key is On.

When the vehicle is first started, or if the key is turned to the "Run" position, the five upper LED's (Active), on the display panel will illuminate for 2 seconds as a prove out of the LED's. The lower Icon LED's are (Backlit) and should remain illuminated whenever the HL515/516 module is awake. The module will stay awake for several minutes after the ignition is turned off.

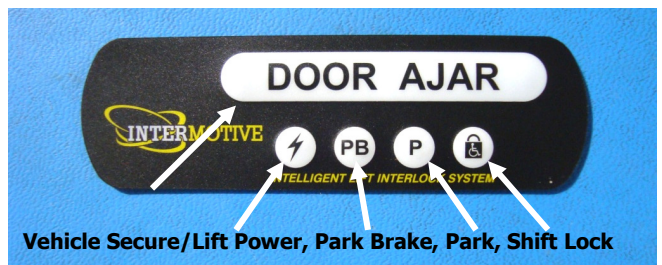
Optional Door Ajar Display Panel

LED function and prove out is the same as the Standard Display Panel, except that all LEDs are (Active) and remain illuminated whenever the module is awake.



The **HL516** will flash the Door Ajar LED when any of the doors are opened.

After prove out, the operation of the LED panel is as follows:



Vehicle Secure – Illuminates in green if the lift is enabled. This means that all conditions for lift operation have been met and the lift has been supplied a vehicle secure signal.

Park Brake – Illuminates in Red when the parking brake is applied.

Park - Illuminates in Red when the vehicle transmission is in the park range.

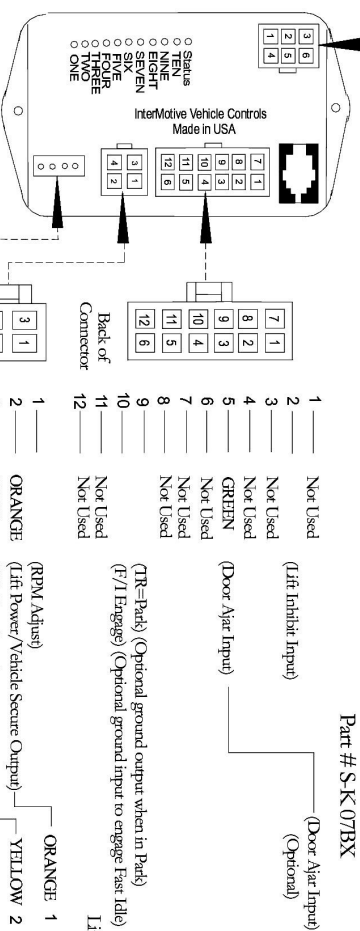
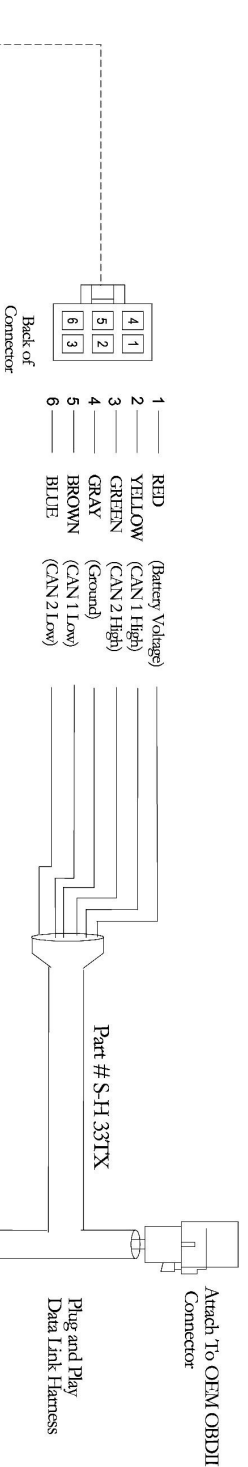
Lift Door - Illuminates in Red when the lift door is open.

Shift Lock - Illuminates in Red when the lift door is open and/or the parking brake is applied. If illuminated, the driver will not be allowed to shift out of park.

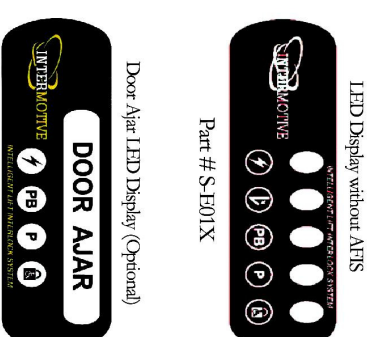
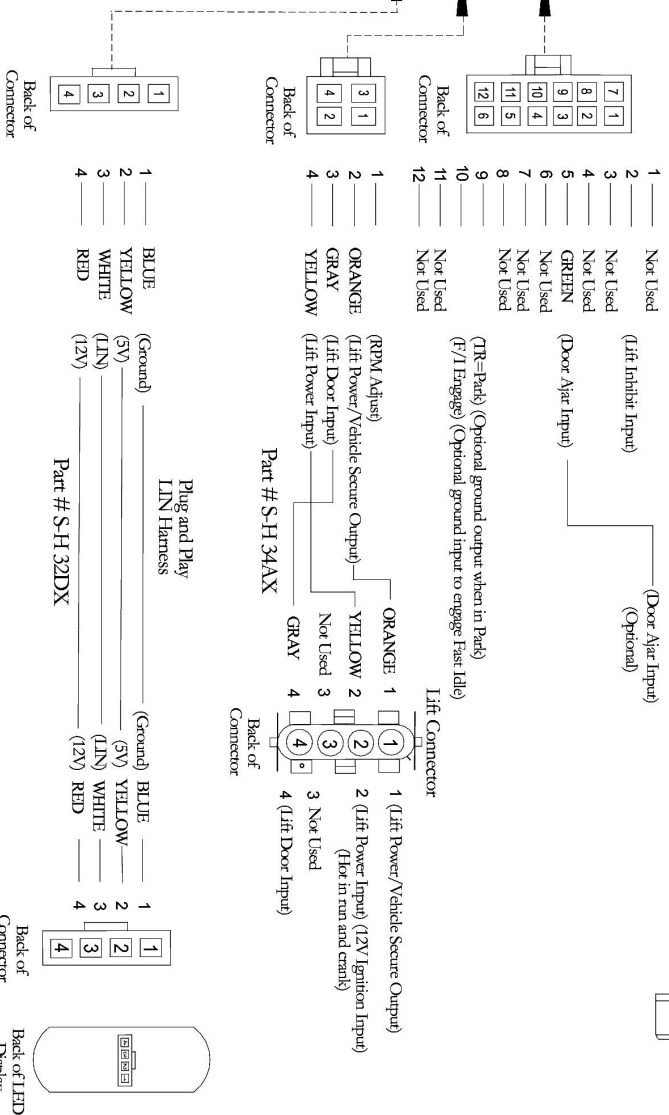
Confirmation Signal – The vehicle lamps and radio will cycle briefly when the ignition is on and the lift door is initially closed. This is a confirmation signal sent from the Ford Econoline controller.

All Five Interlock LED's must be illuminated for the Wheelchair Lift to operate

The HL515/516 initializes when the vehicle ignition is On. After the initialization, the HL515/516 requests various vehicle data by sending data request messages across the OEM CAN diagnostic data network and all control logic is performed. When the HL515/516 module has been running and the vehicle ignition is turned to the Off or accessory positions, the module goes into a low current consumption "sleep" mode. This may take up to 5 minutes.



HI 515-B
S-M 1200-76
HI 516-B
S-M1211-90



Submit product registration at www.intermotive.net

If the HL515/516 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.