



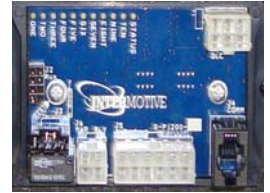
An ISO 9001:2008 Registered Company

GTWY506

Fast Idle, Shift Interlock, IO

2011 Ford F Series

6.2L, 6.8L Gas & 6.7L Diesel



Introduction

The Gateway GTWY506 module represents the next generation of Fast Idle, Lift Interlock and Input Output capabilities from InterMotive Vehicle Controls. The GTWY506 provides a number of benefits for the installer and user. 1/4th the size of its predecessor, easier, faster installation, with a new LED panel which integrates **both** Fast Idle and Lift Interlock functions and requires less dashboard area. Fewer, non-interchangeable connectors simplify installation and help ensure proper connections.



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

Installation Instructions

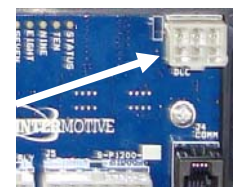
Be sure the vehicle's battery is disconnected before proceeding with installation.

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.

Remove the lower dash panel below the steering column and find a suitable location to mount the module. Do not actually mount the module until all wire harnesses are routed and secure. The last step of the installation is to mount the module. It is recommended the module be mounted with two screws, however 2-sided foam tape may also be used. Be careful to route the harnesses such that the tilt steering column does not contact them in the full down position. When installing the harnesses, leave several inches of take-out such that the module can be removed if necessary.

Data Link Harness Installation

- Locate the vehicle's OBDII Data Link Connector. It will be mounted below the lower left dash panel.
- Remove the mounting screws for the OBDII connector. Plug the Red connector from the GTWY506 Data Link Harness into the vehicle's OBDII connector. Ensure the connection is fully seated and secure with the supplied wire tie.
- Mount the Black pass through connector from the GTWY506 Data Link Harness in the former location of the vehicle's OBDII connector.
- Secure the GTWY506 Data Link harness so that it does not hang below the lower dash panel.
- Plug the free end of the Data Link harness into the mating 6-pin connector "DLC" on the GTWY506 module.



LED Display Panel

- Locate a suitable position on the dashboard within view of the driver for mounting the LED Display Panel. The length of the display harness is 40". This is the maximum distance the display can be mounted from the GTWY506 module.



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LED Display Panel (Cont.)

- Drill a 5/8" hole in the dashboard where you wish the center of the display to be, being careful not to damage anything behind the dashboard.
- Attach the 4 Pin LED display harness to the GTWY506 Module's 4-pin connector. (Note: on vehicles with Merlin systems, a "Y" harness is provided which also connects to the MIM401-A1 module. See MIM401-A1 instructions).
- Run the free end of the display harness under the dash and out through the 5/8" hole.
- Attach the end of the display harness to the LED Display Panel.
- Ensure panel is level, and secure using the supplied screws.



Control Outputs, Input, and Lift Inhibit Connections - 12-pin IO connector (optional)

The GTWY506 provides three ground side configurable outputs and one configurable input/output. The outputs can provide vehicle information such as Vehicle Speed, Park, Park Brake, etc., and are configured per customer requirements at InterMotive prior to shipping. These outputs can be used to control upfitter circuits and can sink up to 1/2 amp. The input pin can be connected to a ground side switch to activate Fast Idle or Shift Lock. Grounding the Lift Inhibit pin-2 input will prevent GTWY506 from supplying power on Vehicle Secure/Lift Power Output pin (4 pin connector). In addition to the above, there is also a dedicated Shift Lock ground activated input on pin 11 which can be connected to an emergency door switch or other equipment.

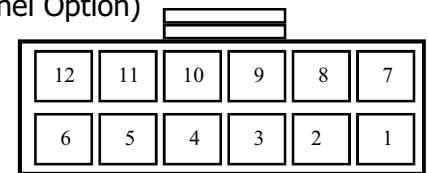
A 12 pin mating connector and seven terminals (two extra) are provided. To use any of these outputs, properly crimp a connector terminal provided to the installer supplied wire using the correct crimping tool. (Molex Part# 11-01-0197), and insert into the correct connector pin housing. The pin MUST be properly oriented for it to fully seat and click into place. The largest wire that can be used with these terminals is 16 AWG. Plug this connector into the GTWY506 module's 12-pin connector.

12-pin Input Output connector pin out definition

- Pin #1 - Not Used
- Pin #2 - Inhibit input - ground to Inhibit Lift
- Pin #3 - IO 2 - Configured output
- Pin #4 - IO 3 - Configured output
- Pin #5 - Green - Door Ajar Input - Ground Signal (Only with Door Ajar Panel Option)
- Pin #6 - Not Used
- Pin #7 - Not Used
- Pin #8 - White - Tow Haul Switch Input (Only with BrakeMax Option)
- Pin #9 - IO 1 - Configured output
- Pin #10 - IO 4 - Configured I/O Pin
- Pin #11 - Dedicated Shift Lock input - ground to activate Shift Lock
- Pin #12 - Not Used



12 Pin IO Connector



Back of Connector

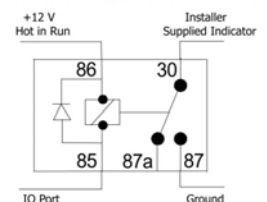
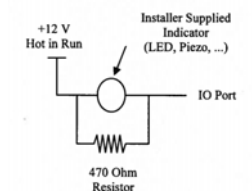
Note: When using the IO port outputs to drive installer supplied low current devices, such as LEDs or Piezo buzzers, a small amount of leakage current when the pin is inactive may cause the low current device to activate. This is indicated by the LED turning on dimly or the Piezo buzzer sounding faintly when the output is inactive (Conditions not met).

To correct this, install a 470 Ohm 1W resistor across the low current device.

Digikey Part # 470WCT-ND

Or, drive a relay with the IO output to switch ground to the low current device.

Digikey Part # PB682-ND



Lift Connector 4-pin

This 12 inch harness contains the ignition power, lift power/vehicle secure, and lift door circuits. The mating harness is to be fabricated by the installer. The recommended mating connector is Molex Part # 0050841040. The recommended mating terminals are Molex Part # 0002081003. The recommended terminal extractor tool is Molex Part # 0011010168. The recommended hand crimp tool is Molex # 0638116800.

- Ignition Circuit – Yellow wire pin 2. This GTWY506 input must be connected to an 8A (or less) fused source which provides 12V when the key is on. This circuit provides the power for the Vehicle Secure output below.
- Vehicle Secure/Lift Enable - Orange wire pin 1. This GTWY506 output provides the 12V lift enable signal to the lift. It can provide 8A max. (see lift manufacturers installation instructions).

Note: Do not power any other loads (i.e.: lights, motors, etc.) from this circuit that could cause the total current draw to exceed 8.0 amps.

- Lift Door Circuit – Gray wire, pin 4. Locate the vehicle's lift door switch circuit. Connect this Gray wire to the vehicles lift door switch, such that when the lift door is open, this signal is grounded. A switch that provides power with the door is open will not operate correctly.
- Finally, plug the White 4-pin connector from the Lift Harness into the control module connector marked "PWR RLY".

GTWY506 System Options

Door Ajar Display Panel - If the Door Ajar Display Panel is used, there is an optional second door input. The green wire included with the panel can be used for this feature, and should be inserted into the GTWY506 12 pin connector Pin #5. Attach the other end to the second door switch (usually passenger door) which provides a ground when the door is open. This will cause the "Door Ajar" display to flash when only the passenger door is open.

GTWY506-B - Gateway with BrakeMax. (6.2L and 6.7L only)

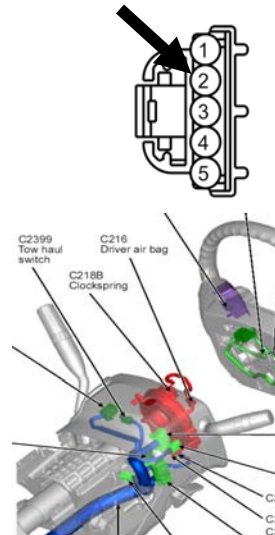
- Locate the OEM Black 5-pin tow-haul switch connector (C2399) located on top of the steering column. Locate Pin #2 Brown/Yellow wire.
- Attach the GTWY506 12 Pin connector Pin #8 White wire to the OEM Black 5-pin tow-haul switch connector Pin #2 Brown/Yellow wire. Solder and heat shrink or tape the connection point.
- Route the wire harness and connect the 12 pin connector Pin #8.

BrakeMax Operation Instructions:

- When the vehicle is started, tow-haul mode is automatically engaged and the tow-haul light will be on.
- To deactivate tow-haul mode, press the tow-haul mode button.
- When vehicle is restarted, tow-haul mode will again be automatically reengaged.

GTWY 506-F - Gateway with Fast Idle. See Fast Idle Post Installation Testing instructions. (Page 4)

GTWY 506-M - Gateway with Merlin. See LED display panel instructions. (Page 2)



OEM connection for Brake Max option.

GTWY506 Post Installation Testing

The following abbreviations are used: TR-Trans Range, P-Park, P-Park, PB-Park Brake, LD-Lift Door, SB-Service Brake, LI-Lift Inhibit switch (optional)

Reconnect the battery to enable system testing.

1. LED panel Tests -

Prove out - When ignition key is turned on, all LED's should turn on for ~2 seconds then back off.

LED Tracking - The Park LED (P) should illuminate when TR=P, Park Brake LED (PB) should illuminate when PB is set. Verify the Lift Door LED illuminates when the Wheel Chair Lift Door is opened. If using the Door Ajar panel, make sure "Door Ajar" illuminates when the lift door is open, and flashes when the second door is open (lift door closed). All LEDs must track properly.

2. Vehicle Secure/Lift Enable Tests -

Set Up: Key on, TR=P, PB set, LD open, LI not on

Verify Lift works: the Vehicle Secure LED (lightening icon) should be on, Lift operates. If the Lift does not operate, verify that Orange lift wire has 12V. If no, verify Yellow lift wire has 12V (Ignition Circuit).

Verify: Lift does NOT work with LI switch on (if installed)

Set up: Key on, LD closed, PB set, TR=P, LI not on

Verify: Lift does not work with lift door closed

Set up: Key on, LD open, PB set, TR *not* = P, LI not on

Verify: Lift does not operate when TR not set to P.

Set up: Key on, LD open, TR=P, PB not set, LI not on.

Verify: Lift does not operate when PB not set.

3. Shift Lock Tests -

Set up: Key on, PB set, TR=P, LD closed

Verify: Press SB, confirm shifter locked in P, and Lock LED illuminated.

Set up: Key on, PB not set, TR=P, LD open

Verify: Press SB, confirm shifter locked in P, and Lock LED illuminated (**CRITICAL TEST!**)

Fast Idle Post Installation Testing (Fast Idle is an option on some models)

1. The Gateway module has several "auto triggers" that will cause it to Fast Idle the engine. These include low battery voltage, air conditioner on, engine cold, and external switch input on IO4 connector pin #10.
2. Manually engage fast idle by placing the vehicle in Park and press the Yellow ENGAGE button on the LED panel. The Green LED should light and the engine RPM should ramp up to 1500 RPM for gas, 1200 RPM for diesel.
3. Press the Service Brake for 1 second. Fast idle must temporarily ramp down anytime the brake pedal is pushed, but will automatically reengage after approximately 2 seconds once the Service Brake pedal is released.
4. Exit Fast Idle mode by pressing the Service Brake and the Yellow Manual ENGAGE button together. Fast Idle should cancel and the Green LED should turn off. This will disable Fast Idle until the key or transmission range is cycled.
5. 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.)



DO NOT PUT VEHICLE IN SERVICE IF IT DOES NOT PASS ALL OF THE ABOVE TESTS!

contact InterMotive at 530-823-1048 for technical assistance.

Go to the next page to continue testing Fast Idle

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GTWY506

Fast Idle, Shift Interlock, IO

2011 Ford F Series 6.2L, 6.8L Gas & 6.7L Diesel

System Operating Instructions

Gateway 506 Operation:

The Gateway 506 initializes when the vehicle ignition is on. During initialization, the LED display panel connected to the Gateway 506 performs a prove-out for 2 seconds. After the initialization, the Gateway 506 obtains various vehicle data over the OBDII connector/network and all control logic is performed. When the Gateway 506 module has been running and the vehicle ignition is turned to the off or accessory positions, the module goes into a very low current consumption "sleep" mode. This may take up to 5 minutes.

In order to not interfere with possible scan tool communication, GTWY506 will refrain from transmitting CAN messages for 10 seconds if scan tool CAN communication is detected. If during these 10 seconds another scan tool message is received, an additional 10 seconds will be added to the end of the first 10 second timeout. When no scan tool messages have been detected for at least 10 seconds, GTWY506 will resume operation.

Advanced Fast Idle

The Advanced Fast-Idle System (AFIS) option of the Gateway 506 includes Charge-Protect as well as fully-automatic 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 (determined by each bus manufacturer), this AFIS feature will increase idle speed and maintain fast idle until the user cycles the shifter, a safety condition is violated or the user manually disengages fast idle. The fully-automatic 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.
Service Brake NOT pressed.
Vehicle Transmission in Park
RPM inside of safe operating range.
Transmission Fluid Temperature below 250° F.
Engine Coolant Temperature below 230° F.

AFIS portion of LED Panel:

The left side of the Control/Display Panel consists of one LED and a Manual Engage Switch (panels with Fast Idle option). The green LED will illuminate when Fast Idle is in progress. The LED is also used for diagnostic code retrieval by an authorized service technician. The Manual ENGAGE button can be used to engage Fast Idle operation if all safety conditions are met.

Fast Idle Operation:

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). Fast Idle operation will be terminated by a safety condition violation, a Merlin Multiplex Network Command, or an automatic trigger going away.

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GTWY506-03 OP

GTWY506 Operating Instructions (continued)

If a Fast Idle operation terminates due to a safety condition violation, automatic Fast Idle is unavailable until the transmission is cycled out of Park and back. Fast default Fast Idle RPM is 1500 for gas engines and 1200 for diesel.

Manual Fast Idle Start Triggers:

LED panel manual ENGAGE button.

Merlin Network Command (for vehicles equipped with Merlin Multiplex system).

Fast Idle Input – ground applied to 12 Pin I-O connector Pin 10 (if configured - such as from an A/C unit)

Automatic Fast Idle Start Triggers:

- Charge Protection - Battery voltage drops below bus manufacturer set minimum voltage.
- Chassis A/C Boost - OEM A/C clutch engaged with ambient temperature above 70° F. Note: shutting off A/C does not disable Fast Idle until transmission range cycled.
- Heater Boost – Ambient air temperature below 70° F and Engine Coolant Temperature below 120° F.

Fast Idle Disengagement:

- Safety Condition Violation.
- Merlin Multiplex Network Command.
- Heater Boost - Engine Coolant Temperature > 120° F. Removes Heater Boost trigger.
- Fast Idle IO4 (pin 10) no longer grounded.
- Transmission Fluid Temperature above 250° F. Overheating condition.
- Ambient Temperature below 70° F (Only in A/C Boost).

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. Fast idle may be manually cancelled by depressing the service brake pedal while simultaneously pressing the manual engage switch.

Manual Operation:

To manually engage Fast Idle, the manual ENGAGE button must be pressed for at least a quarter second and released. The Fast Idle operation will begin when the button is released, not when first pressed. Holding down the button for more than five seconds will initiate a diagnostic routine that displays stored status codes from previous operations. If the driver accidentally enters this routine, it can be exited by cycling the vehicle's ignition off and then back on. To exit Fast Idle operation, the driver can simply press the service brake while simultaneously pressing the ENGAGE button.

Note: When Fast Idle is engaged, the OEM PCM will try to maintain the RPM constant regardless of engine load. There may be some RPM variations observed as loads are increased/decreased.

GTWY506-B - Gateway with BrakeMax.

BrakeMax Operation Instructions:

- When the vehicle is started, tow-haul mode is automatically engaged and the tow-haul light will be on.
- To deactivate tow-haul mode, press the tow-haul mode button.
- When vehicle is restarted, tow-haul mode will again be automatically reengaged.

GTWY506 Operating Instructions (continued)

Lift Operation

The GTWY506 Intelligent Lift Interlock System is a microprocessor based 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 Park Brake is applied.
- The vehicle ignition is on.
- The lift door is open.
- The Lift inhibit switch (if installed) is not activated.

GTWY506 will not allow the vehicle to be shifted out of Park if the lift door is open, or if the Park Brake is set. GTWY506 does not lock the shifter when the passenger door is open.

The shift lock can also be activated through 12 Pin connector Pin #10, if the proper configuration is installed or through a command by the InterMotive Merlin Multiplex system, if equipped.

If the vehicle has Daytime Running Lights, they will be activated when the Park Brake is applied and the Ignition is On.

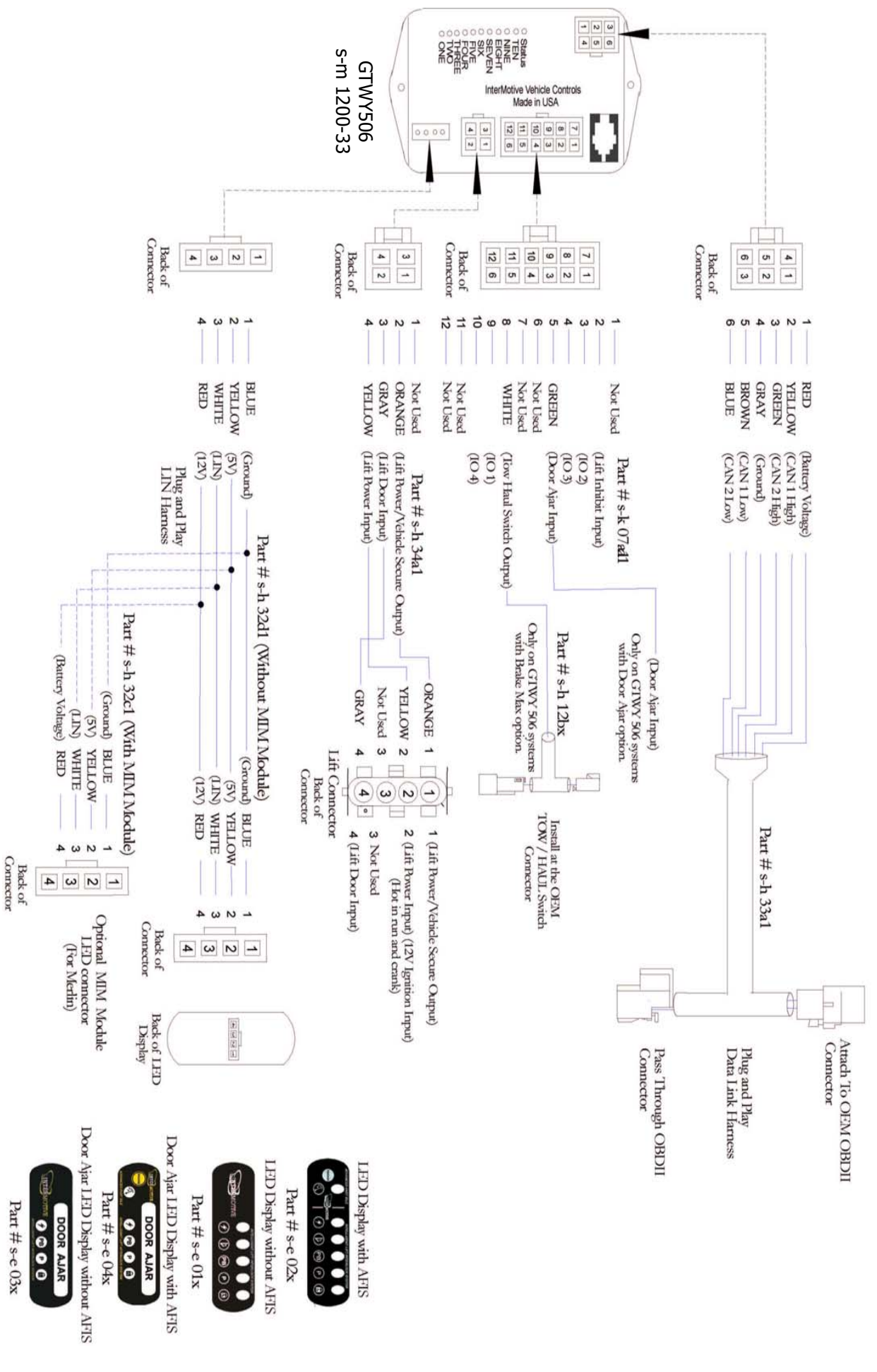
When the vehicle is first started, or if the key is turned to the "Run" position, the five upper LED's on the display panel will illuminate for 2 seconds as a prove out of the LED's. The lower Icon LED's are backlit and should remain illuminated whenever the Gateway 505 module is awake. The module will stay awake for several minutes after the ignition is turned off. After prove out, the operation of the LED panel is as follows (standard LED panel, left to right):

- **Fast Idle indicator** - (tachometer icon) Illuminates green when Fast Idle active.
- **Vehicle Secure/Lift Enable** – (Lightening Icon). Illuminates 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.
- **Door Open** - (door icon) Lift Door Display Panel only- Illuminates in red when the lift door is open.
- **Park Brake** – (PB icon) Illuminates in red when the parking brake is applied.
- **Park** - (P icon) Illuminates in red when the vehicle transmission is in the park range.
- **Shift Lock** - (lock icon) Illuminates in Red when transmission shifter is locked in Park. This occurs when the lift door is open and/or the Park Brake is applied. It can also be illuminated from an external command through the IO 4 input at Pin #10 of the 12 pin connector (proper configuration required). Also a command by the InterMotive Merlin Multiplex system, if equipped, will illuminate the shift lock LED. If illuminated, the driver will not be allowed to shift out of Park.
- **Door Ajar optional panel** - (upper text: **Door Ajar**) Illuminates in red when the lift door is open, flashes in red when the passenger door is open. Solid red when both doors open.

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 controller.

If the GTWY506 fails any step in the System Operating Instructions review the instructions.

If necessary, call InterMotive technical support @ (530) 823-1048.



Submit product registration at www.intermotive.net

If the GTWY506 fails any step in the Post Installation Test, review the installation instructions and check all connections. If necessary, call

InterMotive technical support @ (530) 823-1048.

GTWY506-03 CAD