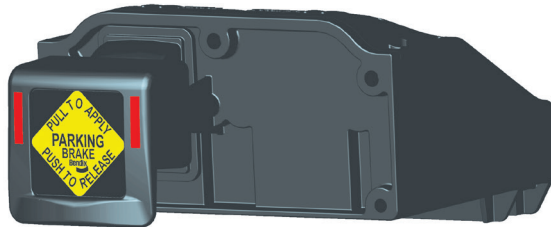


Bendix® Intellipark® Electronic Park Brake (EPB) System



**Dash Electronic Control Unit (DECU)
Towing Vehicle Variant**
(similar to the Bendix® MV-3® Dash Control Valve)



**Dash Electronic Control Unit (DECU)
PP-Left Non-Towing Vehicle Variant**
(similar to the Bendix® PP-DC® Park Control Valve)



**Dash Electronic Control Unit (DECU)
PP-Right Non-Towing Vehicle Variant**
(similar to the Bendix PP-DC Park Control Valve)

NOTE: Both towing and non-towing units may have various switch configurations (vertical and horizontal) and mounting brackets. The DECU PP variant is available in both PP-Right and PP-Left configurations.

Figure 1 – Bendix® Dash Electronic Control Unit (DECU) Variants



GENERAL SAFETY GUIDELINES

WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS

TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following guidelines should be observed **AT ALL TIMES**:

- ▲ Park the vehicle on a level surface, apply the parking brakes and always block the wheels. Always wear personal protection equipment.
- ▲ Stop the engine and remove the ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically-charged components.
- ▲ Do not attempt to install, remove, disassemble or assemble a component until you have read, and thoroughly understand, the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
- ▲ If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning **ANY** work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system, a Bendix® DRM™ dryer reservoir module, a Bendix® AD-9si®, AD-HF®, or AD-HFi® air dryer, be sure to drain the purge reservoir.
- ▲ Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
- ▲ Never exceed manufacturer's recommended pressures.
- ▲ Never connect or disconnect a hose or line containing pressure; it may whip and/or cause hazardous airborne dust and dirt particles. Wear eye protection. Slowly open connections with care, and verify that no pressure is present. Never remove a component or plug unless you are certain all system pressure has been depleted.
- ▲ Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, wiring, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
- ▲ Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
- ▲ Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
- ▲ For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.
- ▲ The power **MUST** be temporarily disconnected from the radar sensor whenever any tests **USING A DYNAMOMETER** are conducted on a vehicle equipped with a Bendix® Wingman® system.
- ▲ You should consult the vehicle manufacturer's operating and service manuals, and any related literature, in conjunction with the Guidelines above.

INTRODUCTION

The Bendix® Intellipark® Electronic Park Brake (EPB) System provides parking capability for commercial vehicles (tractors, trucks, and buses) that utilize air brakes. It is available in various models to support a wide range of applications. The system contains the Dash Electronic Control Unit (DECU), the Park Valve Module (PVM), and an integrated display – provided by the vehicle Original Equipment Manufacturer (OEM) or by Bendix.

The Intellipark EPB system functionally replaces previous Bendix® park brake dash valves such as the MV-3® dash control valve, the Bendix® PP-1® control valve, and the Bendix® PP-DC® park control valve with an electromechanical valve and an electronic controller which includes a driver interface. The Intellipark EPB system provides many of the same features and functions as manual park brake dash valves, but also provides advanced features and functions not available in the previous park brake valves.

Proper integration of the Intellipark EPB system by the vehicle OEM provides the following vehicle operation functions:

- Allows solo vehicle (bobtail tractor, solo truck, or bus) to be parked and unparked
- Allows combination vehicle to be parked and unparked
- Allows power unit with towing provisions to couple to, and uncouple from, a towed unit (power unit brakes to be released while trailer brakes are set)
- Allows power unit with towing provisions to charge towed unit(s) while parked
- Allows power unit with towing provisions to be operated as a solo vehicle (bobtail)
- Allows driver to determine if air is being delivered to the parking brakes
- Allows driver to determine availability of park system

Proper integration of the Intellipark EPB system by the vehicle OEM provides the following vehicle driver assistance functions:

- Assists in mitigating driver error of leaving the vehicle unparked while not present to control the vehicle
- Assists in mitigating driver error of attempting to unpark while not in control of the vehicle
- Reduces the likelihood of damage in a drive-away with the trailer parking brakes applied (Auto Trailer Brake Release – if enabled [refer to the vehicle manufacturer])

WARNING

The Bendix® Intellipark® Electronic Parking Brake (EPB) system cannot detect issues with other components of the park brake system, such as the spring brake chambers. Accordingly, drivers and maintenance personnel must perform inspections and maintenance on the park brake system in accordance with established procedures. For proper operation of the Intellipark EPB system, all other components of the park brake system must be functioning as designed.

WARNING

Improper use of the Intellipark EPB system can result in an unsafe park state, causing property damage, serious injuries, or death. Drivers must be responsible for the safe operation of the vehicle at all times. The Intellipark EPB system does not replace the need for a skilled driver, reacting appropriately and in a timely manner, and using safe driving practices.

IMPORTANT

Bendix®-brand Electronic Control Units (ECUs) are not designed to store data for purposes of accident reconstruction and Bendix® ACom® Diagnostic Software is not intended to retrieve data for purposes of accident reconstruction. Bendix makes no representations as to the accuracy of data or video retrieved and interpreted from ECUs for purposes of accident reconstruction. Bendix does not offer accident reconstruction services or interpretation of stored data. Bendix ECUs are not protected from fire, loss of power, impact damage, or other conditions that may be sustained in a crash situation and may cause data to be unavailable or irretrievable.

VEHICLE OPERATION FEATURES

NOTE: Refer to the applicable operator's manual on B2Bendix.com for further details on vehicle features and interlocks.

- **Towing Vehicle: Single-Button Park:** The Intellipark EPB system provides the ability to park all units of a combination vehicle with a single input. This feature is similar to the single-button park feature of the Bendix® MV-3® dash control valve. Upon pulling the yellow switch of the Dash Electronic Control Unit (DECU), the Park Valve Module (PVM) will exhaust the air from the power unit and towed unit channels. The behavior of this feature is modified if the vehicle is moving. See the section titled *Exhaust-at-Speed* for more details.
- **Towing Vehicle: Independent Trailer Air Control:** The Intellipark EPB system provides the ability to charge or evacuate the trailer supply (red) line independent of the state of the power unit spring brakes. This feature allows operation of a vehicle with towing provisions as a solo vehicle, supports coupling and uncoupling operations, and allows trailer emergency brake control. Upon pulling the red switch of the DECU, the PVM will exhaust the air from the towed unit channel, with no change in state of the power unit (yellow) channel. Upon pushing the red switch of the DECU, if the trailer air charge interlocks have been satisfied, the PVM will deliver air to the towed unit channel, with no change in state of the power unit (yellow) channel.
- **Towing Vehicle: Independent Trailer Air Charge Interlock:** The Intellipark EPB system provides the ability to restrict the air charge function of the trailer based on inputs from the vehicle, including the service brakes and ignition switch. This feature is intended to help mitigate the possibility of release of the trailer park brakes without a driver in control of the vehicle, while allowing the trailer(s) to be charged with the power unit parked. This functionality supports coupling and uncoupling operations, including pre-trip inspections for some types of combination vehicles.

- **Exhaust-at-Speed:** The Bendix® Intellipark® Electronic Parking Brake (EPB) system provides functions to help the driver achieve a controlled stop when the yellow or red switch is pulled while the vehicle is in motion, while at the same time helping to mitigate the possibility that accidental switch operation will cause the spring brakes to apply while driving. This feature provides a short, programmable delay before an exhaust event is initiated when the driver pulls the yellow or red switch when the vehicle is in motion. The delay time is dependent on vehicle speed; at low speeds, no delay is initiated.

This function is intended to fulfill emergency brake operation requirements while reducing the likelihood of unintended activations of the spring brakes at normal on-road speeds. In an emergency situation where the service brakes are not available while driving, if activating the spring brakes is needed to reduce vehicle speed, pull and hold the parking (yellow) and/or trailer emergency (red) switch until the desired spring brakes have been activated. Pull-and-hold of the parking (yellow) switch will activate the spring brakes of the tractor and trailer. Pull-and-hold of the trailer emergency (red) switch will activate the spring brakes of the trailer.

The exhaust-at-speed feature provides an automatic release of the spring brakes once the driver has released the switch and it has returned to its neutral position (dependent on the speed of the driver since at low speeds the vehicle will be parked).

Once an exhaust-at-speed event has been initiated, the driver may push the red and/or yellow switch as needed to indicate intent to charge the spring brakes. Pushing the yellow switch will charge only the tractor channel, while pushing the red switch will charge only the trailer channel. This would only be necessary at low speeds when the system would fully park the vehicle.



Never attempt to test the exhaust-at-speed feature or use it in the course of normal driving. This feature is intended for use only in emergency situations where the tractor and/or trailer service brakes are not available while driving. Testing the exhaust-at-speed feature can only be safely performed on a test track with a trained driver. Failure to follow this warning could lead to vehicle damage, property damage, injury, or death. Drivers and maintenance personnel must read and understand the contents of the Intellipark owner's manual before operating a vehicle equipped with the Bendix® Intellipark® Electronic Parking Brake (EPB) System.

Activation of the spring brakes while driving should only be performed by qualified drivers in emergency situations where the safest action available to the driver is to activate the spring brakes while driving. Activation of the spring brakes while driving can result in a degradation of vehicle control, causing property damage, serious injuries, or death.

The Bendix Intellipark EPB system is designed with features to lessen the possibility of accidental activation of the spring brakes while driving. The driver must pull and hold the switch for 0.25 seconds [a vehicle Original Equipment Manufacturer (OEM) configurable delay] to activate the spring brakes at road speeds. This delay allows emergency brake control while protecting against accidental activation of the spring brakes.

- **Rollaway Mitigation (Driver Assistance Feature):** The Bendix® Intellipark® Electronic Parking Brake (EPB) system's Rollaway Mitigation feature is intended to mitigate the possibility of a roll-away resulting from the driver failing to park the vehicle. The Intellipark EPB system provides the ability to detect some situations where the vehicle is unparked and the driver is not present in the driver's seat, based on inputs from the vehicle including the cab doors, service brakes, and engine throttle pedal. In response to a predetermined sequence of inputs, Rollaway Mitigation will automatically set the parking brake.

The Rollaway Mitigation feature is not intended to be a primary automation feature. In all cases, the driver remains responsible for activating the park switch for each drive cycle. Rollaway Mitigation includes a feature to reinforce proper driver behavior: If this feature has parked the vehicle, the driver will be informed by flashing LEDs and must pull the park switch prior to the system allowing the driver to unpark the vehicle.



Drivers and maintenance personnel must not rely on the Intellipark EPB system to automatically park the vehicle. Drivers continue to be responsible for safe and proper operation of the vehicle.

- **Power Unit Park Brake Release Interlock (Driver Assistance Feature):** The Intellipark EPB system provides the ability to restrict the release of the parking brakes based on inputs from the vehicle including the cab doors, service brakes, and ignition switch. This feature is intended to help mitigate the possibility of unauthorized operation of the vehicle or release of the park brakes without a driver in control of the vehicle.

The standard configuration of this feature inhibits the release of the power unit spring brakes unless the ignition is on, the cab doors are closed, the driver's foot is on the service brake, and – if applicable – the transmission shifter is in the non-park position (verify with the vehicle manufacturer).

- **Towing Vehicle: Auto Trailer Brake Release (Driver Assistance Feature):** The Intellipark EPB system provides the ability to detect some situations where the driver attempts to drive a combination vehicle with the trailer(s) parked, based on inputs from vehicle speed data, powertrain data, engine throttle pedal, service brakes, and measurement of the air pressure in each Intellipark channel. In response to these inputs, the Intellipark EPB system will automatically charge the trailer channel, thereby releasing the trailer parking brakes if the parking brake system downstream of the Intellipark valve is healthy.

This feature is not intended to be a primary automation feature. In all cases, the driver remains responsible for pressing the trailer charge switch at the beginning of each drive cycle. The Auto Trailer Brake Release feature – if enabled (refer to the vehicle manufacturer) – will activate every time the conditions are met unless the system is in bobtail mode.



Under certain conditions, the Bendix® Intellipark® Electronic Parking Brake (EPB) system can automatically release the trailer park brakes. Drivers and maintenance personnel must read and understand the contents of the Intellipark owner's manual before operating an Intellipark-equipped vehicle.

SYSTEM COMPONENTS

The Bendix® Intellipark® Electronic Parking Brake (EPB) system is designed to operate with the Dash Electronic Control Unit (DECU) and Park Valve Module (PVM). Substitution of either component is not permitted. Additionally, the system also requires an integrated display. The integrated display may be provided by Bendix, or the vehicle Original Equipment Manufacturer (OEM) may choose to use the instrument cluster or another existing integrated display on the vehicle to perform the necessary functions.

- **DECU - Dash Electronic Control Unit:** The DECU is an Electronic Control Unit (ECU) with an integrated display with a push-pull switch for the power unit (yellow) channel, and if needed, a similar push-pull switch for the towed unit (red) channel. The DECU interprets switch motion into driver intent. Based on that input and other inputs from the vehicle (via discrete I/O or J1939 CAN), it activates solenoid valves to produce the desired pneumatic response. **NOTE:** Units may have various switch orientations (horizontal or vertical) and mounting brackets. *As shown in Figure 2*, the DECU PP variant is available in both PP-Right and PP-Left variants.

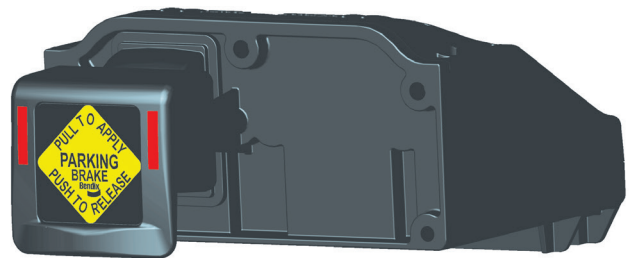


Obstruction of the motion of the Intellipark switches may prevent proper operation of the spring brakes. Failure of the spring brakes to operate properly may cause undesired vehicle behavior such as a roll-away, resulting in property damage, serious injuries, or death.

The switches must only be used for operating the spring brakes of the vehicle. Under no circumstances should the driver or others use the Intellipark EPB system switches as a hook, tray, support, holder, or for another purpose that could cause their accidental activation. Further, under no circumstances should the driver or others use the Intellipark switches as a handle, grab point or step point, or apply more than normal finger force to the switches. While the Intellipark switches are designed to withstand the commercial vehicle environment, damage may occur if excessive force is applied. The vehicle operator should move the switches using only their fingers. Using feet, shoes, tools, hooks, straps, strings, additional levers, or other objects is not necessary and may damage the Intellipark switches.



DECU Towing Vehicle Variant
(similar to the Bendix® MV-3® Dash Control Valve)



DECU PP-Left Non-Towing Vehicle Variant
(similar to the Bendix® PP-DC® Park Control Valve)



DECU PP-Right Non-Towing Vehicle Variant
(similar to the Bendix PP-DC Park Control Valve)

Figure 2 – DECU Variants

- Park Valve Module (PVM):** The PVM is an electromechanical valve assembly with a solenoid-piloted, pneumatically stable valve for each channel. The pneumatically stable valve is spring biased, much like the Bendix® MV-3® dash control valve, which provides a mechanical trip function on low reservoir pressure. The valve module also contains a duplex single-check valve to isolate the primary and secondary supply air, and a pressure transducer for each channel to allow direct measurement of the delivery pressure. See Figure 3 for both PVM configurations.



WARNING

Accumulation of road debris on the PVM may cause blockage of the PVM exhaust ports. If the exhaust ports are blocked, some valve functions may be compromised, leading to undesirable performance of the park system. Undesirable performance of the park system may cause property damage, personal injury, or death.

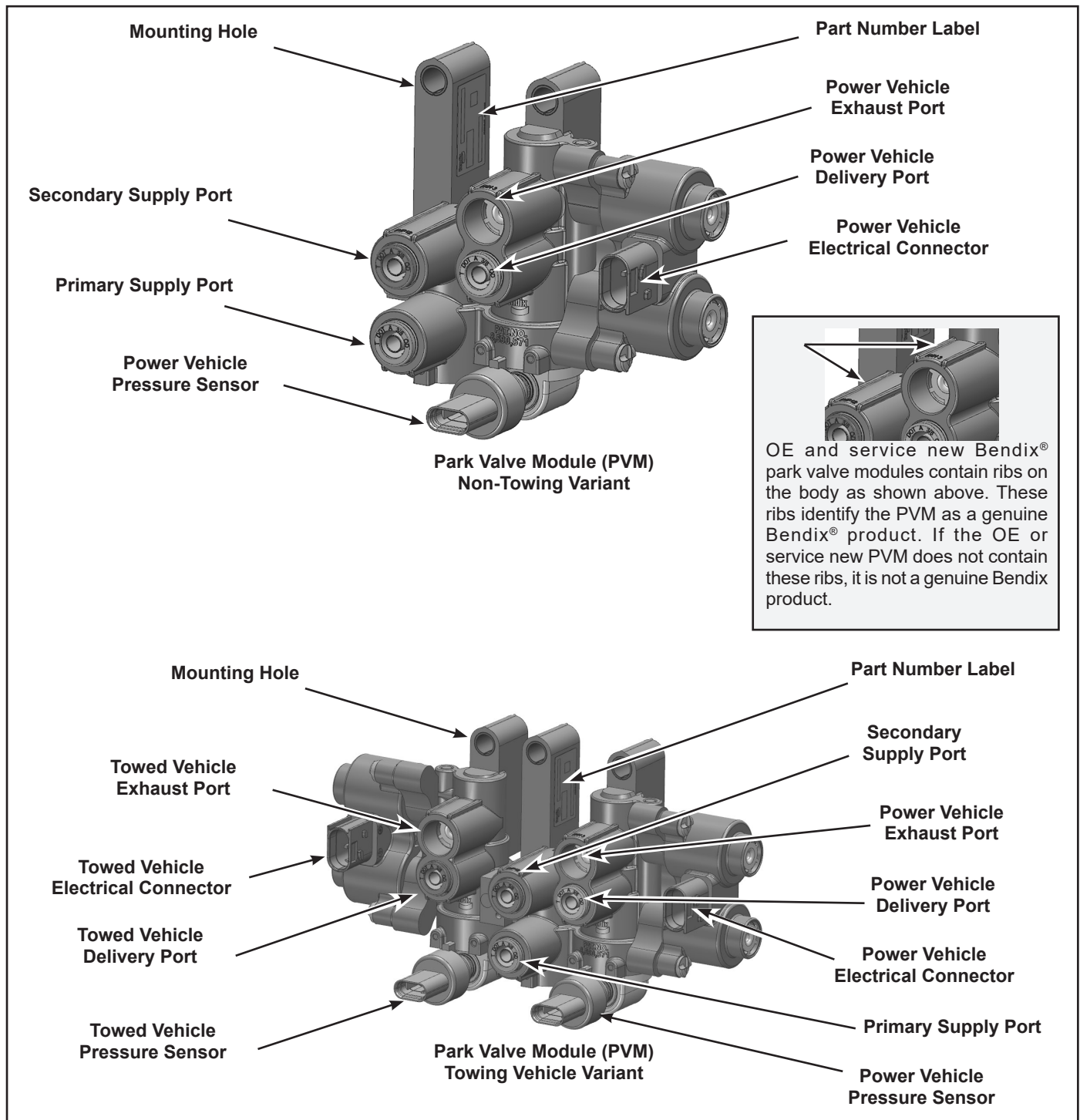


Figure 3 - Bendix® Park Valve Modules (PVM)

Operational Test

For information on dash valve trip pressures, *refer to TCH-003-051, Bendix Dash Valve Trip Pressure/DOT Inspections, on B2Bendix.com.*

Trailer Switch (Red)

1. Key on the vehicle and monitor the Dash Electronic Control Unit (DECU) LEDs. **NOTE:** Any blinking LEDs are indicative of a Diagnostic Trouble Code (DTC) and will need to be diagnosed and repaired prior to continuing.
2. Increase the supply pressure to 120 psi, satisfy all interlocks defined by the vehicle OEM, and push the red switch. The system should deliver air to the trailer and the LEDs on the red switch should turn off.
3. Slowly reduce pressure at both reservoirs. The LEDs on the red switch should start to blink prior to the low air pressure warning as an indication that your pressure is getting low. The trailer side switch should trip when the supply pressure drops to 45 - 20 psi.
4. After the switch trips in the previous step, press and hold the red switch while you continue to reduce the supply pressure. Air should start to escape from the exhaust port when the trailer supply line pressure reaches a minimum of 20 psi.

NOTE: The tractor (yellow switch) side must not trip before the trailer (red switch) side.

NOTE: Close all reservoir drain cocks and deliberately caused leakage points before continuing operational tests.

Tractor Switch (Yellow)

1. With the engine running, allow the supply pressure to build to at least 120 psi. Satisfy all interlocks as defined by the vehicle OEM, then push the yellow switch. The system should deliver air to the tractor (the brakes should release) and the LEDs on the yellow switch should turn off.
2. Allow the supply pressure to build back up to at least 120 psi. With all interlocks still satisfied, push both switches and allow the tractor and trailer brakes to release.
3. Once the brakes have released, pull the red switch. The tractor should remain delivered with both LEDs off and the trailer switch should not be delivering air. The trailer should now be parked, and both LEDs should be off.

Tractor (Red) and Trailer (Yellow) Park

1. With full system pressure and all safety interlocks satisfied, push both the red and yellow switches and allow the brakes on the tractor and trailer to release.

NOTE: If the Bendix® Intellipark® Electronic Parking Brake (EPB) system fails to operate as described, repair or replace the components using genuine Bendix parts.

Park Valve Module (PVM) Removal: Perform the following steps to remove the PVM from the vehicle.



Refer to the *General Safety Guidelines* in this manual before performing any service.

1. Prior to removing a PVM, apply the parking brakes and drain all the vehicle reservoirs.
2. Identify, mark, and disconnect all air lines to the PVM. Push-to-connect fittings require the collar to be pressed toward the valve body before the nylon line can be pulled.
3. Identify, mark, and disconnect all electrical connectors from the PVM.
4. Remove the 5/16 or M8 bolts and remove the PVM from the vehicle. Reuse of the mounting hardware is acceptable.

Park Valve Module (PVM) Installation: Perform the following steps to install the PVM into the vehicle.



The PVM must be mounted as described in this section to minimize the possibility of accumulated debris on the exhaust ports. The exhaust ports must have a minimum of 1-in. clearance from all obstructions. The exhaust ports must not be covered or painted over.

1. If replacing the PVM, use the same mounting location and – if necessary – bracketry/mounting hardware as installed by the OEM. The PVM is designed to be secured to a bracket or the chassis using either 5/16 or M8 bolts.
 2. Install the PVM on the vehicle by tightening the mounting bolts to 150-200 in.-lb (17-23 N•m).
 3. Reconnect the air lines and electrical connectors.
 4. Charge the reservoirs. Check for operation and leakage.
- **Integrated Display:** The Bendix® Intellipark® Electronic Parking Brake (EPB) system also requires an integrated display to perform system monitoring and driver information functions. The integrated display may be provided by Bendix, or the vehicle OEM may choose to use the instrument cluster or another existing integrated display on the vehicle to perform the necessary functions. The integrated display is intended to provide the following functions:
 - » Communicate the status of the vehicle spring brakes for solo (i.e. straight truck, bus) and combination (i.e. tractor/trailer) vehicles during normal use.
 - » Communicate the status of system interlocks to assist the driver with park/unpark functions during normal use.
 - » Indicate to the driver that a driver assistance feature is active or faulted.
 - » Alert the driver in instances when the Intellipark system is offline (i.e. not transmitting on CAN).
 - » Provide system availability information or driver

instruction information in instances when Intellipark is functioning in a 'backup' mode.

The integrated display monitors the Intellipark EPB system and will notify the driver if an Intellipark feature is active. When an Intellipark feature is active, the integrated display will flash the acronym for that respective feature.

- » ARA: Anti Rollaway
- » EAS: Exhaust-at-Speed
- » TBR: Trailer Brake Release

If a feature is faulted, along with the fault information, the main screen will flash an "X" over the applicable Intellipark feature acronym. If the feature is not activated, the acronym will not display on the integrated display. Because the Rollaway Mitigation (also known as Rollaway Intervention) feature is time-dependent, the number of seconds remaining until this feature activates will display on the integrated display. Additionally, the integrated display will inform the driver to press their foot brake if the driver does not want to activate Rollaway Mitigation.



Figure 4 – Integrated Display

The integrated display brightness can be adjusted by rotating the outer dial counterclockwise to decrease brightness or clockwise to increase brightness. The integrated display can also be turned all the way off by rotating the dial counterclockwise until the screen turns off. Once off, the integrated display will remain off unless an issue is detected, or the driver requests the integrated display turns on.

Refer to Table 1 for examples of integrated display icons. These icons are representative only and may vary by OEM. The icons in Table 1 will appear on the integrated display if the particular interlock is not satisfied, and the driver will not be able to unpark unless they satisfy the respective interlock. If multiple interlocks are not satisfied, they will appear in this priority:

- » Right Door
- » Left Door
- » Seat Belt
- » Ignition
- » Foot Brake

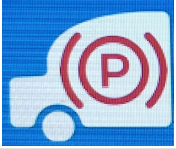





Interlock Signal Name	Integrated Display Icon Description	Icon Example
Tractor Air Delivery Status	<ul style="list-style-type: none"> • Parked: ISO symbol for parking brake (e.g. "P") overlaid on a tractor icon. • Unparked: "P" absent from tractor icon. • If the tractor air deliver status cannot be determined due to a fault, an "X" will flash once per second on the "P" symbol. 	
Trailer Air Delivery Status	<ul style="list-style-type: none"> • Parked: ISO symbol for parking brake (e.g. "P") overlaid on a trailer icon. • Unparked: "P" absent from trailer icon. • If the trailer air deliver status cannot be determined due to a fault, an "X" will flash once per second on the "P" symbol. 	
SLS_Status	The foot brake interlock is not satisfied and is needed to unpark; press the foot brake to unpark the vehicle.	
Ignition_Status	Key interlock is not satisfied and is needed to unpark the vehicle; key on the vehicle to unpark the vehicle.	
OCC2_Status	The left vehicle door interlock is not satisfied and is needed to unpark the vehicle; close the left door to unpark the vehicle.	
OCC1_Status	The right vehicle door interlock is not satisfied and is needed to unpark the vehicle; close the left door to unpark the vehicle.	

Table 1 – Integrated Display Icon Examples

SPECIAL MODES OF OPERATION

The Bendix® Intellipark® Electronic Parking Brake (EPB) system can operate outside the standard operating mode to accommodate situations such as maintenance, bob-tail, installation, etc.

- **Interlock Override Mode:** Interlock Override (aka Limp Home Mode) is intended to allow a driver to operate a vehicle that has a failure in one of the inputs to the park brake release interlock (e.g.: if the door sensor has faulted, this mode allows the driver to override that fault to drive the truck). A vehicle requiring this mode should be serviced as some features of the Intellipark EPB system may not be available.

NOTE: If the park brakes are released while performing the switch pattern, the entry sequence will be aborted and you will have to restart.

For vehicles with a software version of BX23XXX or later, the following conditions must be met to enter the interlock override mode:

NOTE: The next steps should be performed in less than approximately 20 seconds.

1. Turn the ignition key ON.
2. Fully press and release the yellow tractor parking brake switch consecutively four (4) times.
3. On the fifth switch, press and hold the yellow tractor parking brake switch for approximately five (5) seconds.

For vehicles with a software version prior to BX23XXX, the following conditions must be met to enter the interlock override mode:

1. Verify that the vehicle is stationary and parked.
2. Turn the ignition key ON.

NOTE: The next steps should be performed within 90 seconds.

3. Pull the yellow Dash Electronic Control Unit (DECU) switch for three seconds, then release the switch back to the neutral position.
4. Keep the DECU switch in the neutral position for three (3) seconds.
5. Push the DECU switch for three (3) seconds, then release the switch back to the neutral position.
6. Turn the ignition key to OFF, then back ON within five (5) seconds.

7. Repeat steps 3-6 two (2) more times.

8. Push the switch for 20 seconds (continue holding until you see the special blink pattern start).

- **Vehicle Maintenance Mode:** Vehicle maintenance mode allows maintenance or service personnel to ensure that the Intellipark EPB system will not change from its current state and all advanced features shall be disabled (e.g.: Rollaway Mitigation, Auto Trailer Brake Release, etc.). Vehicle maintenance mode is only intended for use when the vehicle is in a controlled workshop environment and has been secured from rolling.

Once the Intellipark EPB system has entered vehicle maintenance mode, it will remain in its current state regardless of switch input. For example, if the Intellipark EPB system is unparked and the DECU is placed into the vehicle maintenance mode, the Intellipark EPB system will remain in the unparked state, even if the red and yellow switches on the DECU are pulled.



While in vehicle maintenance mode, the wheels must be chocked as the system will not change state (unparked to parked). Failure to chock the wheels could lead to vehicle damage, property damage, injury, or death.

The Bendix® ACom® Diagnostic Software can be used to place the DECU into the maintenance mode. The software will require that the vehicle is stationary, and certain other conditions must be met. Once vehicle maintenance mode has been entered, the integrated LED display will blink a unique pattern – two (2) times in one (1) second, then be off for one (1) second – for the duration of the cycle.

The DECU will exit the vehicle maintenance mode when any of the following conditions are met.

- » The DECU detects steer axle wheel speeds
- » ACom Diagnostic Software is used to send a command to the DECU to exit vehicle maintenance mode
- » The battery power cycle is performed
- » The following switch pattern is performed successfully

The Bendix® Intellipark® Electronic Parking Brake (EPB) system also provides a method to enter and exit vehicle maintenance mode without using the Bendix® ACom® Diagnostic Software. Entry is accomplished by using a predefined sequence of inputs that is sufficiently unique to prevent accidental entry, and sufficiently inconvenient to discourage inappropriate use of the mode, while still allowing access to the mode for emergency conditions or at remote locations.

Entry to the vehicle maintenance mode via the switch pattern shall only be possible when all preconditions are met.

- » Battery voltage is normal
- » Ignition key is on
- » Vehicle speed is ≤ 4 mph (6 kph)

After successfully meeting the preconditions, the below pattern will put the vehicle into maintenance mode:

1. Release the park brakes (if the desired state is RELEASED while the system is in maintenance mode).
2. Verify that the vehicle is stationary, the ignition key is ON, and the Dash Electronic Control Unit (DECU) switches are in the neutral position.

NOTE: The next steps should be performed within 10 seconds.

3. Press the foot brake pedal.
4. Release the foot brake pedal.
5. Push the yellow button and hold it in the pushed state continuously (until the end of step 15).
6. Press the foot brake pedal and keep it pressed (until the end of step 15).

NOTE: The next steps should be performed within 40 seconds.

7. Cycle the ignition key from fully ON to fully OFF three times.
 - » ON > OFF > ON > OFF > ON > OFF
8. Keep the ignition switch in the OFF position for at least two seconds.
9. Cycle the ignition key from OFF to ON three times.
 - » OFF > ON > OFF > ON > OFF > ON
10. Keep the ignition switch in the ON position for at least two seconds.

11. Cycle the ignition key from ON to OFF three times.
 - » ON > OFF > ON > OFF > ON > OFF
12. Keep the ignition switch in the OFF position for at least two seconds.
13. Cycle the ignition key from OFF to ON three times.
 - » OFF > ON > OFF > ON > OFF > ON
14. Keep the ignition switch in the ON position for at least two seconds.
15. Verify that the diagnostic LEDs start to blink in the special pattern.

- **Bobtail Mode:** When the towed unit channel of the Intellipark EPB system is evacuated, the two red LED displays on the trailer air supply (red) switch will be illuminated. This is a normal operation scenario for vehicles that are equipped for towing but are used without a trailer (bobtail). Bobtail mode gives the driver the ability to extinguish the two red LED displays on the trailer air supply switch when driving bobtail.

The following conditions must be met to enter the bobtail mode:

- » The driver must release the tractor (power vehicle) park brakes.
- » The vehicle must be below a configurable speed.
- » The Park Valve Module (PVM) trailer (towed vehicle) pressure sensor reading must be below a configurable pressure.
- » The driver must pull and hold the red trailer air supply switch for a minimum of three seconds.

The DECU will exit the bobtail mode when any of the following conditions are met:

- » The vehicle ignition power is removed and re-applied.
- » The driver applies the tractor (power vehicle) park brakes.
- » The vehicle experiences a Rollaway Mitigation event.
- » A Diagnostic Trouble Code (DTC) occurs that inhibits Bobtail Mode.

- Towing an Bendix® Intellipark®-Equipped Vehicle:**
 In the event an Intellipark-equipped vehicle must be towed, there are two (2) ways to tow the vehicle:
 - » Mechanically cage the spring brakes.
 - » Put the truck into vehicle maintenance mode which will prevent the vehicle from changing state (unparked to parked or parked to unparked). The front axle must be raised, otherwise the vehicle will exit maintenance mode.
- Vehicle Configurations:** The Intellipark system provides parking capability for commercial vehicles (tractors, trucks, and buses) that utilize air brakes. It is available in various models to support a wide range of applications. *See Figures 5 and 6* for examples of conceptual installations and connectivity of the Intellipark EPB systems units on different vehicle configurations.

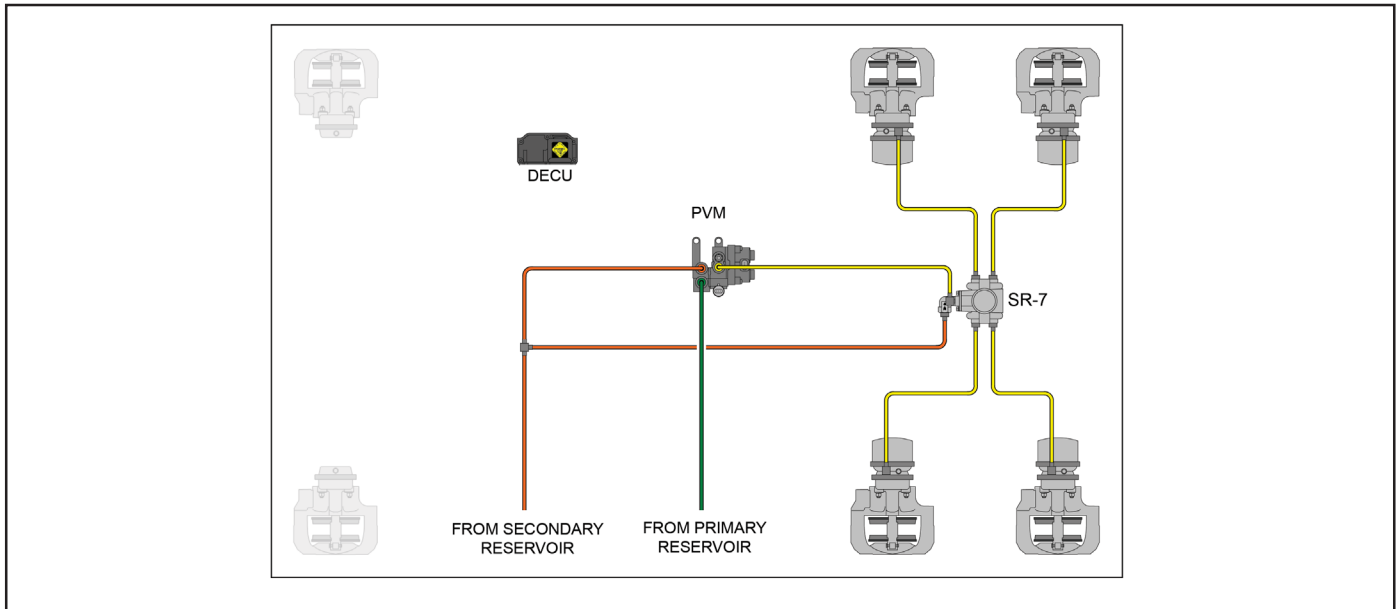


Figure 5 – Conceptual Schematic: Solo Truck or Solo Bus

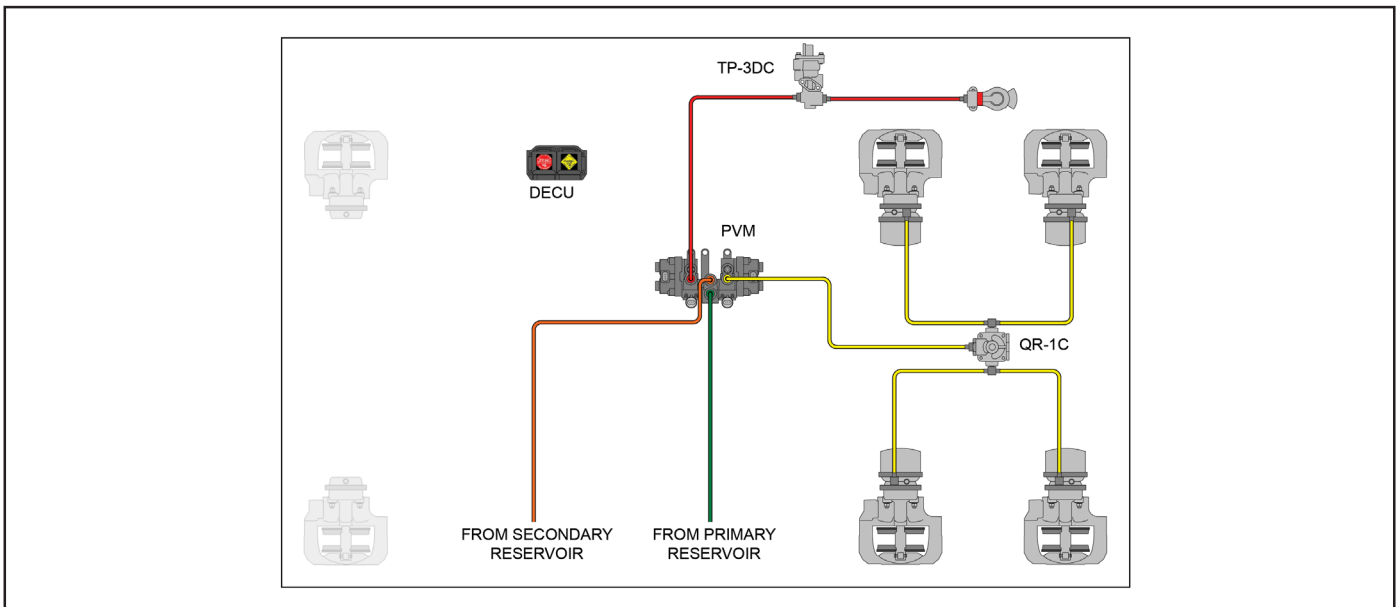


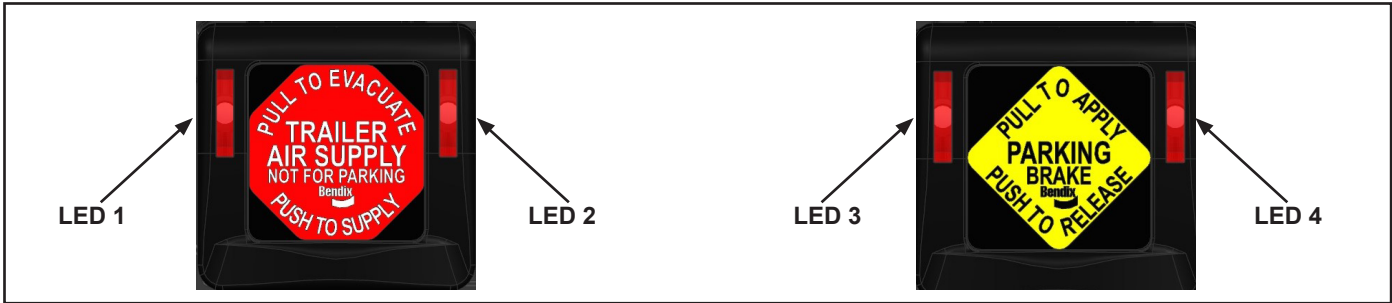
Figure 6 – Conceptual Schematic: Tractor

OPERATIONAL CONDITIONS: NORMAL

The LEDs on the Dash Electronic Control Unit (DECU) are one indicator the Bendix® Intellipark® Electronic Parking Brake (EPB) system is performing under normal operating conditions. *Refer to the applicable Operator's Manual on B2Bendix.com for interlocks and all parking and unparking operation.*

LED Operation				
LED1	LED2	LED3	LED4	Status
On	On	On	On	All LEDs illuminate for three (3) seconds when ignition is applied.
On	On	On	On	All LEDs remain illuminated for a minimum of three (3) minutes after ignition key is off.
On	On	On	On	Three (3) seconds after ignition is applied, and both the power vehicle and the towed vehicle are parked.
Off	Off	Off	Off	Three (3) seconds after ignition is applied, and both the power vehicle and the towed vehicle are unparked.
On	On	Off	Off	The towed vehicle is parked, and the power vehicle is unparked.
Off	Off	On	On	The towed vehicle is unparked and the power vehicle is parked.
Blinking	Blinking	Blinking	Blinking	A Rollaway Mitigation event has occurred for both the tractor and the trailer.
On	On	Blinking	Blinking	A Rollaway Mitigation event has occurred for the tractor only or the tractor pressure sensor is faulted.

Table 2 – DECU LED Operations - Normal Conditions



Refer to Table 3 for the Bendix® Intellipark® Electronic Parking Brake (EPB) system's performance under normal operating conditions.

Switch	Driver Action	Intellipark® EPB System Reaction	Spring Brake Reaction	Vehicle Parking State
Trailer Air Supply	Pushes Red Switch	Applies air to the trailer supply glad-hand through the Tractor Protection Valve (TPV)	Towed vehicle spring brakes are released	Towed vehicle is unparked
Parking Brake	Pushes Yellow Switch	Applies air to the power unit spring brake system	Power vehicle spring brakes are released	Power vehicle is unparked
Trailer Air Supply	Pulls Red Switch	Exhausts air from the trailer glad-hand through the TPV	Towed vehicle spring brakes are applied	Towed vehicle is parked
Parking Brake (DECU Towing Variant)	Pulls Yellow Switch	Exhausts air from the power unit spring brake system and the trailer supply glad-hand through the TPV	Power vehicle spring brakes and the towed vehicle spring brakes are applied	Vehicle combination is parked
Parking Brake (DECU Non-Towing Variant)	Pulls Yellow Switch	Exhausts air from the power unit spring brake system	Power vehicle spring brakes are applied	Power vehicle is parked
Table 3 – Operation Under Normal Conditions				

If the Bendix® Intellipark® Electronic Parking Brake (EPB) system has a fault, one indicator will be the LEDs on the Dash Electronic Control Unit (DECU) *as shown in Table 4*. For specific fault details, see the TROUBLESHOOTING - DIAGNOSTIC MODES section.

NOTE: Blinking indicates a continuously blinking LED independent of any driver input (e.g. button push or pull, ignition cycle, etc.).

LED Operation				
LED1	LED2	LED3	LED4	Status
On	Blinking	On	On	A fault is present on the towed vehicle park brake system. Both the towed vehicle and the power vehicle are parked.
Off	Blinking	Off	Off	A fault is present on the towed vehicle park brake system. Both the towed vehicle and the power vehicle are unparked.
On	On	Blinking	On	A fault is present on the power vehicle park brake system. Both the towed vehicle and the power vehicle are parked.
Off	Off	Blinking	Off	A fault is present on the power vehicle park brake system. Both the towed vehicle and the power vehicle are unparked.
Off	Blinking	Blinking	Off	A fault is present on both the power and towed vehicle park brake system. Both the towed vehicle and the power vehicle are unparked.
On	Blinking	Blinking	On	A fault is present on both the power and towed vehicle park brake system. Both the towed vehicle and the power vehicle are parked.
Blinking	Blinking	Off	Off	The system is unparked. First, the driver should pull the button to ensure it is not a Rollaway Mitigation event. If the blinking persists, a fault with the towed vehicle PVM pressure sensor has been detected. Both LEDs blinking indicates the state of the Intellipark towed vehicle system cannot be determined by the DECU. Immediately chock the wheels and have the system serviced as soon as possible.
Off	Off	Blinking	Blinking	The system is unparked. First, the driver should pull the button to ensure it is not a Rollaway Mitigation event. If the blinking persists, a fault with the power vehicle PVM pressure sensor has been detected. Both LEDs blinking indicates the state of the Intellipark towed vehicle system cannot be determined by the DECU. Immediately chock the wheels and have the system serviced as soon as possible.
Blinking	Blinking	On	On	The system is parked. First, the driver should pull the button to ensure it is not a Rollaway Mitigation event. If the blinking persists, a fault with the towed vehicle PVM pressure sensor has been detected. Both LEDs blinking indicates the state of the Intellipark towed vehicle system cannot be determined by the DECU. Immediately chock the wheels and have the system serviced as soon as possible.
On	On	Blinking	Blinking	The system is parked. First, the driver should pull the button to ensure it is not a Rollaway Mitigation event. If the blinking persists, a fault with the power vehicle PVM pressure sensor has been detected. Both LEDs blinking indicates the state of the Intellipark towed vehicle system cannot be determined by the DECU. Immediately chock the wheels and have the system serviced as soon as possible.
Off	On	On	Off	An internal DECU fault has been detected. Immediately chock the wheels and have the system serviced as soon as possible.

Table 4 – DECU LED Operations - Faulted Conditions

Refer to Table 5 for the Bendix® Intellipark® Electronic Parking Brake (EPB) system's fallback modes.

Missing / Corrupted Input	Fallback Mode
Ignition: Loss of Input	<ul style="list-style-type: none"> • System fault displayed on LEDs • Dash Electronic Control Unit (DECU) power-up via CAN wake-up • LED power-up check not performed • Park brake release interlock available • Rollaway Mitigation available • Auto Trailer Brake Release available • Manual switch operation available • Ability to detect complete loss of J1939 degraded
Battery: Voltage Out of Range	<ul style="list-style-type: none"> • System fault displayed on LEDs (if voltage supports DECU operation) • 8 - 9 V or >18 V: Automatic protection of solenoids via shutdown of output circuits • Status display available on LEDs • Park brake release interlock not available • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual switch operation not available • < 8V: DECU shutdown
Battery: Loss of One Output	<ul style="list-style-type: none"> • System operates using remaining input • All features available • System fault displayed on LEDs
Red / Yellow Switches	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit status available on LEDs • Park brake release interlock not available • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual switch operation not available
Power Unit Solenoid or Wiring Harness	<ul style="list-style-type: none"> • Power unit fault displayed on LEDs • Power and towed unit status available on LEDs • Park brake release interlock available on towed unit • Rollaway Mitigation not available • Auto Trailer Brake Release available • Power unit manual switch operation not available • Towed unit manual switch operation available
Towed Unit Solenoid or Wiring Harness	<ul style="list-style-type: none"> • Towed unit fault displayed on LEDs • Power and towed unit status available on LEDs • Park Brake Release Interlock available on power unit • Rollaway Mitigation available • Auto Trailer Brake Release not available • Power unit manual switch operation available • Towed unit manual switch operation not available
Vehicle Speed: Loss of Electronic Brake Control (EBC2) or Cruise Control Vehicle Speed (CCVS)	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit status available on LEDs • Park brake release interlock available • Rollaway Mitigation available • Auto Trailer Brake Release available • Manual switch operation available

Table 5 – Fallback Modes

Missing / Corrupted Input	Fallback Mode
J1939: All Data Lost	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock available • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual switch operation available
Occupancy Sensors (Driver Door Status) (Passenger Door Status) (SLS Input) (Seat Belt Status - if applicable) Input Missing, Input Stuck, Not Satisfied	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available • Manual deliver switch operation available when moving
Power Unit Pressure Sensor	<ul style="list-style-type: none"> • Power unit fault displayed on LEDs • Power unit park status not available • Towed unit park status available • Park brake release interlock available • Rollaway Mitigation is completely or partially unavailable • Auto Trailer Brake Release available • Manual switch operation available
Towed Unit Pressure Sensor	<ul style="list-style-type: none"> • Towed unit fault displayed on LEDs • Power unit park status available • Towed unit park status not available • Park brake release interlock available • Rollaway Mitigation available • Auto Trailer Brake Release not available • Manual switch operation available
Occupancy Sensor (Wire Harness Resistor RA Open) <i>See Figure 9 for more details.</i>	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available
Occupancy Sensor (Wire Harness Resistor RA Shorted) <i>See Figure 9 for more details.</i>	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available
Occupancy Sensor (Wire Harness Resistor RB Open) <i>See Figure 9 for more details.</i>	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available

Table 5 – Fallback Modes

Missing / Corrupted Input	Fallback Mode
Occupancy Sensor: (Wire Harness Resistor RB Shorted) <i>See Figure 9 for more details.</i>	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available
Occupancy Sensor: (No Wire Harness Resistors RA and RB Missing) <i>See Figure 9 for more details.</i>	<ul style="list-style-type: none"> • System fault displayed on LEDs • Power and towed unit park status is available • Park brake release interlock prevents vehicle from being unparked • Rollaway Mitigation not available • Auto Trailer Brake Release not available • Manual exhaust switch operation available

Table 5 – Fallback Modes

OPERATING THE BENDIX® INTELLIPARK®-EQUIPPED VEHICLE UNDER FAULTED CONDITIONS

If the Bendix® Intellipark® Electronic Parking Brake (EPB) system faults while driving, the driver can continue their route.



WARNING

If the system has faulted, the capability of the Intellipark EPB system may be reduced. Drivers must not rely on the Intellipark EPB system to automatically park the vehicle. Drivers continue to be responsible for safe and proper operation of the vehicle.

- Parking with a faulted Intellipark EPB system requires the following steps to ensure safety:
- Stop on a level surface.
- Shut off the engine and roll down the driver's window so the exhaust of air from the parking brakes can be heard.
- Attempt to park the trailer (if able) by pulling the red switch. Listen for the exhaust of air.
- Attempt to park the tractor by pulling the yellow switch. Listen for the exhaust of air.
- Fan down the air system until the reservoir pressure is fully depleted in both primary and secondary circuits. Confirm the air is fully depleted by checking the dash gauges or opening the drain cocks on all reservoirs.
- Chock the wheels.
- Remove the vehicle battery power if possible.

It may be necessary to unpark with a faulted Intellipark EPB system. If so, follow these initial steps:

- Leave the wheel chocks in place.
- Apply ignition power if necessary.
- Apply vehicle battery power. Do not start the engine.
- Observe the Dash Electronic Control Unit (DECU) LEDs.
- With the interlock satisfied, press the yellow switch to release the parking brakes.

If the Intellipark EPB system is reporting a fault and the vehicle must be operated, perform the following steps:

- Check dash gauges to ensure the air reservoirs are fully depleted of air. If not, fan down the reservoirs, if necessary, by repeatedly applying and releasing the service brakes to automatically apply the spring brakes on both the tractor and trailer.
- Once the air reservoirs are depleted of air, remove the wheel chocks prior to starting the engine.
- Start the engine and stay in the driver's seat as the air reservoirs charge.
- Use the service brakes to hold the vehicle stationary in case the spring brakes unintentionally release as air pressure builds.



WARNING

In case of emergency, the service brakes can be fanned down by repeatedly applying and releasing the service brakes to automatically apply the parking brakes on both the tractor and trailer.

TROUBLESHOOTING - DIAGNOSTIC MODES

If the Bendix® Intellipark® Electronic Parking Brake (EPB) system is powered and is faulted, the inner LEDs will blink. Loss of features is communicated through either the vehicle instrument cluster or a standalone integrated display. Diagnostic information is available by interfacing with the Intellipark EPB system using the Bendix® ACom® Diagnostic Software.

ACom is a PC-based program that is designed to meet RP 1210 industry standards developed by the Truck Maintenance Council (TMC). This software provides the technician with access to all available Intellipark controller's diagnostic information and configuration capability, including:

- Electronic Control Unit (ECU) information
- Diagnostic Trouble Codes (DTCs) and repair information

Refer to Table 6 for the corrective action once the cause of the fault is identified.

SPN	FMI	Description	Cause	Corrective Action
84	2	J1939 CCVS1 Message - Erratic, Intermittent, or Incorrect (Wheel-Based Vehicle Speed)	Wheel-based vehicle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
84	7	J1939 CCVS1 Message - Data Not Available (Wheel Based-Vehicle Speed)	Wheel-based vehicle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
84	19	J1939 CCVS1 Message - Error (Wheel-Based Vehicle Speed)	Wheel-based vehicle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
91	2	J1939 EEC2 Message - Erratic, Intermittent, or Incorrect (Accelerator Pedal Position)	Accelerator pedal position CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
91	7	J1939 EEC2 Message - Not Responding Properly (Accelerator Pedal Position)	Accelerator pedal position CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
91	19	J1939 EEC2 Message - Data Error (Accelerator Pedal Position)	Accelerator pedal position CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
168	3	Battery Voltage Above Normal, J1 Pin 18/1 and J2 Pin 14/1	Battery voltage is under 9v	<ul style="list-style-type: none"> Check battery voltage; if low, charge battery. Check battery connections from J1 Pin 18/1 and J2 Pin 14/1 to fuse panel for open or bad connections. Check fuse panel for blown fuses. This DTC should resolve once the cause is addressed.
168	4	Battery Voltage Below Normal, J1 Pin 18/1 and J2 Pin 14/1	Battery voltage is under 9v	<ul style="list-style-type: none"> Check battery voltage; if low, charge battery. Check battery connections from J1 Pin 18/1 and J2 Pin 14/1 to fuse panel for open or bad connections. Check fuse panel for blown fuses. This DTC should resolve once the cause is addressed.
190	2	J1939 EEC1 Message - Erratic, Intermittent, or Incorrect (Engine Speed)	Engine speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact engine manufacturer or OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
190	7	J1939 EEC1 Message - Data Not Available (Engine Speed)	Engine speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact engine manufacturer or OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
190	19	J1939 EEC1 Message - Error (Engine Speed)	Engine speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact engine manufacturer or OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
523	2	J1939 ETC2 Message - Erratic, Intermittent, or Incorrect (Transmission Current Gear)	Transmission CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact engine manufacturer or OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
524	2	J1939 ETC2 Message - Erratic, Intermittent, or Incorrect (Transmission Select Gear)	Transmission CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact engine manufacturer or OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
619	12	J1939 CAN Transmission Fault, J1 Pin 13 and 15 shorted	Intellipark unable to broadcast on CAN network	<ul style="list-style-type: none"> Check high and low CAN wires, J1 Pin 13 and 15, and the CAN backbone connections for a short to ground, power, or each other. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
904	2	J1939 EBC2 Message - Erratic, Intermittent, or Incorrect (Front Axle Speed)	Front axle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact engine manufacturer or OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
904	7	J1939 EBC2 Message - Data Not Available (Front Axle Speed)	Front axle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact engine manufacturer or OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
904	19	J1939 EBC2 Message - Error (Front Axle Speed)	Front axle speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact engine manufacturer or OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1067	3	Tractor Pressure Sensor J1 Pin 4 - Shorted to High Source	Signal wire reporting shorted to a high source	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the signal wire, J1 Pin 4 to tractor pressure sensor Pin 1. • This DTC should resolve once the cause is addressed.
1067	4	Tractor Pressure Sensor J1 Pin 4 - Shorted to Ground	Signal wire reporting shorted to a ground wire	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the signal wire, J1 Pin 4 to tractor pressure sensor Pin 1. • This DTC should resolve once the cause is addressed.
1068	3	Trailer Pressure Sensor J2 Pin 4 - Shorted to High Source	Signal wire reporting shorted to a high source	<ul style="list-style-type: none"> • Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. • Check for damage/shorts on the signal wire, J2 Pin 4 to trailer pressure sensor Pin 1. • This DTC should resolve once the cause is addressed.
1068	4	Trailer Pressure Sensor J2 Pin 4 - Shorted to Ground	Signal wire reporting shorted to a ground wire	<ul style="list-style-type: none"> • Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. • Check for damage/shorts on the signal wire, J2 Pin 4 to trailer pressure sensor Pin 1. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
1121	12	J1939 EBC1 Message - Data Not Available (EBS Brake Switch)	EBC1 CAN data not received when expected	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1121	19	J1939 EBC1 Message - EBS Brake Switch Implausible	Foot brake signal continuously indicating pressed	<ul style="list-style-type: none"> • Check if the foot brake is stuck in the pressed position. • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1592	2	J1939 HRW Message Front Axle, Left Wheel Speed - Erratic, Intermittent or Incorrect	Front axle left wheel speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1593	2	J1939 HRW Message Front Axle, Right Wheel Speed - Erratic, Intermittent or Incorrect	Front axle right wheel speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1820	2	J1939 DC1 message - Erratic, Intermittent or Incorrect (Wheelchair Door)	DC1 wheelchair door CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1820	19	J1939 DC1 message - Implausible, Interlock Open While in Motion (Wheelchair Door)	Wheelchair door continuously reporting open while driving	<ul style="list-style-type: none"> • Verify the wheel chair door is closed. • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
1821	2	J1939 DC1 message- Erratic, Intermittent, or Incorrect (Position of Doors)	DC1 position of doors CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
3509	3	Internal ECU Issue SPN3509 FMI3	Pressure sensor supply wire reporting shorted to a high source	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the ground and supply wire, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3509	4	Internal ECU Issue SPN3509 FMI4	Pressure sensor supply wire reporting shorted to ground	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the ground and supply wire, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
3510	3	Internal ECU Issue SPN3510 FMI3	Trailer pressure sensor supply wire reporting shorted to a high source	<ul style="list-style-type: none"> Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. Check for damage/shorts on the ground and supply wire, 21 Pin 2/3 to trailer pressure sensor Pin 2/3. This DTC should resolve once the cause is addressed.
3510	4	Internal ECU Issue SPN3510 FMI4	Trailer pressure sensor supply wire reporting shorted to ground	<ul style="list-style-type: none"> Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. Check for damage/shorts on the ground and supply wire, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. This DTC should resolve once the cause is addressed.
3511	2	J1939 DC1, CM1 or BDS Message - Erratic, Intermittent, or Incorrect (Seat Belt or Door)	DC1, CM1, or BDS message not received when expected or received with error	<ul style="list-style-type: none"> Contact OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
3511	3	Occupancy Sensor 1 - J1 Pin 5/6 Shorted to Voltage	Hardwired interlock 1 short to a high source	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 5/6) match. Check for damage or shorts from J1 Pins 5/6 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3511	4	Occupancy Sensor 1 - J1 Pin 5/6 Shorted to Ground	Hardwired interlock 1 short to ground	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 5/6) match. Check for damage or shorts from J1 Pins 5/6 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3511	5	Occupancy Sensor 1 - J1 Pin 5/6 Open Circuit	Hardwired interlock 1 disconnected	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 5/6) match. Check for damage or shorts from J1 Pins 5/6 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3511	7	J1939 DC1, CM1, or BDS Message - Not Responding Properly or Timeout (Seat Belt or Door)	DC1, CM1, or BDS Message not received when expected or received with error	<ul style="list-style-type: none"> Contact OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
3511	12	Occupancy Sensor 1 Fault J1 Pin 6 and 5	Excess noise or invalid signal provided from the hard wired input	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 5/6) match. Check for damage or shorts from J1 Pins 5/6 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3511	19	J1939 Interlocks Message or Hardwired Input Implausible - (Occupancy Sensor 1)	Interlock continuously reporting not satisfied	<ul style="list-style-type: none"> Check interlocks for your vehicle in owners manual; verify operation by testing ability to unpark when it is and is not satisfied. Contact OEM for details on the source of the CAN message and fix. This DTC should resolve once the cause is addressed.
3512	2	J1939 DC1, CM1 or BDS Message - Erratic, Intermittent, or Incorrect (Seat Belt or Door)	DC1, CM1, or BDS message not received when expected or received with error	<ul style="list-style-type: none"> Contact OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.
3512	3	Occupancy Sensor 2 - J1 Pin 7/16 Shorted to Voltage	Hardwired interlock 2 short to a high source	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 7/16) match. Check for damage or shorts from J1 Pins 7/16 to the resistor network located in the doors or seat belts.
3512	4	Occupancy Sensor 2 - J1 Pin 7/16 Shorted to Ground	Hardwired interlock 2 short to ground	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 7/16) match. Check for damage or shorts from J1 Pins 7/16 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3512	5	Occupancy Sensor 2 - J1 Pin 7/16 Open Circuit	Hardwired interlock 2 disconnected	<ul style="list-style-type: none"> Check resistance in occupancy sensor wires (J1 Pin 5/6) match. Check for damage or shorts from J1 Pins 7/16 to the resistor network located in the doors or seat belts. This DTC should resolve once the cause is addressed.
3512	7	J1939 DC1, CM1, or BDS Message - Not Responding Properly or Timeout (Seat Belt or Door)	DC1, CM1, or BDS message not received when expected or received with error	<ul style="list-style-type: none"> Contact OEM for details on the source of the message and fix. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
3512	12	Occupancy Sensor 2 Fault J1 Pin 16 and 7	Excess noise or invalid signal provided from the hard wired input	<ul style="list-style-type: none"> • Check resistance in occupancy sensor wires (J1 Pin 7/16) match. • Check for damage or shorts from J1 Pins 7/16 to the resistor network located in the doors or seat belts.
3512	19	J1939 Interlocks Message Implausible - Interlock Open While in Motion (Occupancy Sensor 2)	Interlock continuously reporting not satisfied	<ul style="list-style-type: none"> • Check interlocks for your vehicle in owners manual; verify operation by testing ability to unpark when it is and is not satisfied. • Contact OEM for details on the source of the CAN message and fix. • This DTC should resolve once the cause is addressed.
3513	3	Tractor Pressure Sensor Supply - J1 Pin 2/3 Shorted to Battery	Tractor pressure sensor supply short to a higher source	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3513	4	Tractor Pressure Sensor Supply - J1 Pin 2/3 Shorted to Ground	Tractor pressure sensor supply short to ground	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3513	6	Tractor Pressure Sensor Supply - J1 Pin 2/3 Current Above Normal	Tractor pressure sensor supply short to another source	<ul style="list-style-type: none"> • Verify the tractor pressure sensor is wired correctly, J1 Pins 2-4 to tractor pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J1 Pin 2/3 to tractor pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3514	3	Trailer Pressure Sensor Supply - J2 Pin 2/3 Shorted to Voltage	Trailer pressure sensor supply short to a higher source	<ul style="list-style-type: none"> • Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J2 Pin 2/3 to trailer pressure sensor Pin 2/3.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
3514	4	Trailer Pressure Sensor Supply - J2 Pin 2/3 Shorted to Ground	Trailer pressure sensor supply short to ground	<ul style="list-style-type: none"> • Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J2 Pin 2/3 to trailer pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3514	6	Trailer Pressure Sensor Supply - J2 Pin 2/3 Current Above Normal	Trailer pressure sensor supply short to another source	<ul style="list-style-type: none"> • Verify the trailer pressure sensor is wired correctly, J2 Pins 2-4 to trailer pressure sensors on valve assembly. • Check for damage/shorts on the power and ground wires, J2 Pin 2/3 to trailer pressure sensor Pin 2/3. • This DTC should resolve once the cause is addressed.
3807	2	J1939 Park Brake Inhibition - Erratic, Intermittent, or Incorrect	Invalid value received on J1939 CAN signal; park brake release inhibit request	<ul style="list-style-type: none"> • Check that the ECU is transmitting a valid CAN signal park brake release inhibit request. • Contact the OEM for details on the source of the message and the corrective action. • The DTC should resolve once the cause is addressed.
3807	13	J1939 Park Brake Inhibition Out of Calibration	Mismatch between Park Brake Release; request inhibit signal on chassis and party CAN	<ul style="list-style-type: none"> • Check the park brake release inhibit interlock status on the chassis and party CAN. • Contact the OEM for details on the source of the message and the corrective action. • The DTC should resolve once the cause is addressed.
7711	19	J1939 CM3 Message - Erratic, Intermittent, or Incorrect (Trailer Status)	CM3 message not received when expected or received with error	<ul style="list-style-type: none"> • Contact OEM for details on the source of the message and fix. • This DTC should resolve once the cause is addressed.
7902	2	Battery 1 Intermittent Connection, J1 Pin 18	Battery input 1 low or disconnected	<ul style="list-style-type: none"> • Check battery voltage; if low, charge battery. • Check battery connections from J1 Pin 18/1 to fuse panel for opens or bad connections. • Check fuse panel for blown fuses. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
7902	4	Battery 1 Connection Shorted to Ground, J1 Pin 18	Battery input 1 low or disconnected	<ul style="list-style-type: none"> • Check battery voltage; if low, charge battery. • Check battery connections from J1 Pin 18/1 to fuse panel for opens or bad connections. • Check fuse panel for blown fuses. • This DTC should resolve once the cause is addressed.
7910	2	Battery 2 Intermittent Connection, J2 Pin 14	Battery input 2 low or disconnected	<ul style="list-style-type: none"> • Check battery voltage; if low, charge battery. • Check battery connections from J2 Pin 14/1 to fuse panel for opens or bad connections. • Check fuse panel for blown fuses. • This DTC should resolve once the cause is addressed.
7910	4	Battery 2 Connection Shorted to Ground, J2 Pin 14	Battery input 2 low or disconnected	<ul style="list-style-type: none"> • Check battery voltage; if low, charge battery. • Check battery connections from J2 Pin 14/1 to fuse panel for opens or bad connections. • Check fuse panel for blown fuses. • This DTC should resolve once the cause is addressed.
8621	2	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
8621	12	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
8621	13	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
8621	19	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
8621	20	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
8621	21	Internal ECU Issue	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516101	2	Tractor Park Brake Exhaust Valve - J1 Pin 8 Harness Related Fault	Tractor exhaust wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 8 on DECU J1 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 1 on the Tractor solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 8 DECU J1 connector to Pin 1 on the tractor solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516101	3	Tractor Park Brake Exhaust Valve - J1 Pin 8 Shorted to Battery	Tractor exhaust wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 8 on DECU J1 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 1 on the tractor solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 8 DECU J1 connector to Pin 1 on the tractor solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516101	4	Tractor Park Brake Exhaust Valve - J1 Pin 8 Shorted to Ground	Tractor exhaust wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 8 on DECU J1 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 1 on the tractor solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 8 DECU J1 connector to Pin 1 on the tractor solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516101	5	Tractor Park Brake Exhaust Valve - J1 Pin 8 Open Circuit	Tractor exhaust wire open circuit	<ul style="list-style-type: none"> • Check Pin 8 on DECU J1 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 1 on the tractor solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 8 DECU J1 connector to Pin 1 on the tractor solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516102	2	Tractor Park Brake Delivery Valve - J1 Pin 12 Harness Related Fault	Tractor deliver wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 12 on DECU J1 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 3 on the tractor solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 12 DECU J1 connector to Pin 3 on the tractor solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516102	3	Tractor Park Brake Deliver Valve - J1 Pin 12 Shorted to Battery	Tractor deliver wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 12 on DECU J1 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 3 on the tractor solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 12 DECU J1 connector to Pin 3 on the tractor solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516102	4	Tractor Park Brake Deliver Valve - J1 Pin 12 Shorted to Ground	Tractor deliver wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 12 on DECU J1 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 3 on the tractor solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 12 DECU J1 connector to Pin 3 on the tractor solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516102	5	Tractor Park Brake Deliver Valve - J1 Pin 12 Open Circuit	Tractor deliver wire open circuit	<ul style="list-style-type: none"> • Check Pin 12 on DECU J1 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 3 on the tractor solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 12 DECU J1 connector to Pin 3 on the tractor solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516103	2	Trailer Park Brake Exhaust Valve - J2 Pin 7 Harness Related Fault	Trailer exhaust wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 7 on DECU J2 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 1 on the trailer solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 7 DECU J2 connector to Pin 1 on the trailer solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516103	3	Trailer Park Brake Exhaust Valve - J2 Pin 7 Shorted to Battery	Trailer exhaust wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 7 on DECU J2 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 1 on the Trailer solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 7 DECU J2 connector to Pin 1 on the trailer solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516103	4	Trailer Park Brake Exhaust Valve - J2 Pin 7 Shorted to Ground	Trailer exhaust wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 7 on DECU J2 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 1 on the Trailer solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 7 DECU J2 connector to Pin 1 on the trailer solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516103	5	Trailer Park Brake Exhaust Valve - J2 Pin 7 Open Circuit	Trailer exhaust wire open circuit	<ul style="list-style-type: none"> • Check Pin 7 on DECU J2 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 1 on the Trailer solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 7 DECU J2 connector to Pin 1 on the trailer solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516104	2	Trailer Park Brake Deliver Valve - J2 Pin 11 Harness Related Fault	Trailer deliver wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 11 on DECU J2 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 3 on the trailer solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 11 DECU J2 connector to Pin 3 on the trailer solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516104	3	Trailer Park Brake Deliver Valve - J2 Pin 11 Shorted to Battery	Trailer deliver wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 11 on DECU J2 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 3 on the trailer solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 11 DECU J2 connector to Pin 3 on the trailer solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516104	4	Trailer Park Brake Deliver Valve - J2 Pin 11 Shorted to Ground	Trailer deliver wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 11 on DECU J2 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 3 on the trailer solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 11 DECU J2 connector to Pin 3 on the trailer solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516104	5	Trailer Park Brake Deliver Valve - J2 Pin 11 Open Circuit	Trailer deliver wire open circuit	<ul style="list-style-type: none"> • Check Pin 11 on DECU J2 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 3 on the trailer solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 11 DECU J2 connector to Pin 3 on the trailer solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516105	2	Tractor Solenoid - J1 Pin 10 Harness-Related Fault	Tractor common wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 10 on DECU J1 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 2 on the Tractor solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 10 DECU J1 connector to Pin 2 on the tractor solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516105	3	Tractor Solenoid Common - J1 Pin 10 Shorted to Voltage	Tractor common wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 10 on DECU J1 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 2 on the Tractor solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 10 DECU J1 connector to Pin 2 on the tractor solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516105	4	Tractor Solenoid Common - J1 Pin 10 Shorted to Ground	Tractor common wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 10 on DECU J1 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 2 on the Tractor solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 10 DECU J1 connector to Pin 2 on the tractor solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516105	5	Tractor Solenoid Common - J1 Pin 10 Open Circuit	Tractor common wire open circuit	<ul style="list-style-type: none"> • Check Pin 10 on DECU J1 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 2 on the Tractor solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 10 DECU J1 connector to Pin 2 on the tractor solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516106	2	Trailer Solenoid - J2 Pin 9 Harness-Related Fault	Trailer common wire noise or short to another source	<ul style="list-style-type: none"> • Check Pin 9 on DECU J2 connector for short to or bad connection; if an issue is found, re-pin at that location. • Check Pin 2 on the trailer solenoid connector for short or bad connection; if an issue is found, re-pin at that location. • Check the connections between Pin 9 DECU J2 connector to Pin 2 on the trailer solenoid connector; re-pin if a short or bad connection is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516106	3	Trailer Solenoid Common - J2 Pin 9 Shorted to Voltage	Trailer common wire short to battery or high source	<ul style="list-style-type: none"> • Check Pin 9 on DECU J2 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 2 on the trailer solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 9 DECU J2 connector to Pin 2 on the trailer solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516106	4	Trailer Solenoid Common - J2 Pin 9 Shorted to Ground	Trailer common wire short to ground or low source	<ul style="list-style-type: none"> • Check Pin 9 on DECU J2 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 2 on the trailer solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 9 DECU J2 connector to Pin 2 on the trailer solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516106	5	Trailer Solenoid Common - J2 Pin 9 Open Circuit	Trailer common wire open circuit	<ul style="list-style-type: none"> • Check Pin 9 on DECU J2 connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check Pin 2 on the trailer solenoid connector for being disconnected or loose; if a poor connection is found, re-pin at that location. • Check the connections between Pin 9 DECU J2 connector to Pin 2 on the trailer solenoid connector; re-pin if an issue is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516107	3	High Side Relay - Shorted to Battery	ECU or wiring damage	<ul style="list-style-type: none"> • Check Pin 10 on J1 and Pin 9 on J2 connector for short to a high source; if an issue is found, re-pin at that location. • Check Pin 2 on the tractor and trailer solenoid connector for short to a high source; if an issue is found, re-pin at that location. • Check the connections between Pin 10 on J1 and Pin 9 DECU J2 connector to Pin 2 on the tractor and trailer solenoid connector; re-pin if a short to a high source is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516107	4	High Side Relay - Voltage Below Normal	ECU or wiring damage	<ul style="list-style-type: none"> • Check Pin 10 on J1 and Pin 9 on DECU J2 connector for short to ground; if an issue is found, re-pin at that location. • Check Pin 2 on the tractor and trailer solenoid connector for short to ground source; if an issue is found, re-pin at that location. • Check the connections between Pin 9 DECU J2 connector to Pin 2 on the tractor and trailer solenoid connector; re-pin if a short to ground is found. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516108	2	Occupancy Sensor 1 Shorted to Occupancy Sensor 2	J1 Pin 6 and 16 shorted to one another	<ul style="list-style-type: none"> • Check wires at J1 Pin 6 and 16 for damage or a short. • If no issues are seen with the wiring, take an ohmmeter and read resistance between J1 Pin 6 and 16; if the reading indicates there is a path for current to travel, trace through the wiring until an issue is seen. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516112	2	Intellipark Tractor LED Failure	Possible ECU damage	<ul style="list-style-type: none"> Power Intellipark off then back on; observe LEDs as they perform the bulb check at start-up (three [3] seconds on, then two [2] seconds off). Verify all LEDs turn on and off as expected. If a part faults, replace the ECU. If this DTC does not occur at start-up, dim the dash brightness and see if the DTC occurs when the vehicle requests the LEDs are dimmed. If the DTC occurs, replace the ECU. This DTC should resolve once the cause is addressed.
516112	12	Intellipark Tractor LED Failure	Possible ECU damage	<ul style="list-style-type: none"> Power Intellipark off then back on; observe LEDs as they perform the bulb check at start-up (three [3] seconds on, then two [2] seconds off). Verify all LEDs turn on and off as expected. If a part faults, replace the ECU. If this DTC does not occur at start-up, dim the dash brightness and see if the DTC occurs when the vehicle requests the LEDs are dimmed. If the DTC occurs, replace the ECU. This DTC should resolve once the cause is addressed.
516113	2	Intellipark Trailer LED Failure	Possible ECU damage	<ul style="list-style-type: none"> Power Intellipark off then back on; observe LEDs as they perform the bulb check at start-up (three [3] seconds on, then two [2] seconds off). Verify all LEDs turn on and off as expected. If a part faults, replace the ECU. If this DTC does not occur at start-up, dim the dash brightness and see if the DTC occurs when the vehicle requests the LEDs are dimmed. If the DTC occurs, replace the ECU. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516113	12	Intellipark Trailer LED Failure	Possible ECU damage	<ul style="list-style-type: none"> Power Intellipark off then back on; observe LEDs as they perform the bulb check at start-up (three [3] seconds on, then two [2] seconds off). Verify all LEDs turn on and off as expected. If a part faults, replace the ECU. If this DTC does not occur at start-up, dim the dash brightness and see if the DTC occurs when the vehicle requests the LEDs are dimmed. If the DTC occurs, replace the ECU. This DTC should resolve once the cause is addressed.
516115	2	Internal ECU Issue	Tractor switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> Check that the yellow tractor switch is in the neutral position when no one is pushing or pulling the switch. If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. The DTC should resolve once the switch returns to the neutral position.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516115	5	Internal ECU Issue	Tractor switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the yellow tractor switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.
516115	7	Internal ECU Issue	Tractor switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the yellow tractor switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516115	19	Internal ECU Issue	Tractor switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the yellow tractor switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.
516116	2	Internal ECU Issue	Trailer switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the red trailer switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516116	5	Internal ECU Issue	Trailer switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the red trailer switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.
516116	7	Internal ECU Issue	Trailer switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the red trailer switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516116	19	Internal ECU Issue	Trailer switch disagreement, noise or incorrect position	<ul style="list-style-type: none"> • Check that the red trailer switch is in the neutral position when no one is pushing or pulling the switch. • If the switch is not in the neutral position, determine if the switch is stuck in another position due to impeded movement (e.g. pinched by a portion of the dash). Remove any dash or other components that may be hindering the motion of the switch. Verify the switch returns to the neutral position. • If the switch does not return to the neutral position automatically, attempt to manually move the switch to the neutral position. • If the DTC does not resolve once the switch returns to the neutral position, replace the DECU. • The DTC should resolve once the switch returns to the neutral position.
516117	12	ECU Unable to Determine Appropriate Vehicle Motion State	Invalid or no speed data received on CAN	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify all ECUs on the CAN bus communicate at the same baud rate; OEM for assistance may be necessary. • Verify the data from each CAN input to the DECU has the same data; OEM for assistance may be necessary. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516117	19	ECU Unable to Determine Appropriate Vehicle Motion State	Invalid or no speed data received on CAN	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify all ECUs on the CAN bus communicate at the same baud rate; OEM for assistance may be necessary. • Verify the data from each CAN input to the DECU has the same data; OEM for assistance may be necessary. • This DTC should resolve once the cause is addressed.
516119	2	Rollaway Mitigation Fault - Erratic, Intermittent, or Incorrect - ECU DTC (46_1B)	Unexpected action seen	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • Unpark the tractor. • Activate ARA; refer to the applicable Operator's Manual on B2Bendix.com for instructions on activating ARA. • If the DTC becomes or remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516119	12	Rollaway Mitigation Fault - ECU DTC (46_18)	Unexpected action seen	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • Unpark the tractor. • Activate ARA; refer to the applicable Operator's Manual on B2Bendix.com for instructions on activating ARA. • If the DTC becomes or remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516120	2	Internal ECU Issue SPN516120 FMI2	ECU damage	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • If the DTC becomes or remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516122	3	DECU Ignition Line - J1 Pin 17 Shorted to Voltage	Ignition wire short to battery	<ul style="list-style-type: none"> • Key off the vehicle and check that 0 volts is received from Pin 17 on the J1 connector. • Check wiring and Pin 17 on J1 connector for short to Pin 18 on J1 or other battery connection. • Check wiring from the DECU to the fuse panel for short to high source. • Check the fuse panel for short to high source. • Verify the CAN messages for the ignition state correctly indicate key-on and key-off on CAN; OEM assistance may be necessary. • This DTC should resolve once the cause is addressed, 12 volts is seen at key-on, and 0 volts is seen at key-off.
516122	5	DECU Ignition Line - J1 Pin 17 Open Circuit	Ignition wire open	<ul style="list-style-type: none"> • Key on the vehicle and check that 9-15 volts is received from Pin 17 on the J1 connector. • Check wiring and Pin 17 on J1 connector for open circuit or poor connection. • Check wiring from the DECU to the fuse panel for open or bad connection. • Check the fuse panel for blown fuse. • Verify the CAN messages for ignition state correctly indicate key-on and key-off on CAN; OEM assistance may be necessary. • This DTC should resolve once the cause is addressed, 12 volts is seen at key-on, and 0 volts is seen at key-off.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516122	19	DECU Ignition Line, J1 Pin 17 short	Ignition wire open or short to high source	<ul style="list-style-type: none"> • Key on the vehicle and check that 9-15 volts is received from Pin 17 on the J1 connector. • Check wiring and Pin 17 on J1 connector for open circuit or poor connection. • Check wiring from DECU to the fuse panel for open or bad connection. • Check the fuse panel for blown fuse. • Key off the vehicle and check that 0 volts is received from Pin 17 on the J1 connector. • Check wiring and Pin 17 on J1 connector for short to Pin 18 on J1 or other battery connection. • Check wiring from the DECU to the fuse panel for short to high source. • Check the fuse panel for short to high source. • Verify the CAN messages for ignition state correctly indicate key-on and key-off on CAN; OEM assistance may be necessary. • This DTC should resolve once the cause is addressed, 12 volts is seen at key-on, and 0 volts is seen at key-off.
516123	2	J1939 ABS Node - Timeout or Communication Loss	Loss of CAN messages	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify the ABS is broadcasting for source address 0B on CAN bus and that intellipark is connected when the vehicle is keyed on. • This DTC should resolve once it receives CAN data from SA 0B.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516124	2	J1939 Engine Node - Timeout or Communication Loss	Loss of CAN messages	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify the engine is broadcasting for source address 00 on CAN bus and that intellipark is connected when the vehicle is keyed on. • This DTC should resolve once it receives CAN data from SA 0B.
516125	2	Tractor Pressure Sensor Shorted to Trailer Pressure Sensor	Sensor wires short to each other	<ul style="list-style-type: none"> • Check Pin 4 on J1 and J2 connectors to see if they are shorted to one another. There should be no connection between the 2 wires. • Check resistance with an ohm meter between the Pins to verify no connection is detected. • Trace the wires from Pin 4 on the J1/J2 connectors to the tractor and trailer pressure sensors on PVM Pin 1 to verify there are no shorts in the wiring harness. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516126	2	Internal ECU Issue SPN516126 FMI2	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516127	2	Internal ECU Issue SPN516127 FMI2	Unexpected action seen	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • Unpark the tractor and drive the vehicle; if the DTC becomes/ remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516127	7	Internal ECU Issue SPN516127 FMI7	Unexpected action seen	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • Unpark the tractor and drive the vehicle; if the DTC becomes/ remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516127	12	Internal ECU Issue SPN516127 FMI12	Unexpected action seen	<ul style="list-style-type: none"> • Disconnect and reconnect power to the DECU; this should heal the DTC if it is active. • Unpark the tractor and drive the vehicle; if the DTC becomes/ remains active, replace the ECU. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516128	13	Internal ECU Issue SPN516128 FMI13	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516129	31	Maintenance Mode Active	DECU in maintenance mode	<ul style="list-style-type: none"> • Use Bendix® ACom® Diagnostic Software to exit maintenance mode; exit maintenance mode by increasing vehicle speed above 12 mph (20 kph). • Once maintenance mode is exited, this DTC should not report as active.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516130	7	Tractor and Trailer Solenoid or Pressure Sensor Wires Swapped	Wires swapped on wiring harness	<ul style="list-style-type: none"> • Pull the yellow tractor switch. If the tractor unparks, Pins 8/12 on the J1 connector are swapped. • Pull the red switch. If the trailer unparks, Pins 7/11 on the J2 connector are swapped. • Push the red switch with interlocks satisfied. If the tractor unparks, either the pressure sensor wires (Pins 2-4 on J1 and J2 connectors) or solenoid wires (Pins 8/10/12 on J1 and Pins 7/9/11 on J2) are swapped. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516132	13	Internal ECU Issue SPN516132 FMI13	DECU incorrect DATA	<ul style="list-style-type: none"> • If the DECU just received a software update, reattempt or revert to previous software version if possible. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516135	2	Pressure Sensor Supply Erratic, Intermittent, or Incorrect	Pressure sensor wires short to each other	<ul style="list-style-type: none"> • Check Pin 2/3 on J1 and J2 connectors to see if they are shorted to one another. There should be no connection between the two wires. • Check resistance with an ohm meter between the pins to verify no connection is detected. • Trace wires from Pin 2/3 on the J1/J2 connectors to the tractor and trailer pressure sensors on PVM Pin 2/3 to verify there are no shorts in the wiring harness. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed.
516141	31	Retrofit Installation Mode Active	DECU in retrofit mode	<ul style="list-style-type: none"> • Use Bendix® ACom® Diagnostic Software to exit retrofit mode. • Exit maintenance mode by increasing the vehicle speed above 12 mph (20 kph). • Once maintenance mode is exited, this DTC should not report as active.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516142	31	OEM Assembly Mode Active	DECU in OEM assembly mode	<ul style="list-style-type: none"> • Drive above 30 mph (48 mph) for at least 10 minutes. Afterwards, park the vehicle, key off for 1 minute, then key on. • Contact the OEM to exit this mode for you. • Once the OEM assembly mode is exited, this DTC should not report as active.
516144	31	Limp Home Mode Active	DECU in Limp home mode	<ul style="list-style-type: none"> • Unpark then park the tractor and the DECU will exit this mode. • Key off the vehicle until Intellipark turns off. The next time the DECU turns on, it should not be in limp home mode. • Once limp home mode is exited, this DTC should not report as active.
516145	12	Internal ECU Issue SPN516145 FMI12	Solenoid wire noise	<ul style="list-style-type: none"> • Check solenoid wires for bad or lose connections, Pins 8/10/12 on J1, Pins 7/9/11 on J2, and Pins 1-3 on the PVM solenoid connectors. • Cycle the battery and/or place the key in the off position for 30 seconds. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516146	12	Internal ECU Issue SPN516146 FMI12	Information mismatch	<ul style="list-style-type: none"> • Battery reset the ECU. • This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516147	2	J1939 CAN2 ABS Node - Erratic, Intermittent, or Incorrect	Loss of CAN messages	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on the J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify the ABS is broadcasting for the source address 0B on CAN bus that Intellipark is connected to when the vehicle is keyed on. • This DTC should resolve once the CAN data is received from SA 0B.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516148	2	J1939 CAN2 Engine Node - Erratic, Intermittent, or Incorrect	Loss of CAN messages	<ul style="list-style-type: none"> Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. Verify the engine is broadcasting for the source address 00 on CAN bus that Intellipark is connected to when the vehicle is keyed on. This DTC should resolve once the CAN data is received from SA 0B.
516149	12	Internal ECU Issue SPN516149 FMI12	Continuous voltage issue or ECU damage	<ul style="list-style-type: none"> Verify the battery voltage is in the nominal range of approximately 14V. Once the battery is fully charged, battery cycle the ECU. Cycle the battery and/or place the key in the off position for 30 seconds. This DTC should resolve once the cause is addressed. If the DTC persists, replace the ECU.
516150	2	External Park/Unpark Request Inhibit Unpark Erratic, Intermittent, or Incorrect - ECU DTC (89_11)	XPURT CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516151	2	J1939 AIR1 Message - Erratic, Intermittent, or Incorrect	AIR1 CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516152	2	Reservoir Pressure - Erratic, Intermittent, or Incorrect	Reservoir CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516153	2	External Park/Unpark Request Inhibit Park Erratic, Intermittent, or Incorrect - ECU DTC (83_11)	XPURT CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516154	2	J1939 CAN Stop Lamp Switch - Erratic, Intermittent, or Incorrect	Stop Lamp Switch message CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516154	13	J1939 CAN Stop Lamp Switch Out of Calibration	Stop mismatch between brake switch signal on chassis and party CAN	<ul style="list-style-type: none"> Check the park brake release request inhibit interlock status on the chassis and party CAN. Contact the OEM for details on the source of message and the fix. The DTC should resolve once the cause is addressed.
516155	2	External Park/Unpark Request Manual Park Erratic, Intermittent, or Incorrect - ECU DTC (84_11)	XPURT CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516156	2	External Park/Unpark Request Manual Unpark Erratic, Intermittent, or Incorrect - ECU DTC (85_11)	XPURT CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516156	12	Park Brake Power State Failure	Mismatch between LV1 and LV2 signals	<ul style="list-style-type: none"> Check the battery and CAN connections to the DECU. Contact the OEM for further assistance. This DTC should resolve once the cause is addressed.
516157	2	External Park/Unpark Request Inhibit Rollaway Mitigation Erratic, Intermittent, or Incorrect - ECU DTC (8B_11)	XPURT CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516158	2	J1939 Seat Belt Message - Erratic, Intermittent, or Incorrect	Seat belt message CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516159	19	J1939 CAN Vehicle Speed Implausible	Speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.
516159	31	On the Air Lockout Release Mode Active	There is an OTA release lockout request ongoing	<ul style="list-style-type: none"> ECU is in OTA release lockout mode; wait for the OTA lockout mode to exit or execute an OTA stop. Contact the OEM for assistance. This DTC should resolve once the cause is addressed.
516160	2	J1939 Ignition Message - Erratic, Intermittent, or Incorrect	Ignition message CAN data not received when expected or received with error	<ul style="list-style-type: none"> Contact the OEM for details on the source of the message and the fix. This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

SPN	FMI	Description	Cause	Corrective Action
516161	2	J1939 Primary Speed Message - Erratic, Intermittent, or Incorrect	Speed CAN data not received when expected or received with error	<ul style="list-style-type: none"> • Contact the OEM for details on the source of the message and the fix. • This DTC should resolve once the cause is addressed.
516161	19	ECU Unable to Determine Appropriate Vehicle Motion State	Invalid or no speed data received on CAN	<ul style="list-style-type: none"> • Verify there are no open wires or shorts on the 2 CAN inputs, Pins 13/15 on J1 and Pins 6/8 on J2 connector. • Verify the 2 CAN inputs have terminating resistors at the DECU side and at the backbone. • Verify all ECUs on the CAN bus communicate at the same baud rate; OEM assistance may be needed. • Verify the data from each CAN input to the DECU has the same data; OEM assistance may be needed. • This DTC should resolve once the cause is addressed.
516161	19	J1939 Speed Data Error	Speed information available on both CAN channels do not match	<ul style="list-style-type: none"> • Check if the speed information available on both the CAN channels is the same. • Contact the OEM for further assistance.
524032	12	J1939 CAN Transmission Fault	Intellipark unable to broadcast on CAN network	<ul style="list-style-type: none"> • Check the high and low CAN wires, J1 Pin 13 and 15, and the CAN backbone connections for a short to ground, power, or each other. • This DTC should resolve once the cause is addressed.

Table 6 – Diagnostic Trouble Codes (DTCs)

ELECTRICAL INTERFACE DETAILS

See Figures 7 and 8 for the electrical interface details.

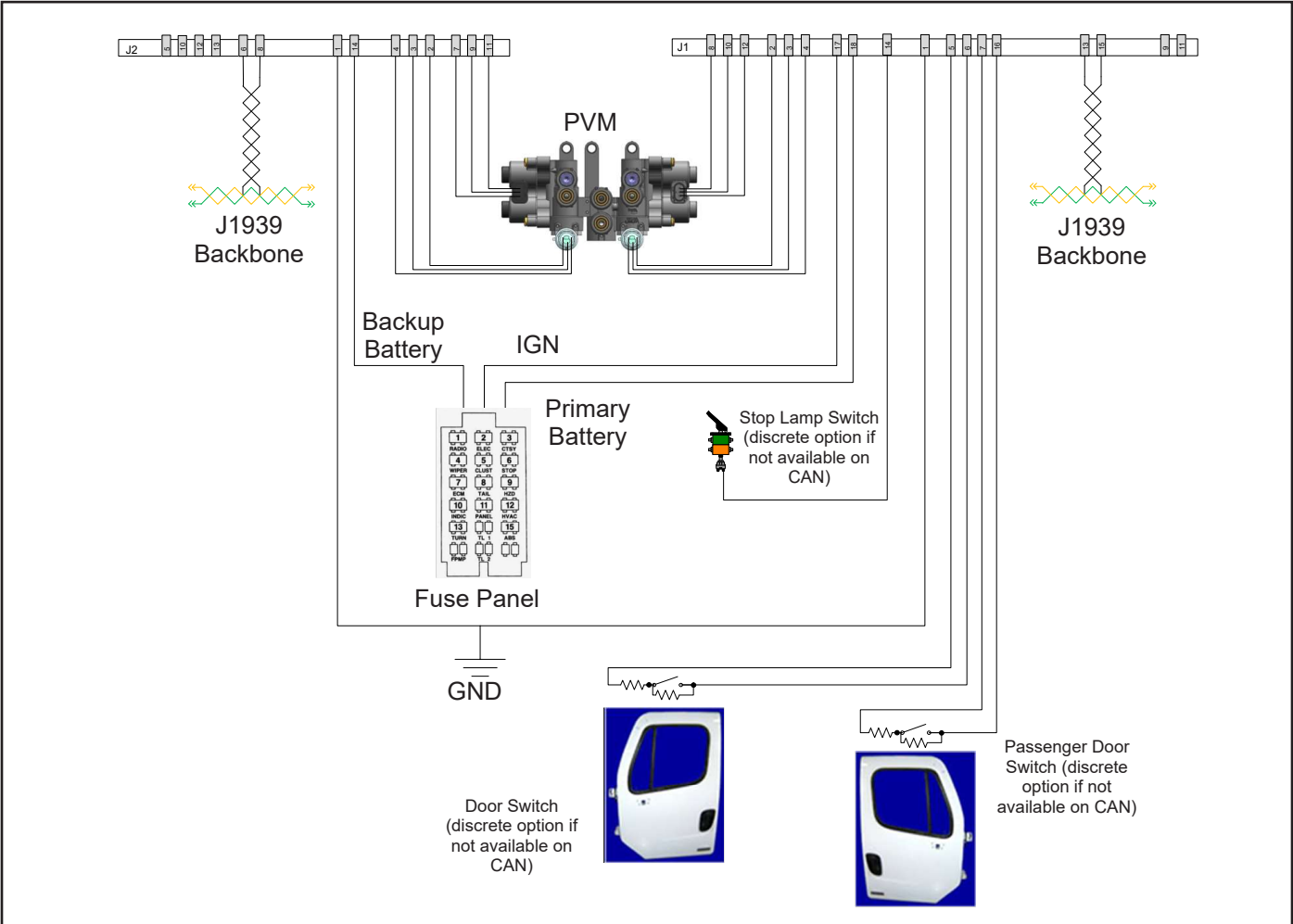


Figure 7 – Towing Vehicle Variant

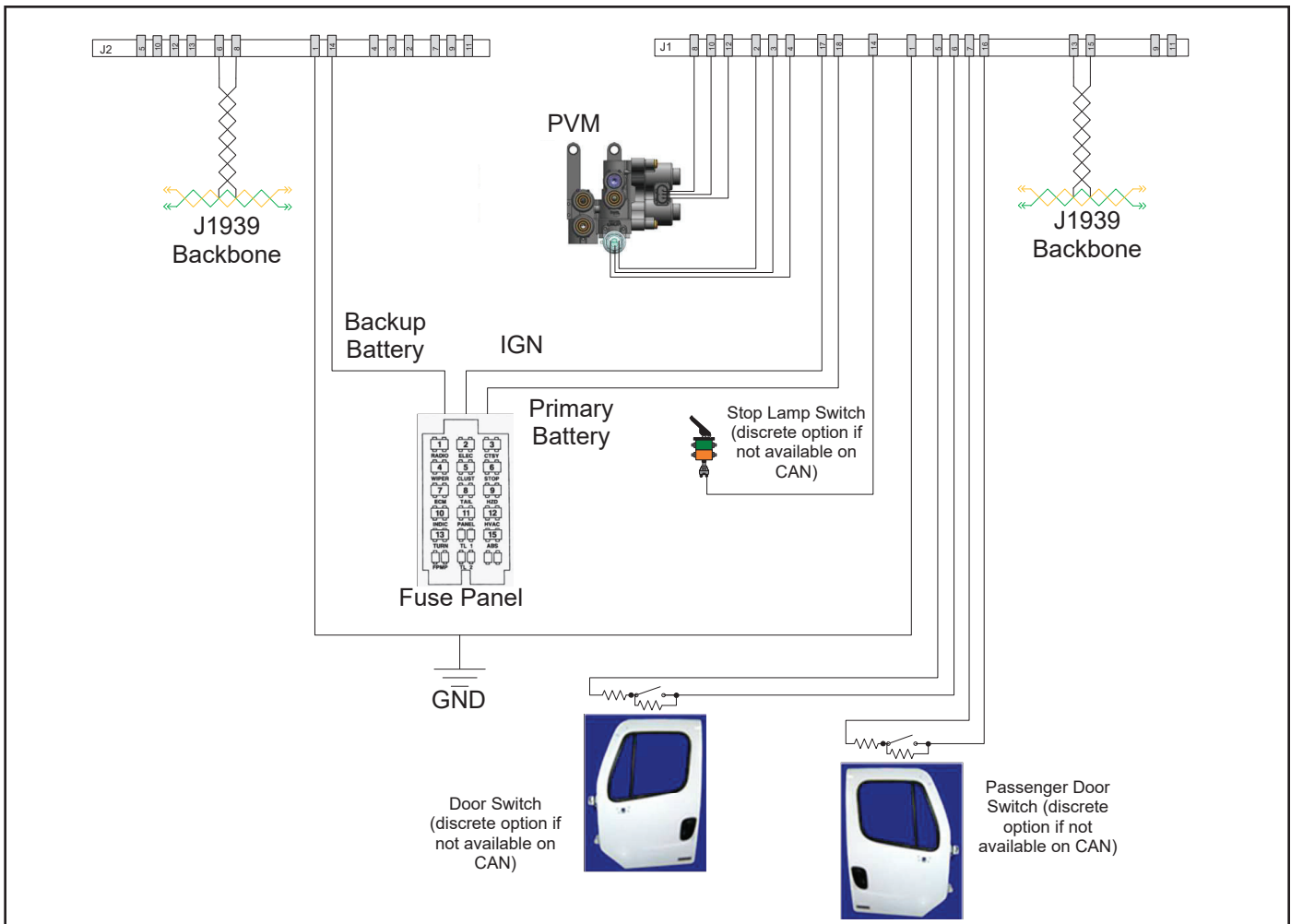


Figure 8 – Solo Vehicle Variant

Occupancy Sensors

The Dash Electronic Control Unit (DECU) supports occupancy sensors to determine if the driver's seat is occupied.



If all LEDs do not illuminate when the DECU powers up, immediately chock the wheels and have the Bendix® Intellipark® Electronic Parking Brake (EPB) system serviced as soon as possible.

The occupancy sensor signals may come from the vehicle J1939 or from dedicated hardwire input Pins on the DECU. If J1939 is used to communicate the occupancy sensor signals to the DECU, the vehicle system is responsible for detecting faults and wire harness issues associated with the occupancy sensors. If hardwire inputs are used, the occupancy sensor shall be a switch biased by an external R/2R network, where $R_A = R_B = 16 \text{ kohm}$. Resistance should measure 3 kohm when the OCC switch is open and 16 kohm when the switch is closed. See Figure 9.

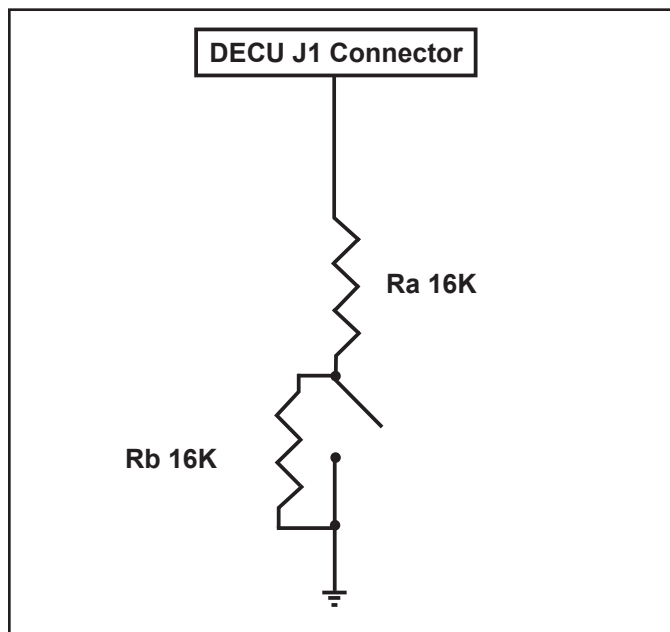


Figure 9 – Occupancy Sensors

NOTE: Bendix does not supply the connectors listed.

PVM Feedback Connections

The Park Valve Module (PVM) contains the exhaust and delivery solenoids for the power vehicle (tractor) and the towed vehicle (trailer). The DECU monitors the PVM state via feedback signals. The DECU supplies +5VDC to the external pressure sensors.

PVM Connector Pin Assignments

All wire harness connectors must be properly seated. The use of secondary locks is strongly advised.

Pin	Name
1	Solenoid Exhaust
2	Solenoid Common
3	Solenoid Deliver

PVM Pressure Transducer Connector

The pressure transducers utilize the following connect Pin assignments.

Pin	Name
1	Output
2	Ground
3	Power

PVM Solenoid Resistance

Parameter	Value	Unit
Solenoid exhaust	10 ± 0	Ohms
Solenoid driver	10 ± 0	Ohms

DECU Input Voltages

Parameter	Value	Unit
Maximum voltage	10	VDC
Minimum voltage	0	VDC
Nominal voltage	15	VDC

Dash Electronic Control Unit (DECU) Connector Part Numbers

All wire harness connectors must be properly seated. The use of secondary locks is strongly advised.

DECU: J1 Connector Pin Assignments**(Towing and Non-Towing Dash Electronic Control Unit - DECU - Variants)**

Pin	Name	Description
1	GND_1	Ground
2	PS_GND	PVM pressure sensor supply ground
3	PU_PS_SPL	PVM power vehicle pressure sensor supply (5V)
4	PU_PS_SIG_1	PVM power vehicle pressure sensor signal 1
5	OCC_SEN_GND	Driver occupancy sensor 1 ground
6	OCC_SEN_1	Driver occupancy sensor 1
7	OCC_SEN_GND	Driver occupancy sensor 2 ground
8	PU_SOL_EXH	PVM power vehicle park brake exhaust solenoid
9	NC	No contact
10	PU_SOL_COM	PVM power vehicle solenoid common
11	NC	No contact
12	PU_SOL_DEL	PVM power vehicle park brake deliver solenoid
13	J1939_LO	CAN1 low
14	SLS	Stop lamp switch input
15	J1939_HI	CAN1 high
16	OCC_SEN_2	Driver occupancy sensor 2
17	VIGN	Ignition input
18	VBATT_1	Battery input 1

DECU: J2 Connector Pin Assignments**(Towing DECU Variant)**

Parameter	Value	Unit
1	GND_2	Ground
2	PS_GND	PVM pressure sensor supply ground
3	TU_PS_SPL	PVM towed vehicle pressure sensor supply (5V)
4	TU_PS_SIG_1	PVM towed vehicle pressure sensor signal 1
5	NC	No contact
6	CAN2_LO	CAN2 low
7	TU_SOL_EXH	PVM towed vehicle park brake exhaust solenoid
8	CAN2_HI	CAN2 high
9	TU_SOL_COM	PVM towed vehicle solenoid common
10	NC	No contact
11	TU_SOL_DEL	PVM towed vehicle park brake deliver solenoid
12	NC	No contact
13	NC	No contact
14	VBATT_2	Battery input 2

**Dash Electronic Control Unit (DECU): J2 Connector Pin Assignments
(Non-Towing DECU Variant)**

Parameter	Value	Unit
1	GND_2	Ground
2	NC	No contact
3	NC	No contact
4	NC	No contact
5	NC	No contact
6	CAN2_LO	CAN2 low
7	NC	No contact
8	CAN2_HI	CAN2 high
9	NC	No contact
10	NC	No contact
11	NC	No contact
12	NC	No contact
13	NC	No contact
14	VBATT_2	Battery input 2

COMMUNICATIONS INTERFACE

CAN1

The DECU provides support for a CAN transceiver. CAN 1 is intended for use on the vehicle J1939 bus. It can be configured for either 250 kbps or 500 kbps operation.

CAN2

A second DECU CAN channel, designated CAN 2, is also available. It can be configured for either 250 kbps or 500 kbps operation.

