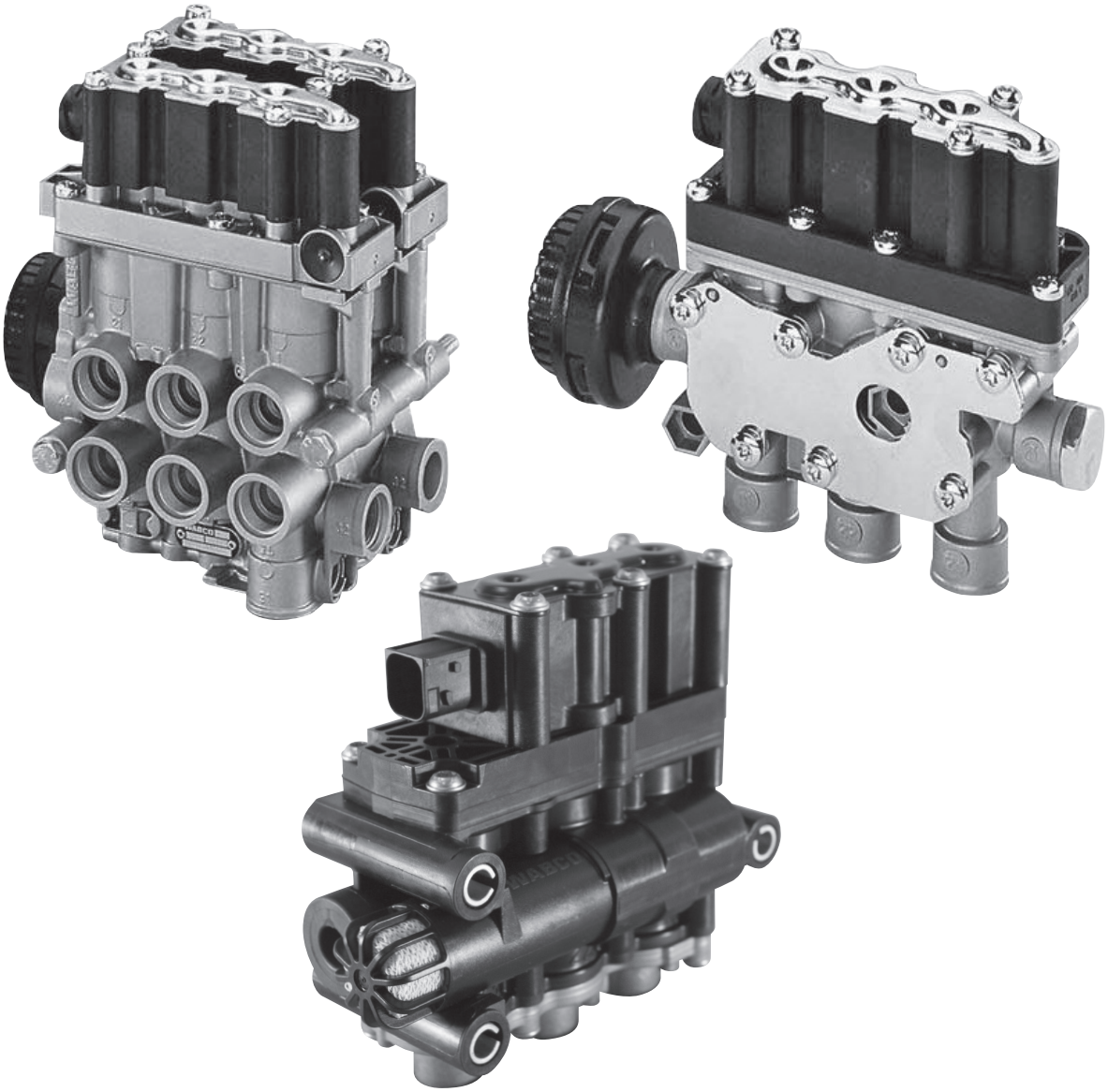
OPTIRIDE™ ELECTRONICALLY CONTROLLED AIR SUSPENSION (ECAS) FOR BUSES AND TRUCKS WITH CAN II (SAE 1939)

MAINTENANCE MANUAL



MM1315

WABCO

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Edition 1
Version 2 (02.2022)
MM1315 (en)

1 General Information

1.1 Symbols Used in this Document

⚠ DANGER

Description of an immediate situation which will result in irreversible injury or death if the warning is ignored.

⚠ WARNING

Description of a possible situation which may result in irreversible injury or death if the warning is ignored.

⚠ CAUTION

Description of a possible situation which may result in irreversible injury if the warning is ignored.

NOTICE

Description of a possible situation which may result in material damage if the warning is ignored.

Important information, notices and/or tips

Reference to information on the Internet

Descriptive text

– Action step

1. Action step 1 (in ascending order)
2. Action step 2 (in ascending order)

⇨ Result of an action

• Listing

Indicating the use of a tool / WABCO tool

General Information

1.2 How to Obtain Additional Maintenance, Service and Product Information

If you have any questions about the material covered in this publication, or for more information about the WABCO product line, please contact WABCO Customer Care Center at 855-228-3203, by email at wabconacustomercare@zf.com, or visit our website: www.zf.com/cv.

Refer to the Society of Automotive Engineers (SAE) website to find all current SAE documents and standards applicable to WABCO products (such as SAE J447 and SAE J908 at www.sae.org).

Refer to the National Highway Traffic Safety Administration (NHTSA) website to find all current documents referenced in the manual at www.nhtsa.gov.

1.3 How to Obtain Parts and Kits

Contact the WABCO Customer Care Center at 855-228-3203 (United States and Canada); 800-953-0248 (Mexico). Email: wabconacustomercare@zf.com.

1.4 WABCO TOOLBOX PLUS™ Software

TOOLBOX PLUS™ Software provides PC diagnostic for WABCO products and can be purchased and downloaded from https://wabco.snapon.com.

The software User Guide, MM19047 can be obtained by visiting our Literature Center.

Purchase and Download TOOLBOX PLUS™
https://wabco.snapon.com

ZF Commercial Vehicle Literature Center
https://zf.com/cvliterature

1.5 WABCO Academy

www.wabco-academy.com

1.6 WABCO Online Product Catalog

www.wabco-customercenter.com

1.7 Your Direct Contact to ZF CVS

ZF CV Systems North America LLC

1220 Pacific Drive
Auburn Hills, MI 48326

Customer Care Center: (855) 228-3203

www.zf.com/cv

wabconacustomercare@zf.com

2 Safety Information

2.1 Provisions for a safe work environment

- Only experienced, trained and qualified automotive technicians may carry out work on the vehicle.
- Read this publication carefully.
- Follow all warnings, notices and instructions to avoid personal injury and property damage.
- Always abide by the vehicle's Original Equipment Manufacturer (OEM) specifications and instructions.
- Observe all accident regulations of the repair facility as well as regional and national regulations.
- The workplace should be dry, sufficiently lit and ventilated.
- Use personal protective equipment if required (safety shoes, protective goggles, respiratory protection and ear protectors).

Read and observe all Danger, Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

⚠WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip or fall over. Serious personal injury and damage to components can result.

⚠WARNING

This product can expose you to chemicals including Nickel, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

3 Introduction

3.1 Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠ CAUTION

Due to the active standby feature on OptiRide™, disconnect the height sensor or disconnect the OptiRide™ ECU prior to replacing or working on OptiRide™ components.

3.2 Contents

This manual contains service information for the WABCO OptiRide™ electronically controlled air suspension (ECAS) for buses and trucks with CAN II (SAE 1939) and with air suspensions.

The OptiRide™ system operates in conjunction with the WABCO anti-lock braking system (ABS). The OptiRide™ cannot function correctly without the ABS. The OptiRide™ system uses information from the ABS to determine vehicle speed and wheel slippage to adjust OptiRide™ operation accordingly.

For testing and service information for a bus or truck ECAS without CAN II (SAE 1939), refer to Maintenance Manual 37, Electronically Controlled Air Suspension (ECAS) for Buses, for a bus system; or Maintenance Manual 36, Electronically Controlled Air Suspension (ECAS) for Trucks, for a truck system. If you cannot identify the OptiRide™ version installed on your vehicle, contact the WABCO Customer Care Center at 855-228-3203.

3.3 Overview

The WABCO OptiRide™ ECAS is an electrically controlled air suspension system designed to enhance the performance of the vehicle's air suspension. OptiRide™ maintains an accurate leveling of the chassis height through the use of height sensors, electronic control unit (ECU) and solenoid valves. Because of the variety of suspension types and vehicle features, a particular set of parameters was developed for each vehicle type. These parameters determine some of the features and characteristics for the OptiRide™ configuration. In the event of a malfunction in the system, the OptiRide™ indicator lamp will alert the driver and the suspension will retain the existing air pressure in the air suspension bellows.

Some of the features provided by OptiRide™ include:

- Automatic Level Control — OptiRide™ continually monitors the vehicle's height (axle-to-frame distances) through the ECU and the use of height and pressure sensors. When the height deviates from the preset nominal level, a correction is made quickly, exhausting or pressurizing the air suspension bellows by actuating solenoid valves. OptiRide™ will maintain the nominal vehicle level regardless of the road changes. There are pre-selected restrictions for when the height corrections can be made.
- Driver-Controlled Level Adjustment — Other than the nominal vehicle level, there can be additional levels selected by the driver to raise the vehicle for rough surfaces or lower vehicle height. These levels can be selected by switches on the vehicle dash panel. The driver can also return the vehicle to the nominal level with another dash panel switch (Recovery). There are pre-selected restrictions for when the height changes can be made.

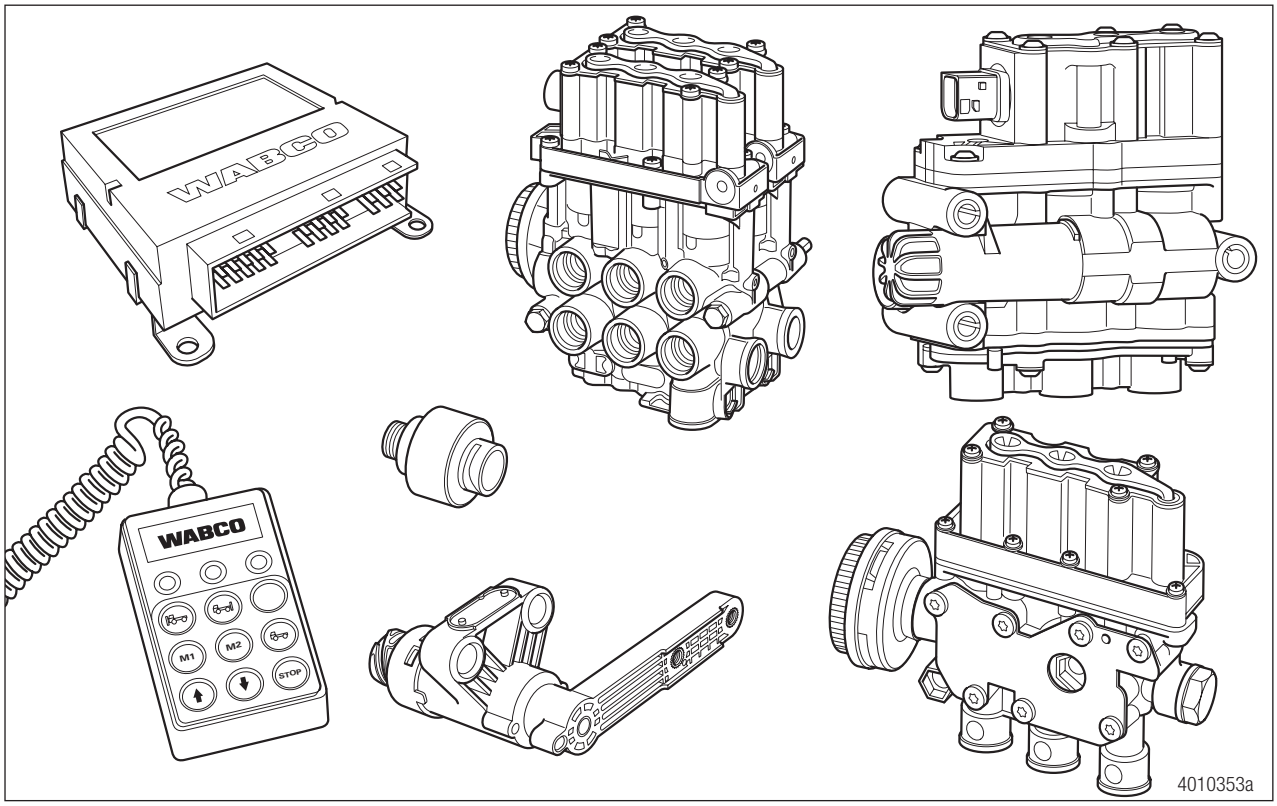
- Vehicle Front Kneeling — This function, normally only on bus and coach, is also selected by the driver activating a switch on the vehicle dash panel, when the vehicle is stationary, and is used to facilitate the passenger entry and exit. Activating the KNEELING switch signals OptiRide™ to activate the front axle valve, exhausting air from the front bellows while maintaining the rear suspension at nominal level. This lowers the vehicle at the entry door step. There are pre-selected restrictions for when the kneeling function can be activated.
- Automatic Traction Help Load Transfer — When wheel slippage is detected by the vehicle's ABS (due to slippery road surface conditions), a signal from the ABS triggers the OptiRide™ system. OptiRide™ can transfer weight from the non-drive axle (tag) to the vehicle's drive axle by changing air pressures in the rear axles air suspension bellows. By transferring pressure from the tag axle to the drive axle air bellows, additional weight is transferred to the drive axle, increasing drive wheel traction. This function may also be initiated by the driver activating a switch on the vehicle dash panel. There are pre-selected restrictions for when the traction help can be activated and how much weight can be transferred.

OptiRide™ will continue to hold the transferred load until the preset limits of time or speed have been met, per the vehicle manufacturer settings.

- Inclination Level Control (Pressure Equality) — The OptiRide™ ECU can adjust pressures in all air suspension bellows together or in individual air bellows. This allows OptiRide™ to compensate for inclinations caused by unbalanced loads or uneven road surfaces.
- OptiRide™ Height Change Requirements — OptiRide™ has several safety features to help ensure safe and correct level changes. Before OptiRide™ can automatically change vehicle heights, certain requirements, selected via BUS parameters, have to be met. For example, in order to make driver-selected height changes, the status of the doors, parking brake, transmission, vehicle speed and vehicle height may be considered. The requirements are determined by the OEM. Contact your vehicle OEM for further setting details.

3.4 Components

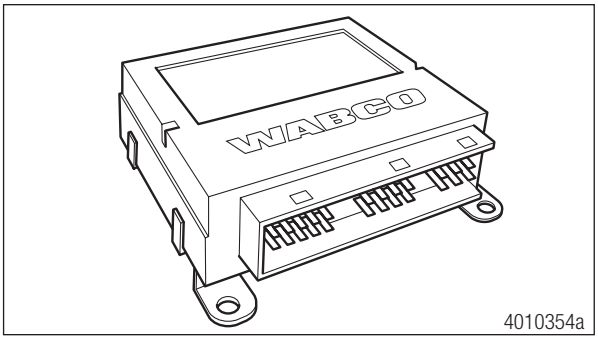
The major components of OptiRide™ are illustrated here.



3.5 Electronic Control Unit (ECU)

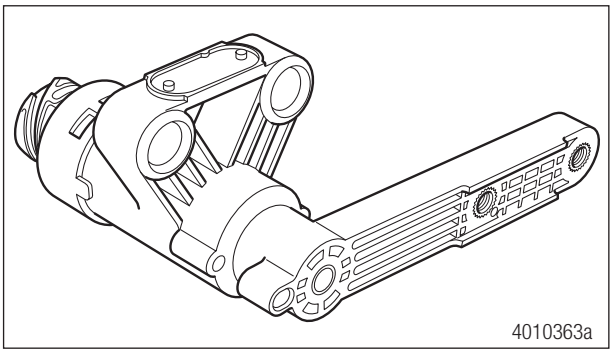
The ECU is connected to the other OptiRide™ components, vehicle power, vehicle ground and CAN link through three different AMP connectors. The ECU has the following functions:

- Monitors up to four height sensors
- Monitors up to five pressure sensors
- Monitors sidewalk detector (optional)
- Monitors transverse accelerometer sensor (optional)
- Controls up to nine solenoid valves
- Communicates with CAN
- Controls vehicle indicator lamps (optional)
- Monitors function of system components, stores faults and performs diagnostics



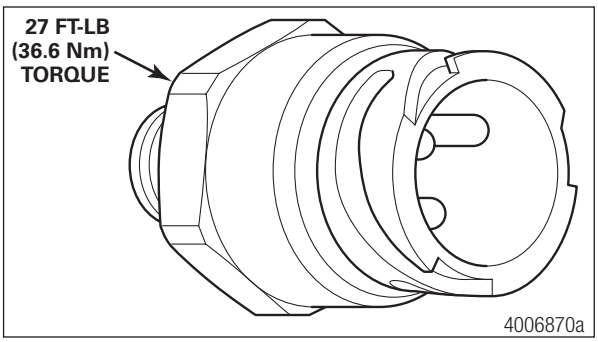
3.6 Height Sensor

The WABCO OptiRide™ height sensors are mounted to the vehicle chassis and connected by linkage to the axle housing providing the ECU with ride height information. The height sensor uses use a lever-type sensor housing that contains an inductive coil in which an armature moves inside the housing. The armature is connected to a lever which is attached to the axle by a linkage rod. When the distance between the chassis and the axle changes, the lever causes the armature to move within the coil, changing the analog signal produced by the sensor. The OptiRide™ ECU converts the analog sensor signal into digital numbers called “Timer Ticks” (TT) or “Counts”.



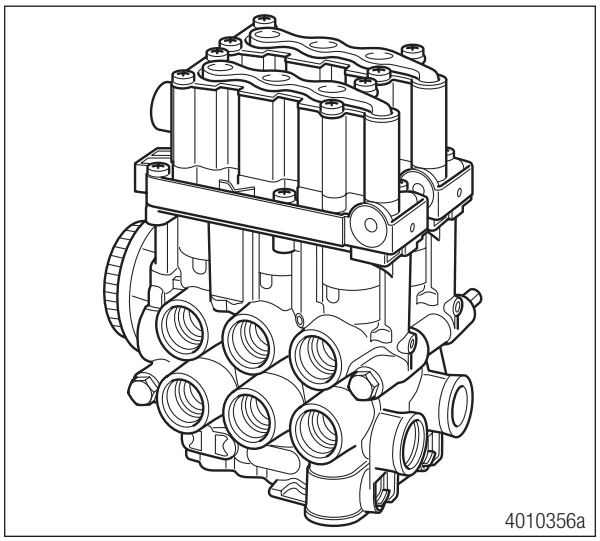
3.7 Pressure Sensors

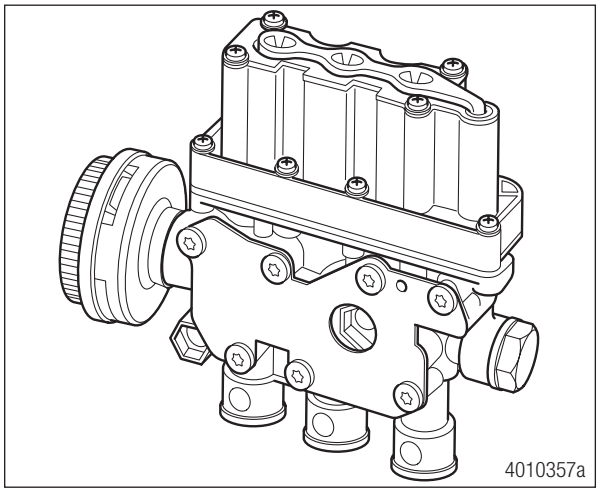
The vehicle axle loads are determined by using pressure sensors attached to the suspension bellows. OptiRide™ may have pressure sensors on the front axle, the drive axle right and left and or any non-drive rear axle (tag axle) right and left.

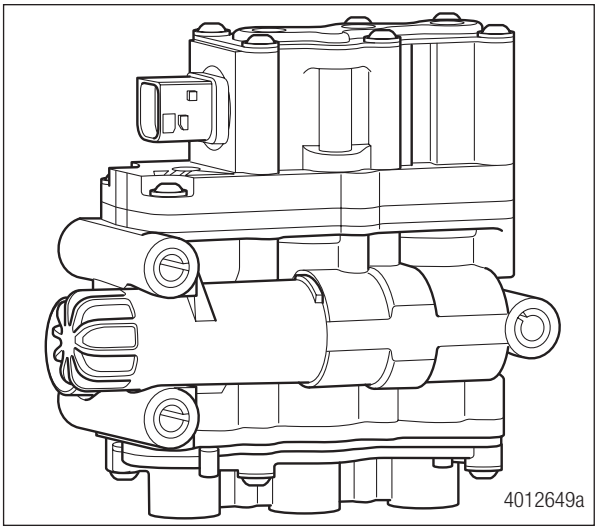


3.8 Solenoid Valve Block

Solenoid valve blocks have been developed for the OptiRide™ system. Several solenoid valves may be combined into one compact valve block. The solenoid valves control the air volume within the suspension air bellows by either increasing or decreasing the pressure as required by the ECU. Electrical connectors link the valve block to the ECU. Air ports connect the valve to air supply and to the suspension air bellows. The valve also has an exhaust port which is covered with a noise reduction device called a buffer.

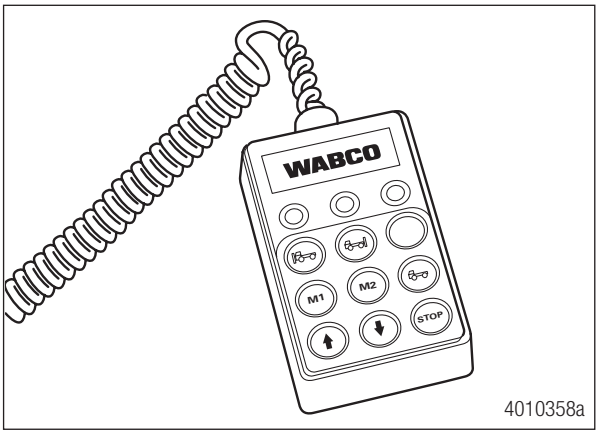






3.9 Remote Control Unit (Optional)

The hand-held remote control unit or keypad is positioned in a bracket that can be mounted on the instrument panel or behind/ below the driver's seat. The driver uses this keypad to alter the vehicle frame height for loading and unloading vehicle and for connecting or disconnecting vehicle from trailers. The keypad is connected to the OptiRide™ ECU by a coiled cable and a socket on the vehicle.



3.9.1 Remote Control Operation

The hand-held remote control has several functions:

- Raising and lowering the vehicle suspension
- Returning vehicle to normal ride level
- Stopping all OptiRide™ functions
- Driver ability to preset and store up to two separate chassis heights

3.9.2 ON/OFF — Axle Selection Switch

Before the remote control unit can be used, the remote must be turned on. By pressing the rear axle selection key (center button top row), the remote control is activated and the remote is turned on. An acknowledgment lamp on the remote control indicates that the axle is selected and the unit is active. Pressing the key a second time will turn off the remote control unit and turn off the acknowledgment lamp.

3.9.3 Raising and Lowering Rear Suspension

The remote control unit allows the driver to change the vehicle's rear suspension height within programmed limits. Pressing the up or down arrow keys cause the chassis height to be immediately altered. Releasing the key ends the height change. Remote control height changes can only be initiated while the vehicle is stationary or traveling at speeds less than the pre-selected parameters allow.

3.9.4 Normal Ride Height Level

Pressing the green Normal Ride Height Level key will immediately return the chassis to the pre-calibrated normal ride height level.

3.9.5 Setting and Selecting Memory Levels

By simultaneously pressing the STOP key and either the M1 or M2 memory keys, the current vehicle level will be stored as a memory height. Memory heights can only be stored while the vehicle is stationary. By pressing only the M1 or M2 memory keys, the chassis level is quickly adjusted to the stored memory height. The M1 or M2 height changes can only be initiated while the vehicle is stationary or at speeds less than 5 mph.

3.9.6 Stop Key

Pressing the STOP key discontinues all height control functions. This allows the driver to discontinue any manually activated height change which could be hazardous.

3.10 OptiRide™-Related Vehicle Lamps, Switches and Optional Features

The following tables describe most of the OptiRide™-related dash panel lamps and switches that could be installed in a vehicle.

TABLE A: INSTRUMENT PANEL OPTIRIDE™ 12V TRACTOR LAMPS AND SWITCHES

Lamps	Switches	Functionality
None	Rear Rise or Up Arrow	Raise rear suspension to pre-set height. Front suspension will remain at current level.
None	Rear Lower or Down Arrow	Lower rear suspension to pre-set height limit. Front suspension will remain at current level.
None	Load Transfer/Momentary Switch	Transfers air pressure from the non-drive axle (tag) to the vehicle's drive axle.
OptiRide™ ECAS Fault or Red Lamp	None	Indicates when system fault is active.
Ride Height or Amber Lamp	None	Indicates when suspension level is outside of the normal ride height level.

TABLE B: INSTRUMENT PANEL OPTIRIDE™ 24V TRACTOR LAMPS AND SWITCHES

Lamps	Switches	Functionality
Rear Rise	Rear Rise or Up Arrow at back of vehicle	Raise rear suspension to pre-set height. Front suspension will remain at current level.
Low Rise	Level Control, Low Ride or Down Arrow at side of vehicle	Lower rear suspension to pre-set height limit. Front suspension will remain at current level.
High Rise	Level Control, High Ride or Up Arrow at side of vehicle	Raise both front and rear suspension to maximum pre-set height limit.
Kneel	Kneel or Down Arrow at side of vehicle	By holding switch, vehicle front will lower to kneeled position.
Kneel	Normal Ride, Kneel Recover or UP/DOWN Arrow at side of vehicle	Will return suspension to normal pre-set ride height.
OptiRide™ ECAS Fault or Red Lamp	None	Indicates when system fault is active.
Ride Height or Amber Lamp	None	Indicates when suspension level is outside of the normal ride height level.
None	Economical Ride Enable/ Disable	Enables or disables economical ride features selected by vehicle manufacturer.

4 Diagnostics, Troubleshooting and Testing

4.1 General Information

4.1.1 Maintenance Information

There is no regularly scheduled maintenance required for the WABCO OptiRide™ or ABS. However, OptiRide™ does not change current vehicle maintenance requirements.

4.1.2 ABS Faults

Before performing any OptiRide™ diagnostics, make sure there are no ABS faults. Because of the interaction between the ABS and OptiRide™, a fault in the ABS may restrict the functionality of the OptiRide™ system. ABS faults can be diagnosed using the vehicle blink code or WABCO TOOLBOX™ Software.

4.1.3 OptiRide™ Faults

The OptiRide™ Warning Lamp, mounted on the dash panel, indicates when OptiRide™ system faults are detected by the Electronic Control Unit (ECU) and stored in memory as active. If the fault is no longer active, the fault will be stored as inactive. OptiRide™ faults can be diagnosed using the WABCO TOOLBOX™ Software 12.2 or higher on a Personal Computer (PC). Refer to Personal Computer and Diagnostics Software Program in the section that describes using the software.

4.1.4 Personal Computer and Diagnostics Software Program

The WABCO OptiRide™ diagnostics software program runs in Windows 7, 8, and 10. If you have TOOLBOX™ Software with the OptiRide™ program installed on your computer, it may be used to:

- View current system status
- Retrieve and identify system faults
- Get on-screen repair instructions
- Illuminate lamps and activate certain outputs
- Calibrate the OptiRide™ system
- Raise and lower the suspension
- Test valve function and position
- View programmed vehicle parameters

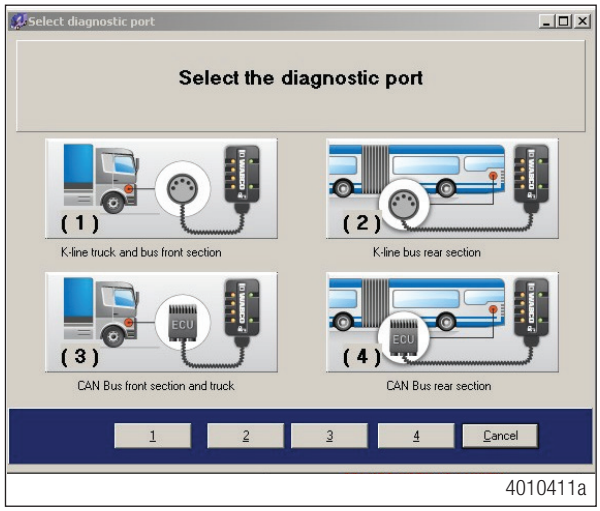
The PC is connected to the vehicle's SAE J1939 (Deutsch) diagnostic plug through special cables and a converter device. The diagnostic plug is wired to the vehicle's data system that includes the OptiRide™ and ABS ECUs. In order to access the WABCO diagnostic software, the appropriate ECU and J1939 interface devices need to be selected.

4.1.5 Diagnostic Startup

1. Connect the computer to the vehicle as follows. Attach the J1939 interface device cable from your computer to the vehicle diagnostic port (9 pin Deutsch Connector). Turn the vehicle ignition switch ON.

2. Select the TOOLBOX Icon on the desktop. For TOOLBOX 12 Select the ECAS CAN 2 (truck and Bus) from Main screen. For TOOLBOX Plus Select ECAS CAN2 (OptiRide) from Left Menu.
3. The ECAS main screen will be displayed with a pop-up warning note. Select Yes to clear the note.

4. The next pop-up screen will ask you to select the diagnostic interface. Select option 3, CAN Bus front section and truck.



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5. The screen will display information relevant to the ECAS system and the ECAS ECU. A drop-down menu is displayed above a row of icons as follows.

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4.2 Accessing Diagnostic Memory (Fault Codes)

1. To access the ECAS Diagnostic Memory, select Information from the pull-down menu, then select Diagnostic memory to display the diagnostic memory contents. Select Yes in the pop-up ATTENTION warning screen to continue.

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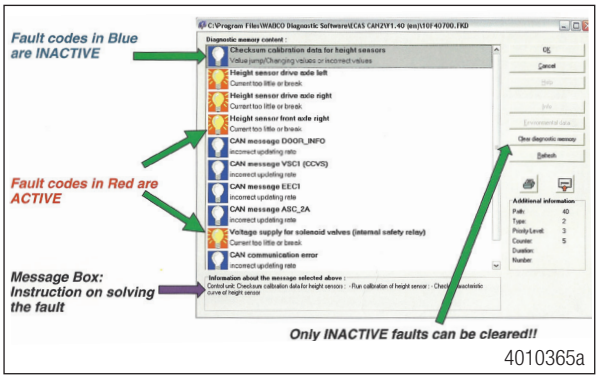
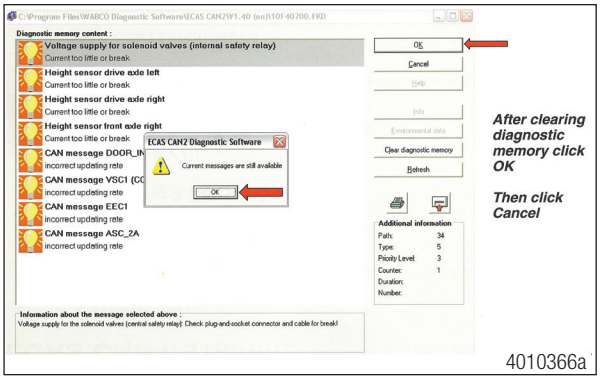
2. The Active faults are displayed in red and the Inactive faults are in blue. Information about the selected (highlighted) fault is shown in the Message Box at the bottom of the screen.



3. The Inactive faults in blue can be cleared by selecting the Clear Diagnostic Memory tab. The Active faults have to be repaired before they can be cleared.

4. The Fault identifiers are listed in the Additional Information box on the bottom right of the screen. The first entry is the SID-marked path, the second is the FMI-marked type, the third entry is priority level and the fourth is the number of occurrences. The list of SID/FMI codes is shown below.



5. After the Inactive faults are cleared, select the OK tab, then the Cancel tab. This will permanently remove the Inactive faults from the ECU memory.

4.3 SPN SID FMI Fault Codes for OptiRide™ ECAS-CAN2

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Control Unit (ECU)								
Internal Fault	274430	254	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact the WABCO Customer Care Center at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 9-16 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 9-16 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Internal Fault	274430	254	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact the WABCO Customer Care Center at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 9-16 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 9-16 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Internal Fault	274430	254	12	Faulty device/ component	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact WABCO North America Customer Care at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 9-16 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 9-16 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Checksum ECU-Specific Data Incorrect	274214	38	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Parameters Incorrect	274215	39	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Calibration Data Height Sensors Incorrect	274216	40	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Re-calibrate the height sensor with TOOLBOX™ Software. If you are unable to save the calibration, follow the diagnostic steps below. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion. Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.

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12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Checksum Calibration Data Height Sensors Incorrect	274216	40	13	Out of calibration	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming/ Calibration or External Resistance	Re-calibrate the height sensor with TOOLBOX™ Software. If you are unable to save the calibration, follow the diagnostic steps below. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect harness at the height sensor and inspect both connector and component for damage, contamination or corrosion. Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both the connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.
Checksum Calibration Data Pressure Sensors	274217	41	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Re-calibrate the pressure sensors with TOOLBOX™ Software. If you are unable to save the calibration, follow the diagnostic steps below. Verify a 0 psi reading on the calibration screen (reading may flicker but should not fluctuate by more than 2 psi). If the readings are fluctuating (more than 2 psi) or static (not 0 psi), isolate the complete pressure sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU. Check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X3/3 - chassis ground = OL With pressure sensors connected, check for continuity: X2/7 - X2/1 = (reading will vary, should not be OL) --> X2/7 - X2/6 = (reading will vary, should not be OL) --> X2/7 - X3/3 = (reading will vary, should not be OL). Reconnect the X-2 and X-3 ECU connectors. Disconnect the harness at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for both axles).
Checksum Permissible Axle Pressures Incorrect	274218	42	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Permissible Axle Pressures Incorrect	274218	42	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Permissible Axle Pressures Incorrect	274218	42	12	Faulty device/ component	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Configuration CAN Data Incorrect	274268	92	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.

4012003a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Parameter Check	274274	98	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Parameter Check	274274	98	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
SAE-CAN Bus								
CAN-Bus OFF (SAE J1939 Data Link)	274407	231	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	If OptiRide™ ECU is only vehicle ECU not communicating, verify J1939 wiring between ECU and J1939 backbone. Resistance should be 60 ohms between J1939 high and low. Verify J1939 low and high are not switched.
CAN Communication Error	274236	60	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	If OptiRide™ ECU is only vehicle ECU not communicating, verify J1939 wiring between ECU and J1939 backbone. Resistance should be 60 ohms between J1939 high and low. Verify J1939 low and high are not switched.
CAN-Message CCVS	274237	61	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify J1939 wiring between the external ECU that is sending the message (Cruise Control/Vehicle Speed) and J1939 backbone.
CAN-Message EEC1	274238	62	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify J1939 wiring between the external ECU that is sending the message (Electronic Engine Controller) and J1939 backbone.
CAN-Message TCO1	274244	68	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify J1939 wiring between the external ECU that is sending the message (Tachograph Main Frame) and J1939 backbone.
Height Sensors								
Driving Axle Left	274195	19	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.

4012004a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left	274195	19	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.
Driving Axle Left	274195	19	5	Low current or open	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.
Driving Axle Left	274195	19	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If the sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect both pressure sensors (height sensor and both pressure sensors disconnected), inspect both connector and pressure sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/1 = OL --> X2/7 - X2/5 = OL --> X2/7 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/7 - Chassis ground = OL --> X2/1 - Chassis ground = OL --> X2/5 - Chassis ground = OL --> X2/6 - Chassis ground = OL --> X3/3 - Chassis ground = OL.

4012005a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Pressure Sensors								
Driving Axle Left	274201	25	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Driving Axle Left	274201	25	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Driving Axle Left	274201	25	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Lifting/Trailing Axle Left	274203	27	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect pressure reading/ Over or Under Inflation of Air bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL.
Lifting/Trailing Axle Left	274203	27	5	Low current or open	Red Lamp/ Check ECAS	Incorrect pressure reading/ Over or Under Inflation of Air bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL.

4012006a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lifting/Trailing Axle Left	274203	27	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL.
Common Power for Pressure Sensors	274222	46	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for both axles). Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X3/3-chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL --> X2/6 - X3/3 = OL.
Common Power for Pressure Sensors	274222	46	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for both axles). Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X3/3-chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL --> X2/6 - X3/3 = OL.
Common Power for Pressure Sensors	274222	46	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for both axles). Key Off- Disconnect both pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X3/3-chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL --> X2/6 - X3/3 = OL.

4012007a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Solenoid Valves								
Driving Axle Left (2/2 Solenoid Valve)	274180	4	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3) If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10 – X2/4 = 15-25 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/10 =OL --> X2/4 - X2/11 =OL --> X2/10 - X2/11 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Left (2/2 Solenoid Valve)	274180	4	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3) If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10 – X2/4 = 15-25 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/10 =OL --> X2/4 - X2/11 =OL --> X2/10 - X2/11 =OL Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012008a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (2/2 Solenoid Valve)	274180	4	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10 – X2/4 = 15-25 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/10 =OL --> X2/4 - X2/11 =OL --> X2/10 - X2/11 =OL Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lifting/Trailing = Tag Axle Left (2/2 Solenoid Valve)	274182	6	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14– X2/4 = 15-25 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012009a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lifting/Trailing = Tag Axle Left (2/2 Solenoid Valve)	274182	6	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14– X2/4 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lifting/Trailing = Tag Axle Left (2/2 Solenoid Valve)	274182	6	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14– X2/4 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 15-25 ohms and 4-3 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012010a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (3/2 Solenoid Valve)	274183	7	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/11– X2/4 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Left (3/2 Solenoid Valve)	274183	7	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/11– X2/4 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012011a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (3/2 Solenoid Valve)	274183	7	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/11– X2/4 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Common Solenoid Valve Power Connection	274210	34	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL --> X2/11 - chassis ground = OL --> X2/14 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL --> X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the drive and tag axle valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012012a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Common Solenoid Valve Power Connection	274210	34	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL --> X2/11 - chassis ground = OL --> X2/14 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL --> X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the drive and tag axle valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Common Solenoid Valve Power Connection	274210	34	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL --> X2/11 - chassis ground = OL --> X2/14 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/11 =OL --> X2/4 - X2/10 =OL --> X2/11 - X2/10 =OL --> X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the drive and tag axle valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012013a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lifting/Trailing = Tag Axle Left (3/2 Solenoid Valve)	274219	43	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/4– X3/6 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lifting/Trailing = Tag Axle Left (3/2 Solenoid Valve)	274219	43	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3) If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/4– X3/6 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

4012014a

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lifting/Trailing = Tag Axle Left (3/2 Solenoid Valve)	274219	43	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	"Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/4– X3/6 = 15-25 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-1 = 15-25 ohms and 4-1 =15-25 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected, check resistance to X2/4 - X2/14 =OL --> X2/4 - X3/6 =OL --> X2/14 - X3/6 =OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL."
Remote Control Unit								
Remote Control Unit	274209	33	11	Fault cannot be identified	Red Lamp/ Check ECAS	No Automatic or Manual Function	Remote Damaged or Faulty	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the harness side of the connector = 9 - 14 v.
UB for Remote Control Unit	274223	47	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the harness side of the connector = 9 - 14 v.
UB for Remote Control Unit	274223	47	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the chassis harness connector = 9 - 14 v. Key Off- Pin 2 to chassis ground varies when going through ECU (not OL). Key Off- X1 ECU connector disconnected. On the chassis harness connector Pin 1 - chassis ground = OL --> Pin 2 - chassis ground = OL --> Pin 3 - chassis ground = OL --> Pin 4 - chassis ground = OL.
Data Line	274224	48	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the chassis harness connector = 9 - 14 v. Key Off- Pin 2 to chassis ground varies when going through ECU (not OL). Key Off- X1 ECU connector disconnected. On the chassis harness connector Pin 1 - chassis ground = OL --> Pin 2 - chassis ground = OL --> Pin 3 - chassis ground = OL --> Pin 4 - chassis ground = OL.

12V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Data Line	274224	48	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the chassis harness connector = 9 - 14 v. Key Off- Pin 2 to chassis ground varies when going through ECU (not OL). Key Off- X1 ECU connector disconnected. On the chassis harness connector Pin 1 - chassis ground = OL --> Pin 2 - chassis ground = OL --> Pin 3 - chassis ground = OL --> Pin 4 - chassis ground = OL.
Clock Line	274225	49	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the chassis harness connector = 9 - 14 v. Key Off- Pin 2 to chassis ground varies when going through ECU (not OL). Key Off- X1 ECU connector disconnected. On the chassis harness connector Pin 1 - chassis ground = OL --> Pin 2 - chassis ground = OL --> Pin 3 - chassis ground = OL --> Pin 4 - chassis ground = OL.
Clock Line	274225	49	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Automatic or Manual Function	Component or Harness Damage	Disconnect and inspect both connector and component for damage, contamination or corrosion. Verify power and ground to the RCU: Key On- Pin 1 -2 on the chassis harness connector = 9 - 14 v. Key Off- Pin 2 to chassis ground varies when going through ECU (not OL). Key Off- X1 ECU connector disconnected. On the chassis harness connector Pin 1 - chassis ground = OL --> Pin 2 - chassis ground = OL --> Pin 3 - chassis ground = OL --> Pin 4 - chassis ground = OL.

4012016a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Control Unit (ECU)								
Internal Fault	254	254	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact the WABCO Customer Care Center at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 18-30 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 18-30 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Internal Fault	254	254	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact the WABCO Customer Care Center at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 18-30 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 18-30 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Internal Fault	254	254	12	Faulty device/ component	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Internal Fault	Verify correct power and ground readings at the X-1 connector. Contact the WABCO Customer Care Center at 855-228-3203 with exact readings. Battery Voltage: Key On- X1/10 – X1/12 = 18-30 volts DC. Ignition Voltage: Key Off- X1/7 – X1/12 = 18-30 volts DC. Ground Resistance: Key Off- X1/12 - Chassis ground = less than 2 ohms.
Checksum ECU-Specific Data Incorrect	38	38	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Parameters Incorrect	39	39	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Calibration Data Height Sensors Incorrect	40	40	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Re-calibrate the height sensor with TOOLBOX™ Software. If you are unable to save the calibration, follow the height sensor diagnostic steps.
Checksum Calibration Data Height Sensors Incorrect	40	40	13	Out of calibration	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Re-calibrate the height sensor with TOOLBOX™ Software. If you are unable to save the calibration, follow the height sensor diagnostic steps.
Checksum Calibration Data Pressure Sensors	41	41	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Re-calibrate the height sensor with TOOLBOX™ Software. If you are unable to save the calibration, follow the height sensor diagnostic steps.
Checksum Permissible Axle Pressures Incorrect	42	42	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Checksum Permissible Axle Pressures Incorrect	42	42	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Permissible Axle Pressures Incorrect	42	42	12	Faulty device/ component	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Configuration CAN Data Incorrect	92	92	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Checksum Calibration Data Acceleration Sensor	95	95	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Parameter Check	98	98	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
Parameter Check	98	98	11	Fault cannot be identified	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function	Incorrect Programming or Calibration	Download .ECU file from the ECU and contact the WABCO Customer Care Center at 855-228-3203 or email the file along with a precall sheet to wnacustomercare@wabco-auto.com.
SAE-CAN-Bus								
CAN-Bus OFF (SAE J1939 Data Link)	231	231	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	If the OptiRide™ ECU is the only vehicle ECU not communicating, verify the J1939 wiring between the ECU and J1939 backbone. Resistance should be 60 ohms between J1939 high and low. Verify J1939 low and high are not switched.
CAN Communication Error	60	60	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	If the OptiRide™ ECU is the only vehicle ECU not communicating, verify the J1939 wiring between the ECU and J1939 backbone. Resistance should be 60 ohms between J1939 high and low. Verify J1939 low and high are not switched.
CAN Message CCVS	61	61	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message EEC1	62	62	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message EBC2	63	63	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message Air1 (ECAM)	65	65	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
CAN Message TCO 1	68	68	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message Time/Date	69	69	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message Articulation Information	73	73	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message ASC2_C	74	74	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message ASC2_A	75	75	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message ASC2_B	76	76	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message ASC6_A	77	77	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message ASC6_B	78	78	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message Door Control	79	79	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message EBC1	80	80	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message VDHR	101	101	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.
CAN Message HRW	103	103	9	Incorrect updating rate	Red Lamp/ Check ECAS	No Automatic/ CAN-Based Function	CAN Network Disconnected or Damaged	Verify the J1939 wiring between the external ECU that is sending the message and the J1939 backbone.

4012019a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Height Sensors								
Front Axle Right	16	16	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/5 = OL --> X2/7 - Chassis ground = OL --> X2/5 - Chassis ground = OL.
Front Axle Right	16	16	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/5 = OL --> X2/7 - Chassis ground = OL --> X2/5 - Chassis ground = OL.
Front Axle Right	16	16	5	Low current or open	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/5 = OL --> X2/7 - Chassis ground = OL --> X2/5 - Chassis ground = OL.

4012020a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Front Axle Right	16	16	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/5 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/5 = OL --> X2/7 - Chassis ground = OL --> X2/5 - Chassis ground = OL.
Front Axle Left	17	17	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X3/7 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X3/7 = OL --> X2/7 - Chassis ground = OL --> X3/7 - Chassis ground = OL.
Front Axle Left	17	17	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X3/7 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X3/7 = OL --> X2/7 - Chassis ground = OL --> X3/7 - Chassis ground = OL.

4012021a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Front Axle Left	17	17	5	Low current or open	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X3/7 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X3/7 = OL --> X2/7 - Chassis ground = OL --> X3/7 - Chassis ground = OL.
Front Axle Left	17	17	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X3/7 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X3/7 = OL --> X2/7 - Chassis ground = OL --> X3/7 - Chassis ground = OL.
Driving Axle Right	18	18	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/8 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/8 = OL --> X2/7 - Chassis ground = OL --> X2/8 - Chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Right	18	18	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/8 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/8 = OL --> X2/7 - Chassis ground = OL --> X2/8 - Chassis ground = OL.
Driving Axle Right	18	18	5	Low current or open	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/8 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/8 = OL --> X2/7 - Chassis ground = OL --> X2/8 - Chassis ground = OL.
Driving Axle Right	18	18	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/8 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/8 = OL --> X2/7 - Chassis ground = OL --> X2/8 - Chassis ground = OL.

4012023a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left	19	19	2	Value jump/ Changing values or incorrect values	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/9 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/9 = OL --> X2/7 - Chassis ground = OL --> X2/9 - Chassis ground = OL.
Driving Axle Left	19	19	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/9 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/9 = OL --> X2/7 - Chassis ground = OL --> X2/9 - Chassis ground = OL.
Driving Axle Left	19	19	5	Low current or open	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/9 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/9 = OL --> X2/7 - Chassis ground = OL --> X2/9 - Chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left	19	19	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS - Amber Lamp/ Susp Air	No Automatic or Manual Function/ Incorrect Ride Height	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the height sensor and inspect both connector and component for damage, contamination or corrosion. Disconnect both the X-2 and X-3 connector at the ECU: Key Off- Resistance from X2/7 - X2/9 = 70-110 ohms. If the reading is out of spec, verify correct resistance at the height sensor. With X-2 and X-3 disconnected, disconnect the harness at the height sensor and inspect both connector and component for damage, contamination or corrosion: Key Off- Across pin 1 and 2 = 70-110 ohms. If sensor readings are correct, isolate the complete height sensor circuit: Key Off- Disconnect both the X-2 and X-3 connectors at the ECU, then disconnect all height sensors and inspect both connector and sensor for damage, contamination or corrosion. Key Off- Resistance from X2/7 - X2/9 = OL --> X2/7 - Chassis ground = OL --> X2/9 - Chassis ground = OL.
Pressure Sensors								
Front Axle	22	22	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/3 = OL.
Front Axle	22	22	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/3 = OL.
Front Axle	22	22	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/3 = OL.
Driving Axle Right	24	24	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/2 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/2 = OL.

4012025a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Right	24	24	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/2 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/2 = OL.
Driving Axle Right	24	24	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/2 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/3 = OL --> X2/1 - X2/2 = OL.
Driving Axle Left	25	25	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Driving Axle Left	25	25	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Driving Axle Left	25	25	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X2/6 = OL --> X2/1 - X2/6 = OL.
Trailing Axle Right	26	26	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/4 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/4 = OL --> X2/1 - X3/4 = OL.

4012054a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Trailing Axle Right	26	26	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/4 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/4 = OL --> X2/1 - X3/4 = OL.
Trailing Axle Right	26	26	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/3 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/3 = OL --> X2/1 - X3/3 = OL.
Trailing Axle Left	27	27	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/4 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/4 = OL --> X2/1 - X3/4 = OL.
Trailing Axle Left	27	27	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/4 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/4 = OL --> X2/1 - X3/4 = OL.
Trailing Axle Left	27	27	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v. Key Off- Disconnect pressure sensor and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X3/4 - chassis ground = OL. Key Off- Check X2/7 - X2/1 = OL --> X2/7 - X3/4 = OL --> X2/1 - X3/4 = OL.
Common Power for Pressure Sensors	46	46	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles). Key Off- Disconnect all pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X2/3-chassis ground = OL --> X3/3 - chassis ground = OL --> X3/4 - chassis ground = OL.

4012055a

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Common Power for Pressure Sensors	46	46	5	Low current or open	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles). Key Off- Disconnect all pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X2/3-chassis ground = OL --> X3/3 - chassis ground = OL --> X3/4 - chassis ground = OL.
Common Power for Pressure Sensors	46	46	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect Pressure Reading/ Over or Under Inflation of Air Bag	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles). Key Off- Disconnect all pressure sensors and disconnect both the X-2 and X-3 connectors at the ECU check resistance from X2/7 - chassis ground = OL --> X2/1 - chassis ground = OL --> X2/6 - chassis ground = OL --> X2/3-chassis ground = OL --> X3/3 - chassis ground = OL --> X3/4 - chassis ground = OL.
Acceleration Sensors								
Acceleration Sensor	97	97	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	Incorrect reading	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles).
Acceleration Sensor	97	97	3	Low current or open	Red Lamp/ Check ECAS	Incorrect reading	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles).
Acceleration Sensor	97	97	3	Current too high or short circuit to ground	Red Lamp/ Check ECAS	Incorrect reading	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the sensor and inspect both connector and component for damage, contamination or corrosion. Key On- Check for DC voltage from pin 1 - 2 on the sensor connector = 8 - 30 v (repeat for all axles).
Security Device								
Sidewalk Detector	29	29	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Kneeling Function	Component or Harness Failure/ Damage/ Corrosion	Optional component-refer to the OEM diagram and Diag X3/4 to chassis ground 24v.
Sidewalk Detector	29	29	5	Low current or open	Red Lamp/ Check ECAS	No Kneeling Function	Component or Harness Failure/ Damage/ Corrosion	Optional component-refer to the OEM diagram and Diag X3/4 to chassis ground 24v.
Sidewalk Detector	29	29	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Kneeling Function	Component or Harness Failure/ Damage/ Corrosion	Optional component-refer to the OEM diagram and Diag X3/4 to chassis ground 24v.

24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Solenoid Valves								
Front Axle Right (2/2 Solenoid Valve)	1	1	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/15– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/15 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/15 =OL --> X2/4 - X3/2 =OL --> X2/15 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Front Axle Right (2/2 Solenoid Valve)	1	1	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion: Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/15– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/15 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/15 =OL --> X2/4 - X3/2 =OL --> X2/15 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Front Axle Right (2/2 Solenoid Valve)	1	1	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/15– X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/15 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/15 =OL --> X2/4 - X3/2 =OL --> X2/15 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Front Axle Left (2/2 Solenoid Valve)	2	2	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/12– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/12 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Front Axle Left (2/2 Solenoid Valve)	2	2	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/12– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/12 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Front Axle Left (2/2 Solenoid Valve)	2	2	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/12– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/12 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Right (2/2 Solenoid Valve)	3	3	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/13– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/13 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/13 =OL --> X2/4 - X3/2 =OL --> X2/13 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Right (2/2 Solenoid Valve)	3	3	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/13– X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/13 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/13 =OL --> X2/4 - X3/2 =OL --> X2/13 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Right (2/2 Solenoid Valve)	3	3	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/13– X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/13 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/13 =OL --> X2/4 - X3/2 =OL --> X2/13 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Left (2/2 Solenoid Valve)	4	4	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/10 =OL --> X2/4 - X3/2 =OL --> X2/10 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (2/2 Solenoid Valve)	4	4	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/10 =OL --> X2/4 - X3/2 =OL --> X2/10 - X3/2 = OL. Key Off - Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Left (2/2 Solenoid Valve)	4	4	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/10– X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/10 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/10 =OL --> X2/4 - X3/2 =OL --> X2/10 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Trailing Axle Right (2/2 Solenoid Valve)	5	5	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/6 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/6 =OL --> X2/4 - X3/2 =OL --> X3/6 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Trailing Axle Right (2/2 Solenoid Valve)	5	5	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/6 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/6 =OL --> X2/4 - X3/2 =OL --> X3/6 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Trailing Axle Right (2/2 Solenoid Valve)	5	5	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/6 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/6 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/6 =OL --> X2/4 - X3/2 =OL --> X3/6 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Trailing Axle Left (2/2 Solenoid Valve)	6	6	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/1 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/1 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/1 =OL --> X2/4 - X3/2 =OL --> X3/1 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Trailing Axle Left (2/2 Solenoid Valve)	6	6	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/1 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/1 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/1 =OL --> X2/4 - X3/2 =OL --> X3/1 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Trailing Axle Left (2/2 Solenoid Valve)	6	6	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion: Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/1 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/1 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X3/1 =OL --> X2/4 - X3/2 =OL --> X3/1 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (3/2 Solenoid Valve)	7	7	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/11 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/11 =OL --> X2/4 - X3/2 =OL --> X2/11 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Driving Axle Left (3/2 Solenoid Valve)	7	7	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/11 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/11 =OL --> X2/4 - X3/2 =OL --> X2/11 - X3/2 = OL. Key Off - Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Driving Axle Left (3/2 Solenoid Valve)	7	7	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off - Verify the resistance from X2/11 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/11 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/11 =OL --> X2/4 - X3/2 =OL --> X2/11 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lifting/Trailing Axle (3/3 Solenoid Valve)	8	8	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lifting/Trailing Axle (3/3 Solenoid Valve)	8	8	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lifting/Trailing Axle (3/3 Solenoid Valve)	8	8	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lower Lifting/ Trailing Axle (3/3 Solenoid Valve)	9	9	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4 v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Lower Lifting/ Trailing Axle (3/3 Solenoid Valve)	9	9	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4 v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Front Axle Central (3/2 Solenoid Valve)	44	44	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect the all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off - Verify the resistance from X3/2– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/2 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off - Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Front Axle Central (3/2 Solenoid Valve)	44	44	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect the all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X3/2– X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/2 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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24V Fault	SPN	SID	FMI	Description	Lamp	Reaction	Cause	Action/Checks
Lower Lifting/ Trailing Axle (3/3 Solenoid Valve)	9	9	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off- Verify the resistance from X2/14 – X2/4 = 60-90 ohms. If the reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X2/14 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/14 =OL --> X2/4 - X3/2 =OL --> X2/14 - X3/2 = OL. Key Off- Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.
Common Solenoid Valve Power Connection	34	34	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3).
Common Solenoid Valve Power Connection	34	34	5	Low current or open	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3).
Common Solenoid Valve Power Connection	34	34	6	Current too high or short circuit to ground	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3).
Front Axle Central (3/2 Solenoid Valve)	44	44	3	Overvoltage or short circuit to +Ubatt	Red Lamp/ Check ECAS	No Charging/ Venting	Component or Harness Failure/ Damage/ Corrosion	Disconnect at the valve and inspect both connector and component for damage, contamination or corrosion. Key On- Verify the voltage on the chassis harness from pin 2 - to chassis = 4v - 7v and 4 - to chassis = 4v - 7v (depending on OEM vs Aftermarket installation, voltage may be found only on pin 2-3). If the voltage is off, disconnect the all valves and re-check. With the chassis harness reconnected, disconnect the X/2 and X/3 connectors. Key Off - Verify the resistance from X3/2– X2/4 = 60-90 ohms. If reading is out of spec, check at the valve: Resistance from pin 2-3 = 60-90 ohms and 4-3 = 60-90 ohms. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance to ground: X2/4 - chassis ground = OL --> X3/2 - chassis ground = OL. Key Off- With X/2 - X/3 ECU connectors disconnected and the valve disconnected. Check resistance from X2/4 - X2/12 =OL --> X2/4 - X3/2 =OL --> X2/12 - X3/2 = OL. Key Off - Check each pin on the valve to chassis ground: Pin1- chassis ground = OL --> Pin2- chassis ground = OL --> Pin3- chassis ground = OL --> Pin4- chassis ground = OL.

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4.4 Setting Vehicle Suspension Height Levels (Calibration)

The ECAS ECU needs to know to what level the vehicle's chassis must be during driving (normal ride height). In addition it also needs to know the highest and lowest possible chassis levels (upper and lower ride height). On buses, the kneeling levels also need to be set (kneeling level). The three primary vehicle suspension height levels selected by the manufacturer have to be set in the ECAS ECU memory using the diagnostic software. The three primary levels that need to be set are:

1. Normal Ride Level Height – level vehicle maintains during driving
2. Upper Level Height – highest possible suspension level
3. Lower Level Height – lowest possible suspension level

On buses and coaches, a kneeling level may also be required.

4.5 Vehicle Preparation

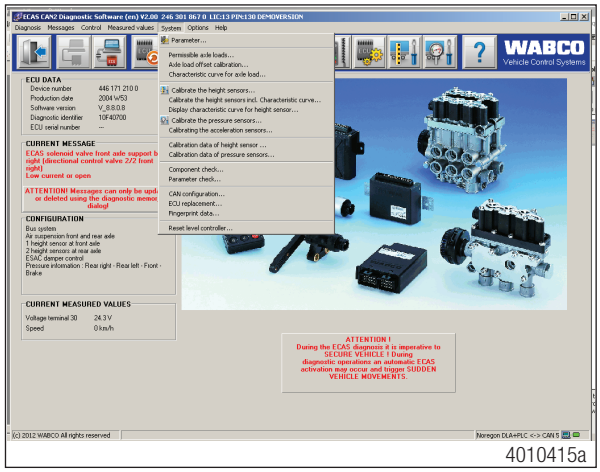
Observe the following to prepare the vehicle.

Park the vehicle on a level surface. Release the vehicle park and service brakes in order to prevent any distortion in the vehicle suspension. Block the wheels to prevent the vehicle from moving.

- Verify zero pressure sensor calibration.
- Verify Normal Level 1 (NL1) conforms to the vehicle's designed normal ride level determined by the OEM.
- Check the counts displayed (Timer Tick/mm) to be optimized if appropriate.
- Using the diagnostic software tool and the arrows for charging and venting the bellows located in the start calibration screen, raise and lower the vehicle several times in order to adapt the level control system to the vehicle.
- Verify Normal Level 2 (NL2) to be defined per OEM specifications as vehicle low ride height.
- Verify Normal Level 3 (NL3) to be defined per OEM specifications as vehicle high ride height.

4.6 24V Vehicle Height Calibration Procedure Using PC Diagnostics

1. To perform the Distance/Height Sensor Calibration, select System from the pull-down menu, then select the Calibrate the distance sensors option. This will open the Start Calibration screen. Select OK in the pop-up CAUTION screen to continue.



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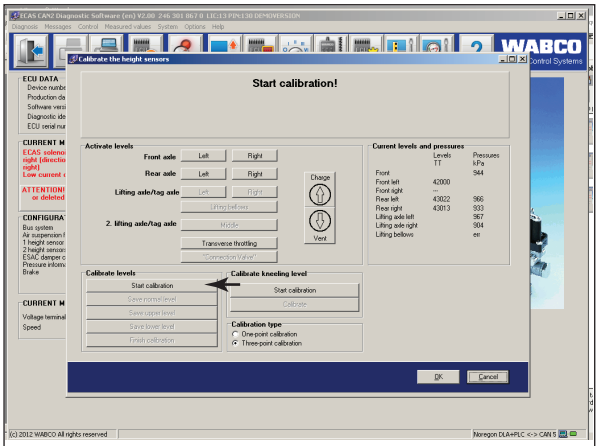
2. Under Calibrate levels, select Start Calibration. The Start Calibration screen will be displayed with a Enter PIN/PIN2 SCREEN pop-up. Enter your PIN number in the PIN2 window and select OK.



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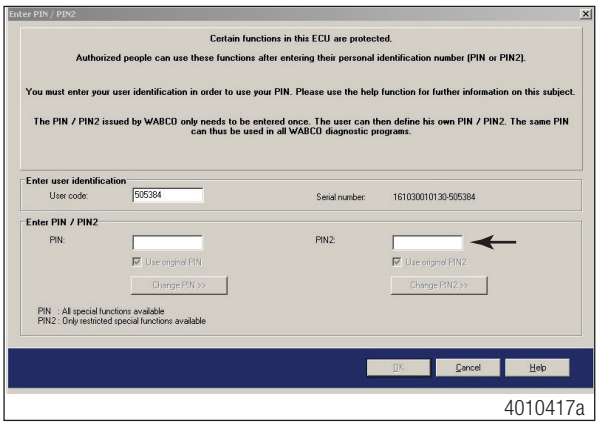

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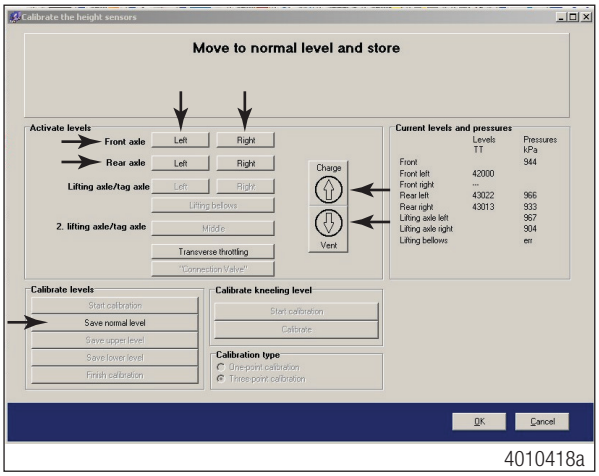
3. Select one axle, either front, rear or tag. Then select the left side, right side or both sides. Selecting the axles and sides will enable the selected air bellows to be inflated or deflated by the Charge and Vent keys. Select the desired air bellows and raise or lower the vehicle until the manufacturer's normal ride level is measured.



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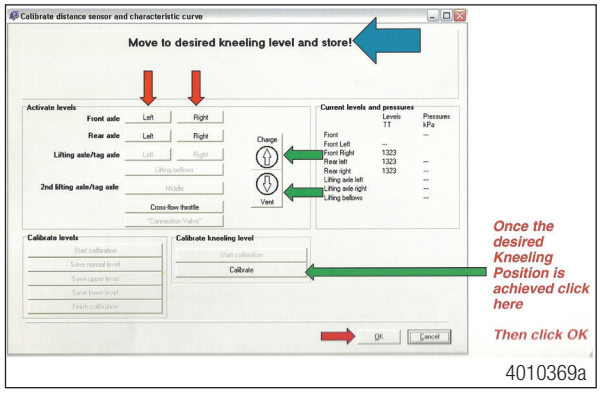
4. Note the TT numbers and pressures for all axle locations. With the vehicle at the normal ride level, select the Save normal level button.

5. The screen will move to the Calibration of Upper Level Limit followed by Calibration of Lower Level Limit. Follow the same procedure as used for the Normal Ride Height Calibration in order to calibrate these levels.

6. If a bus kneeling level is to be calibrated, select Start calibration under Calibrate Kneeling Level. Under the Activate Levels, select the front axle and again raise or lower the axle using the Charge or Vent keys until the desired kneeling level is reached. Once the desired kneeling position is achieved, select Calibrate, then click OK.



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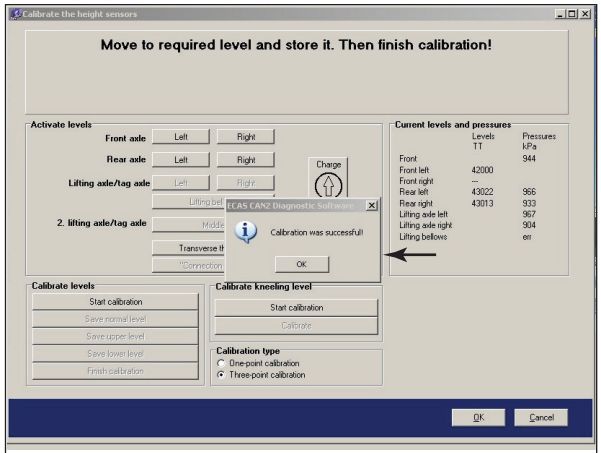
7. Once all levels in the vehicle have been achieved and saved, select Finish Calibration. A pop-up screen will appear indicating a successful calibration.



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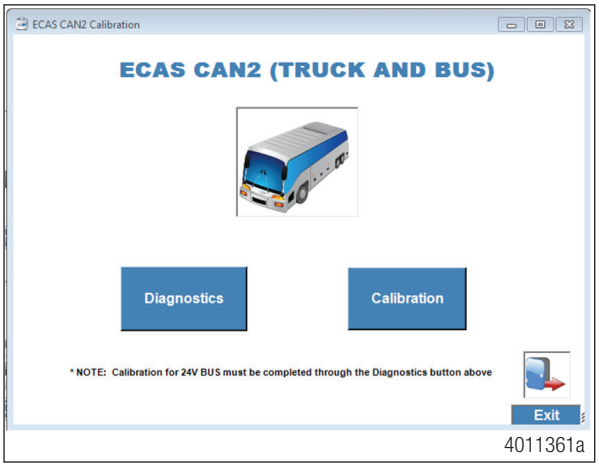
4.7 12V Vehicle Height Calibration Procedure Using PC Diagnostics

4.7.1 Pin Free ECAS Calibration and Testing

⚠ WARNING

When activating components, canceling or interrupting the function may result in automatic control occurring or trigger unexpected movements. Do not stand or place limbs near suspension or pinch points. The ECAS system will not function and both lamps will be illuminated until the system is calibrated.

1. Connect a computer with TOOLBOX™ Software 12.2 or newer to the vehicle and select ECAS CAN2 (Truck and Bus).
2. Select the Calibration button.



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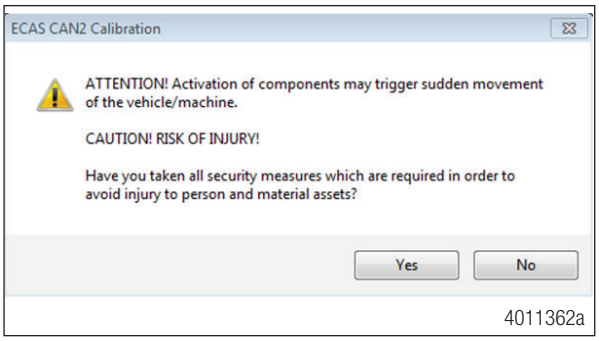
3. Read the pop-up Caution screen and click “OK” to continue.



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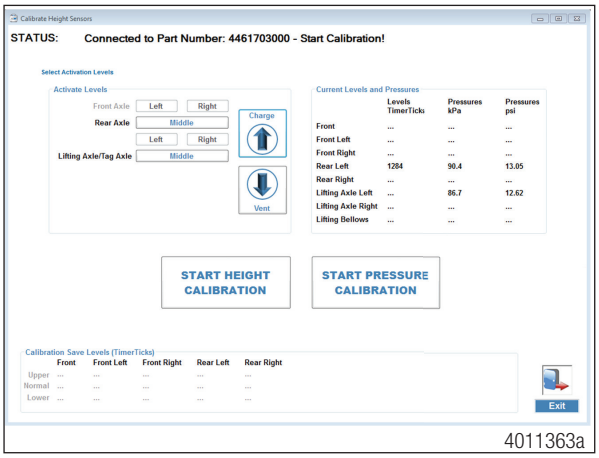
4. Verify the connection in the upper left corner of the screen. The Status will display the base part number.

4.7.2 Verify Zero Pressure Sensor Calibration

1. To perform the zero pressure sensor calibration, select “START PRESSURE CALIBRATION”.



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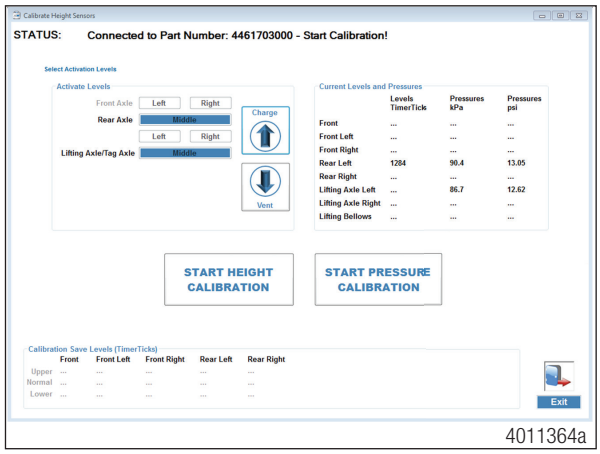
2. A pop-up will direct you to “Exhaust all air bags to calibrate the pressure sensors to 0 kPa”. Click “OK”.

3. This will automatically activate the “Rear Axle” and “Lifting Axle/Tag Axle” levels for pressure sensor calibration.
4. Lower the vehicle until the air bags are exhausted and save the values to the ECU. A pop-up will state that “Pressure values successfully saved to ECU”. Click “OK”. The values are now saved to the ECAS ECU.

4.7.3 Vehicle Height Calibration Procedure

1. To perform the Distance/Height Sensor Calibration, verify that both “Rear Axle “and “Lifting Axle/Tag Axle” levels are selected, then press “START HEIGHT CALIBRATION”. NOTE: You will not be able to proceed without selecting “Rear Axle” and “Lifting Axle/Tag Axle”.



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2. **Normal Level Calibration**

   Using the “Charge” and “Vent” keys, raise or lower the vehicle until the manufacturer’s Normal Ride Level is measured. Note: To ensure a more accurate calibration, do not manually charge or vent the air bags without the TOOLBOX™ Software 11.0 or higher during calibration.

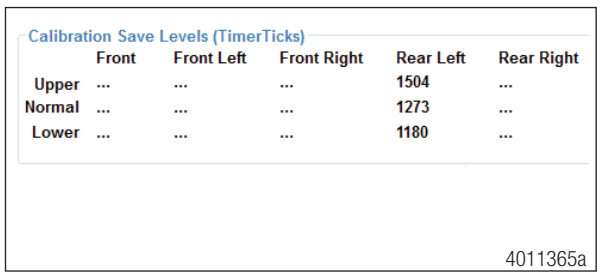
3. Select “SAVE NORMAL LEVEL” to save the calibration level.
4. **Upper/Lower Level Calibration**

   The button and “STATUS” will continue to the Calibration of “Upper Level Limit” followed by “Calibration of Lower Level Limit”. Raise or lower the vehicle until the manufacturer’s Upper/Lower Level is measured. Note: To ensure a more accurate calibration, do not manually charge or vent the air bags without the TOOLBOX™ Software 12.2 or newer during calibration.

5. Select Save Upper then lower level to calibrate.
6. **Complete the Calibration**

   Once all levels on the vehicle have been achieved and saved, select Finish Calibration. A pop-up screen will appear indicating a successful calibration.

7. The saved levels will be displayed in ticks, at the bottom of the screen under “Calibration Save Levels (TIMER TICKS)”.



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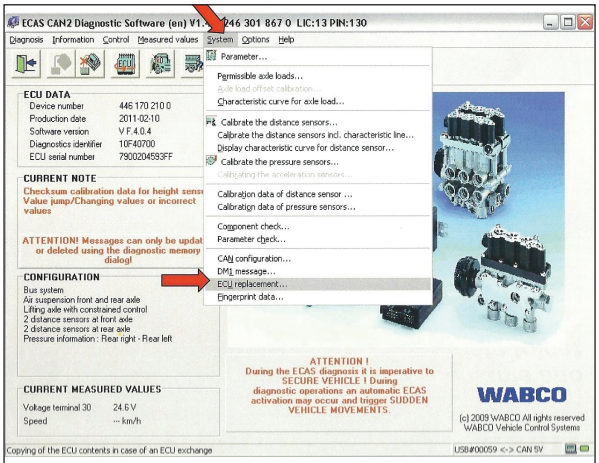
4.8 Downloading Parameter and Calibration Settings from File to ECAS ECU

4.8.1 (Requires PIN Level ECU Access)

When replacing an OptiRide™ ECU, it may be necessary to reset the correct vehicle parameter and height calibration.

1. From the ECAS main screen, select System and from the drop-down menu, select ECU replacement.



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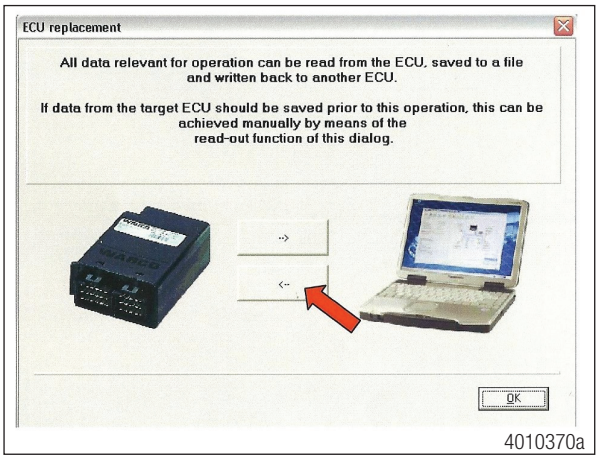
2. The ECU Replacement screen will be displayed. This screen gives you the choice of saving data from the ECU to a file or data from a file to the ECU. To write data to the ECU, select the arrow extending from the laptop to the ECU.



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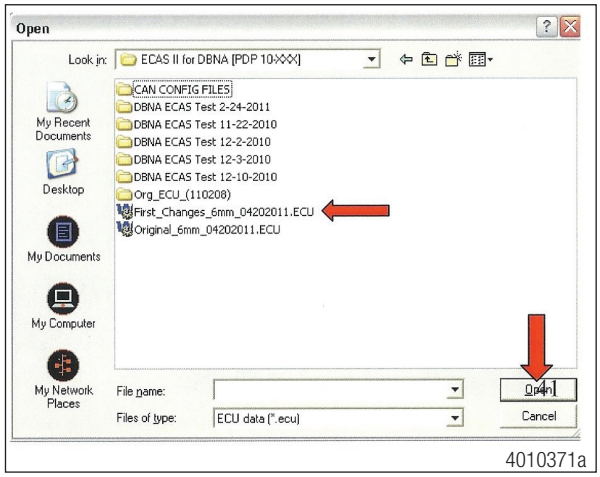
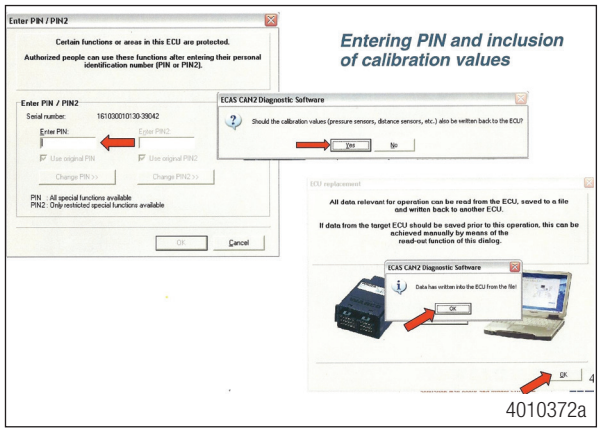
3. Select the appropriate file from the vehicle manufacture and select Open.



4. The next screen will ask for you to enter your PIN in the Enter PIN1 box. If it was previously entered, you will not be asked to enter it again. It will ask if the calibration values (pressure sensors, distance sensors, etc.) should also be written to the ECU. Only PIN 1 level can perform this operation.



5. The ECAS CAN2 Diagnostic Software dialog box will indicate if the data was successfully written to the ECU. Select OK.

4.9 Testing Components and Circuits

4.9.1 Test Instructions

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

⚠ CAUTION

When troubleshooting or testing the system at the ECU connectors, use caution not to damage the electrical connectors.

Refer to the Volt-Ohm Meter (VOM) manufacturer's instructions on how to use the VOM correctly.

1. Turn the vehicle ignition OFF.
2. Disconnect the appropriate connector from the ECAS ECU.
3. Check ECU part number and select the correct table.
4. Refer to the "Ignition Status" column of the table. If necessary, turn the vehicle's ignition to the ON position. The vehicle engine does not need to be running.
5. Check that the air system pressure is above the compressor cut-in pressure.
6. Set the VOM to the appropriate setting that will accommodate the expected range listed in the "Measurement/Reaction" column of the table.
7. For each step in the table, compare the VOM reading or reaction with the acceptable values or reactions listed in the "Measurement/Reaction" column. Write down the results of your comparisons.
8. Repair or replace wiring or components when the measurements or reactions do not meet the required results. Confirm that the repairs or replacement provides the correct required results.

5 Component Replacement

5.1 Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

⚠ WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury can result.

⚠ CAUTION

Due to the active standby feature on the OptiRide™ ECAS, disconnect the height sensor or disconnect the OptiRide™ ECAS ECU prior to replacing or working on OptiRide™ ECAS components. Failure to do so may trigger unexpected movements.

5.2 Component Removal and Installation

5.2.1 ECU Replacement

Replacing the ECU requires ECAS calibration using WABCO TOOLBOX 12.2 or newer Software. The appropriate parameters selected for the vehicle may also need to be downloaded from a file obtained from the vehicle manufacturer. Refer to the instructions in Section 4.

Refer to the vehicle manufacturer's service literature for ECU location and removal/installation procedures.

5.2.1.1 Removal

1. Apply the parking brake and turn the ignition to the OFF position.
2. Place blocks under the front and rear wheels to prevent the vehicle from moving.
3. Remove any covers and/or equipment that restrict access to the ECAS ECU.
4. Disconnect the three wiring harness connectors from the ECAS ECU.
5. Remove any fasteners that attach the ECAS ECU to the vehicle. Remove the ECAS ECU.

5.2.1.2 Installation

1. Install the ECAS ECU using the manufacturer's mounting hardware. Tighten the fasteners per the manufacturer's recommendations.
2. Install the three wiring harness connectors to the ECAS ECU.
3. Replace any covers and/or equipment that were removed to gain access to the ECU.
4. Follow the ECAS calibration procedure described in Section 4.
5. When the ECAS calibration procedure is completed, the vehicle should be at the normal ride level and the ECAS lamp should be off.
6. Remove the blocks.
7. Test the ECAS installation.

5.3 Valve Block Replacement

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

⚠ WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury can result.

⚠ WARNING

Release all air from the suspension system before you remove any components. Pressurized air can cause serious personal injury.

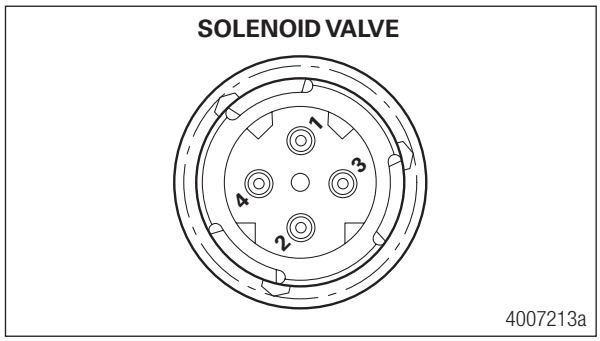
Refer to the vehicle manufacturer's service information for the ECAS valve location and removal/installation procedures.

5.3.1 Removal

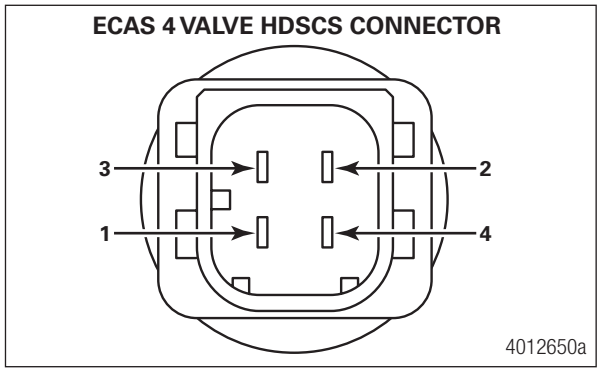
1. Apply the parking brake and turn the ignition to the OFF position.
2. Place blocks under the front and rear wheels to prevent the vehicle from moving.
3. If necessary, raise the vehicle off the ground and place safety stands under the chassis.
4. Note the location of the wiring connectors attached to the block and disconnect them.
5. Relieve air line pressure by bleeding all the air from the appropriate supply tank.
6. Mark the air lines for future reference when installing the new valve.
7. Disconnect the air lines from the valve block.
8. Loosen the mounting bolts that attach the valve block to the mounting bracket or the vehicle frame.
9. Remove the valve block.

5.3.2 Installation

1. Attach the new valve block to the mounting bracket or the vehicle frame.
2. Install the mounting bolts and tighten to 76 in-lb (8.5 Nm).
3. Connect the air lines to the valve block as marked during the removal process.
4. Connect the wiring connectors to the valve block as noted during the removal process.
5. Test the valve functions. Refer to the vehicle manual to reference all ECAS functions such as normal ride height, raise and lower vehicle, etc.



Pin	1-Ch Valve Circuit	2-Ch Valve Circuit
1	3/2 Valve	3/2 Valve
2	Power	2/2 Valve
3	2/2 Valve	2/2 Valve
4	Power	Power



Pin	1-Ch Valve Circuit	2-Ch Valve Circuit
1	3/2 Valve	3/2 Valve
2	Not Used	2/2 Valve
3	2/2 Valve	2/2 Valve
4	Power	Power

Component Replacement

5.4 Height Sensor Replacement

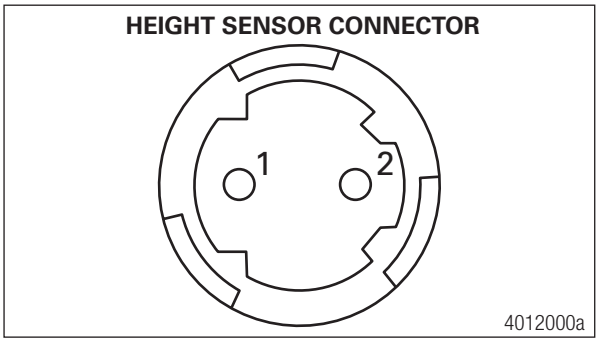
The ECAS height sensors are mounted between the vehicle chassis rails and the axle housing. WABCO currently supplies two types of height sensors. The older version has a replaceable lever arm and the newer version has a fixed lever arm. Replace a height sensor only if the diagnostic process indicates a faulty sensor or physical damage is present. Replacing a height sensor may require ECAS suspension height level recalibration using the PC diagnostic software program.

5.4.1 Removal

1. Apply the parking brake and turn the ignition to the OFF position.
2. Place blocks under the front and rear wheels to prevent the vehicle from moving.
3. If necessary, raise the vehicle off the ground and place safety stands under the chassis.
4. Disconnect the wiring connector from the height sensor.
5. Disconnect the linkage rod from the lever arm. Note the position of the large ribs on the older-style sensor cylinder. The replacement sensor has to be mounted with the sensor cylinder in the same orientation.
6. Remove the bolts that attach the height sensor to the mounting bracket on the chassis.
7. Remove the height sensor.

5.4.2 Installation

1. If replacing an older-style height sensor, attach the lever arm in the same orientation on the new sensor as it was on the sensor being replaced. Tighten the lever arm to 31 in-lb (3.5 Nm). When attaching the lever to the height sensor, the large ribs on the sensor cylinder must be aligned correctly with the lever.
2. Position the sensor on the mounting bracket on the vehicle chassis.
3. Install the height sensor mounting bolts and tighten to 9 ft-lb (12 Nm) or the vehicle manufacturer's specifications.
4. Reattach the linkage rod to the lever arm.
5. Connect the wiring connector to the height sensor.
6. Check the vehicle normal ride level. If the vehicle does not return to the correct level, follow the ECAS Calibration procedure described in Section 4.



Pin	Circuit
1	Signal to ECU
2	Ground from ECU

5.5 Pressure Sensor Replacement

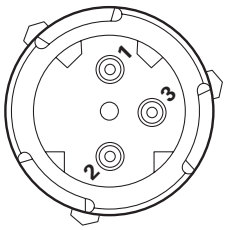
5.5.1 Removal

1. Apply the parking brake and turn the ignition to the OFF position.
2. Place blocks under the front and rear wheels to prevent the vehicle from moving.
3. Relieve air line pressure by bleeding all the air from the appropriate supply tank.
4. Mark the air lines for future reference when installing the new valve.
5. Disconnect the wiring connector from the pressure sensor.
6. Remove the pressure sensor from the air bellows fitting.

5.5.2 Installation

1. Attach the pressure sensor to air bellows fitting and tighten to specification.
2. Connect the air lines to the pressure sensor as marked during the removal process.
3. Connect the wiring connectors to the valve block as noted during the removal process.
4. Test the pressure sensor functions. Refer to the vehicle manual to reference all ECAS functions such as normal ride height, raise and lower vehicle, etc.

PRESSURE SENSOR CONNECTOR



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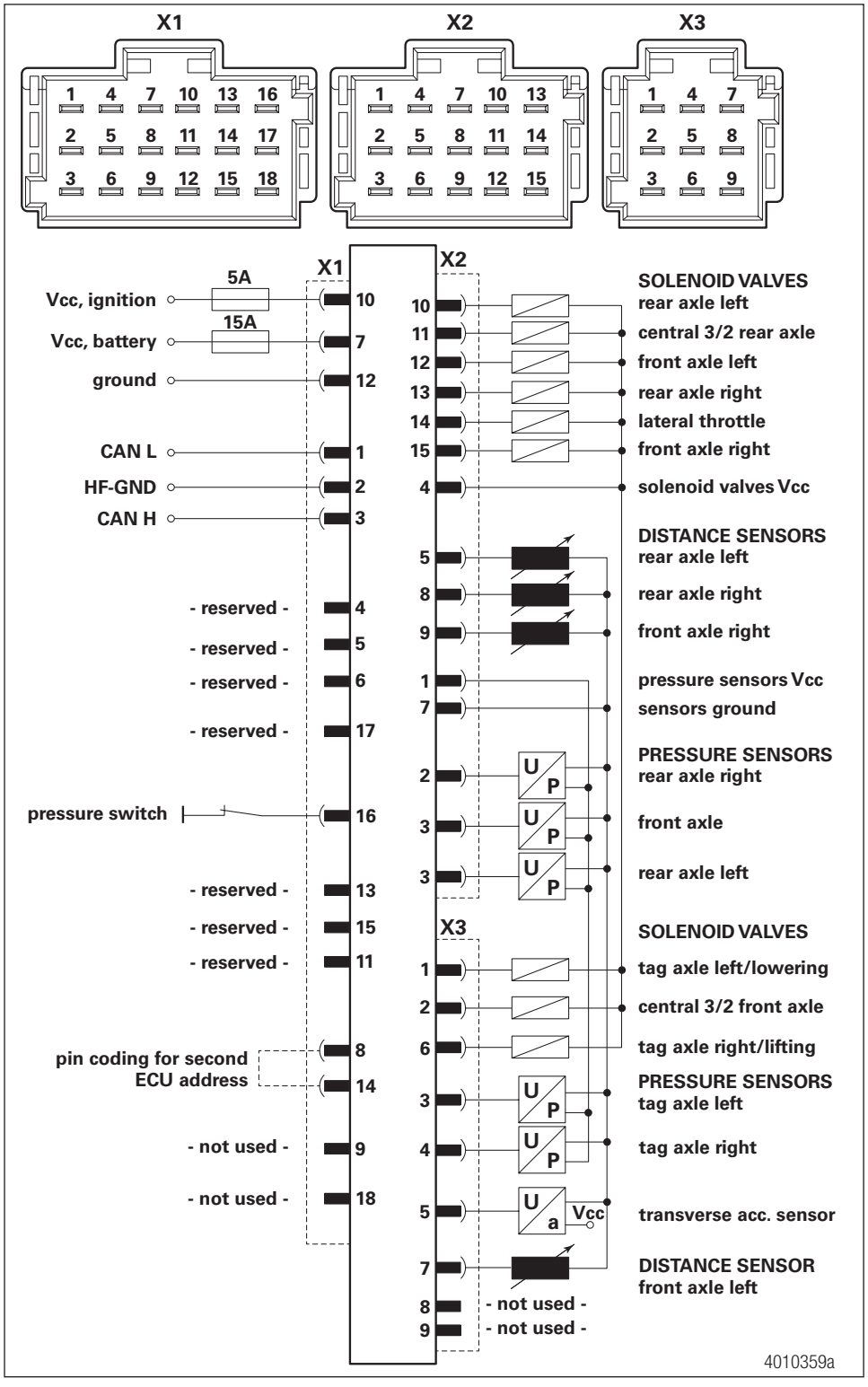
Pin	Circuit
1	Power Supply
2	Ground
3	Pressure Signal

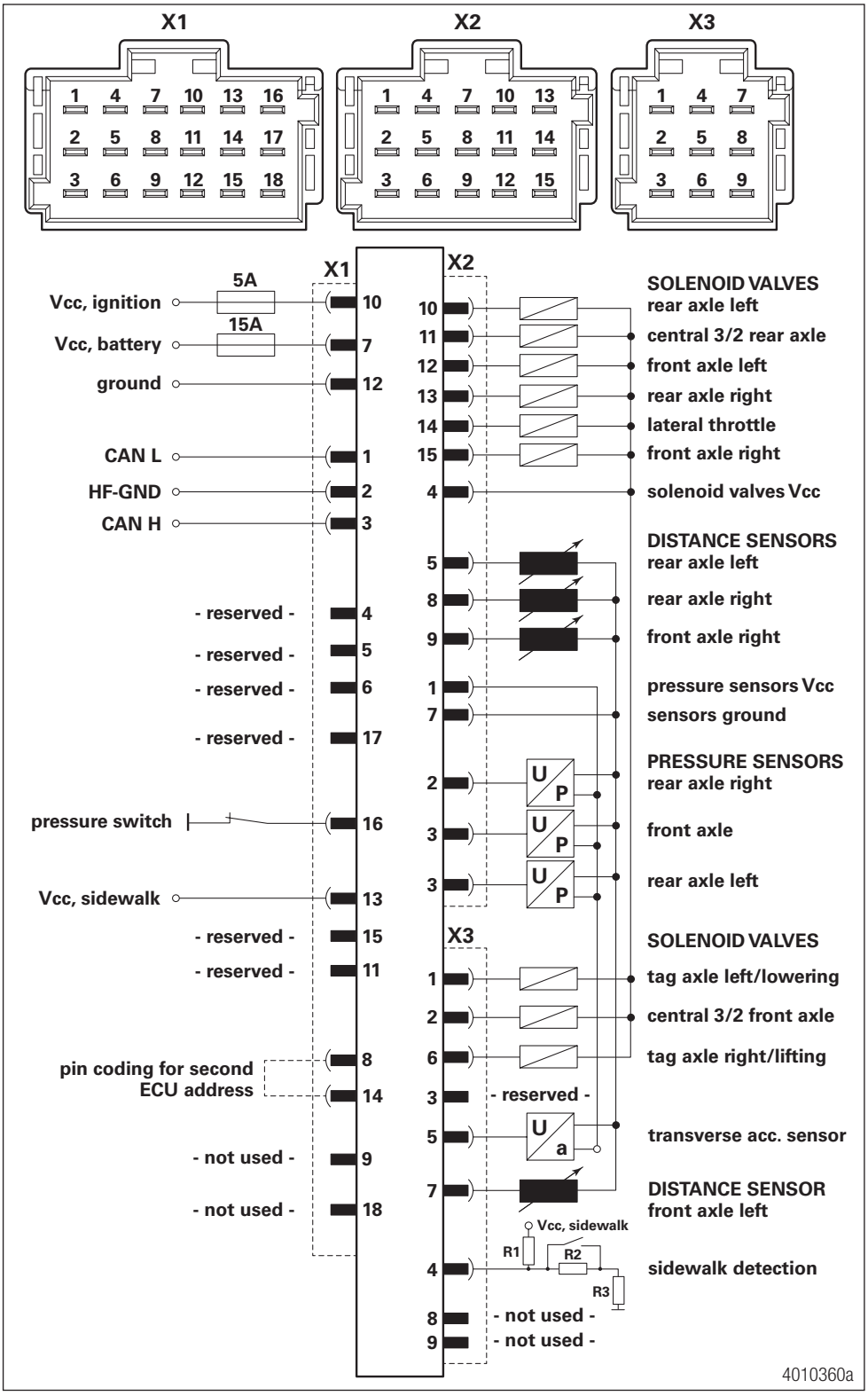
6 System and Component Diagrams

6.1 Diagrams

6.1.1 ECU Part Number 446 170 210 0 Connection Scheme for Pressure Ratio

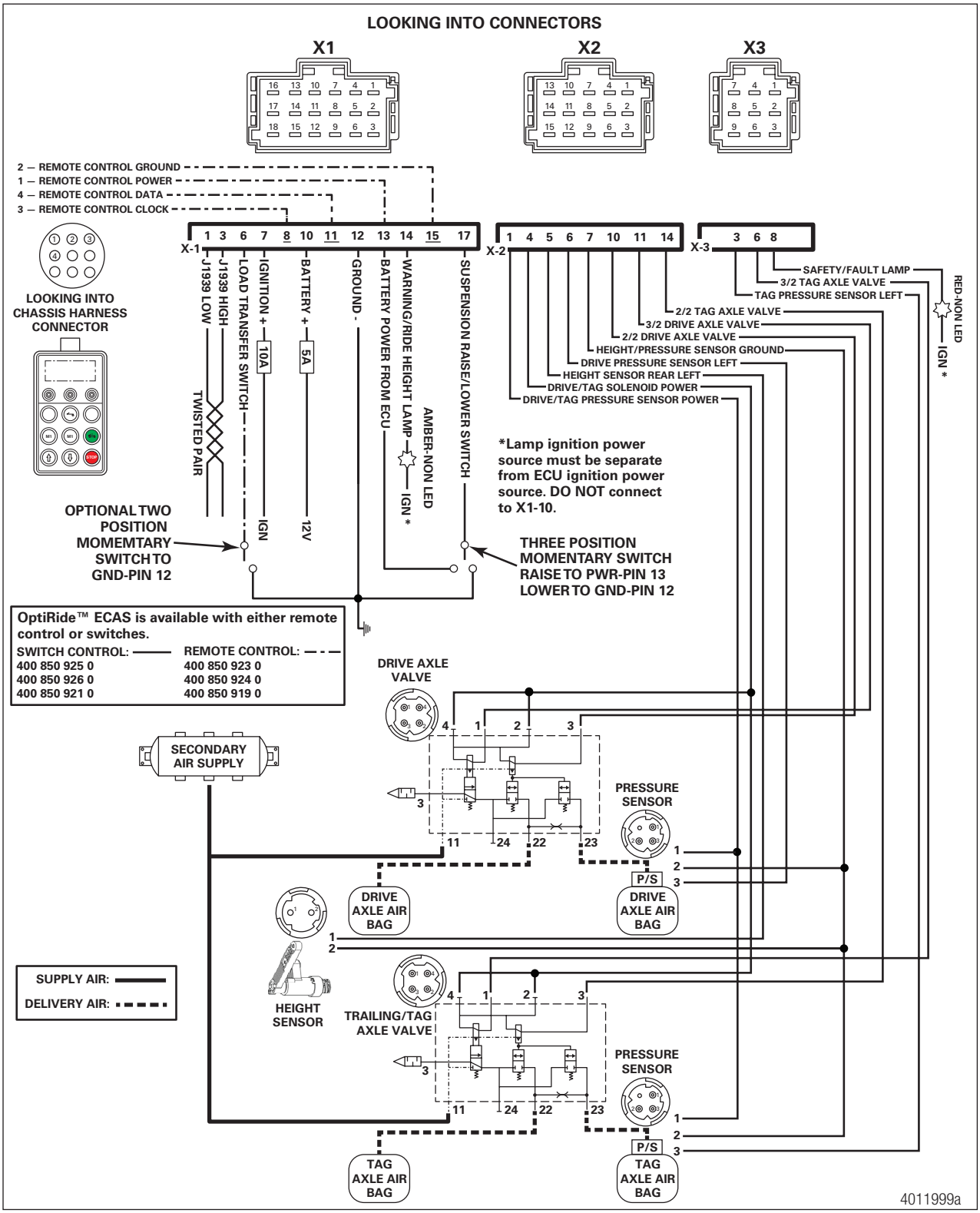


6.1.2 ECU Part Number 446 170 210 0 Connection Scheme for Pressure Equality

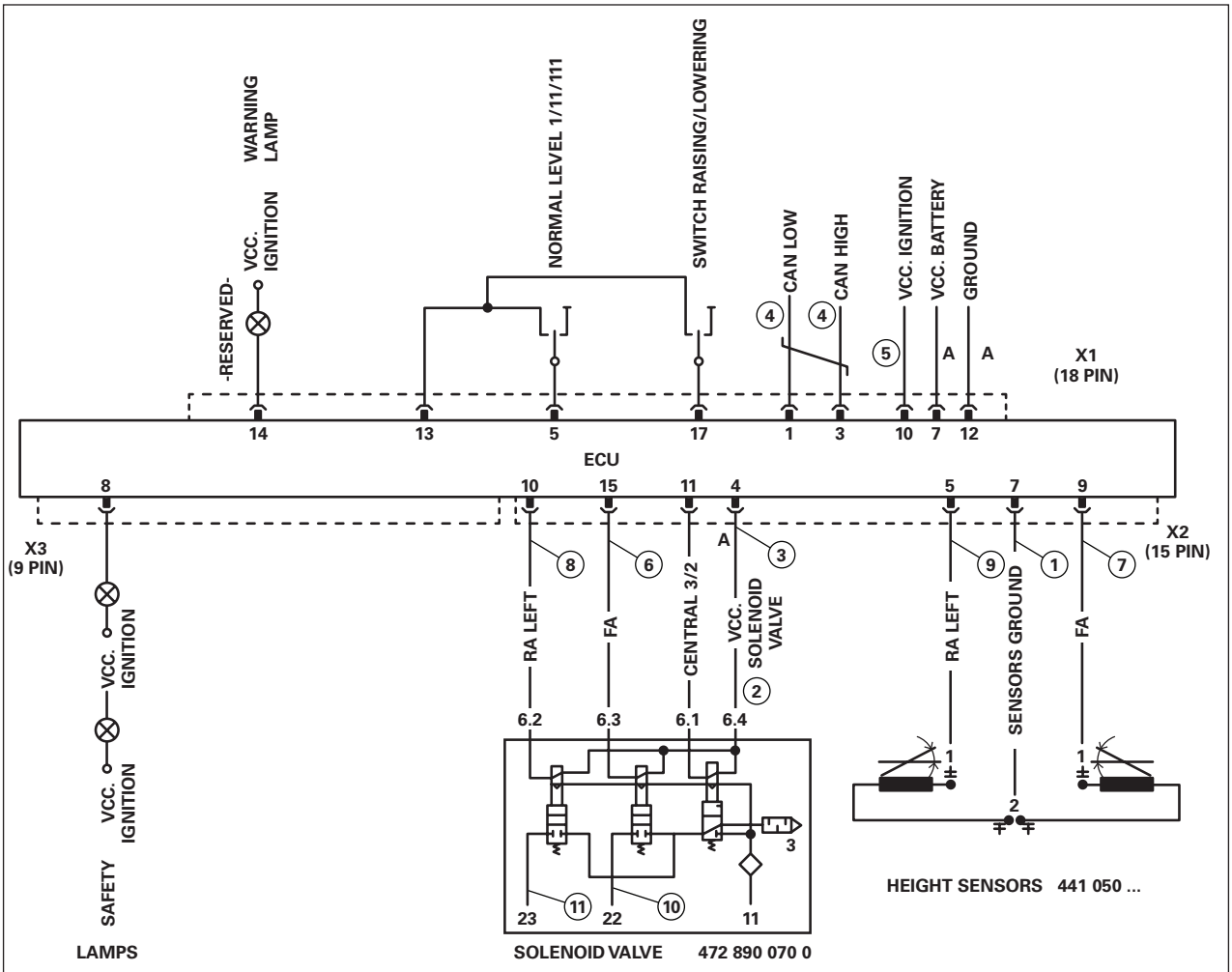


System and Component Diagrams

6.1.3 ECU Part Number 446 170 300 0 Connection Scheme for 12-Volt Truck



6.1.4 ECU Part Number 446 170 300 0 Connection Scheme for 12-Volt Shuttle Bus (4x2)



(1) CENTRAL COLLECTING POINT, DISTANCE <1 M FROM ECU
HEIGHT SENSOR CABLES SHOULD BE TWISTED IN PAIRS

(2) PIN 6.4 CONNECTED WITH (3)

(3) $+U_B$ FOR SOLENOID VALVES

(4) ACCORDING TO SAE J1939

(5) IGNITION

ALL DECLARATIONS OF NOMINAL WIDTHS/CROSS SECTIONS ARE RECOMMENDATIONS.
A = 2.5 MM 2
ALL ELECTRIC WIRES WITHOUT DECLARATION OF CROSS SECTION A = 0.75 MM
ALL PIPES WITHOUT DECLARATION OF NOMINAL WIDTHS NW = 7 MM

(6)	SOLENOID VALVE FRONT AXLE WITH CONNECTION TO	PIN X 2/15
(7)	DISTANCE SENSOR FRONT AXLE WITH CONNECTION TO	PIN X 2/9
(8)	SOLENOID VALVE REAR AXLE WITH CONNECTION TO	PIN X 2/10
(9)	DISTANCE SENSOR REAR AXLE LEFT WITH CONNECTION TO	PIN X 2/5
(10)	VALVE DELIVERY PORT 22 WITH CONNECTION TO	FRONT AXLE BELLOWS
(11)	VALVE DELIVERY PORT 23 WITH CONNECTION TO	REAR AXLE BELLOWS

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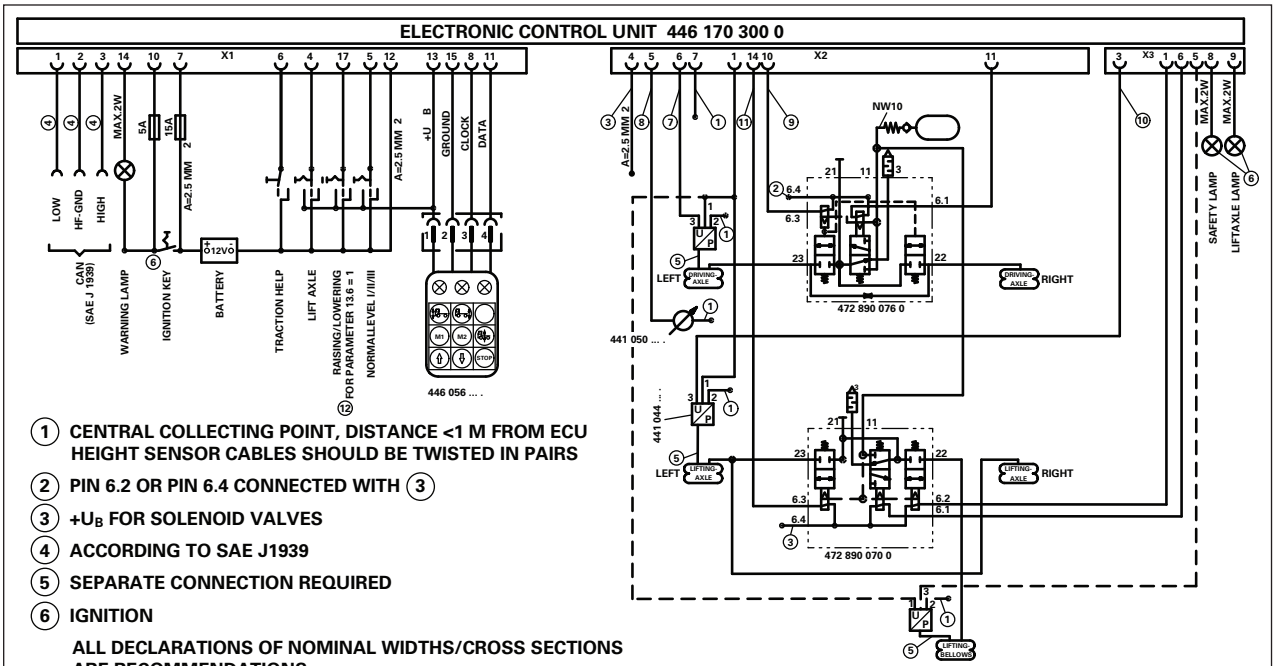
System and Component Diagrams

6.1.5 ECU Part Number 446 170 300 0 Connection Scheme for 12-Volt Lift Axle Truck with ECAS 4



(1) CENTRAL COLLECTING POINT, DISTANCE <1 M FROM ECU
HEIGHT SENSOR CABLES SHOULD BE TWISTED IN PAIRS

(2) PIN 6.2 OR PIN 6.4 CONNECTED WITH (3)

(3) $+U_B$ FOR SOLENOID VALVES

(4) ACCORDING TO SAE J1939

(5) SEPARATE CONNECTION REQUIRED

(6) IGNITION

ALL DECLARATIONS OF NOMINAL WIDTHS/CROSS SECTIONS ARE RECOMMENDATIONS.

ALL ELECTRIC WIRES WITHOUT DECLARATION OF CROSS SECTION A = 0.75 MM

ALL PIPES WITHOUT DECLARATION OF NOMINAL WIDTHS NW = 7 MM

		LEFT	RIGHT
		PAR. 2.2 = 0	PAR. 2.2 = 1
(7)	PRESSURE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/6	PIN X 2/2
(8)	DISTANCE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/5	PIN X 2/8
(9)	SOLENOID VALVE DRIVING AXLE WITH CONNECTION TO	PIN X 2/10	PIN X 2/13
(10)	PRESSURE SENSOR TRAILING AXLE WITH CONNECTION TO	PIN X 3/3	PIN X 3/4
(11)	SOLENOID VALVE TRAILING AXLE WITH CONNECTION TO	PIN X 2/14	PIN X 2/12
(12)	SWITCH PRESSURE RATION 1/11 FOR PARAMETER 13.6 = 0	PIN X 1/17	

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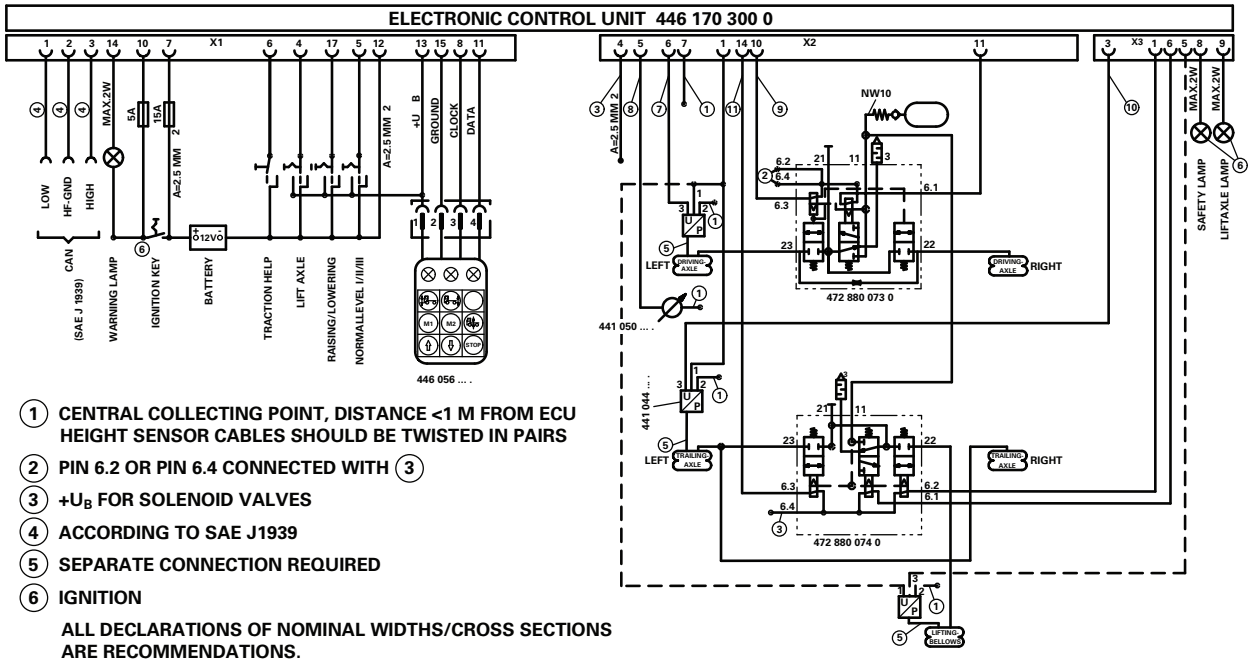
6.1.6 ECU Part Number 446 170 300 0 Connection Scheme for 12-Volt Lift Axle Truck with ECAS 3 Valve



(1) CENTRAL COLLECTING POINT, DISTANCE <1 M FROM ECU
HEIGHT SENSOR CABLES SHOULD BE TWISTED IN PAIRS

(2) PIN 6.2 OR PIN 6.4 CONNECTED WITH (3)

(3) $+U_B$ FOR SOLENOID VALVES

(4) ACCORDING TO SAE J1939

(5) SEPARATE CONNECTION REQUIRED

(6) IGNITION

ALL DECLARATIONS OF NOMINAL WIDTHS/CROSS SECTIONS ARE RECOMMENDATIONS.

ALL ELECTRIC WIRES WITHOUT DECLARATION OF CROSS SECTION A = 0.75 MM

ALL PIPES WITHOUT DECLARATION OF NOMINAL WIDTHS NW = 7 MM

		LEFT	RIGHT
		PAR. 2.2 = 0	PAR. 2.2 = 1
(7)	PRESSURE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/6	PIN X 2/2
(8)	DISTANCE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/5	PIN X 2/8
(9)	SOLENOID VALVE DRIVING AXLE WITH CONNECTION TO	PIN X 2/10	PIN X 2/13
(10)	PRESSURE SENSOR TRAILING AXLE WITH CONNECTION TO	PIN X 3/3	PIN X 3/4
(11)	SOLENOID VALVE TRAILING AXLE WITH CONNECTION TO	PIN X 2/14	PIN X 2/12

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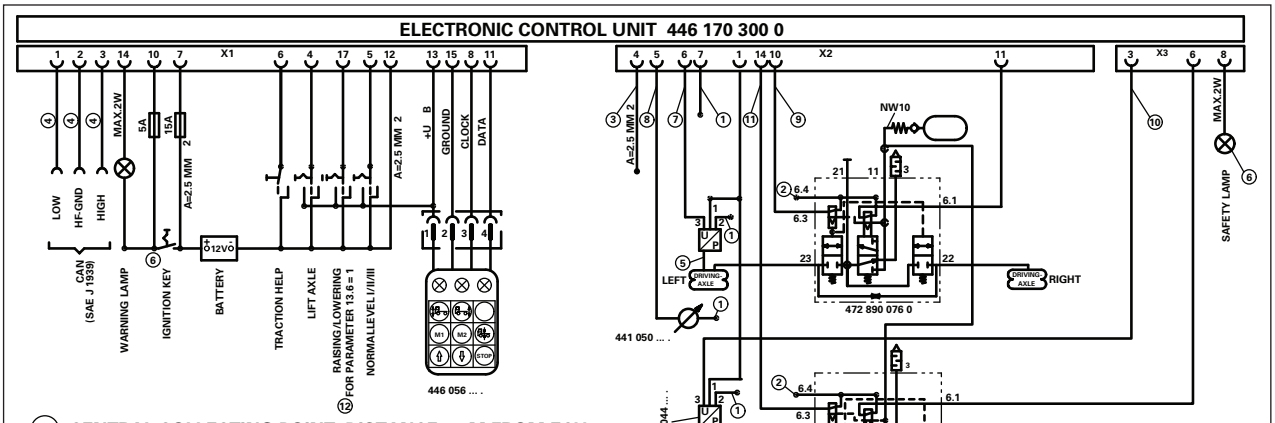
System and Component Diagrams

6.1.7 ECU Part Number 446 170 300 0 Connection Scheme for 12-Volt Truck with ECAS 4 Valve



(1) CENTRAL COLLECTING POINT, DISTANCE <1 M FROM ECU
HEIGHT SENSOR CABLES SHOULD BE TWISTED IN PAIRS

(2) PIN 6.2 OR PIN 6.4 CONNECTED WITH (3)

(3) $+U_B$ FOR SOLENOID VALVES

(4) ACCORDING TO SAE J1939

(5) SEPARATE CONNECTION REQUIRED

(6) IGNITION

ALL DECLARATIONS OF NOMINAL WIDTHS/CROSS SECTIONS ARE RECOMMENDATIONS.

ALL ELECTRIC WIRES WITHOUT DECLARATION OF CROSS SECTION A = 0.75 MM

ALL PIPES WITHOUT DECLARATION OF NOMINAL WIDTHS NW = 7 MM

		LEFT	RIGHT
		PAR. 2.2 = 0	PAR. 2.2 = 1
(7)	PRESSURE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/6	PIN X 2/2
(8)	DISTANCE SENSOR DRIVING AXLE WITH CONNECTION TO	PIN X 2/5	PIN X 2/8
(9)	SOLENOID VALVE DRIVING AXLE WITH CONNECTION TO	PIN X 2/10	PIN X 2/13
(10)	PRESSURE SENSOR TRAILING AXLE WITH CONNECTION TO	PIN X 3/3	PIN X 3/4
(11)	SOLENOID VALVE TRAILING AXLE WITH CONNECTION TO	PIN X 2/14	PIN X 2/12
(12)	SWITCH PRESSURE RATION 1/11 FOR PARAMETER 13.6 = 0	PIN X 1/17	

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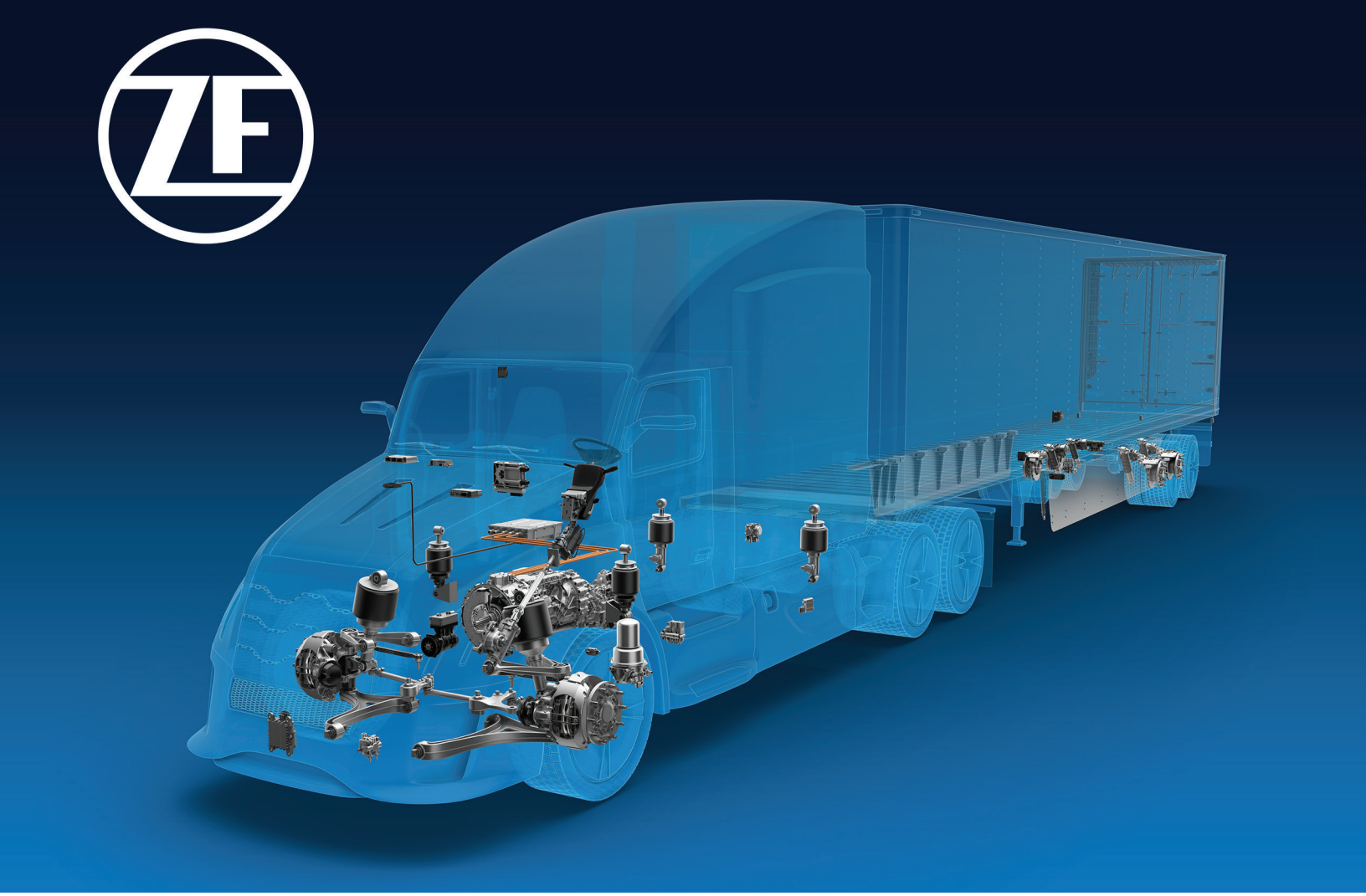

For further details, contact the
WABCO Customer Care Center at 855-228-3203.

About CVS Division

ZF's Commercial Vehicle Solutions (CVS) division is helping shape the future of commercial transportation ecosystems. Our mission is to be the preferred global technology partner to the commercial vehicle industry. Powerfully combining ZF's commercial vehicle systems expertise, extensive technology portfolio and global operations, the division serves the full commercial vehicle industry value chain. As the automotive industry progresses towards an increasingly autonomous, connected, and electrified (ACE) future, ZF's CVS division innovates, integrates and supplies components and advanced control systems that help make commercial vehicles and fleets operate more safely and sustainably. CVS unites ZF's former Commercial Vehicle Technology and Commercial Vehicle Control Systems divisions, the latter being formed following ZF's acquisition of WABCO in Spring 2020.

For more information, visit: **www.zf.com/cv**