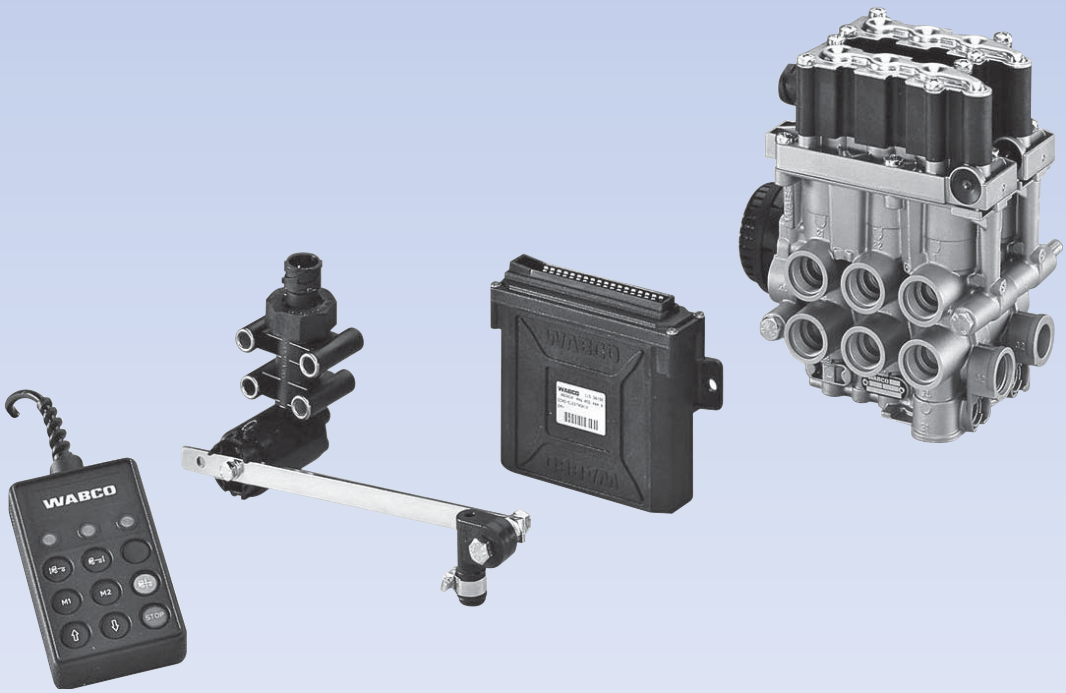
ELECTRONICALLY CONTROLLED AIR SUSPENSION (ECAS) FOR TRUCKS

MAINTENANCE MANUAL



WABCO

About This Manual

This manual contains the correct service and repair procedures for Meritor WABCO's Electronically Controlled Air Suspension (ECAS) for trucks. This manual describes the ECAS system for 6 X 2 and 6 X 4 vehicles with rear air suspensions.

Before You Begin

1. Read and understand all instructions and procedures before you begin to service components.
2. 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.
3. Follow your company's maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Hazard Alert Messages and Torque Symbols

⚠ WARNING

A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

⚠ CAUTION

A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components.

This symbol alerts you to tighten fasteners to a specified torque value.

How to Obtain Additional Maintenance and Service Information

On the Web

Visit Literature on Demand at wabco-auto.com to access and order product, service, aftermarket, and warranty literature for WABCOs truck, trailer and specialty vehicle components. WABCO publications are also available on our website:

www.wabco-auto.com

How to Obtain Tools and Supplies Specified in This Manual

Call WABCOs Commercial Vehicle Aftermarket at 888-725-9355 to obtain WABCO tools and supplies.

Contents

Contents

This manual contains service information for the WABCO Electronically Controlled Air Suspension (ECAS) for 6 x 2 and 6 x 4 trucks with rear air suspensions.

Overview

ECAS System

The electronically controlled air suspension system is compatible with the WABCO Antilock Braking System (ABS) and Automatic Traction Control (ATC) system, C and D versions.

Most trucks manufactured prior to March 1997 have C version ABS/ATC. Figure 1.1.

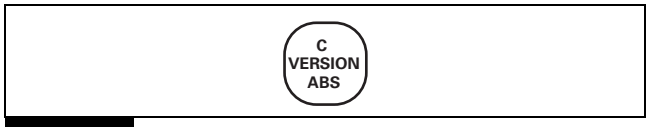


Figure 1.1

Trucks manufactured March 1, 1997 and later have D version ABS/ATC. Figure 1.2.

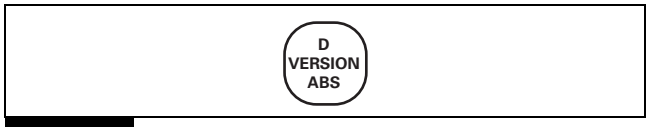


Figure 1.2

In some cases, ECAS functions differently depending upon the ABS/ATC version installed on the truck. Any differences are explained in this manual.

The electronically controlled air suspension maintains an accurate leveling of chassis height through the use of a sensor, electronic control unit (ECU) and a solenoid valve. The ECU uses sensor information to determine vehicle chassis height. If the height needs to be adjusted, the ECU controls pressure within the air bags by actuating a solenoid valve. In this way, ECAS is able to quickly adjust chassis height to a predetermined normal level. This automatic function can occur while the vehicle is in motion or stationary. Figure 1.3.

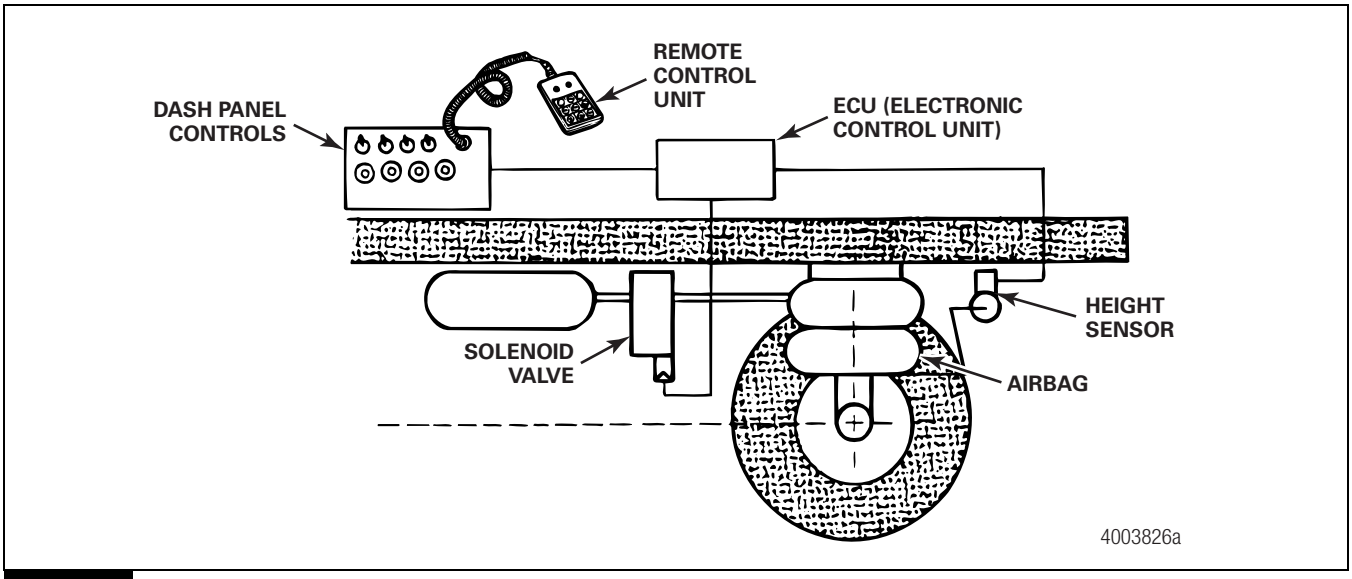


Figure 1.3

A remote control unit allows the vehicle operator to raise and lower the suspension within preset upper and lower stop limits. In addition to the preset upper and lower stop limits, the operator may also program two different vehicle heights into the ECAS ECU. These two selections must be between the preset upper and lower stop limits. These heights can be achieved by pushing a single button on the remote control.

ECAS provides an optional automatic load transfer feature for 6 x 2 vehicles. When a low traction situation is detected, ECAS will automatically increase traction to the drive axle by briefly decreasing pressure in the tag axle air bags. The vehicle must be equipped with WABCO ABS or ABS/ATC to activate the optional ECAS automatic load transfer feature.

The ECU also provides ECAS with self-diagnostic and reprogramming capabilities. Detected component or system failures are stored in the ECU's memory and can be retrieved using the WABCO diagnostic controller. The reprogramming feature allows the setting of preset normal, upper and lower levels, as well as other parameters. Reprogramming is done by using the WABCO diagnostic controller.

Components

Electronic Control Unit (ECU)

The ECU contains a microprocessor, memory, input conditioners and output drivers. A 35-pin connector links the ECU with other ECAS components, the vehicle's communication datalink and, depending upon the ECAS generation, with the ABS/ATC ECU, an additional speed sensor and the stop light switch. Figure 1.4.

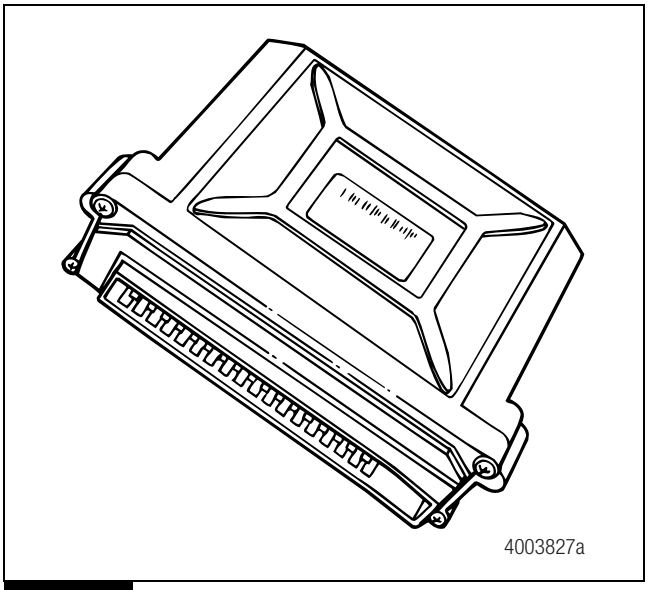


Figure 1.4

The ECU is responsible for:

- Constantly monitoring incoming signals
- Comparing the signal to nominal values stored in memory
- Determining the required controlling reaction if the actual level differs from the nominal level
- Actuating the solenoid valve unit to adjust the level
- Managing and storing index levels (normal levels, memory levels, etc.)
- Monitoring the function of all system components and storing information about any detected errors
- Receiving data from the remote control unit
- Exchanging data with the diagnostic controller

Height Sensor

A height sensor, mounted on the chassis, provides the ECU with a chassis height signal that determines the distance between the chassis and the axle. The sensor housing contains a coil in which an armature is moved up and down. The armature is connected to a lever which is attached to the drive axle housing by a linkage rod. When the distance between the chassis and the axle changes, the lever turns, causing the armature to move into or out of the coil within the sensor. This modifies the signal produced by the sensor. Figure 1.5.

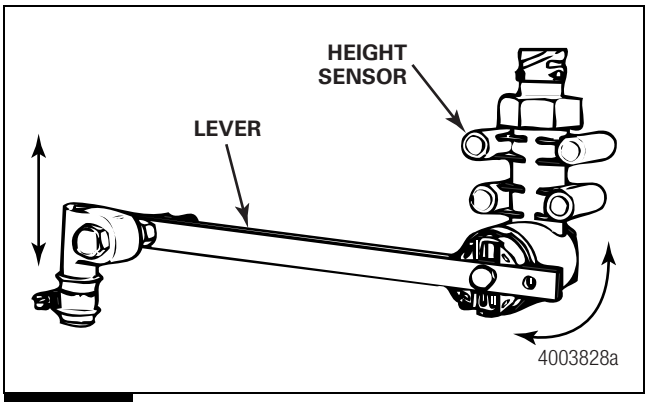


Figure 1.5

Solenoid Valve Unit

Special solenoid valve blocks have been developed for the ECAS system. Several solenoid valves are combined into one compact block. This saves space and reduces installation time. The solenoid valves are actuated by the ECU. The solenoids convert the voltage into a pressurizing or venting process which either increases or reduces the air volume within the air bags. If not activated, the valves are closed and maintain the air bags volume. The solenoid valve unit is usually mounted on a chassis rail. A four-pin connector links it to the ECU. The solenoid valve includes air ports to supply air or vent air from the air bags through the air lines. The configuration of the air lines and ports will vary with vehicle applications. Figure 1.6.

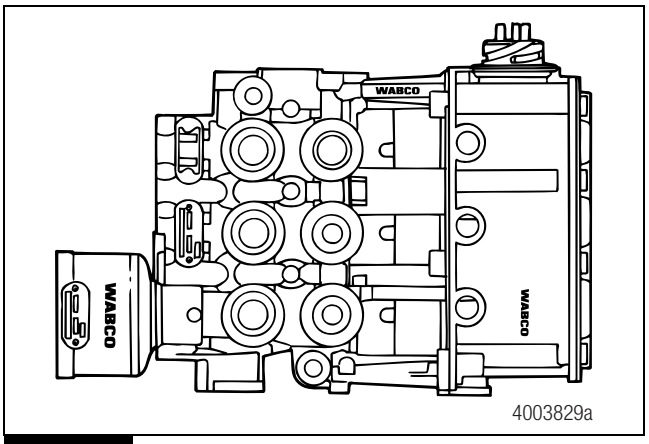


Figure 1.6

Vehicle Speed Sensor

With C version ABS/ATC, a speed sensor is mounted in the transmission tail. This sensor provides the ECU with vehicle speed information. Figure 1.7.

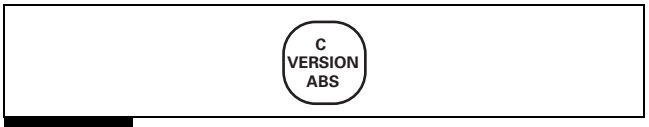


Figure 1.7

With D version ABS/ATC, the speed signal is transmitted over the communication data link (SAE J-1587). Figure 1.8.

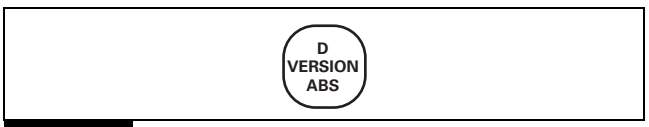


Figure 1.8

Lamps

A dash-mounted “ECAS FAIL” indicator lamp indicates a system fault.

A load transfer lamp displays the load transfer status. Load transfer status is explained in Section 2.

Switches

Either a three-position dash switch or two separate dash switches allow the operator to set the ECAS system to perform either automatic load transfer, driver activated load transfer or no load transfer.

A stop light switch signals the ECU when the brakes are applied.

Remote Control Unit

The hand-held remote control unit, or keypad, is positioned in a bracket mounted on the instrument panel. The operator uses this keypad to alter the frame height for loading and unloading. The keypad is connected to the ECU by a coiled cable and a socket on the vehicle. Figure 1.9.

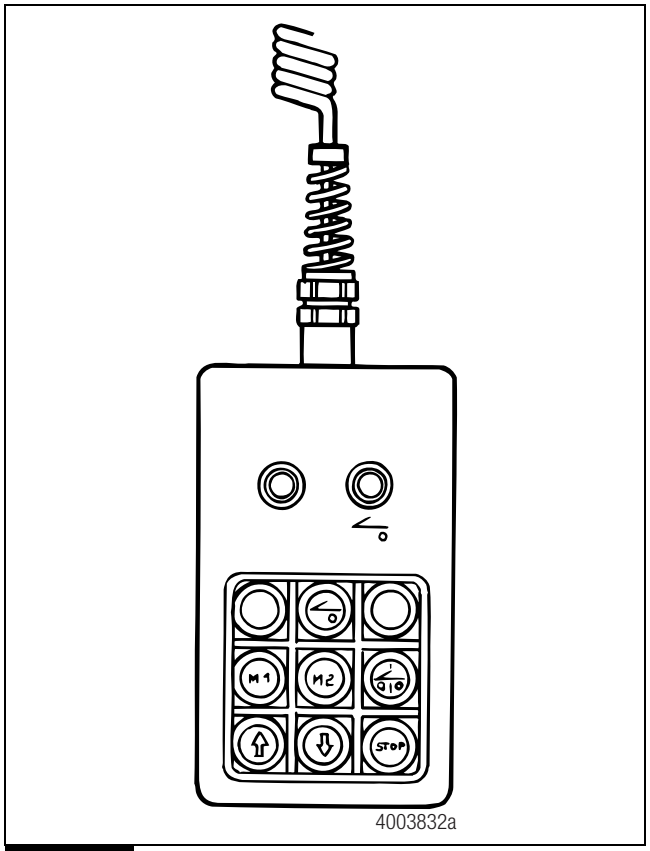


Figure 1.9

System Functions

Automatic Height Control

This is the basic ECAS function. By constantly comparing the readings supplied by the height sensors with the preset heights stored in the ECU, ECAS is aware of the current height of the vehicle chassis at all times. As soon as there are any deviations exceeding a certain tolerance band, the solenoid valve is activated; and by increasing or decreasing the pressure in the air bags, the actual height is adjusted to the preset height.

If the brakes are applied, the ECU will freeze all ECAS control activities until the brakes are released.

Load Transfer (6 x 2 Vehicles)

To increase traction on a slippery road when drive axle wheel spin is detected, an automatic load transfer occurs. This transfers as much of the load as possible from the tag or pusher axle to the drive axle.

ECAS will continue to hold the transferred load for 20 seconds. After this interval, the load is transferred back to a normal condition. The transfer back to normal takes approximately 20 seconds.

If load transfer is active, all chassis height control functions are disabled until the load transfer ends.

The operator can manually activate the load transfer function by pressing the ON (momentary on) side of the load transfer switch. This manual activation only works at speeds less than 30 mph (48 km/h).

The load transfer function will terminate under the following conditions:

- Brakes are applied at a speed greater than 30 mph (48 km/h).
- Vehicle speed exceeds 70 mph (112 km/h).
- Stop button on remote control is pressed or the remote control is disconnected.

On some vehicles a load transfer indicator lamp comes on when the automatic load transfer is turned off.

Remote Control Operation

The hand-held remote control has several functions: Figure 2.1.

- Raising and lowering the vehicle suspension
- Returning the vehicle to normal level
- Stopping all ECAS functions
- Storing and selecting two preset height levels

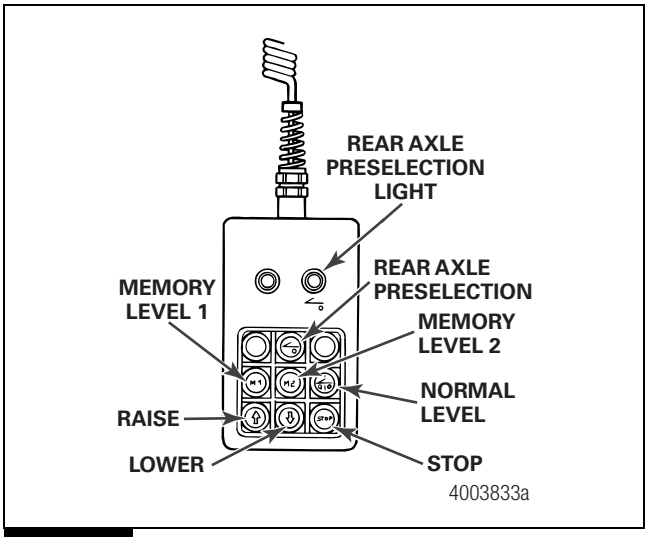


Figure 2.1

Axle Preselection

Before the remote control can be used, the rear axle must be selected for activation. Pushing the rear axle preselection key enables the level control for this axle. An acknowledgment light on the remote control indicates that the axle is selected. Pressing the rear axle preselection key a second time will disable remote control and turn off the acknowledgment light.

Raising and Lowering

The remote control unit allows the operator to change the vehicle's rear height within programmed limits. Pressing the up or down arrow keys causes 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 travelling at speeds less than 7 mph (11 km/h).

Normal Height

Pressing the normal height key will immediately return the chassis height to the programmed normal level.

Setting and Selecting Memory Levels M1 M2

By simultaneously pressing the STOP key and either the M1 or M2 memory keys, the current height can be stored as a memory height. Memory heights can only be stored while the vehicle is stationary.

By pressing just the M1 or M2 memory keys, the chassis height is quickly adjusted to the stored memory height. M1 or M2 height changes can only be initiated while the vehicle is stationary or travelling at speeds less than 7 mph (11 km/h).

STOP Key STOP

Pressing the STOP key discontinues all height control functions. This function allows the operator to discontinue any automatic height change if the continuance of the change could be hazardous. Pressing the STOP key will also discontinue the load transfer function immediately. Figure 2.2.

NOTE: Disconnecting the remote control performs the same functions as pressing the STOP key.

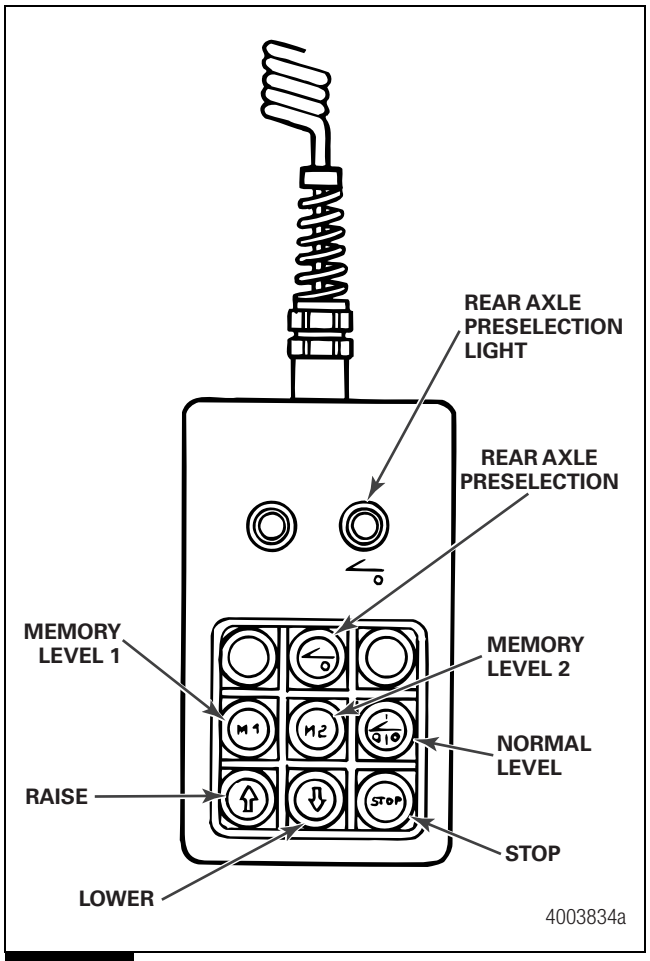


Figure 2.2

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.

All personnel must be clear of the vehicle before you begin to troubleshoot ECAS. Serious personal injury can result when the vehicle frame moves up and down.

ABS Faults

Before performing any ECAS diagnostics, make sure there are no ABS faults. Because of the interaction between the ABS and ECAS systems, a fault in the ABS system may restrict the functionality of the ECAS system.

ECAS FAIL Indicator Lamp

The dash-mounted "ECAS FAIL" indicator lamp indicates a system fault. When the ignition key is switched on, the lamp will come on for two seconds and then go out. This indicates there are no faults present. If the lamp does not come on at start-up, the bulb or wiring is defective.

The following failures will cause the "ECAS FAIL" indicator lamp to remain on:

- ECAS FAIL lamp wire grounded
- No power at ECU pin 1
- Electrical fault in height sensor
- Electrical fault in solenoid valve
- J1587 datalink fault
- Internal ECU fault
- Incorrect height control calibration
- Chassis height cannot be adjusted within five minutes after ignition or within 30 seconds during normal service

Depending upon the severity of the failure, the ECAS system may be partially or completely switched **OFF.**

WABCO Test Adaptor for ECAS

The test adaptor allows troubleshooting the ECAS system by providing breakout access to the circuits contained in the 35-pin connector attached to the ECU. This allows easy Volt-ohmmeter measurement of voltage and resistance of ECAS wiring and components. Figure 3.1.

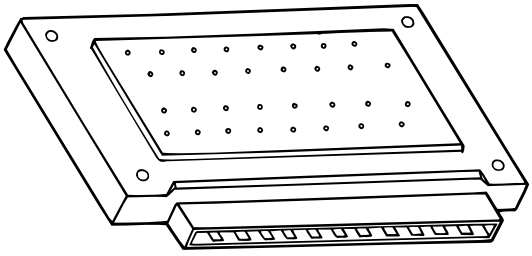


Figure 3.1

Installing the Test Adaptor

1. Turn the vehicle ignition **OFF**.
2. Disconnect the 35-pin connector from the ECAS ECU.
3. Insert the test adaptor into the 35-pin connector on the ECU harness. Figure 3.2.

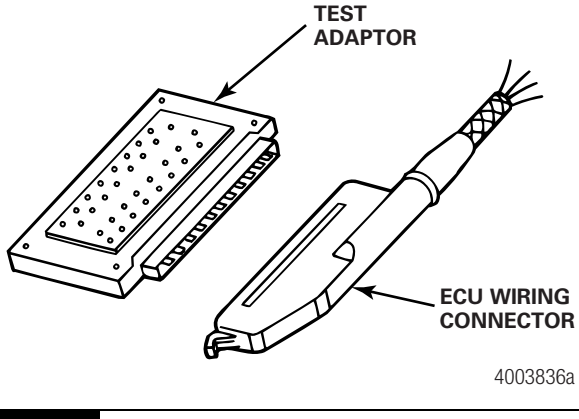


Figure 3.2

Test Instructions

NOTE: Refer to the Volt-ohmmeter (VOM) manufacturer's manual for VOM operating instructions.

The following information applies to the tests presented in Table A.

1. Before you perform any of the steps listed in Table A:
   - Check the "Ignition Status" column of the table. The vehicle's ignition may be required to be either in the **ON** or **OFF** position. The engine does not have to be running.
   - Check that the air system pressure reading is between the compressor cut-in and cut-out pressure.
2. Set the VOM to the appropriate setting that will accommodate the expected readings listed in the "Measurement or Reaction" column of the table.
3. For each step in Table A, compare the VOM reading or reaction with the acceptable values or reactions listed in the "Measurement or Reaction" column. Write down the results of your comparisons.
4. Repair or replace wiring or components when a meter reading or reaction is different than that listed in the "Measurements or Reaction" column of Table A.
5. Disconnect the test adaptor.
   - If the ignition is **ON** from previous testing, turn it **OFF** before you disconnect the test adaptor.
   - Reconnect the 35-pin connector to the ECU.
6. Perform a vehicle inspection. After completing the procedures in Table A and any required repairs:
   - Verify that ECAS will bring the vehicle frame to the normal ride height position. When the chassis is in this position, the instrument panel indicator lamp will go **OFF**.
   - If the indicator lamp remains **ON**, check the height sensor linkage for correct installation (refer to the vehicle manufacturer's service literature).
   - Make sure the ABS indicator lamp does not remain **ON**.

Test Adaptor Guide

Table A: Testing Procedures

ECAS Power Supply					
Step	**Check**	**Ignition Status**	**Adaptor Pins**	**Measurement or Reaction**	**Possible Cause of Malfunction**
1	Voltage to ECU	**ON** or **OFF**	1 and 27	9-15 volts DC	• Blown fuse
2	Voltage to ECU	**ON**	9 and 27	9-15 volts DC	• Power to ECU interrupted
		OFF	9 and 27	0 volts DC	• Constant power to ECU
ECAS Connected Features If vehicle is not equipped with load transfer, skip Steps 5 and 6. A second test adaptor is required to test ABS ECU pin 12.					
Step	**Check**	**Ignition Status**	**Adaptor Pins**	**Measurement or Reaction**	**Possible Cause of Malfunction**
3	Indicator lamp	**OFF**	9 and 23	Greater than 30 ohms	• Defective bulb/LED • Wiring to indicator lamp
4	Stop light switch **OFF**	**ON** or **OFF**	7 and 27	0 volts DC	• Switch broken or defective • Wiring to stoplight switch
	Stop light switch **ON**	**ON** or **OFF**	7 and 27	9-15 volts DC	

Table A: Testing Procedures

ECAS Power Supply					
5	Load transfer switch **OFF**	**OFF**	17 and 27	Greater than 30 kilo ohms	• Switch broken or defective • Wiring to stoplight switch
	Load transfer switch **ON**	**OFF**	17 and 27	0-2 ohms	
6	Connection to ABS ECU (C version only) 	**OFF**	16 on ECAS and 12 on ABS	0-2 ohms	• Interrupted wiring between ECAS ECU and ABS ECU
ECAS Height and Speed Sensors					
Step	**Check**	**Ignition Status**	**Adaptor Pins**	**Measurement or Reaction**	**Possible Cause of Malfunction**
7	Height sensor resistance	**OFF**	25 and 27	100-140 ohms	• Broken wire between ECU and sensor • Sensor connector • Defective sensor
8	Speed sensor resistance (C version only) 	**OFF**	20 and 22	800-2,000 ohms	• Broken wire between ECU and sensor • Sensor connector • Defective sensor
9	Speed sensor resistance to ground (C version only) 	**OFF**	20 and 27 22 and 27	Greater than 30,000 ohms	• Short between sensor and ground • Sensor connector • Defective sensor
ECAS Valve					
Step	**Check**	**Ignition Status**	**Adaptor Pins**	**Measurement or Reaction**	**Possible Cause of Malfunction**
10	ECAS valve coil resistance	**OFF**	13 and 27 15 and 27 30 and 27	15-25 ohms If vehicle is not equipped with load transfer, no reading needs to be done between pins 30 and 27.	• Interrupted wiring between ECU and valve connector • Ground lead to valve interrupted • Shorted valve coil

WABCO Diagnostic Controller

The WABCO diagnostic controller is an electronic diagnostic tool that is capable of communicating with the ECAS ECU. Figure 3.3.

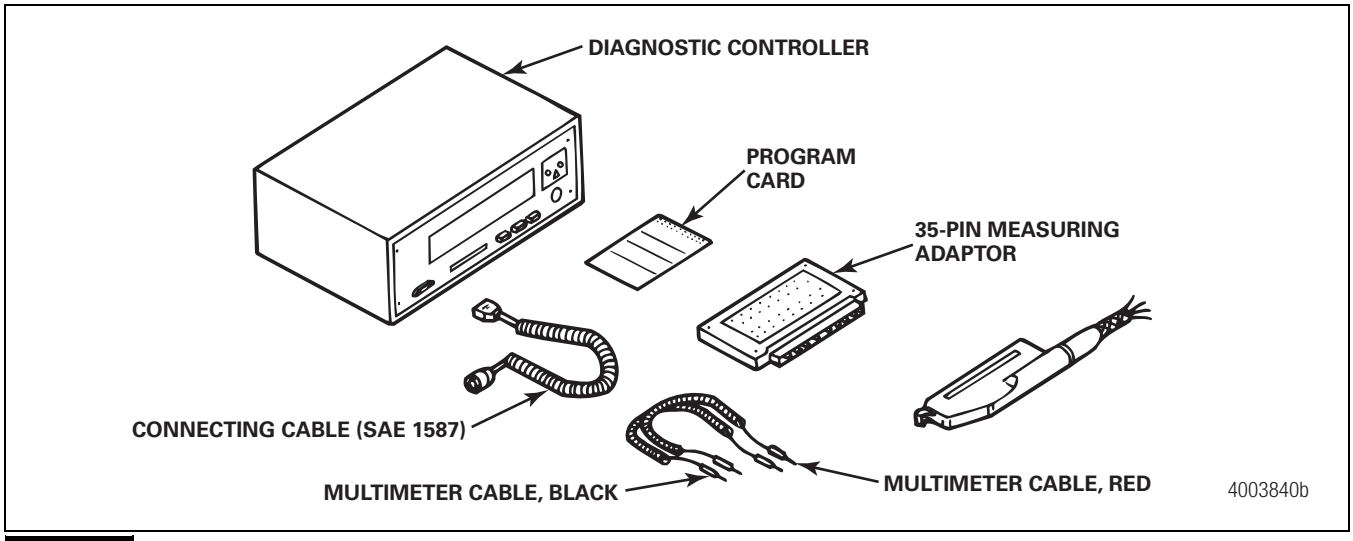


Figure 3.3

Use the controller to:

- Access ECAS system faults stored in the ECU
- Perform functionality tests on ECAS components
- Perform multimeter style voltage and resistance checks on system wiring and components
- View control equipment data stored in the ECU
- Calibrate the ECAS ECU

NOTE: This manual provides a brief overview of the capabilities and operation of the diagnostic controller. For detailed instructions on using the controller, refer to the operating instructions included with the diagnostic controller.

Connecting the Diagnostic Controller

The diagnostic controller is connected to the vehicle through an SAE J1587 diagnostic plug that is wired to the ECU.

When the appropriate ECAS program card is inserted into the diagnostic controller, the controller is able to retrieve all relevant data from the ECU and perform a variety of diagnostic functions.

Diagnostic Controller Functions

Failure Memory

If faults are present in the ECAS system, they are displayed in clear text on the controller screen. Also shown are the number of times the fault has occurred and whether the fault is currently present. A displayed fault that is not currently present represents an intermittent malfunction.

In order to locate the exact source of a fault, the diagnostic controller will change to the multimeter mode if necessary. The controller display screen indicates specific tests that should be performed on the ECAS wiring. Connecting an adaptor to the ECU harness allows easy access to the ECAS wiring for these tests.

After successful repair of a fault, an acknowledgment is displayed on the controller screen and the fault is automatically erased from the ECU memory.

Component Function Tests

This feature allows specific ECAS components to be controlled and their functionality tested. Components are actuated by the diagnostic controller. If a fault is detected during the test, it is reported on the display screen.

Calibration

This function allows recalibration of the ECAS system when components (particularly the ECU or a sensor) are replaced.

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.

All personnel must clear of the vehicle before you begin to troubleshoot ECAS. Serious personal injury can result when the vehicle frame moves up and down.

Component Removal and Installation

ECU Replacement

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

⚠ 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 and damage to components can result.

Removal

1. Park the vehicle on a level surface. Turn the ignition to the **OFF** position and set the parking brake. Block the front wheels.
2. Remove any covers and cab equipment that restricts access to the ECU.
3. Disconnect wiring connector from the ECU.
4. Remove fasteners that attach ECU to the cab.

Installation

1. Install ECU in the cab.
2. Tighten fasteners to vehicle manufacturer's specification.
3. Connect wiring connector to the ECU.
4. Replace any covers and cab equipment that was removed to gain access to the ECU.
5. Use the diagnostic controller to calibrate the ECU.

Solenoid Valve Replacement

NOTE: Refer to vehicle manufacturer's service literature for solenoid valve location and removal/installation procedures.

⚠ 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 and damage to components can result.

Removal

1. Park the vehicle on a level surface. Turn the ignition to the **OFF** position and set the parking brake. If necessary, raise the vehicle off the ground and put safety stands under the axle.

⚠ WARNING

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

2. Drain the air from the air system.
3. Disconnect the wiring connector from the solenoid valve. Figure 4.1.

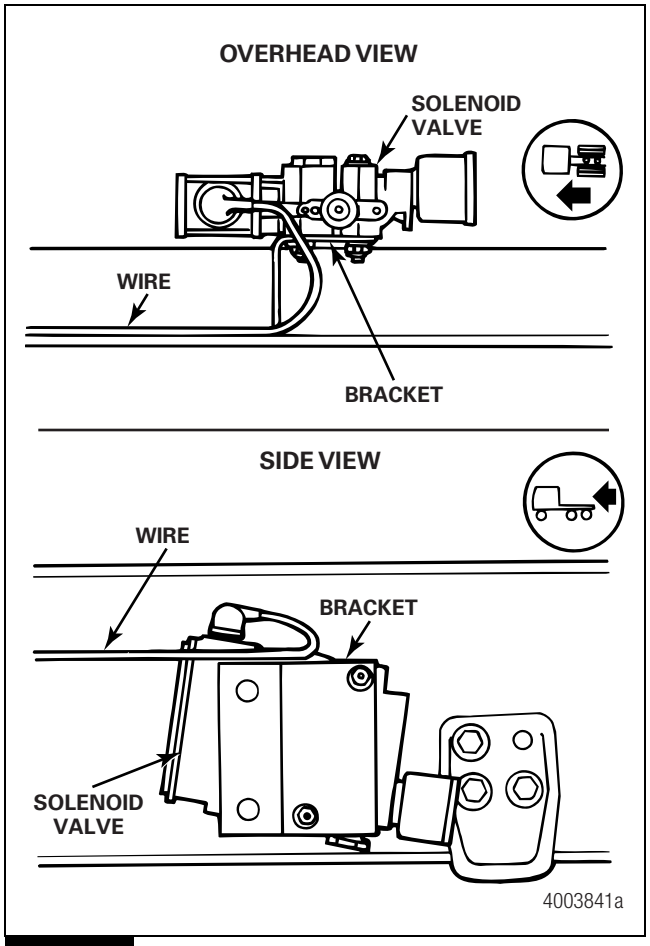


Figure 4.1

4. Mark the air lines for reference when installing the new valve.
5. Disconnect the air lines from the solenoid valve.
6. Remove the two bolts attaching the solenoid valve to the mounting bracket.
7. Remove the solenoid valve from the mounting bracket.

Installation

1. Attach the new solenoid valve to the mounting bracket.
2. Install the two mounting bolts and tighten them to the vehicle manufacturer's specifications.
3. Connect the air lines to the solenoid valve as marked during the removal process.
4. Connect the wiring connector to the solenoid valve.
5. Test the solenoid valve.

Solenoid Valve Test

After installing a solenoid valve, perform the following test procedure:

1. Start the engine.
2. Wait until the system is fully charged.
3. Press the "Normal" button on the remote control to fill the air bags. This will place the ECAS at normal level.
4. Turn the ignition to the **OFF** position.
5. Listen for leaks at the solenoid valve air line connections.
6. Use the remote control to raise and lower the vehicle height, checking for correct operation.

Height Sensor Replacement

Removal

⚠ 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 and damage to components can result.

The ECAS height sensor is mounted between the chassis and the drive axle housing. Figure 4.2.

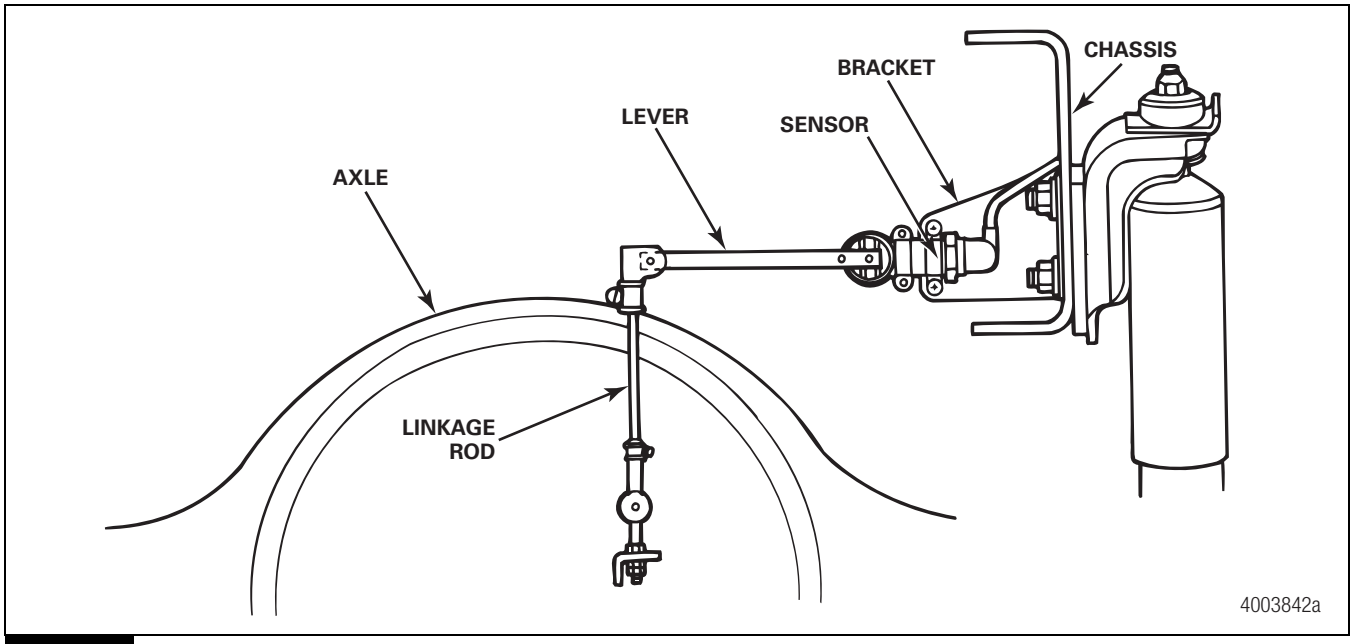


Figure 4.2

1. Park the vehicle on a level surface. Turn the ignition to the **OFF** position and set the parking brake. Block the front wheels.
2. Disconnect the wiring connector from the height sensor.
3. Remove the lever from the height sensor.
4. Remove the bolts that attach the sensor to the mounting bracket on the chassis.
5. Remove the height sensor.

Installation

1. Position the sensor on the mounting bracket on the chassis.
2. Install the height sensor mounting bolts and tighten them to the vehicle manufacturer's specifications.
3. Attach the lever to the height sensor. Tighten the mounting bolt to 31 in-lb (3.5 N•m).
4. Connect the wiring connector to the height sensor.
5. Use the diagnostic controller to calibrate the ECU for the height sensor.

Height Sensor Calibration Using Diagnostic Controller

IMPORTANT:

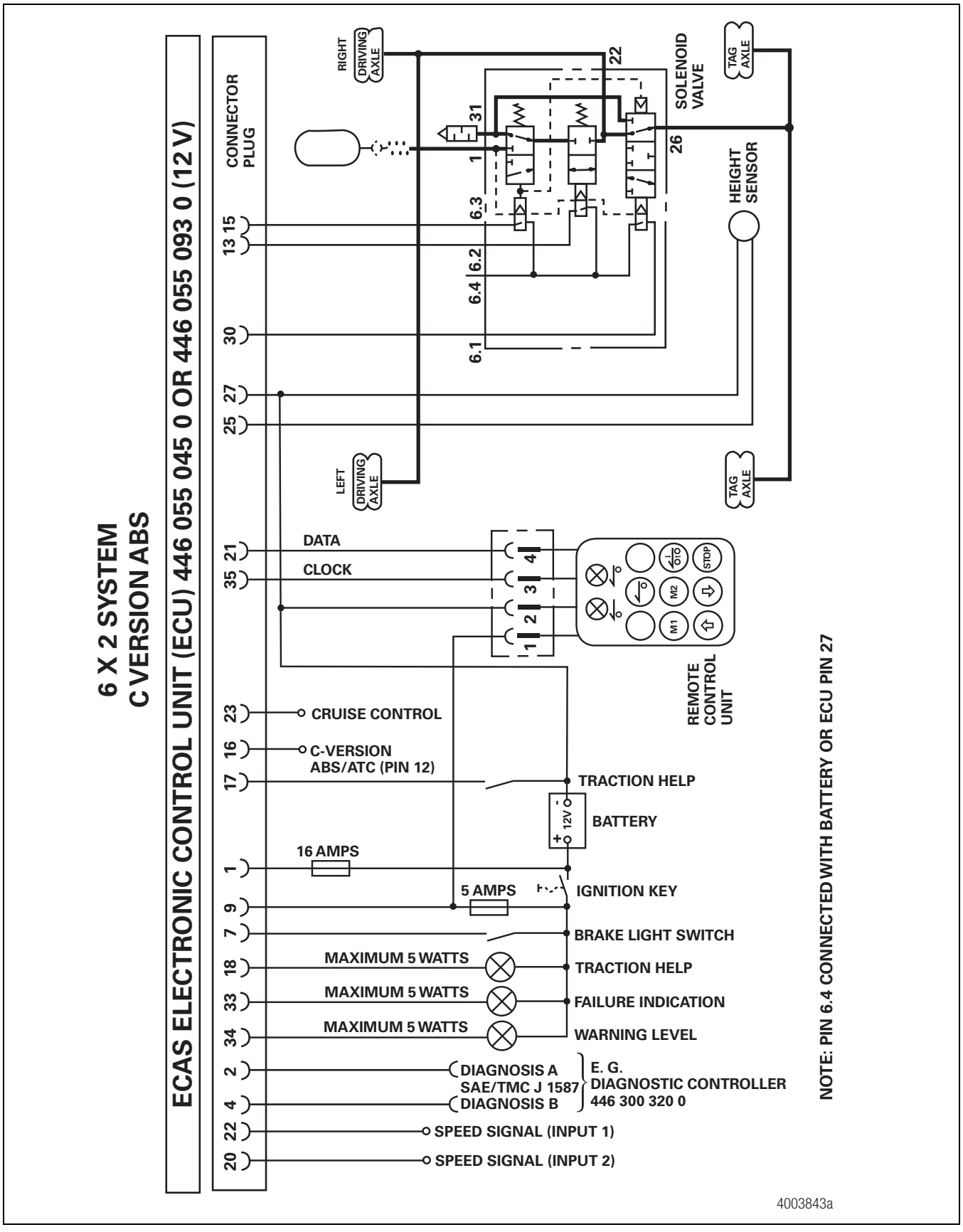
Refer to the vehicle manufacturer's specifications for height recommendations **BEFORE** recalibrating the height sensor.

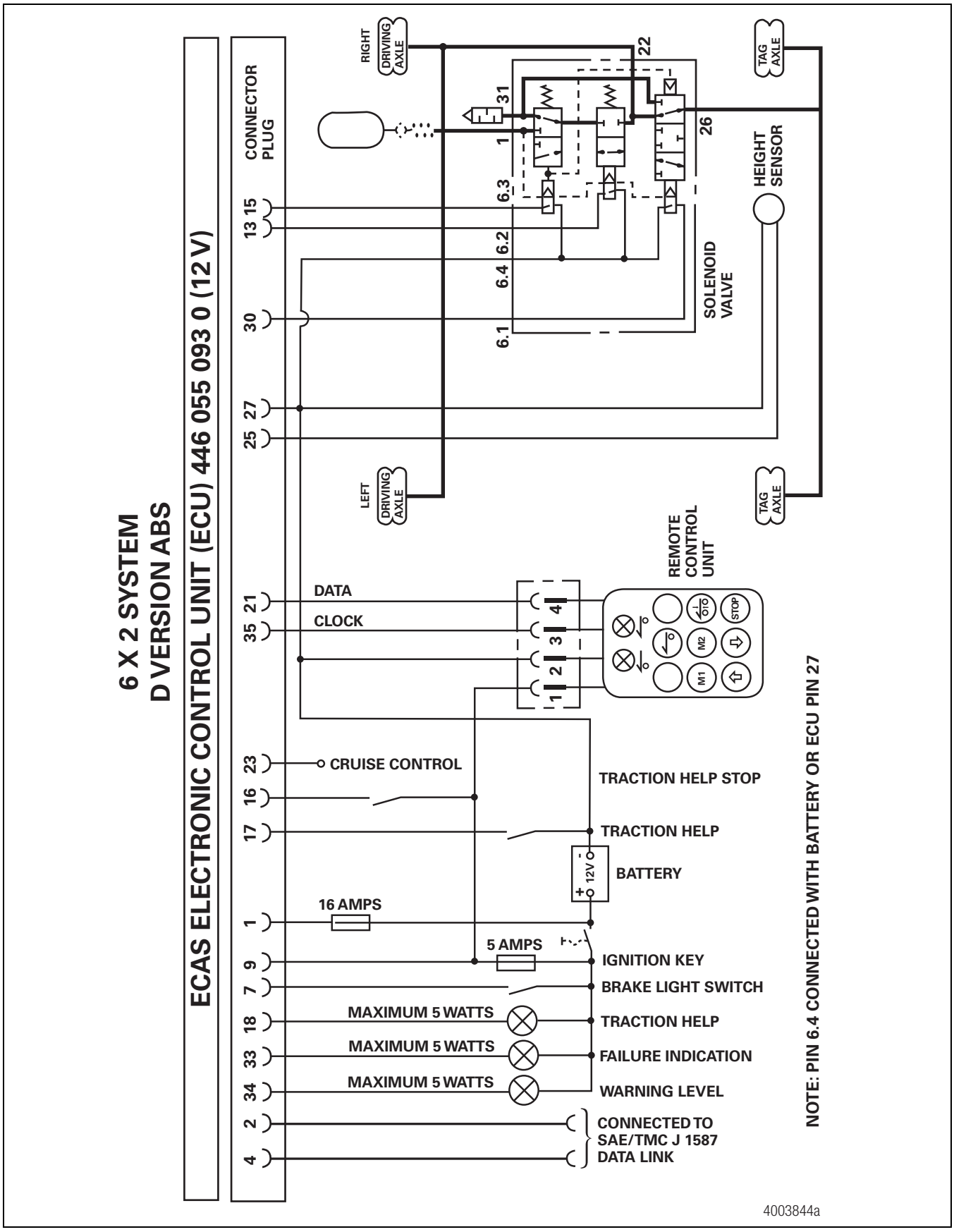
NOTE: This manual provides a brief overview of the capabilities and operation of the diagnostic controller. For detailed instructions on using the controller, refer to the operating instructions included with the diagnostic controller.

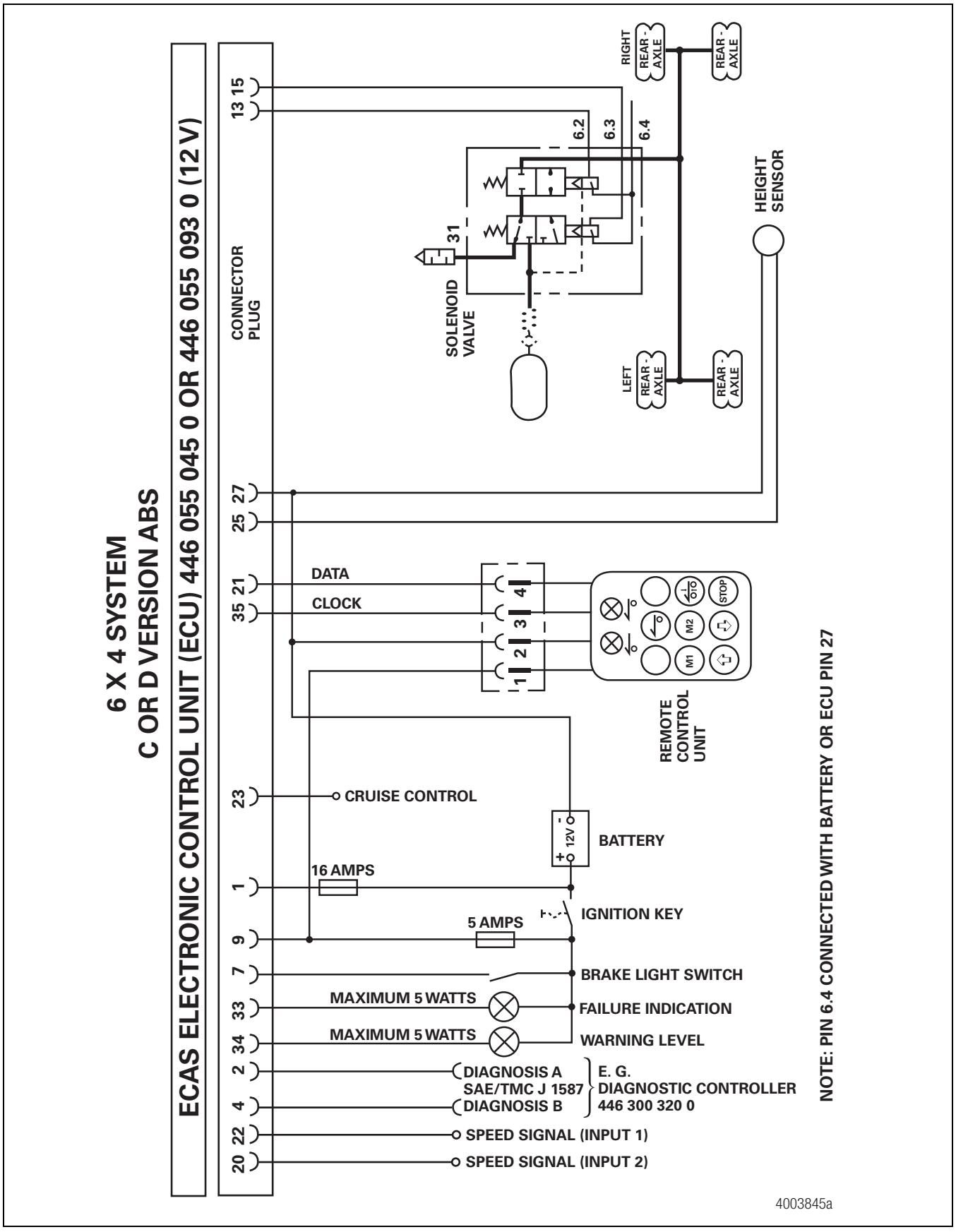
1. Connect the diagnostic controller to the vehicle's SAE 1587 diagnostic plug.
2. Insert the appropriate program card for the vehicle's ECAS application into the diagnostic controller.
3. Select the Diagnosis menu option.
4. From the Diagnosis menu, select the calibration option.
5. From the Calibration menu, select the Calibrate Height Sensor option.
6. Use the control key to raise or lower the vehicle to normal level 1.
7. Initiate calibration.
8. Use the control key to raise the vehicle to the upper stop level.

9. Initiate calibration. Refer to the vehicle manufacturer's repair instructions for height level information.
10. Use the control key to lower the vehicle to the lower stop level.
11. Initiate calibration.
12. Disconnect the diagnostic controller from the vehicle.

System Configuration Layouts




6 X 2 SYSTEM
D VERSION ABS
ECAS ELECTRONIC CONTROL UNIT (ECU) 446 055 093 0 (12 V)
CONNECTOR PLUG
13 15
30
27
25
21
35
23
16
17
1
9
7
18
33
34
2
4
RIGHT DRIVING AXLE
LEFT DRIVING AXLE
TAG AXLE
TAG AXLE
22
31
1
6.3
6.2
6.4
6.1
26
HEIGHT SENSOR
SOLENOID VALVE
REMOTE CONTROL UNIT
DATA
CLOCK
CRUISE CONTROL
TRACTION HELP STOP
TRACTION HELP
BATTERY
12V
16 AMPS
5 AMPS
IGNITION KEY
BRAKE LIGHT SWITCH
MAXIMUM 5 WATTS
TRACTION HELP
MAXIMUM 5 WATTS
FAILURE INDICATION
MAXIMUM 5 WATTS
WARNING LEVEL
CONNECTED TO SAE/TMC J 1587 DATA LINK
NOTE: PIN 6.4 CONNECTED WITH BATTERY OR ECU PIN 27
4003844a


6 X 4 SYSTEM
C OR D VERSION ABS
ECAS ELECTRONIC CONTROL UNIT (ECU) 446 055 045 0 OR 446 055 093 0 (12 V)
CONNECTOR PLUG
13 15
25 27
35 21
23
1
9
7
33
34
2
4
22
20
RIGHT REAR - AXLE
REAR - AXLE
LEFT REAR - AXLE
REAR - AXLE
6.2
6.3
6.4
31
SOLENOID VALVE
HEIGHT SENSOR
DATA
CLOCK
1 2 3 4
STOP
M2
M1
REMOTE CONTROL UNIT
CRUISE CONTROL
12V
BATTERY
16 AMPS
IGNITION KEY
5 AMPS
BRAKE LIGHT SWITCH
MAXIMUM 5 WATTS
FAILURE INDICATION
MAXIMUM 5 WATTS
WARNING LEVEL
DIAGNOSIS A
SAE/TMC J 1587
DIAGNOSIS B
E. G.
DIAGNOSTIC CONTROLLER
446 300 320 0
SPEED SIGNAL (INPUT 1)
SPEED SIGNAL (INPUT 2)
NOTE: PIN 6.4 CONNECTED WITH BATTERY OR ECU PIN 27
4003845a

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