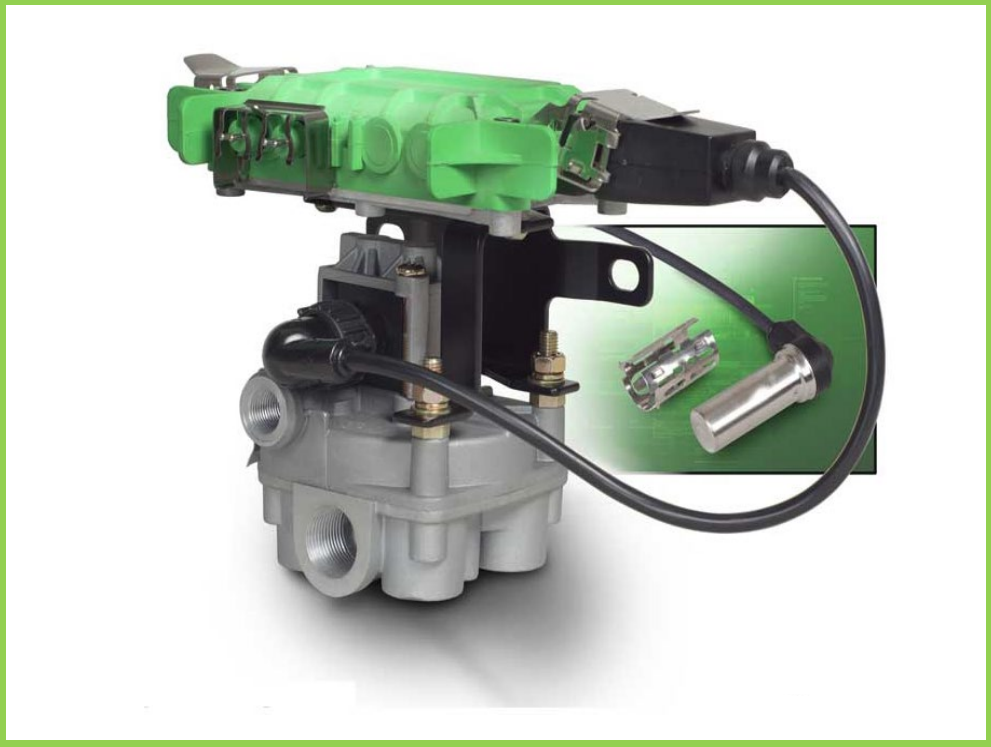
Installation Guide

Heavy Duty Trailer ABS



Notes, Cautions, and Warnings

This manual contains Notes, Cautions, and Warnings in addition to the assembly instructions.

Notes: Provide additional comments to help with installation and setup.

Cautions: Provide notification of situations that can cause damage to machinery and tools.

Warnings: Provide alerts to situations that can cause personal injury or death.

Please take the time to read and understand this manual before beginning assembly and / or repairs.

CAREFULLY FOLLOW THE SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL.

Due to a policy of continuous product improvement, we reserve the right to make changes at any time, without notice, in prices, materials, colors, specifications, equipment, models, and availability. Some photos and drawings in this manual contain optional equipment. Since some information may have been updated since the time of printing, please check web-site and/or with technical support for complete details.

GEN2 Identification

Before service or diagnostics is performed on a GEN2 unit, the system design must be verified. Do not rely on labels or verbal descriptions to identify the GEN2 system. Refer to the integrated wireless communication (direct WiFi) information provided by the GEN2 system. Make sure to properly identify system configurations of the GEN2 as system components are different for each system.

Contents

GEN2 ABS Introduction

The GEN2 ABS enhances the conventional ABS systems by having WIFI interactions, Power Line Carrier (PLC) and expanding the number of configuration options. The system can be configured with either two or four sensors and either one or two pneumatic control modules. The choice of service brake relay can be separate from choice of ABS. This is also an advantage when troubleshooting the brake system.

Smart ECU. Smart Investment

Trailer monitoring and control is critical for any fleet or vehicle operator on the road today. From safe stopping to rollover prevention to cargo protection and more, the trailer anti-lock braking system (ABS) plays a key role in productivity and uptime. For maximum time on the road, you need a cost-effective ABS solution that's easy to install and maintain while taking advantage of the latest in communications technology.

Introducing Gen2 Trailer ABS from Globetech MFG Inc. Gen2 allows you to quickly and easily replace your existing trailer ABS electronic control unit (ECU) for unparalleled trailer monitoring and control with more capabilities. Standard ABS ECUs utilize external tools and software for system diagnostics. Gen2 is a SMART ECU that does not require the use of external software for diagnostics and fault codes. By integrating exclusive control logic into the ABS governing hub and information portal, Gen2 allows for highly efficient diagnostic evaluation and dramatically lower cost of operation.

The First to Offer Intelligent Interface

Gen2 offers revolutionary communication capabilities. It is the first trailer ABS to incorporate a Wi-Fi access point that sends diagnostics to any smart phone, tablet or laptop. Now GEN 2 offers you the ability receive mobile alerts included in most complete diagnostic tools. Future plans for Gen2's intelligent interface include additional monitoring capabilities such as brake and pad wear, tire inflation, trailer tracking and more. All to enhance your condition-based trailer maintenance programs.

Take advantage of the industry-first Gen2 intelligent interface and be at the forefront of innovative trailer ABS diagnostic communications.

GEN2 System Components

GEN2 system includes unique ABS components as well as interfacing with standard trailer components.

Label on top of ECU, next to ABS Indicator Lamp and next to 7 Way which shows

- WiFi address
- website
- Type
- Blink Code Status
- Build date

Part Number	Description	Interchange
ABS Components		Replaces Meritor®
ECU ONLY		
GEN2-2010	2S/1M ECU Only (WIFI)	S4008506000/S4461082060
GEN2-6011	4S/1M ECU Only (WIFI)	S4008506010
GEN2-6010	4S/2M ECU Only (WIFI)	S4008506010
FULL ECU/VALVE COMBO/UNIT		
GEN2-1010	2S/1M Valve/ECU (WIFI, No Power Cable)	S4005001010
GEN2-1031	4S/1M Valve/ECU (WIFI)	S4005001030
GEN2-1030	4S/2M Valve/ECU (WIFI)	S4005001030
GEN2-0210	2S/1M Kit (Includes GEN2-3120 Cable)	R955344/S4725000210
GEN2-0233	2S/1M Kit Includes GEN2-0100 Power Cable	
BRACKETS		
GEN2-0584	Bracket for 2S/1M	S4784070584
GEN2-0585	Bracket for 4S/2M	
MODULATOR CABLES		
GEN2-2752	Modulator Cable 2S/1M	S894662752
GEN2-2753	Modulator Cable for 4S/2M	
VALVES		
GEN2-0330	Valve GEN2-1010/1030	S4721950330/S4008506020
ACCESSORY CABLES		
GEN2-0470	14ft 4 Conductor Power Cable	S4493260470
GEN2-3120	1ft Power Adapter Cable	S8946073120
GEN2-0100	3.3 ft Power Adapter Cable	S4493260100
GEN2-0101	7.5 Power Cable	
MISC. ACCESSORIES		
GEN2-8154	ABS Sensor Clip	R955458
Meritor WABCO® Style ABS Sensors		
		Replaces Meritor
GEN2-5349	2 ft Straight	
GEN2-5329	Straight	R955329
GEN2-5337		R955337
GEN2-5335	90 degree	R955335
GEN2-5336		R955336
GEN2-5365		R955365
GEN2-5341		R955341
GEN2-5342		R955342
Bendix® Style ABS Sensors		
		Replaces Bendix
GEN2-801544	90 degree; GDA5801544 - 1 ft	801544
GEN2-801545	90 degree; GDA80145 - 8.6 ft	801545
GEN2-801546	90 degree; GDA801545 - 5 ft	801546
ABS Extension Cables		
		Replaces Haldex®/Meritor
GEN2-AL919802	ABS Extension Cable	AL919802
GEN2-AL919803		AL919803
GEN2-AL919806		AL919806
GEN2-0180		S4497130180

GEN2 Part numbers and descriptions

General Air Brake Requirements

FMVSS-121 identifies minimum requirements for air brake systems on commercial vehicles built in the U.S. (Requirements in Canada are covered under CMVSS-121 and are virtually identical.) These regulations cover requirements for new construction. Once put into operation, proper use and maintenance is covered under standards such as:

- FMCSR 393 – Covers required equipment
- FMCSR 396 – Covers inspection and repair.

The requirements for spring brake performance and operation, reservoir size and air timing have not been changed with the introduction of ABS. Because the addition of ABS components can have an effect on air brake timing, it is important to verify acceptable performance on new ABS installations. The maximum application and release times permitted under FMVSS-121.

	Apply Time (mSec)		Release Time (mSec)	
	From pedal movement to reach 60 PSIG	From pedal movement to reach 60 PSIG	From pedal movement to reach 5 PSIG	From pedal movement to reach 5 PSIG
Measured at	Brake Chamber	50 CI Reservoir	Brake Chamber	50 CI Reservoir
Initial Condition	0 PSIG	0 PSIG	95 PSIG	5 PSIG
Towing Trailer	500	500	1000	1000
Converter Dolly	550	550	1100	1000
Single Trailer	600	N/A	1200	N/A

Air Timing Requirements

ABS

Key Dates

March 1, 1997	Tractors must be equipped to provide full time power to trailers.
March 1, 1998	Newly manufactured trailers must be equipped with ABS. Some special use cases are exempt. (Refer to FMVSS-121 for specific details.)
April 1, 2000	ABS required on newly manufactured Canadian Vehicles.
March 1, 2001	Trailer Indicator Lamp is required in the tractor cab.

ABS Design Requirements

Under FMVSS-121, an approved ABS must automatically control the degree of rotational wheel slip during braking by:

1. Sensing the rate of angular rotation of the wheels.
2. Transmitting signals regarding the rate of wheel angular rotation to one or more controlling devices which interpret those signals and generate responsive controlling output signals.
3. Transmitting those controlling signals to one or more modulators which adjust brake actuating forces in response to those signals.

Type of ABS Required for Trailers

ABS control is required on trailers as follows:

- Full Trailers – Direct ABS Control is required on at least one front and one rear tandem axles.
- Semi-Trailers and Dollies – Direct ABS Control is required on at least one axle.

Direct Control refers to an axle that is equipped with wheel speed sensors and is controlled by a modulator valve or valves in response to the wheel speed sensor signals. If this valve(s) also controls the brakes of other axle(s) that does not have sensors, the axle(s) is referred to as an indirectly controlled axle(s).

Power Requirements for ABS

For trailers built after 2001, the trailer wiring system must provide two sources of power for the antilock system.

1. Full-time power (when ignition is on) must be provided by the tractor. This full-time power source may be shared with other trailer circuits. The SAE J560 Blue (AUX) circuit is commonly used as the full-time power source. In other cases, a separate ISO 3731 connector is provided.

2. Brake light power. This input provides a source of backup power for cases where an older tractor (without full-time power) is used to tow a trailer or in case of a failure of the permanent power source.

Industry standards (TMC RP-137 and SAE2247) require that the tractor provide at least 10 amps at 12 volts at the trailer end of the SAE J560 or ISO cable on all ABS power circuits. Suppliers of Trailer ABS have agreed to provide for proper antilock brake operation down to a minimum of 8.5 volts. The ABS Indicator Lamp will light if voltages drop too low to maintain reliable solenoid operation.

GEN2 antilock systems operate at voltages down to 7.0 volts. Current requirements are approximately 330 milliamps per control unit and 1.25 amps per PCM.

ABS Indicator Lamp

Rules for the location, color, labeling, intensity and photometrics for external ABS Indicator Lamps have been established by the National Highway Transportation Safety Administration (NHTSA). These requirements are effective as of March 1, 1998.

Location

The lamp mounting location shall be near the left side rear of the trailer, no closer than 150 mm (5.9 inches) and not more than 600 mm (23.6 inches) from the rear red side marker indicator lamp. On a converter dolly, the lamp mounting location shall be on a permanent structure of the dolly at least 375 mm (14 inches) above the road surface. After March 1st, 2001 a second ABS Indicator Lamp must be located in the cab.

Color and Labeling

The ABS indicator lamp must be yellow in color and identified with the letters “ABS” to distinguish the lamp from other yellow side markers. The letters may be on the lens, on the lens housing, or on the trailer itself, near the lamp.

Intensity and Photometric Requirements

The external ABS indicator lamp must conform to SAE-J592 JUN92. Trailers shall use a combination clearance/side marker lamp marked with a “PC” or “P2”. These lamps offer a widely diffused beam pattern throughout a full 180-degree left and right range.

Power Line Carrier (PLC) And WIFI Communication

One method to provide a tractor-mounted trailer ABS Indicator Lamp, the industry originally adopted power line carrier (PLC) technology. The use of a power-line-carrier permits transmission of data between tractors and trailers without adding wires or connectors.

Data is transmitted as a series of high frequency chirps that appear on the ABS full-time power line (the blue wire). The chirps vary in frequency between 100K Hz and 400K Hz. The PLC signals are transmitted between trailer ABS control units and tractor ABS control units. The tractor ABS unit has an additional output signal that controls the cab-mounted trailer ABS Indicator Lamp.

The cab-mounted trailer ABS Indicator Lamp:

- Lights to indicate a bulb check at start-up
- Remains lit at start-up if a fault code is set
- Will turn OFF after two seconds if the trailer is disconnected
- Lights during vehicle operation to indicate a fault has occurred.

A second method, only the GEN2 ABS systems provide, is a WIFI communications for ABS status and diagnostics.

For PLC to function, tractors and trailers must both be equipped with PLC versions of ABS. For WIFI communications, the driver only needs to have a WIFI device such as smart phone, tablet, or laptop. The GEN2 will provide the technician or driver with ABS status and fault information if the ABS has an issue.

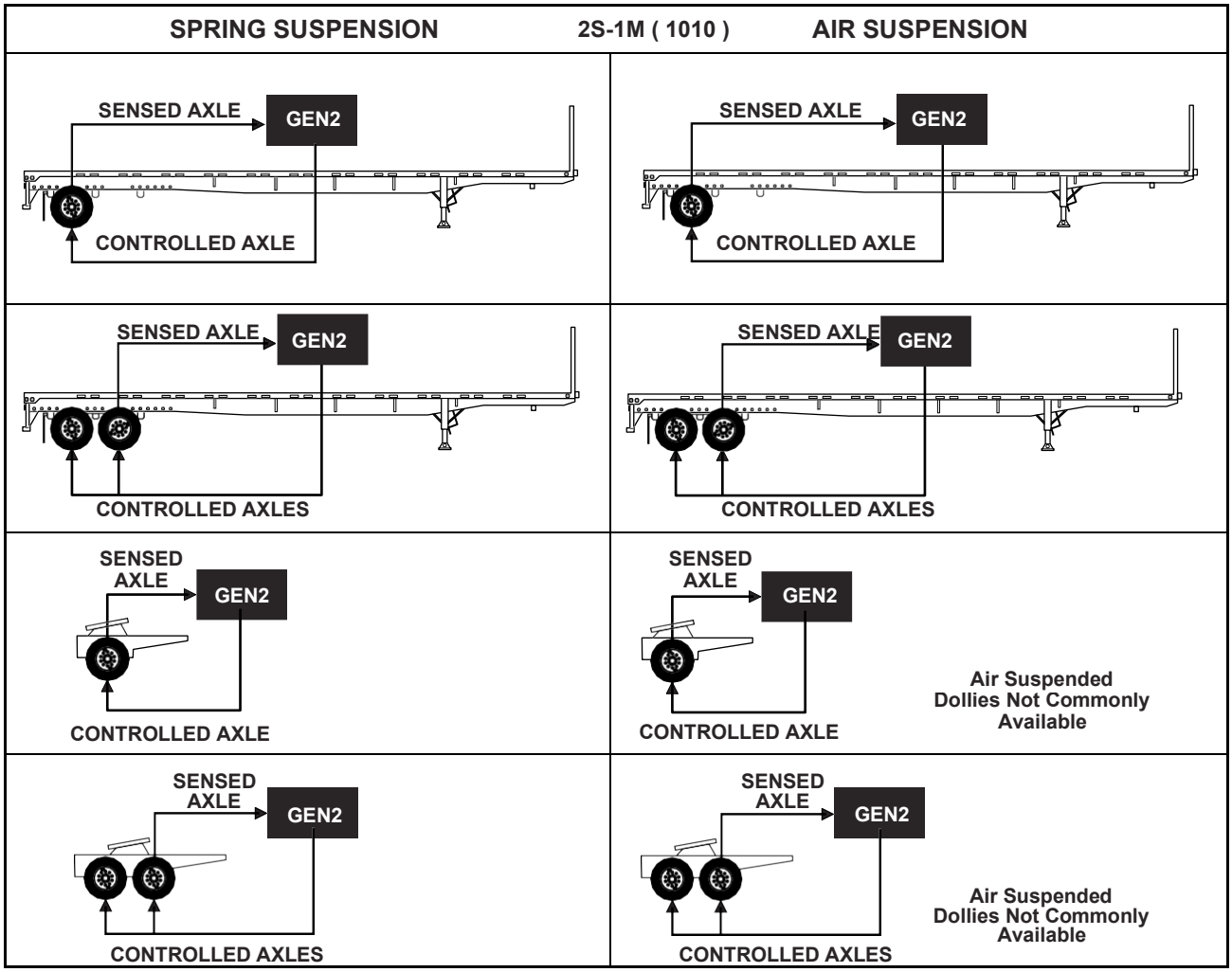
Applications

The performance of the GEN2 ABS depends upon proper installation of all components. Trailer suspension, axle configuration, and other brake components can affect the performance level of ABS.

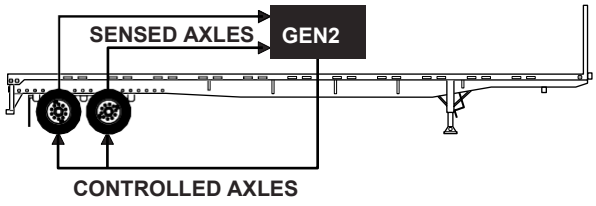
The “Sensed” and the “Controlled” axles must be considered prior to installation of the GEN2. The following are guidelines for typical GEN2 installations.

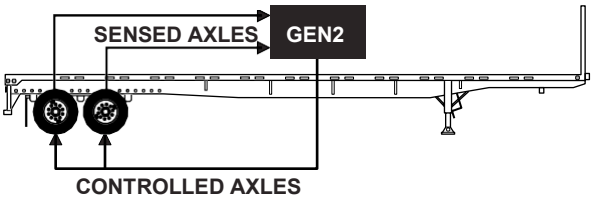
When locating the sensors on a 2S system, choose the axle that locks up first during hard braking. Typically, the front axle tends to lock up first on spring suspension trailer applications. On air suspension systems, both axles tend to lock up at the same time, so it is recommended that the rear axle be sensed because of the added stability.

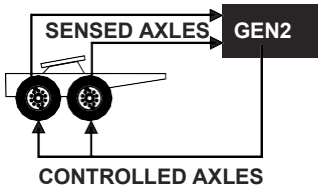
The following diagrams are for reference and selection purposes of the system to use. Follow the **New Installation** section for proper instructions on installation of all the components and air connections.

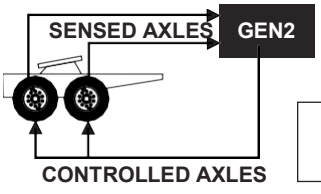


SPRING SUSPENSION **4S-1M (1031)** **AIR SUSPENSION**



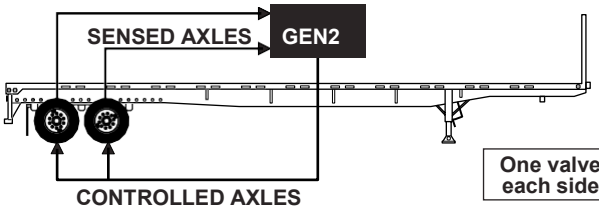




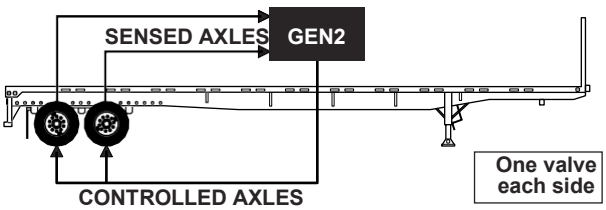


Air Suspended Dollies Not Commonly Available

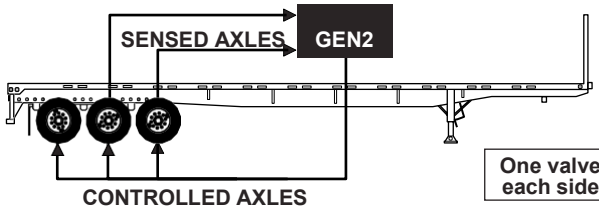
SPRING SUSPENSION **4S-2M Side Control (1030)** **AIR SUSPENSION**



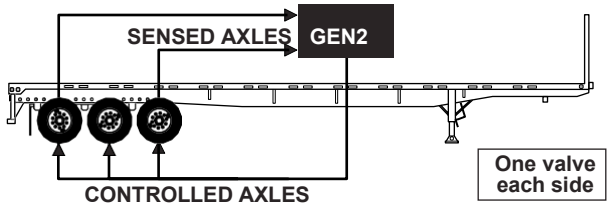
One valve each side



One valve each side

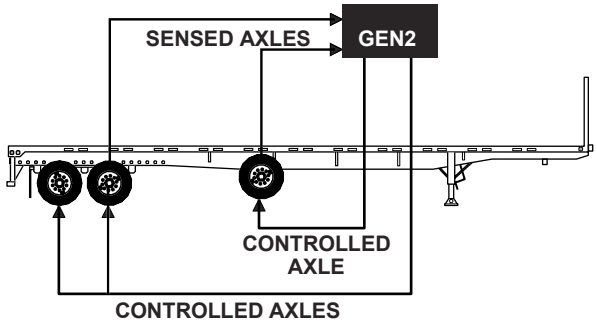


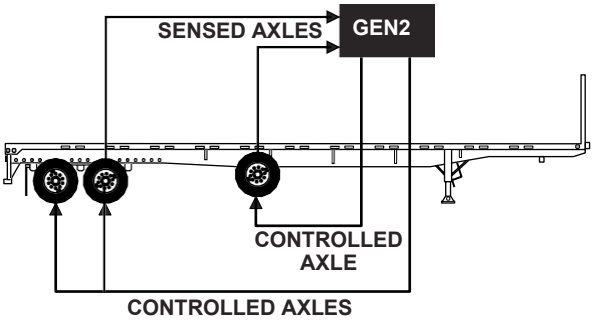
One valve each side



One valve each side

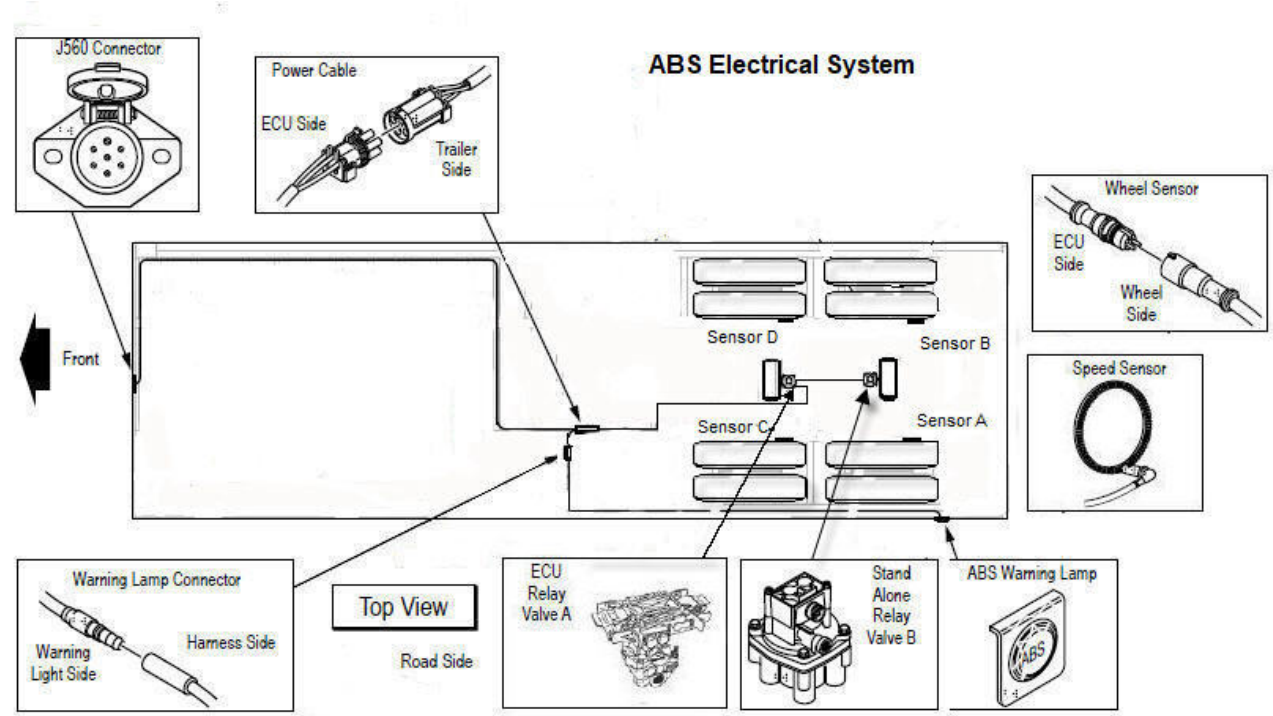
SPRING SUSPENSION **4S-2M Axle Control (1030)** **AIR SUSPENSION**

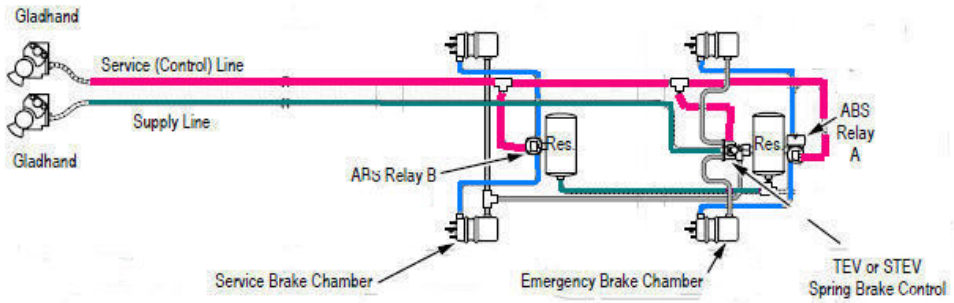




General ABS System Connections

The following is for reference only and can be reconfigured to meet the needs of each installation. It is meant to show the hardware and connections associated with a typical ABS installation. The following chapters provide a more in depth assembly for each configuration.





New Installation General Information

The Antilock Brake System (ABS) consists of an Electronic Control Unit (ECU) and a Pneumatic Control Module (PCM) combined as one unit. However, they are individually field replaceable. The wheel sensor, Indicator Lamp, and power harnesses are connected to the ECM.

Installation of the GEN 2 trailer ABS system is similar from one configuration to another. All systems use the same speed sensors and valves. Refer to the following general component instructions and to the wiring and plumbing diagrams for specific system configuration.

Circuit Requirements

For a nominal 12-volt supply, current consumption less than 1.25 amperes per PCM maximum during ABS activity. Satisfactory operation is available down to 7 volts.

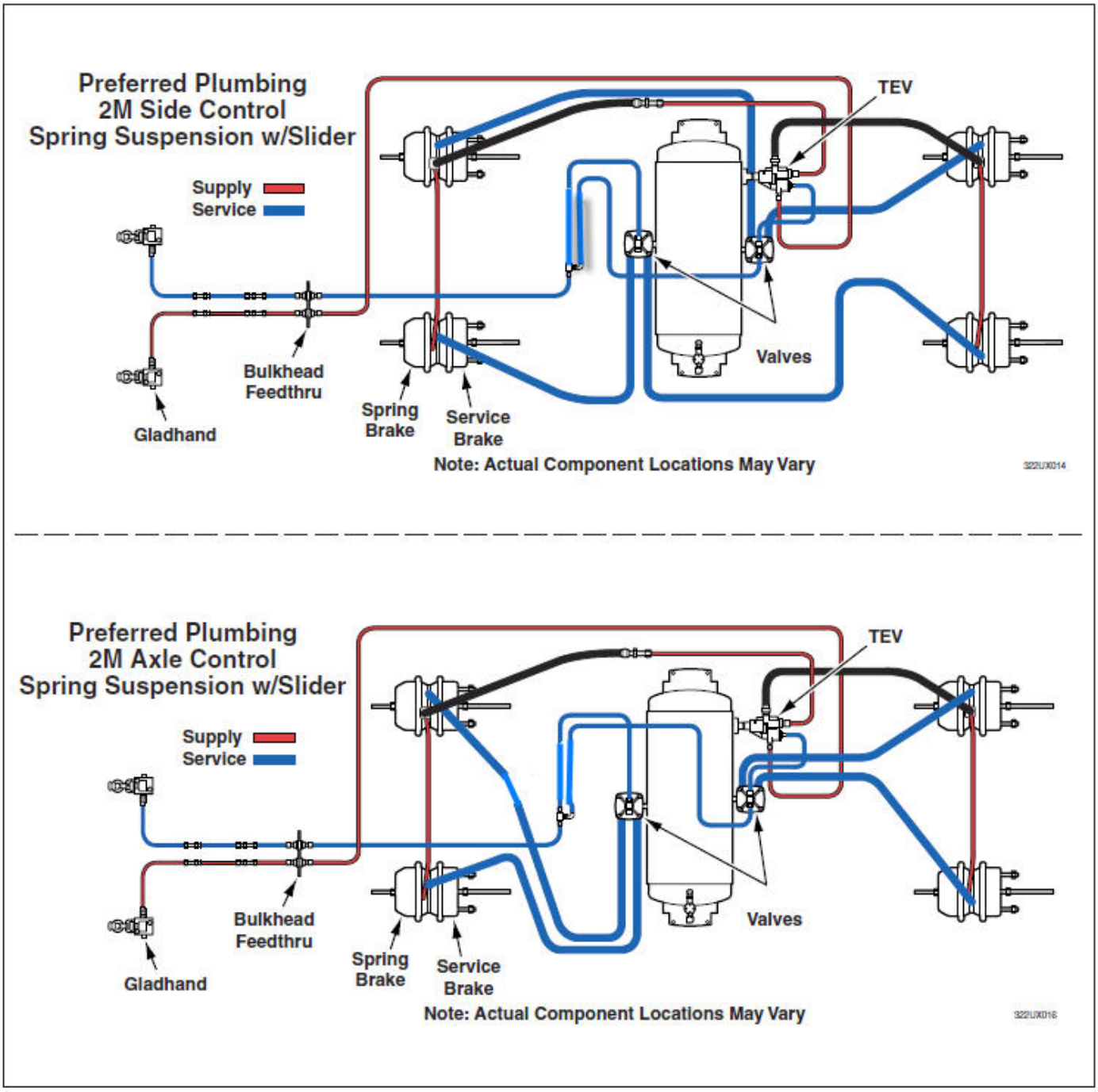
The GEN2 minimizes trailer issues caused by inadequate voltage (typically found in 3-trailer units).

Pneumatic System

The GEN2 valve has an integrated relay valve. This allows some mounting flexibility, provides good ABS performance, and complies with brake application and release timing requirements. For this configuration, the volume of the line to the spring brake valve is not included in the calculation.

Following these guidelines will usually result in an installation that complies with application and release brake timing requirements. However, always check application and release times for each configuration.

IMPORTANT: When the anti-compounding port of the Trailer Emergency Valve (TEV) is plumbed in before the PCM the straight through connection must be plumbed to the PCM and the branch connection to the TEV. All air line used in this case can be 3/8” tubing because the PCM does not exhaust this portion of the air line during an ABS event. For this plumbing configuration, omit this length of air line when calculating allowable tubing lengths.



Side Control: Top valve roadside and bottom curbside
Axle Control: Top valve front and bottom rear

Service also supplies control line

2S1M is based on Axle control only using control on one axle
4S1M is based on Axle control utilizing all ports to control all 4 brakes

Hub Installation

On retrofit applications, ABS wheel hubs with tone rings must be installed.

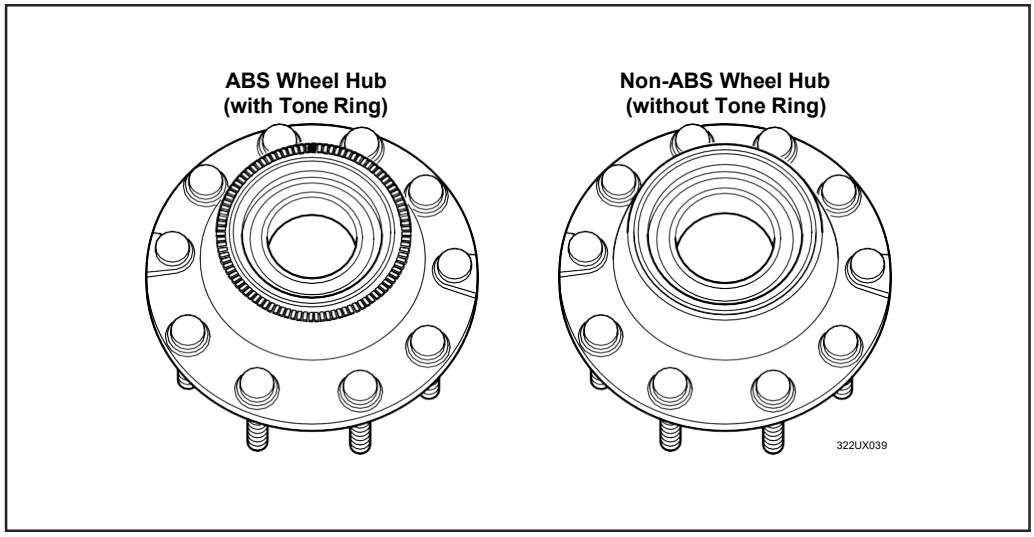
Ensure all sensed wheel ends have sensor blocks that the sensors can be installed in.

Purpose: to ensure hub installation is performed uniformly and consistently.

Recommended tools: 1-15/16", 4-13/16", 4-3/8", 3-1/4", and 3-3/16" sockets, vice grips, band cutters, allen wrench pack, 5 lb. rubber mallet, 1/2" impact wrench, standard screwdriver, utility knife, crowbar, 1/2" drive torque wrench, 3/4" drive torque wrench, 2 lb. hammer, 1" impact wrench.

This procedure must be followed unless otherwise specified by engineering, customer contracts or regulatory requirements.

1. Identify and prepare the type of spindle being used.
   A. Identify whether the spindle is a parallel spindle type or a tapered spindle type with the tapered smaller end.
   B. Remove the rubber spindle boot from the axle.
   C. Clean the spindle completely with a rag and mineral spirits making sure to remove all lubrication and contaminants from the wheel end.
   D. Inspect the seal shoulder and bearing races for nicks and/or burrs by rubbing the surface with your hand. Smooth any defects with an emery cloth, then reclean the spindle.
   E. Visually inspect brake shoes for defects such as broken corners, missing rollers, and missing springs. Replace brake shoe components as necessary.
   F. Apply a thin layer of lubricant specified to the seal shoulder and bearing races.



ABS Wheel Hub Identification

New Installation Recommended Order

Suggested Installation Order *

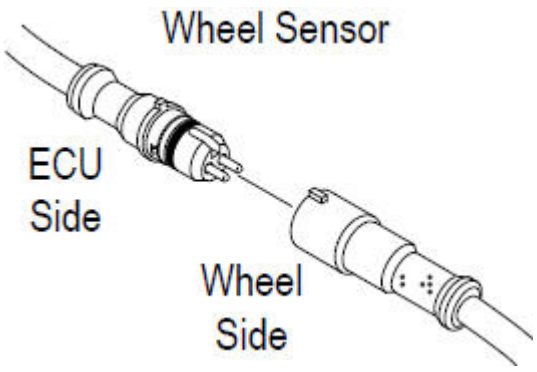
Following is a suggested order of installation of the GEN 2 trailer ABS.

1. Install Wheel Speed Sensors.
2. Install ECU / Modulator Valve(s) assembly.
3. Install the Power Cable, but do not apply power until the installation is complete.
4. Final installation of sensor extension cables and cable install to ECU.
5. Install the trailer-mounted ABS Warning Lamp.
6. Perform the End-of-Line None Functional Checkout.
7. Perform Initial System Functional Test

Install the Wheel Speed Sensors and Sensor Friction Sleeves

Refer to the appropriate diagram for your system.

1. Install the sensor friction sleeve with the flange stops towards the inboard side of the vehicle.
2. Apply high-temperature silicon-based grease to the body of the speed sensor.
3. Push the speed sensor completely into sensor friction sleeve by hand until it stops against the tone ring. The speed sensor is properly installed and adjusted when it is touching the tone ring.
4. Route the cable to the frame. Use tie wraps as required to hold the cable. Ensure you are not causing any strain on the cable
5. Ensure there is dielectric gel to the “O” rings of each extension cable.
6. Connect sensor cable to extension cable and install fasteners to hold the sensor cable in position.



Install the ECU / Modulator Valve Assembly / Stand Alone Modulator Valve

In all installations, the ECU / Modulator Valve assembly appears in the diagrams. The Stand-Alone Modulator Valve is identical to the ECU / Relay Valve except it does not have the ECU and ECU mounting bracket. The relay valves may be installed on the air tanks or on the frame.

The Stand-Alone Modulator Valve is the second relay valve in systems with two relay valves and is labeled in the diagrams.

The assembly may be mounted on the air tank or on the frame and / or cross member of the vehicle.

Gen2 Tank-Mounted

1. Use a 3/4-inch NPTF Schedule 80 hex nipple to attach the GEN2 assembly to a reinforced air tank.

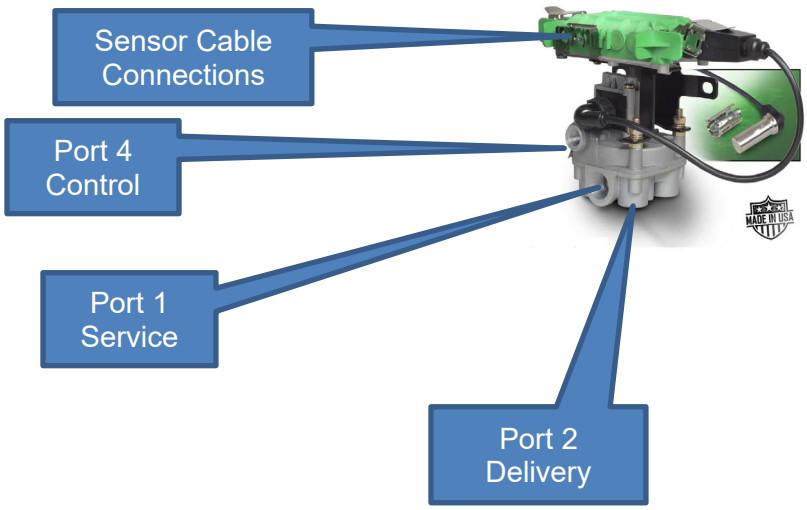
   Do not overtighten.

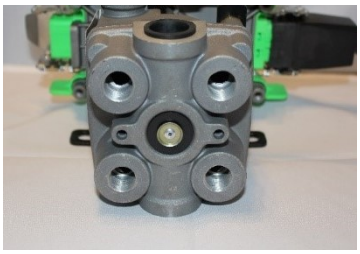
   Do not use a vise when installing the hex nipple as this may cause over clamping and damage the valve

.

2. Use a 3/4-inch NPTF pipe plug to plug the unused supply port (Port 1). Apply paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.

3. Rotate and tighten the GEN2 assembly until the exhaust port (port 2) faces DOWN and the connection is secure. Use a torque wrench or ratchet with an extension at the 3/4-inch pipe plug installed on the front supply port (Port 1).


Sensor Cable Connections
Port 4 Control
Port 1 Service
Port 2 Delivery



Pipe Fitting Torques

Refer to the following torque specifications when installing pipe nipples. Torques are for NPT threads with thread sealant applied. Do not use thread tape. Contamination by thread tape can cause component failure.

Tighten pipe nipples as follows:

- With Thread Sealant - Finger tight plus 1 1/2 turns
- Without Thread Sealant - Finger tight plus 2 turns

Leak Test *

1. Park vehicle on level surface and block wheels.
2. Press to make brake application. No air leaks are permitted.
3. Release parking brake to governor cut out point.
4. Turn engine OFF. Press service brake several times, then hold and check for immediate brake air chamber application and release at all wheels.
5. Apply brake and hold. Spray the outside of the valve assembly with a soapy mixture. No leakage is permitted.

   NOTE: If a sluggish response is noted at all wheels, inspect for kinked or obstructed air line leading to or from valve.

6. Increase air pressure to governor cut-off. With brakes released, spray relay valve with a soap mixture. Leak showing a 1” bubble in 5 seconds is permissible.
7. Press foot valve and hold. Spray exhaust port with a soapy mixture. Leak showing a 1” bubble in 3 seconds is permissible.

Install the Inline Power Connector

The inline power connector is on the end of the main ABS harness and connects the ABS system to the trailer electrical system.

Power and Sensor Cables

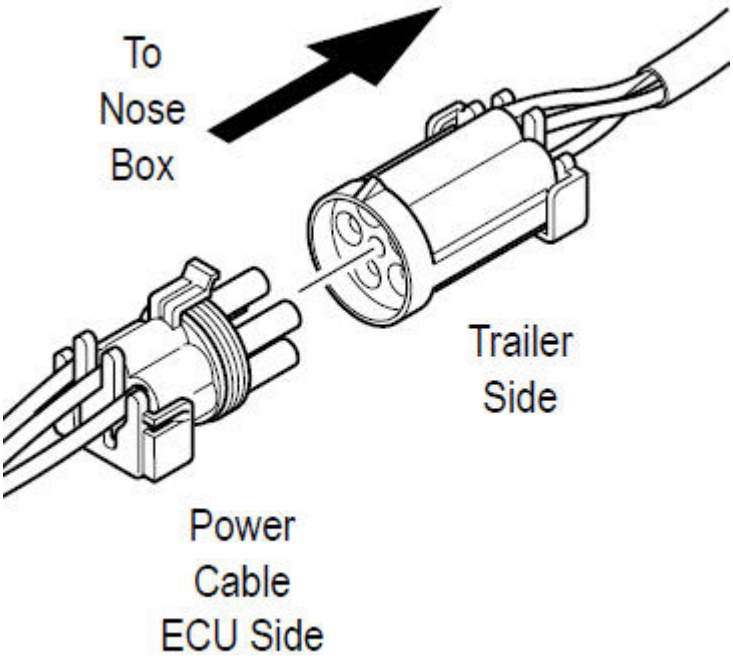
One power cable, and two or four sensor extension cables / sensors are required for the GEN2 ABS. The power cable runs to the Weather Pack 5-way connector on the trailer. The extension cables / sensors terminate in molded two-pin (industry standard) connectors.

GEN2 Cable Options

The GEN2 ABS can be configured with either a long or short power cable.

The short power cable is typically used with fixed bogies.

The long power cable is typically used with sliding bogies. Route the power cable with the slider hoses to the trailer frame.



Route the cable from the harness connector to the GEN2 valve assembly and secure it to prevent damage.

Leave enough slack in the cable to compensate for flexing of the trailer and sub-frame.

Bundle any excess cable in a loop (tie wrap) and secure it in the sub-frame of the trailer body to prevent cable damage.

Plug the power cable into the GEN2 assembly.

Pull the hinged power connector retaining clip on the ECU/Modulator assembly DOWN to secure the connection.

Final Assembly Procedure for Sensor Cables

Connect the sensor and cables on the prepped axles to the sensor extension cables.

Ensure that each connection is secure.

Route the sensor cable along the back side of the trailer axle to the GEN2 assembly.

Do not overtighten the tie wraps on a cable as overtightening can damage the cable.

The sensor extension cable must follow the brake hose to the GEN2 assembly to allow for axle jounce and rebound.

Secure the cables approximately every eight inches (203 mm) with tie wraps or cable clips.

Push the sensor retainer clip on the GEN2 assembly UP.

Plug the sensor extension cable into the GEN2 assembly. To secure the connection, push the sensor retainer clip DOWN. Retainer clips must fit in the groove of the sensor connectors to ensure correct connection.

Follow the wheel sensor connection guide to connect the sensors to the correct Terminal. Designators are listed on the enclosure.

Create a strain relief to protect the sensor extension connector terminals. Use a tie wrap or clip to secure the cable to the air hose as close to the fitting as possible.

Secure excess cable in the sub-frame of the vehicle or along the air hoses as appropriate.

Wheel Sensor Connections Guide

2S/1M	Application Axle	
	YE2	
	YE1	

4S/1M	Front	Rear
	YE2	BU1
	YE1	BU2

4S/2M A/A	Front	Rear
	YE1	BU2
	YE2	BU1

4S/2M S/S	Side 1	Side2
	YE2	YE1
	BU1	BU2

Install ABS Warning Lamp

The warning light is mounted on the road side of the trailer, forward of the marker light.

The lamp mounting location shall be near the left side rear of the trailer, no closer than 150 mm (5.9 inches) and not more than 600 mm (23.6 inches) from the rear red side marker indicator lamp. On a converter dolly, the lamp mounting location shall be on a permanent structure of the dolly at least 375 mm (14 inches) above the road surface.

Parts List

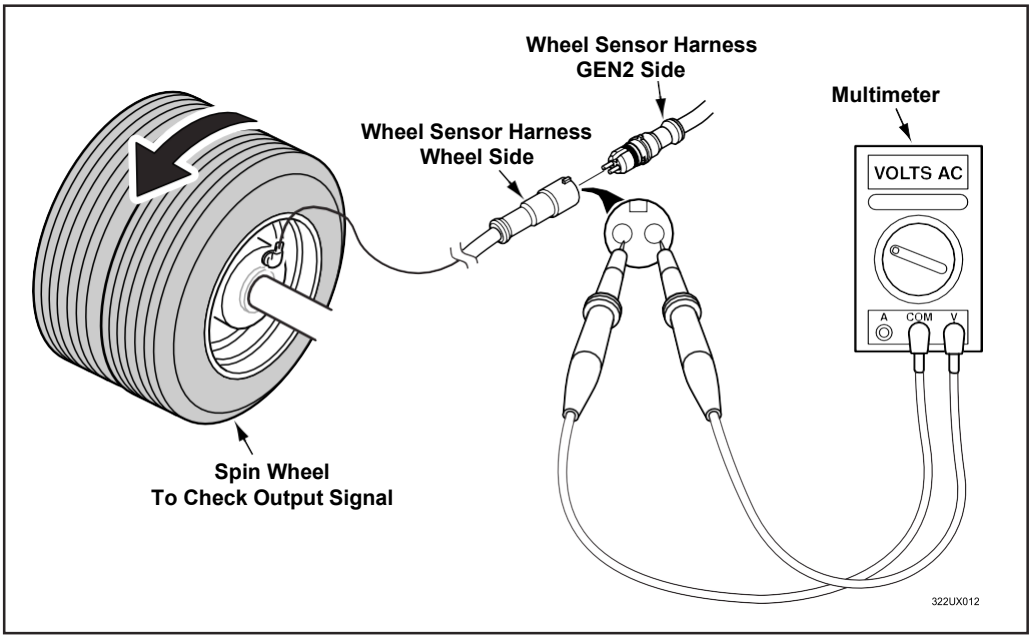
	2S/1M	2S/2M	4S/1M	4S/2M Axle X Axle	4S/2M Side X Side
ECU /Relay Valve	1	1	1	1	1
Relay Valve		1		1	1
Extension Cable	2	2	4	4	4
Power Cable	1	1	1	1	1
Sensor	2	2	4	4	4

Initial System Checkout

Following initial installation or service of the GEN2 system, perform the following checkout procedure to verify proper operation of the braking system.

1. Check each sensor for proper output.
    - Use a digital multimeter to read the sensor voltage. It should be in excess of 200 MV AC and should increase if the wheel is spun faster.
2. Check the service brakes for normal, non-ABS operation.
3. Check the ABS lamp for proper operation as follows:
    - Power up the trailer – the ABS lamp should turn OFF after two seconds.

NOTE: In some cases, it may be necessary to spin the sensor equipped wheels to verify proper lamp operation.



Wheel Speed Sensor Output Test

4. Perform Wifi Identification and connection check and that the system shows a green screen and ABS OK.
5. Perform PLC operational check

ABS System Diagnostics

Initial System Checkout

When the system is first powered up, the ABS lamp will come ON for two seconds then go OFF, indicating the system has passed all self-tests. All GEN2 units must pass operation checks before the trailer is placed in service.

Pneumatic Diagnostics

The GEN2 ABS system does not monitor the air system of the vehicle. For example, if there is an air leak, kink in the line, or faulty valve, the ABS Indicator Lamp will not show a fault in the system. However, if a malfunction in the air system arises and it cannot be determined and if the ABS valve is causing the problem, remove power cable to the ABS electronic control unit (ECU). This will allow the valve to let the air straight through to the brake system without ABS intervention. For example, if an unknown kink exists in the control line and the brakes will not apply, simply remove power to the ECU. The system can then be reexamined without the ABS affecting the system. If the brakes still do not apply it can then be determined that the ABS valve is not causing the problem.

Electrical Diagnostics

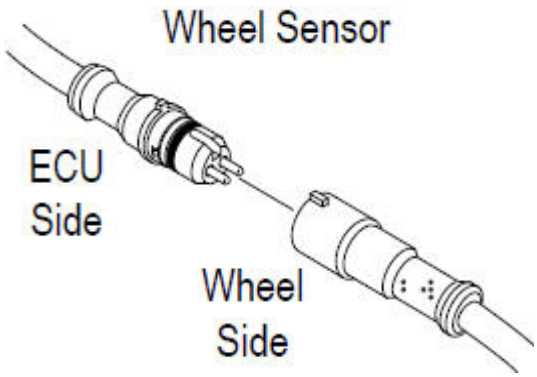
The ABS lamp is an important tool when assessing the status of the ABS system. When the system is operating properly the ABS lamp will illuminate briefly, then go OFF every time the system is powered up. If the vehicle is stationary at power up, the lamp will remain ON for two seconds and the PCM will perform a functional test causing an audible clicking or puffing. If the vehicle is mobile at power up, the lamp will remain ON for one second and the PCM self-test will be aborted. The PCM self-test is performed at each stationary power up to give the operator an audible sign that everything is performing normally.

The ABS system receives power from the stop lamp circuit (pin 4 of J560 connector – red) and the auxiliary circuit (pin 7 of J560 connector – blue). This means the system will operate on a tractor with or without the auxiliary circuit powered at tractor ignition. In a situation where the system only receives power from the stop circuit, the Indicator Lamp will illuminate briefly each time the brakes are applied and the PCM self test will be performed at each stationary brake application.

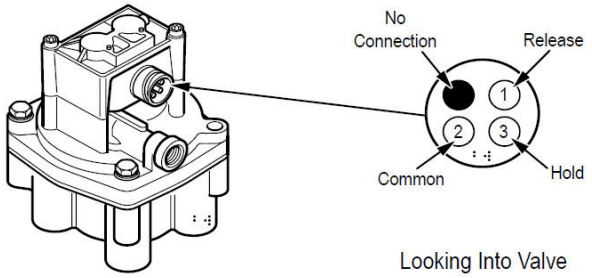
Upon power up, if the system behaves differently than described above, such as the ABS lamp remains illuminated or does not come ON at all, follow the instructions in the next section to determine the cause of the problem.

Troubleshooting Guide

1. Inspect ABS and wiring for any potential issues
    a. Broken or loose connectors
        i. Refer to Connector Sheet for review
    b. Clamping Mechanisms in correct position
2. Apply power to trailer
    a. If lamp on and then off, trailer abs system is fine but review all connections as there might be an intermittent that need attention.
    b. If Light never on
        i. Check for power to ABS ECU
        ii. Check Warning Lamp light and wiring
    c. If lamp on and stays on proceed to 3.
3. Follow wifi diagnostics procedure to connect to the abs with your phone, tablet, or laptop
    a. It should be noted that on Versions 2.5 and earlier blink codes are not activated.
    b. If lamp on and screen green (ABS OK)
        i. Clean all sensor terminals and reseat
        ii. Proceed to Fault Clear Procedure
    c. Else proceed to 3.
4. Determine proper fault
    a. Sensor fault go to step 5
    b. Valve fault go to step 6
5. Sensor Fault
    a. Check resistance for the speed sensor circuit
        i. Resistance should be between 900 and 2500 ohms
        ii. Measure from the connection to the enclosure to check both the extension cable and sensor.
            1. If outside the specifications measure the sensor itself.
    b. Reseat all connections (enclosure, extension cable and sensor cable) pertaining to the sensor in question following the steps
        i. Perform Wheel Speed Sensor Test
        ii. Remove connector
        iii. Inspect male connector for corrosion
        iv. Inspect female connector for corrosion and disform
        v. Clean terminal
        vi. Apply dielectric gel to “O” ring on male side
        vii. Reseat connector
        viii. Ensure connector lock is properly in place
    c. Go to step 1 to retest



6. Valve Fault
    a. Remove Valve cable and inspect cable and terminals for any corrosion or damage on both ends of the cable
    b. Perform the following tests



Looking Into Valve

Measure From:	Measure To:	Resistance Range:
Pin 2	Pin 1	3-8 Ohms
Pin 2	Pin 3	3-8 Ohms
Pin 1	Pin 3	6-16 Ohms

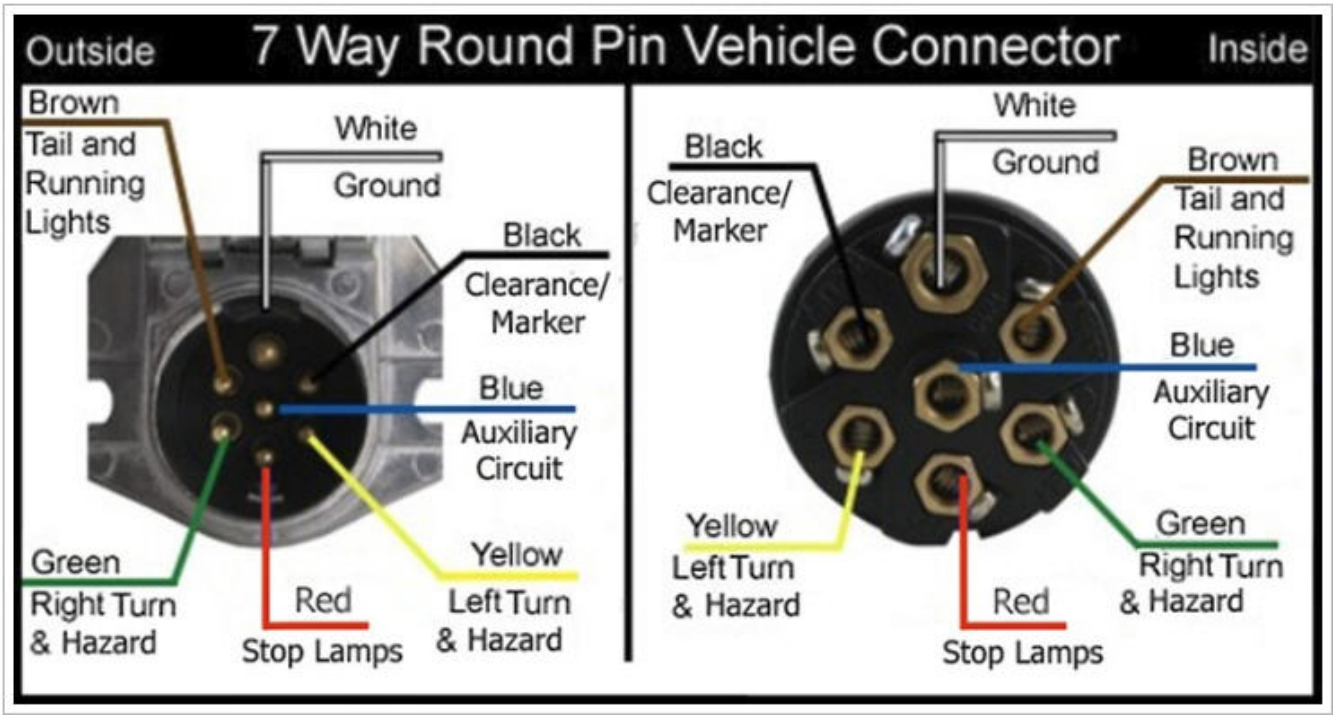
Valve Resistance Test

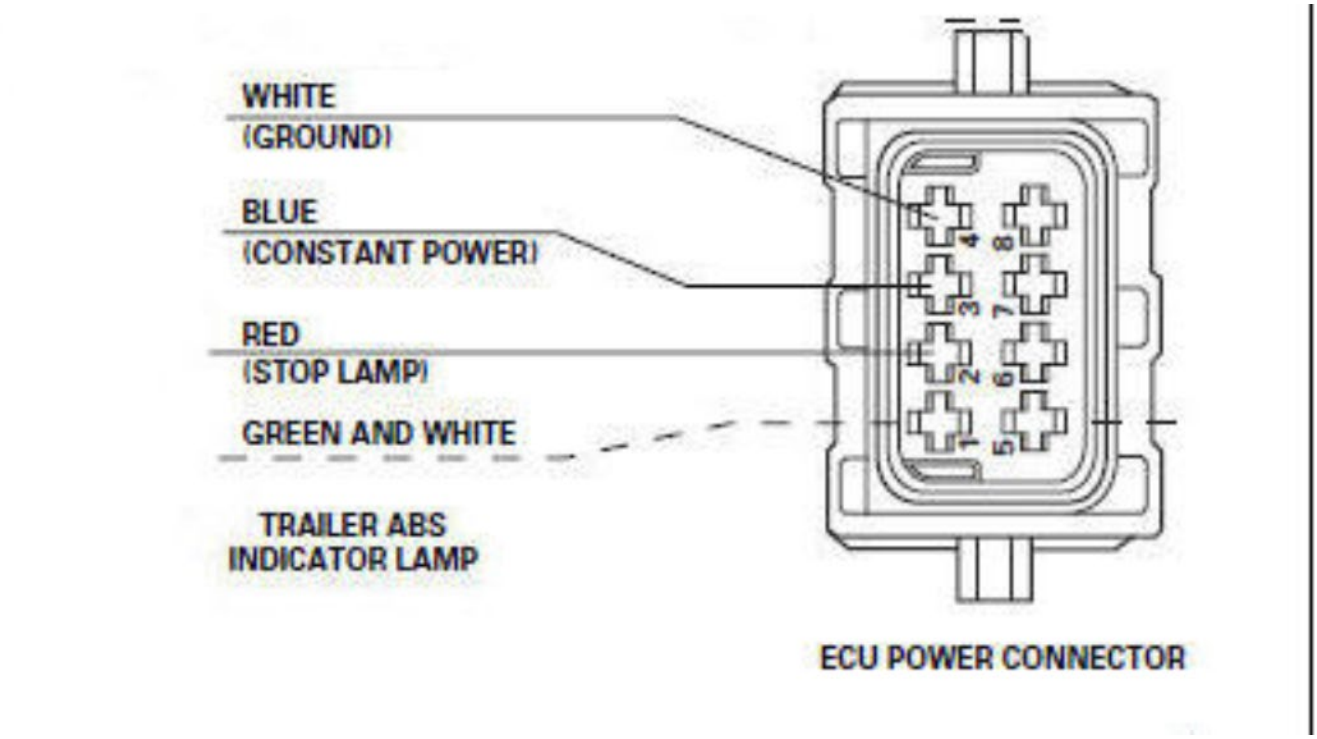
Measure resistance at the ABS valve location to check the solenoid.

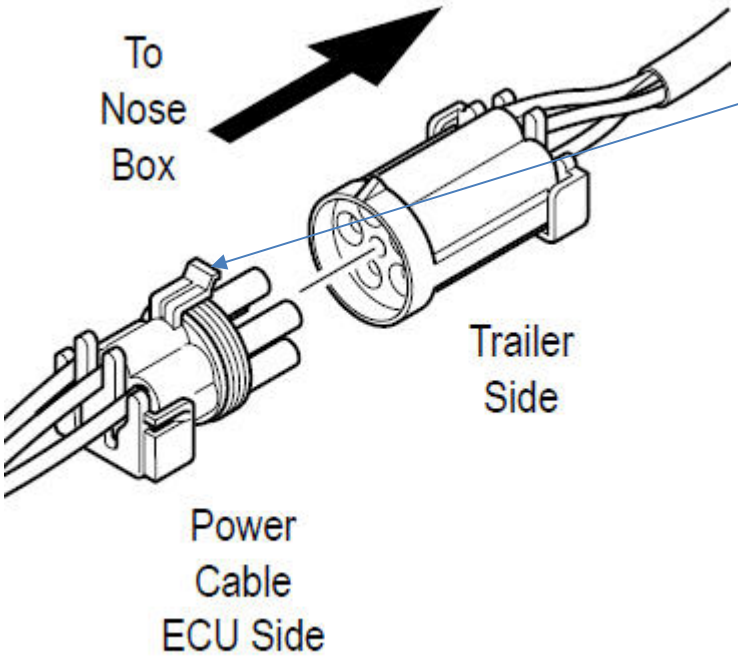
Measure resistance at the appropriate ECU harness connector pins to check the cable and valve.

Note: Refer to the chart for pin identification.

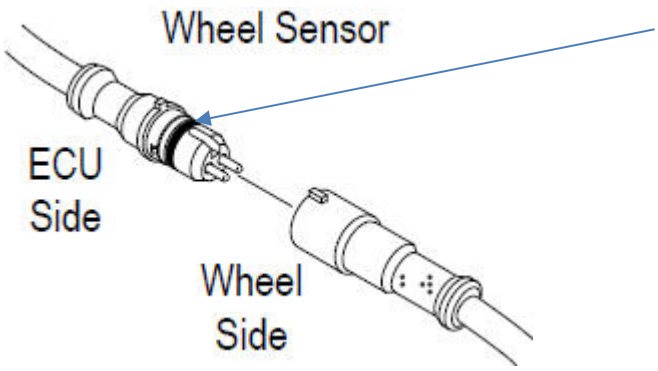
Connector Details







Make sure lock clip is securely in place



Apply Nyogel To “O-rings on both cable and enclosure

Two Procedures to clear stored faults
Procedure #1
Fault Clear Procedure with Use Of Nexiq Pocket IQ

1. Connect Nexiq tool and turn on. Apply power to trailer. Actuate the Connect / Scan Vehicle.
2. Display will show that the tool is scanning vehicle
3. Select and load the J1708 selection
4. Select View Faults
5. Actuate Clear All Faults
6. Faults are now clear
7. Turn off power to trailer

Procedure #2
Active Clear

1. While trailer is connected to tractor
2. Turn ignition on
3. Visually you will see warning lamp on
4. Start moving and visually you will see lamp off
    a. Lamp will remain off during travel and remain off until the truck is turned off
5. Travel about 5 miles, after that fault will be cleared and ABS will act normally
    a. If less travel time and the truck has been turned off the next time it is turned on that lamp will come on and stay on until forward movement and the lamp will turn back off/
6. To verify, turn ignition off and then turn ignition back on
    a. Lamp will turn on and after about 2 seconds turn off

Procedure #3
Blink Code Clear

1. Follow procedures from section “Clearing Stored Faults” in GEN2 Blink Code Diagnostics
2. To verify, turn ignition off and then turn ignition back on
    a. Lamp will turn on and after about 2 seconds turn off

Wheel Speed Sensors Test

NOTE: At initial installation, no gap must exist between the sensor and the tooth wheel.

NOTE: After you install a hub, always check that the sensor is adjusted properly.

Operating the trailer can cause a gap to develop between the sensor and the tooth wheel. If the gap exceeds 0.040-inch, the system may not function correctly.

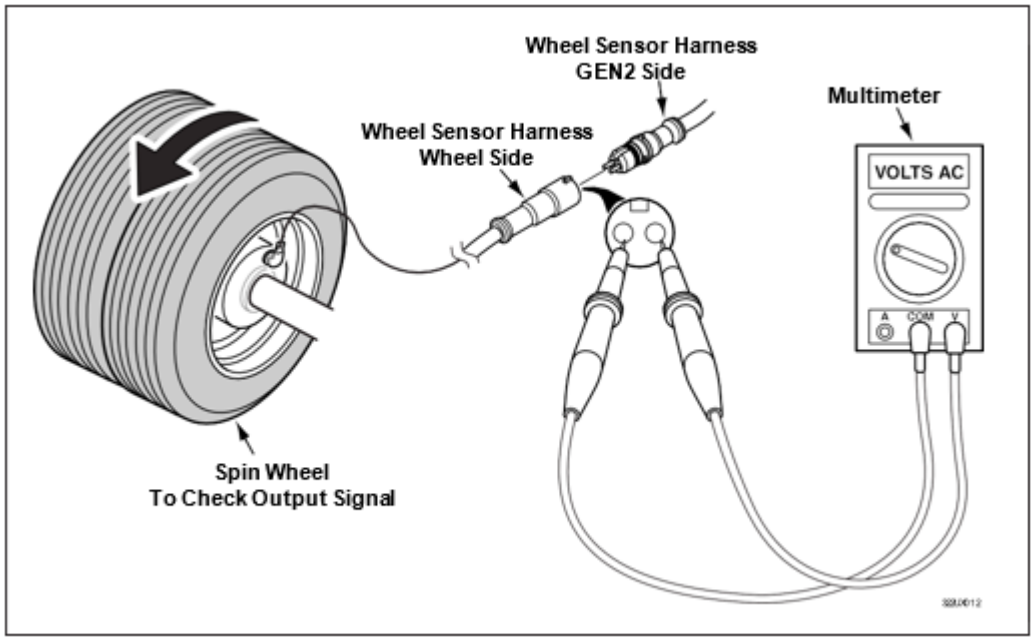
To adjust the sensor, twist and push the sensor through the sensor bracket as far as possible or until the sensor touches the tooth wheel.

Sensor Test Procedure

1. Disconnect power to the ECU/Valve Assembly.
2. Disconnect the sensor electrical connector from the ECU/Valve Assembly.
3. Connect the volt/ohm meter leads to the two wire component terminals inside the disconnected connector.
4. When checking the resistance, the meter must read 900-2500 ohms.
5. Check and replace the sensor and cables as required.
6. Repeat Steps 1-5 for each sensor in the system.

Sensor Output Voltage Test

1. Disconnect power from the ECU/Valve Assembly.
2. Connect the AC volt/ohm meter leads to the sensor terminals inside the connector.
3. Rotate the corresponding wheel at a constant speed of one-half revolution per second.
4. The output voltage must be greater than 0.2 volts AC.
5. When there is no reading:
    A. Trace the cable to verify that the cable connects to the wheel you turned.
    B. Check that you turned the correct wheel.
    C. Check that the system is wired correctly.
    D. Check that the sensor touches the tooth wheel.
6. If the volt/ohm meter still indicates no reading or a low reading after following the above procedures, check and replace the component and cables as required.
7. Repeat Steps 1-5 for each sensor in the system.



Wheel Speed Sensor Output Test

WIFI Diagnostics

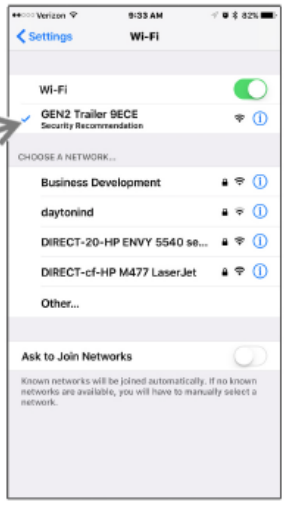
Connecting for ABS status and diagnostics and be performed on smart phones, tablets or laptops. All basically have the same connection scheme whereas the available channels are selected and then the connection process is to connect to the channel, bring up the browser, and use the address. The following instructions are in more detail, but they pertain to any device of your choosing.

Gen2 User Instructions for Access to ABS Information

Trailer Gen2 ID

1. Turn power off to the trailer
2. Wait a few seconds
3. Turn power back on
   a. This step reloads the information of the ABS to be displayed
4. Open WIFI channels or available networks & look for "Gen2 Trailer XXXX" (where XXX or XXXX is unit of interest)
5. Click on WIFI channel of interest to connect
6. Once connected, you will see the screen below
   a. Communication is from your smartphone or tablet directly to the ABS unit
   b. It does not access the internet

iPhone



Android

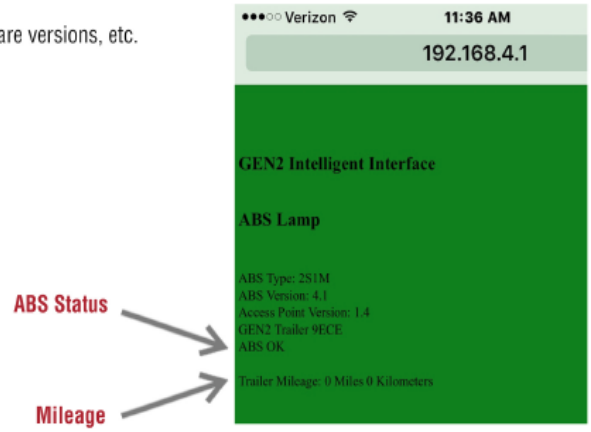
***If prompted, use password gtii1234 (all lowercase)**

7. Launch your internet browser
8. Type 192.168.4.1/read in the address bar and hit enter
9. You should see the display as follows on the next page

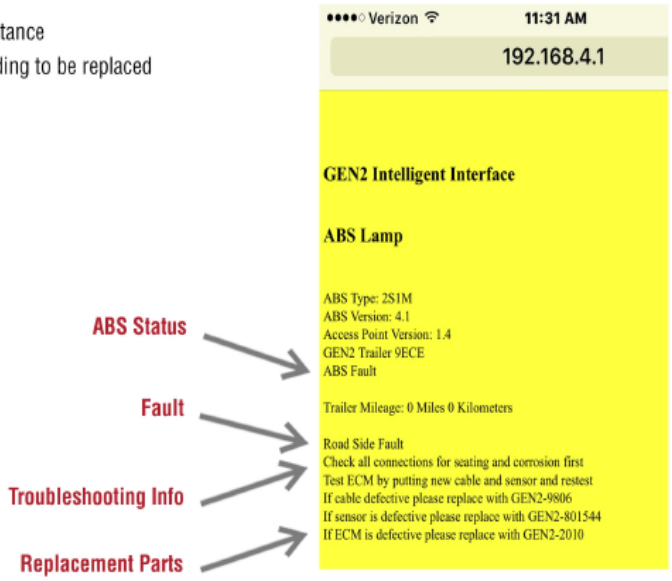
www.gen2abs.com

On the Display

1. Information on the type of ABS, software versions, etc.
2. Either:
   a. ABS OK



   b. ABS Fault
      i. What caused the fault
      ii. Troubleshooting Assistance
      iii. The part number needing to be replaced



www.gen2abs.com

Gen2 ABS System Blink Code Diagnostics

The BC at the end of the version designates blink code capable

Note:

If you experience problems connecting to the wifi channel follow the next steps

1. Make sure that the channel is available on your wifi channel list
2. Select wifi channel and go to procedure to forget the channel
3. Close browser
4. Power off ABS system
5. Restart procedure from the beginning.

Initial System Checkout

When the system is first powered up, the ABS Indicator Lamp will come ON for two seconds then go OFF, indicating the system has passed all
self-tests. All Gen2 units must pass operation checks before the trailer is placed in service.

Electrical Diagnostics

The Indicator Lamp is an important tool when assessing the status of the ABS system. When the system is operating properly the Indicator Lamp willilluminate briefly, then go OFF every time the system is powered up. If the vehicle is stationary at power up, the lamp will remain ON for two seconds and the valve will perform a functional test causing an audible clicking or puffing (usually 3 times). If the vehicle is mobile at power up, the lamp will remain ON for one second and the valve self-test will be aborted. The valve self-test is performed at each stationary power up to give the operator an audible sign that everything is performing normally.

The ABS system receives power from the stop lamp circuit (pin 4 of J560 connector – red) and the auxiliary circuit (pin 7 of J560 connector – blue). This means the system will operate on a tractor with or without the auxiliary circuit powered at tractor ignition. In a situation where the system only receives power from the stop circuit, the Indicator Lamp will illuminate briefly each time the brakes are applied, and the valve self-test will be performed at each stationary brake application.

Upon power up, if the system behaves differently than described above, such as the Indicator Lamp remains illuminated or does not come ON at all, follow the instructions in the next section to determine the cause of the problem.

It is a good idea to clear faults after a new installation to ensure that everything is starting from a known point.

Entering the flash code diagnostic mode

The Globetech GEN2 ABS system has an enhanced flash or blink code system so utilization of a tester is not required to be able to analyze active faults, stored faults or to clear faults. All faults (active and stored) along with control or clearing can be accomplished via a light tester or ignition / brake combination.

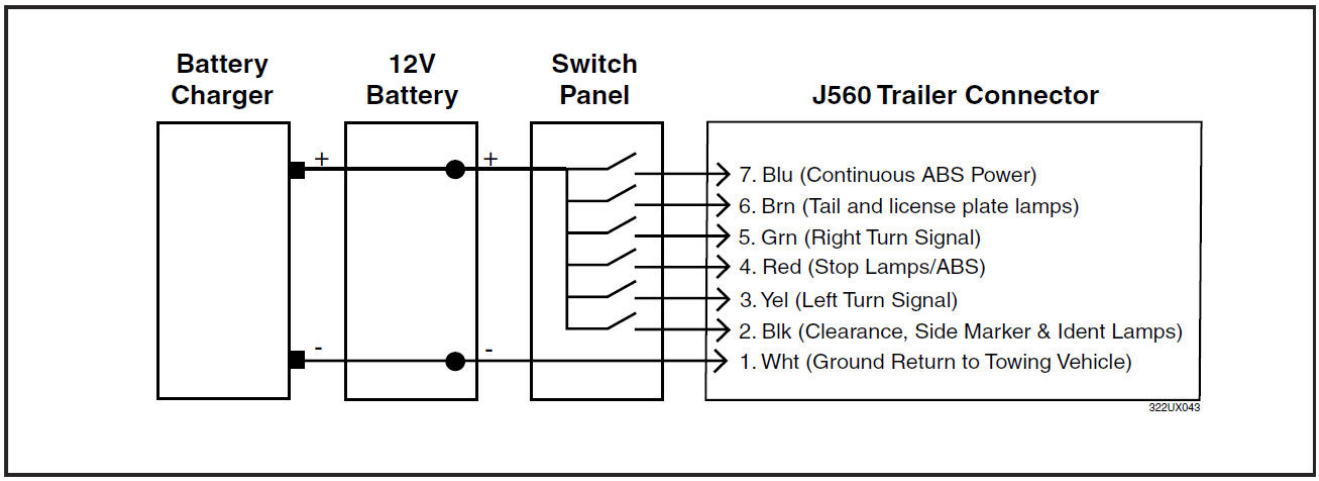
Fault identification is provided via flashes or blinks of the ABS Indicator Lamp. To enter the flash code diagnostic mode, it must be possible to power the auxiliary circuit. On March 1997 and newer tractors, this circuit is switched with the ignition. Alternately, a suitable light tester may be used.

Light Tester

Faults are categorized in two types:

- Current Faults – Faults that are active when the system is powered up, causing the Indicator Lamp to remain illuminated. All current faults become stored faults after they are repaired.
- Stored Faults – Faults that were current faults at one time but are no longer active and allow the Indicator Lamp to go OFF at power up. Typically, they may be caused by intermittent problems that only occur when the vehicle is moving.

Both, stored faults and current faults can be identified using the ABS flash code system.



Typical Light Tester

Current Faults

To access the flash code identification for a current fault, turn all power OFF to the ABS and perform the following steps.

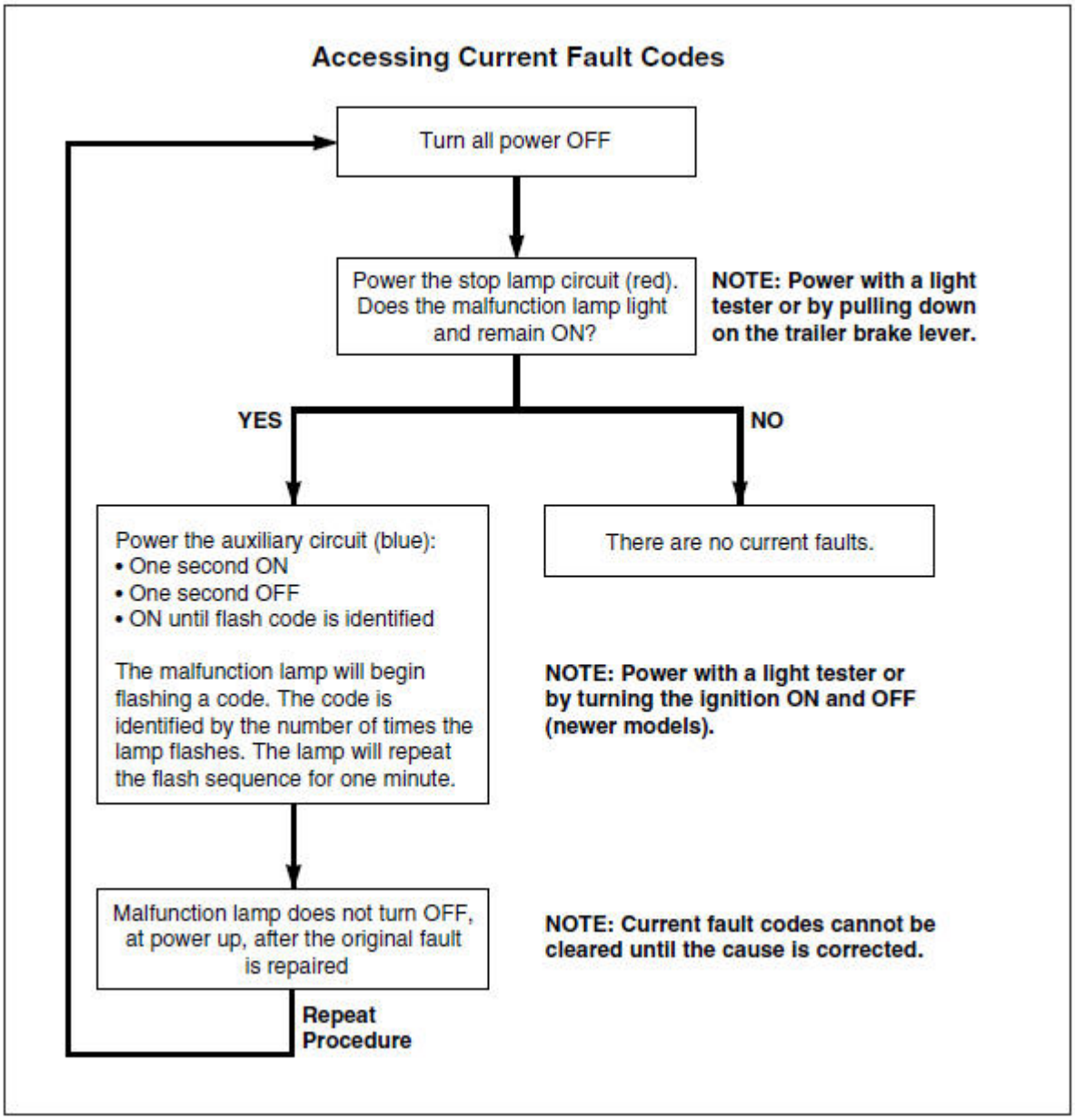
Note: On some new vehicles the brake / key actuation may not work as the circuitry in the vehicle may not allow independent operation. Under these circumstances, the light tester is to be used.

1. Power the stop lamp circuit (red) by applying brake or appropriate switch on light tester and allow power to remain ON this circuit until the flash code has been identified (see step 3 below). The Indicator Lamp will light with the stop lamps and remain ON (if the lamp goes out, there are no current faults).
2. Power the auxiliary circuit (blue) by switching on ignition or switching appropriate switch on light tester for one second, then power down for one second, then power back up and allow the power to remain ON until the flash code has been identified (power ON two times).
3. The Indicator Lamp will begin flashing a code. The code is identified by the number of times the lamp illuminates.

To identify the fault, the code will correspond to a specific fault found in the Flash Code Identification Table at the end of this paper. Before any maintenance is performed, disconnect all power from the system.

In the unlikely event that more than one fault is present, the Indicator Lamp will not turn OFF at power up after the original fault is repaired. Repeat the above steps to identify other faults.

If a stored fault exists, it will be identified after the last stored fault is cleared (see Clearing Stored Faults). Current faults will always be displayed first and cannot be cleared.


Accessing Current Fault Codes
Turn all power OFF
Power the stop lamp circuit (red). Does the malfunction lamp light and remain ON?
NOTE: Power with a light tester or by pulling down on the trailer brake lever.
YES
NO
Power the auxiliary circuit (blue):
• One second ON
• One second OFF
• ON until flash code is identified
The malfunction lamp will begin flashing a code. The code is identified by the number of times the lamp flashes. The lamp will repeat the flash sequence for one minute.
There are no current faults.
NOTE: Power with a light tester or by turning the ignition ON and OFF (newer models).
Malfunction lamp does not turn OFF, at power up, after the original fault is repaired
NOTE: Current fault codes cannot be cleared until the cause is corrected.
Repeat Procedure

Stored Faults

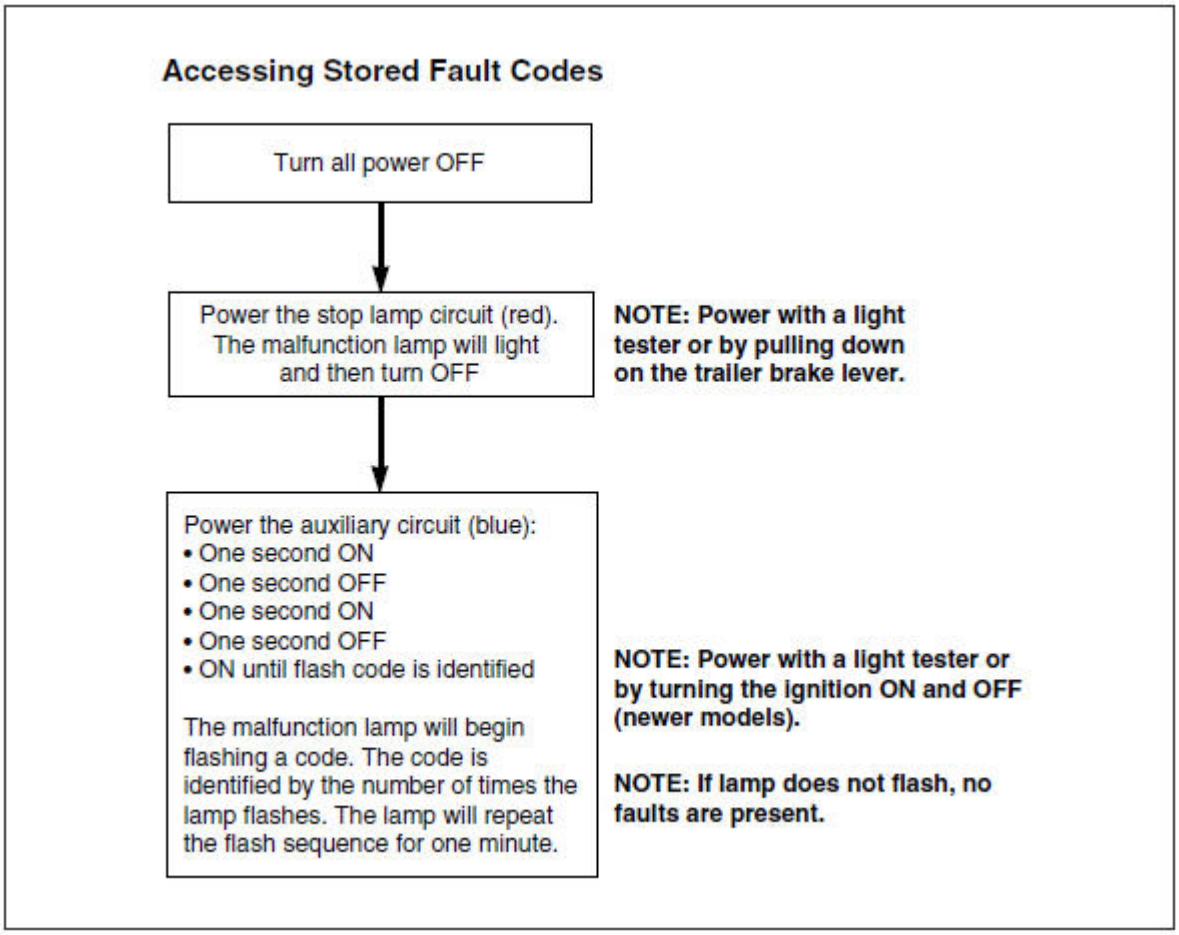
To access the flash code identification for a stored fault, turn all power OFF to the ABS and perform the following steps.

1. Power the stop lamp circuit (red) by applying brake or appropriate switch on light tester and allow power to remain ON this circuit until the flash code has been identified (see step 3 below). The Indicator Lamp will light with the stop lamps and then turn OFF.
2. Power the auxiliary circuit (blue) by switching on ignition or switching appropriate switch on light tester for one second, power down for one second, power back up for one second, power down for one second, then power back up and allow the power to remain ON until the flash code has been identified (power ON three times).
3. The Indicator Lamp will begin flashing a code. The code is identified by the number of times the lamp illuminates.

To identify the fault code, refer to the Flash Code Identification Table at the end of this report.

Before any maintenance is performed, all power must be disconnected from the system.

If more than one stored fault exists, it will be identified after you clear each fault.


Accessing Stored Fault Codes
Turn all power OFF
Power the stop lamp circuit (red). The malfunction lamp will light and then turn OFF
NOTE: Power with a light tester or by pulling down on the trailer brake lever.
Power the auxiliary circuit (blue):
• One second ON
• One second OFF
• One second ON
• One second OFF
• ON until flash code is identified
The malfunction lamp will begin flashing a code. The code is identified by the number of times the lamp flashes. The lamp will repeat the flash sequence for one minute.
NOTE: Power with a light tester or by turning the ignition ON and OFF (newer models).
NOTE: If lamp does not flash, no faults are present.

Clearing Stored Faults

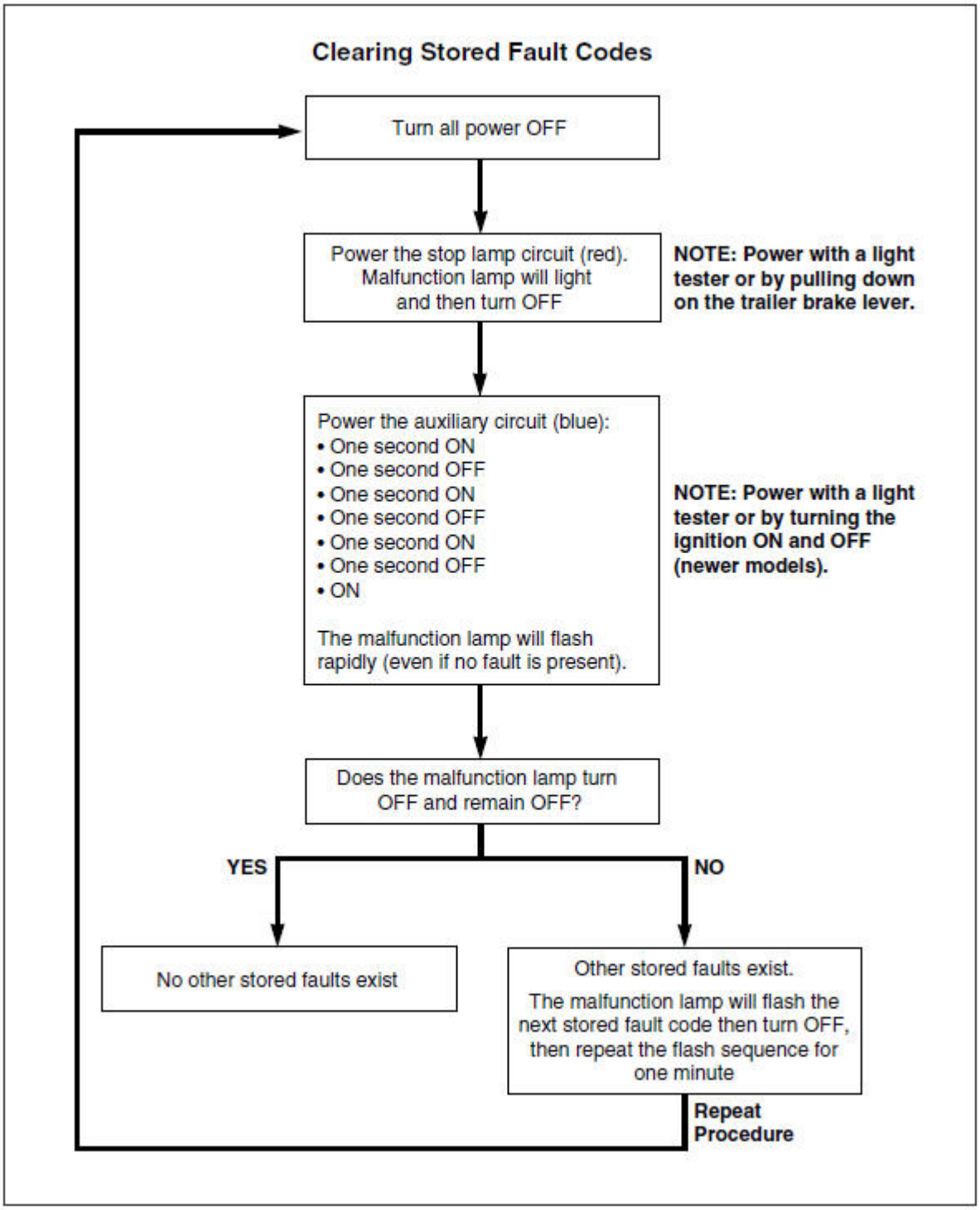
To clear a stored fault, turn all power OFF to the ABS and perform the following steps:

1. Power the stop lamp circuit (red) by applying brake or appropriate switch on light tester and allow power to remain ON this circuit until the faults have been cleared (see step 3 below). The Indicator Lamp will light with the stop lamps and turn OFF.
2. Power the auxiliary circuit (blue) by switching on ignition or switching appropriate switch on light tester for one second, power down for one second, power back up for one second, power down for one second, power up for one second, power down for one second, then power back up and allow the power to remain ON (power ON four times).
3. The Indicator Lamp will begin flashing rapidly for ten seconds signaling the system is in the fault clear mode. The fault is actually cleared in the first fraction of a second but the delay is designed to allow time for the technician to confirm the fault clear mode was entered.

Rapid flashing will occur even if no fault is present.

After the rapid flash sequence, the Indicator Lamp will turn OFF and remain OFF unless another stored fault exists.

The Indicator Lamp will flash a fault code shortly after the rapid flash sequence if more than one fault was stored in memory. After the appropriate number of flashes, the lamp will turn OFF briefly, then repeat the flashsequence. This will continue for one minute, giving personnel time to return from the tractor cab to check the count. To identify the code, refer to the Flash Code Identification Table.


Clearing Stored Fault Codes
Turn all power OFF
Power the stop lamp circuit (red). Malfunction lamp will light and then turn OFF
NOTE: Power with a light tester or by pulling down on the trailer brake lever.
Power the auxiliary circuit (blue):
• One second ON
• One second OFF
• One second ON
• One second OFF
• One second ON
• One second OFF
• ON
The malfunction lamp will flash rapidly (even if no fault is present).
NOTE: Power with a light tester or by turning the ignition ON and OFF (newer models).
Does the malfunction lamp turn OFF and remain OFF?
YES
NO
No other stored faults exist
Other stored faults exist.
The malfunction lamp will flash the next stored fault code then turn OFF, then repeat the flash sequence for one minute
Repeat Procedure

Flash Code	Fault	Comments
4	YE1 (Curbside front sensor connection fault.)	Check curbside front sensor resistance and electrical connections.
6	YE2 (Roadside front sensor connection fault.)	Check roadside front sensor resistance and electrical connections.
7	Modulator valve assembly	Check connections or replace valve assembly
14	Low voltage to ABS.	Check tractor and trailer wiring on auxiliary and stop lamp circuits. Check tractor battery and charging system.
15	Electronic Control Module failure.	Replace the ECM.

Gen2 2S1M ABS Flash Code Identification Table

Flash Code	Fault	Comments
3	YE1 (Curbside front sensor signal fault.)	Check curbside front sensor resistance and electrical connections
4	YE1 (Curbside front sensor connection fault.)	Check curbside front sensor resistance and electrical connections.
5	YE2 (Roadside rear sensor signal fault.)	Check roadside front sensor resistance and electrical connections
6	YE2 (Roadside front sensor connection fault.)	Check roadside front sensor resistance and electrical connections
7	BU2 (Curbside front sensor signal fault.)	Check curbside rear sensor resistance and electrical connections
8	BU2 (Curbside front sensor connection fault.)	Check curbside rear sensor resistance and electrical connections
9	BU1 (Roadside rear sensor signal fault.)	Check roadside rear sensor resistance and electrical connections
10	BU1 (Roadside front sensor connection fault.)	Check roadside rear sensor resistance and electrical connections
11	Remote valve fault	Check connections and / or replace valve assembly
12	Primary valve fault	Check connections and / or replace valve assembly
14	Low voltage to ABS.	Check tractor and trailer wiring on auxiliary and stop lamp circuits. Check tractor battery and charging system.
15	Electronic Control Module failure.	Replace the ECM.

Gen2 ABS (All other versions) Flash Code Identification Table

Commercial Diagnostics Equipment

Full diagnostics, clearing codes and stored codes are available via J1587. Commercial equipment manufacturers are incorporating GEN2 structures to their systems. Until full implementation access can be performed via use of Generic j1708.

NOTE : When using a Nexiq commercial test system, clearing faults shows multiple faults. When in clearing mode the faults will go to 0 then maximum faults again. The faults are cleared. After the procedure go through the ABS test sequence again.

ABS Lamp Failure

If the Indicator Lamp does not illuminate at power up but the solenoids perform the self-test (audible sound) or air brake sounds (chuffing sound) with treadle valve applied, check the following:

- The lamp power harness may be disconnected.
- The bulb may have a bad ground connection.
- The ABS lamp may be faulty.

If the ABS lamp does not illuminate on power up and the solenoids do not perform the self-test, check the following:

- The GEN2 may not be receiving power. Check the Weather Pack 5-way power connector for a loose connection.
- The GEN2 may have failed.

NOTE: When checking for proper operation, keep in mind the Indicator Lamp circuit is only powered for two seconds at initial power up.

If a replacement part or other customer service is needed, please contact the Globetech Manufacturing Customer Service Department at
937-274-5587.

ABS Replacement Guide

The ECU/Modulator Assembly

WARNING

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

How to Remove and Replace the ECU Assembly Only

Note This procedure will work with replacing a Wabco 2S1M with a GEN 2

1. Release all pressure from the air system.
2. Disconnect the power cable, additional relay valve cable (if used), and all sensor cables from the ECU/ Modulator Valve Assembly.
3. Remove the 3 bolts that hold the ECU to the bracket.

NOTE: Do not remove the 4 bolts that hold the enclosure to the casting that is used to bolt to the bracket. By doing this the environmental integrity (seal) has been compromised and the unit is prone to failure to internal corrosion.

4. Replace ECU by torqueing the 3 bolts to 6 lb-ft.
5. 2. Connect the power cable, additional relay valve cable (if used), and all sensor cables of the ECU/ Modulator Valve Assembly.

How to Remove the ECU / Modulator Assembly

1. Release all pressure from the air system.
2. Attach labels to identify all air lines.
3. Disconnect the air lines from the ECU/Valve Assembly.
4. Disconnect the power cable, additional relay valve cable (if used), and all sensor cables from the ECU/Valve Assembly. Label all sensor cables with locations (YE1, YE2, BU1, or BU2)
5. Remove the ECU / Modulator Valve Assembly from its mounting location:

How to Install the ECU / Modulator Valve Assembly

NOTE: The ECU/ Modulator Valve Assembly is supplied with green protective caps on each sensor connector.

NOTE: When a sensor cable is not plugged into a sensor connector, the green cap must remain on the connector to protect it from dirt and contamination.

You must use a Schedule 80 pipe nipple (3/4-inch NPTF) to nipple mount the ECU/ Modulator Valve Assembly securely to the air tank to avoid possible serious personal injury and damage to components.

Tank-Mounted WARNING

You must use a Schedule 80 hex nipple (3/4-inch NPTF) to mount the ECU/single modulator valve assembly securely to the air tank to avoid possible serious personal injury and damage to the component.

1. Use a 3/4-inch Schedule 80 hex nipple to attach ECU/single modulator valve assembly to a reinforced air tank. Do not overtighten.

NOTE: Not recommend use of a vise when installing the hex nipple. Use of a vise may cause over clamping. Over clamping may damage the internal components of the ECU/single modulator valve assembly.

2. Use a 3/4-inch pipe plug to plug unused supply port (Port 1). Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.
3. Rotate and tighten the ECU/single modulator valve assembly until the exhaust port faces down and the connection is secure. Use a torque wrench or ratchet with extension at the 3/4-inch pipe plug installed on the front supply port (Port 1).

Bracket-Mounted to Cross Member of Vehicle

1. Install a 3/4-inch NPTF fitting in supply port (Port 1). Use a 3/4-inch pipe plug to plug unused supply port (Port 1).
    - Use a 3/4-inch pipe plug to plug unused supply port (Port 1). Apply SAE-standard, DOT-approved Teflon tape or paste-type thread sealant to all pipe threads beyond the first two threads. Pipes with pre-applied thread sealant may also be used.
2. Attach mounting bracket to vehicle cross member midway between the side rails, close to the brake chambers the valve serves.
3. Use two 3/8-inch Grade 8 bolts with prevailing torque nuts and washers to attach assembly to the vehicle cross member. Tighten bolts to 18 lb-ft (24 N•m).

Retrofit Guide

In general, retrofitting is changing from one suppliers ABS system to a GEN2 ABS system. The step by step procedure is outlined in the following pages to accomplish this task. The basic task is to change the following

Service air lines
Delivery air lines
Control lines
Sensors

The step by step are directed below. To identify the supplier's ports might require access to their manual to ensure identity correctness.

To ensure proper specification to specific items of the installation, refer to the ABS Replacement Guide or the New Installation Guide. Assistance is available on specific installations of retrofits. Procedures beyond the procedures below will be available or generated and made available as a continuing effort to make the retrofits easy for you.

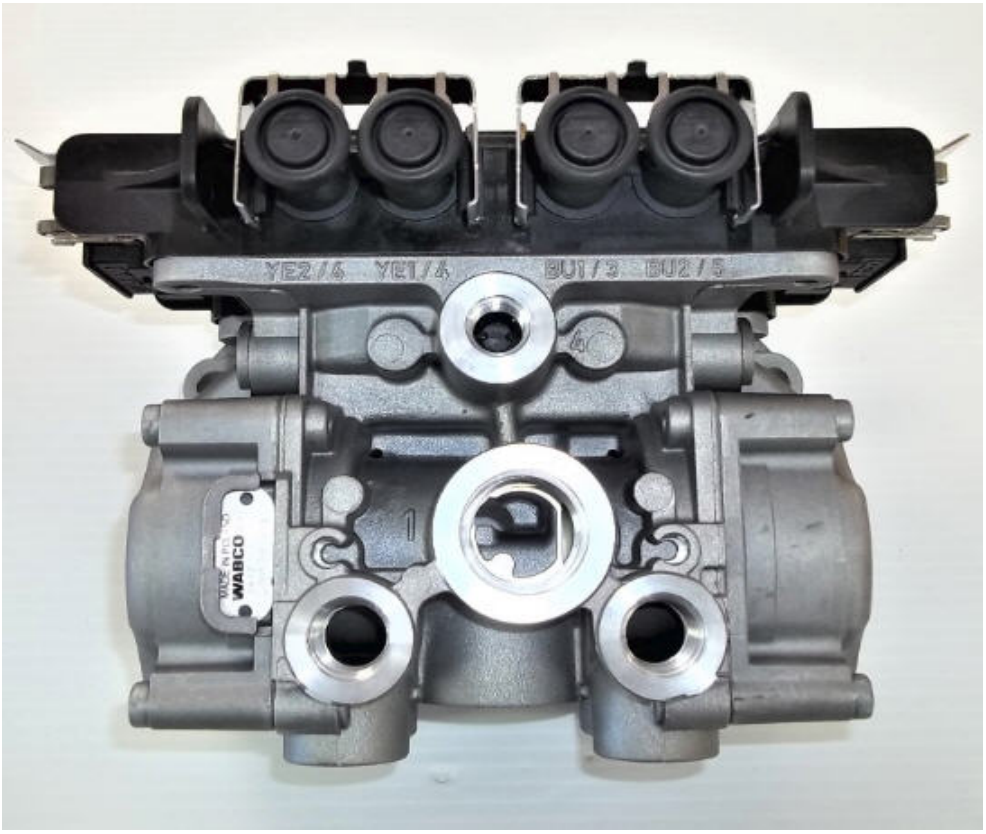
Wabco 2S/1M

Note The Wabco ECU can be replaced by itself with the GEN 2 ECU. Please follow the instructions **How to Remove and Replace the ECU Assembly Only.**

If the complete unit needs to be replaced, follow theses instructions

1. Let out all pressure from the air system
2. Remove power from the trailer
3. Disconnect the power cable from the ECU / Modulator Assembly
4. Label to identify each air line.
5. Disconnect all air lines
6. Label and identify each sensor connection
7. Disconnect each sensor connection
8. Remove the ECU / Modulator Valve Assembly from its mounting location
9. Install the ECU / Modulator Valve Assembly
   A. Refer to **How to Install the ECU / Modulator Valve Assembly in ABS Replacement Guide**
10. Install each sensor to its corresponding location based on the label position and secure locking mechanism.
11. Install power connector and secure locking mechanism.
12. Install each air line to its corresponding location based on label position
13 Perform end of line test

Wabco 4S/2M to 4S/1M



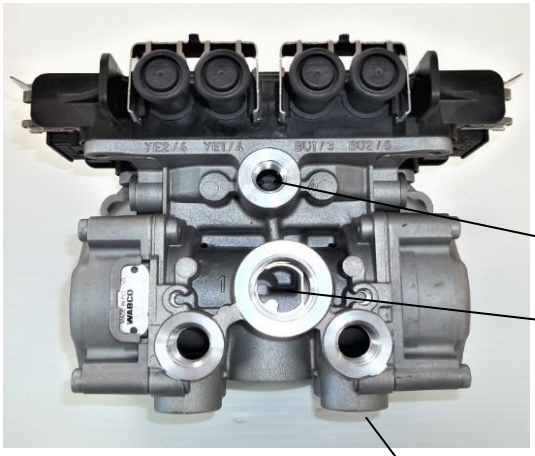
NOTE Our recommendation is to use the GEN2 4S1M in retrofitting the 4S2M (axle by axle). If 4S2M side by side the retrofit must be a GEN2 4S2M side by side.

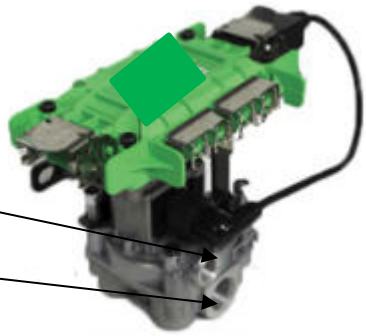
1. Let out all pressure from the air system
2. Remove power from the trailer
3. Disconnect the power cable from the ECU / Modulator Assembly
4. Label to identify each air line
5. Disconnect all air lines
6. Label and identify each sensor connection
7. Disconnect each sensor connection
8. Remove the ECU / Modulator Valve Assembly from its mounting location
9. Install the ECU / Modulator Valve Assembly
   A. Refer to **How to Install the ECU / Modulator Valve Assembly in ABS Replacement Guide**
   B. If tank mounted, install relay valve B on second port and use extended cable.
   C. Plug all unused ports.
10. Install each sensor to its corresponding location based on the label position and secure locking mechanism.
11. Install power connector and secure locking mechanism.
12. Install each air line to its corresponding location based on label position
13 Perform end of line test

Note : Retrofit of 4S1M

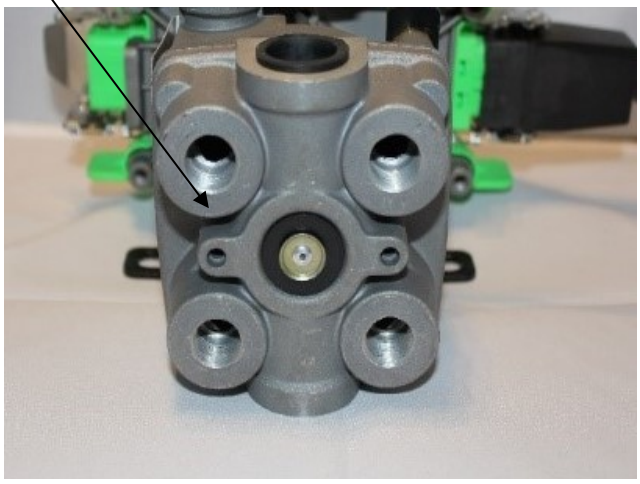
Make all connections as follows to retrofit Wabco 4S2M to GEN2 4S1M

Label and move all sensors to appropriate connections



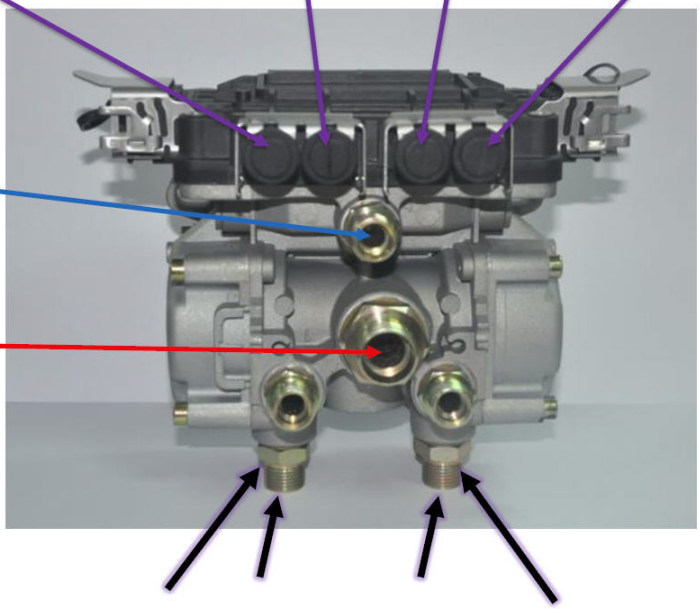


Label and transfer all
delivery air lines and control port line

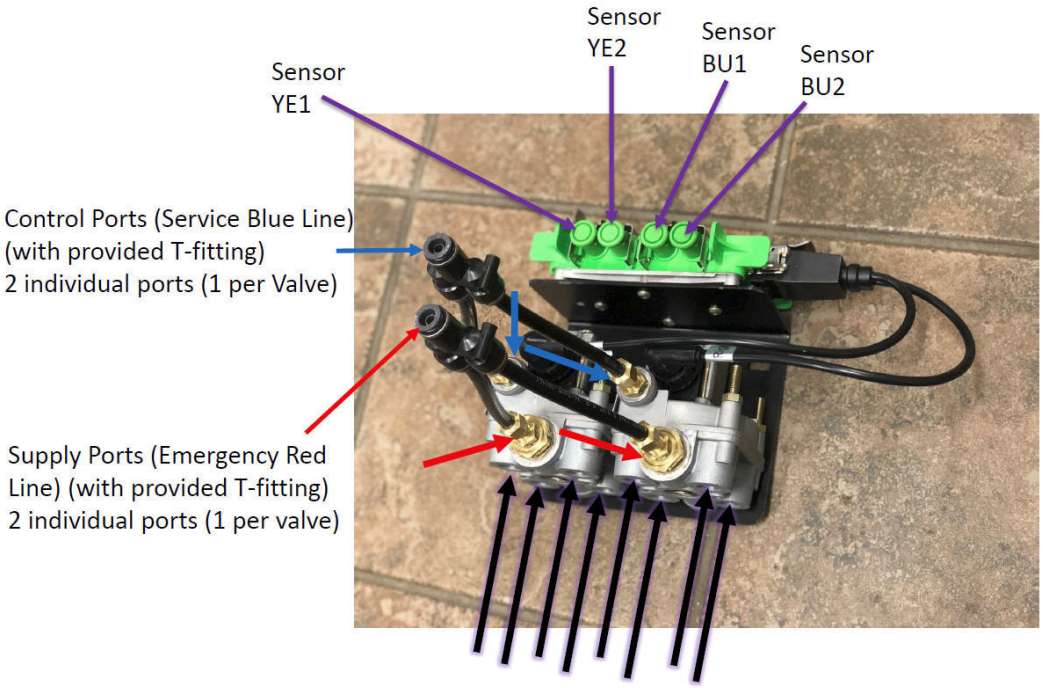


Wabco 4S/2M to GEN2 4S/2M

1. Let out all pressure from the air system
2. Remove power from the trailer
3. Disconnect the power cable from the ECU / Modulator Assembly
4. Label to identify each air line
5. Disconnect all air lines
6. Label and identify each sensor connection
7. Disconnect each sensor connection
8. Remove the ECU / Modulator Valve Assembly from its mounting location
9. Install the ECU / Modulator Valve Assembly
   A. Refer to **How to Install the ECU / Modulator Valve Assembly in ABS Replacement Guide**
10. Install each sensor to its corresponding location based on the label position and secure locking mechanism.
11. Install power connector and secure locking mechanism.
12. Install each air line to its corresponding location based on label position
13 Perform end of line test

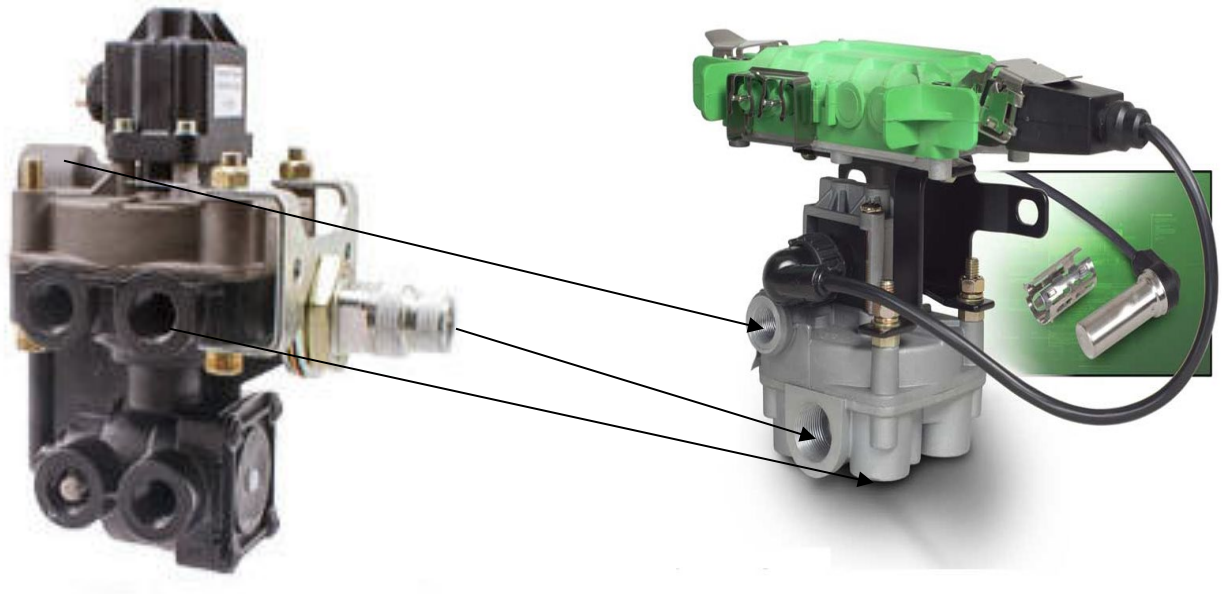


This design is usually air tank mounted with the Red (Supply Port) plugged on the front. The Red (Supply Port) on the back of the unit is mounted directly to the air tank.



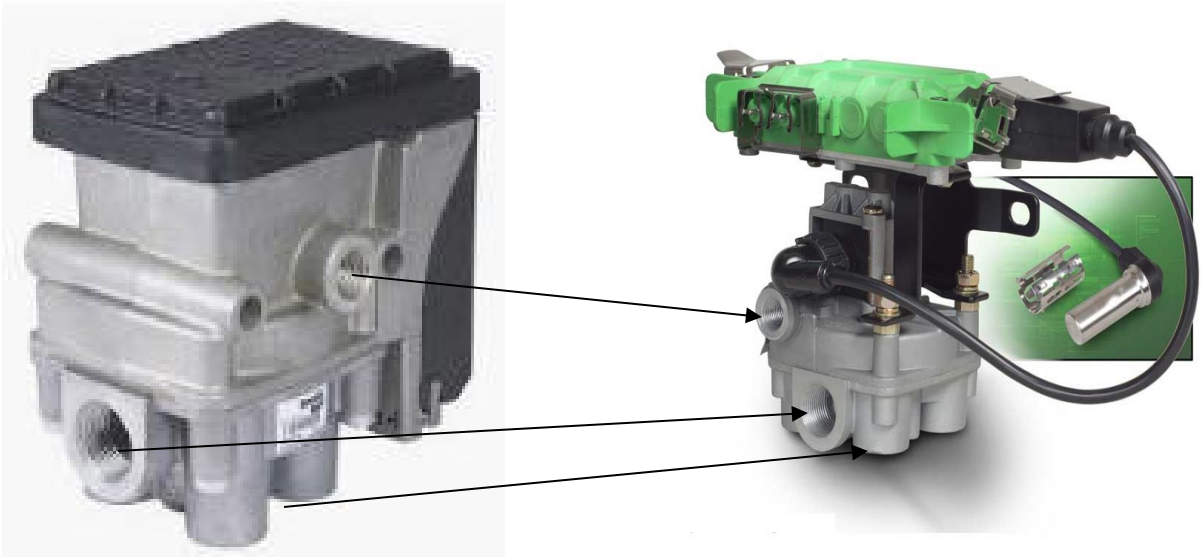
1. Place control Line from Blue Glad Hand into tee that feeds the control line on both valves
2. Place supply Line from Red Glad Hand into tee that feeds the supply line on both valves
3. Attach Delivery Ports to Brake Chambers. Plug any unused delivery ports at bottom of valve
4. Plug sensors into corresponding wheel end

Haldex



1. Let out all pressure from the air system
2. Remove power from the trailer
3. Disconnect and remove the power cable from the ECU / Modulator Assembly
    a. Note: The power cable must be replaced
4. Label to identify each air line
5. Disconnect all air lines
6. Label and identify each sensor connection
7. Disconnect each sensor connection
8. Remove the ECU / Modulator Valve Assembly from its mounting location
9. Install the ECU / Modulator Valve Assembly
   A. Refer to **How to Install the ECU / Modulator Valve Assembly in ABS Replacement Guide**
10. A spring brake control valve must be installed if replacing a FFABS system.
11. Install each sensor to its corresponding location based on the label position and secure locking mechanism.
12. Install GEN 2 power cable and connect power cable connector to ECU. Secure locking mechanism.
13. Install each air line to its corresponding location based on label position
14. Perform end of line test

Bendix Tab 6



1. Let out all pressure from the air system
2. Remove power from the trailer
3. Disconnect and remove the power cable / sensor cable assembly from the ECU / Modulator Assembly
    a. Note: The power cable must be replaced.
4. Label to identify each air line
5. Disconnect all air lines
6. Label and identify each sensor connection
7. Disconnect each sensor connection
8. Remove the ECU / Modulator Valve Assembly from its mounting location
9. Install the ECU / Modulator Valve Assembly
   A. Refer to **How to Install the ECU / Modulator Valve Assembly in ABS Replacement Guide**
   B. On 4S2M retrofits, use kit with extended modulator valve cable to connect to ABS relay B.
   C. On 4S1M retrofits
      a. Remove ABS relay B and install plug in its place.
      b. Installation of air lines with include all 4 delivery ports.
10. Install extension cables to each sensor. Follow procedures of Final Assembly Procedure For Sensor Cables.
11. Install each sensor to its corresponding location based on the label position and secure locking mechanism.
12. Install GEN 2 power cable and connect power cable connector to ECU. Secure locking mechanism.
13. Install each air line to its corresponding location based on label position
14. Perform end of line test

Glossary

2S/1M Two sensor, one modulator system.

2S/2M Two sensor, two modulator system.

4S/1M Four sensor, one modulator system.

4S/2M Four sensor, two modulator system.

Axle-by-Axle Control Axle-by-axle control is available only on 4S-2M system. Each sensed axle is controlled independently based on wheel speeds from both wheels on a single axle.

Side-by-Side Control Side-by-side control is available only on 4S-2M system. Each side of the vehicle is controlled independently based on wheel speeds from sensed wheels on each side of the vehicle.

ACM Antilock Control Module. Consists of ECM and PCM(s).

Current Faults Faults that are active when the system is powered up which cause the ABS lamp to remain illuminated.

ECM Electronic Control Module.

ABS Lamp Located on the rear driver side corner of the vehicle just forward of the rear marker lamp, the ABS lamp verifies the system is functioning properly or alerts the operator if a problem arises with the ABS.

PCM Pneumatic Control Module.

Stored Faults Faults that were current faults at one time, but are no longer present and allow the ABS lamp to go out at power up. Can be checked with commercial equipment.

Trace Fault A temporary record of a previous fault that slightly modifies Indicator Lamp operation but does not affect ABS function.

Wheel Speed Sensors Located either in the front and/or rear axle, depending on the geometry of each particular tandem, the wheel sensors receive wheel speed information.

Notes

Customer And Technical Support

For answers to questions, ordering parts or anything related to GEN2

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Or please visit our website for up to date information and downloads

www.gen2abs.com