



Installation Instructions

Bendix® Trailer ABS Service Replacement Kit Intended for Service Replacement of Bendix® MC-30™ Controller Assemblies for 2S/2M (2 Sensor/2 Modulator) Through 4S/2M Trailer ABS

Prior to installation or performing service to ABS controllers, always perform the following steps:

1. Inspect the vehicle for damage (e.g. chafing, cuts, etc.) to current ABS unit, hoses or wiring and adjust routing of replacement installation as necessary.
2. Turn power off.
3. Drain the air pressure from all reservoirs.
4. Remove as much contamination as possible prior to disconnecting electrical connections and air hoses.
5. Note the original controller assembly mounting position on the vehicle.
6. Follow all General Maintenance Precautions as found on page 4 of these instructions.

REMOVING THE ORIGINAL CONTROLLER

1. Disconnect the ECU connector and any modulator connector from the controller.
2. Remove all air hoses connected to the unit. (Use spray lubricant on the swivel fittings of the delivery hoses where necessary before attempting to remove them.)
3. Remove the controller assembly from the vehicle by removing the mounting bracket nuts or by rotating the entire assembly counterclockwise from the tank mount.
4. Disconnect the ABS sensors and remove the existing harness. Bendix requires that only Bendix wheel speed sensors be used for Bendix ABS systems.
5. Disconnect the electrical connector from any remote modulator relay valve.
6. Remove all air hoses connected to any remote modulator relay valve. (Use spray lubricant on the swivel fittings of the delivery hoses where necessary before attempting to remove them.)
7. Remove the remote modulator relay valve by removing the mounting bracket nuts or by rotating the entire assembly counterclockwise from the tank mount.

WHEEL SPEED SENSOR REPLACEMENT

Due to the critical safety function provided by any ABS product, Bendix does not assume responsibility for antilock system reliability or performance issues in situations where substitute non-Bendix® ABS components, not supplied by Bendix (for example, substituting a non-Bendix wheel speed sensor or modulator valve) are used on a vehicle equipped with Bendix ABS. In addition, use of alternate components in place of genuine Bendix components could lead to rejection of ABS warranty claims. See Bulletin TCH-013-009 for more details.

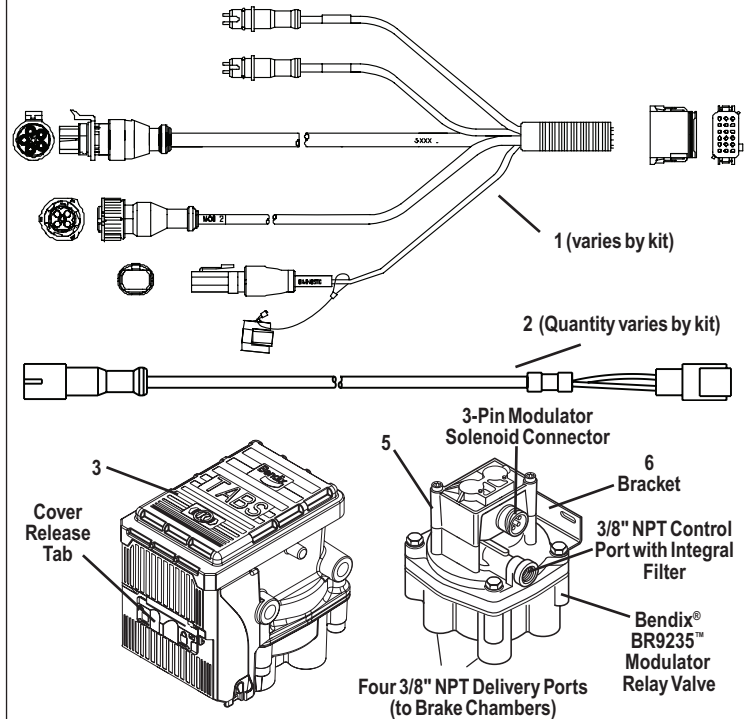
INSPECTION

Inspect the location selected for installation and clean as necessary.

NOTE: Inspect all components – including the replacement trailer ABS module – for any external damage such as cracked valve ports, electronic housings, etc. Any components found to be damaged should not be installed on the vehicle and must be replaced.

KIT CONTENTS

| Item | Description | Qty. |
|------|---|------|
| 1 | ABS Power Harness (varies by kit) | 1 |
| 2 | Wheel Speed Sensor Harness (quantity varies by kit) | 2-4 |
| 3 | Trailer ABS Module (varies by kit) | 1 |
| 4 | Identification Label | 1 |
| 5 | Bendix® BR9235™ Modulator Relay Valve | 1 |
| 6 | Mounting Bracket & Hardware/Nuts/Lockwashers (Bracket shown below attached to BR9235) | 1 |
| | (not shown) . . . Service Data sheet. | 1 |



Bendix TABS-6 Trailer ABS

| Diagnostic Code | Code Description | Test/Blind Code |
|-----------------|------------------|--|
| 1 | ABS | 1 No fault |
| 2 | Sensor SL | 1 Sensor signal valid - large air gap |
| 3 | Sensor SR | 2 Sensor signal valid - loss of signal |
| 4 | Sensor SAL | 3 Sensor signal valid - wrong |
| 5 | Sensor SAR | 4 Sensor shorted or open |
| | | 5 Line driver not lit |
| | | 6 Sensor coil signal line error |
| 6 | Power | 1 Over-voltage |
| | | 2 Low voltage |
| | | 3 Excessive power line resistance |
| 7 | Valve W001 | 1 Valve solenoid (W00) shorted or open |
| 8 | Valve W002 | 2 Valve solenoid (W02) shorted or open |
| 9 | Valve W003 | 3 ABS modulator dynamic error-all valves |
| | | 4 Excessive ABS activity |
| 10 | Common | 1 Valve Mod/2 Two-side valve shorted to ground |
| | | 2 Valve Mod/3 One-side valve shorted to ground |
| | | 3 ABS modulator dynamic error-all valves |
| | | 4 Excessive ABS activity |
| 11 | ECU | 1 ECU internal error |
| | | 2 ECU initialization error |
| 12 | Indicator Lamp | 1 ABS Lamp (A07) shorted or open |
| 13 | Diagnostics | 1 J5901 diagnostics (A08) shorted or open |

To Read/Clear Diagnostic Troubleshooting Codes (DTC's):

1. Apply constant power to the trailer (ignition switch).
2. Within 15 seconds, apply/release the brake pedal at 1 second intervals:
 - a) 3 times for Active DTC's.
 - b) 4 times for Inactive DTC's.
 - c) 5 times for clearing Active DTC's.
3. After a 5 second delay, the blink codes will be activated.
4. Observe the trailer-mounted ABS indicator lamp and record blink code(s).
5. Refer to blink code chart for description.
6. After making repairs and clearing DTC's, verify lamp is no longer illuminated.

For assistance: 1-800-AIR-BRAKE P/N 5015457_0

FIGURE 1 - KIT COMPONENTS
INSTALLATION

1. Use a 1/2 inch to 3/4 inch **heavy-walled** nipple (e.g. Parker 216P-12-8) for the Bendix® TABS-6™ and BR9235™ modulator relay valve supply ports. (Thin-walled nipples may not be able to support the valve weight nor cope with potential vibration stresses.)
2. Position and secure the ABS valves, ensuring that the remote modulator valve BR9235 and TABS-6 ECU valve are installed as per system drawings shown in Figures 4, 5 and 6. **Note: The side of the vehicle that the valves are installed on, will be the opposite to that of the original Bendix® MC-30™ installation for 2S/2M side and 4S/2M side.**

Tank (nipple) mount the Bendix® TABS-6™ modulator relay valve by installing the nipple fitting into the port marked module supply. Then rotate the entire assembly into the tank port until secure (the exhaust port must point straight down). Over-torquing of the tank nipple could cause damage to the Module. Limit torquing of nipple into TABS-6 supply port to 240 inch pounds (about one and a half turns after hand tight).

Position and secure the Bendix® BR9235™ remote modulator relay valve. (The exhaust port must point straight down.) Tank (nipple) mount the unit, installing the nipple fitting into the BR9235 relay valve supply port. Then rotate the entire assembly into the tank port until secure. Over-torquing of the tank nipple could cause damage to the valve. Limit torquing of nipple into BR9235 relay valve supply port to 240 inch pounds.

The kit comes with a BR9235 relay valve mounting bracket and fasteners/nuts/lockwashers. The bracket is used for frame-mounted BR9235 relay valve units. Torque the nuts/lockwashers to 120-170 in-lbs. When frame (bracket) mounting unit, torque the mounting nuts (not included) to 180-220 in-lbs.

3. Reconnect all air hoses and plugs to the modulator-valve assemblies. Thread sealant products that contain Teflon may be used, however thread sealant tape is not recommended as there is a potential for tape material entering the valve and affecting the valve's operation. Make certain that no thread sealant enters the valve. All air hoses and fittings should be checked for leaks prior to returning the vehicle to service.
4. Reconnect the ECU and sensor electrical connectors to the unit. Use of wheel speed extensions (included in the kit) that adapt from the old wheel speed sensors to the TABS-6 will be required. Slide the cover locking tab to gain access to the internal connections. Apply a moderate amount of non-conductive electrical grease to each connector pin before reconnecting.
5. Install the new harness, starting at the ECU, and properly secure the harness (every 18 inches) to the power connector location. Replace and lock the cover.
6. Reconnect the remote modulator valve electrical connector. For spread axle trailers with large spreads, it may be necessary to purchase a modulator extension harness. Contact Bendix and reference drawing number 0802018 for available lengths.
7. Where the harness length is more than needed, reroute harness, or tie extra harness as shown in Figure 3.
8. The new controller may need to be reconfigured for proper operation. See Bendix Service Data sheet SD-13-4767 included in the kit for more details. Leakage and operational tests must be performed before returning the vehicle to service.

LEAKAGE AND OPERATIONAL TESTS

1. Before performing leak tests, block the wheels.
2. Fully charge the air brake system and verify proper brake adjustment.
3. Make several trailer brake applications and check for prompt application and release at each wheel.
4. Check the TABS-6 and BR9235 modulator relay valve bodies and all air line fittings for leakage by spraying each area with a soap solution:

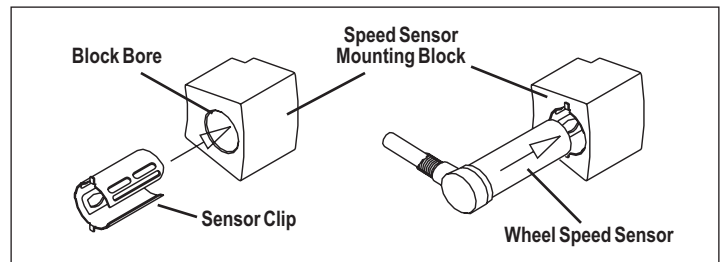


FIGURE 2 - SENSOR CLIP AND SENSOR INSTALLATION

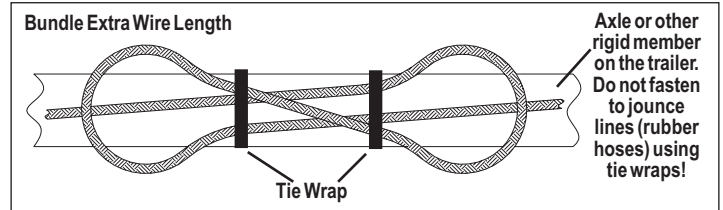


FIGURE 3 - BUNDLING EXTRA WIRE LENGTH

- Check the ABS solenoid body with the trailer service brakes fully applied. If leakage is excessive, replace the entire TABS-6 or BR9235 modulator relay valve.
- Check the TABS-6 and BR9235 relay valve exhaust ports and the area around the retaining rings with the trailer service brakes released. A single 1 in. bubble within three (3) seconds is permitted.
- Check the TABS-6 and BR9235 relay valve exhaust ports and the areas around the retaining rings with the trailer service brakes fully applied. A single 1 in. bubble within three (3) seconds is permitted.

If excessive leakage is detected at the relay exhaust port, perform the following test before replacing the TABS-6 or BR9235 modulator relay valve:

Apply the trailer spring brakes. Recheck for leakage around the relay exhaust port. If the exhaust port stops leaking, this indicates a leak between the emergency and service sides of the spring brake chamber. However, if the relay exhaust port continues to leak, replace the entire TABS-6 or BR9235 modulator valve.

5. Apply power and monitor the TABS-6 power-up sequence to verify proper system operation. Refer to the TABS-6 power-up sequence section in the supplied Service Data sheet.
6. Determine the current ABS configuration by using handheld or PC-based diagnostic tools, or by activating blink code diagnostics. If necessary, reconfigure the TABS-6 using a diagnostic tool. Refer to Bendix Service Data sheet SD-13-4767 for more information.
7. The correct wheel speed sensor position and connection can be verified by disconnecting each sensor and monitoring with a diagnostic tool. After a single sensor position is confirmed, reconnect the sensor connector and the Diagnostic Trouble Code (DTC) indication will automatically clear. Repeat with each sensor connector. If the DTC does not automatically clear, use a diagnostic tool to clear the DTC.
8. Calibrate and set odometer parameters if necessary using a diagnostic tool. Refer to SD-13-4767 for more information.
9. When necessary, it is possible to road test the ABS function by making an abrupt stop from a vehicle speed of about 20 MPH to check for proper function. The wheels should not enter a prolonged lock condition, and ABS function should be audible. It is the responsibility of the technician to perform this test in a safe location.

2S/2M - SIDE CONTROL

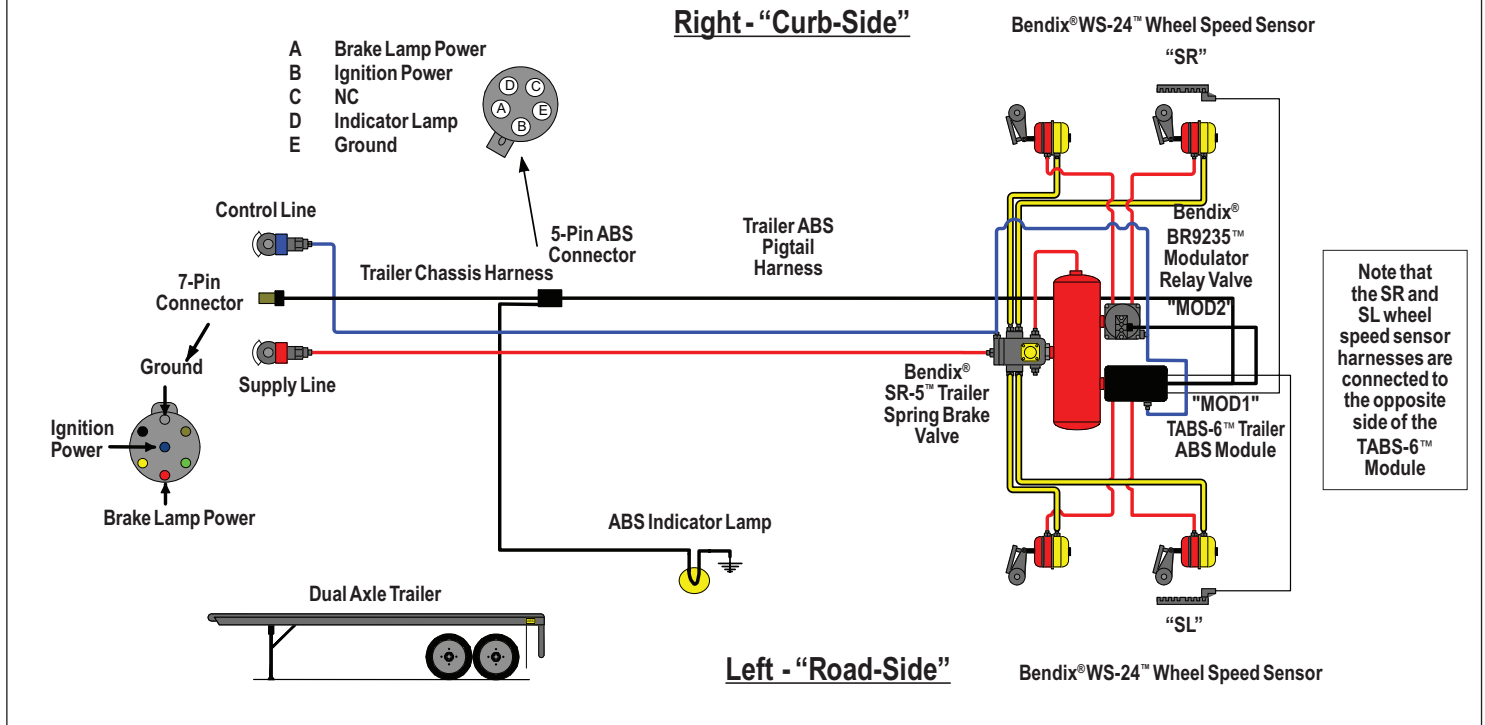


FIGURE 4 - TRAILER ABS 2S/2M SIDE CONTROL SYSTEM SCHEMATIC

4S/2M - SIDE CONTROL

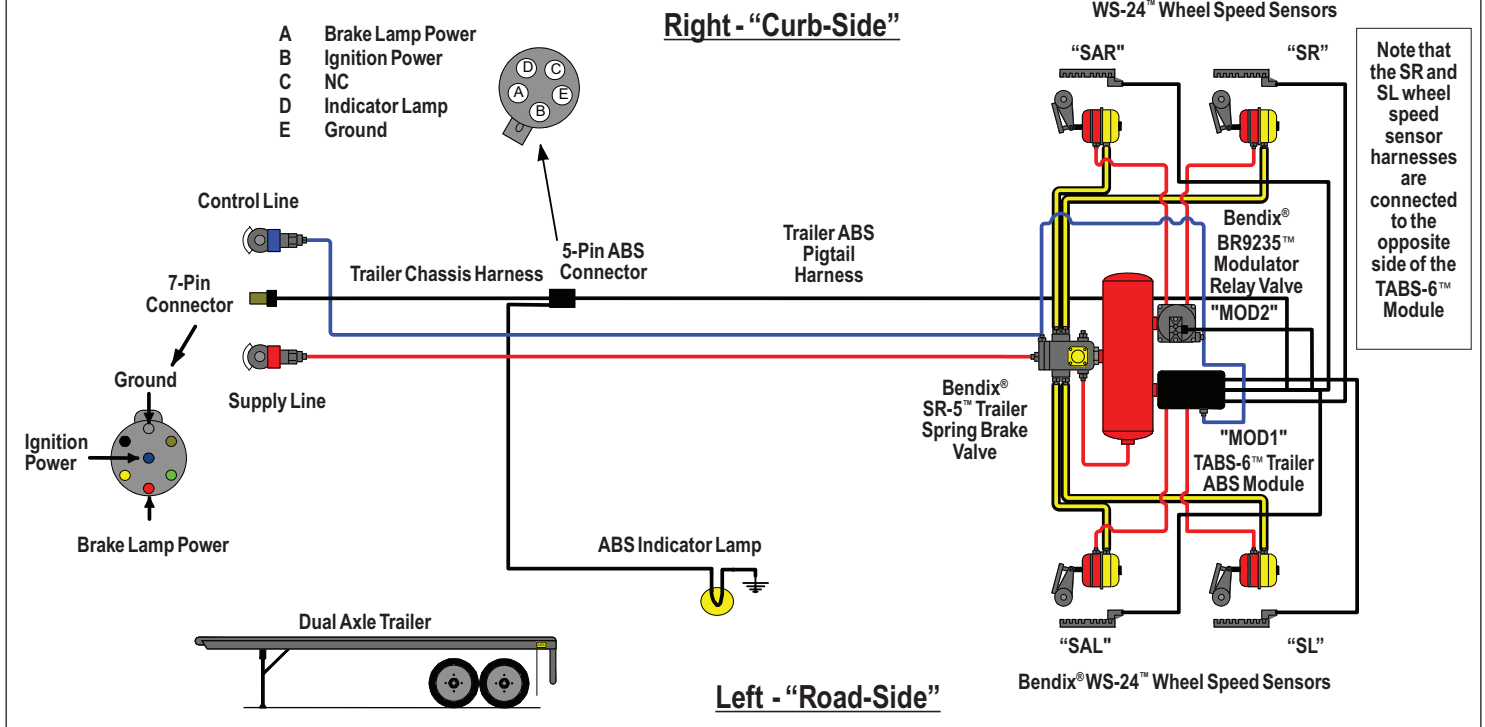


FIGURE 5 - TRAILER ABS 4S/2M SIDE CONTROL SYSTEM SCHEMATIC

ABS WIRING

The Bendix pigtail wiring harness and connectors are weather resistant and sealed at the connector interface.

TROUBLESHOOTING

Fault information can be retrieved from the controller by using blink code diagnostics shown on the yellow label included in the kit, or a diagnostic tool. See the Bendix Service Data sheet SD-13-4767 included in the kit for more details.

www.bendix.com

For the latest information, for free downloads of literature and the Bendix® ACom® Diagnostics software, visit www.bendix.com.

Bendix Technical Assistance Team

For direct personal technical support, call the Bendix Tech Team at 1-800-AIR-BRAKE (1-800-247-2725-2-1), Monday - Friday, 8:00 A.M. to 6:00 P.M. EST, and follow the prompts.

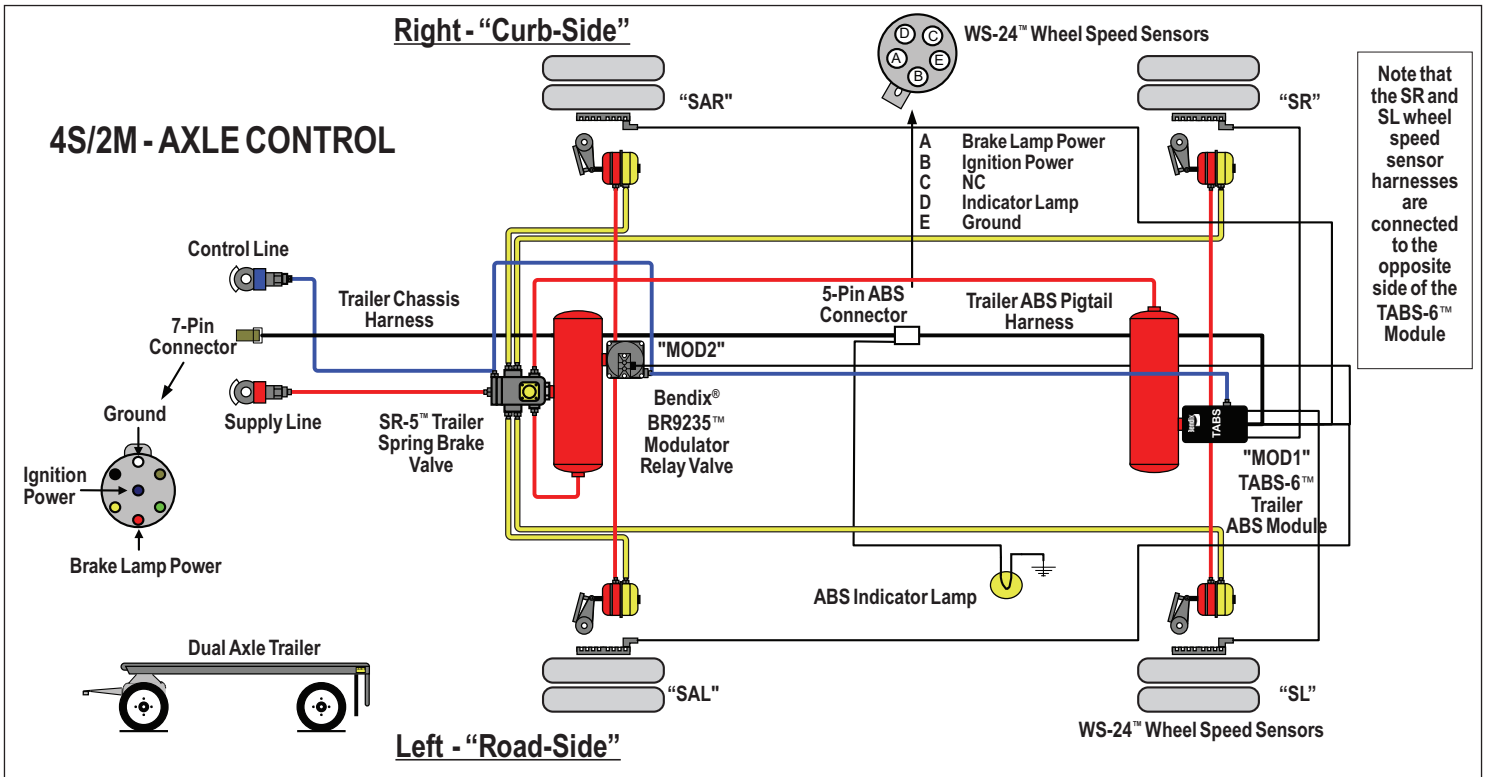


FIGURE 6 - TRAILER ABS 4S/2M SIDE CONTROL SYSTEM SCHEMATIC

You may also email the Bendix Tech Team at: techteam@bendix.com. To better serve you, please collect the following information before calling the Bendix Tech Team: (a) the Bendix product model number, part number and configuration; (b) the vehicle make and model; (c) the vehicle configuration (number of axles, tire size, etc.); (d) any system performance symptoms (when do they occur?); (e) what DTCs have been identified using blink codes or diagnostic tools?; (f) what troubleshooting / measurements have been performed?; and (g) what Bendix service data literature do you have or need?

GENERAL MAINTENANCE PRECAUTIONS

WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:

When working on or around a vehicle, the following general precautions should be observed at all times.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
3. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.

4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle. If the vehicle is equipped with a Bendix® AD-IS® air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.
6. Never exceed manufacturer's recommended pressures.
7. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
8. Use only genuine Bendix® brand replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
9. Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.
10. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.
11. For vehicles with Automatic Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.

