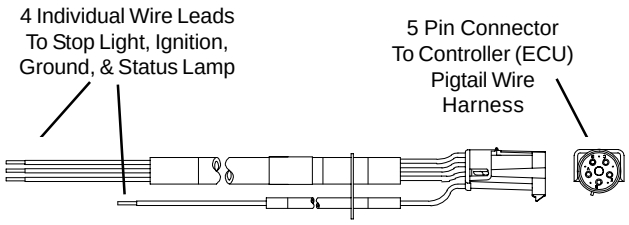
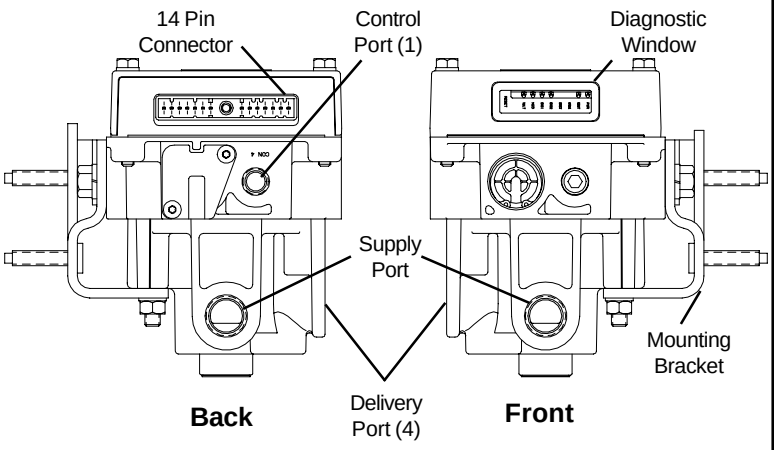
Installation Instructions

AntiLock Retro-Fit Kit for Trailers

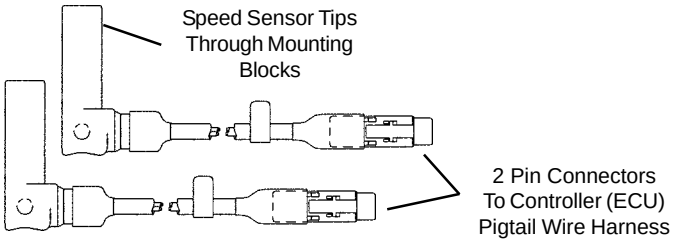
Power, Ground, Status Lamp Wire Harness (4 Conductor)



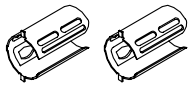
MC-12 Modulator Controller Assembly



WS-20 Wheel Speed Sensor Assemblies

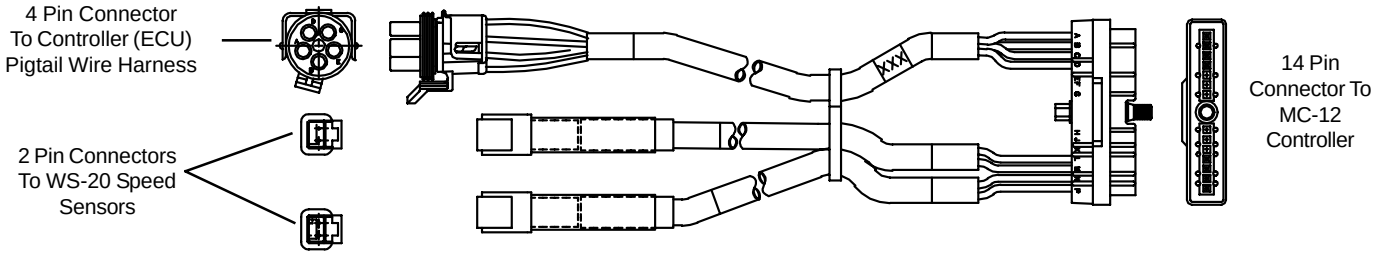


WS-20 Speed Sensor Spring Clips



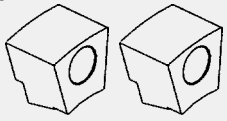
Spring Clips

MC-12 Modulator Controller Pigtail Wire Harness



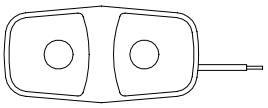
Important

Speed sensor mounting blocks are not included in this kit and must be obtained separately. Two blocks are required for each antilock kit that is installed.



Kit Contents

Qty.	Description
1	MC-12 Modulator Controller Assy.
2	Speed Sensor Assy.
2	Speed Sensor Spring Clips
1	Indicator Light
1	MC-12 Pigtail Wire Harness
1	Power & Status Wire Harness
6	Tie Wraps 24.7" long
25	Tie Wraps 8" long
10	Tie Wraps 11.8" long
1	Decal
3	Instruction Booklets
1	Laminated Diagnostic Card



Indicator Light

Figure 1 Kit Components

GENERAL KIT INFORMATION

This kit is available only to Bendix authorized and trained installation facilities. It is intended for the installation of Bendix AntiLock Systems on trailers that have been **pre-approved** for this purpose and presumes that the appropriate number and types of kits required to complete the installation are on hand when the installation begins.

The instructions presented here are meant to be used as an INSTALLATION SEQUENCE OUTLINE. Additional Instructional items may be required to provide the details of the installation. The additional instructional materials required are as follows:

BW-101-A	Application Guidelines - MC-12 Trailer AntiLock
BW1959	Troubleshooting the MC-12 Trailer AntiLock
BW1785	MC-12 Antilock Installation Wall Chart
BW1667	Service Data Sheet SD-13-4762 MC-12 Trailer Antilock
BW1662	Service Data Sheet SD-13-4754 WS-20 Speed Sensor
BW1669	Service Data Sheet SD-13-4769 M-12 Antilock Modulator
BW1680	Service Data Sheet SD-03-4516 SR-5 Trailer Valve
BW1818	Sealco to Bendix Change over Instructions
BW1817	Midland to Bendix Change over Instructions

Do not begin installation without access to these reference materials.

IMPORTANT! 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.**
2. **Stop the engine when working around the vehicle.**
3. **If the vehicle is equipped with air brakes, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle.**
4. **Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in manner that removes all electrical power from the vehicle.**
5. **When working in the engine compartment the engine should be shut off. 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.**
6. **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.**
7. **Never exceed recommended pressures and always wear safety glasses.**
8. **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.**
9. **Use only genuine Bendix replacement parts, components, and kits. Replacement hardware, tubing, hose, fittings, etc. should be of equivalent size, type, and strength as original equipment and be designed specifically for such applications and systems.**
10. **Components with stripped threads or damaged parts should be replaced rather than repaired. Repairs requiring machining or welding should not be attempted unless specifically approved and stated by the vehicle or component manufacturer.**
11. **Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.**

IMPORTANT NOTICE

These instructions are intended for personnel specifically trained to install the Bendix Trailer Antilock kit. In addition, the complete installation of this kit may require electric welding and machining. Only personnel experienced and trained in these processes should be used.

AntiLock ready axles and wheel hubs are preferred, however existing components can be modified. It should be noted that modifications to the axle or wheel hubs may impact the manufacturer's warranty.

ANTILOCK KIT INSTALLATION

General

The kit installation instructions are divided into these major areas;

Determining the Number of Kits Required
Welding Speed Sensor Blocks
Installing Tone (Exciter) Rings
Mounting the MC-12
Trailer AntiLock Wiring
Trailer System Connections
System Testing

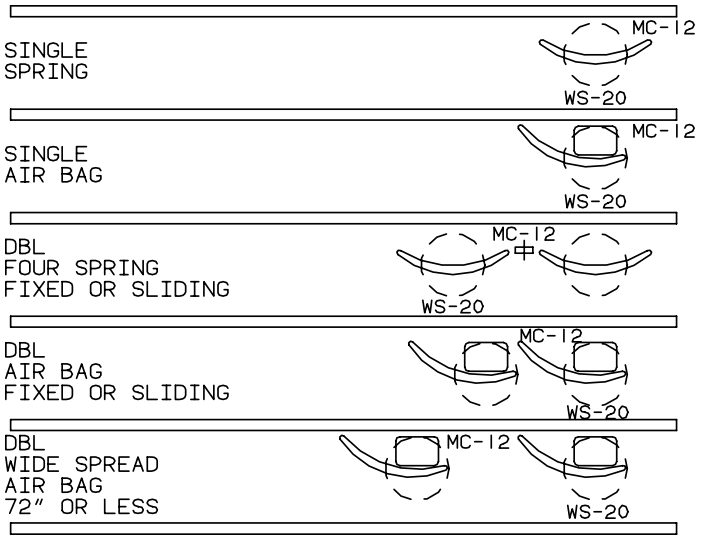
The installation should be made in the order presented to avoid unnecessary steps and possible rework.

Vehicle Preparation

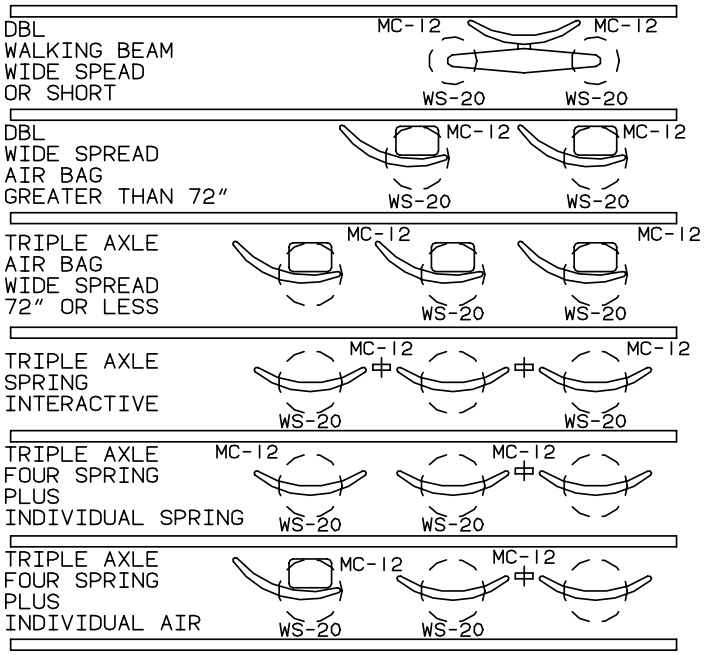
1. Place the trailer on a level surface and block the wheels and/or hold the vehicle by means other than the air brakes.
2. Drain the air pressure from all trailer reservoirs.
3. Following the vehicle manufacturer's instructions, mechanically cage the parking brakes.

NUMBER OF KITS REQUIRED

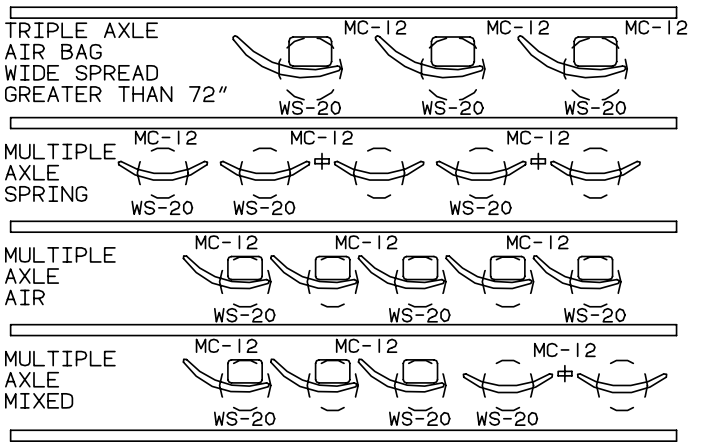
One Kit Required For These Suspensions



Two Kits Required For These Suspensions



Three Kits Required For These Suspensions

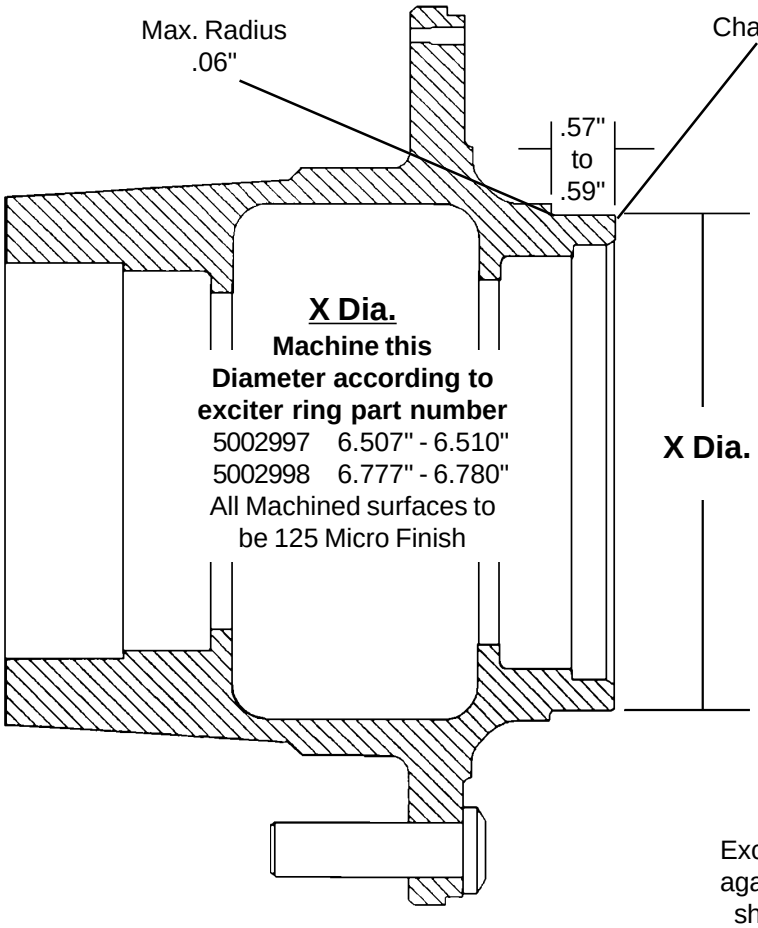


Using the trailer suspensions drawings to the left, note the following:

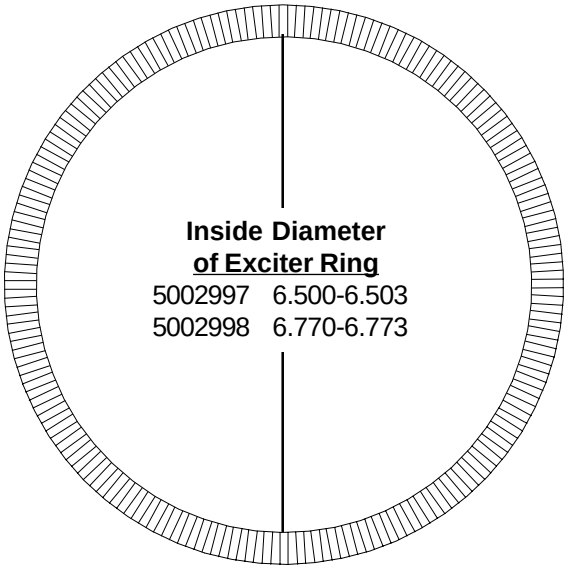
1. The number of kits required for the installation.
2. The approximate location of the MC-12 Modulator controller.
3. Which axle(s) will require installation of Speed Sensor mounting blocks.

Note:
If the desired vehicle suspension is not illustrated here, refer to Application Specification BW-101A in the master book.

INSTALLING TONE (EXCITER) RINGS



Wheel Hub
Figure 1



Exciter Ring
Figure 2

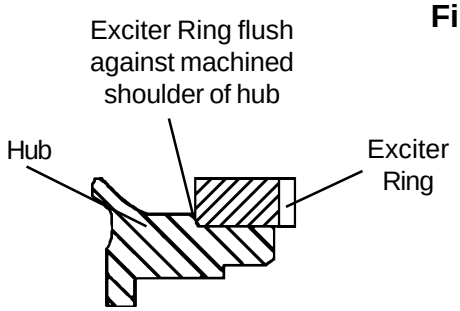


Figure 3

GENERAL

This section is not required if antilock ready hubs are already in use on the trailer or if new antilock ready hubs have been purchased for the antilock installation.

1. Existing hubs can be retrofitted with exciters rings by machining to the dimensions shown above. The machined diameter is determined by the part number of the exciter ring. A minimum interference fit of .004 inches is desired. Cold pressing the exciter ring on the hub is not recommended.
2. Uniformly heat the exciter ring to approximately 350° F. Install the ring on the machined diameter of hub making certain it fits squarely on the machined hub diameter and the backside of the ring (side opposite the teeth) is flush with the machined shoulder. See Figure 3.
3. After the ring and hub have cooled make certain the ring is tight on the hub and does not slip. As a final check, install the hub and ring on the axle and check the axial run out. While turning the hub, note that **axial run out does not exceed +0.008 to -0.008 inches.**

WELDING SPEED SENSOR BLOCKS

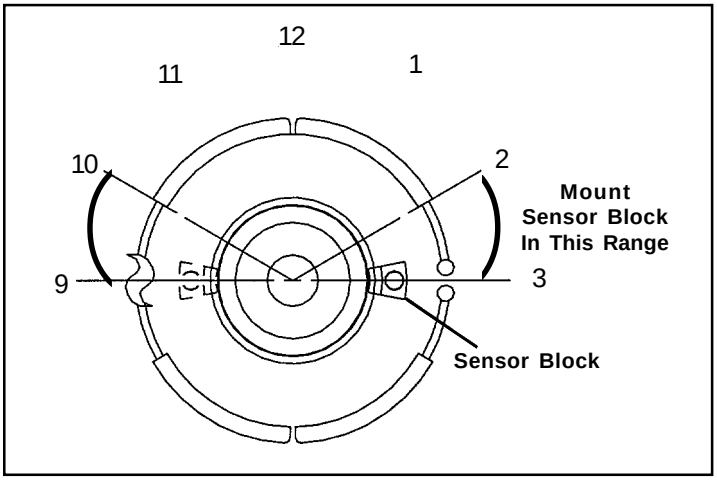


Figure 1

Correct installation of the speed sensor blocks is extremely important for proper operation of the AntiLock system. Bendix has provided a welding aid to assist in properly aligning and holding the blocks in position during this operation. Use electric welding equipment only to install the blocks.

1. Properly support the trailer axle using jack stands. Be sure to provide proper clearance to be able to weld the sensor block on the axle near the tone (exciter) ring.
2. For best results, the sensor mounting block needs to be welded into position at approximately the 9 or 3 o'clock position on the axle spindle to lessen the effect from axle flexure due to loading. See Figure 1.
3. Insert the spare spring clip into the sensor block, then insert the sensor block placement tool into block/clip assembly. See Figure 2. Adjust the amount that the placement tool protrudes through the block to between .125" to .187".
4. Clean all oil or grease from the axle spindle.
5. Securely position the Sensor Mounting Block by applying the magnetic tip of the Sensor Block Mounting Tool to the tone ring. See Figure 3. Check that the Mounting Block is squarely placed relative to the tone ring.
6. Before welding, check the distance from the mounting block. IMPORTANT: The distance of the sensor block from the face of the tone ring "teeth" must be between .125" to .187". See Figure 4.
7. Weld the sensor block to the spindle axle along both sides of the block.
8. Remove the Sensor Block Mounting Tool and spring clip and let the sensor block cool. Then install a new sensor spring clip, grease, and sensor.

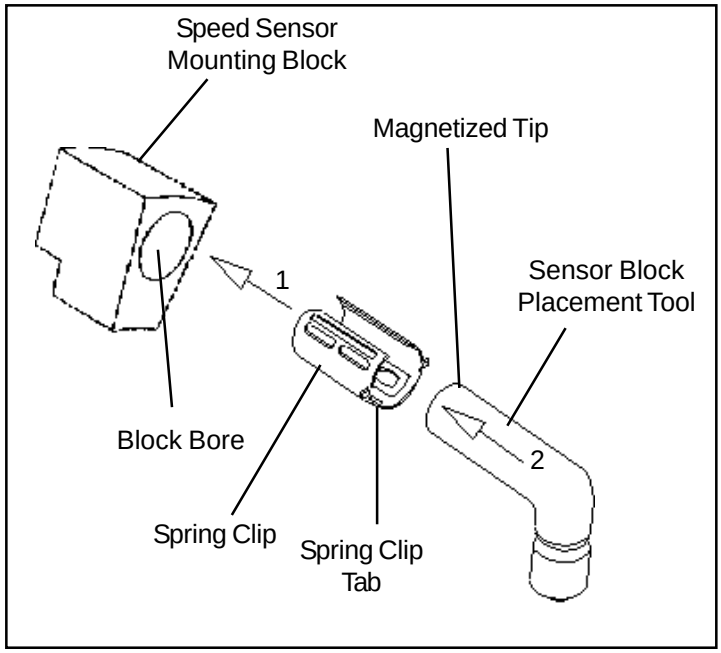


Figure 2

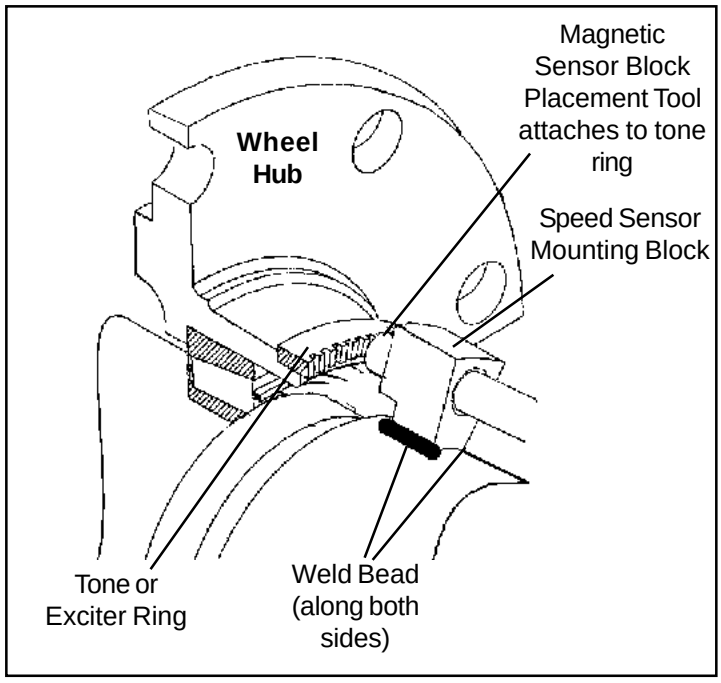


Figure 3

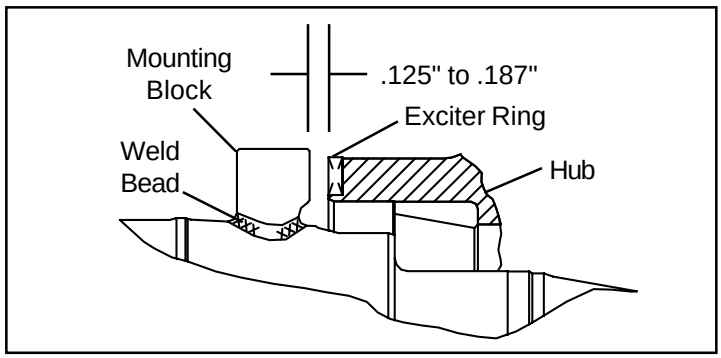
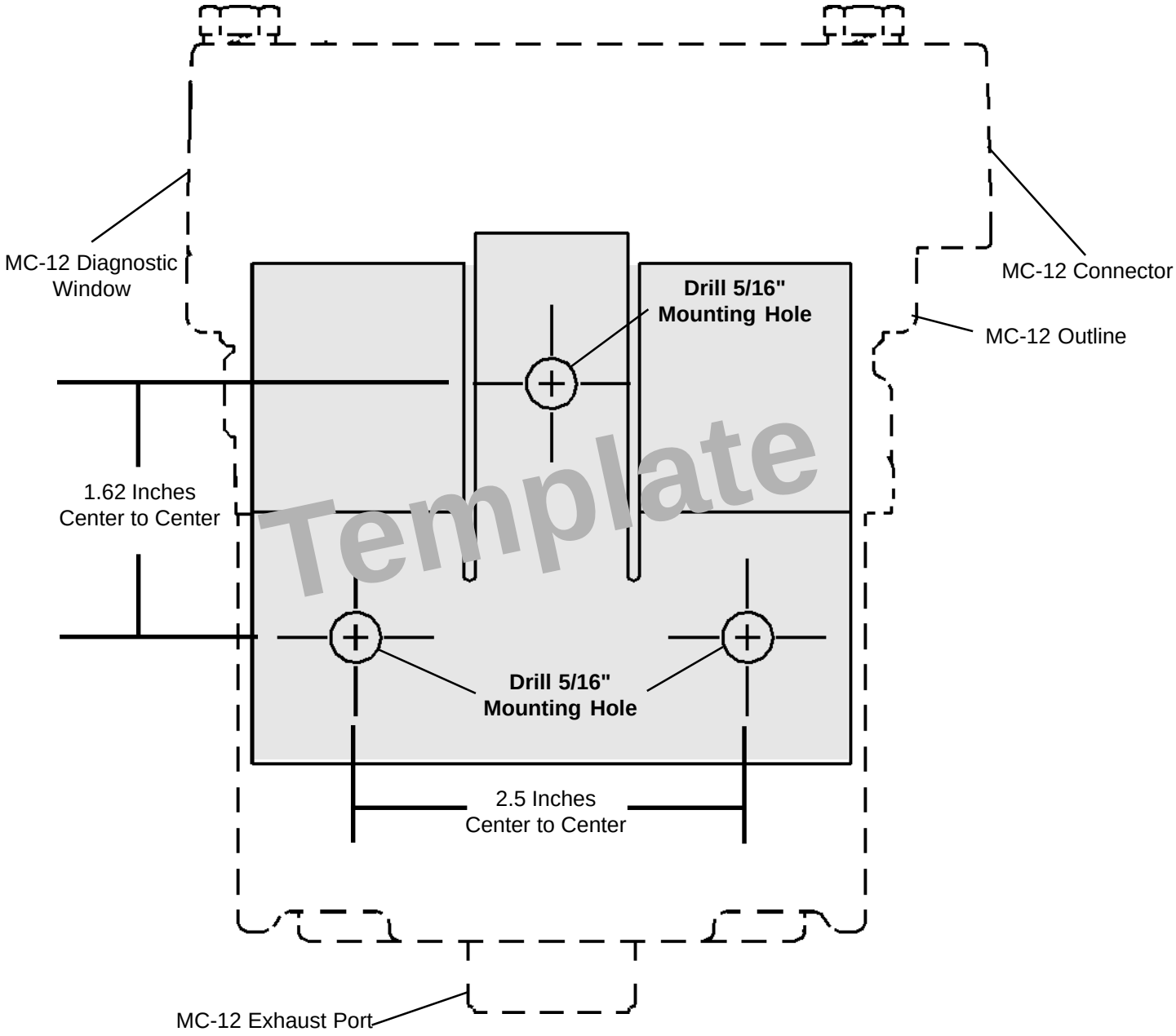


Figure 4

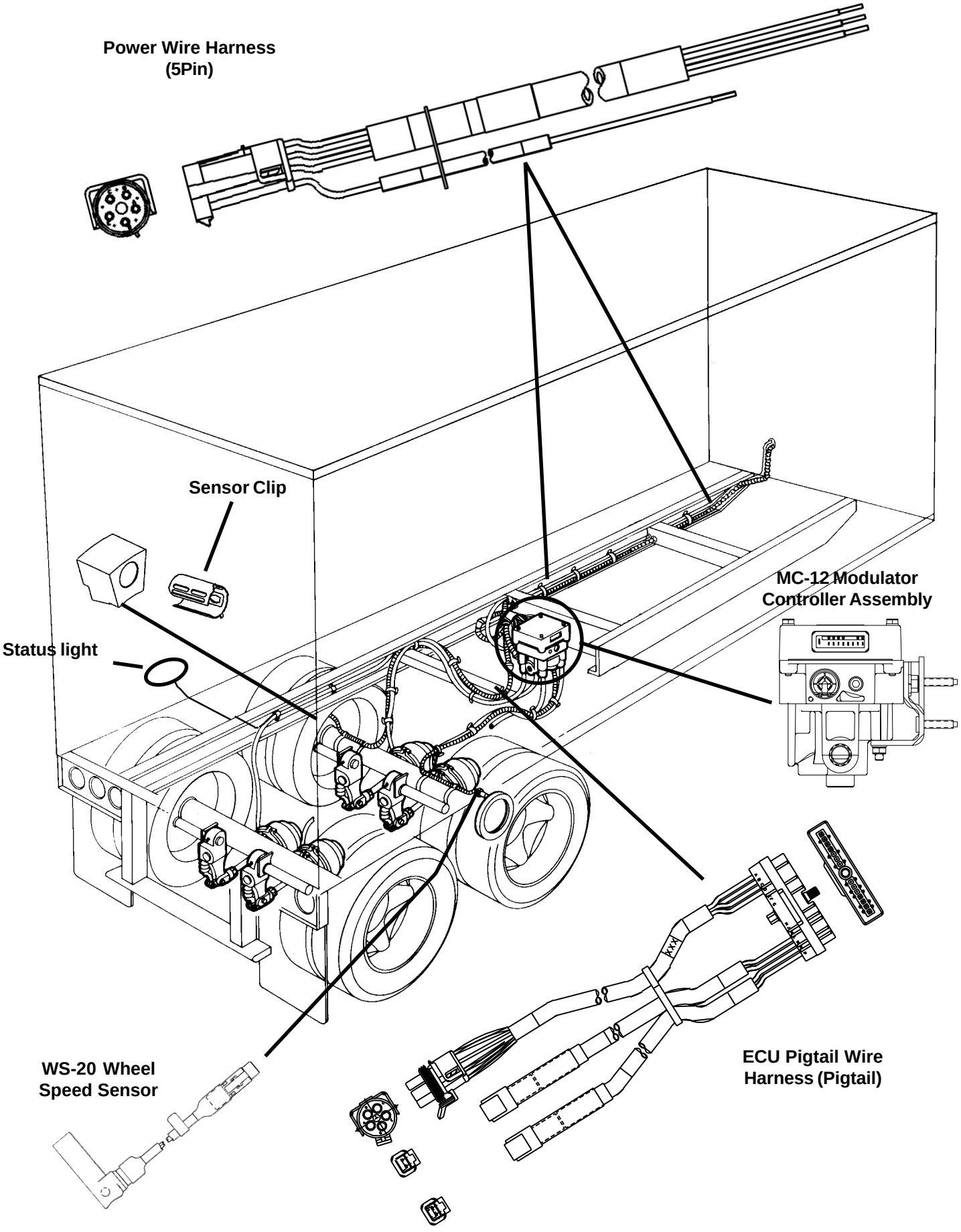
MOUNTING THE MC-12



The MC-12(s) should be installed on the trailer in the general location indicated on the suspension drawings. The MC-12(s) must be mounted vertically (exhaust toward road surface) on a frame rail or cross member.

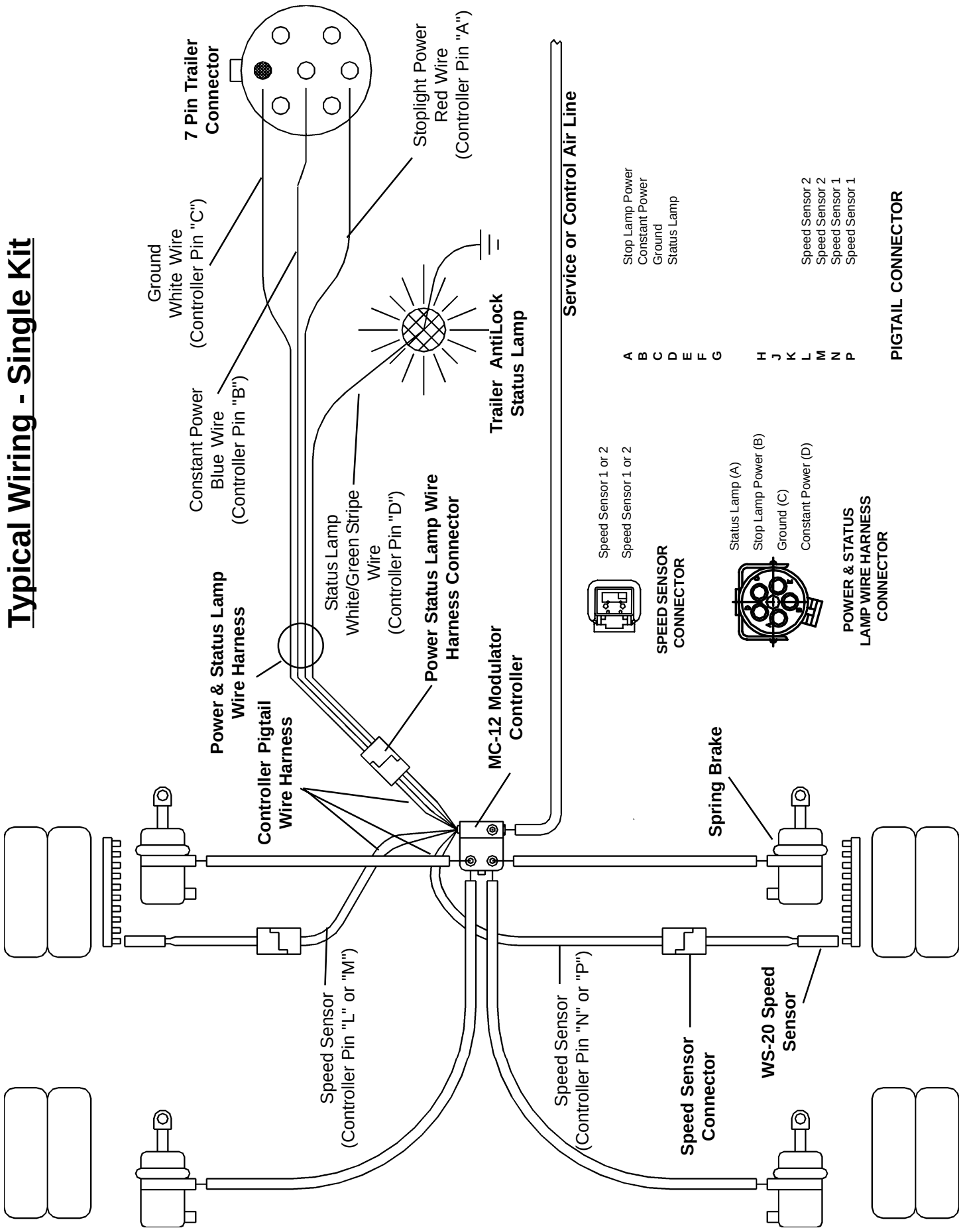
Use the template above to center punch the MC-12 mounting hole locations. Note that the template includes a dotted outline of the MC-12 to assist in locating and mounting.

TRAILER ANTILOCK COMPONENTS



TRAILER ANTILOCK WIRING

Typical Wiring - Single Kit



TRAILER ANTILOCK WIRING

GENERAL NOTES

The wires that carry information and power into and out of the MC-12 are generally grouped and terminate at a connector. The connectors used on the MC-12 are illustrated above. The wiring harnesses and connectors are weather resistant and the wires that enter the connector are sealed to the connector. The wire gauge used in the wire harnesses is specific to the task performed and other sizes must not be substituted.

When wiring the AntiLock system the following general rules apply and should be followed where applicable:

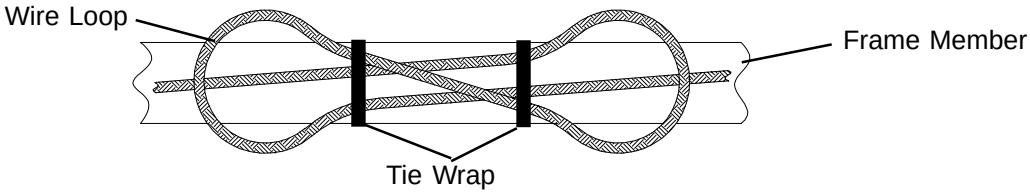
1. It is generally advisable not to splice wires in the harness. If a splice repair must be made, it is important that the splice be properly soldered with a rosin flux (not acid based) and made water proof.
2. Do not pierce wire insulation when checking for continuity. Check for power, ground or continuity by disconnecting the connector and testing the individual pins or sockets in the connector.
3. An assortment of wire tie wraps is provided in the basic antilock kit. Wire harnesses should generally be tied down at 16 to 20 inch intervals in areas exposed to weather. A guide for use of the tie wraps is as follows:

24.7 inch long - Use 3 on each side of axle to tie the speed sensor wire harness to the axle.

11.8 inch long - Use 5 on each side of axle to tie the speed sensor wire harness to the brake hose. These are "bow tie" wraps and form a Figure 8.

8 inch long - Use the 25 pieces to tie the power & status wire harness to the trailer and to bundle excess wire in the wire harnesses.

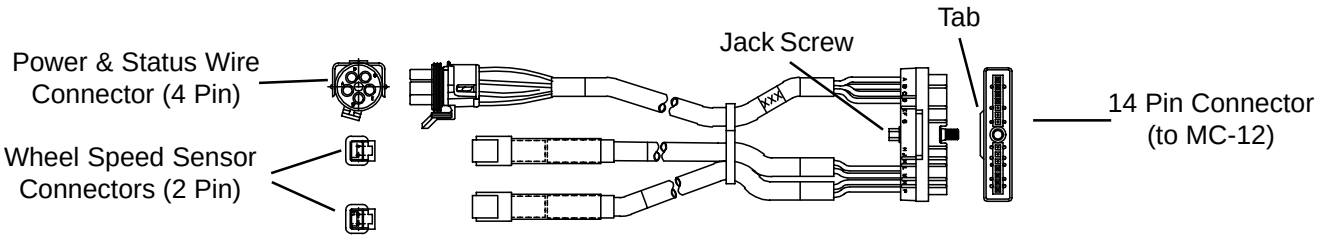
4. Bundle excess portions of any wire harness and securely tie wrap it to a frame member. Do not tighten the loop at each end of the wire bundle to a dimension smaller than 3.5" diameter.



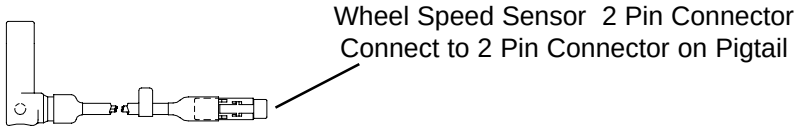
TRAILER ANTILOCK WIRING

CONNECTING THE WIRE HARNESSES

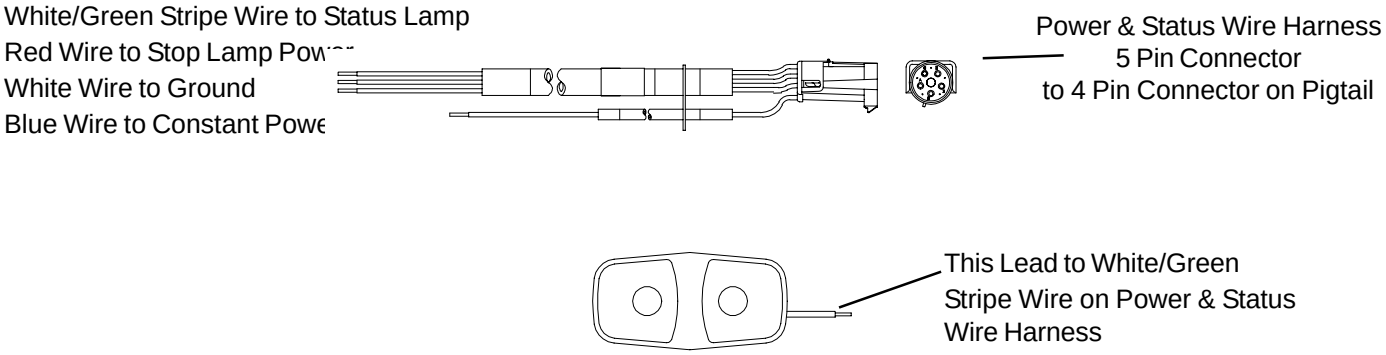
In general the wire harnesses can not be mis-connected since each is a unique connector. It is advisable to use care in pushing the connector halves together to avoid damaging the pins. This is most important when connecting the Pigtail harness to the MC-12. The 14 pin connector fits into the MC-12 in one way only and must not be forced.



1. Connect the Pigtail wire harness to the MC-12. Orient the tab (side with letters visible) to the top of the MC-12 controller then push straight in and tighten the "jack screw" to 7 - 13 inch pounds secure the connector to the controller.

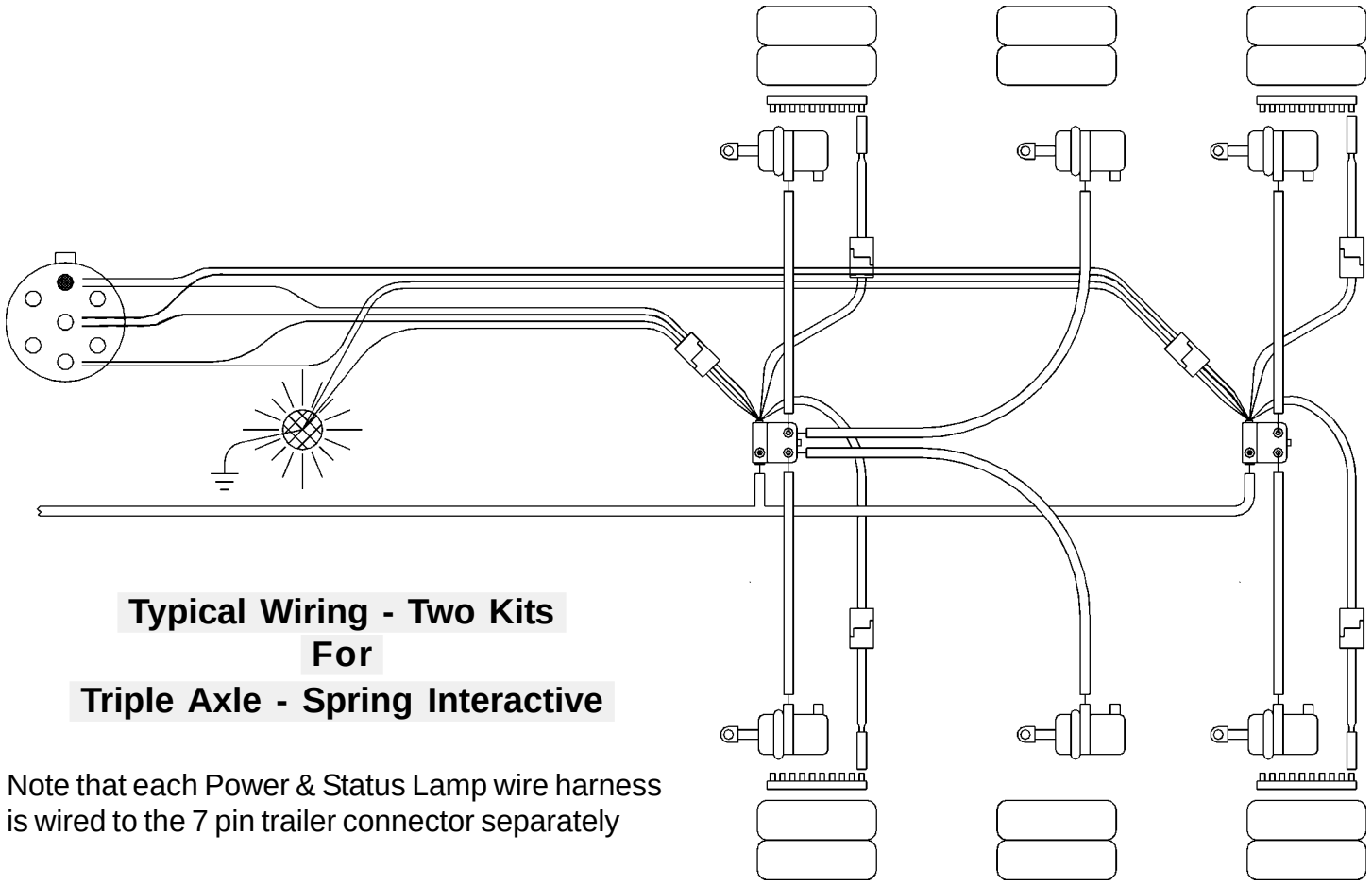


2. Attach each Speed Sensor wire harness to the pigtail. Either speed sensor can be attached to either 2 pin connector on the pigtail harness. Push the connector halves together until an audible "click" is heard. This assures the connector halves are completely mated.



3. Attach the Power and Status wire harness to the pigtail. Push the connector halves together until an audible "click" is heard. This assures the connector halves are completely mated. Attach the individual wires to the Trailer Junction Box or 7 Pin Connector. The wires are color coded.
4. Install the status Lamp in a convenient location on the trailer making certain a good ground is provided. Using the proper water proofing techniques join the status lamp lead to the Violet wire on the Power & Status wire harness.

TRAILER ANTILOCK WIRING



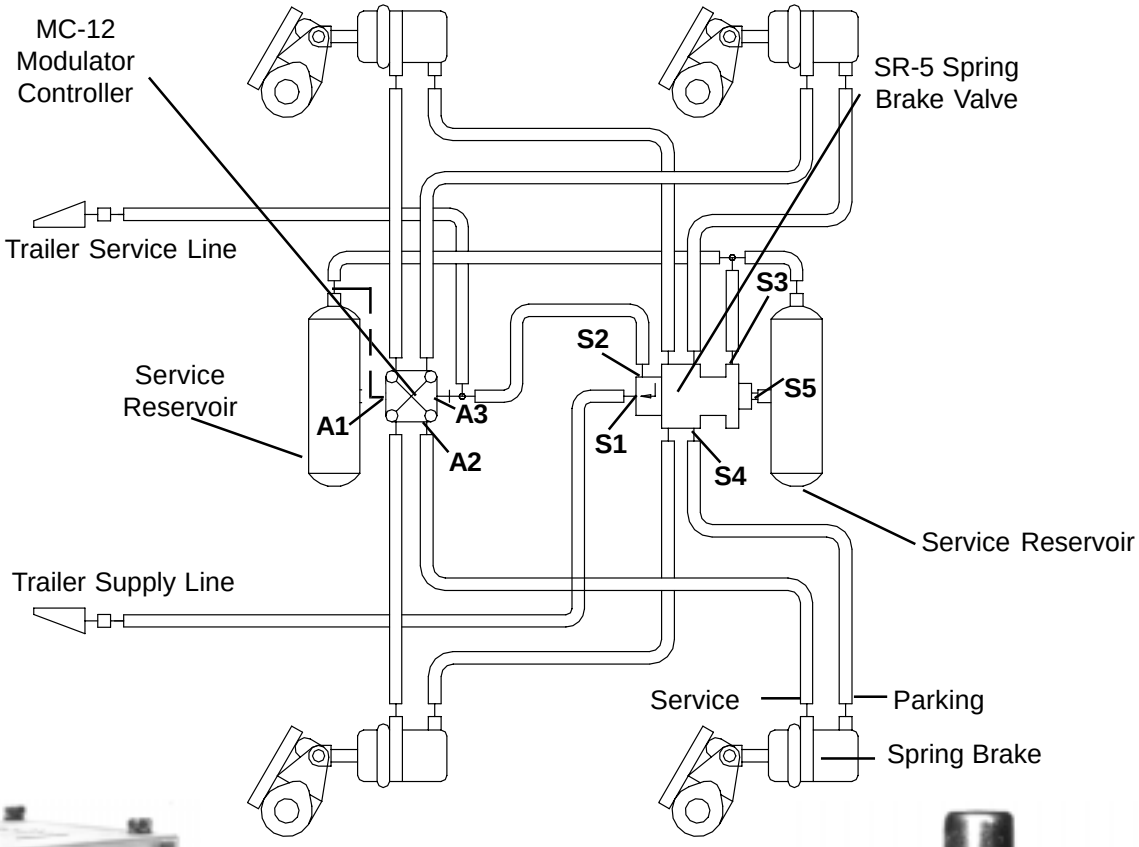
Typical Wiring - Two Kits
For
Triple Axle - Spring Interactive

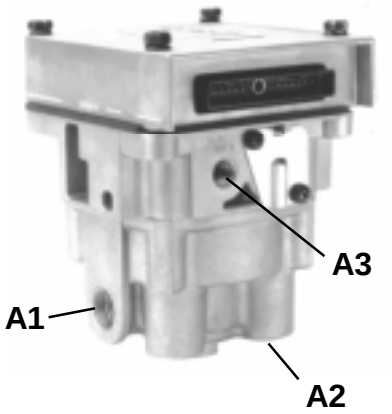
Note that each Power & Status Lamp wire harness is wired to the 7 pin trailer connector separately

Wiring Multiple Kits

1. If the trailer requires more than one AntiLock kit, wire each kit on the appropriate axle(s) as shown under the page heading "NUMBER OF KITS REQUIRED". Each kit should be treated as an individual installation with no wire splicing.
2. Route each kit's Power & Status Lamp wire harness to the electrical junction box or directly to the 7 pin trailer connector at the nose of the trailer. DO NOT SPLICE the Power & Status Lamp wire harnesses together. Each harness must be routed to the junction box or the 7 pin connector.

TRAILER AIR SYSTEM CONNECTIONS

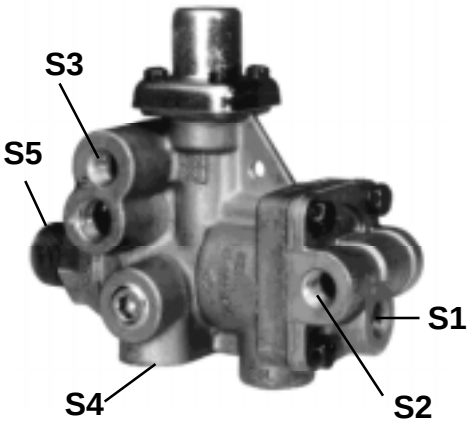




MC-12 MODULATOR CONTROLLER

Air Connection Identification

Port	MC-12	SR-5
Reservoir (Supply)	A1	S5
Delivery (To chambers)	A2	S4
Control (Service)	A3	---
Anti-Compound	---	S2
Supply (Other Reservoir)	---	S3
Trailer Supply Line	---	S1

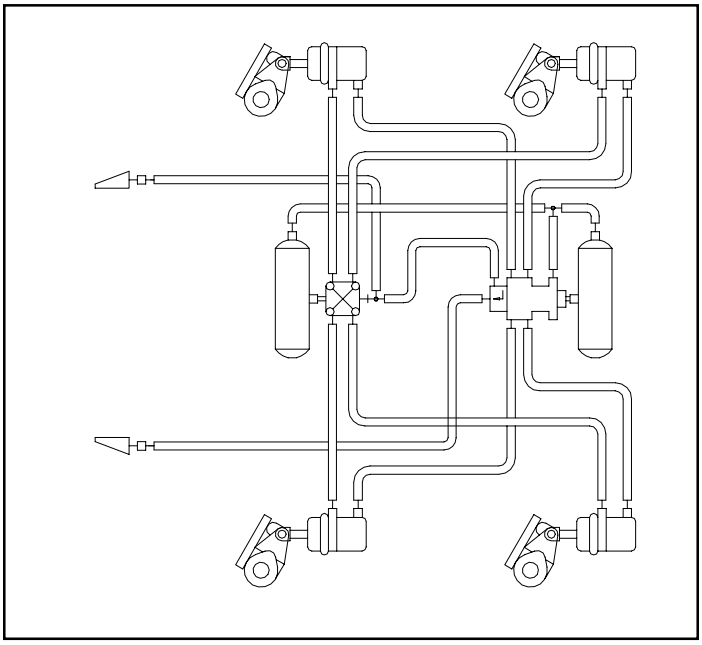


SR-5 TRAILER SPRING BRAKE VALVE

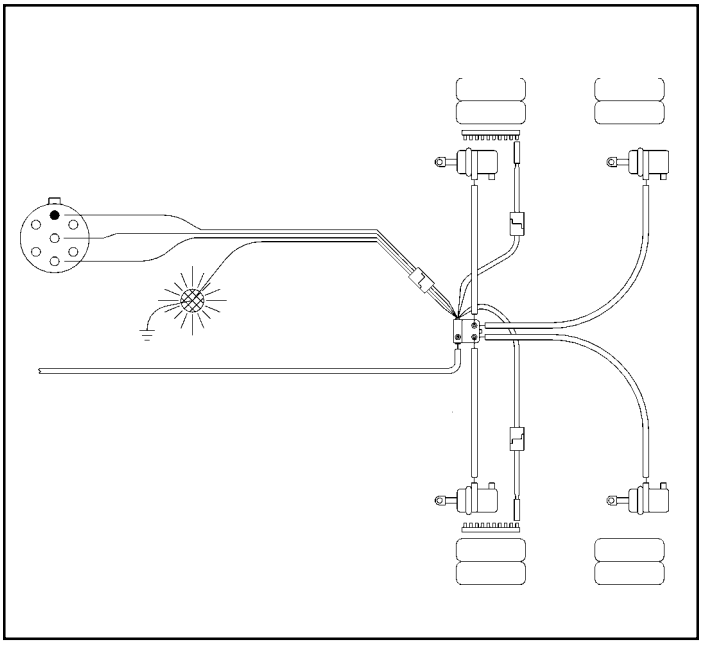
The MC-12 replaces the standard service relay valve on the trailer. Remove the existing relay and install the MC-12. The MC-12 must be mounted vertically (exhaust toward road surface) on a frame rail or cross member. Do not nipple mount the MC-12 on a reservoir (reservoirs must be specially reinforced to accept a nipple mount MC-12). If the relay was nipple-mounted on a reservoir, route a hose from the reservoir to the supply port (A1) of the MC-12. Use the template, presented elsewhere in this manual, to mount the MC-12.

In some cases it may be necessary to replace the spring brake control valve. Use the Bendix SR-5 and the schematic above.

TESTING THE INSTALLATION



Air System



AntiLock System

GENERAL

Before placing the trailer in service the installation must be tested. Testing can most easily be accomplished by connecting the trailer to a tractor. If this is not practical, testing can be performed using shop air pressure (reduced to a maximum of 130 psi), and a clean source of D.C. power (e.g. batteries). Do not use battery chargers, step down AC transformers or similar sources since errors in testing results will occur.

For air testing an on-off air control valve (e.g. TW-1 or PP-1) and a graduating air control valve (e.g. TC-2 or TC-7) will be required. Test the air system first.

AIR SYSTEM

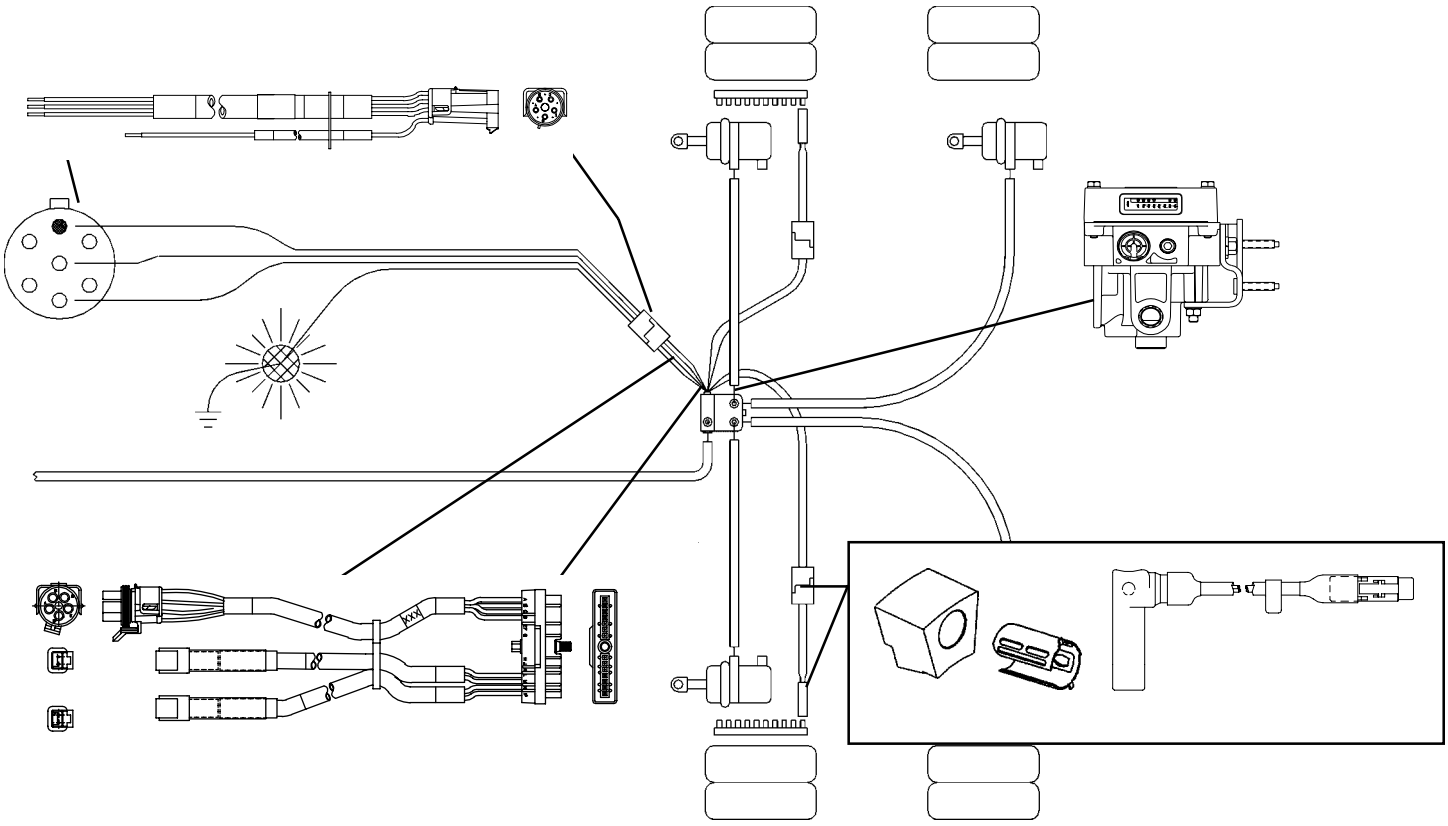
For more detailed, complete testing of operation and leakage see the Service Data Sheets covering the MC-12 and SR-5. The following is a quick general series of tests.

1. Charge the trailer air system and note the spring brake release.
2. Test for supply leakage at all hose and tubing removed or installed during the installation of the MC-12 and SR-5 (if installed).
3. Make a series of brake applications and note that the trailer service brakes apply and release promptly.
4. Make and hold a full service brake application and test for leakage at all hose and tubing fittings removed or installed during the installation of the MC-12 and SR-5 (if installed).
5. Remove air pressure from the trailer Supply line (pull the Trailer Supply Valve on the dash) and note the spring brakes apply promptly.

ANTILOCK SYSTEM

For more detailed, complete testing and troubleshooting see the Service Data Sheets covering the MC-12 and M-12. Use the laminated card packaged with the kit for quick testing and troubleshooting.

Installation Notes



Installation Notes