

TECHNICAL PROCEDURE

TIREMAAX® TIRE INFLATION SYSTEM

SUBJECT: TIREMAAX® EC to TIREMAAX® CP
Conversion Instructions

LIT NO: L1077

DATE: July 2008

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This document focuses on the TIREMAAX® EC to TIREMAAX® CP tire inflation system conversion process. Before conducting any work on either system:

- Read and understand Hendrickson publication L995, *TIREMAAX® CP Tire Inflation System Installation, Service and Troubleshooting Procedures* (available at www.hendrickson-intl.com) for additional instructions and safety information.
- Read and understand all applicable work instructions and safety information provided by the trailer or tractor manufacturer.
- Park the trailer on a flat, level, debris-free surface.

- Remove electrical power from the trailer. Shut off the tractor and disconnect the electrical power supply cable from the SAE J560 trailer connector.
- Chock the trailer wheels to prevent the trailer from moving.

The controller assembly in this kit is a direct replacement for the controller assembly in the TIREMAAX EC tire inflation system.

The EC-to-CP conversion process consists of five broad steps: removing the existing TIREMAAX EC controller assembly, installing the new TIREMAAX CP controller assembly, connecting the new TIREMAAX CP wiring harness, changing tee (or elbow) fittings and adding delivery line restrictors. The following instructions describe each of these broad steps in more detail.



REMOVING THE EXISTING TIREMAAX® EC CONTROLLER ASSEMBLY

1. Exhaust the trailer air tank.
2. Disconnect the ECU power connector (figure 1).
3. Disconnect the air supply line (air IN). Label the line "IN" to avoid confusion when installing the replacement controller assembly.
4. Disconnect the air delivery line (air OUT). Label the line "OUT" to avoid confusion when installing the replacement controller assembly.

5. If reusing the delivery line (air OUT) fitting, remove it from the tee fittings on the controller assembly.

NOTE: TIREMAAX CP uses a $\frac{1}{4}$ -inch NPT air supply line (air IN) fitting, so the TIREMAAX EC $\frac{1}{8}$ -inch fitting cannot be reused without an adapter.

6. Remove the two bracket-to-frame mounting bolts and remove the TIREMAAX EC controller from the trailer.

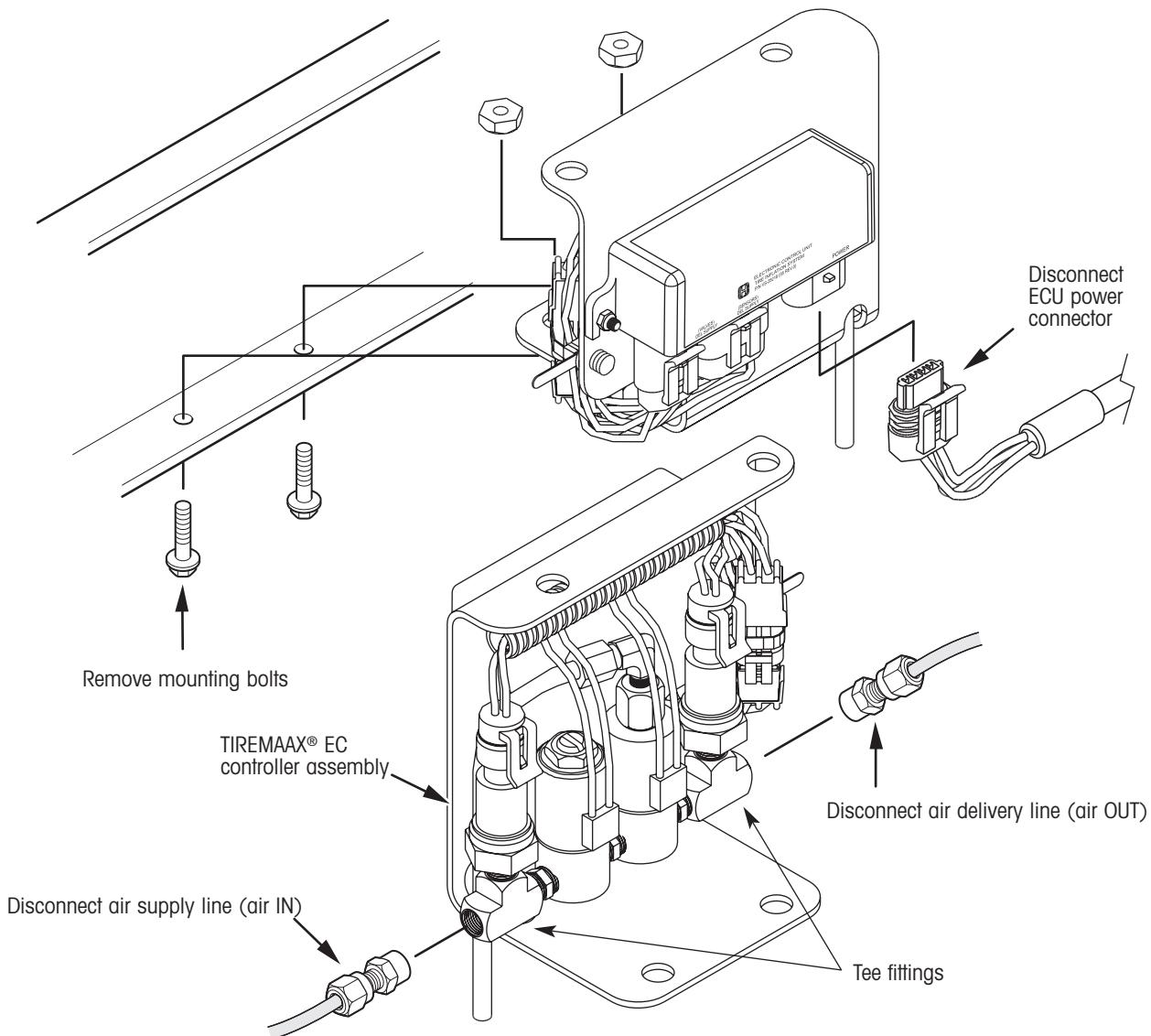


Figure 1. Removing an existing TIREMAAX EC controller assembly



INSTALLING THE NEW TIREMAAX® CP CONTROLLER ASSEMBLY

Hendrickson recommends the forwardmost cross member as the controller assembly mounting location (figure 2). A mounting bracket is included in this kit so the controller assembly can be mounted

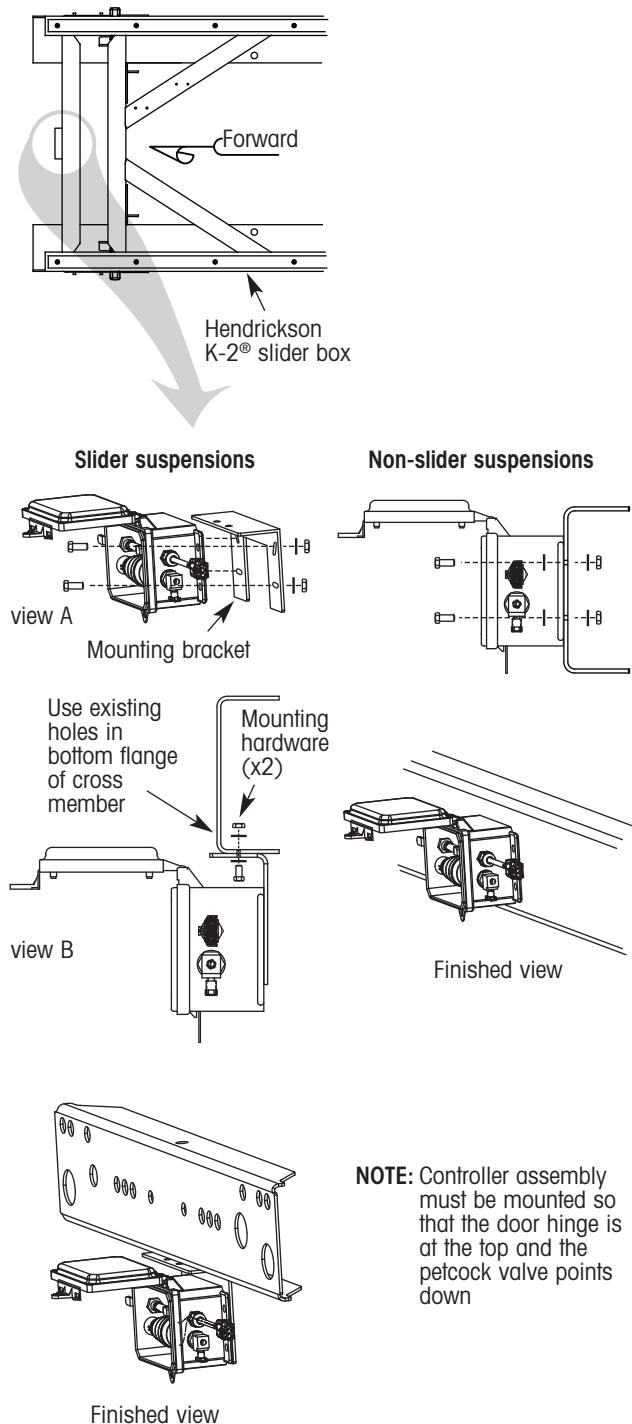


Figure 2. Installing the new TIREMAAX CP controller assembly

without drilling holes in the cross member. On slider suspensions, the bracket and controller assembly must be mounted below the cross member as shown in figure 2 to avoid interference with the slider stop bar. On non-slider suspensions, the controller can be mounted below the cross member as shown in figure 2 or flush mounted to the vertical surface of the cross member if desired, since slider stop bar interference is not an issue.

For slider suspensions

1. Attach each corner of the controller assembly to the bracket with the four $\frac{5}{16}$ -inch bolts, washers and nuts as shown in figure 2, view A. Orient the enclosure so that the door hinge is at the top and the petcock valve points down.
2. Attach the controller and bracket assembly to the existing holes in the bottom surface of the cross member as shown in figure 2, view B.

⚠ WARNING Failure to properly orient the controller and mounting bracket as shown in figure 2 and described above will result in slider stop bar interference and controller assembly damage.

For non-slider suspensions

Use the slider assembly mounting method described above, or attach each corner of the controller assembly directly to the vertical surface of the cross member with the four $\frac{5}{16}$ -inch bolts, washers and nuts (figure 2). Orient the enclosure so that the door hinge is at the top and the petcock valve points down (figure 2).

⚠ CAUTION: The controller assembly must be mounted so that the door hinge is at the top and the petcock valve points down (figure 2).



CONNECTING THE NEW TIREMAAX CP WIRING HARNESS

A minor modification must be made to the existing TIREMAAX EC wiring harness to convert the system to TIREMAAX CP.

Your existing TIREMAAX® EC system has one of two wiring harnesses: a standard, three-wire, 18-inch long harness or a premium, 15-foot long ABS-ready harness (figure 4).

If you have the standard, three-wire, 18-inch long harness, cut it where it splices into the trailer wiring system and replace it with the two-wire adapter in this kit (figure 4).

If you have the premium, 15-foot long, ABS-ready harness, cut the connector off as shown in figure 4 leaving as much wire length as possible and replace it with the two-wire adapter in this kit. More wire will make it easier to splice together the adapter from this kit.

WIRE SPLICING INSTRUCTIONS

The termination of the harness wires is the responsibility of the installer. Terminals and connectors must be weatherproof, and corrosion prevention compound must be used on all connectors. Refer to The Technology Maintenance Council (TMC, 703-838-1763, tmc.truckline.com) RP 113, 114, and 704 for recommended wiring practices.

To make wiring splices, you must use the crimp and solder connectors provided in the kit (figure 3).

1. Strip the wire insulation so that $\frac{1}{4}$ -inch of bare wire is exposed (figure 3).
2. Insert a stripped wire into each end of the crimp and solder connector.
3. Using a proper crimping tool or needle-nose pliers, crimp the connector in two places as shown in figure 3.
4. Using a heat gun, heat the crimp and solder connector until the solder slug in the middle of the connector melts and disappears.

IMPORTANT: You must use a heat gun and it must be held in place over the crimp and solder

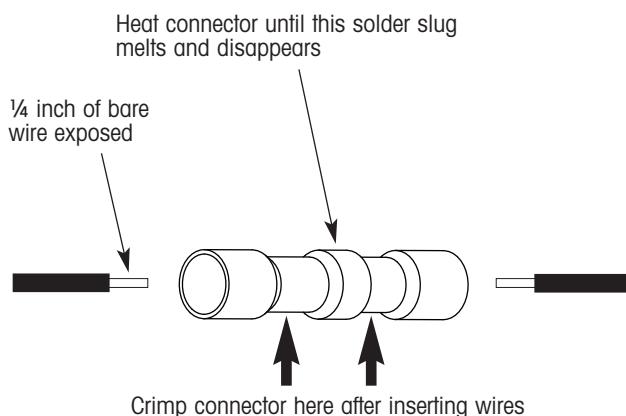


Figure 3. Crimp and solder connection details

connector until the solder slug melts and disappears.

5. Because the new wiring harness you just installed only has two wires and the existing harness had three, an existing wire will be unused and must be protected.

Fold the end of this wire onto itself and slip the length of heat shrink tubing from the kit onto the wire. Using a heat gun, heat the heat shrink tubing until it shrinks and forms tightly against the wire.

The object is to make a weatherproof seal with the heat shrink tubing on the unused wire. When complete, secure the unused wire to the existing wiring with cable ties.



TIREMAAX® EC TO CP CONVERSION PROCEDURE

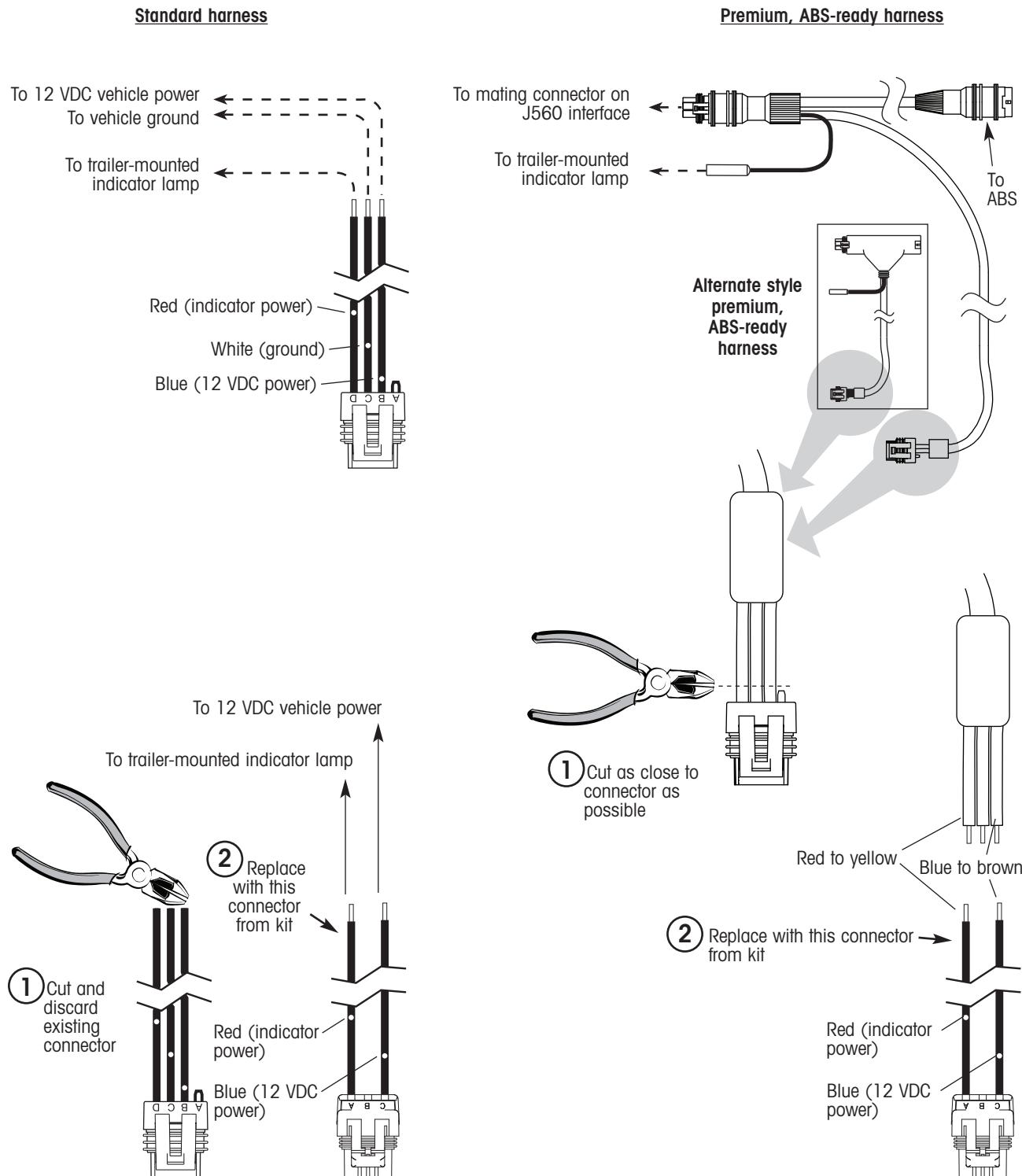


Figure 4. Trailer wiring harness installation



CHANGING TEE OR ELBOW FITTINGS

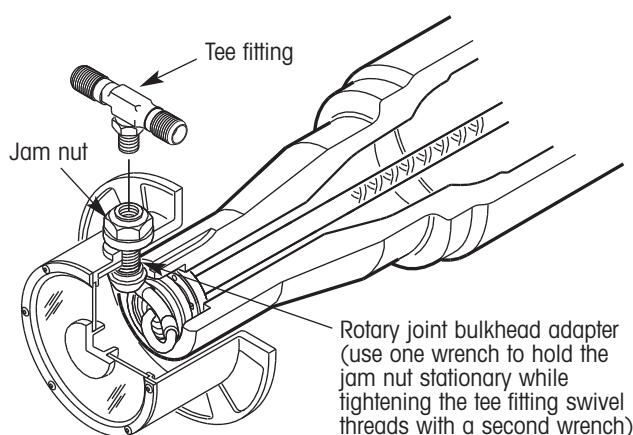
The tee (or elbow) fittings in this kit must be installed when converting the TIREMAAX system from EC to CP. These tee (or elbow) fittings have internal check valves that stop air flow when a tire hose is disconnected. Because the TIREMAAX CP system is constantly pressurized, these tee (or elbow) fittings will maintain air pressure in the system when manually checking tire pressure or when the tire hose is disconnected for any other reason.

EXISTING TEE OR ELBOW FITTING REMOVAL

1. Disconnect the tire hose(s) at the tee (or elbow) on the hubcap (figure 6).
2. Remove the two hubcap bolts securing the tee (or elbow) fitting guard to the wheel end and remove the tee (or elbow) fitting guard.

NOTE: The tee (or elbow) fitting guard may not be used on all TIREMAAX® systems. For example, it is not used on HUS® hubs with screw-on hubcaps.

3. Using two wrenches, remove the tee (or elbow) fitting from the hubcap fitting. Use one wrench to hold the jam nut on the rotary joint bulkhead adapter stationary and use the second wrench to loosen the tee (or elbow) fitting swivel threads (figure 5).



NOTE: A dual wheel tee fitting is shown in the illustration above, but removal / installation is the same for elbow-style fittings used on super single wheel configurations.

Figure 5. Tee (or elbow) removal and installation

NEW TEE OR ELBOW FITTING INSTALLATION

1. Screw the tee (or elbow) fitting from the kit onto the rotary joint bulkhead adapter (figure 5) and tighten the swivel threads to 130 ± 10 in.lbs. (14.7 N·m) of torque. Use two wrenches to achieve the final torque value. Use one wrench to hold the jam nut on the rotary joint bulkhead adapter stationary and use the second wrench to tighten the tee (or elbow) fitting swivel threads to the final torque value.

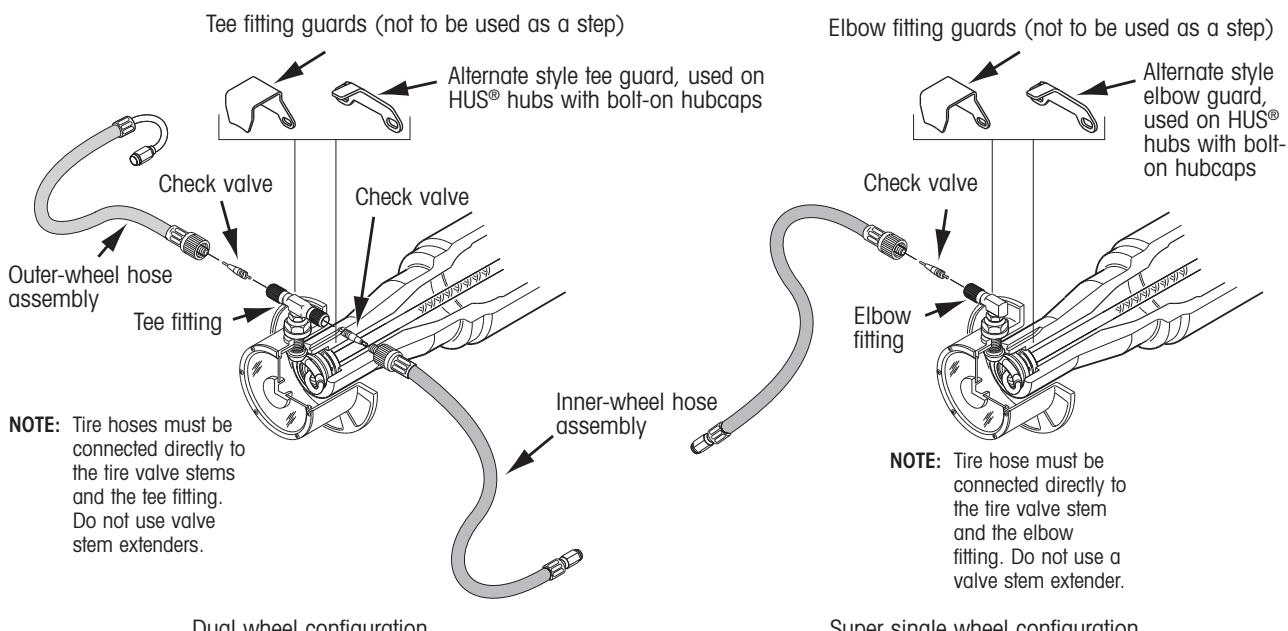


Figure 6. Tire hose, check valve and tee (or elbow) fitting guard removal and installation



TIREMAAX® EC TO CP CONVERSION PROCEDURE

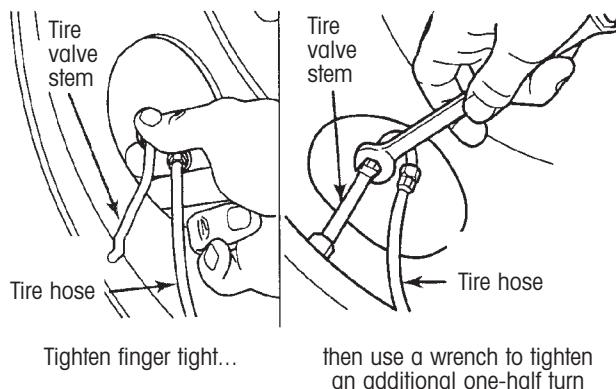


Figure 7. Attaching the tire hose to the tire valve stem

One way to approximate 130 ± 10 in. lbs. (14.7 N·m) of torque is to tighten the tee (or elbow) fitting swivel threads hand tight and then use the two-wrench method as described previously to tighten the swivel threads one additional turn. Hendrickson recommends tightening to the stated torque value, but if you use the approximate method, make sure the tee (or elbow) fitting cannot be rotated freely within the bulkhead fitting after the additional one full turn.

2. Attach the tire hose(s) to the tire valve stem(s) and tighten finger tight (figure 7).

NOTE: Tire hoses must be connected directly to the tire valve stems and the tee (or elbow) fitting. Do not use valve stem extenders.

3. Using a $\frac{7}{16}$ -inch wrench, tighten the tire hose / valve stem connection an additional one-half turn (figure 7). **Do not overtighten this connection.** The hose connections are tight enough when moving the hose back-and-forth does not cause the connection to move.



Check tire pressure at T-fitting

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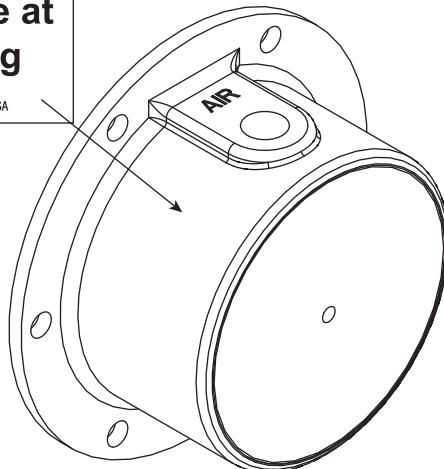


Figure 8. Recommended decal mounting location

4. Attach tire hose and check valve assemblies to the tee (or elbow) fitting and tighten finger tight (figure 6). Using pliers, carefully and gently verify that the hose connection is tight.

⚠ CAUTION: **Do not overtighten the knurled tire hose nut. Doing so will bend the tee (or elbow) fitting stem and compromise the integrity of internal tee / elbow fitting components. Do not damage knurled finish on tire hose nut. Doing so will make tire hose removal extremely difficult.**

Recheck the tire hose connections at the valve stems. Verify that the tire hose / valve stem connection did not loosen during the tire hose / tee (or elbow) fitting connection process.

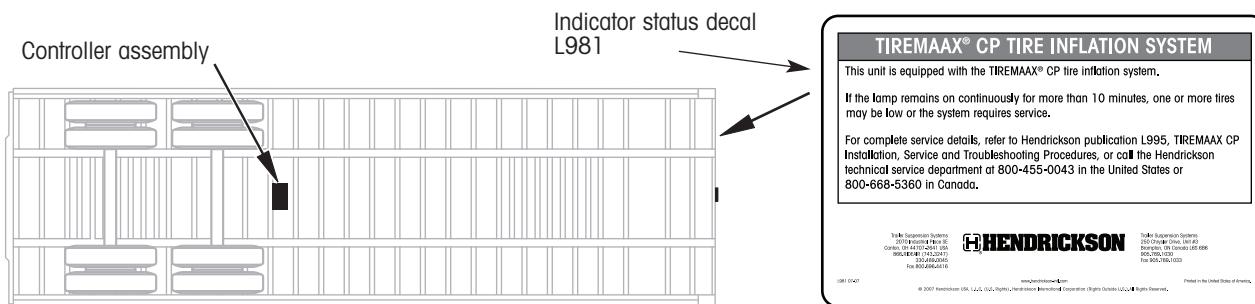


Figure 9. Recommended controller assembly mounting location and label placement



After assembly is complete, check the tire hose / valve stem connection (and all other air system connections) for leaks using the system integrity check found on page 12.

NOTE: Simply spraying the connections to look for leaks is acceptable. Use a commercially available leak detector solution to verify airtight connections.

5. Attach the tee (or elbow) fitting guard. Remove the two hubcap bolts closest to the rotary joint bulkhead adapter, place the tee (or elbow) fitting guard over the rotary joint bulkhead adapter and reinstall the hubcap bolts through the holes in the tee (or elbow) fitting guard. Tighten to 12 - 18 ft. lbs. (16 - 24 N•m) of torque.

NOTE: The tee (or elbow) fitting guard is not used on HUS® hubs with screw-on hubcaps.

6. Remove the existing TIREMAAX EC indicator status decal, L861, from the front of the trailer near the indicator lamp (figure 9).
7. If decal L918 is included in the literature packet, install it on the hubcap as shown in figure 8.

INSTALLING DELIVERY LINE RESTRICTORS

The TIREMAAX® CP system requires restrictor fittings on the delivery line of each wheel end.

The DOT push-to-connect restrictor fittings in this kit should be installed as close as possible to the controller assembly delivery port. Refer to figures 11 through 13 for location suggestions.

Depending on the number of axles on the trailer, or if the trailer is equipped with a junction manifold, some plumbing systems may have a $\frac{3}{8}$ -inch air delivery line coming out of the controller assembly. If that is the case, follow the $\frac{3}{8}$ -inch line "downstream" from the controller assembly until you find $\frac{1}{4}$ -inch lines. The $\frac{1}{4}$ -inch lines are usually found branching from the $\frac{3}{8}$ -inch line at a union tee junction.

1. Cut the $\frac{1}{4}$ -inch delivery line about six inches after the union tee. Cut tubing squarely. Make sure the end of the tubing is free of scratches, nicks, paint, oil, undercoating, etc.

2. Push a restrictor fitting (figure 10) onto the $\frac{1}{4}$ -inch line just cut. The restrictor fitting has no orientation and therefore is not sensitive to installation direction. Push the fitting firmly onto the line to fully seat the line against the internal o-ring.
3. Insert the remaining $\frac{1}{4}$ -inch line end into the restrictor fitting to complete the installation. Make sure this tubing is also clean, free of debris and scratches or nicks.
4. Repeat steps 1 through 3 for each $\frac{1}{4}$ -inch delivery line on the suspension.
5. Secure the delivery lines to the suspension or trailer structure with tie wraps. Allow for any suspension travel that may occur during operation before securing the lines.

Tubing ends must be free of debris, nicks and scratches

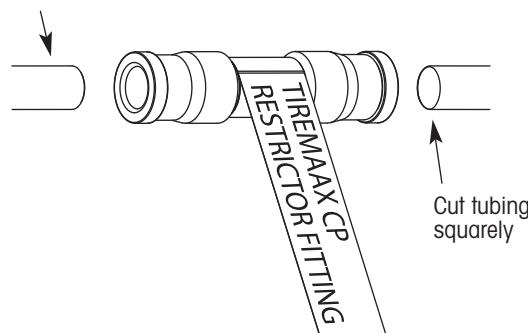
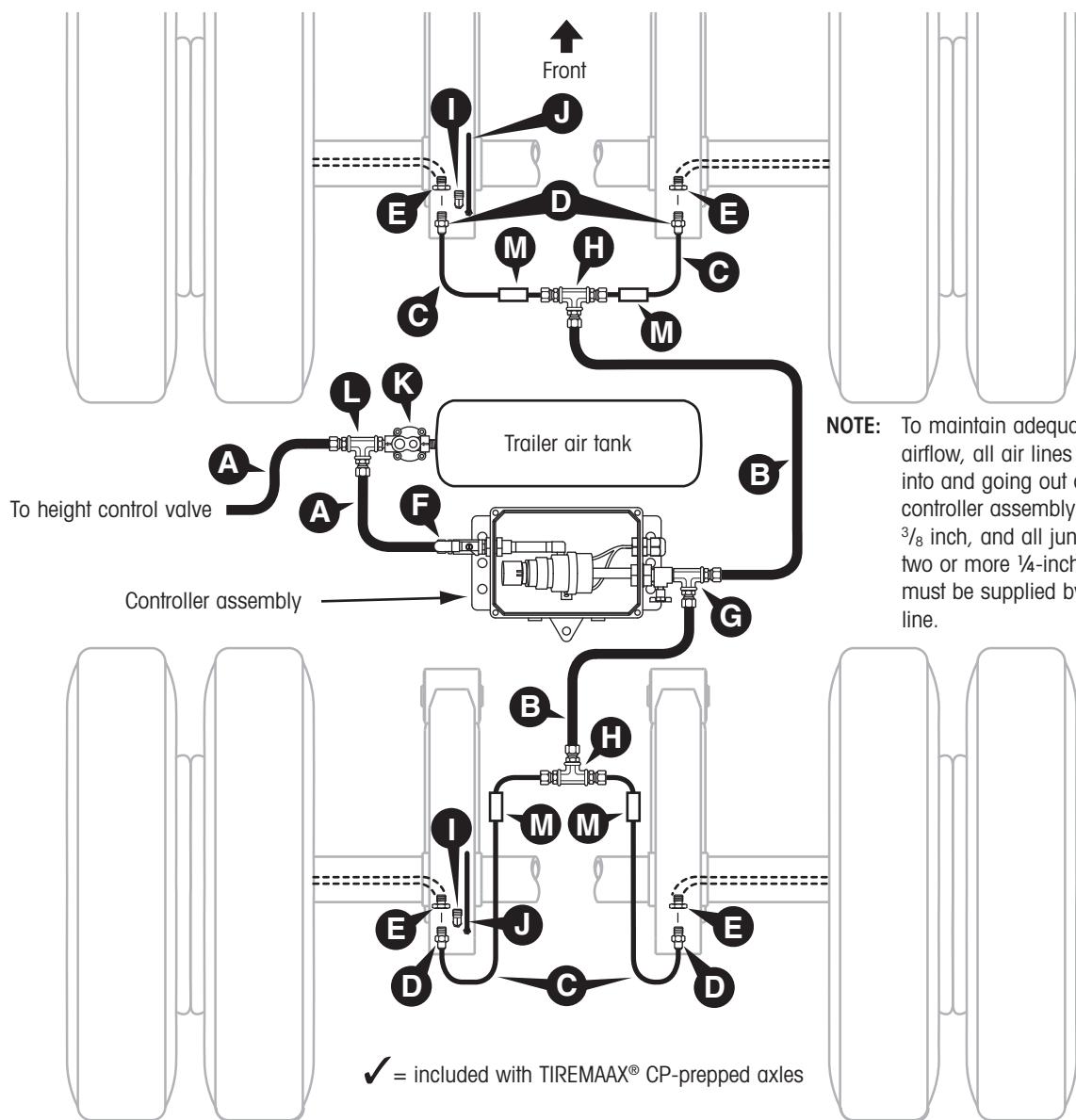


Figure 10. Restrictor fitting installation details



TIREMAAX® EC TO CP CONVERSION PROCEDURE



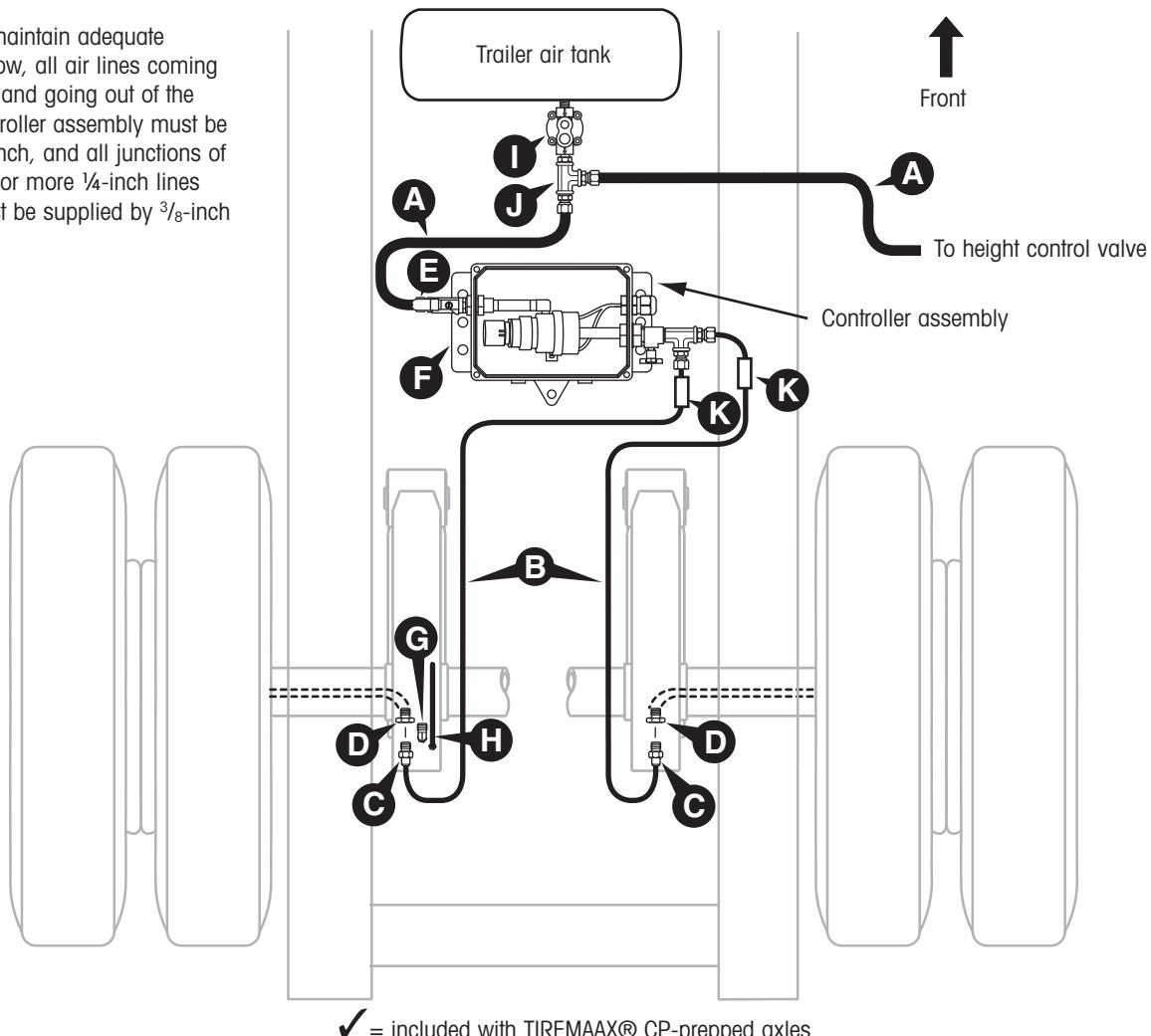
Item	Description	NTA = nylon tubing adapter
A	Air line	
B	Air line	
✓ C	Air line	
✓ D	Axle connector	
✓ E	Axle hose fitting	
F	Controller IN fitting*	
G	Controller OUT fitting	
H	Tee assembly	
✓ I	Axle vent fitting	
✓ J	Air line	
K	Pressure protection valve	
L	PPV OUT fitting	
M	Restrictor fitting	

*NOTE: TIREMAAX EC models have a $\frac{1}{8}$ -inch NPT input port. The fitting must be changed.

Figure 11. Typical TIREMAAX CP plumbing schematic — two axles with $\frac{3}{8}$ - and $\frac{1}{4}$ -inch lines



NOTE: To maintain adequate airflow, all air lines coming into and going out of the controller assembly must be $\frac{3}{8}$ inch, and all junctions of two or more $\frac{1}{4}$ -inch lines must be supplied by $\frac{3}{8}$ -inch line.



NTA = nylon tubing adapter

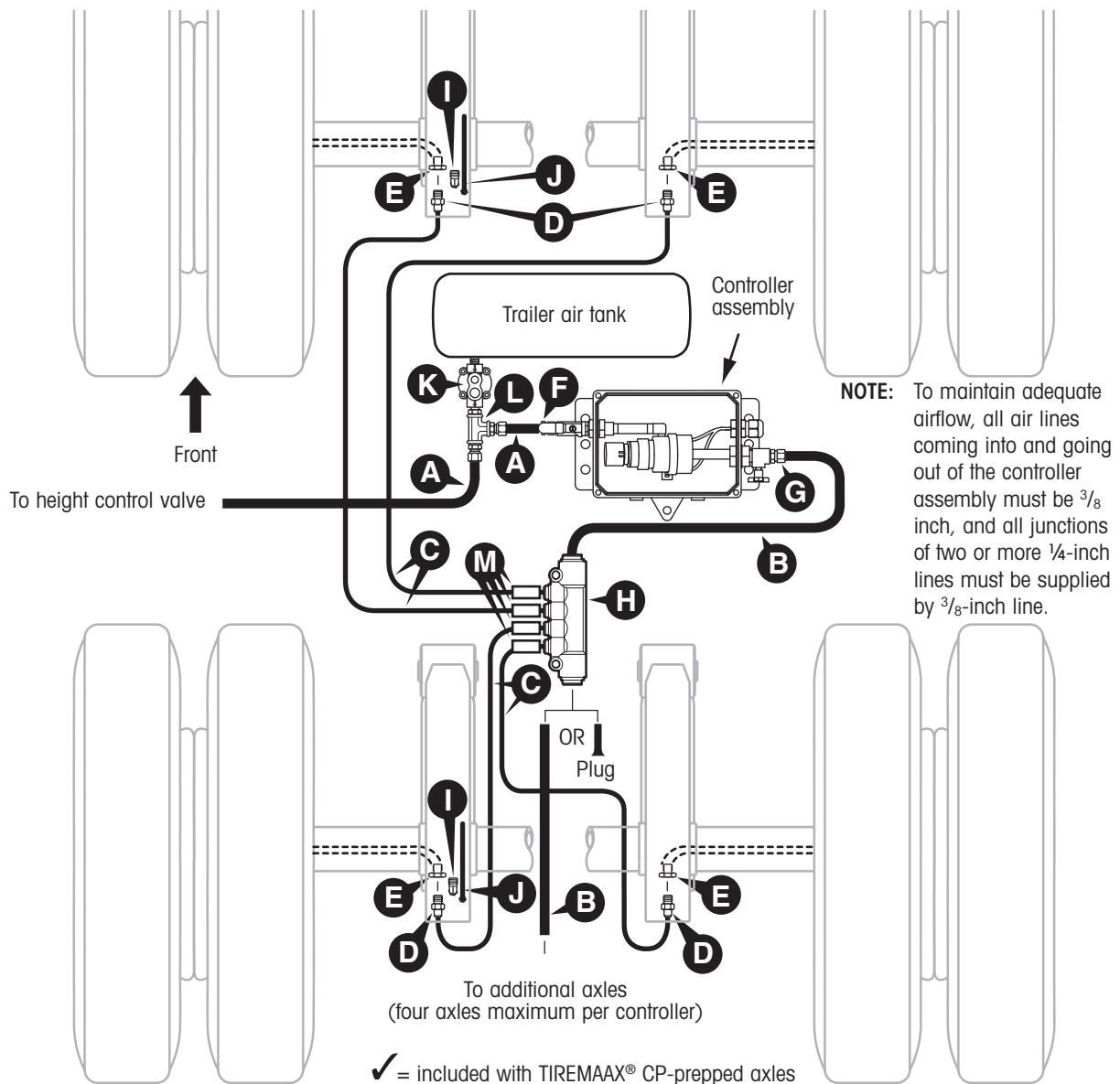
Item	Description
A	Air line $\frac{3}{8}$ -inch OD nylon air brake tubing; any length
✓ B	Air line $\frac{1}{4}$ -inch OD nylon air brake tubing; 10 to 25 feet total system length
✓ C	Axle connector $\frac{1}{8}$ -inch NPT male to $\frac{1}{4}$ -inch NTA
✓ D	Axle hose fitting 90-degree elbow, $\frac{1}{8}$ -inch NPT female
E	Controller IN fitting* $\frac{1}{4}$ -inch NPT male to $\frac{3}{8}$ -inch NTA*
F	Controller OUT assembly run tee: $\frac{1}{8}$ -inch NPT male, $\frac{1}{4}$ -inch NTA, $\frac{1}{4}$ -inch NTA (three total fittings)
✓ G	Axle vent fitting 90-degree elbow, $\frac{1}{4}$ -inch NPT male to $\frac{3}{8}$ -inch NTA
✓ H	Air line $\frac{3}{8}$ -inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end required; 70 psi minimum closing pressure; existing suspension valve can be used
I	Pressure protection valve run tee: $\frac{1}{4}$ -inch NPT male, $\frac{3}{8}$ -inch NTA, $\frac{3}{8}$ -inch NTA
J	PPV OUT fitting $\frac{1}{4}$ -inch DOT push-to-connect to $\frac{1}{4}$ -inch DOT push-to-connect union restrictor fitting
K	Restrictor fitting

*NOTE: TIREMAAX EC models have a $\frac{1}{8}$ -inch NPT input port. The fitting must be changed.

Figure 12. Typical TIREMAAX CP plumbing schematic — single axle with $\frac{1}{4}$ - and $\frac{3}{8}$ -inch lines



TIREMAAX® EC TO CP CONVERSION PROCEDURE



Item	Description
A	Air line
B	Air line
\checkmark C	Air line
\checkmark D	Axle connector
\checkmark E	Axle hose fitting
F	Controller IN fitting*
G	Controller OUT fitting
H	Junction manifold
\checkmark I	Axle vent fitting
\checkmark J	Air line
K	Pressure protection valve
L	PPV OUT fitting
M	Restrictor fitting

NTA = nylon tubing adapter

*NOTE: TIREMAAX EC models have a $\frac{1}{8}$ -inch NPT input port. The fitting must be changed.

Figure 13. Typical TIREMAAX CP plumbing schematic — two axles with $\frac{3}{8}$ - and $\frac{1}{4}$ -inch lines and junction manifold



SYSTEM INTEGRITY CHECK

After the kit installation is complete but before the trailer is put into service, all air system connections must be checked for leaks. This is done by applying soapy water to all air connections. Bubbles in the soapy water or a hissing sound will provide visual and audible indications of air leaks.

The TIREMAAX® CP system can be pressurized without applying electrical power. Pressurize the TIREMAAX CP system as follows:

1. Fill the trailer air system and set all tire pressures as close to target pressure as possible without exceeding the target pressure. Manually measure pressure at each tire:
 - Disconnect tire hose from tee at hubcap (or from elbow at hubcap if super single configuration)
 - Use a conventional gauge to measure tire pressure at hose end
 - Reattach and firmly hand-tighten tire hose. Using pliers, carefully and gently verify that the hose connection is tight.
2. Ensure that the TIREMAAX CP shutoff valve is in the open position (figure 14).
3. Apply soapy water to all air-fitting connections. Bubbles in the soapy water will provide a visual indication of an air leak. Fix if necessary. All connections must be air tight.

An additional benefit of the system integrity check is balanced tire pressures. For example, assume that eight new tires were added to the trailer and the desired target tire pressure is 95 psi. The new tires could conceivably have pressures of 89, 91, 94 or anywhere near the desired 95 psi target pressure. While you are using the system integrity check to identify possible leaks, it will simultaneously inflate any low tires to the 95 psi target tire pressure (there will be no change to tires already at or above 95 psi).

SYSTEM SETUP

The TIREMAAX CP controller is pre-programmed from Hendrickson, therefore no additional setup is required. To program a pressure other than the factory setting, follow the SETTING TARGET PRESSURE instructions beginning on this page.

NOTE: For TIREMAAX CP to function properly, the trailer air tank pressure must be higher than the target tire pressure. TIREMAAX CP is only capable of allowing available air tank pressure to reach the tires. **It is not capable of supplying pressure above the available air tank pressure.**

TROUBLESHOOTING

TROUBLESHOOTING INTRODUCTION

The system identifies system leaks and reports them by illuminating the trailer-mounted indicator. The operator is informed whenever a tire is low enough to require service or there is a leak in the system. If the trailer-mounted indicator remains on constantly for more than 10 minutes, it is an indication of a potential system or tire leak. First, inspect all tires for leaks using a soapy water solution and check each tire for a low pressure condition. To troubleshoot for a system leak, complete the system integrity check procedure on this page.

SETTING TARGET PRESSURE

The TIREMAAX CP controller is pre-programmed from Hendrickson, therefore no additional setup is required. To program a pressure other than the factory setting, follow these instructions.

1. Using a shop air supply, pressurize the trailer air system to a level slightly higher than target pressure (desired tire inflation pressure).
2. Close the controller shutoff valve on the supply line (figure 14).
3. Open the petcock valve on the delivery line to vent the system.
4. Remove the delivery line from the controller and install a pressure gauge in the delivery port.
5. Close the petcock valve on the delivery line.
6. Open the controller shutoff valve on the supply line and monitor delivery pressure on the gauge.
7. Delivery pressure should be set 3 psi higher than the desired target pressure due to the "crack pressure" characteristic of the check valves in the tire hoses.



TIREMAAX® EC TO CP CONVERSION PROCEDURE

NOTE: Factory pre-programmed controllers have been set to account for the difference in target tire pressure versus controller delivery pressure. The label on the factory programmed controller represents the desired target tire pressure.

Delivery pressure is regulated by rotating the regulator knob either clockwise or counterclockwise (as viewed from the end of the knob). Before the knob can be rotated, it must be unlocked. To unlock the regulator knob, pull it away from the regulator body (figure 14). An audible “click” will be heard.

If delivery pressure is too low, increase it by rotating the regulator knob clockwise (as viewed from the end of the knob).

NOTE: Always approach the target pressure setting from an increasing-pressure direction.

If you go past the desired target pressure (increase the pressure too much), turn the regulator knob counterclockwise to lower the pressure setting to at least 5 psi below the

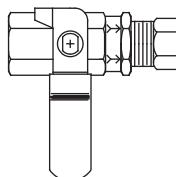
desired target pressure setting. Then turn the knob clockwise again to the desired target pressure setting.

If delivery pressure is too high, decrease it by rotating the regulator knob counterclockwise (as viewed from the end of the knob). Lower the pressure setting to at least 5 psi below the desired target pressure setting. Then turn the knob clockwise again to the desired target pressure setting.

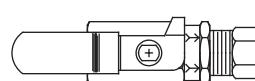
8. Disconnect the tire hose for each tire at the tee (or elbow) fitting and manually depress the check valve core in the tire hose to reduce the pressure in each tire by 5 to 10 psi. Reconnect each tire hose to the tee (or elbow) fitting. Using pliers, carefully and gently verify that the hose connection is tight.
9. Close the controller shutoff valve on the supply line (figure 14).
10. Open the petcock valve on the delivery line to vent the system.

Controller shutoff valve

Closed position



Open position



NOTE: For clarity, the enclosure shown below is depicted with the cover removed. You will need to open the enclosure to access the regulator. A small flatblade screwdriver may be needed to help unlatch the enclosure cover.

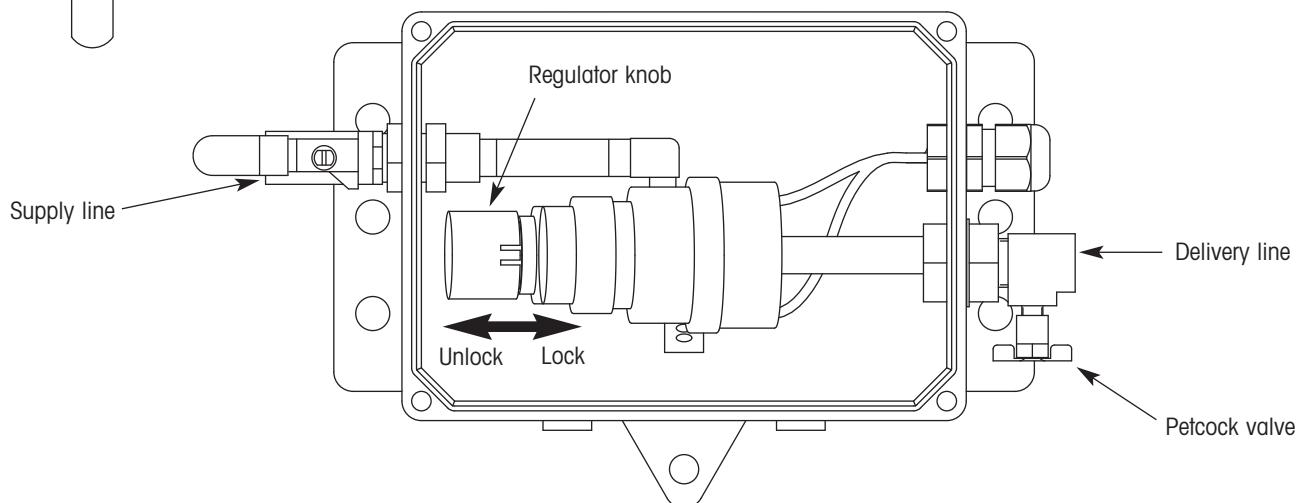


Figure 14. Setting target pressure with the IPCU



11. Remove the pressure gauge from the delivery port, reinstall the delivery line and close the petcock valve.
12. Open the controller shutoff valve on the supply line. When the flow of air to the tires has stopped, use a conventional gauge to manually measure tire pressure. Tire pressure should be checked at the hose end only.
13. If necessary, repeat steps 1 through 11 until the pressure at the tire hoses is at the desired target pressure.
14. Lock the regulator knob by pushing it in toward the regulator body (figure 14). An audible "click" will be heard.
15. Close and latch the controller enclosure and disconnect the shop air supply.



TIREMAAX® EC TO CP CONVERSION PROCEDURE

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