

TECHNICAL PROCEDURE

TIREMAAX® PRO AND CP TIRE INFLATION SYSTEMS

SUBJECT: Installation, Service and
Troubleshooting Procedures

LIT NO: T51002

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REVISION: H

NOTE: For information on TIREMAAX® CP
systems purchased prior to April 2012,
refer to Hendrickson literature number
L995.

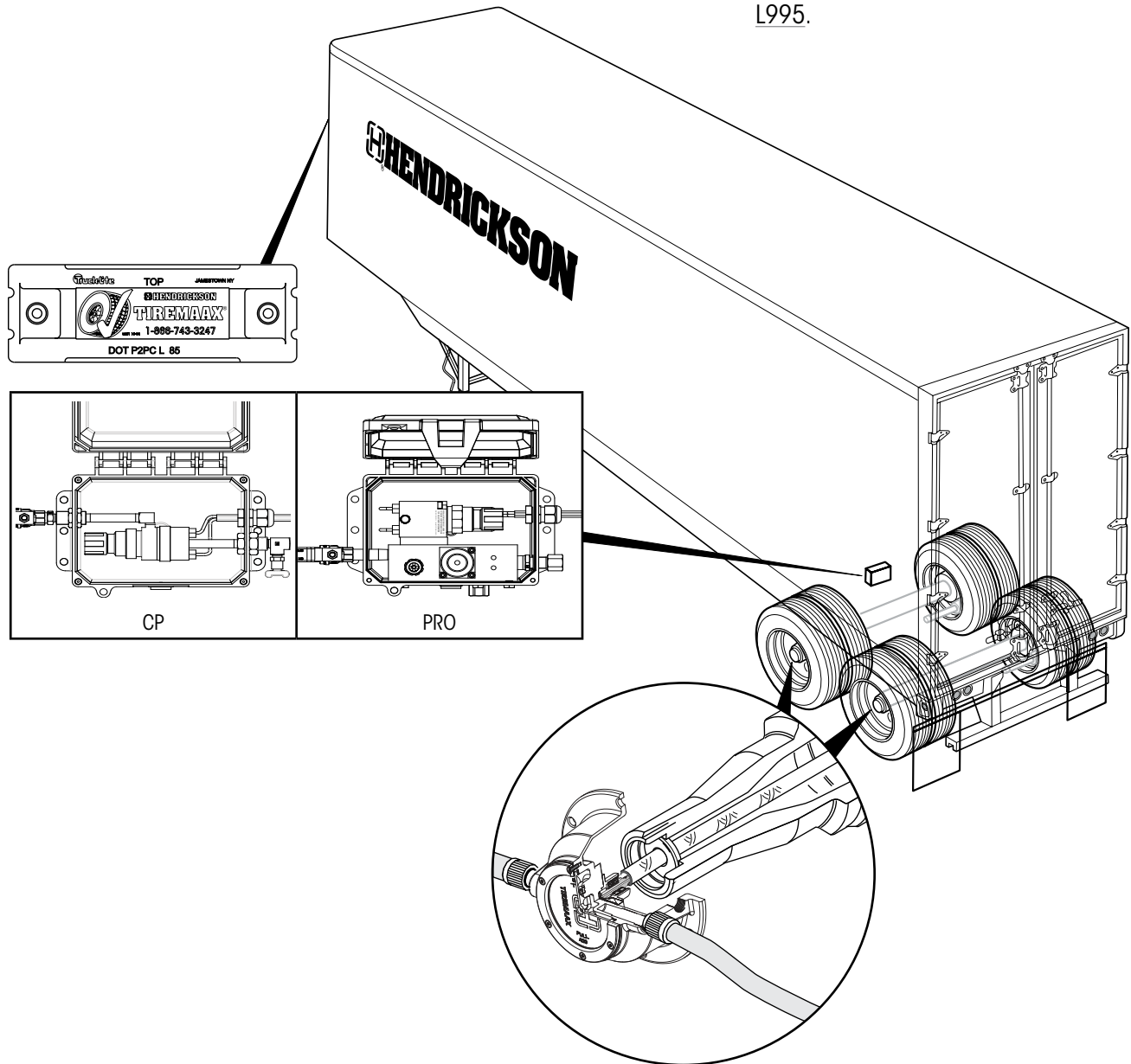


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IMPORTANT SAFETY NOTICES

Hendrickson literature number **T12007** *Technical Procedure General Safety Precautions and Information*, available at www.Hendrickson-intl.com/TrailerLit, includes important preparation, precautionary and safety information pertaining to the procedures included in this document.

To help prevent personal injury and equipment damage; warnings, cautions and other relative statements included in Hendrickson literature number **T12007** are to be read carefully and applied during the performance of the procedures included in this document.

Improper maintenance, service or repair can cause damage to the vehicle and other property, personal injury, unsafe operating conditions and potentially void the manufacturer's warranty.

CONVENTIONS APPLIED IN THIS DOCUMENT

This section explains the techniques used in this document to convey important information, safety issues, how to contact Hendrickson and how to apply hyperlink.

EXPLANATION OF SIGNAL WORDS

Hazard signal words (such as DANGER, WARNING or CAUTION) appear in various locations throughout this publication. Information accented by one of these signal words must be observed at all times. Additional notes are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions comply with ANSI Z535.6 and indicate the use of safety signal words as they appear throughout the publication.

DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

IMPORTANT: An operating procedure, practice or condition that is essential to emphasize.



Safety Alert Symbol used to indicate a condition exists that, if not avoided, may result in personal injury or harm to individuals. It must be applied to DANGER, WARNING and CAUTION statements, which emphasize severity.

HYPERLINKS

Links are identified by a dark grey line under the linked text. Internal links allow the reader to jump to a heading, step or page in this document. External links open the website or document referenced.

CONTACTING HENDRICKSON

Contact Hendrickson Trailer Technical Services for technical assistance as needed. To do so, several options are available. Technical Services must be contacted before performing any warranty related service.

NOTE: DO NOT service a suspension or any component that is under warranty without first contacting Hendrickson Technical Services.

Prior to contacting Technical Services, it is best to have the following information about the vehicle and Hendrickson suspension available (all that apply):

- **Hendrickson suspension** information, (refer to [L977 Suspension and Axle Identification](#)) –
 - Suspension model number
 - Suspension serial number
 - Approximate number of suspension miles
- **Trailer information** (located on VIN plate) -
 - Type (van, reefer, flat bed, etc...)
 - Manufacturer
 - VIN (vehicle identification number)
 - In-service date¹
 - Fleet/owner name
 - Unit #

¹ If the in-service date is unknown or not available, the vehicle date of manufacture will be substituted.



- **Failure information**
 - Description of the system problem, the part number and/or the part description of the reported non-functioning part.
 - **Date of failure.**
 - Where applicable, **location of problem** on suspension / trailer (e.g., road side, front axle, rear axle, curb side rear, etc.).
- **Digital photos** of suspension and damaged areas.
- **Special application** approval documentation (if applicable).

PHONE

Contact **Hendrickson Trailer Technical Services** directly in the United States and Canada at **866-RIDEAIR (743-3247)**. From the menu, select:

- **Technical Services/Warranty** for technical information.
- Other selections include:
 - **Aftermarket Sales** for replacement parts information and ordering.
 - **Original Equipment Sales** for parts inquiries and ordering for trailer manufacturers.

EMAIL

HTTS@Hendrickson-intl.com

Contact Hendrickson for additional details regarding specifications, applications, capacities, operation, service and maintenance instructions.

All applications must comply with applicable Hendrickson specifications and must be approved by the respective vehicle manufacturer with the vehicle in its original, as-built configuration.

RELATED LITERATURE

If you suspect your version of this or any other Hendrickson manual is not "Up-to-Date", the most current version is free online at:

www.Hendrickson-intl.com/TrailerLit

Available Hendrickson documentation can be viewed or downloaded from this site.

All Hendrickson online documentation is in PDF format that requires PDF reader software to open. A free application is downloadable from Adobe at <http://get.adobe.com/reader/>.

Other related literature may include:

NAME	DESCRIPTION
L583	<i>Comprehensive Warranty Statement (US and Canada)</i>
L878	<i>TIREMAAX® Parts List</i>
L995	<i>TIREMAAX® CP Installation, Service and Troubleshooting Procedures (applies to TIREMAAX CP systems purchased prior to April 2012)</i>
T50018	<i>TIREMAAX® Manual Tire Check Decal</i>
T51003	<i>TIREMAAX® CP & PRO Installation Poster</i>
T52001	<i>ToolBox Tip: TIREMAAX® PRO - Setting Target Pressures</i>
T52003	<i>ToolBox Tip: TIREMAAX® Hubcap Clocking</i>

Table 1: Related literature

Videos are also available at

www.Hendrickson-intl.com/TIREMAAX

Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Consult the Hendrickson website for the latest version of this manual.

PREPARING TRAILER FOR MAINTENANCE SERVICE

Information for trailer preparation, safety and precautionary statements, refer to Hendrickson literature number [T12007](#), available at

www.Hendrickson-intl.com/TrailerLit.

NOTE: DO NOT service a suspension or any components that is under warranty without first contacting Hendrickson Technical Services. Refer to [CONTACTING HENDRICKSON](#) for details.

⚠WARNING **DO NOT** work under a trailer supported only by jacks. Jacks can slip or fall over, resulting in serious personal injury. Always use safety stands to support a raised trailer.



SYSTEM OVERVIEW

The Hendrickson TIREMAAX® tire inflation system is available in two versions: TIREMAAX PRO and TIREMAAX CP. System highlights include:

- TIREMAAX CP is capable of inflating tires found to be below a target pressure.
- TIREMAAX PRO inflates low pressure tires, but also has the ability to relieve pressure from over-inflated tires, as well as equalize pressure across all wheel positions.

FEATURES

Features include:

- Indicator lamp (Figure 3 on page 9) that illuminates when regulated air flow exceeds the designed threshold. This occurs while tires are inflating or if there is a system leak.
- Tire pressure is continuously and automatically held at the desired Inflation Pressure.
- Does not pressurize axle tube.
- In-axle filter helps prevent hub contamination and allows any wheel-end air leaks to evacuate through and out the axle vent.
- No venting at wheel-end helps prevent contamination from entering hubcap.
- Integrated valves isolate tires from system when parked.
- The rotary union is integrated into the hubcap assembly for simpler installation and service.
- Manual pressure check or fill is available through tire hoses at the hubcap.
- Inflates tires and detects leaks.
- Air supply valve includes a screen that prevents debris from entering system and helps keep lines and seals clean.
- Cold tire Inflation Pressure set to OEM specifications.
- TIREMAAX PRO includes a Deflation Pressure that is preset greater than the Inflation Pressure. Excess pressure above the Deflation Pressure is exhausted.

SYSTEM SPECIFICATIONS

Unless otherwise specified, specifications listed apply to both TIREMAAX PRO and CP.

SPECIFICATION	US	METRIC
CP tire pressure setting range	70 to 120 psi	482 to 827 kPa
PRO tire pressure setting range	85 to 120 psi	586 to 827 kPa
Pressure check interval	Continuous	
Minimum operating voltage	9 volts	
Indicator lamp current range	50 mA to 1 A	
Inflate capacity (one tire in approximately two minutes)	10 psi	69 kPa
Maximum number of axles supported per control	Four	

Table 2: TIREMAAX® PRO and CP general specifications

NOTICE

Use of products inside the tire (e.g. balancing beads or liquids, tire sealants or tire coolants) are not recommended with TIREMAAX PRO. These products can damage seal and valve components within the hubcap and controller, and may result in improper function of the TIREMAAX PRO system and contamination of the wheel-end.



INSTALLATION, SERVICE AND TROUBLESHOOTING PROCEDURES

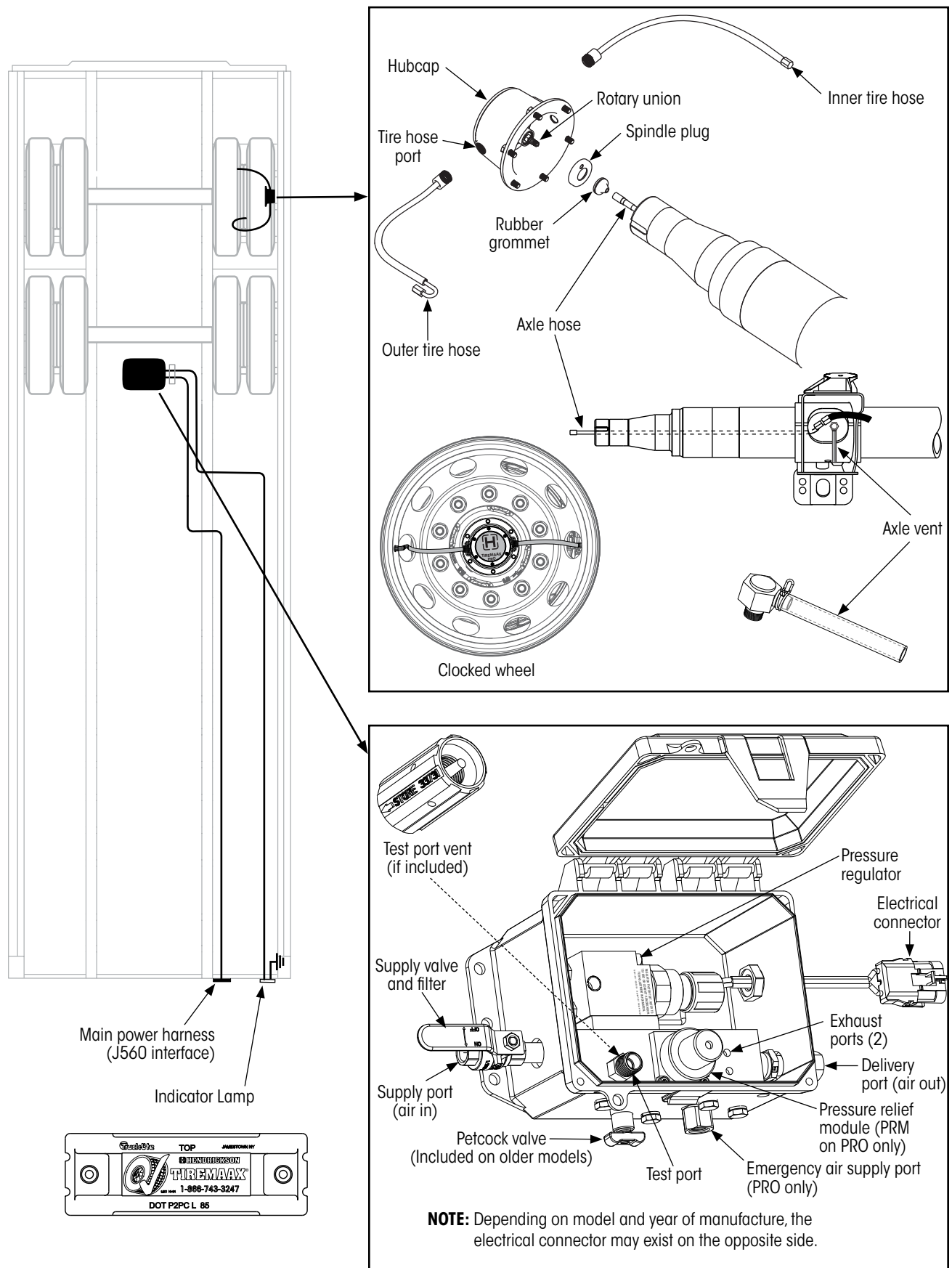


Figure 1: TIREMAAX® components (PRO controller shown)

COMPONENT DESCRIPTION

This section includes a brief overview of TIREMAAX® PRO and CP components. Refer to [Figure 1](#) on previous page.

TIREMAAX® CONTROLLERS

The controllers in the TIREMAAX systems control [Inflation Pressure](#) and provide protection in case of tire or system leaks. Two versions are currently available:

- CP** Provides constant pressure to tires for inflation only.
- PRO** Provides tire inflation, same as CP, but also provides a deflation feature.

CONTROLLER DETAILS

- Externally mounted on structure under the trailer (Refer to [Figure 31](#) on page 24):
 - Includes mounting flanges integral to enclosure.
 - Can be mounted on new or existing trailers.
 - Sealed lid protects internal components from environment.
- Internal components include:
 - **Pressure regulator**
 - » Regulates air flow from trailer air tank to tires.
 - » Regulated pressure is set to match the desired cold tire [Inflation Pressure](#).
 - **(PRO Only) PRM (Pressure Relief Module)**
 - » Relieves tire pressures that are 10 psi (69 kPa) above [Inflation Pressure](#).
 - » Includes PRM set screw for setting [Deflation Pressure](#). Excess pressure is dumped out the PRM exhaust vent located on the bottom side of the valve body below the PRM.
 - **(PRO Only) Test port** for connecting Hendrickson TIREMAAX calibration tool and test port vent.
 - **(PRO Only) Test port vent** used in [INDICATOR LAMP TEST](#) on page 45 for newer models.
- External connections:
 - **Supply port** provides air from the trailer air tank.
 - » Supply valve allows isolation of trailer air tank pressure for maintenance and other service functions.
 - » Inlet screen reduces contamination from air supply.
 - **Delivery port** feeds regulated air pressure through air hoses and hubcaps to tires.
 - **Petcock valve** (included on CP and older PRO models) allows trailer-mounted indicator lamp

functionality to be tested. See [INDICATOR LAMP TEST](#) on page 45.

- **(PRO only) Emergency air supply port** functions similar to a pilot valve controlling the operation of the exhaust valve. This feature:
 - » Isolates TIREMAAX PRO components from supply (tank air).
 - » Maintains tire pressure while the trailer is idle for extended periods of time.

NOTICE

While the trailer emergency brake are engaged, delivery air pressure exhausts to zero psi in the delivery air lines only. Hubcap wheel valves close to isolate wheels from the system.

WARNING

While servicing the TIREMAAX PRO system, it may be necessary to disengage the trailer emergency brake to allow the controller to function. Trailer wheels must be chocked during these procedures.

HUBCAP

Although the hubcaps appear similar, TIREMAAX PRO will have the word “PRO” on the hubcap window. Each hubcap is configured and assembled to match the requirements of the application (spindle type, PRO or CP, grease or oil). Hubcap variations are listed in [L878 TIREMAAX Parts List](#).

This assembly:

- Integrates important components relative to TIREMAAX PRO and CP systems.
- Seals and protects wheel-end components.
- Connects air system from stationary axle to rotating hub and wheels.
- Includes factory assembled integrated components:

NOTICE

Field disassembly of hubcap integrated components will void warranty.

- Rotary union that connects rotating hubcap directly to stationary axle hose.
- **(PRO only) Hubcap wheel valves -**
 - » Identified by red anodized adapter plate inside hubcap.
 - » Assumes function of tire hose check valve.



- Hubcap check valve -
 - » Close to isolate system and tire when tire hoses are disconnected.
 - » Color and function differences between CP and PRO:
 - **Silver** - The CP valve allows air flow into the tires only. The tire hose check valve is not defeated.
 - **Red** - Designed to hold the tire hose check valve open while tire hose is connected to the hubcap port. This allows air to flow both directions for inflation and deflation.
- Window (Includes "PRO" to identify TIREMAAX® PRO version.)

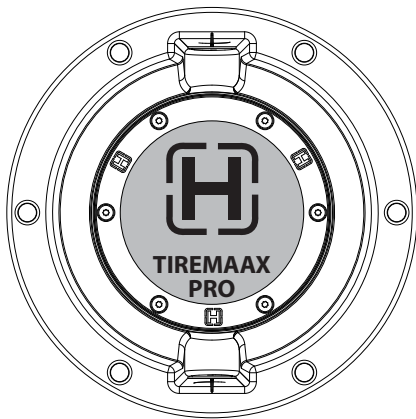


Figure 2: Hubcap window example
(grease PRO hubcap shown)

AXLE HOSES AND FITTINGS

- Provide an air passage from the controller, through the axle(s), to the hubcap.
- Allows axle to remain non-pressurized.

SPINDLE PLUG AND GROMMET

- Provides air pressure vent (breather hole) for wheel-end during normal use and in the event of increased pressure.
- Restrains and positions the axle hose in hubcap and spindle.

TIRE HOSES

- Attach to valve stem.
- Allow for manual pressure check and fill at the hubcap end. Refer to MANUALLY CHECK TIRE PRESSURE on page 46.

INDICATOR LAMP

The indicator lamp is controlled by the flow switch in the controller regulator.

- Provides a means for the driver to check system status.
- Used during testing and calibration to indicate air flow through system.
- Under some circumstances can be used to identify a leak in the system. Refer to TROUBLESHOOTING on page 36.

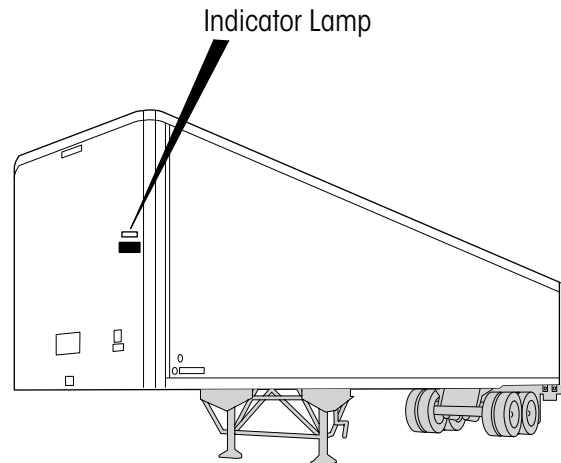


Figure 3: Indicator lamp typical location

OPERATION

TIREMAAX® PRO and CP function similarly for tire inflation. Deflation is a function of TIREMAAX PRO only. No operation is required by the driver/operator for either system to function normally. However, the Indicator Lamp should be monitored to verify system function and integrity. The Indicator Lamp is located on the front of the trailer (Figure 3 on page 9) or in a location within view of the driver from the cab.

TIREMAAX® FUNCTIONAL DIAGRAMS

For TIREMAAX CP (Figure 4), tire hose check valves prevent tire air pressure from feeding back to the controller and isolate wheels should a blow-out occur.

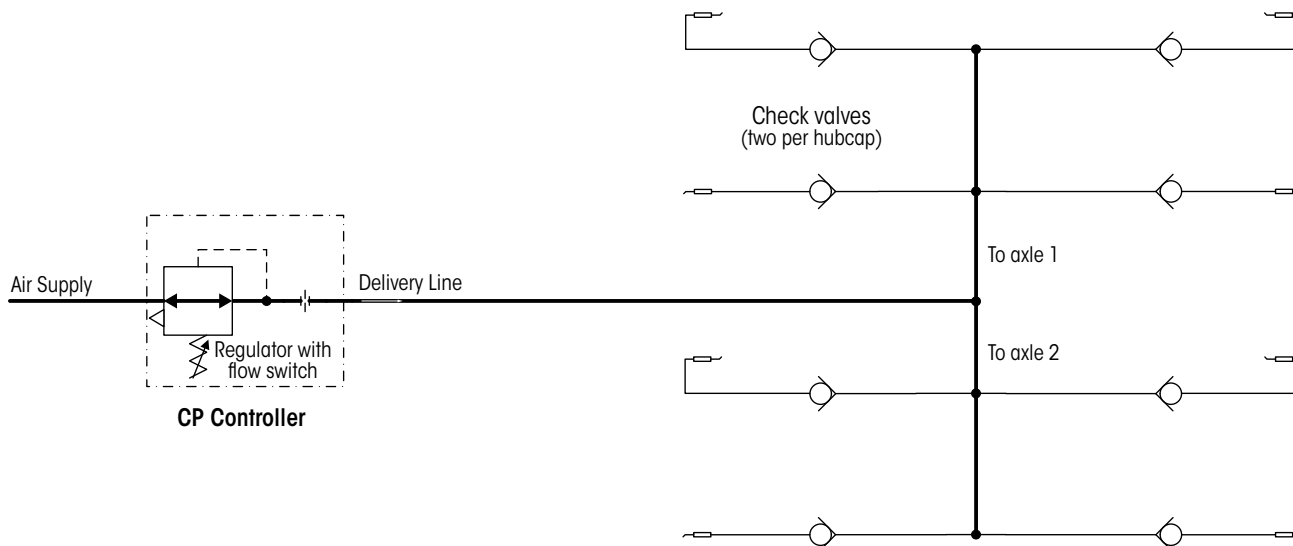


Figure 4: TIREMAAX CP functional diagram

For TIREMAAX PRO (Figure 5), when connected to a PRO hubcap, tire hose check valves are manually held open to allow two way air flow. Hubcap wheel valves prevent tire air pressure from falling below the run-flat setting. For more details, refer to HUBCAP on page 8.

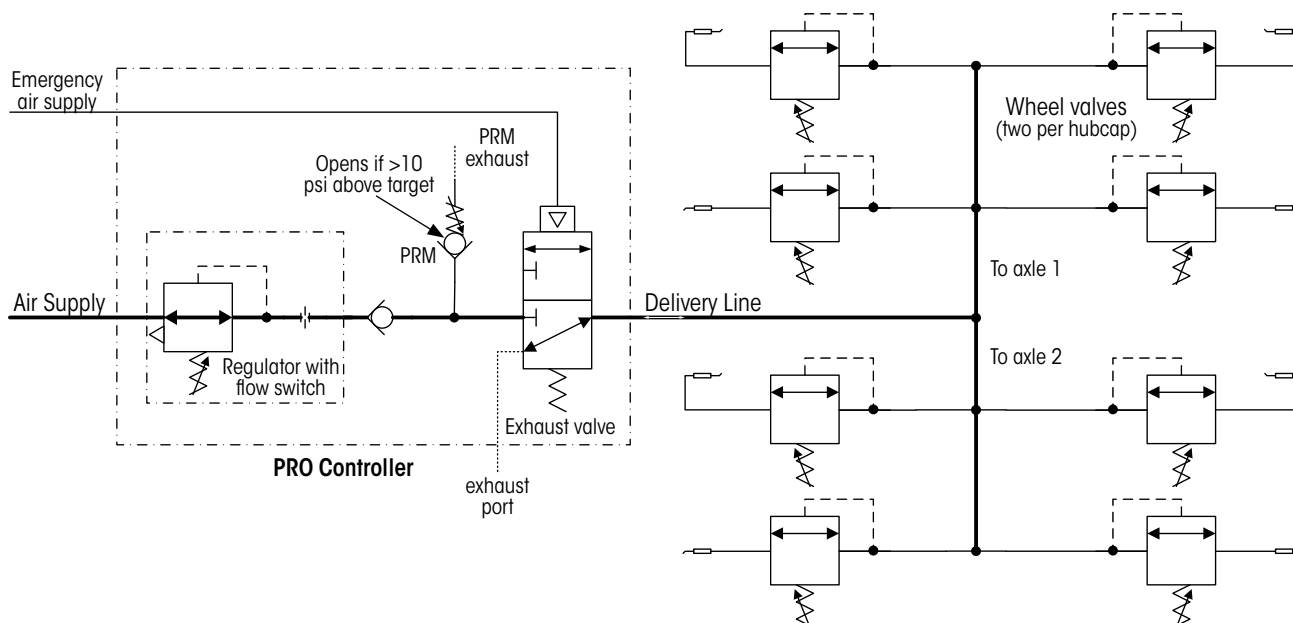


Figure 5: TIREMAAX PRO functional diagram



TIRE INFLATION

The TIREMAAX® system is set to a specified Inflation Pressure for inflation. As long as the pressure in the trailer air tank is above the desired Inflation Pressure, the controller will continuously supply and maintain tire pressure at target.

NOTE: For the TIREMAAX controller to function properly, trailer air must be clean, dry and tank pressure must be greater than the tire Inflation Pressure. The controller cannot supply pressure above the available air tank pressure.

When functioning normally, the trailer air tank will supply air pressure to the TIREMAAX controller. The controller will deliver regulated air to pressurize air lines and tires to the specified Inflation Pressure. For TIREMAAX PRO, all check valves are held open. This allows air to flow in both directions with the same psi throughout the system.

If tires are low, air from the trailer air tank will continue to inflate tires to the Inflation Pressure. Delivery (regulated) air flowing from the controller to air lines and tires may cause the indicator lamp to remain lit until the specified Inflation Pressure is reached. The controller delivers constant pressure to lines and tires to maintain Inflation Pressure.

If there is a tire leak or leak in the lines, the indicator lamp may or may not remain on. The operator should stop and check the tires to determine if it is safe to continue to operate the vehicle and should seek service at the next opportunity.

- If the indicator lamp ([Figure 1](#)) remains illuminated for more than 10 minutes as the system is attempting to inflate the tires but may not be able to adequately maintain proper tire pressure.
- If the indicator continues to turn on and off, there is likely a slow leak in plumbing or tires.

For tire leaks, the remaining tires are protected from pressure loss by integral valves located in each tire hose (CP) or hubcap (PRO).

Refer to [TROUBLESHOOTING](#) on page 36.

TIRE DEFLATION (TIREMAAX PRO only)

A common cause of pressure variance in tires is temperature. Tire pressure can rise when:

- Traveling from cold to warm or hot weather.
- Inflating while cold, then tires heat up during operation of the trailer.
- Tire temperature increases with speed.
- Travelling to a higher elevation.

Deflation Pressure is set at a fixed value greater than the Inflation Pressure. If the tire pressure increases above this setting, the TIREMAAX PRO controller will exhaust air and maintain pressure at this higher value.

Cooling tires may result in tire pressure dropping below the Inflation Pressure while parked. This may illuminate the indicator lamp at start-up.

INSTALLATION

Installation of TIREMAAX® PRO and CP systems can be done on new or existing axles. For application and installation questions, refer to [CONTACTING HENDRICKSON](#) on page 4.

INSTALLATION MATERIALS AND SUPPLIES

In addition to the hardware provided, the installer shall provide the following:

- Controller assembly **mounting bolts** (Figure 31 on page 24)
- **PPV**, Pressure Protection Valve.
- **Indicator lamp and wire**, if not configured as part of TIREMAAX kit (Figure 43 to Figure 44).
- **Spindle plug driver and handle**¹ (Figure 19 on page 19), unless the spindle plugs are already installed in the axle from the factory.
- **Air lines and fittings** as defined in Figure 36 to Figure 41.

INSTALLATION INTRODUCTION

Installation procedures are divided into sections relative to installation requirements of both suspension and trailer. Refer to [Table 3](#), below, to determine the best starting point for your application.

IF	START AT
New system with nothing installed	Axle Preparation
Axles are pre-drilled but no TIREMAAX hardware has been installed	Axle Component Installation on page 15
Axle hose and spindle plugs are already installed, but undressed	HUBCAP INSTALLATION on page 20
System hardware is already installed on a dressed axle	TIRE HOSE INSTALLATION on page 22

Table 3: Installation starting points

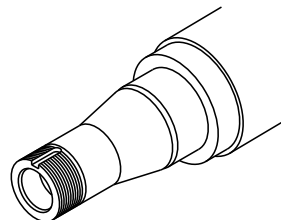
AXLE PREPARATION

The first stage of TIREMAAX installation is axle preparation. Starting with [Figure 6](#), this section defines procedures for drilling holes and other steps required to prep a Hendrickson axle to receive hoses and fittings.

NOTE: The TIREMAAX system is compatible with most spindle nut systems. To avoid interference when using a castle (cotter pin-locked) spindle nut system, the use of an extended hubcap is required for PRO. The cotter pin cannot be longer than one inch.

⚠WARNING Chock all wheels before beginning this installation procedure. Never work under a vehicle supported **ONLY** by a jack. Refer to Hendrickson literature number [T12007](#) for details.

HN spindle



HP spindle

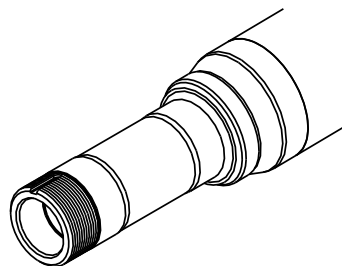


Figure 6: Axle spindle identification

1. **Chock** wheels to keep trailer from moving.
2. If the wheel-end is oil lubricated, drain oil from the hubcap and discard oil.
3. **Remove** hubcap bolts and hubcap.
4. **Remove** spindle plug from the spindle.
5. **Remove** in-axle filter.
6. **Inspect** spindle plug bore and remove any burrs or sealant.
7. **Check** inside of spindle to ensure there is a passage through the axle to allow installation of air lines.

¹ Components unique to TIREMAAX® are available only from Hendrickson.

8. Select and complete this step for your axle type:

- A. **For all TIREMAAX® prepped INTRAAX® and VANTRAAX® suspensions** - locate the three ¼ inch pipe plugs in the axle wrap windows, remove the plugs and proceed to AXLE COMPONENT INSTALLATION on page 15. If the axle does not have pre-drilled holes in the axle wrap windows, proceed to Step 9 for hole drilling details.
- B. **For Hendrickson TRLAXLE® Trailer Axles** - locate the three ¼ inch pipe plugs in the middle of the axle, remove the plugs and proceed to the AXLE COMPONENT INSTALLATION on page 15. If the axle does not have three pre-drilled holes in the middle of the axle, proceed to Step 9 for hole drilling details.

9. Using the information in Figure 7 or Figure 8, drill and tap three ¼ inch - 18 NPT holes in the axle wrap windows (on INTRAAX and VANTRAAX suspensions) or at the midpoint of the axle (on Hendrickson TRLAXLE Trailer Axles).

NOTE: In most cases, it will be necessary to remove the slack adjuster and camshaft to gain access to the approved drilling area on INTRAAX and VANTRAAX suspensions. Refer to Hendrickson publication L496, Wheel-End Maintenance Procedures (available at www.Hendrickson-intl.com/TrailerLit), for complete slack adjuster and camshaft removal instructions.

10. **Remove** the debris generated by the drilling and tapping operations from inside the axle before proceeding with AXLE COMPONENT INSTALLATION on page 15.

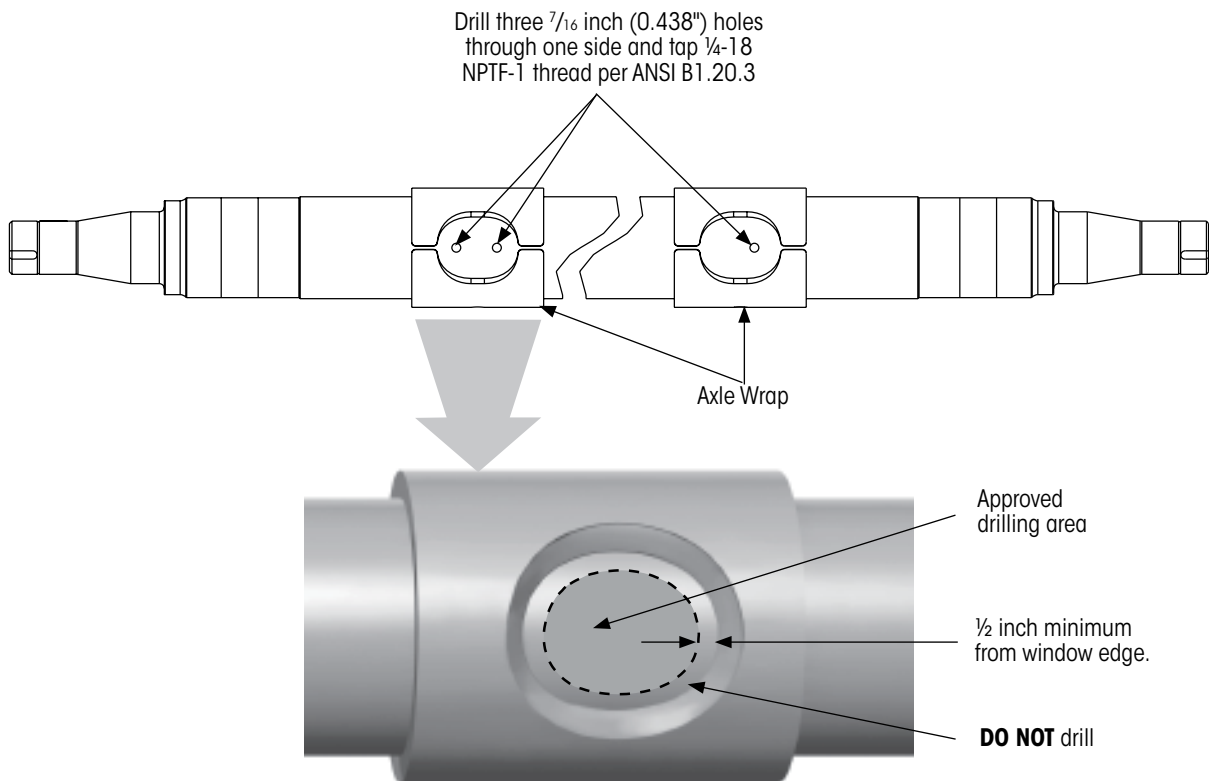


Figure 7: INTRAAX®/VANTRAAX® suspension axle drilling details

IMPORTANT: As shown above, the edge of any hole must be a minimum of ½ inch (12 mm) away from the edge of the fillet weld that surrounds the wrap window. Allow 1.75 inches between hole centers to ensure adequate fitting clearance.

Top View

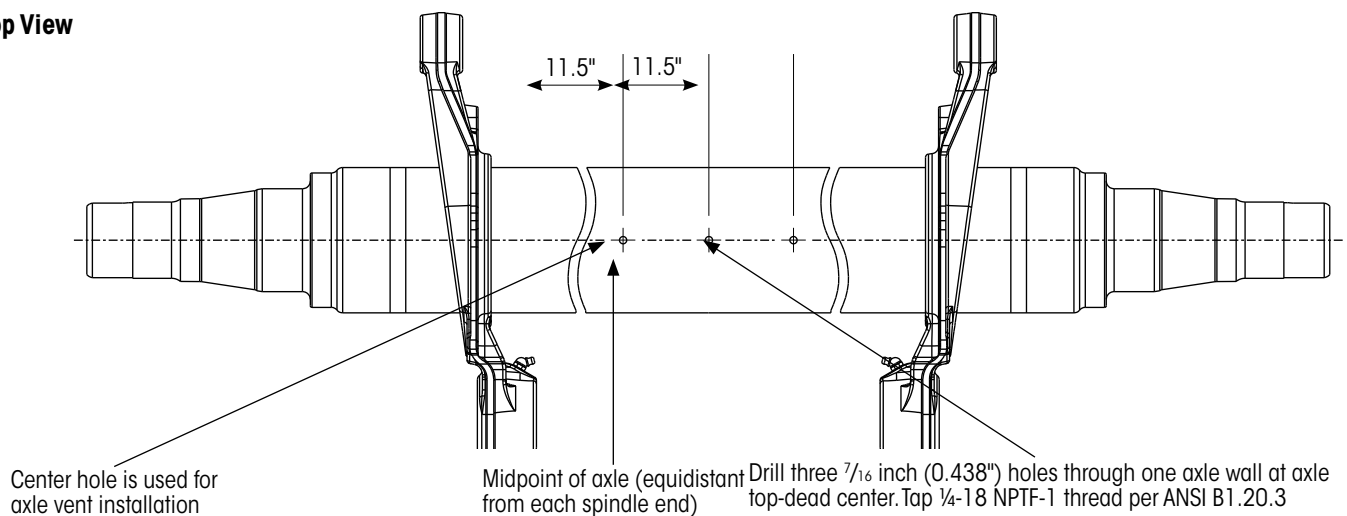


Figure 8: Hendrickson TRLAXLE® drilling details

NOTICE

Before drilling, make sure holes will not interfere with suspension mounting method. If hole will interfere, refer to [CONTACTING HENDRICKSON](#) on [page 4](#).

NOTE: Figure 8 drilling details are for Hendrickson TRLAXLE®. If other than TRLAXLE, refer to L980 for drilled axle installation orientation.

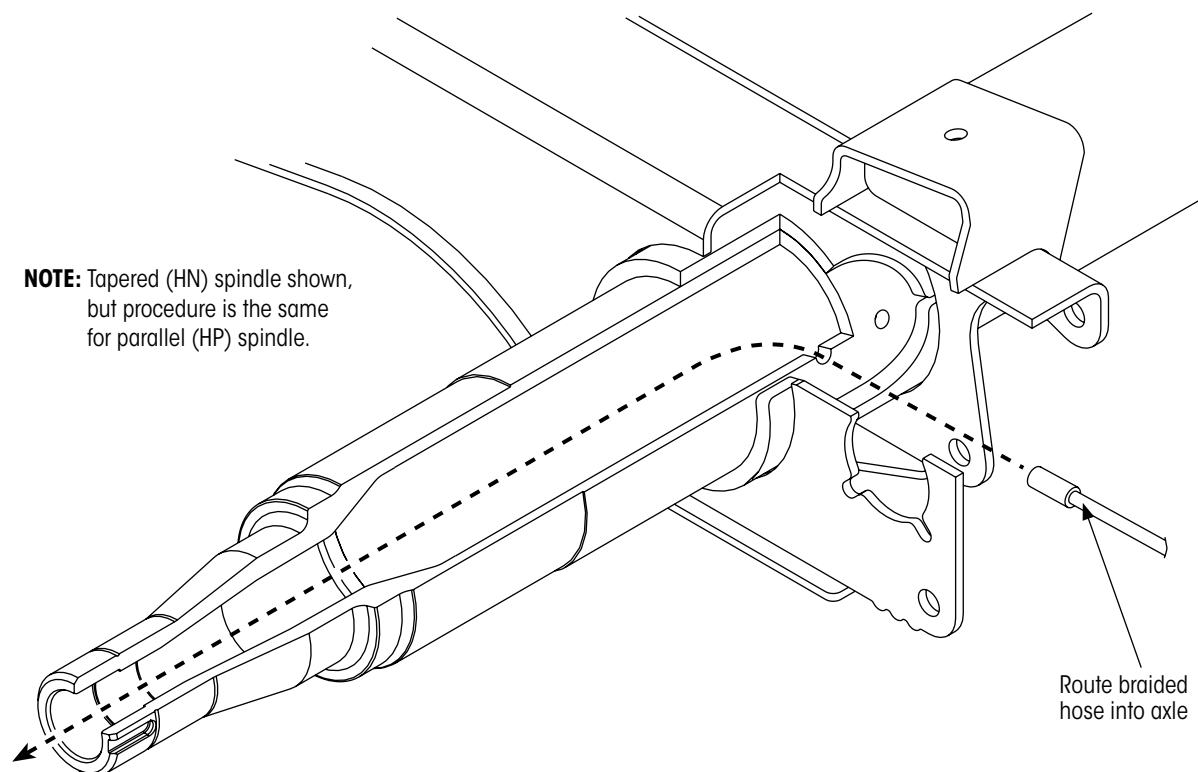


Figure 9: Routing axle hose

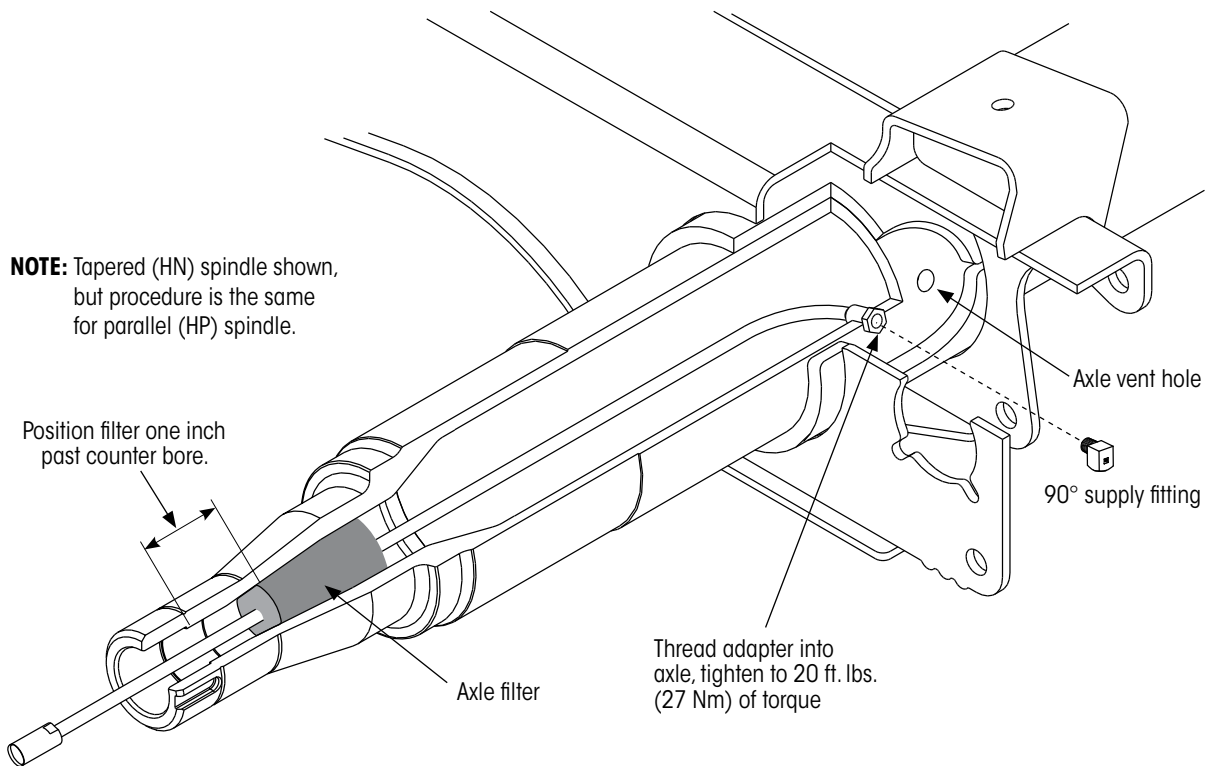


Figure 10: Installed position of axle hose assembly

AXLE COMPONENT INSTALLATION

Refer to the following assembly procedures to complete the installation of the TIREMAAX® tire inflation system. Component installation procedures include:

- [AXLE HOSE INSTALLATION on page 15](#)
- [ADDITIONAL AXLES on page 16](#)
- [AXLE VENT INSTALLATION on page 18](#)
- [SPINDLE PLUG INSTALLATION on page 18](#)
- [HUBCAP INSTALLATION on page 20](#)
- [TIRE HOSE INSTALLATION on page 22](#)

AXLE HOSE INSTALLATION

Follow this procedure to install the axle hose in the pre-drilled hole, through the axle and to the rotary union in the hubcap.

IMPORTANT: The axle hose for TIREMAAX CP systems installed prior to March 2012 included an air flow choke. **If retrofitting from an older model CP to PRO**, these axle hoses must be replaced.

1. On the end of the axle tube with two ¼ inch holes in the wrap window (on **INTRAAX®** and **VANTRAAX®** suspensions), **route** the small end of the metal braided hose into the hole closest to the spindle end (Figure 9). On Hendrickson **TRLAXLE®** non-integrated trailer axle, **route** the small end of the

metal braided hose into the hole closest to the spindle.

2. Making sure hose heads toward the spindle end, **continue feeding** metal braided hose into the axle tube until small end of the hose exits spindle end.
3. **Thread** the large adapter end of axle hose assembly into axle.
4. **Tighten** fitting to 20 ft. lbs. (27 Nm) of torque (Figure 10).
5. **Feed** metal braided hose through slit in filter.
6. **Push** axle filter into spindle cavity (Figure 10).

IMPORTANT: Enough air space must be present between spindle plug and filter to allow sufficient axle ventilation.

7. **Remove** protective coverings from end of axle hose assembly and blow air through hose assembly to remove any debris.

Repeat **Step 1** through **Step 7** on each axle and wheel-end. For axle vent installation, (Figure 10), refer to [AXLE VENT INSTALLATION on page 18](#).

90° SUPPLY FITTING INSTALLATION

1. Thread 90° supply fitting into each axle hose as shown in Figure 10.
2. Tighten fitting to 10 ft. lbs. (13 Nm) of torque.
3. Clock fitting, in tightening direction only, for applicable suspension. See Figure 11 to Figure 15.
4. If applicable, cover fitting with vinyl cover to keep out paint and contaminants.

ADDITIONAL AXLES

For systems with one, two or more additional axles, observe the installation requirements as shown in the following diagrams (Figure 11 to Figure 15). Extend the main $\frac{3}{8}$ inch tubing as necessary.

IMPORTANT: Long length air lines increase reaction time to pressure fluctuations. A second TIREMAAX® system may be required to support 5 or more axles. Refer to CONTACTING HENDRICKSON for details.

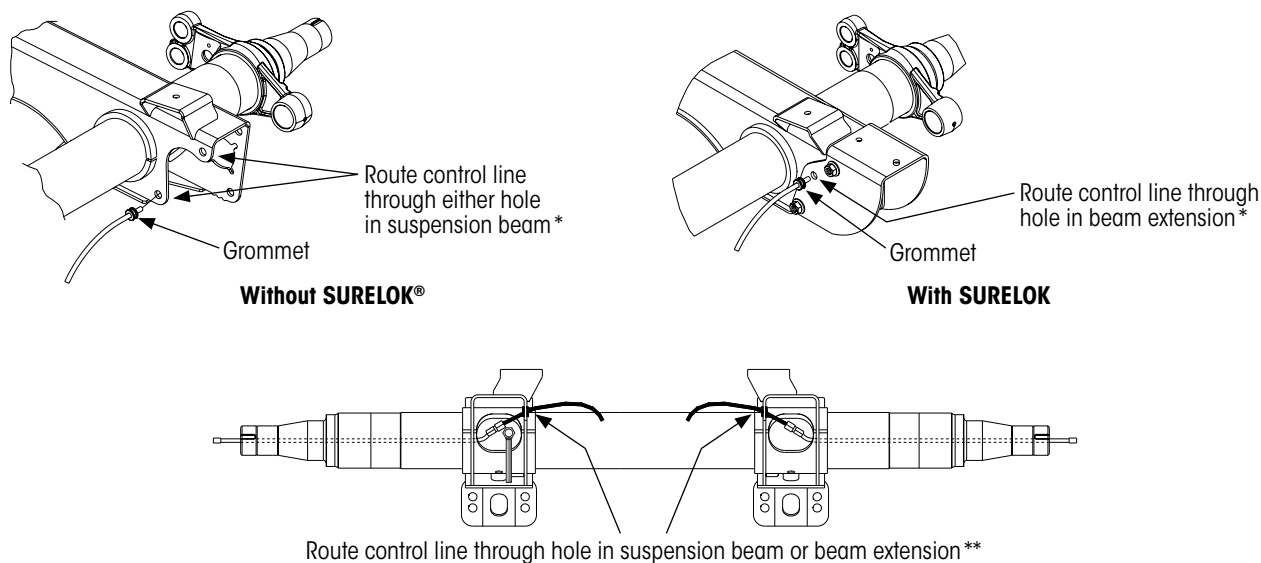


Figure 11: Suggested control line installation details for Top Mount, Wide Bushing, Standard Duty Models **AAT, HKAT**

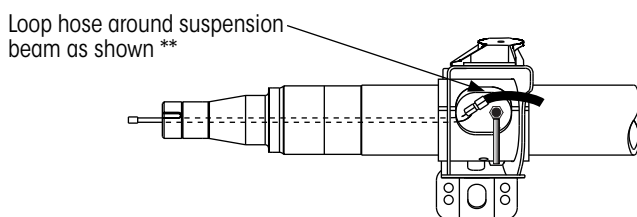


Figure 12: Suggested control line installation details for Top Mount, Narrow Bushing, Standard Duty Models **AANT, HKANT, AAZNT**

* On top mount, wide bushing, standard duty models without SURELOK, it is permissible to route the control line through either hole in suspension beam. Just orient the axle connector fitting to obtain the best slack adjuster/air line clearance.

** It is the OEMs responsibility to route air lines and orient axle connector fittings so as to eliminate interference between slack adjusters and air lines. Lines should be protected against chaffing when passing through or by metal edges.

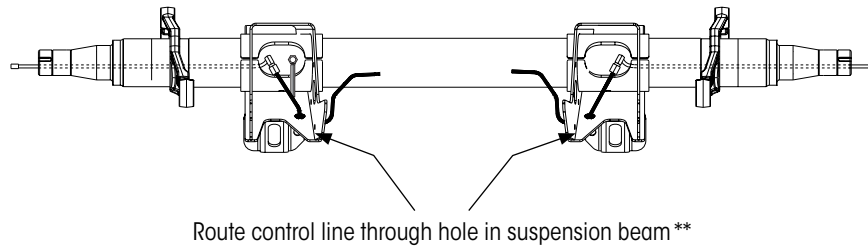


Figure 13: Suggested control line installation details for Low Ride, Wide Bushing, Standard Duty **AAL, HKAL, AAZL**; Low Ride, Wide Bushing, Extreme Duty **AAEDL 30K** and Top Mount, Wide Bushing, Extreme Duty **AAEDT 30K** Models

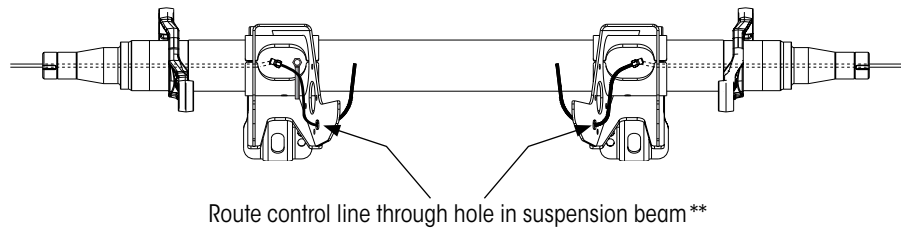


Figure 14: Suggested control line installation details for Low Ride, Short Beam, Narrow Bushing, Standard Duty Models **AANLS 20K**

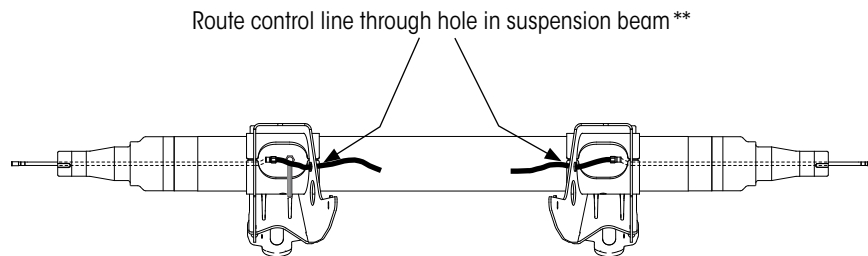


Figure 15: Suggested control line installation details for Low Ride, Narrow Bushing, Standard Duty Models **AANL, HKANL**

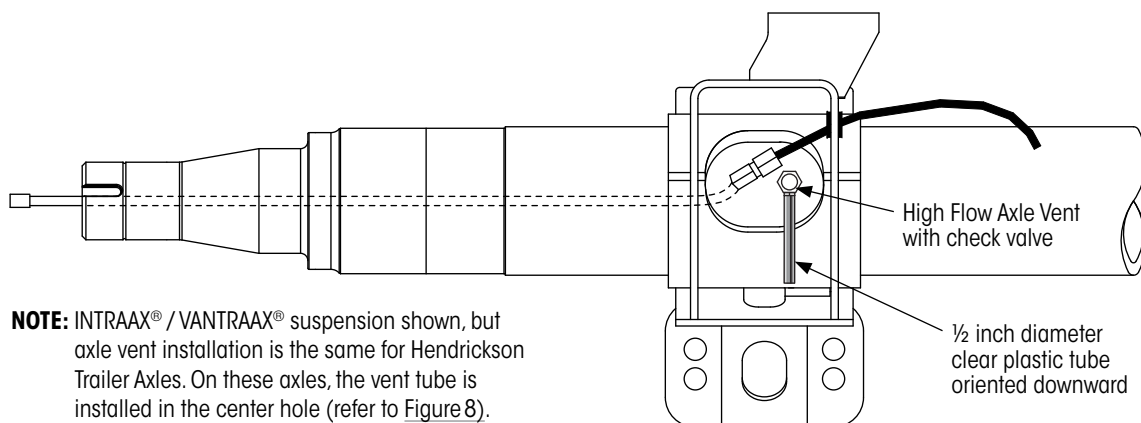


Figure 16: Typical axle vent installation

** It is the OEMs responsibility to route air lines and orient axle connector fittings so as to eliminate interference between slack adjusters and air lines. Lines should be protected against chaffing when passing through or by metal edges.

AXLE VENT INSTALLATION

The High Flow Axle Vent is installed in the previously drilled hole as shown in Figure 16. Refer to Axle Preparation on page 12 for drilling details.

NOTICE To prevent contamination of the axle, ensure High Flow Axle Vent is securely fastened and vent tube points down.

WARNING Failure to properly install axle vent may result in wheel-end pressurization or water ingestion. This could cause wheel-end failure resulting in severe personal injury or death.

1. **Install** axle vent into hole provided in axle (Figure 16 on page 17) and **hand-tighten**.

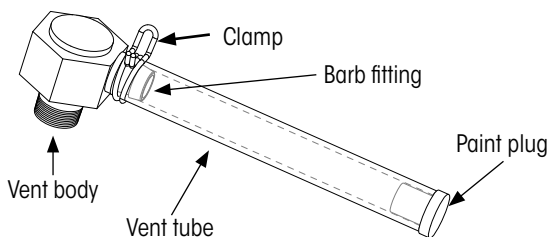


Figure 17: INTRAAX®/VANTRAAX®/ULTRAAX-K® axle vent assembly

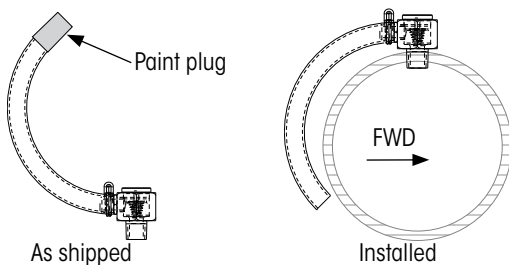


Figure 18: TRLAXLE axle vent

NOTE: As shown in Figure 18, the axle vent for TRLAXLE® uses a curved tube that is shipped pointing up for ease of installation.

2. **Use** a 1-inch socket to **tighten** the vent body to 10 ft. lbs. (13 Nm) of torque.
 - A. For INTRAAX installations, **continue to tighten** the vent body until the vent tube points downward.
 - B. For TRLAXLE installations, **continue to tighten** the vent body until the tube fitting points rearward. **Rotate** the curved tube on the barb fitting until the tube points downward, behind the axle.

3. If present, **remove and discard** paint plug, Figure 17 and Figure 18.

NOTICE Air pressure can build up inside the axle if the paint plug is not removed.

SPINDLE PLUG INSTALLATION

Follow this procedure to install a spindle plug at the end of each spindle.

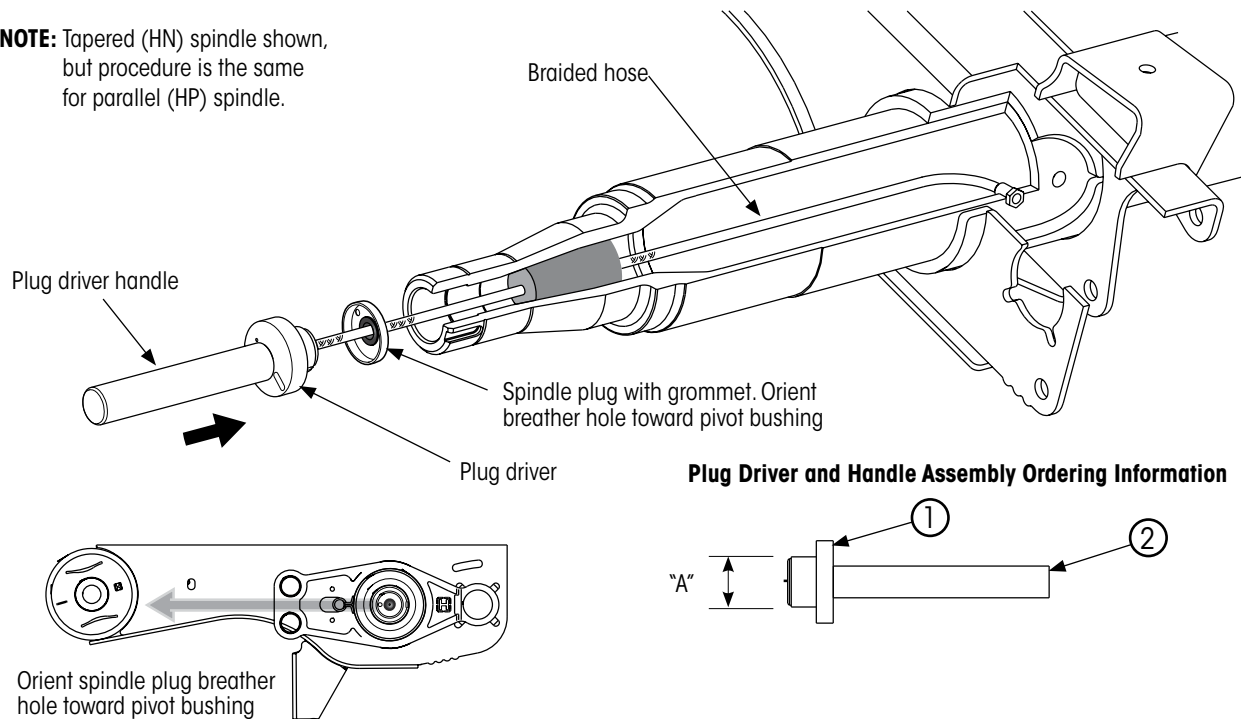
1. **Orient** spindle plug as shown in Figure 19 and **install** grommet pointing into spindle.
2. **Push** the axle hose fitting through the grommet.
3. With spindle plug breather hole oriented toward the pivot bushing (Figure 19), **place** plug assembly against the spindle end.
4. With axle hose fitting centered in the plug driver, **press** plug into spindle end until driver bottoms on end of spindle.

Repeat Step 1 through Step 4 for each wheel-end.

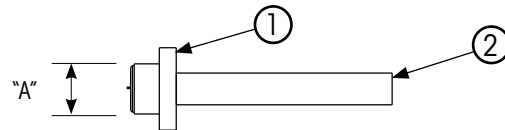
NOTE: The recommended plug driver (refer to the table in Figure 19) regulates the correct installation depth as shown in Figure 20. If using the tool, be sure to select the correct tool size for your application.

Hendrickson recognizes that the tool may not always be available. For this reason, Figure 20 provides the recommended depth dimensions.

NOTE: Tapered (HN) spindle shown, but procedure is the same for parallel (HP) spindle.



Plug Driver and Handle Assembly Ordering Information



ITEM	NAME	SPINDLE TYPE	"A" DIMENSION	PART NUMBER
1	Plug Driver	HN	1.75 inches	S-28146-1
		HP ¹	2.75 inches	S-28146-3
2	Plug Driver Handle	N/A	N/A	S-27399

¹ Before March 28, 2003, Hendrickson manufactured HP spindles with both 2.50" and 2.75" inner bore diameters. After this date, the HP spindle bore was standardized at 2.75".

Figure 19: Spindle plug installation

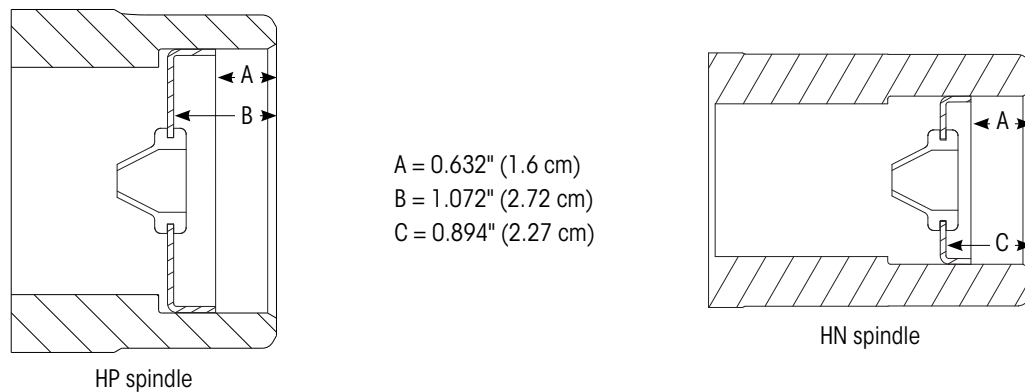


Figure 20: Recommended spindle plug depth (if not using plug tool shown in Figure 19)

HUBCAP INSTALLATION

IMPORTANT: Once installed, **DO NOT remove hubcap**. To protect warranty on Hendrickson dressed axles, skip to TIRE HOSE INSTALLATION on page 22. Refer to CONTACTING HENDRICKSON Technical Services before removing any Hendrickson assembled wheel-end components.

Three basic hubcap types, table below, are available. Hubcap installation is the same for each (refer to HUBCAP on page 8 for more hubcap options).

SPINDLE TYPE	HUBCAP
HN	HN
HP	HP
HP with castle nut system	HP extended

Table 4: Basic hubcap types

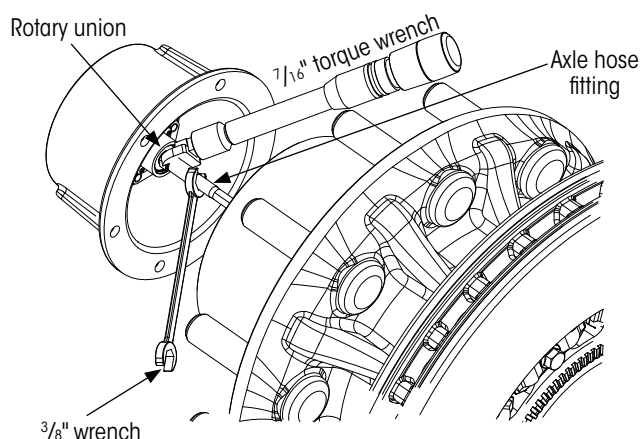


Figure 21: Hubcap to axle hose connection

To install the hubcap:

1. Draw just enough axle hose out from center of spindle to **attach** axle hose fitting to the rotary union inside the hubcap (Figure 21).
 2. **Place** hubcap gasket over axle hose for later positioning.
- NOTE:** Shaft has pre-applied dry thread locker. Loctite® or other thread locking compound is not required.
3. **Hand thread** rotary union onto axle hose fitting. **DO NOT rotate axle hose fitting.**

4. **Using** a 3/8-inch wrench to prevent rotation of the axle hose fitting, (Figure 21) **tighten** the rotary union shaft to 50±5 in. lbs. (5.7±0.6 Nm) of torque.
5. **Place** two opposing bolts in hubcap and **align** gasket to bolts.
6. **Orient** hubcap for proper tire hose routing. **Aligning** the tire hose ports so they are **BETWEEN** two wheel mounting studs will generally provide the best tire hose routing, Figure 24 on page 21.
7. **Install** all hubcap bolts and **hand-tighten**.

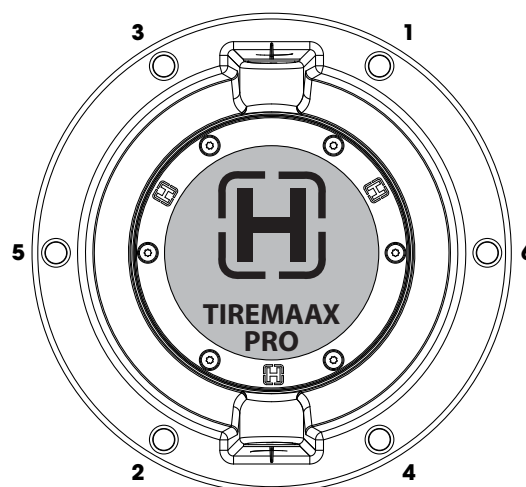


Figure 22: 6-bolt hubcap torque pattern

8. **Tighten** hubcap bolts in the order shown in above figure to 15±3 ft. lbs. (20±4 Nm) of torque.
9. **Repeat** procedure for each wheel-end.

NOTE: If oil lubricated wheel-end, **oil can be added after hubcap is installed**. For details on wheel-end lubrication, refer to applicable wheel-end or OEM documentation.

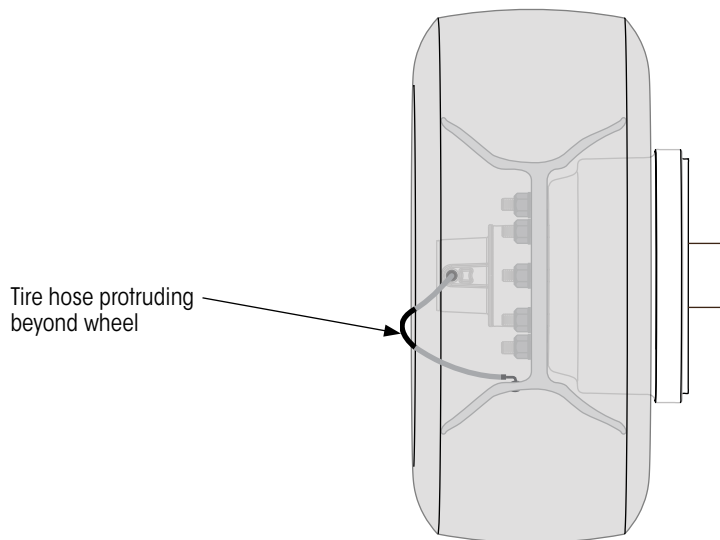


Figure 23: Improper tire hose installation (super single shown)

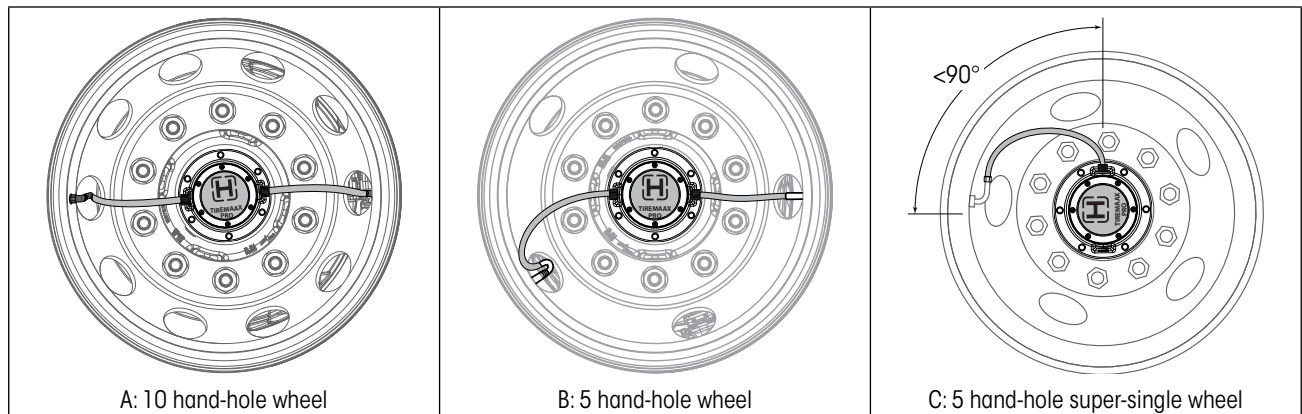


Figure 24: Properly clocking hubcap and wheels to prevent tire hose damage during operation

When clocking hubcaps/wheels:

1. Ensure hubcap is clocked to aim tire hose ports between wheel studs.
2. Clock wheels to align valve stem with hubcap tire hose port(s). If duals, align inner wheel (straight hose) first.

When installing tire hoses, ensure:

- Tire hose is not stretched so tightly a strain is introduced at either end.
- Tire hose is not so loose or tight that it contacts the wheel.
- No portion of the tire hose extends outward past the wheel.

TIRE HOSE INSTALLATION

Tire hoses connect the hubcap port to the valve stem on the tire.

NOTICE During installation and operation, **NO PART OF THE TIRE HOSE CAN EXTEND Laterally beyond the hubcap.**

This procedure applies to both dual and super single installations and assumes the wheel is off during the TIREMAAX® installation. If wheel is on and properly clocked, go to [Step 2](#).

1. Using two lug nuts, **mount** wheel on hub with the rotation clocked for best tire hose placement ([Figure 24](#)).

NOTICE The wheel must be properly “clocked” to the hubcap to prevent the hoses from rubbing on the wheel ([Figure 24](#)) and extending beyond hubcap.

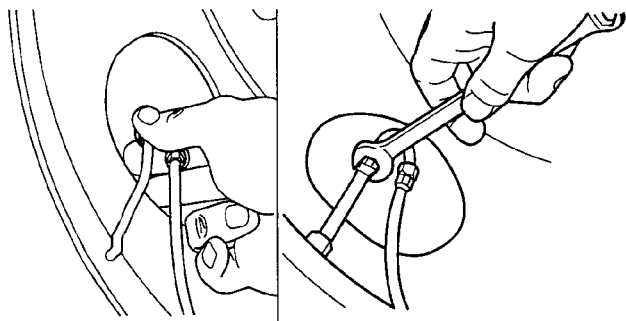


Figure 25: Attaching tire hoses to tire valve stem

2. **Remove** nylon port plugs from tire hose ports using a Torx T45 driver and **discard**. For single tire applications remove one plug, for dual tire applications remove both plugs.
3. **Attach** the tire hose(s) directly to the tire valve stem(s). **DO NOT use valve stem extenders.**
4. **Tighten** the tire hose/valve stem connection finger tight ([Figure 25](#)).
5. Using a 7/16 inch wrench, **tighten** the tire hose / valve stem connection an additional one-half turn ([Figure 25](#)). **DO NOT overtighten this connection.**

NOTE: If using a torque wrench, **tighten** to 28±2 in. lbs. (3±0 Nm) of torque.

6. **Ensure** hose connections are tight enough that, when moving the hose back and forth, it does not cause the connection to move.

IMPORTANT: Hold tire hose with free hand to prevent side loading and avoid cross threading. The knurled nut should easily turn 3 to 4 rotations by hand. Any drag before 3 turns suggests cross threading.

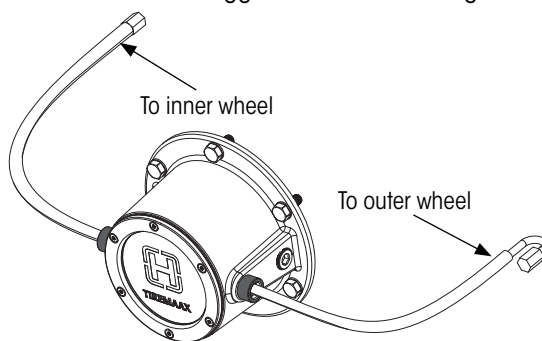


Figure 26: Dual tire hose to hubcap connection(s)

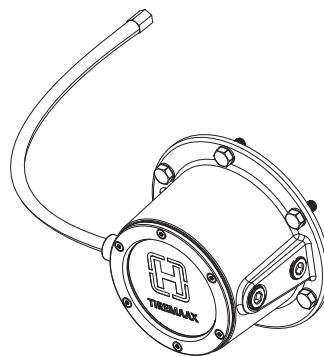


Figure 27: Super-single tire hose to hubcap connection

7. **Loosely connect** other end of tire hose(s) ([Figure 26](#) for dual or [Figure 27](#) for super-single) to the outlet port of the hubcap and check to ensure hose(s) meet criteria of [Figure 23](#) and [Figure 24](#).

If not:

- A. **Disconnect** tire hose(s) at hubcap only.
 - B. **Remove** lug nuts and wheel.
 - C. **Adjust** clocking of wheel, then repeat [Step 1](#) through [Step 5](#) as needed.
8. Once properly clocked, **install** remaining lug nuts and **tighten** all to manufacturer's specifications.
 9. **Hand-tighten** hubcap connection(s) from [Step 7](#). Using pliers, carefully and gently verify the hose connection is tight.

NOTICE **DO NOT** overtighten the knurled tire hose nut or damage knurled finish. Doing so will make tire hose removal extremely difficult for service requirements.

10. **Repeat** procedure for remaining wheel-ends.

Tire hose installation tips

(Refer to Figure 23 and Figure 24 on page 21 for examples):

- A. Route tire hoses inside rim area (Figure 23).
- B. To further restrain tire hoses within rim area and take up slack, "clock" wheel rotation relative to hubcap position (Figure 24).
- C. Properly orient valve stem to ensure tire hoses do not contact wheel during operation.
- D. For dual wheel configurations, proper clocking is particularly important since the two wheels (inner and outer) must be properly oriented, with valve stems on opposite sides, for proper installation.
- E. Super single wheels, view C of Figure 24 and Figure 27, require only one tire hose. Positioning the hubcap port 90° from the valve stem provides optimum fit. The unused port will remain plugged.

CONTROLLER INSTALLATION

The following **criteria is recommended** when locating and mounting the controller assembly:

- Protect the controller and air lines from flying debris.
- Provide a secure and stable mounting surface.
- Allow access for maintenance.
- Provide easy access to a reservoir, emergency air supply line and delivery lines.
- Mount with the hinge at top, with room to open upward.
- If drilling is required, use the hole pattern shown in Figure 28.
- Attach box using at least four of the mounting holes. Recommended fasteners are 5/16-18 bolts and nuts, with flat washers on both sides. Recommended torque for 5/16-18 fasteners is 12±1 ft. lbs (16±1 Nm).

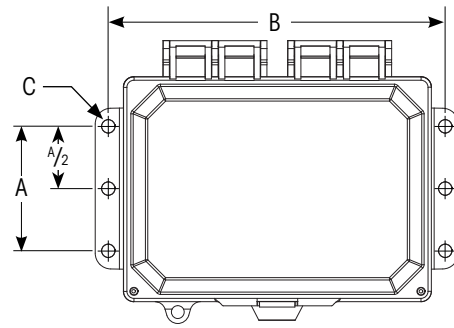
NOTICE

Failure to follow mounting recommendations can result in damage to controller box.

- **DO NOT** weld to slider box. Holes are provided for fastening brackets and other components as needed. Holes can be drilled as defined in the following methods.

NOTICE

Over torquing fasteners may result in distortion, cracking and eventual breaking of the controller enclosure flange.



DIMENSION.	INCH	mm
A	3	76.2
B	8.12	206.2
C	6 x 0.32 DIA	6 x 8.1 DIA

Figure 28: Controller box hole pattern

The method for mounting is determined by the type of suspension and trailer. Refer to the applicable method A, B, C or D.

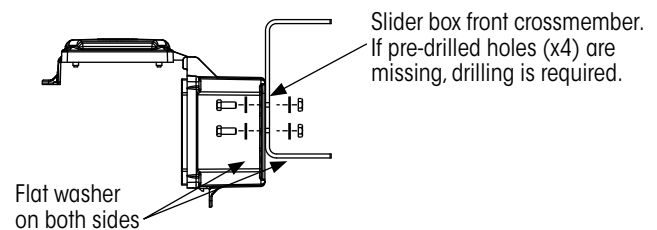
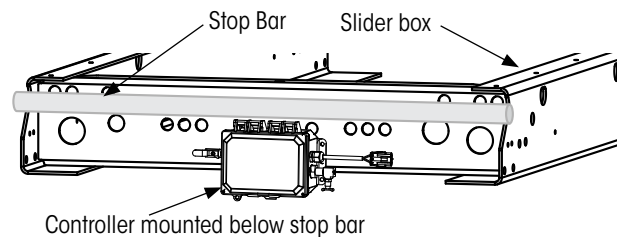


Figure 29: Controller mounting to slider

- A. Hendrickson VANTRAAX® or K-2® slider box mounting (Figure 29, mounted low to avoid interference with slider stop bar). Four holes are pre-drilled in the crossmember for this purpose.

NOTICE

Failure to properly orient the controller and mounting bracket as shown in Figure 29 may result in slider stop bar interference and controller assembly damage.

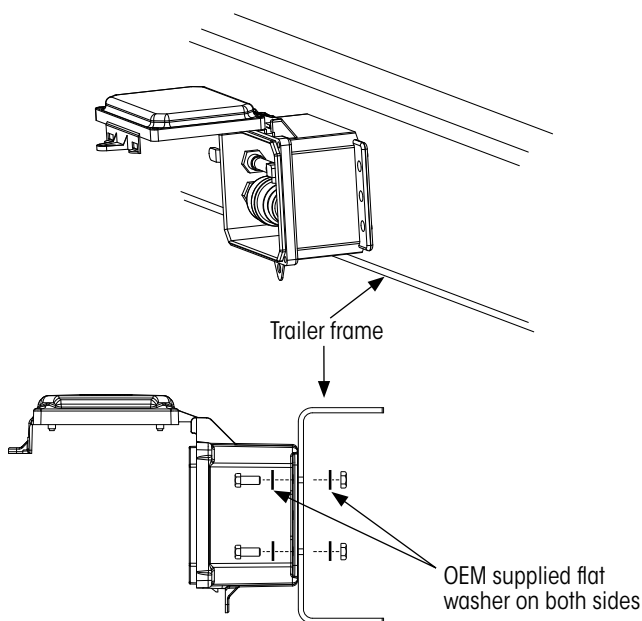
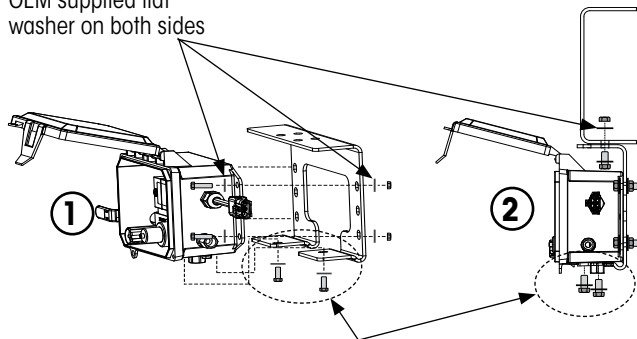


Figure 30: Controller mounted to trailer frame

B. Flush mount to trailer crossmember or subframe. Mount directly to (select one):

- Trailer frame, Figure 30
- Optional bracket (Figure 31)
- OEM supplied bracket (Figure 33)

OEM supplied flat washer on both sides

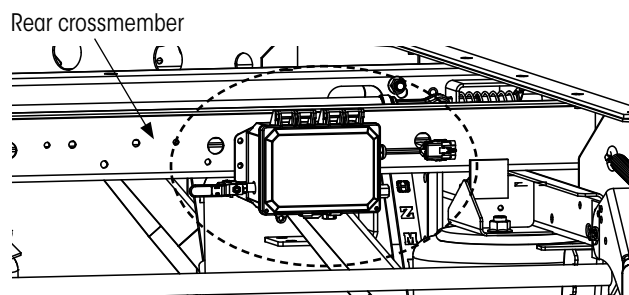


NOTE: TIREMAAX® PRO only. Use existing fasteners at bottom of controller. Remove, then replace after positioning on bracket. Torque to 60±12 in. lb. (8±2 Nm).

Figure 31: Controller assembly installation

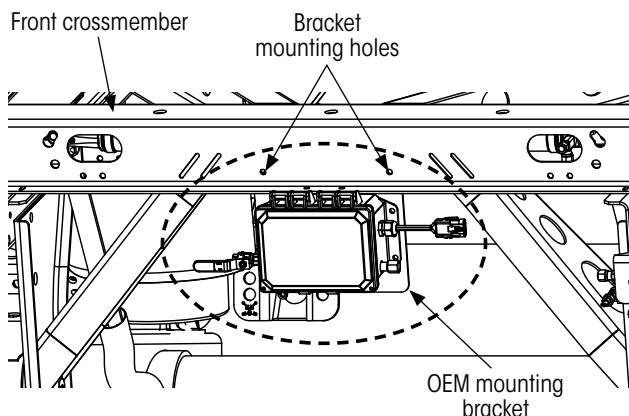
C. Hendrickson mounting bracket for optional drop-down mounting, Figure 31. Attach the controller to the bracket first, then mount the assembly to the trailer frame, as shown.

D. Mounting to ULTRAA-K® slider is different than VANTRAAX® or K-2® slider mounting. The slider includes pre-drilled holes for mounting the TIREMAAX controller directly to crossmembers, Figure 32 and Figure 33. Holes are also provided for various other brackets and options.



NOTE: Four holes are provided for mounting controller to rear crossmember.

Figure 32: Mounting to rear crossmember of ULTRAA-K slider (recommended)



NOTE: Holes are also provided for mounting an optional OEM bracket to the front crossmember.

Figure 33: Mounting to ULTRAA-K front crossmember

MANIFOLD INSTALLATION

The optional manifold offers the following advantages:

- Simpler installation
- Improved air distribution and flow to tires; fewer fittings
- Easier troubleshooting for locating leaks

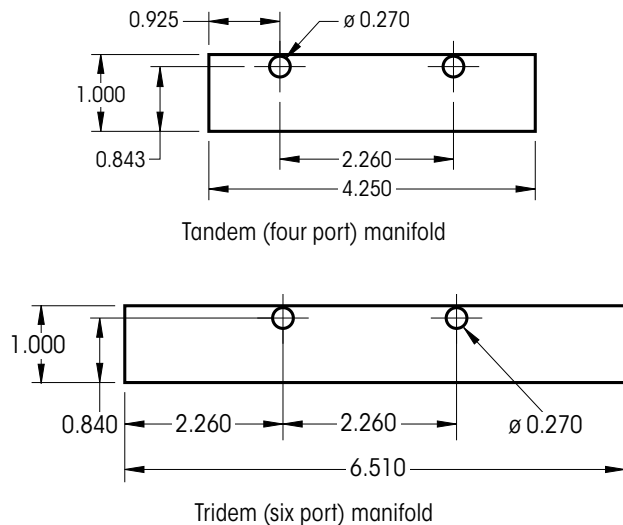
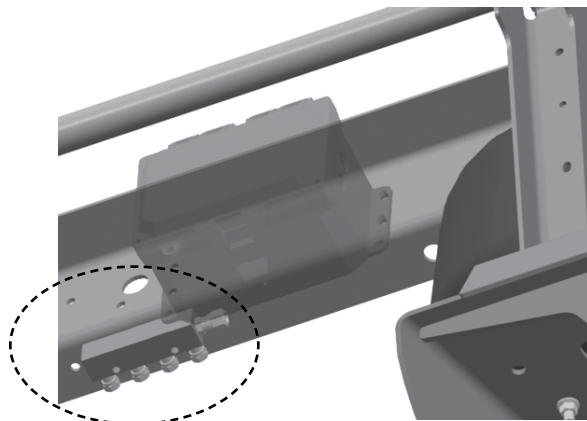
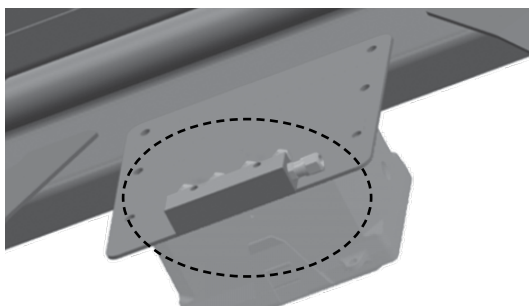


Figure 34: Manifold mounting dimensions (inch)

Figure 34 shows size and bolt hole patterns for a tandem and tridem manifold.



Mounted to slider rear crossmember



Mounted to back of OEM controller bracket

Figure 35: Manifold mounted on ULTRA-K® slider

The manifold can be located on the trailer frame, slider box or on an OEM bracket as shown in Figure 35.

CONTROL LINE INSTALLATION

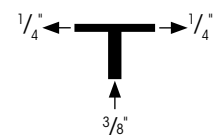
Controller line installation criteria varies with suspension type, axle type and TIREMAAX® model (CP or PRO).

Plumbing diagrams show air brake tubing sizes and associated fittings required to complete the system installation. Control line routing recommendations are also included. Available diagrams include:

- CP installation, refer to Figure 36 to Figure 38.
- PRO installation, refer to Figure 39 to Figure 41.
- **ADDITIONAL AXLES** on page 16, refer to Figure 11 to Figure 15.

The following plumbing criteria must be followed during TIREMAAX installation:

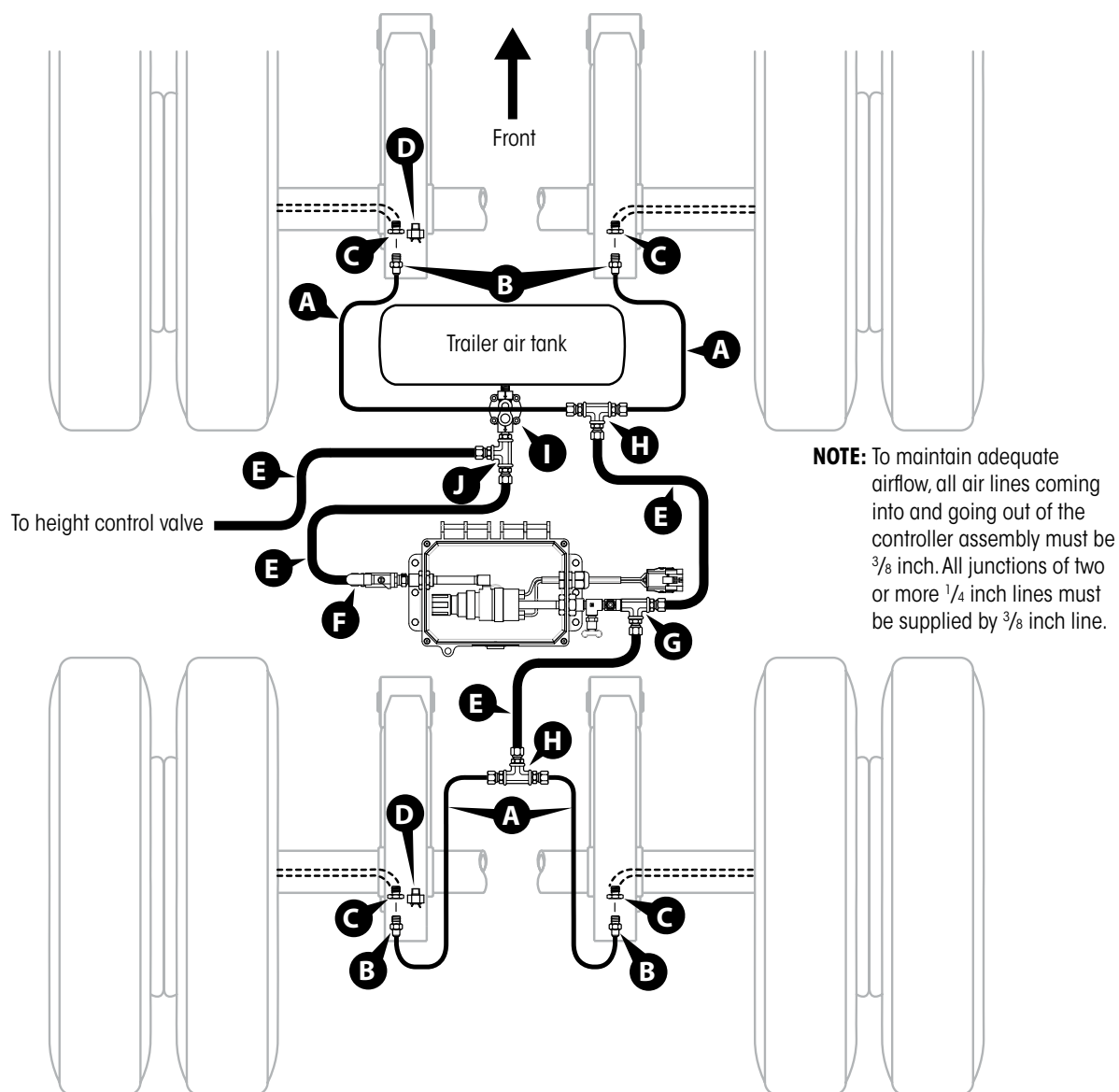
- Use a wrench to hold axle hose fitting to prevent twisting of air line inside the axle.
- Proper TIREMAAX operation requires correct air line diameters. Installation sizes must be as shown in diagram.
- To maintain adequate air flow:
 - All air lines coming into and going out of the controller assembly must be $\frac{3}{8}$ inch.
 - $\frac{3}{8}$ inch line splits must decrease to two or more $\frac{1}{4}$ inch lines to wheel-ends as shown in diagrams.



- Only use straight or Tee fitting at delivery port.

IMPORTANT: Installing a 90° (elbow) fitting at the delivery port will restrict air flow and slow air-up time and closing of hubcap wheel valves.

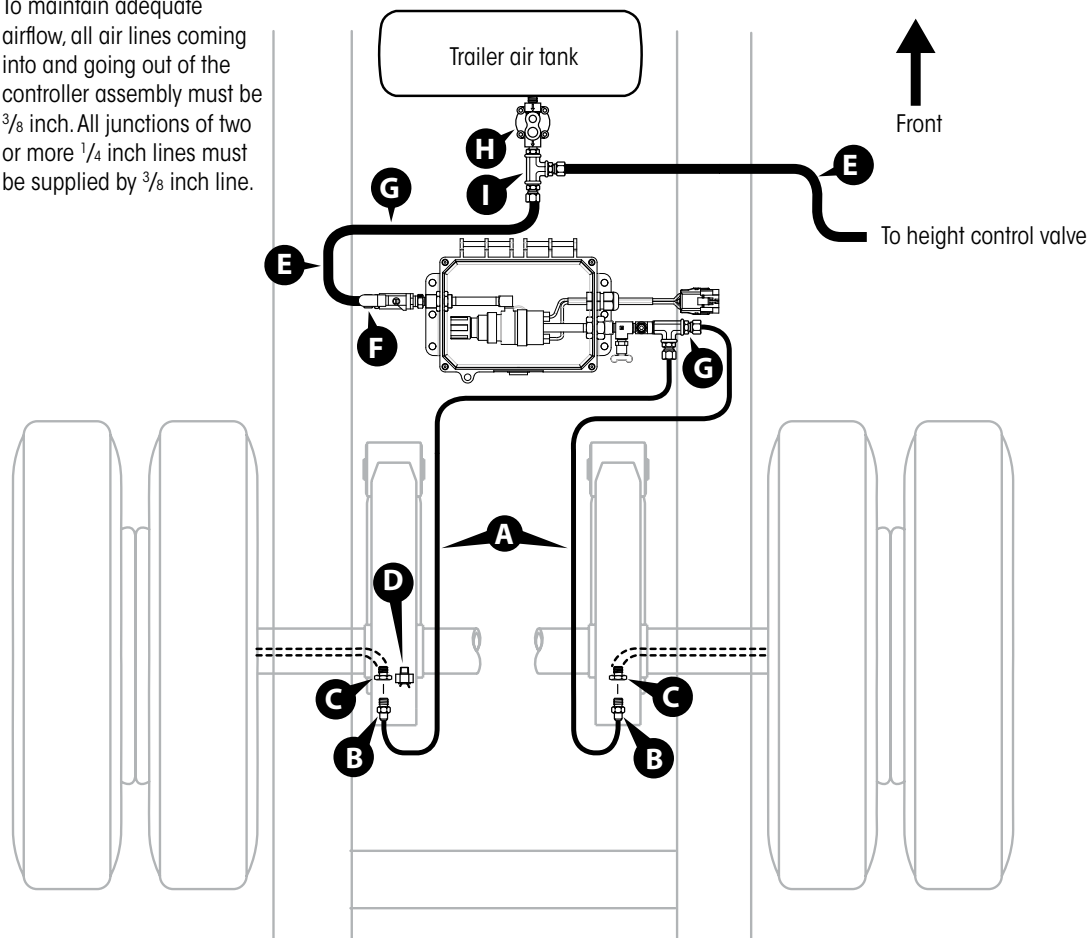
- Moisture and other contaminants collect at the bottom of the air tank. **DO NOT** install fittings on the bottom of the trailer air tank.



Item	Description
Supplied with TIREMAAX®	A Air line $\frac{1}{4}$ inch OD nylon air brake tubing
	B Axle connector 90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
	C Axle hose fitting $\frac{1}{8}$ inch NPT female
	D Axle vent fitting High flow axle vent (includes check valve)
Provided by installer	E Air line $\frac{3}{8}$ inch OD nylon air brake tubing
	F Controller IN fitting $\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
	G Controller OUT fitting Run tee; $\frac{1}{8}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA
	H Tee assembly Union tee; $\frac{1}{4}$ inch NTA, $\frac{1}{4}$ inch NTA, $\frac{3}{8}$ inch NTA
	I Pressure protection valve (PPV) Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	J PPV OUT fitting Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA

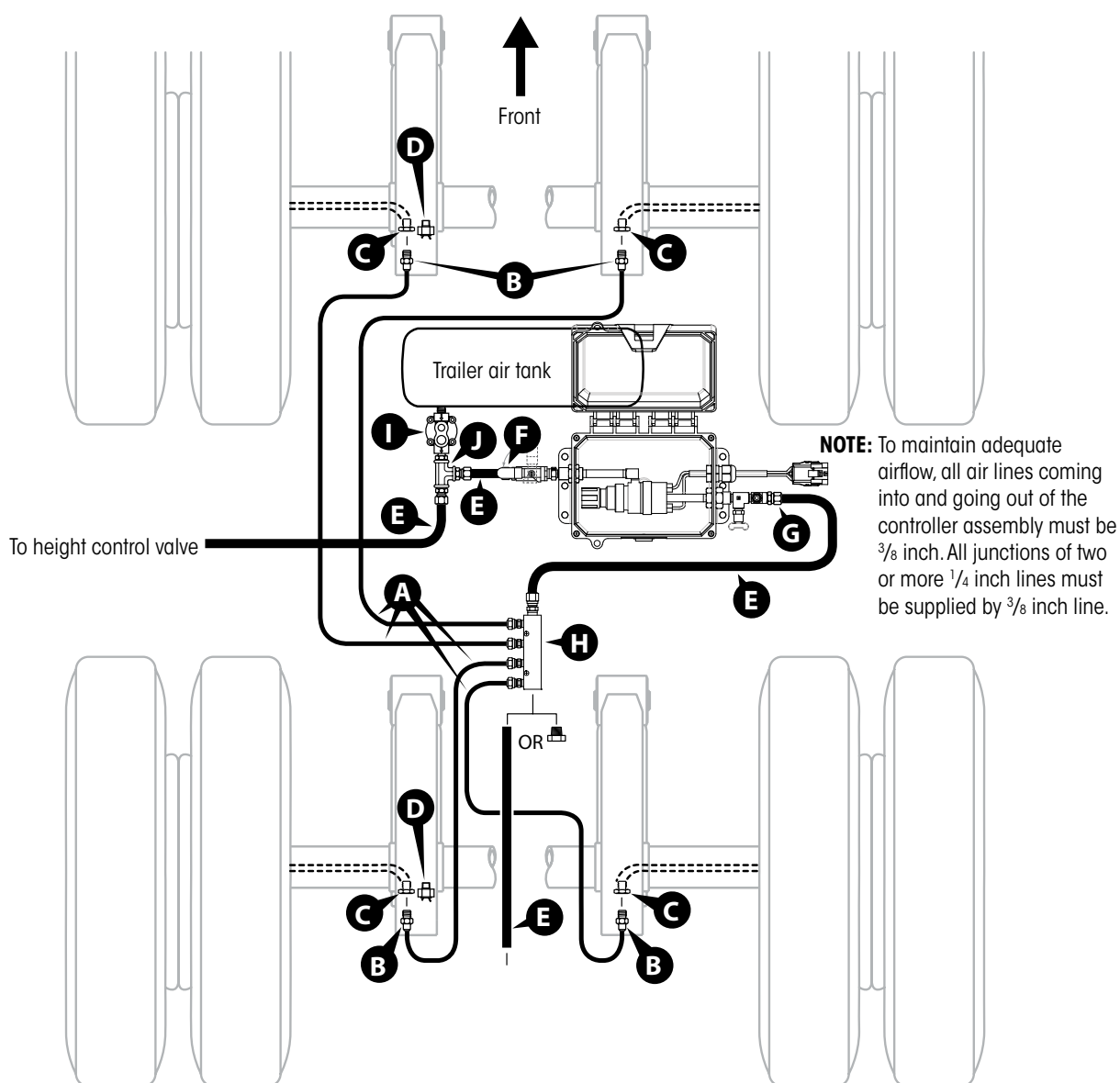
Figure 36: Typical TIREMAAX® CP plumbing schematic - two axles with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines.

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



Item	Description
Supplied with TIREMAX®	
A Air line	$\frac{1}{4}$ inch OD nylon air brake tubing
B Axle connector	90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
C Axle hose fitting	$\frac{1}{8}$ inch NPT female
D Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	
E Air line	$\frac{3}{8}$ inch OD nylon air brake tubing
F Controller IN fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
G Controller OUT fitting	Run tee; $\frac{1}{8}$ inch NPT male, $\frac{1}{4}$ inch NTA, $\frac{1}{4}$ inch NTA
H Pressure protection valve (PPV)	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
I PPV OUT fitting	Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA

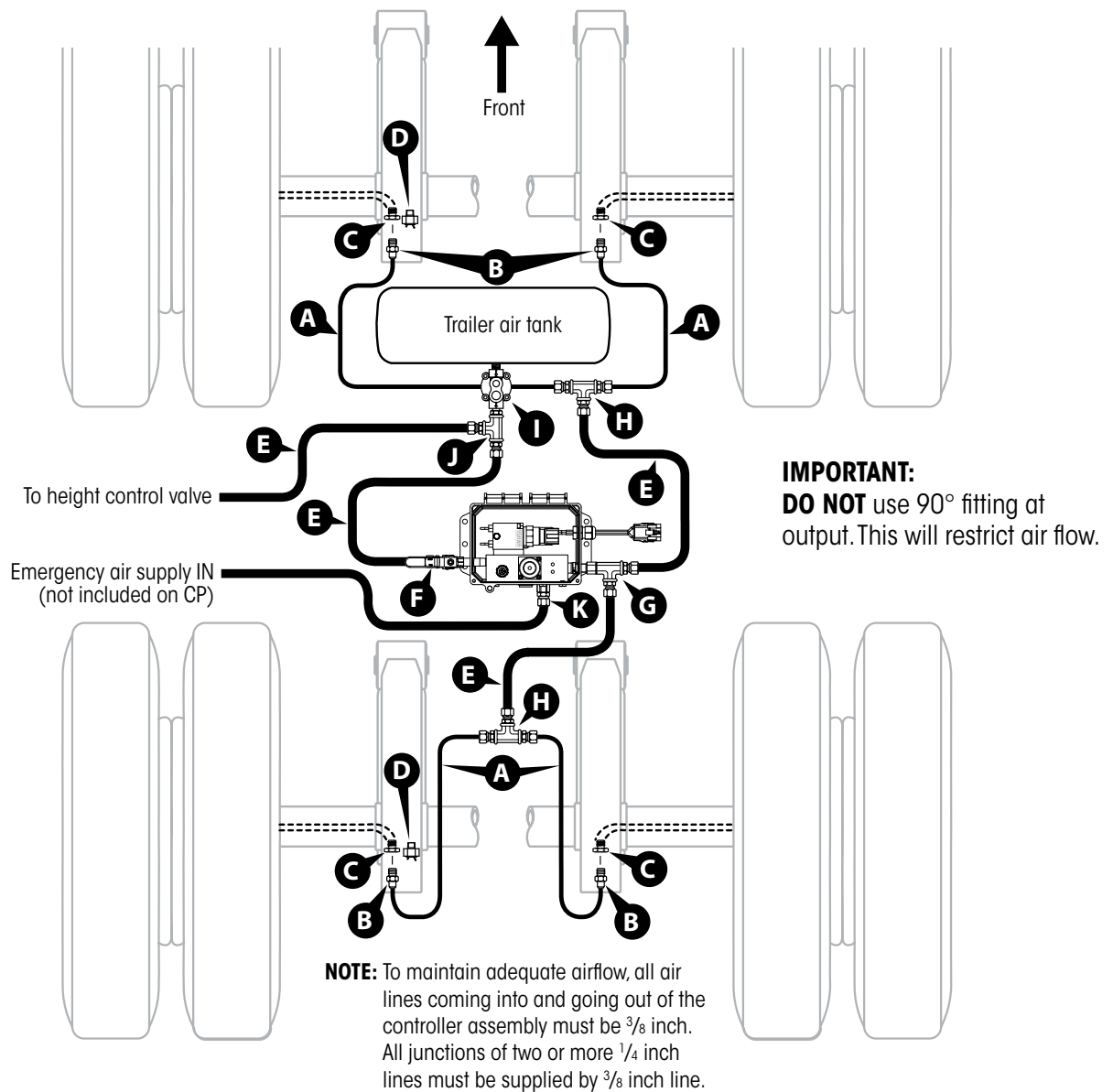
Figure 37: Typical TIREMAX® CP plumbing schematic - single axle with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines.



Item	Description
Supplied with TIREMAAX®	A Air line $\frac{1}{4}$ inch OD nylon air brake tubing
	B Axle connector 90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
	C Axle hose fitting $\frac{1}{8}$ inch NPT female
	D Axle vent fitting High flow axle vent (includes check valve)
Provided by installer	E Air line $\frac{3}{8}$ inch OD nylon air brake tubing
	F Controller IN fitting $\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
	G Controller OUT fitting $\frac{1}{8}$ inch NPT male to $\frac{3}{8}$ inch NTA
	H Junction manifold ¹ $\frac{3}{8}$ inch NTA inlet, $\frac{1}{4}$ inch NTA outlets
	I Pressure protection valve (PPV) Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	J PPV OUT fitting Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA

¹ These parts are available from Hendrickson. Refer to **RELATED LITERATURE** on page 5 to get part numbers.

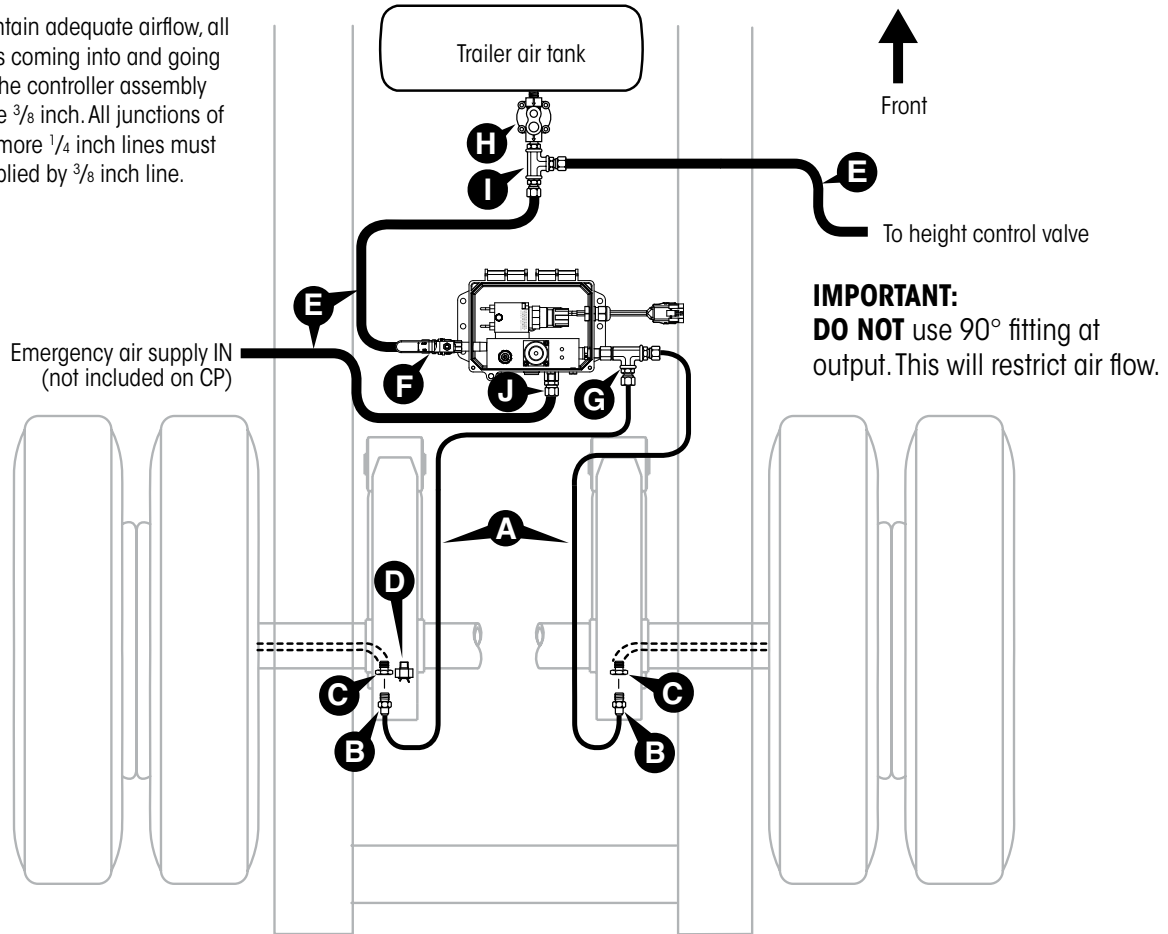
Figure 38: Typical TIREMAAX® CP plumbing schematic - two axles with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines and junction manifold.



	Item	Description
Supplied with TIREMAAX®	A Air line	$\frac{1}{4}$ inch OD nylon air brake tubing
	B Axle connector	90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
	C Axle hose fitting	$\frac{1}{8}$ inch NPT female
	D Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	E Air line	$\frac{3}{8}$ inch OD nylon air brake tubing
	F Controller IN fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
	G Controller OUT fitting	Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA
	H Tee assembly	Union tee; $\frac{1}{4}$ inch NTA, $\frac{1}{4}$ inch NTA, $\frac{3}{8}$ inch NTA
	I Pressure protection valve (PPV)	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	J PPV OUT fitting	Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA
	K Emergency supply IN fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA

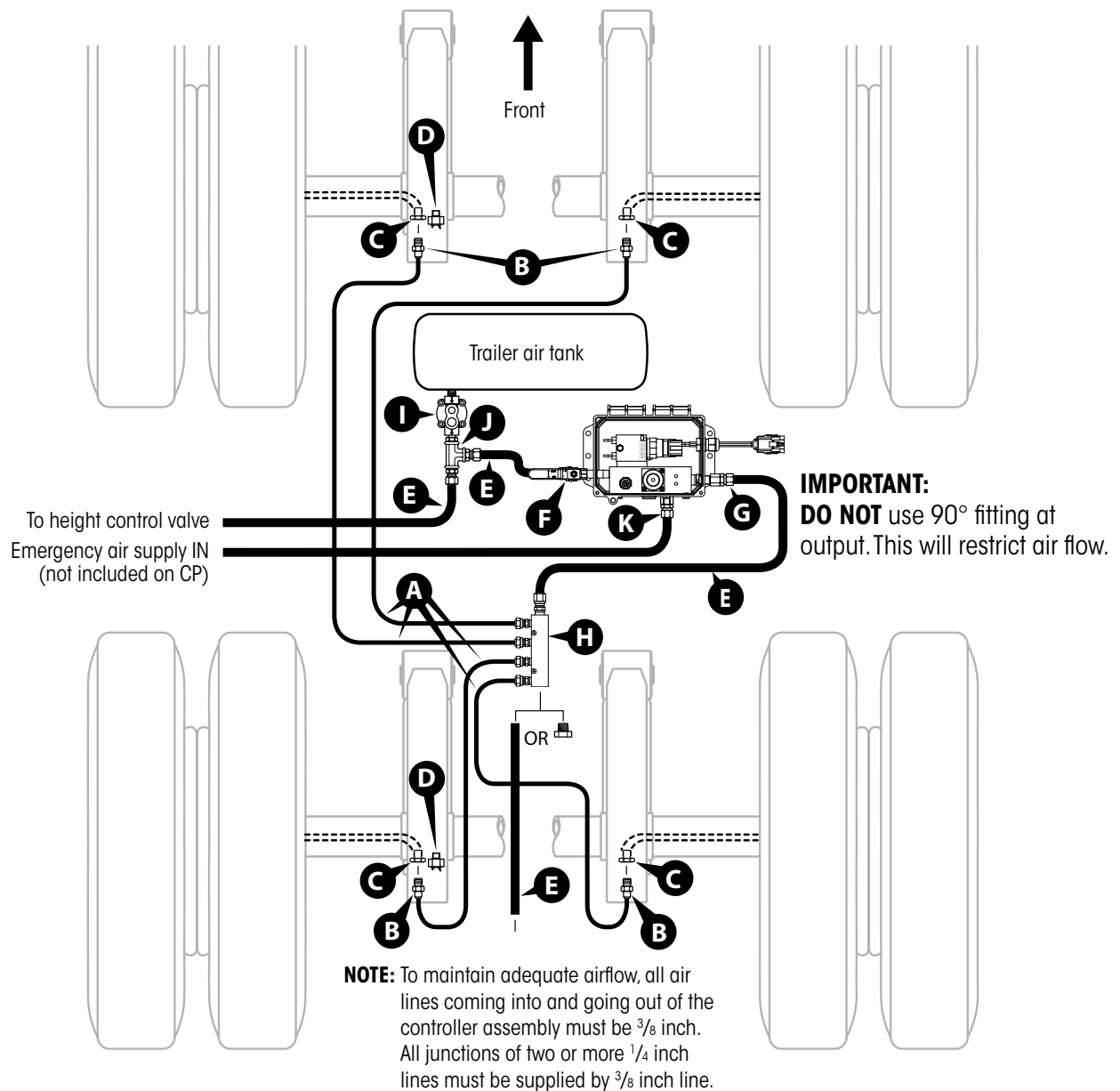
Figure 39: Typical TIREMAAX® PRO plumbing schematic - two axles with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines.

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



Item	Description
Supplied with TIREMAAX®	A Air line $\frac{1}{4}$ inch OD nylon air brake tubing
	B Axle connector 90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
	C Axle hose fitting $\frac{1}{8}$ inch NPT female
	D Axle vent fitting High flow axle vent (includes check valve)
Provided by installer	E Air line $\frac{3}{8}$ inch OD nylon air brake tubing
	F Controller IN fitting $\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
	G Controller OUT fitting Run tee; $\frac{1}{4}$ inch NPT male, $\frac{1}{4}$ inch NTA, $\frac{1}{4}$ inch NTA
	H Pressure protection valve (PPV) Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	I PPV OUT fitting Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA
	J Emergency supply IN fitting $\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA

Figure 40: Typical TIREMAAX® PRO plumbing schematic - single axle with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines.



Item	Description
Supplied with TIREMAAX®	
A Air line	$\frac{1}{4}$ inch OD nylon air brake tubing
B Axle connector	90 degree elbow, $\frac{1}{8}$ inch NPT male to $\frac{1}{4}$ inch NTA (Nylon Tubing Adapter)
C Axle hose fitting	$\frac{1}{8}$ inch NPT female
D Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	
E Air line	$\frac{3}{8}$ inch OD nylon air brake tubing
F Controller IN fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
G Controller OUT fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA
H Junction manifold ¹	$\frac{3}{8}$ inch NTA inlet, $\frac{1}{4}$ inch NTA outlets
I Pressure protection valve (PPV)	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
J PPV OUT fitting	Run tee; $\frac{1}{4}$ inch NPT male, $\frac{3}{8}$ inch NTA, $\frac{3}{8}$ inch NTA
K Emergency supply IN fitting	$\frac{1}{4}$ inch NPT male to $\frac{3}{8}$ inch NTA

¹ These parts are available from Hendrickson. Refer to RELATED LITERATURE on page 5 to get part numbers.

Figure 41: Typical TIREMAAX® PRO plumbing schematic - two axles with $\frac{3}{8}$ and $\frac{1}{4}$ inch lines and junction manifold.

ELECTRICAL COMPONENT INSTALLATION

Once the controller is located and mounted to the trailer or slider, the electrical wiring can be completed. Multiple wiring options are available during the TIREMAAX® system configuration. These options are addressed in the following installation procedures for electrical components.

Electrical components include:

- Wire Harnesses
- Controller connectors
- Trailer-mounted indicator lamp (may not be included with TIREMAAX kit)

⚠ WARNING

Improper wiring or operation of TIREMAAX systems can lead to situations where the driver is not aware of damage to tire inflation system or wheel-end components.

WIRE HARNESS OPTIONS AND DETAILS

This section includes basic instructions for routing and installation of optional wire harnesses available from Hendrickson. Detailed information and criteria are also provided:

- Figure 42 shows a typical wiring schematic for the TIREMAAX systems.
- Figure 43 shows various connections based on the options selected for the installation.

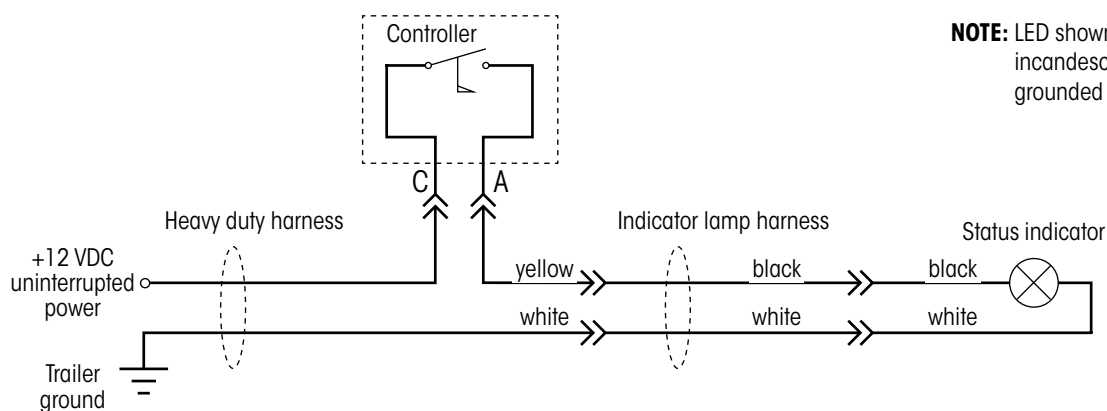
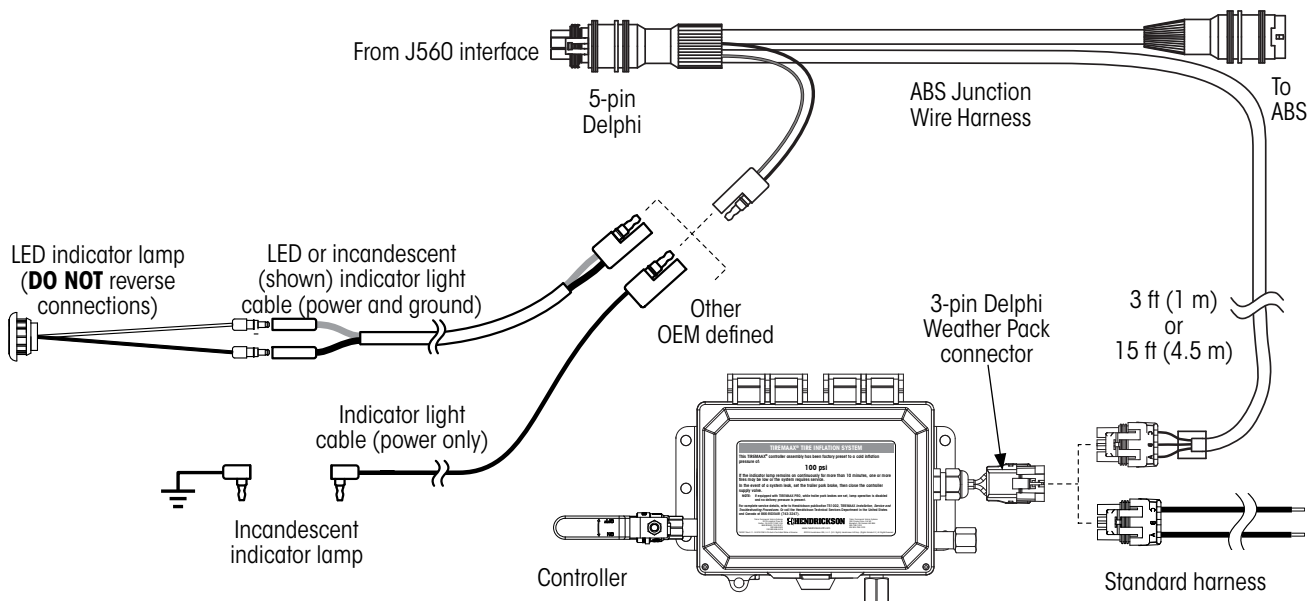


Figure 42: Typical wiring schematic for indicator lamp



NOTE: TIREMAAX® PRO controller shown.

Figure 43: Wire harness and indicator lamp options

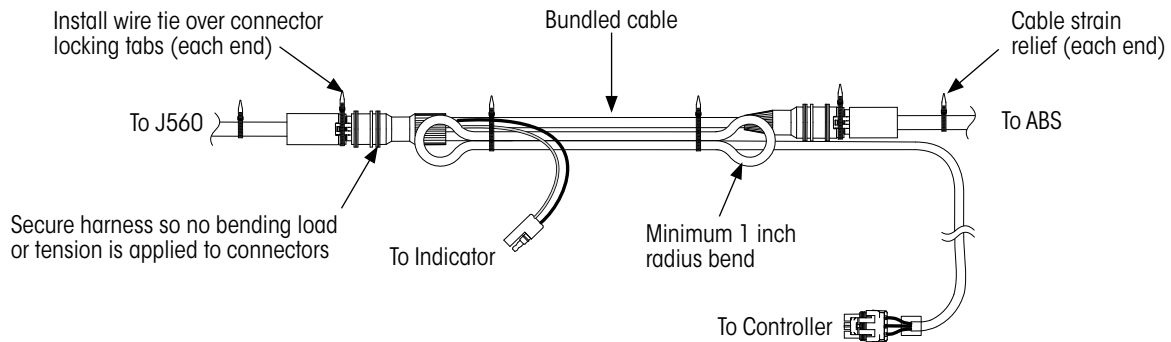


Figure 44: Harness restraints

STANDARD WIRE HARNESS INSTALLATION

Refer to Figure 42 schematic before continuing.

1. **Connect** the blue wire (terminal C) to vehicle uninterrupted power.
2. **Route** indicator lamp power wire (16 AWG minimum) and connect to the red wire on standard harness.

NOTICE Termination of all wires for the standard harness is the responsibility of the installer.

NOTE: For indicator lamp mounting instructions, refer to TRAILER-MOUNTED INDICATOR LAMP INSTALLATION on page 34.

3. **Connect** other end of indicator lamp power wire and ground connection according to Figure 42.
4. **Plug** male harness connector into female connector of controller assembly.
5. **Secure and restrain** all wires as needed.

ABS JUNCTION WIRE HARNESS INSTALLATION

Refer to information provided in Figure 43 before continuing.

1. Using Figure 43 on page 32: **Unplug** 5-pin Delphi ABS power connector.
2. **Plug** 5-pin male Delphi connector of Hendrickson TIREMAAX® ABS Junction Wire Harness into the mating connector coming from the J560 interface.
3. **Plug** other end of harness into ABS female connector to complete the ABS circuit.
4. **Connect** 3-pin Delphi Weather Pack male connector into the controller assembly as shown in Figure 43 on page 32.

5. **Weatherproof** all terminals and connectors as needed. Corrosion prevention compound must be used on all connectors. Refer to TMC RP 113, 114, 120 and 154 for recommended wiring practices.
6. **Secure** harness and wires as needed. Refer to ADDING RESTRAINT TO WIRING.
7. **Proceed** to TRAILER-MOUNTED INDICATOR LAMP INSTALLATION on page 34.

ADDING RESTRAINT TO WIRING

This procedure provides recommendations for securing and restraining the TIREMAAX Premium 15 ft. power harness. If desired, a 3 ft. version of this cable is also available. Contact Hendrickson Aftermarket or OEM Sales at 866-RIDEAIR (743-3247) for more information.

IMPORTANT: The cable bend radius should not be less than 1 inch.

DO NOT make bends in the cable near the connectors, Figure 44. This places stress on the connectors and may result in loss of connection or harness failure.

DO NOT place the harness and connectors in tension. Make sure when the slider is positioned at the most extreme positions the harness is not pulled.

DO NOT allow the cable to rub against a sharp edge of a hole or straight edge of a structural member. Use grommets or loom to protect the cable from sharp edges.

To restrain the harness:

1. **Route** harness under trailer as required.
2. **Secure** harness every 12 to 18 inches using nylon ties or other wire management hardware such as conduit or wire trays.
3. **Support** harness near connectors, as shown in Figure 44, so the weight of the cable is not supported by the connectors. Make sure connections are secure and not able move around during vehicle operation.
4. **Bundle** excess cable as shown in Figure 44.

TRAILER-MOUNTED INDICATOR LAMP INSTALLATION

Unless configured with lamp option, a trailer-mounted indicator lamp (incandescent or LED) is **NOT provided** with TIREMAAX® systems. Refer to Figure 43 on page 32 for indicator lamp and wiring options and details. Refer to TMC RP 161 and 704.

Mount indicator lamp to trailer as follows:

1. **Determine** best location on the front corner or side of the trailer within view of the driver side view mirror.

NOTE: On truck applications with large wind fairings, locating the indicator lamp near the left rear wheels (near the ABS warning lamp) may be preferable.

2. **Mount** indicator lamp at determined location (fasteners not provided). Recommended assembly torque is 17.5±2.5 in. lbs. (2.0±2 Nm) with a #10 machine screw.
3. **Connect** indicator lamp wires according to information provided in Figure 43 on page 32 and wire harness installation instructions on page 33.

SYSTEM INTEGRITY CHECK

After the installation is complete, but before the trailer is put into service, all air system connections must be tested. To accomplish this:

- A. Complete the procedure CHECKING FOR AIR LEAKS on page 44.
- B. Perform the INDICATOR LAMP TEST on page 45.

For PRO - The test procedure for validating proper TIREMAAX PRO controller function during the application of the trailer emergency brake should be as follows:

1. **Set** the trailer emergency brake by removing the emergency/supply gladhand or simulating this event by exhausting the pilot pressure at the PRO controller.

Upon setting the emergency brake, a brief audible exhaust will be present at the controller. The maximum allowable time limit for the audible exhaust to be present is 10 seconds.

2. Once the audible exhaust has dissipated, a small airflow can continue to be detected at the exhaust port of the controller. **Use** leak detection solution and **observe** bubble formation.

The maximum allowable time limit for bubble formation to be present is 5 minutes. If the system conforms to the allowable limits for audible exhaust and leak detection criteria above, the controller is considered to be within allowable factory specifications.

SYSTEM SETUP

The TIREMAAX controller is pre-programmed from the factory, therefore no additional setup is required. To program a pressure other than the factory setting, follow the appropriate procedure:

- | | |
|-----------|---|
| For CP - | <u>ADJUSTING CP INFLATION PRESSURE</u>
on page 48 |
| For PRO - | <u>ADJUSTING PRO INFLATION PRESSURE</u>
on page 50 |



INSTALLATION, SERVICE AND TROUBLESHOOTING PROCEDURES

DECAL LOCATION

Various decals, Table 5 are provided with TIREMAAX® systems. These decals include important information related to TIREMAAX operation and function. They must

not be removed after installation. If included with the literature packet and not already installed on the trailer, place decals using the below figures and table.

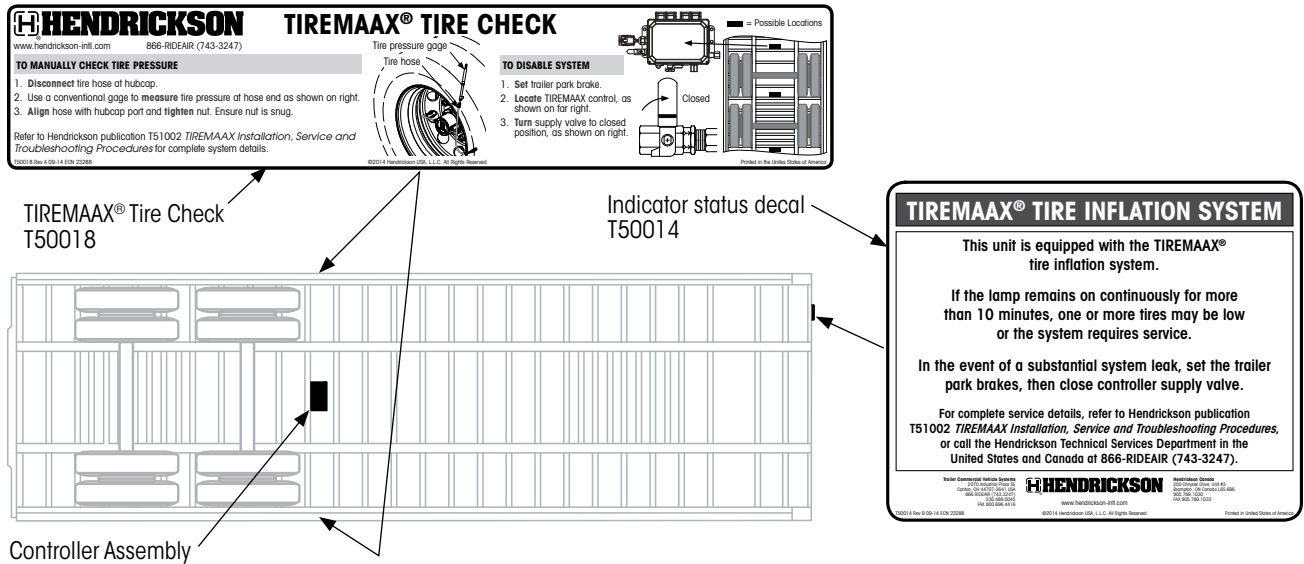


Figure 45: Trailer decal locations

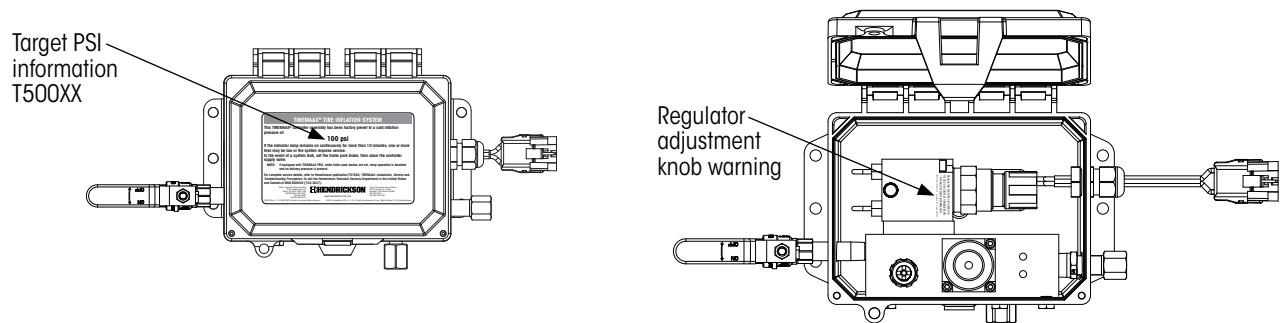


Figure 46: Controller decal locations (Installed by Hendrickson)

DECAL #	DESCRIPTION	LOCATION	FIGURE
T50003 - T50011	Inflation Pressure information.	On the outside surface of the controller cover.	Figure 46
Label	Regulator adjustment knob warning.	On the regulator body.	
T50014	Should the lamp remain on, this decal includes instructions and contact information.	Depending on trailer type, locate near the indicator lamp.	Figure 45
T50018	Manually check tire pressure	Depending upon trailer type, locate on the trailer rail near the controller box.	

Table 5: Decal locations

TROUBLESHOOTING

Troubleshooting aids include:

- TROUBLESHOOTING MATRIX on page 37
- LIST OF EFFECTS WITH DESCRIPTIONS on page 38
- PROBABLE CAUSES WITH RECOMMENDED FIX on page 39

IMPORTANT: In the event of a severe leak, TIREMAAX® is designed to isolate tires. **Check valves** (Figure 4 and Figure 5 on page 10) **will close and not allow air to completely exhaust from tires.** This **allows the driver to cautiously transport trailer** to the nearest service center.

NOTICE Air additives or antifreeze containing alcohol will degrade the performance rubber components (TMC RP 730).

TROUBLESHOOTING PROCEDURE

CAUTION Follow recommended safety practices at all times while troubleshooting.

1. **Should a problem occur:**
 - A. **Conduct a general inspection** for obvious signs of damage and leaking at all TIREMAAX components. **If not found**, proceed to B. **If found and the fix is not obvious**, proceed to Step 2.
 - B. **Check** tires and components for leaks using a soapy water solution and **check** each tire for a low pressure condition. Refer to IN THE EVENT OF A LEAK on page 43. Proceed to Step 2 if needed.
2. From TROUBLESHOOTING MATRIX on page 37, **select the effect (letter)** that best matches the symptoms associated with problem.

NOTE: If needed, refer to LIST OF EFFECTS WITH DESCRIPTIONS on page 38.
3. Following down the lettered effect column from Step 2, **select a numbered probable cause** that most likely applies according to problem's symptoms.
4. **Refer to** PROBABLE CAUSES WITH RECOMMENDED FIX on page 39.

If, while investigating each probable cause, it is determined that:

 - A. The probable cause does not apply, investigate the next most likely or simplest probable cause.
 - B. The probable cause is found, complete the recommended fix, test and, if no other effects, restore system to normal operation.
 - C. None of the probable causes for the selected effect prove valid, return to Step 2 and investigate the next likely effect with its probable cause(s).
5. **Repeat** process until the problem is resolved. If help is required, refer to CONTACTING HENDRICKSON on page 4.



TROUBLESHOOTING MATRIX

This matrix includes a list of effects (lettered columns) and probable causes (numbered rows) to problems that may arise during the life of TIREMAAX® PRO and CP TIS. Start by evaluating the list of effects to determine those which may apply to your symptoms. Then match the checked (✓) probable cause which also applies.

For details on Effects (letters), refer to page 38; for numbered Probable Causes, refer to page 39.				EFFECTS																	
				Indicator lamp on intermittently	Indicator lamp on for more than 10 min	Indicator lamp continuously on	Indicator lamp is always off	All tires low	Tires low at any one wheel-end	Tires low on one axle	Tires not inflating to target	One dual tire low	Air leaking from controller enclosure	Exhaust ports leaking air	Damage to tire hose	Air exhausting from axle vent	Controller cover missing or damaged	No Inflation Pressure	Low Inflation Pressure	Controller cover will not close	Air leaking when gladhand removed
If the problem is not found within this matrix, refer to CONTACTING HENDRICKSON for assistance.				A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Probable Causes		✓	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
System is functioning normally		12	✓									✓	✓								
Leakage	Slow leak	13	✓					✓				✓	✓		✓	✓			✓		
	Medium leak	14		✓			✓	✓	✓		✓	✓		✓	✓				✓		
	Severe leak	15		✓	✓		✓		✓	✓		✓							✓		
	Tire or rim leak	16									✓										
	Manifold leak (if included)	17					✓	✓		✓											
	Axle supply line/fitting leak	18						✓	✓		✓				✓						
	Controller component leak	19	✓	✓			✓					✓								✓	
	Inflation/Deflation PSI set too close	20	✓				✓					✓	✓								
	Leak at hubcap assembly	21						✓			✓		✓		✓						
	Axle hose leak	22						✓	✓						✓						
	Tire hose leak	23						✓			✓										
Equipment	Controller malfunction	24	✓	✓	✓	✓	✓			✓		✓	✓					✓			✓
	Debris (blockage) in air system	25				✓	✓	✓	✓	✓	✓							✓			
	Pinched line	26				✓	✓	✓	✓	✓	✓							✓			
	Ice in system	27				✓	✓	✓	✓	✓	✓	✓						✓			
	PPV not functioning	28				✓	✓			✓								✓			
	Tire hose not properly clocked	29												✓							
	Hubcap wheel valve problem	30	✓	✓	✓			✓	✓	✓	✓	✓	✓								
	Problem in hubcap assembly	31						✓		✓	✓				✓						
	Controller improperly mounted	32															✓				
	Cover not properly closed	33															✓				
	Insufficient air tank pressure	34				✓	✓			✓								✓	✓		
	Problem at emergency port	35		✓			✓						✓					✓			
	Low tire pressure	36		✓															✓		
	Test port vent in wrong position	37	✓		✓								✓							✓	
	Problem not with TIREMAAX	38															✓				✓
Electrical	No power to controller	39				✓	Not Applicable														
	Failed connection or cable	40				✓															
	Bad bulb or LED indicator	41				✓															
	Electrical short	42			✓																
	Bad ground	43				✓															
	Loose wire or connection	44	✓			✓															

Not Applicable

LIST OF EFFECTS WITH DESCRIPTIONS

Referenced from the TROUBLESHOOTING MATRIX, use the below table to obtain a more detailed description of the effects. Each is identified by the corresponding name and letter (column).

EFFECT		DESCRIPTION
A	Indicator lamp on intermittently	The indicator lamp flickers and does not stay lit for any length of time while inflating.
B	Indicator lamp on for more than 10 min	During normal operation, the indicator lamp may come on while tires are being inflated. If the indicator lamp is on for more than 10 min., it is likely indicating the existence of a leak. NOTE: After startup, the lamp will remain on while inflating low tires.
C	Indicator lamp continuously on	The lamp comes on and stays on after power is applied to trailer.
D	Indicator lamp is always off	There may be no noticeable change in lamp status after power is applied to trailer if system integrity is good and tires are consistently at the desired <u>Inflation Pressure</u> . If in doubt, perform INDICATOR LAMP TEST on page 45.
E	All tires low	With the CP system, wheel valves only allow air to flow in one direction for inflation and tires are independent. For the PRO system, wheel valves allow air flow in both directions and tire pressures are equalized while trailer emergency brake are released. As a safety precaution, wheel valves automatically close when necessary.
F	Tires low at any one wheel-end	All other wheel-ends appear to have normal inflation and tire pressure.
G	Tires low on one axle	Tires are low at both wheel-ends of a common axle.
H	Tires not inflating to target	Tires are low with no indication of being inflated by TIREMAAX®. Refer to effect E.
I	One dual tire low	Only one tire is affected for the wheel-end of a dual tire wheel-end.
J	Air leaking from controller enclosure	Air can be heard or felt leaking from inside the controller enclosure. If air continues to exhaust or leak, investigate probable causes. For a PRO system, refer to effect K.
K	Exhaust ports leaking air	TIREMAAX PRO only (Figure 5 on page 10 and Figure 54 on page 49): After the trailer emergency brake are set, 1-2 seconds to close is normal. Abnormal conditions would include the exhaust valve not closing and hubcap wheel valves not closing or closing slowly.
L	Damage to tire hose	Noticeable damage exists to tire hose(s), especially on the same wheel-end or side.
M	Air exhausting from axle vent	Escaping air pressure can be heard or felt leaking from axle vent tube Figure 16 on page 17.
N	Controller cover missing or damaged	The controller cover is not present or is damaged in some way.
O	No Inflation Pressure	No air (pressure) is available at the deliver port on the controller
P	Low <u>Inflation Pressure</u>	It is normal for the <u>Inflation Pressure</u> to be low while there is no air flow through the controller. Otherwise, a problem may exist.
Q	Controller cover will not close	The cover closes with difficulty or not at all.
R	Air leaking when gladhand removed	A short spurt of air is normal as air bleeds from the gladhand connectors at the front of the trailer, when the gladhand is removed. If air continues to bleed from the gladhand, determine if the controller is the source by: **** I. Close the supply valve at the controller. If air stops leaking out the gladhand, there could be a plumbing issue, check plumbing as shown in **** II. Disconnect the emergency line at the bottom of the controller. This is the line that connects the emergency air supply to the port at the controller. a. If air comes out of the emergency air supply port from the controller, replace the controller. b. If air comes out of the emergency air line, the issue must be in the parking brake valve or a plumbing error.



PROBABLE CAUSES WITH RECOMMENDED FIX

As with the list of effects, one or more probable causes may apply. For each effect selected, choose the most likely probable cause or ones that are easy to investigate first. Footnotes are located at end of table.

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
12	System is functioning normally ¹	Refer to Figure 5 on page 10	No action may be required.
		During normal operation, the indicator lamp remains off if tire pressures are at or near the desired Inflation Pressure .	If the integrity of the indicator lamp is in question, perform the INDICATOR LAMP TEST on page 45. Also refer to the Electrical 5 section of the matrix and this table.
		Should tires lose air during trailer idle time, the system will restore pressure at startup and the indicator lamp will remain ON until target is reached.	If necessary, see effect B Indicator lamp on for more than 10 min or review other causes listed in the TROUBLESHOOTING MATRIX .
		TIREMAAX® PRO only: Excess pressure is exhausted below the PRM when tire pressures exceed the target setting or settings are improperly adjusted.	If the air flow is continuous, readjust controller settings. Refer to SETTING TIREMAAX® PRO INFLATION PRESSURE on page 49 or T52001.
Leakage ²			
13	Slow leak	A slow leak in a tire or elsewhere may cause the system to frequently or continuously deliver air to inflate tires. The amount of air flow may not be enough to turn on the indicator lamp , but the system will be able to maintain Inflation Pressure as long as tank pressure is maintained.	I. Check tire for leaks from puncture, rim leaks, etc. II. Perform CHECKING FOR AIR LEAKS on page 44 for tire hose and fittings.
14	Medium leak	Light on more than 10 minutes or intermittent. The leak should be audible. This type of leak flows enough air out the system to cause the indicator to come on, but the system can still maintain tire pressures.	I. Check for system damage and obvious leaks in tires or plumbing. II. Refer to effect M Air exhausting from axle vent . III. If needed, perform SYSTEM INTEGRITY CHECK on page 34.
15	Severe leak	Light on continuously, damaged tire or other condition that allows maximum air flow. In this case, the source of the leak should be audible and obvious.	IV. Repair as needed.
16	Tire or rim leak	If the tire or rim leak is large enough, the wheel valve will close and isolate the tire at the hubcap.	Refer to IN THE EVENT OF A LEAK on page 43.
17	Manifold leak (if included)	If your system has a manifold, it is a potential source of leaks. For CP system, refer to Figure 38 on page 28 . For PRO system, refer to Figure 41 on page 31 .	I. Perform CHECKING FOR AIR LEAKS on page 44 for manifold hoses and fittings. II. Repair or replace as needed.
18	Axle supply line/ fitting leak	These are the hoses and fittings that supply air to both ends of the axle. For CP, refer to Figure 36 through Figure 38 . For PRO, refer to Figure 39 through Figure 41 .	I. Perform CHECKING FOR AIR LEAKS on page 44 for supply lines and fittings. II. Repair or replace as needed.
19	Controller component leak	If air is exhausting from the controller enclosure, first check Effect K . If air is leaking from the test port, check probable cause 37. Controller leaks can be caused by operator error, damage, corrosion, worn or malfunctioning components.	I. Check controller enclosure and components for possible damage and leaking. II. If CP or previous version of PRO controller, check the petcock (if included). It should be closed tightly. III. If current PRO controller, check the test port vent for proper installation, Figure 48 on page 45 . IV. Unless the leaky component is an external OEM supplied fitting, replace controller.
	Inflation/ Deflation PSI set too close	TIREMAAX PRO only: If Inflation Pressure and Deflation Pressure settings are too close or reversed, supply air will bleed out the PRM exhaust port (Figure 5 on page 10).	Perform SETTING TIREMAAX® PRO INFLATION PRESSURE on page 49.
20			



PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
21	Leak at hubcap assembly	Rotary union or other assembled components in hubcap assembly may have worn or failed, resulting in a leak or blockage. Leaking air pressure in the wheel-end and axle is vented at the axle vent.	Refer to the applicable plumbing schematic to help locate and repair leak. ³ I. For CP controllers, close the controller supply valve. For PRO controllers, set the trailer emergency brake.
22	Axle hose leak	Leaking air pressure in the axle is vented at the axle vent. Most likely the leak is at an end fitting. If not follow procedure to right to isolate the leak.	II. Temporarily disconnect the airline going to one end of the axle. CAUTION When disconnecting a delivery airline of a CP controller, there may be residual pressure in the airlines. Plug the loose airline. III. For CP controllers, open the controller supply valve. For PRO control charge the emergency/supply line. CAUTION Make sure the wheels are chocked when releasing trailer emergency brake. IV. Check for air escaping axle vent. If: a. Air continues escaping from the axle vent, repeat Step I. Reconnect the airline. Disconnect and plug the airline on the opposite end of the axle. Repeat Step III. b. Air stops escaping from the axle vent, it indicates the leak exists on the axle hose and or the hubcap of the disconnected airline. V. Inspect the suspect hubcap and axle hose. Replace if found to be defective. ^{3,4}
23	Tire hose leak	A leak in the tire hose can be the result of: 3. Over stretching 4. Hose catching on object while driving 5. Improper installation 6. Cut O-ring or gasket Also refer to probable cause 29.	I. Perform CHECKING FOR AIR LEAKS on page 44 for tire hose(s) and fittings. II. Replace the tire hose if: a. Leaking or shows any evidence of damage. a. O-ring is torn, distorted or is otherwise damaged. b. Threads are damaged, in which case the hubcap may also need to be replaced.
Equipment⁴			
24	Controller malfunction	Once closed and sealed, the internal components are protected. However, environmental changes and external influences from air supply can effect component operation. For PRO, excess pressure is exhausted from the PRM exhaust port within the controller (Figure 54 on page 49); this is normal.	I. Check controller for damage. II. Perform CHECKING FOR AIR LEAKS on page 44 for components inside the controller and external fittings. III. Repair⁴ or replace as needed. IV. Refer to probable cause 37.
25	Debris (blockage) in air system	The supply valve (Figure 51 on page 46) includes a screen to filter larger debris from entering and contaminating the air within the system. However, should passable bits of debris collect at any point within components of the system, a blockage can occur. Regular maintenance of the compressor and air tank can help to avoid this problem.	I. Check and clean the screen filter at the supply valve. Replace valve as needed. II. If the effect of a possible blockage can be narrowed with the matrix, disconnect fittings and hoses to clear the suspected blockage. ⁴ III. If attempts to clear the suspected blockage fail, replace components as needed.
26	Pinched line	Air line is kinked or pinched between objects.	Make corrections as needed.
27	Ice in system	Moisture and low temperatures can combine to form ice particles in the system plumbing. This can lead to blockages or diminished air flow and corrosion.	I. Park trailer in warm environment. II. Bleed moisture from air tank. III. Check drier at compressor (TMC RP 637). IV. Replace components that show evidence of corrosion. V. Perform CHECKING FOR AIR LEAKS on page 44 for components inside the controller and external fittings.



INSTALLATION, SERVICE AND TROUBLESHOOTING PROCEDURES

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
28	PPV not functioning	The Hendrickson PPV has an opening pressure of 75±5 psi and a closing pressure of 70±5 psi. For various reasons, it may fail to open or close.	If the pressure in the tank is known to be above 80 psi and the valve remains closed, replace the PPV.
29	Tire hose not properly clocked	Improperly installed (clocked) tire hoses can lead to stretching or expose tire hoses to objects that can damage the tire hose.	Refer to and review TIRE HOSE INSTALLATION on page 22 to determine if properly installed and clocked. Make corrections as needed.
30	Hubcap wheel valve problem	TIREMAAX® PRO only: When the trailer emergency brake are set, the wheel valves should close within 2 seconds. Debris or contaminants in the air lines can cause wheel valves (Figure 5) to close more slowly and bleed air from one or more wheels out through the controller exhaust ports.	<ol style="list-style-type: none"> Inspect delivery airlines for kinks. Confirm that plumbing meets requirements specified in section CONTROL LINE INSTALLATION on page 25. With brakes set, isolate the affected hubcap by disconnecting tire hoses at the hubcaps, one at a time, until air stops exhausting from the controller exhaust vents. Replace the hubcap if: <ol style="list-style-type: none"> Air stops exhausting from the controller exhaust vents when the tire hose is disconnected. Tire pressure is significantly below the set Inflation Pressure. <p>NOTE: More than one hubcap may need to be replaced before the problem is resolved.</p> If all hubcaps exhibit the issue, inspect the axle hoses by removing the 90 degree axle connector fitting (see item B on page 29) and insert a .078" diameter pin into the axle hose bulkhead fitting. The pin should pass through the orifice in the fitting. If it does not, replace the axle hose.
31	Problem in hubcap assembly ^{3,4}	The hubcap contains moving parts, valves and other components that have the potential for mechanical issues caused by debris or contaminants.	If contamination is suspected, See probable cause 25 . Replace entire hubcap assembly as needed.
32	Controller improperly mounted	The controller should be placed in a location to minimize exposure to the environment and flying road debris. Hendrickson sliders include pre-drilled holes to mount the controller on the front crossmember.	Refer to CONTROLLER INSTALLATION on page 23 to verify proper controller installation and mounting.
33	Cover not properly closed	Not properly closing and securing the controller cover directly exposes internal components to the environment and flying road debris.	<ol style="list-style-type: none"> Refer to probable cause 37. Close and secure the controller cover with a wire tie or fastener.
34	Insufficient air tank pressure	<ol style="list-style-type: none"> Air tank pressure must be greater than 75±5 psi to open Hendrickson's PPV. See probable cause 28. Tank pressure is below the Inflation Pressure setting listed on front of the controller. Refer to DECAL LOCATION on page 35. Compressor maximum output is below target. 	<ol style="list-style-type: none"> Check truck air outlet and correct as needed. Inspect hoses and fittings from gladhand coupling to air tank. Inspect air tank for damage and leaks.
35	Problem at emergency port	TIREMAAX® PRO only (Figure 5 and Figure 41): While trailer emergency brake are set, no pressure should be present at controller's emergency air supply port. Zero pressure is required to fully close off the delivery port. See effect K for more details. Alternately, while emergency brake are released, air pressure should be present at the emergency air supply port (Figure 5) to open the delivery port.	<p>Check to ensure:</p> <ol style="list-style-type: none"> Emergency air line is connected to the emergency air supply port. When trailer emergency brake are released, not set, pressure is present in the line. When trailer emergency brake are set, pressure is not present in the line. The emergency air lines and fittings have no blockages, breaks, leaks or kinks.

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
36	Low tire pressure	One or more tires appear to be low. This could be a normal condition if the trailer has been idle for a period of time and the controller is off. Decreased elevation or drop in temperature can also cause tire pressures to drop.	If all tires are low, the problem may exist with the controller and associated plumbing. If one or more tires are low, look for other probable causes. Refer to IN THE EVENT OF A LEAK on page 43.
37	Test port vent in wrong position	The test port vent is included with current TIREMAAX PRO controllers. It can be threaded to the test port in the TEST or STORE position, see <u>INDICATOR LAMP TEST on page 45</u> . If left in the TEST position: 1. Air may leak out the test port. 2. The controller cover will not properly close.	Unthread test port vent from the test port, flip and reinstall in the STORE position. Ensure cover completely closes and latches. If the cover is damaged, replace it.
38	Problem not with TIREMAAX	TIREMAAX depends on supply air integrity, power for the indicator lamp and, for the PRO controller, emergency air pressure.	Where applicable, check each input to the controller to ensure no problems exist. Check other effects and probable causes related to these external inputs.
Electrical ⁵			
39	No power to controller	Power is not required for the TIREMAAX system to operate, but it is required to operate the indicator lamp and inform the driver of malfunctions and status.	I. Ensure truck uninterrupted power is available at the J560 connector. II. Check wiring to controller according to <u>Figure 42 on page 32</u> .
40	Failed connection or cable	Loss of connection anywhere in the system can prevent the indicator lamp from illuminating. If not properly secure, connected or weather proofed, connections can fail.	I. Check wiring according to <u>Figure 42 on page 32</u> . II. Ensure all connectors are properly and securely connected. Refer to <u>ELECTRICAL COMPONENT INSTALLATION on page 32</u> .
41	Bad bulb or LED indicator	Like power, the TIREMAAX system is fully functional with a bad indicator lamp. However, driver feedback for malfunctions and status is not provided.	Perform <u>INDICATOR LAMP TEST on page 45</u> .
42	Electrical short	Power side of indicator lamp is shorted or flow switch is stuck on. Refer to <u>Figure 42</u> and <u>Figure 43 on page 32</u> .	I. Disconnect connector at controller. If lamp stays on, power wire or lamp cable is shorted. Fix or replace as needed. II. Close supply valve. If lamp stays on, flow switch is stuck in ON position or short is in controller. Replace controller.
43	Bad ground	Corrosive surface bonding and frayed wires can result in poor electrical connection. This would effect indicator lamp function during inflation.	I. Refer to <u>Figure 42 on page 32</u> to trace and check all electrical wiring and connections. II. Repair as needed. In some cases, sealing connections against weather conditions may be necessary.
44	Loose wire or connection	Loose wires can lead to no or intermittent illumination of the indicator lamp during inflation.	I. Refer to <u>Figure 42 and Figure 43 on page 32</u> to trace and check all electrical connections. II. Refer to <u>ADDING RESTRAINT TO WIRING on page 33</u> to ensure all wires and wire harnesses are properly restrained.

¹ If there are no tires damaged and no leaks present, let the TIS continue to operate. Low temperature, poor air supplies and low tire pressures will increase the period of time required to inflate and maintain tire pressure. If the indicator lamp remains on after an additional 10 minutes, service is required. **The use of air additives and antifreeze containing alcohol will cause deterioration of rubber components and must be avoided.**

² The system identifies leaks and reports them by illuminating the trailer-mounted indicator lamp. The operator is informed whenever a tire is low enough to require service or there is a leak in the system. **Wheel valves isolate the leaking or damaged wheel from the system. Probable cause 2, 3 and 4 help identify the severity of the leak in general and apply to all other causes of leaks. Other causes, with their associated effect, help to identify the location of the leak referenced in causes 2, 3 and 4.**

³ Before removing a hubcap for any procedure, refer to manufacturer's warranty requirements. **Disturbing spindle nut, wheel bearings and hub assembly can violate the wheel-end warranty.** Also, replace the gasket with new and replenish any lost lubricant during reassembly according to manufacturer's requirements.

⁴ Any attempts to disassemble hubcap assembly or controller and its components **will void the TIREMAAX® warranty.**

⁵ When working around electricity and with electrical components, always observe proper safety precautions.



SERVICE PROCEDURES

This section includes service information and requirements relative to TIREMAAX® PRO and CP systems. An online training video is also available for these procedures at <https://www.Hendrickson-intl.com/Trailer/Videos>.

TOOLS REQUIRED

TOOL	WHERE USED
CP Target Gauge VS-32344 ¹	SETTING CP INFLATION PRESSURE on page 47
PRO Target Gauge VS-32331 ¹	SETTING TIREMAAX® PRO INFLATION PRESSURE on page 49
Tire pressure gauge	Checking tire pressures
1/8 inch Allen wrench	Adjusting controller pressure
3/8 inch wrench	HUBCAP INSTALLATION on page 20
7/16 inch open-end torque wrench	
7/16 inch wrench	Tighten tire hose/valve stem connection

¹ Available from Hendrickson, refer to L878 TIREMAAX Parts List.

Table 6: List of required tools

Table 6 includes a list of primary tools required to install and service TIREMAAX systems.

INSPECTIONS AND INSPECTION INTERVALS

Hendrickson recommends:

- Tires be inspected for wear and damage at regular intervals.
- Check tire pressure at regular intervals using the method described in MANUALLY CHECK TIRE PRESSURE. Reference tire manufacturers' guidelines for acceptable inspection intervals.
- At regular intervals, check TIREMAAX components for air leaks and indicator lamp operation.

In addition to the periodic intervals listed below:

- All inspections should be completed any time a tire is removed from the trailer or if any tire is suspected to be at a low pressure condition.
- Always maintain current shop preventive maintenance and pre-trip inspection practices.
- Any preventive maintenance practices followed for general trailer air system inspections should also be applied to the TIREMAAX system components.

EVERY THREE MONTHS

To test system integrity, perform the following:

1. **Check** indicator lamp, see [INDICATOR LAMP TEST](#) on page 45.
2. **Manually check** all tires for a low pressure condition by removing the tire hoses at the hubcap using [MANUALLY CHECK TIRE PRESSURE](#) on page 46.
3. **Inspect** all tire hoses to **ensure** that they are secure.

EVERY 12 MONTHS

In addition to the above three month check, perform the following:

1. **Inspect** all system connections for leaks. **Apply** soapy water to all air fitting connections, including the axle vent. Bubbles in the soapy water will provide a visual indication of an air leak. **All connections must be air tight.**
2. **Check:**
 - A. [Regulator Inflation Pressure](#) (PRO and CP)
 - B. [PRM Deflation Pressure](#) (PRO only).

IN THE EVENT OF A LEAK

Should a leak occur in the system:

- A small leak in one or more tires will result in continuous air flow in the lines.
 - If the **flow rate is below the flow switch monitored rate** (located in the controller), the light will remain off and not affect system performance.
 - If the **flow rate is above the monitored rate** of the indicator lamp flow switch, the light will remain on as long as the [Inflation Pressure](#) is below the [Inflation Pressure](#) setting.

PRO Only:

- **If a system leak is large** enough to cause the controller [Inflation Pressure](#) to fall below the shut-off threshold of the hubcap wheel valve:
 - The wheel valves will close.
 - With the wheel valves closed, tires are isolated from the controller, delivery air line plumbing and each other.
- If the **leak is too large to maintain tire pressure**, the system can be temporarily disabled until the system can be repaired. Refer to [DISABLE TIREMAAX®](#) on page 46.

CHECKING FOR AIR LEAKS

If a leak is suspected and not obvious, perform this procedure to locate leaks on air hoses, fittings and components. Also perform this procedure as a system integrity check after installation.

⚠ WARNING Chock all wheels before beginning this procedure. Refer to Hendrickson literature number T12007 for details.

NOTE: If the system includes a pressure gauge (CP only), the gauge will appear to register low pressure while tires are being inflated or if a leak exists in the system. A simple test for a leak would be to temporarily close the supply valve and observe to see if pressure holds steady. If pressure decreases, there may be a leak in the system.

NOTE: The TIREMAAX® system can be pressurized without applying electrical power (indicator lamp is disabled).

Pressurize and check the TIREMAAX system as follows:

1. Fill trailer air system to at least 90 psi. If conducting an integrity check after installation, the system must be filled to 5 psi above the desired Inflation Pressure.
2. **(PRO Only)** Chock wheels and **release** trailer emergency brake while checking for leaks.

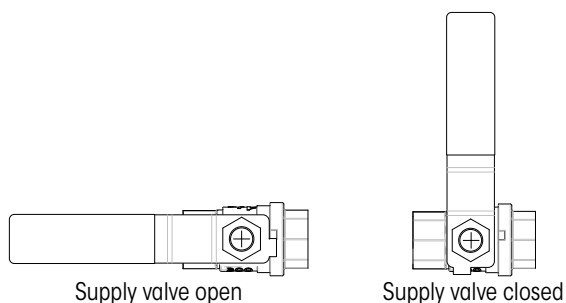


Figure 47: Supply Valve Operation

3. Ensure TIREMAAX supply valve (if equipped) is in open position (Figure 47).
4. **Inspect** hoses and components for damage and listen for audible indications of a leak. Repair as required.
5. **Apply** soapy water to all air-fitting connections. Bubbles in the soapy water will provide a visual indication of an air leak.

NOTE: Simply spraying the connections to look for leaks is acceptable. Using a commercially available leak detector solution or soapy water to verify airtight connections is best and recommended.

6. At axle vent, **listen** for air flow through the vent tube and **apply** leak detection fluid to find any leaks internal to the axle and hubcaps.

NOTE: Temporarily removing and capping supply hose to road or curb side axle hose will further isolate a suspected leak.

7. **Check** tire hose connections at valve stems. Verify tire hose/valve stem connection did not loosen during the tire hose connection process.
8. **Fix** any leaky connections to ensure they are air tight.
9. After fixes are complete, **repeat** procedure until no leaks are detected.

NOTE: If conducting a system integrity check to identify possible leaks, an additional benefit is all tires will be inflated to the Inflation Pressure (refer to TIRE INFLATION on page 11).

INDICATOR LAMP TEST

This procedure tests both the indicator lamp and flow switch in the controller.

NOTE: The indicator lamp may flash momentarily when the trailer emergency brake are released. If this occurs, the following steps are not required.

1. **Verify** 12 VDC power is available to trailer. Refer to Figure 42 and Figure 43 on page 32 for wiring diagrams.
2. **Enable** air flow through controller (select applicable method, A or B):

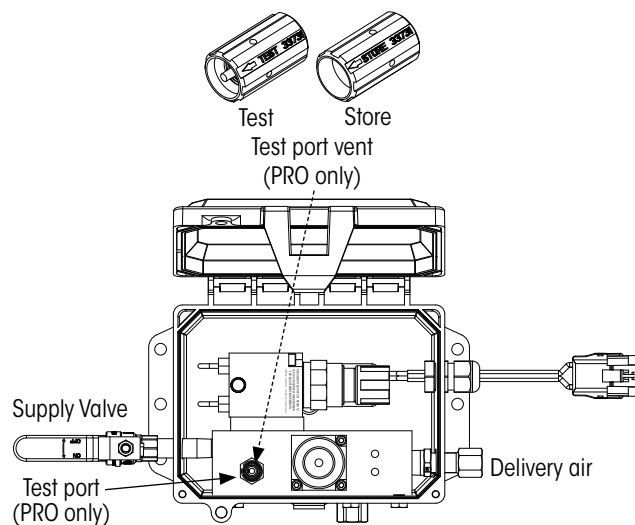


Figure 48: TIREMAAX® PRO controller with test port vent

NOTE: If the PRO controller includes a petcock, refer to method B.

- A. The current PRO controller includes a **test port vent tool** that threads into the test port (Figure 48) in the STORE position. To perform a lamp test:
 - i. **Open** controller.
 - ii. **Unthread** the test port vent from the test port.
 - iii. **Reverse** the test port vent and reinstall in the TEST position. In this position, the inner pin allows air to pass out the port.

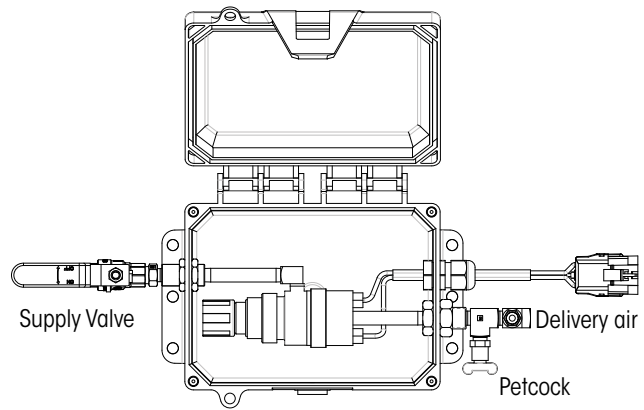


Figure 49: TIREMAAX controller with petcock (CP shown)

- B. If included: **Open petcock** on controller (Figure 48) to generate air flow across internal flow switch.

NOTE: A petcock is included on previous version of the PRO controller, if not present, use method A.

3. **Observe** indicator lamp:
 - A. **If illuminated**, both indicator lamp and controller internal flow switch are working properly.
 - B. If indicator lamp is **NOT illuminated**:
 - i. **Check** continuity at controller connector. If the flow switch is working, the circuit should be closed. If circuit is open, replace controller.
 - ii. **Apply** 12 VDC power directly to the lamp. If indicator lamp is **not on**, replace the indicator.
 - iii. If indicator lamp is still not on, **check** wiring.
4. **Test complete:**
 - A. If included: **Unthread** test port vent and **reinstall** in the STORE position.
 - B. **Close** the controller cover.
 - C. If included: **Completely close** petcock at controller.

MANUALLY CHECK TIRE PRESSURE

⚠ WARNING To prevent injury, always wear eye protection when maintaining or servicing the vehicle.

NOTE: Check valves in the tire hoses help prevent tire pressure loss when a tire hose is removed. You may experience a slight burst of air when the hose is disconnected.

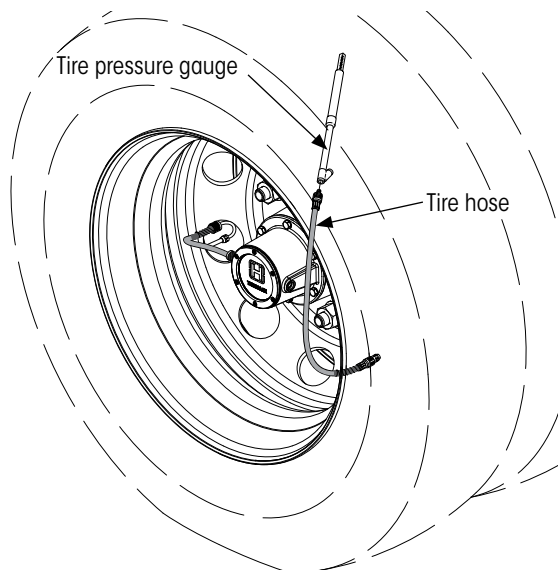


Figure 50: Manually checking tire pressure

To manually check tire pressure (Figure 50):

- Turn vehicle off.
- Disconnect tire hose from hubcap.
- Use a conventional gauge to measure tire pressure at hose end.
- Inspect tire hose O-rings for nicks or cuts. Replace as needed.
- Reattach and firmly hand-tighten tire hose. Using pliers, carefully and gently verify the hose connection is tight. Refer to TIRE HOSE INSTALLATION on page 22 for details.

NOTICE **DO NOT** overtighten the tire hose at the tire valve stem or the internal tire hose seal may be damaged. Ensure tire hoses are not stretched or rubbing on the wheel.

NOTE: If a hose is removed, the system will:

- Isolate disconnected tire.
- Continuously maintain Inflation Pressure for all connected tires.

IMPORTANT: While tire hoses are removed at the hubcap, a check valve (spring type valve core - 2 to 3 psi), in the tire hose, prevents air leaking from tire.

DISABLE TIREMAAX®

This procedure may be required in case of a system leak or failure.

1. **Set** trailer emergency brake.

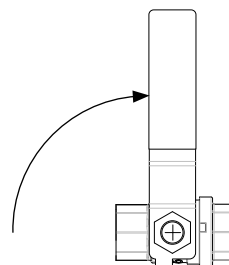


Figure 51: Supply valve closed

2. Located on the TIREMAAX controller, **turn** the Supply valve (if equipped) to the closed position (Figure 51).
3. At each tire:
 - A. **Detach** tire hose at the hubcap.
 - B. **Completely remove** tire hose(s) from tire and store.
 - C. **Check** tire for correct inflate pressure. Refer to MANUALLY CHECK TIRE PRESSURE. Adjust accordingly, if necessary.

IMPORTANT: **DO NOT discard tire hoses.** They will need to be reinstalled during service.

4. **Seek service** when possible.

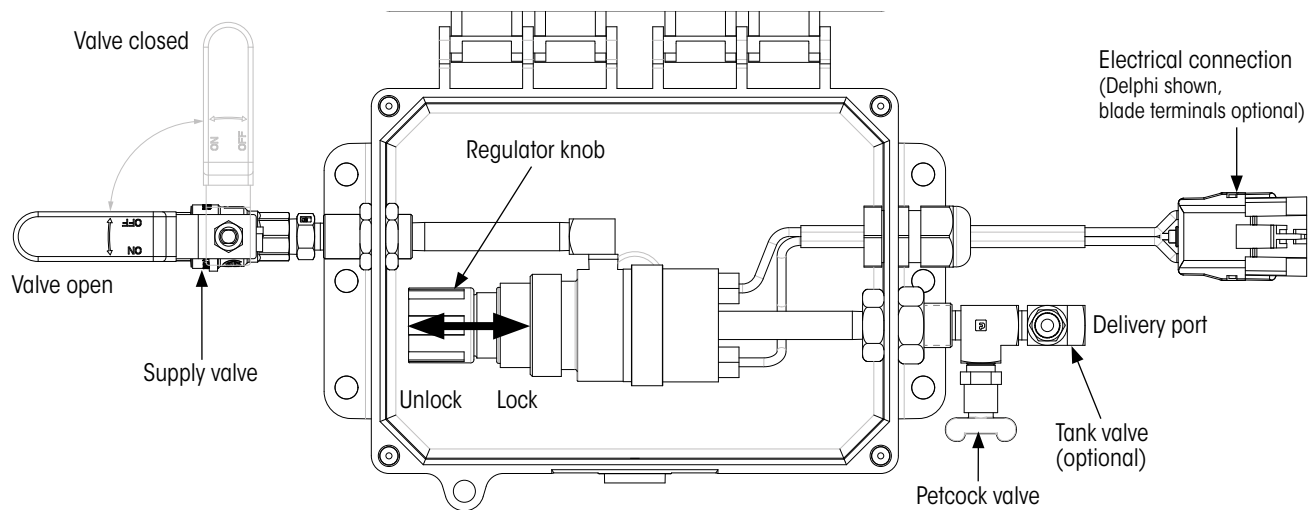


Figure 52: Setting TIREMAAX® CP Inflation Pressure

SETTING CP INFLATION PRESSURE

The TIREMAAX® CP controller is pre-set at the factory, therefore no additional setup is required. To reset a pressure other than the factory setting, follow these instructions.

IMPORTANT: The system must be free of air leaks prior to performing these procedures. Refer to [CHECKING FOR AIR LEAKS](#) on page 44.

REQUIRED TOOLS

The following tools are required to adjust TIREMAAX CP controller settings.

- Clean, dry shop air supply capable of generating at least 5 psi above desired cold [Inflation Pressure](#).
- Tire pressure gauge.
- CP target gauge: A dial pressure gauge capable of reading 5 psi above cold [Inflation Pressure](#), may also be used.

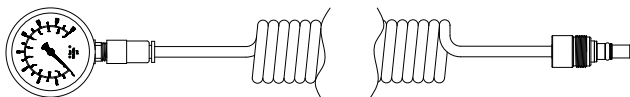


Figure 53: CP Target Gauge VS-32344

NOTE: The TIREMAAX PRO target gauge (Figure 55 on page 49) cannot be used in place of the CP target gauge. Fittings are not compatible.

IMPORTANT: If a gauge is installed at the delivery port with the air line removed, it will not show leaks in the system as defined in [Step 4](#).

CHECKING CP INFLATION PRESSURE

Follow this procedure to check [Inflation Pressure](#) at the delivery port (Figure 52) of a TIREMAAX CP controller.

1. **Chock** wheels or otherwise immobilize trailer.
2. Using clean, dry shop air supply, **pressurize** trailer air tank to at least 5 psi above desired [Inflation Pressure](#).
3. **Disconnect** a tire hose at one of the hubcaps and **install** CP target gauge (Figure 53) in the hubcap port.

NOTE: Check valves prevent air from escaping at the hubcap and wheel.

4. **Monitor** [Inflation Pressure](#) on the gauge:
 - A. **Close** supply valve (Figure 52).
 - B. **Observe** CP target gauge: if pressure decreases, there may be a leak in the system plumbing, a low tire or a tire leak. **Locate and repair** before continuing. Refer to [CHECKING FOR AIR LEAKS](#) on page 44.
 - C. **Open** supply valve and allow tires to inflate to the current [Inflation Pressure](#) before continuing.

NOTE: Current [Inflation Pressure](#) at the delivery port **should be 3-5 psi higher than desired cold [Inflation Pressure](#)** due to valve "Crack Pressure".

5. **If necessary**, continue to next procedure to **adjust** the [Inflation Pressure](#) to match the desired cold target [Inflation Pressure](#).
6. **Remove** the CP target gauge and reinstall tire hose.
7. **Restore** system to normal operation.



ADJUSTING CP INFLATION PRESSURE

Before making any adjustments:

- A. **If not already done so, perform** CHECKING CP INFLATION PRESSURE on page 47. The CP target gauge should remain installed from that procedure.
- B. **Disconnect** all tire hoses at the hubcaps. This reduces adjustment response time for changes in regulated pressure and increases accuracy.
- C. The supply valve should remain open for this adjustment.

NOTE: Inflation 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.**

1. **Unlock** the regulator knob by pulling it away from the regulator body (Figure 52).
2. **From the results of the previous procedure:**
 - A. **If Inflation Pressure at the gauge is set too low, increase** Inflation Pressure by rotating the regulator knob **clockwise** (as viewed from the end of the knob).

IMPORTANT: Always approach the Inflation Pressure setting from an increasing-pressure direction.

- B. **If Inflation Pressure is set too high,**
 - i. **Decrease** it by rotating the regulator knob **counterclockwise** (as viewed from the end of the knob).
 - ii. **Lower** the pressure setting to at **least 5 psi below the desired** Inflation Pressure setting.
 - iii. **Turn** knob clockwise to the desired cold Inflation Pressure setting.
3. **Disconnect** CP target gauge from hubcap port.
4. **If the Inflation Pressure was decreased, manually depress** the check valve core at the end of each tire hose to **reduce tire pressure** of each tire to at **least 5 psi below target**.
5. **Reconnect** all tire hoses to the hubcaps, firmly hand-tighten. Using pliers, carefully and gently verify the hose connection is tight. At this point, the TIREMAX indicator lamp should be lit until the target pressure is reached.

6. Ten minutes after the indicator lamp turns off **MANUALLY CHECK TIRE PRESSURE** (using procedure on page 46) of at least two tires, each at different wheel-ends.
7. **If necessary, repeat** CHECKING CP INFLATION PRESSURE on page 47 and readjust (in that order) until the pressure at the tire hoses is at the desired cold Inflation Pressure per specifications.

RESTORE CP SYSTEM TO NORMAL OPERATION

Once cold Inflation Pressure is set:

1. **Lock** regulator knob by pushing it in toward the regulator body (Figure 52). Ensure knob will not rotate.
2. **Close and latch** controller enclosure.
3. If necessary, **update** decal on controller cover (Figure 46 on page 35).
4. **Disconnect** shop air supply from trailer air tank.
5. At each wheel-end, **ensure** all tire hoses are **installed and properly secured**. See Step 5 of the previous procedure in the left column of text.

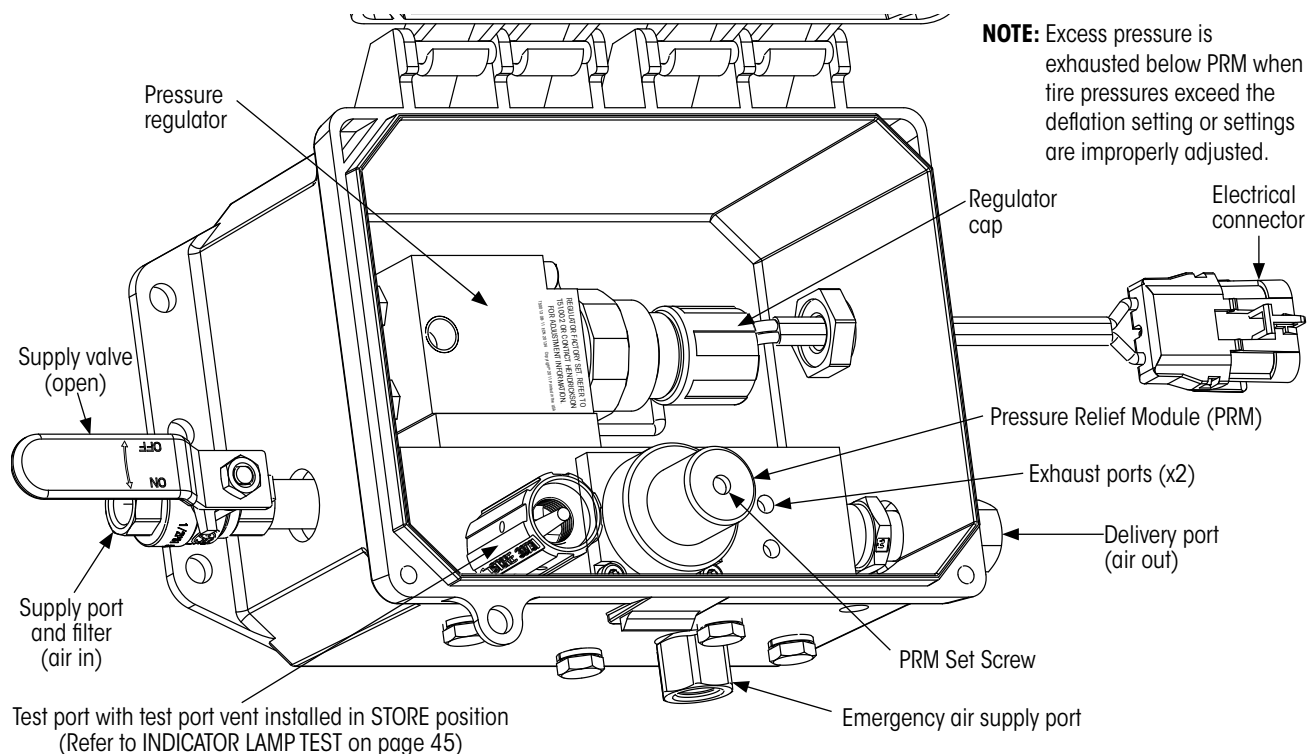


Figure 54: Setting TIREMAAX® PRO Inflation Pressure and Deflation Pressure

SETTING TIREMAAX® PRO INFLATION PRESSURE

The TIREMAAX PRO controller is pre-set at the factory, therefore additional setup is **normally not required**. If a change to the Inflation Pressure or Deflation Pressure settings is required, follow these instructions.

IMPORTANT: The system must be free of air leaks prior to performing these procedures. Refer to CHECKING FOR AIR LEAKS on page 44.

⚠ WARNING Emergency air supply must be available at the emergency air supply port on the controller to enable TIREMAAX PRO operation. Supplying air at the emergency gladhand will also release trailer brakes.

These procedures can also be found in Hendrickson literature number T52001 *Toolbox Tips: TIREMAAX PRO - Setting Target Pressures* and online at <https://www.Hendrickson-intl.com/Trailer/Videos/TIREMAAX-Training>.

REQUIRED TOOLS

The following tools are required to adjust TIREMAAX PRO controller settings.

- Clean, dry shop air capable of supplying at least 15 psi above Inflation Pressure listed on controller decal.
- Tire pressure gauge.

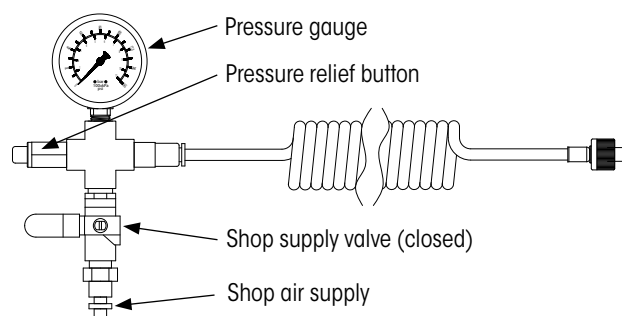


Figure 55: TIREMAAX PRO target gauge VS-32331

- TIREMAAX PRO target gauge (Figure 55).

NOTE: The PRO target gauge might not display an accurate Inflation Pressure while trailer emergency brake are released. To isolate the delivery lines from the air supply, set the trailer emergency brake before reading the gauge.

- 1/8 inch Allen wrench.



CHECKING PRO COLD INFLATION PRESSURE

Follow this procedure to check the cold Inflation Pressure for TIREMAAX® PRO systems.

IMPORTANT: The TIREMAAX PRO target gauge (Figure 55) is required for this procedure. The PRO regulator does not self exhaust which could result in false readings.

Available clean, dry shop air supply must be at least 15 psi above cold target Inflation Pressure for this test.

1. **Set** trailer emergency brake.
2. **Chock** wheels or otherwise **immobilize trailer**.
3. **Locate** controller on the trailer, Figure 51 on page 46.
4. Using clean, dry shop air supply, **pressurize** trailer air tank to at least 15 psi above desired Inflation Pressure by connecting to emergency air supply gladhand. Once charged, disconnect from emergency air supply gladhand.
5. **Open** controller cover and **remove** test port vent, if included, Figure 54.
6. **Connect** shop air to PRO target gauge shop air supply port, Figure 55.
7. **Connect** PRO target gauge to controller test port.

IMPORTANT: Ensure PRO target gauge shop supply valve is closed and the pressure relief button is not pressed during installation and removal.

8. **Check** PRO Inflation Pressure.
 - A. **Ensure** PRO target gauge shop supply valve is closed.
 - B. **Press and release** the pressure relief button on PRO target gauge.
 - C. **Read and record** target gauge pressure.

NOTE: Current Inflation Pressure **should be at the specified cold target** Inflation Pressure on the controller decal (Figure 46 on page 35).

9. **Check** PRO Deflation Pressure.
 - A. **Open** the shop supply valve. You should hear air exiting the valve.

- B. **Close** the shop supply valve. Air should stop exiting after 45 to 60 seconds.
- C. **Read and record** the target gauge pressure. This is the current Deflation Pressure.

10. **Compare** measured Inflation Pressure and Deflation Pressure readings to desired settings.

NOTE: Deflation Pressure should be 10 psi higher than the specified cold Inflation Pressure on the controller decal (Figure 46 on page 35).

- A. **If not at specified cold Inflation Pressure** settings, refer to TROUBLESHOOTING on page 36.
- B. **If adjusting Inflation Pressure**, proceed to ADJUSTING PRO INFLATION PRESSURE.

11. **Disconnect** shop air supply at target gauge.
12. **Disconnect** target gauge from controller test port.
13. **Reinstall** test port vent, if included, in store position.
14. **Close** controller cover.

ADJUSTING PRO INFLATION PRESSURE

NOTE: To properly perform this procedure, there must be sufficient air pressure in the trailer air tank and the trailer emergency brake must be set.

When adjusting TIREMAAX PRO, Deflation Pressure **must be set 10 psi above Inflation Pressure**. The order in which the adjustments are made depends on the direction of change:

NOTICE While adjusting pressure settings, it is important that the Deflation Pressure remains ABOVE the Inflation Pressure, otherwise the PRM will open and continuously vent air. If this occurs, reduce the regulator Inflation Pressure setting until the venting stops.



If increasing Inflation Pressure: first ADJUST PRO DEFLATION PRESSURE, then ADJUST PRO INFLATION PRESSURE.

If decreasing Inflation Pressure: first ADJUST PRO INFLATION PRESSURE, then ADJUST PRO DEFLATION PRESSURE.

Adjust PRO Inflation Pressure

This adjustment is set at the controller regulator (Figure 54 on page 49).

IMPORTANT: The TIREMAAX® PRO system is designed to operate with cold inflation pressures between 85 and 120 psi. Setting the inflation pressure outside of this range may cause the system to function improperly.

1. **Set** trailer emergency brake and **open** the controller supply valve.
2. **Remove** regulator cap by pulling to the right.
3. **Momentarily press** the pressure relief button on the PRO target gauge after each adjustment and before reading the gauge. This removes any residual air pressure in the gauge.
4. **Use** a 1/8 Allen wrench to **adjust** controller regulator until desired Inflation Pressure is reached:

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

- A. **If Inflation Pressure is set too low**, increase pressure by rotating the regulator adjustment screw **clockwise** (as viewed from the end of the screw).
 - B. **If Inflation Pressure is set too high:**
 - i. **Decrease** it by rotating the regulator adjustment screw **counterclockwise** (as viewed from the end of the regulator screw).
 - ii. **Use** pressure relief button on target gauge (Figure 55) to **lower** Inflation Pressure at **least 5 psi below the desired Inflation Pressure** setting.
 - iii. **Turn** screw clockwise again to the desired Inflation Pressure.
5. **Repeat** Step 3 and Step 4 until the desired pressure is reached.

6. **Reinstall** regulator cap.

Adjust PRO Deflation Pressure

This setting is performed at the controller's PRM (Figure 54 on page 49). For proper operation, Deflation Pressure must be set to 10 psi above Inflation Pressure.

1. **Set** trailer emergency brake.
2. **Connect** clean, dry shop air supply to PRO target gauge (Figure 55 on page 49). An air supply **at least** 15 psi above the desired cold Inflation Pressure is required.
3. **Open** gauge shop supply valve. The flowing air should create an audible sound.
4. **Close** gauge shop supply valve. The audible sound will then stop when current Deflation Pressure is reached
5. **Observe** pressure gauge to ensure no leaks are present and pressure remains constant. If the pressure does not remain constant, leaks exist. Repair the leaks before continuing.
6. **Read and record** current Deflation Pressure at gauge. If not correct, go to the next step. Otherwise, go to next procedure.
7. **If adjustment is needed**, use 1/8 inch Allen wrench to **adjust** PRM set screw (Figure 54). (A quarter turn is approximately 5 psi.)
 - A. If Deflation Pressure is **low**, turn the PRM set screw clockwise, then return to Step 3.
 - B. If Deflation Pressure is **high**, turn the PRM set screw counterclockwise, then return to Step 3.

Restore PRO System to normal operation

At this point, the controller should be set to the desired Inflation Pressure and Deflation Pressure. To restore system to normal operation:

1. **Disconnect** shop air supply from PRO target gauge.
2. **Disconnect** PRO target gauge from controller.
3. **Reinstall** the test port vent (Figure 54) in the store position.
4. **Close** controller, **secure** latch and **ensure** controller supply valve is open.
5. **Update** decal on controller cover (Figure 46 on page 35), if necessary.

WIRING HARNESS REPLACEMENT

As discussed in [WIRE HARNESS OPTIONS AND DETAILS](#) on page 32, various wiring harnesses are available.

NOTICE

To avoid arcing and other electrical damage, remove power to trailer. Observe electrical safety considerations when disconnecting and connecting wires and electrical connections.

With the standard wiring harness, replacement is simply a matter of disconnecting the existing harness and connecting the new one. On the standard harness, the red wire is the indicator lamp power lead and the blue wire is 12 VDC vehicle power. The termination of these wires is the responsibility of the harness installer. Terminals and connectors must be weatherproof and corrosion prevention compound must be used on all connectors. Refer to TMC RP 113, 114 and 120 for recommended wiring practices.

REPLACING PREMIUM ABS JUNCTION HARNESS

This procedure applies to Hendrickson components as listed in [Figure 43](#) on page 32.

Removal

1. Turn off all power to trailer.
2. Disconnect the following:
 - A. Five-pin ABS connector ([Figure 43](#) on page 32).
 - B. Five-pin power supply connector.
 - C. Indicator lamp connection.
 - D. Controller assembly connector.

Installation

For installation details and criteria, refer to [ABS JUNCTION WIRE HARNESS INSTALLATION](#) on page 33.

1. Connect the following:
 - A. Five-pin ABS connector.
 - B. Five-pin power supply connector.
 - C. Indicator lamp connector.
 - D. Controller assembly connector.
2. Refer to [ADDING RESTRAINT TO WIRING](#) on page 33 to weatherproof, secure and restrain harness and wiring as needed.

CONTROLLER ASSEMBLY REPLACEMENT

This procedure replaces the controller assembly as one complete unit. For controller connections, refer to:

For CP - [Figure 52](#) on page 47

For PRO - [Figure 54](#) on page 49

REMOVAL

1. Exhaust air from trailer air tank. This will cause trailer emergency brake to be set.
2. Disconnect controller electrical connector.
3. Disconnect air supply line. Label the line "SUPPLY" to avoid confusion when installing the new controller assembly.
4. (**PRO only**) Disconnect emergency air supply line. Label the line "EMERG" to avoid confusion when installing the new controller assembly.
5. Disconnect delivery air line. Label the line "DELIVERY" to avoid confusion when the new controller assembly is installed.
6. If reusing air fittings, remove air fittings from the ports on the controller assembly.
7. Remove mounting bolts and controller assembly enclosure from subframe.

INSTALLATION

1. Mount controller assembly enclosure to subframe using screws removed in removal procedure. Replace fasteners as needed. Refer to [CONTROLLER INSTALLATION](#) on page 23 for torque values.
2. If necessary, apply thread sealant to air fittings.
3. Install air line fittings on supply and delivery ports. Use the two-wrench method shown in [Figure 21](#) on page 20 to avoid overtightening the fittings.
4. (**PRO only**) Repeat [Step 3](#) for Emergency air supply port.
5. Connect air lines, labeled from removal procedure, to the appropriate ports:
 - A. SUPPLY
 - B. DELIVERY
 - C. (**PRO only**) EMERG.
6. Connect controller assembly wire connector.
7. Recharge trailer air system.

8. **Test** for air leaks by listening or using soapy water. Refer to [CHECKING FOR AIR LEAKS](#) on page 44.
9. **Perform** [MANUALLY CHECK TIRE PRESSURE](#) on page 46 for at least two tires.
10. **Check Inflation Pressure:**
 - For CP - [CHECKING CP INFLATION PRESSURE](#) on page 47
 - For PRO - [CHECKING PRO COLD INFLATION PRESSURE](#) on page 50

REPLACING HUBCAP WINDOW

Replacement hubcap window kits are available (Hendrickson literature number [L878 TIREMAAX® Parts List](#)) for various TIREMAAX hubcap windows.

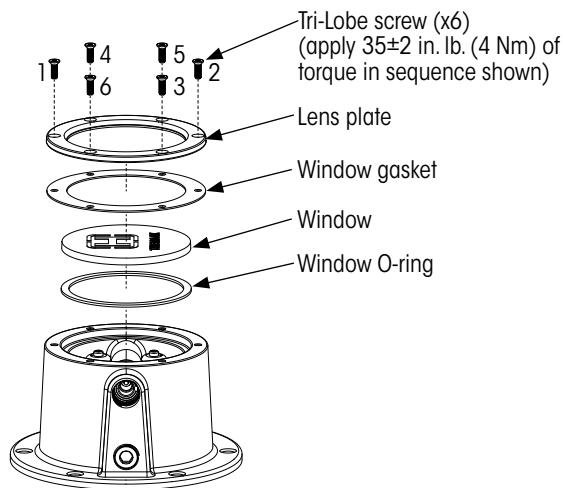


Figure 56: Hubcap window assembly

When replacing the window, assemble in the order shown in Figure 56. **Tighten** Tri-Lobe screws to 35±2 in. lbs. (4 Nm) of torque **in the sequence shown**.

WHEEL REMOVAL AND INSTALLATION

Set trailer emergency brake and disable the system before wheel removal.

1. **Close** supply valve on the controller to shut off pressure to the system.
2. **Turn vehicle off** and **disconnect** tire hose(s) at both ends ([Figure 26](#) on page 22).
3. **Observe and record** wheel orientation (clocking) Refer to [Figure 24](#) on page 21.
4. **Remove** wheel(s) as needed.

NOTICE

Take care not to damage the hubcap port and threads.

5. **Install** new or repaired wheel(s) as needed, making sure the wheel is properly oriented as recorded in [Step 3](#).

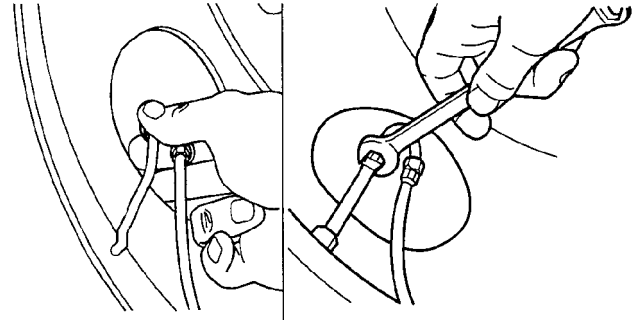


Figure 57: Reattaching tire hoses to tire valve stem

6. **Attach** tire hose(s) to tire valve stem(s) and tighten finger tight ([Figure 57](#)).

NOTE: Tire hoses must be connected directly to the tire valve stems and hubcap port. **DO NOT use valve stem extenders.**

7. Using a $\frac{7}{16}$ inch wrench, **tighten tire hose/valve stem connection** an additional one-half turn ([Figure 57](#)).

DO NOT overtighten this connection. Ensure hose connections are tight enough that, when moving the hose back and forth, it does not cause the connection to move.

IMPORTANT: Hold tire hose with free hand to prevent side loading and avoid cross threading. The knurled nut should easily turn 3 to 4 rotations by hand. Any drag before 3 turns suggests cross threading.

8. **Reattach** tire hose(s) to hubcap, hand-tighten. Using pliers, carefully and gently verify the hose connection is tight.



CONVERTING FROM CP TO PRO

Plumbing from the delivery port to the hubcap is the same for current TIREMAAX® CP and PRO systems. To convert, only the controller and hubcaps need to be exchanged.

IMPORTANT: For converting legacy TIREMAAX CP or EC systems purchased prior to April 2012; the axle hose, axle vent, spindle plug and tire hoses must also be changed. Hendrickson recommends using the TIREMAAX ordering guide to configure a complete TIREMAAX PRO system, minus electrical components.

Electrical components are also the same or can be easily adapted as needed for both current and legacy systems.

Procedures for completing the conversion include:

- CONTROLLER ASSEMBLY REPLACEMENT on page 52
- HUBCAP INSTALLATION on page 20

If for legacy CP or EC systems, also include:

- AXLE HOSE INSTALLATION on page 15
- AXLE VENT INSTALLATION on page 18
- SPINDLE PLUG INSTALLATION on page 18
- TIRE HOSE INSTALLATION on page 22

For assistance or questions, refer to CONTACTING HENDRICKSON on page 4.

APPENDIX A: GLOSSARY

References to system components mentioned in the following descriptions can be found in OPERATION on page 10, Figure 52 on page 47 and Figure 54 on page 49.

The following terms are relative to TIREMAAX PRO or CP systems defined and discussed in this document:

Crack Pressure

A characteristic of spring-loaded check valves. The spring tension determines the pressure differential required to open the valve.

Deflation Pressure

This adjustment is set at the TIREMAAX PRO PRM to be 10 PSI above the Inflation Pressure. Tire pressures above this setting will be exhausted out the PRM exhaust port.

Emergency close (run-flat) pressure

A minimum pressure that tires will deflate to in the event of a catastrophic leak in the system.

Inflation Pressure

Set at the controller's regulator, this is the desired tire pressure for tire inflation when tires are at ambient temperature. The minimum pressure is based on tire manufacturer's tire load/psi charts and tables.

OEM

Original Equipment Manufacturer

PRM

(Pressure Relief Module)

A unit in a TIREMAAX PRO controller that allows and controls tire deflation pressure.

Rotary Union

Rotary air sealed assembly that allows air transfer from fixed spindle to the rotating wheel-end and wheel(s).

TIS

(Tire Inflation Systems)

A system designed to maintain desired pressure in tires and activates a warning to alert the vehicle operator if there is a system or tire leak.



NOTES:

[illegible]

Actual product performance may vary depending upon vehicle configuration, operation, service and other factors.

Call Hendrickson at 866.RIDEAIR (743.3247) for additional information.



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