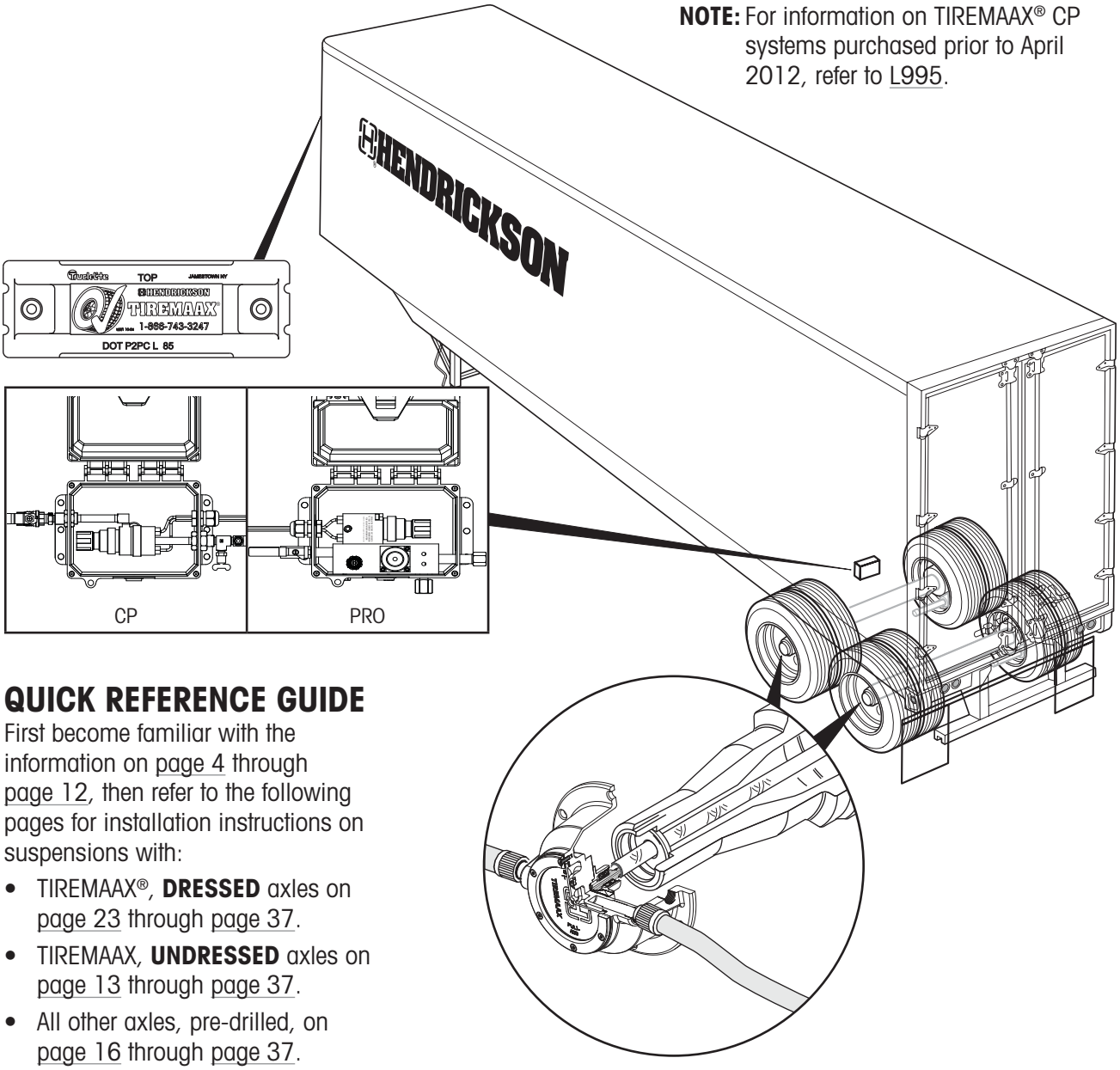
TECHNICAL PROCEDURE

TIREMAAX® PRO AND CP TIRE INFLATION SYSTEMS

SUBJECT: Installation, Service and Troubleshooting Procedures

LIT NO: T51002
DATE: April 2015 **REVISION:** E

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



QUICK REFERENCE GUIDE

First become familiar with the information on page 4 through page 12, then refer to the following pages for installation instructions on suspensions with:

- TIREMAAX®, **DRESSED** axles on page 23 through page 37.
- TIREMAAX, **UNDRESSED** axles on page 13 through page 37.
- All other axles, pre-drilled, on page 16 through page 37.
- All other axles, not drilled, on page 13 through page 37.

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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 hyperlinks.

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 Z535.4 and indicate the use of safety signal words as they appear throughout the publication.

⚠DANGER: INDICATES IMMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH.

⚠WARNING: Indicates hazards or unsafe practices which could result in severe personal injury or death.

⚠CAUTION: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Indicates hazards or unsafe practices which could result in damage to machine or equipment.

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

⚠ **Safety alert symbol** used to indicate a condition exists that may result in personal injury or harm to individuals. It must be applied to DANGER, WARNING and CAUTION statements which emphasize severity.

LINKS

This documents includes links that can be applied when viewed electronically. Links are identified by a dark grey line under the linked text.

GENERAL SERVICE NOTES

IMPORTANT: Special attention should be paid to the information included in EXPLANATION OF SIGNAL WORDS.

Before you begin:
Read, understand and comply with:

- All instructions and procedures.
- All signal word (CAUTION, WARNING and DANGER) statements to help avoid personal injury or property damage.
- Company's maintenance, service, installation and diagnostic practices.
- Vehicle manufacturer's safety instructions when working on the vehicle.
- Vehicle manufacturer's instructions for recommended practices not described in this manual.
- Local safety regulations.

DURING SERVICE:

- Work must be carried out by trained personnel.
- Sudden release of tensioned springs (e.g. the spring brake part of the brake chamber or the brake return spring) may cause injury.
- Use recommended tools only.
- Before releasing trailer back into service, perform operational checks and test the trailer to make sure brakes are working correctly.

NOTICE: While the parking brake is engaged, TIREMAAX® PRO delivery air pressure exhausts to zero psi. Wheel valves close to isolate tires from the system.

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

Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Consult the Hendrickson website (www.hendrickson-intl.com) for the latest version of this manual.

IMPORTANT SAFETY NOTICES

Proper maintenance, service and repair is important to the reliable operation of the suspension system and components. The procedures recommended by Hendrickson and described in this publication are methods of performing inspection, maintenance, service and repair.

The warnings and cautions should be read carefully to help prevent personal injury and to assure that proper methods are used. Improper maintenance, service or repair can cause damage to the vehicle and other property, personal injury, an unsafe operating condition or void the manufacturer's warranty.

Carefully read, understand and follow all safety related information within this publication.

⚠WARNING: DO NOT modify or rework parts. Use ONLY Hendrickson authorized replacement parts. Use of substitute, modified or replacement parts not authorized by Hendrickson may not meet Hendrickson's specifications. It can also result in failure of the part, loss of vehicle control and possible personal injury or property damage. Do not modify parts without written authorization from Hendrickson.

⚠WARNING: Always wear proper eye protection and other required PPE (personal protective equipment) when performing vehicle maintenance, repair or service. Follow federal, state and local regulations as appropriate.

⚠WARNING: Solvent cleaners can be flammable, poisonous and can cause burns. To help avoid serious personal injury, carefully follow the manufacturer's product instructions and guidelines and the following procedures:

- **Wear proper eye protection.**
- **Wear clothing that protects your skin.**
- **Work in a well ventilated area.**
- **DO NOT use gasoline, or solvents that contain gasoline. Gasoline can explode.**
- **Hot solution tanks or alkaline solutions must be used correctly. Follow the manufacturer's recommended instructions and guidelines carefully to help prevent personal accident or injury.**

⚠WARNING: The following precautions and considerations should be applied when handling brake lining:

- **Compressed air or dry brushing should never be used for cleaning brake assemblies or work area.**
- **Follow applicable shop, local, state and federal safe practices for working with and disposal of brake lining materials.**
- **Hendrickson recommends that workers doing brake work should take steps to minimize exposure to airborne brake lining particles. Proper procedures to reduce exposure include working in well ventilated area, segregation of areas where brake work is done, use of local filtered ventilation systems or use of enclosed cells with filtered vacuums.**
- **Material Safety Data Sheets (MSDS) on this product, as required by OSHA, are available online from Hendrickson.**

⚠CAUTION: A mechanic using a service procedure or tool which has not been recommended by Hendrickson must first satisfy himself that neither his safety nor the vehicle's safety will be jeopardized by the method or tool selected. Individuals deviating in any manner from the provided instructions assume all risks of consequential personal injury or damage to equipment.

NOTICE: When welding to or on the axle, take every caution to prevent bearing damage. When grounding welding equipment to axle, prevent current from passing through the wheel bearings.

A connection that places a wheel bearing between the ground cable connection and the weld area can damage the bearing by electric arcing.

CONTACT HENDRICKSON

Contact Hendrickson Trailer Technical Services for technical assistance as needed. To do so, several options are available, however, some preparation is recommended.

Prior to contacting Technical Services, gather the following applicable information about your Hendrickson suspension:

- Suspension ID Tag information (Refer to Hendrickson Lit. No. L977 *ID Guide*, page 2 for tag location and details):
  - Suspension model number
  - Suspension serial number
  - Approximate number of suspension miles.
- Vehicle VIN number. Refer to trailer OEM manual for VIN plate location.
  - Trailer Type (van, reefer, flat bed, etc…)
  - Manufacturer
  - VIN (vehicle identification number)
  - In-service date [1]
- If applicable, description of the system problem, part number and/or 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
  - Symptoms-
    - » Systems, components or function effected by failure.
    - » When does failure occur?
    - » How often do they occur?
    - » Etc…
- What troubleshooting and/or measurements have been performed?
- What service data literature do you have or need?
- Digital photos of suspension and damaged areas.
- Special application approval documentation (if applicable).

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

EMAIL

For Hendrickson Trailer Technical Services, use the following e-mail address:

htts@hendrickson-intl.com

PHONE

Contact Hendrickson directly in the United States or in Canada at 866-RIDEAIR (743-3247). From the menu, select:

- **Technical Services**/Warranty.

Other choices include:

- **Aftermarket Sales** for replacement parts information and ordering.
- **Original Equipment Sales** for parts inquires and ordering for trailer manufacturers.

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/literature/

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

Other relative literature may include:

NAME	DESCRIPTION
L583	*Comprehensive Warranty Statement (US and Canada)*
L878	*TIREMAAX® Parts List*
L995	*TIREMAAX CP Installation, Service and Troubleshooting Procedures* (applies to TIREMAAX CP systems purchased prior to April 2012)
T51003	*TIREMAAX® CP & PRO Installation Poster*
T50018	*TIREMAAX® Manual Tire Check Decal*

Table 1: *Relative literature*

PREPARING TRAILER FOR SERVICE

NOTE: DO NOT service a suspension or any components that are under warranty without first contacting Hendrickson Technical Services. Refer to CONTACT HENDRICKSON for details.

⚠WARNING: To prevent serious eye injury, always wear safety glasses when performing trailer maintenance and service.

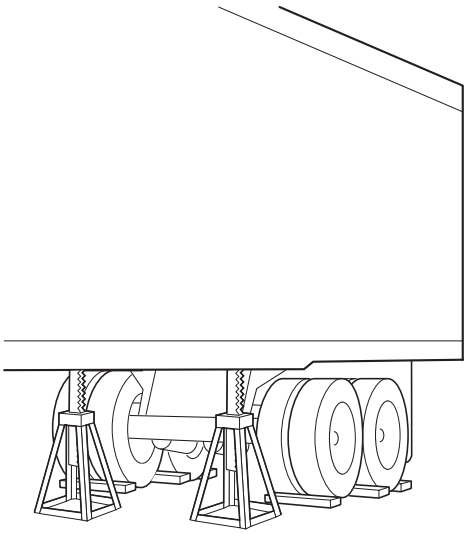


Figure 1: *Trailer preparation*

Before beginning any work on a trailer suspension system, the following steps help to ensure conditions are safe. Refer to GENERAL SERVICE NOTES on page 4.

1. **Park** trailer on a level, debris-free surface.
2. **Set** trailer parking brakes.
3. To prevent the trailer from moving, **chock** wheels on axle not being raised.
4. **Exhaust** air from the trailer suspension.
5. **Release** trailer parking brakes.
6. If necessary, using a jack, **raise** trailer until wheels clear the work surface.
7. **Support** raised trailer with safety stands.

⚠WARNING: Do not work under a trailer supported only by jacks. Jacks can slip or fall over, resulting in serious personal injury.

GENERAL INFORMATION

This sections includes a general overview of the information included in this manual and TIREMAAX® PRO and CP systems.

ABOUT THIS MANUAL

This manual is provided to support Hendrickson TIREMAAX® CP and TIREMAAX® PRO tire inflation systems. The manual provides the following information:

- General Information
- Operation
- Components
- Installation
- Service
- Troubleshooting
- Glossary
- Appendices

SYSTEM OVERVIEW

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

- TIREMAAX PRO and CP controllers use trailer air tank supply to provide a constant regulated target pressure to air seals and hoses to inflate all tires.
- TIREMAAX PRO additionally monitors and deflates tire pressure as needed

FEATURES

Features include:

- Indicator lamp (Figure 4 on page 12) that illuminates when regulated air flow exceeds the designed threshold. This occurs while tires are inflating or there is a system leak.
- Tire pressure is continuously and automatically held at target pressure for inflation.
- Does not pressurize axle tube (helps prevent contamination of seals).
- In-axle filter prevents hub contamination and allows any wheel-end air leaks to evacuate through the axle vent.
- Seal and line leaks will not pressurize wheel ends.
- No venting at wheel end helps prevent contamination from entering hubcap.
- Integrated valves isolate tires from system when there is a problem (e.g. damaged or flat tire).
- The rotary union is incorporated in 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.
- Tire target pressure set to OE specifications.
- TIREMAAX PRO includes a deflation pressure that is preset greater than the target 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

Table 2: TIREMAAX® PRO *and* CP *general specifications*

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 in the front of the trailer (Figure 4 on page 12) or in a location within view of the driver from the cab.

HOW THE SYSTEM OPERATES

TIRE INFLATION

The TIREMAAX system is set to a specified **target pressure** for inflation. As long as the pressure in the trailer air tank is above the target 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 target 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 target pressure. For TIREMAAX PRO, all check valves are open allowing air to flow in both directions with the same psi throughout.

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

If there is a tire leak or leak in the lines, the indicator lamp may or may not remain on. Refer to TROUBLESHOOTING on page 37.

- If the indicator lamp (Figure 2) remains on for more than 10 minutes, the system is attempting to inflate the tires but may not be able to adequately maintain proper tire pressure. 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.
- The remaining tires are protected from pressure loss by integral valves located in each tire hose or hubcap.

TIRE DEFLATION (TIREMAAX® PRO only)

A common cause of pressure variance in tires is temperature (Figure 55 on page 56). Tire temperature and pressure can rise when:

- Transporting from cold to warm or hot weather.
- Inflating while cold, then tires heat up during operation of the trailer.
- Tire temperature increases with speed.
- Tire pressure is affected by a change in elevation.

Deflation pressure is set at a fixed value greater than the target pressure[2]. 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 target pressure while parked. This may illuminate the indicator lamp at start-up. Refer to GLOSSARY on page 55 for examples of temperature effects on tire pressure.

[2] TIREMAAX® PRO target pressure and deflation pressure are factory preset to trailer OE specifications. Hendrickson presets the deflation pressure at 10 psi above target pressure.

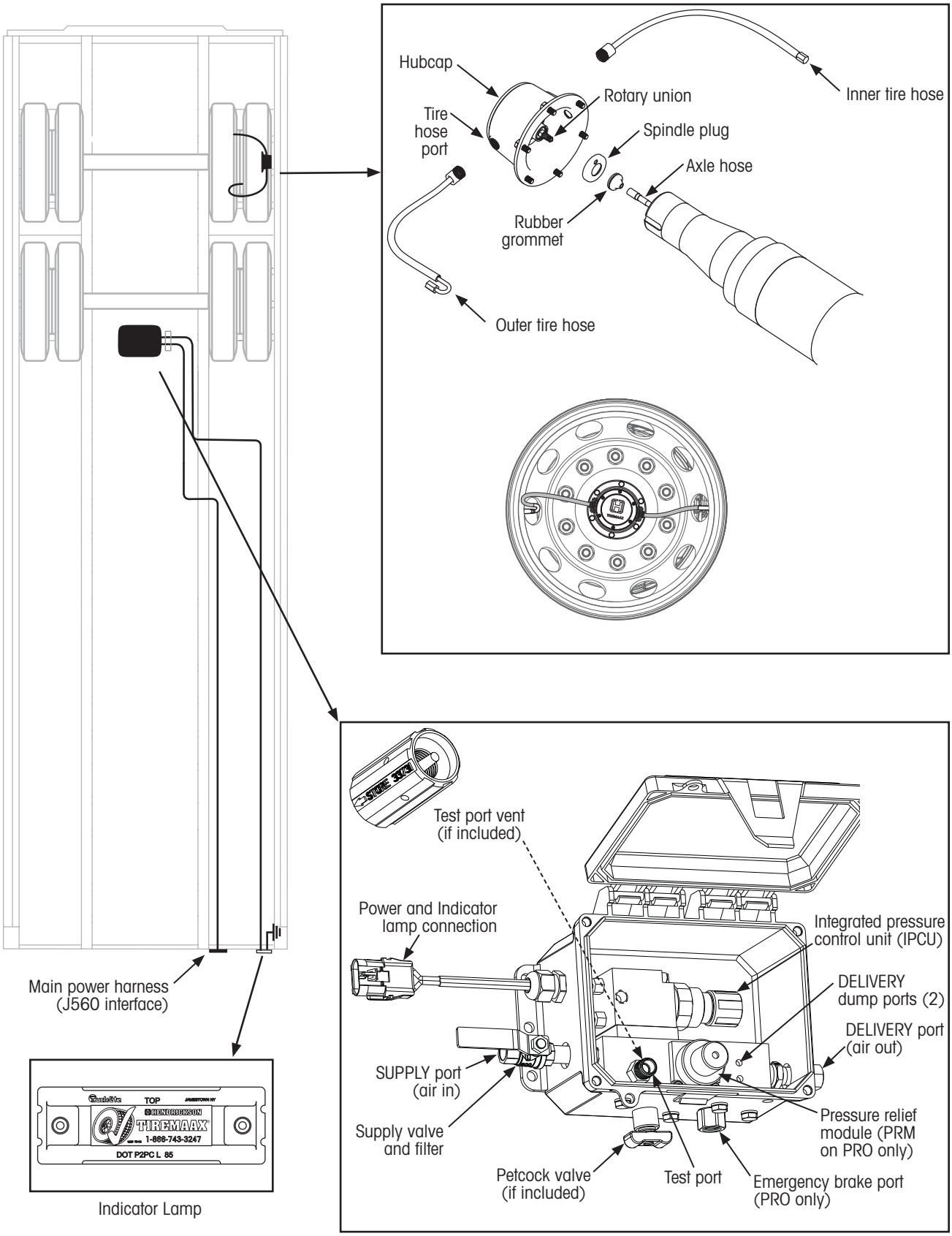


Figure 2: TIREMAAX® *components*

COMPONENT DESCRIPTION

This section includes a brief overview of TIREMAAX® PRO and CP components. Refer to Figure 2 on previous page.

TIREMAAX® CONTROLLERS

The controllers in the TIREMAAX systems control target 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 29 on page 25):
  - Include mounting flanges integral to enclosure.
  - Can be mounted on new or existing trailers.
  - Sealed lid protects internal components from environment.
- Internal components include:
  - **IPCU** (Integrated Pressure Control Unit)
    - » Regulates air flow from trailer air tank to tires.
    - » Regulated target pressure is set to match cold tire inflation pressure.
  - **PRM** (Pressure Relief Module, **PRO only**)
    - » Relieves tire pressures that are 10 psi (69 kPa) above target pressure.
    - » Includes adjustment for setting deflation pressure point. Excess pressure is dumped out the delivery dump ports.
  - (**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 (parking) brake port** — when emergency or parking brake is set:
    - » Isolates TIREMAAX PRO components from supply (tank air).
    - » Pressure in TIREMAAX delivery lines drop to zero psi.

NOTICE: While the parking brake is engaged, delivery air pressure exhausts to zero psi. Wheel valves close to isolate tires from the system.

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

HUBCAP

Although the same casting is used for each hubcap, TIREMAAX PRO will have the word "PRO" on the hubcap window. Each hubcap is configured and assembled to match the requirements of the application (CP or PRO, grease or oil, etc.) Hubcap variations are listed in L868 TIREMAAX *ordering guide*.

NOTE: For compatibility with hub and wheel-end components or application concerns, CONTACT HENDRICKSON.

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 violate warranty.

  - Rotary union that connects rotating hubcap directly to stationary axle hose.

- (**PRO only**) Hubcap wheel valves -
  - » Identified by red anodized 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.)

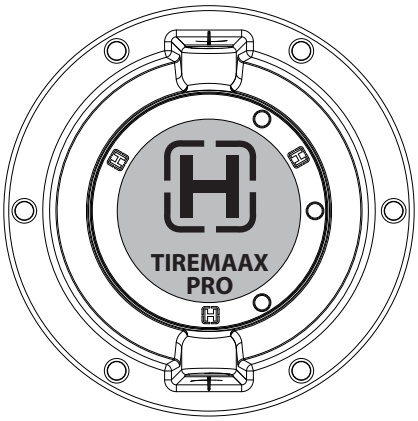


Figure 3: *Hubcap window example (oil-filled PRO hubcap shown)*

AXLE HOSES AND FITTINGS

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

Refer to Figure 9 through Figure 39 for a complete description of air hoses and fittings.

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

- Do not require modification to the standard valve stem or core.
- Allow for manual pressure check and fill at the hose end. Refer to MANUALLY CHECK TIRE PRESSURE on page 46.

INDICATOR LAMP

- 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 37.

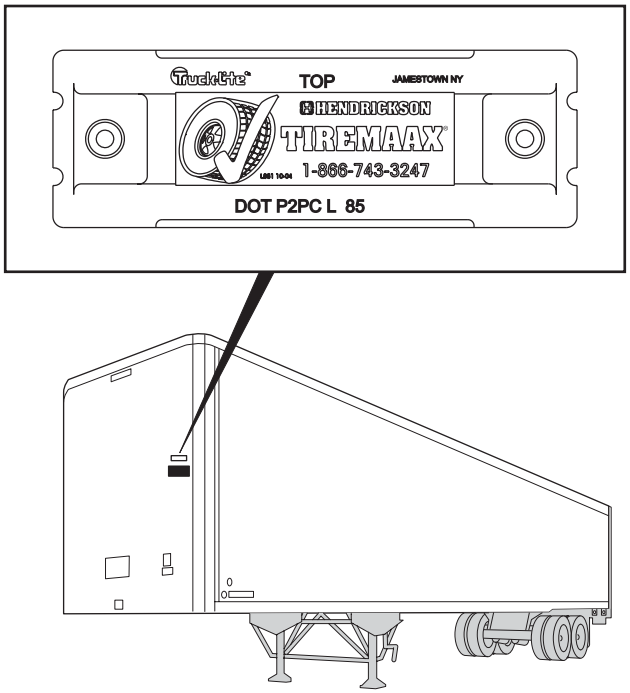


Figure 4: *Indicator lamp typical location*

INSTALLATION

Installation of TIREMAAX® PRO and CP systems can be done on new or existing axles. For application and installation questions, refer to CONTACT HENDRICKSON on page 6.

INSTALLATION MATERIALS AND SUPPLIES

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

- Controller assembly **mounting bolts** (Figure 29 on page 25)
- **PPV**, Pressure Protection Valve.
- **Indicator lamp and wire**, if not configured as part of TIREMAAX kit (Figure 41 to Figure 42).
- **Spindle plug driver and handle**[3] (Figure 17 on page 19), unless the spindle plugs are already installed in the axle from the factory.
- **Air lines and fittings** as defined in Figure 34 to Figure 39.

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 16
Axle hose and spindle plugs are already **installed**, but undressed	HUBCAP INSTALLATION on page 21
System hardware is already installed on a **dressed axle**	TIRE HOSE INSTALLATION on page 23

Table 3: *Installation starting points*

[3] Components unique to TIREMAAX® are available only from Hendrickson.

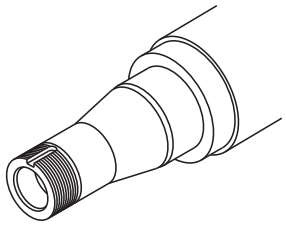
AXLE PREPARATION

The first stage of TIREMAAX installation is axle preparation. Starting with Figure 5, 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. 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 PREPARING TRAILER FOR SERVICE on page 7 for details.

HN spindle



HP spindle

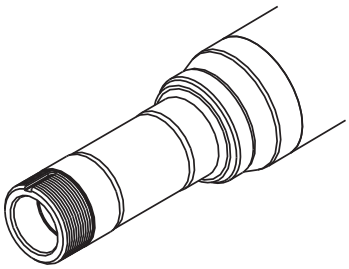


Figure 5: *Axle spindle identification*

1. **Chock** wheels to keep trailer from moving according to PREPARING TRAILER FOR SERVICE on page 7.
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.

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 16. 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 16. 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 6 or Figure 7, 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/literature), 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 16.

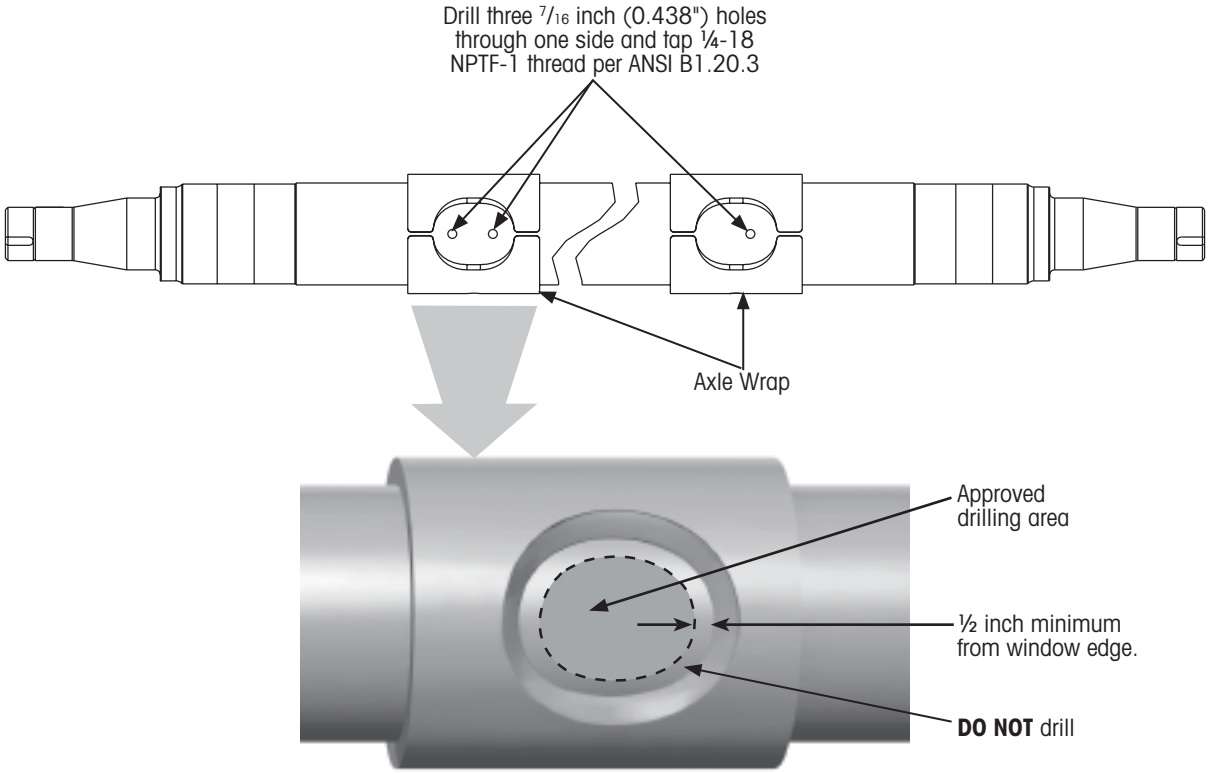


Figure 6: INTRAAX® / VANTRAAX® *suspension axle drilling details*

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.

NOTE: If pre-drilled by Hendrickson, the second hole in the window wrap is on the roadside and accommodates an axle vent assembly. These holes must be within the approved drilling area, but spaced far enough apart to allow 90° elbow fittings to be threaded into them.

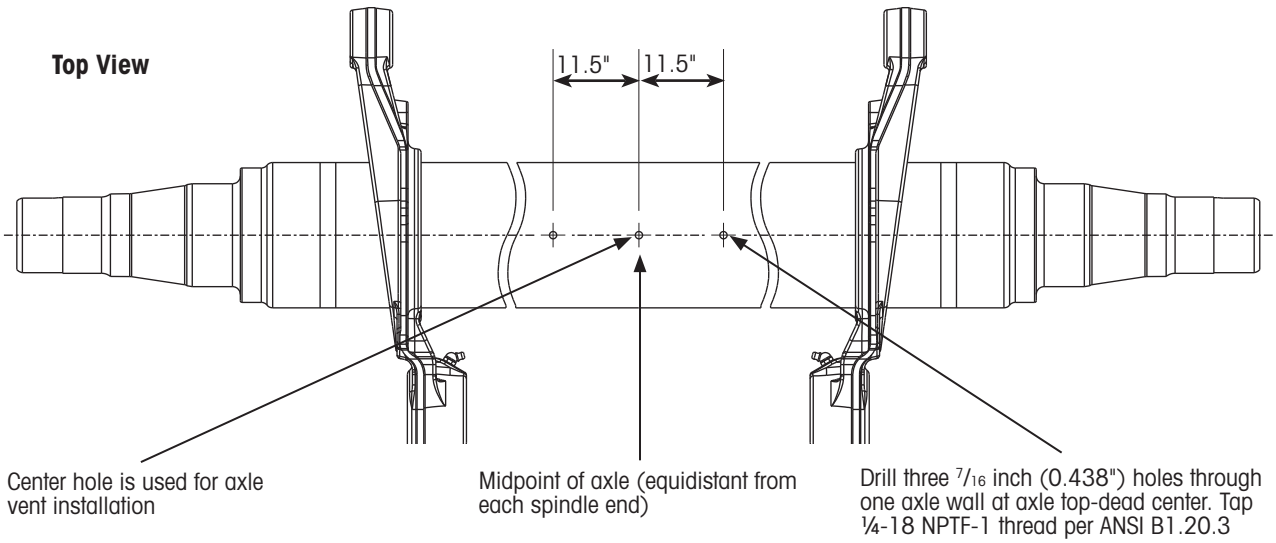


Figure 7: *Hendrickson* TRLAXLE® *drilling details*

NOTICE: Before drilling, make sure holes will not interfere with suspension mounting method. If hole will interfere, contact Hendrickson Technical Services using CONTACT HENDRICKSON on page 6.

NOTE: Figure 7 drilling details are for Hendrickson TRLAXLE®. If other than TRLAXLE, CONTACT HENDRICKSON.

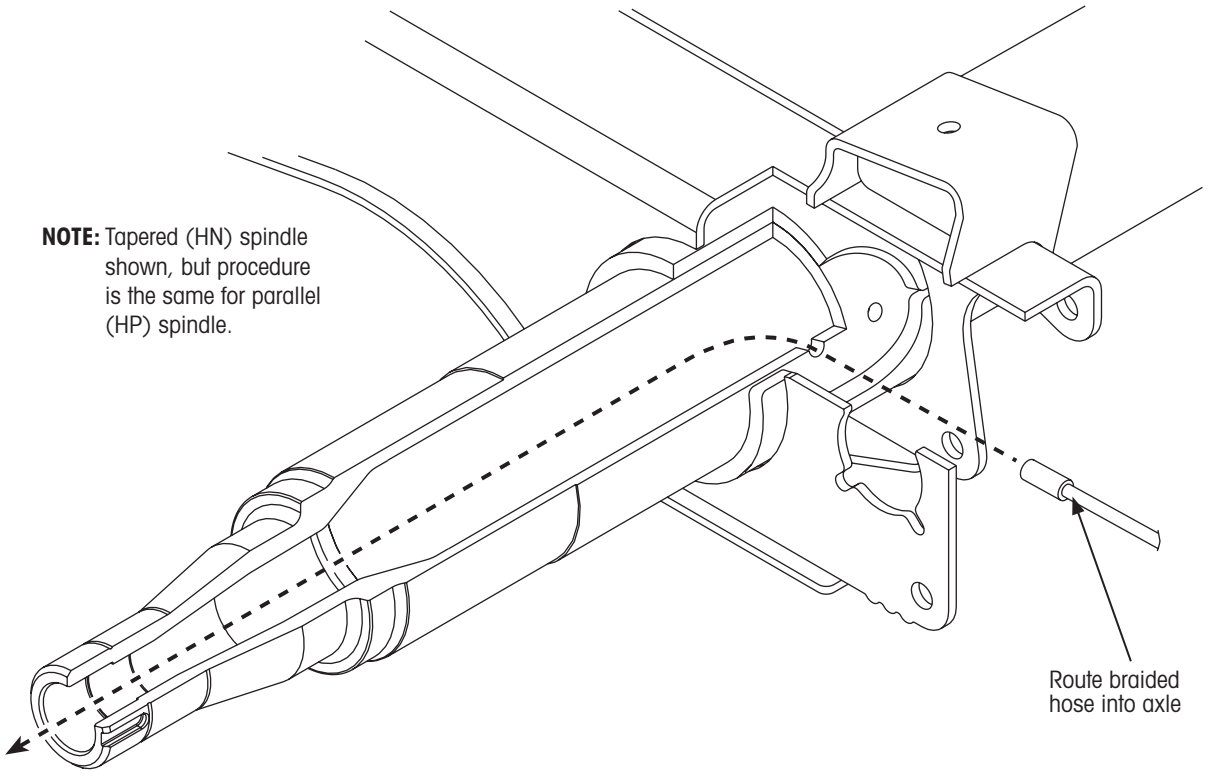


Figure 8: *Routing axle hose*

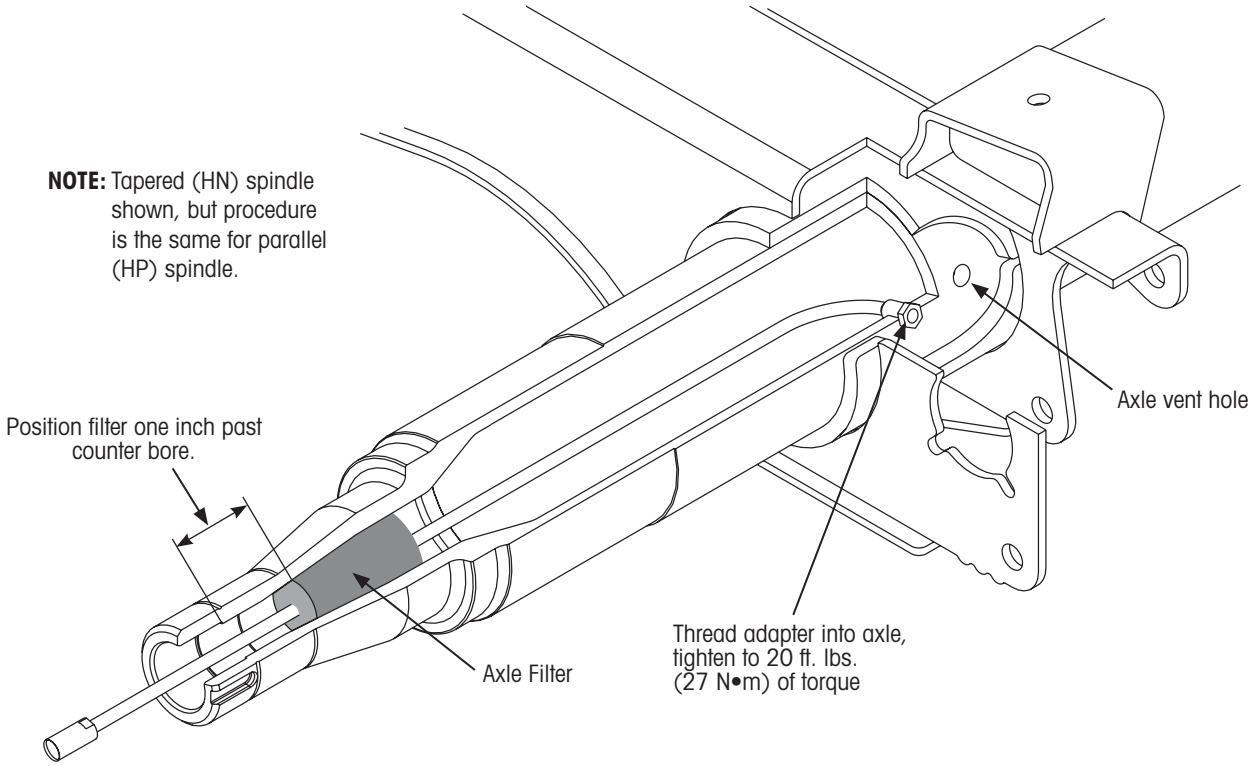


Figure 9: *Installed position of axle hose assembly*

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 16
- ADDITIONAL AXLES on page 17
- AXLE VENT INSTALLATION on page 18
- SPINDLE PLUG INSTALLATION on page 20
- HUBCAP INSTALLATION on page 21
- TIRE HOSE INSTALLATION on page 23

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.

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 8). On Hendrickson **TRLAXLE®** Trailer Axles, **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 N•m) of torque (Figure 9).
5. **Feed** metal braided hose through slit in filter.
6. **Push** axle filter into spindle cavity (Figure 9).

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 9), refer to AXLE VENT INSTALLATION on page 18.

ADDITIONAL AXLES

For systems with one, two or more additional axles, observe the installation requirements as shown in the following diagrams (Figure 10 to Figure 14). Extend the main 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. CONTACT HENDRICKSON for details.

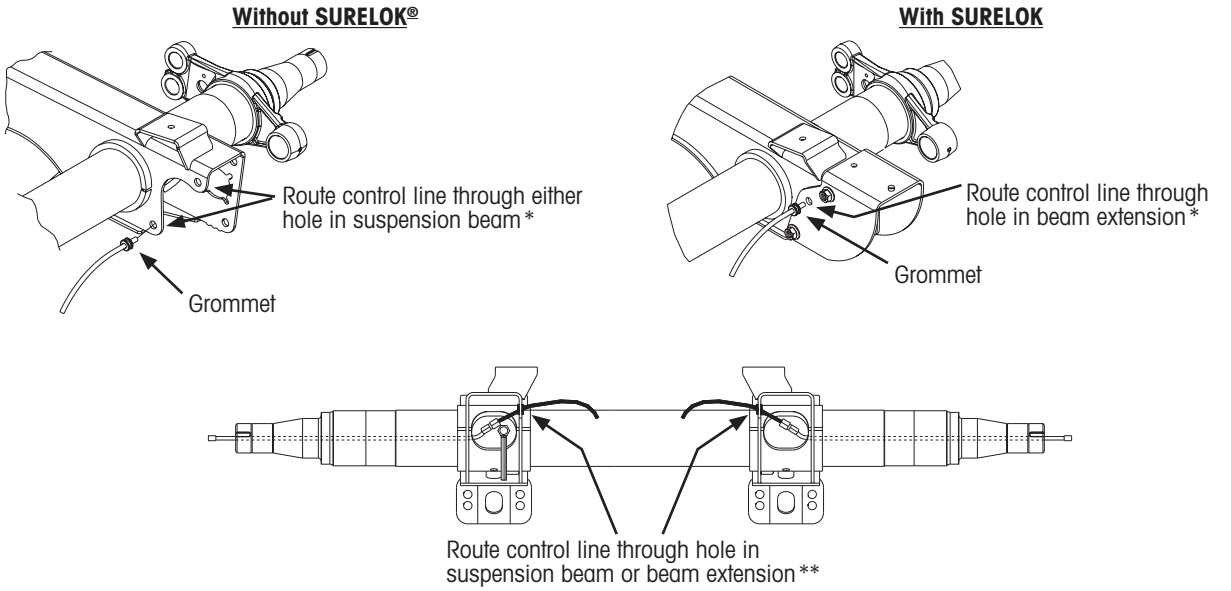


Figure 10: *Suggested control line installation details for Top Mount, Wide Bushing, Standard Duty Models* ***AAT, HKAT***

* 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.

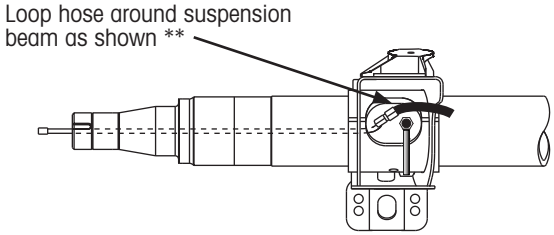


Figure 11: *Suggested control line installation details for Top Mount, Narrow Bushing, Standard Duty Models* ***AANT, HKANT, AAZNT***

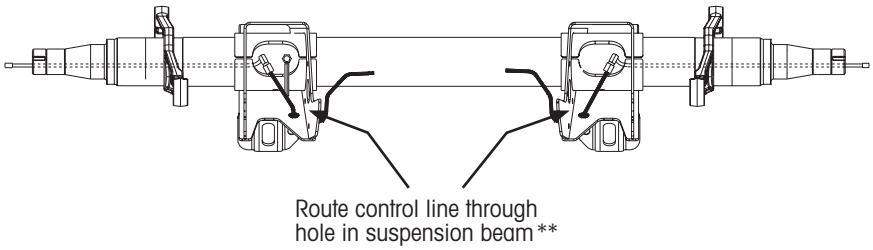


Figure 12: *Suggested control line installation details for Low Ride, Wide Bushing, Standard Duty* ***AAL, HKAL, AAZL****; Low Ride, Wide Bushing, Extreme Duty* ***AAEDL 30K*** *and Top Mount, Wide Bushing, Extreme Duty* ***AAEDT 30K*** *Models*

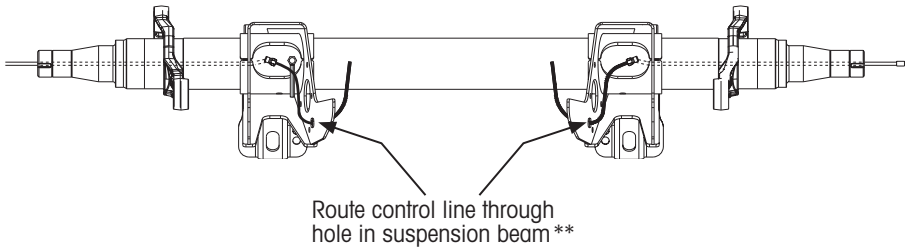


Figure 13: *Suggested control line installation details for Low Ride, Short Beam, Narrow Bushing, Standard Duty Models* ***AANLS 20K***

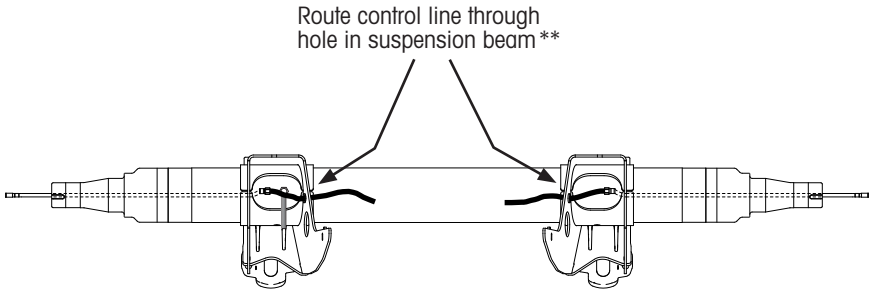


Figure 14: *Suggested control line installation details for Low Ride, Narrow Bushing, Standard Duty Models* ***AANL, HKANL***

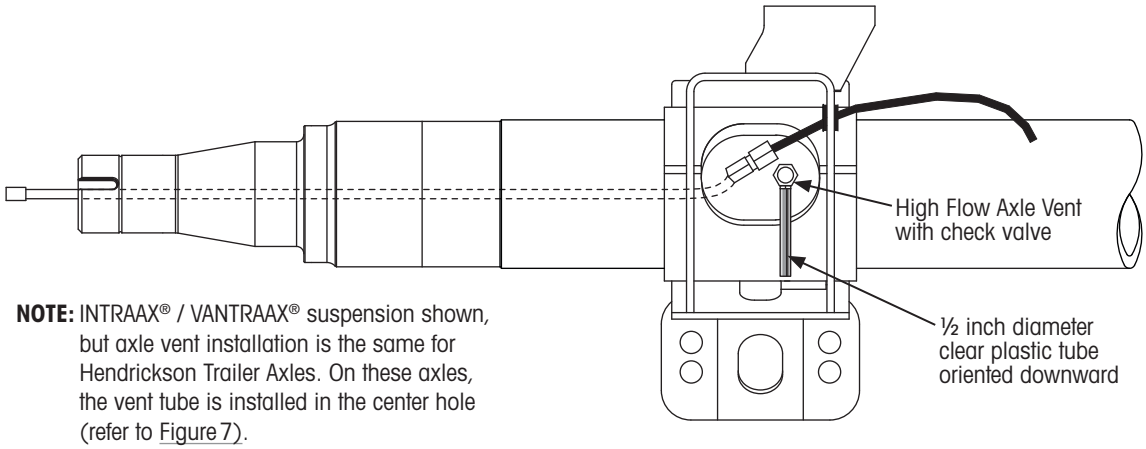
** It is the OEMs responsibility to route air lines and orient axle connector fittings so as to eliminate interference between slack adjusters and air lines. Lines should be protected against chaffing when passing through or by metal edges.

AXLE VENT INSTALLATION

The High Flow Axle Vent is installed in the previously drilled hole as shown in Figure 15. Refer to Axle Preparation on page 13 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 and/or water ingestion. This could cause wheel-end failure resulting in severe personal injury or death.



NOTE: INTRAAX® / VANTRAAX® suspension shown, but axle vent installation is the same for Hendrickson Trailer Axles. On these axles, the vent tube is installed in the center hole (refer to Figure 7).

Figure 15: *Typical axle vent installation*

1. **Install** axle vent into hole provided in axle (Figure 15 on page 18) and **hand-tighten**.

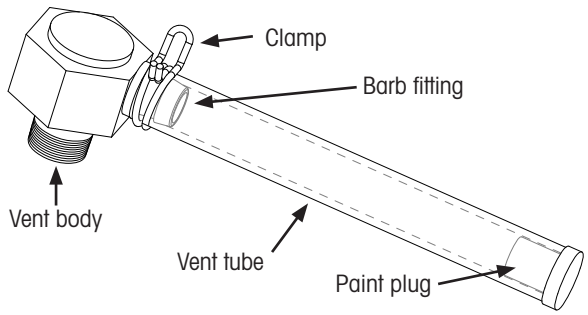
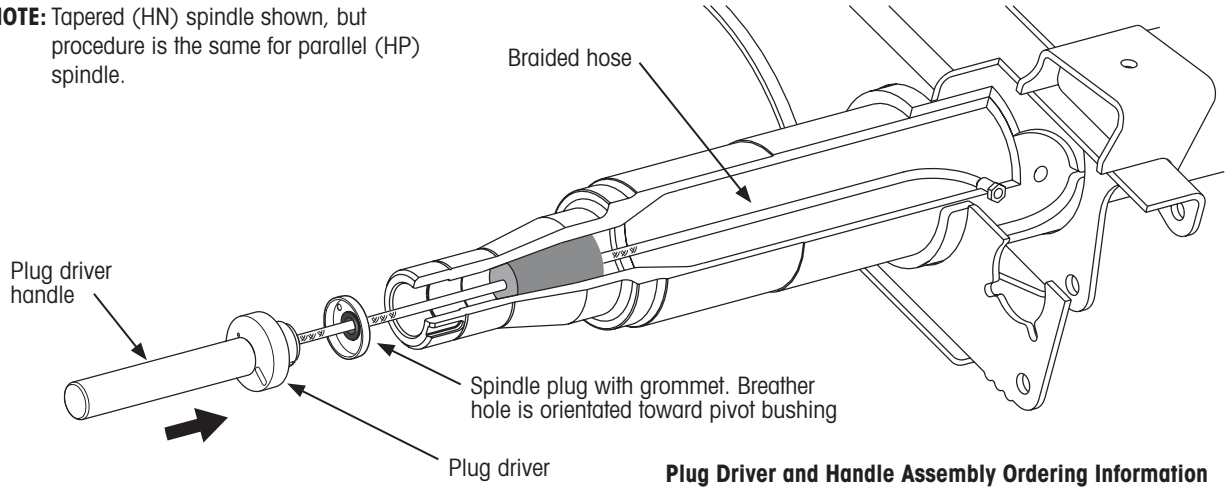


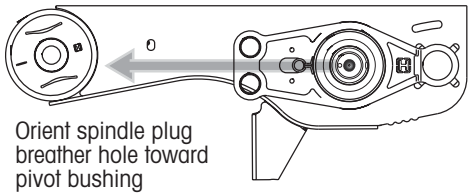
Figure 16: *High Flow Axle Vent Assembly*

NOTE: For TRLAXLE® refer to Figure 7 on page 15 for location. In this case, the vent tube is different from that in Figure 16 and curves to point downward. It can be rotated upward during installation.

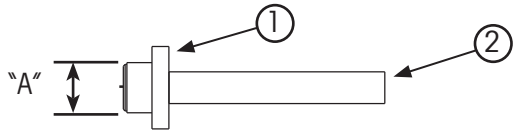
2. Using a 1 inch socket and torque wrench, **tighten** vent body to 10 ft. lbs. (13 N•m) then rotate to aim tube fitting downward as shown in Figure 15.
3. If necessary, use 1 inch wrench to adjust vent body and tube to **point downward** after torquing.
4. Remove and **discard** paint plug (if present).

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 17: *Spindle plug installation*

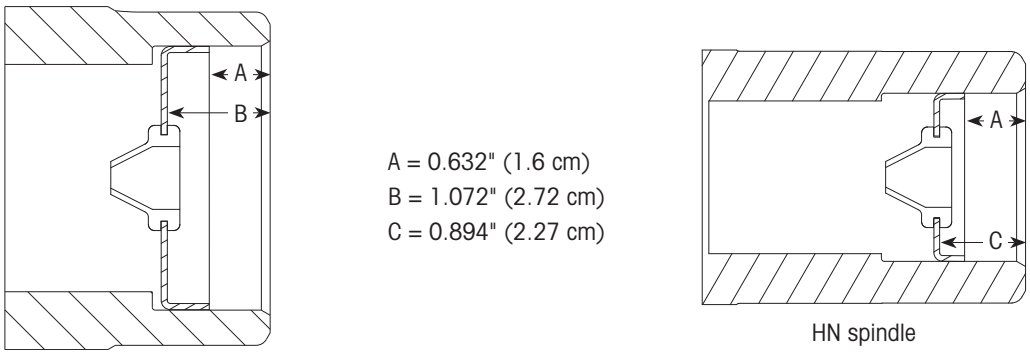


Figure 18: *Recommended spindle plug depth (if not using plug tool shown in Figure 17)*

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 17 and **install** grommet pointing into spindle.
2. **Thread** brass fitting of axle hose through grommet.
3. With spindle plug breather hole oriented toward the pivot bushing (Figure 17), **place** plug assembly against the spindle end.
4. With axle hose brass 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 17) regulates the correct installation depth as shown in Figure 18. 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 or cost effective. For this reason, Figure 18 provides the recommended depth dimensions.

HUBCAP INSTALLATION

IMPORTANT: Once installed, **DO NOT remove hubcap**. To protect warranty on Hendrickson dressed axles, skip to TIRE HOSE INSTALLATION on page 23. CONTACT 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 11 for more hubcap options).

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

Table 4: *Basic hubcap types*

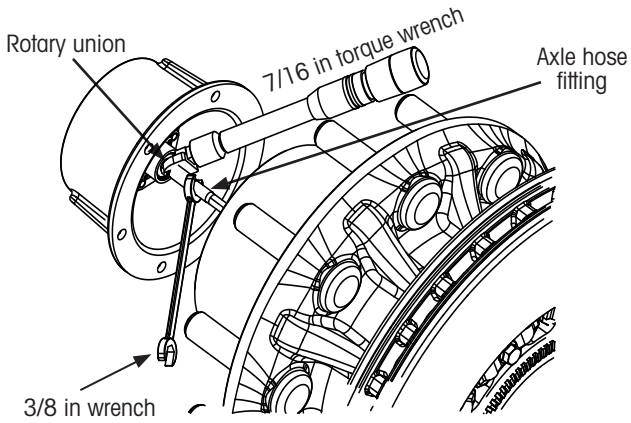


Figure 19: *Hubcap to axle hose connection*

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 19).
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. Similarly to Figure 19, applying an inch-pound torque wrench on the 7/16 inch flats on rotary union shaft and 3/8 inch wrench on the flats of the axle hose fitting, **tighten** connection to 50±5 in. lbs. (5.7±0.6 N•m).

   NOTICE: For clocking of tire hose positioning, review TIRE HOSE INSTALLATION on page 23 **before proceeding.**
5. **Place** two opposing bolts in hubcap and **align** gasket to bolts.
6. **Orient** hubcap for best tire hose positioning (Figure 22 on page 22) and **align** holes with hub face threaded holes. **Hand-tighten** the two bolts.
7. **Install** remaining four hubcap bolts and **hand-tighten**.

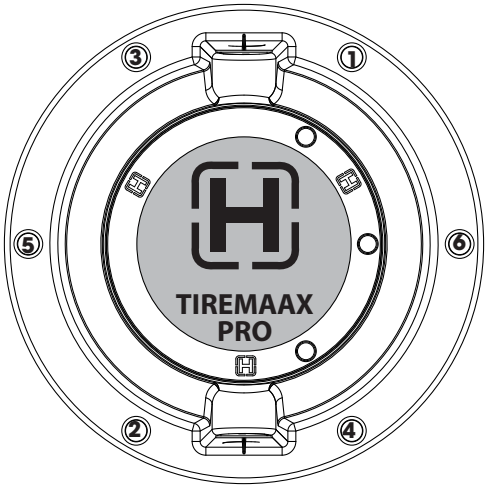


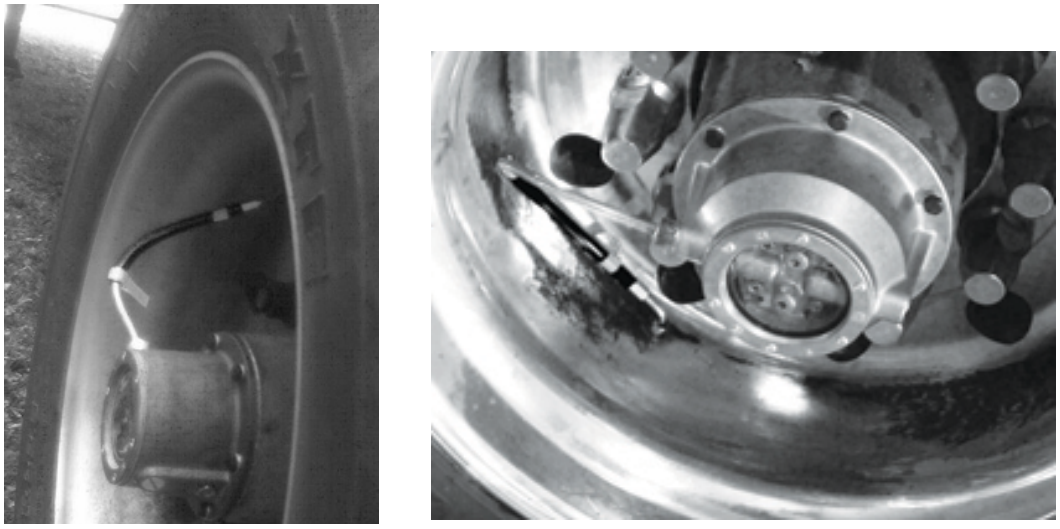
Figure 20: *6-bolt hubcap torque pattern*

8. **Torque** hubcap bolts in the order shown in above figure. Torque is 15±3 ft. lbs. (20.3±4.1 N•m).

Repeat procedure for each wheel end.

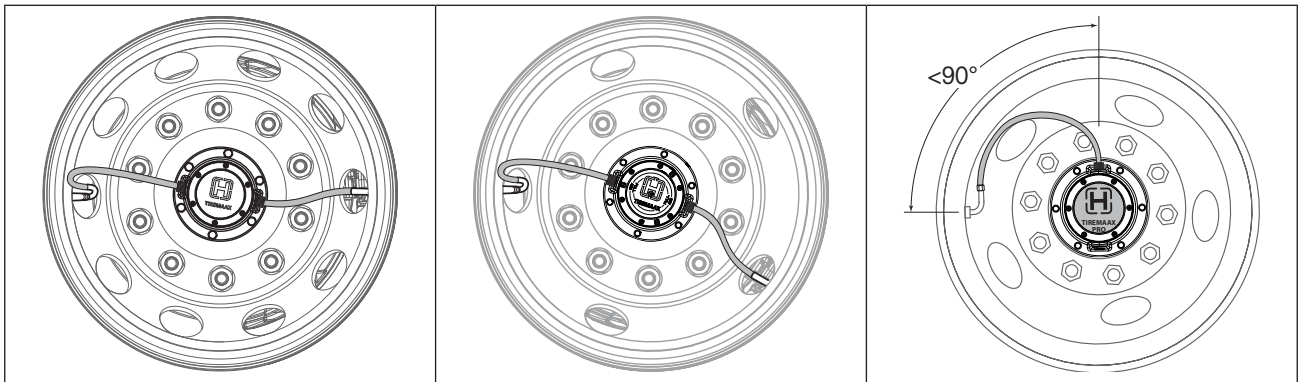
NOTE: If oil lubricated wheel-end, **oil can be added after hubcap is installed** and before installing tire hoses. For details on wheel-end lubrication, refer to L496 or OE documentation.

The **oil-fill plug comes loosely installed** from the factory in the hubcap port. This plug must be tightened to prevent wheel end lubricant from leaking out of the hub.



Not OK, extends beyond hubcap and rim **OK**

Figure 21: *Tire hose installation sample*



NOTE: When the wheel is installed, verify:

- Tire hose is not stretched so tightly a strain is introduced at either the valve stem or hubcap.
- Make sure the tire hose is not so loose it contacts the wheel.
- Check to ensure no portion of the tire hose extends out past the wheel.

Figure 22: *Properly clocking hubcap and wheels to prevent tire hose damage during operation*

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 22).

NOTICE: The wheel must be properly "clocked" to the hubcap to prevent the hoses from rubbing on the wheel (Figure 22) and extending beyond hubcap.

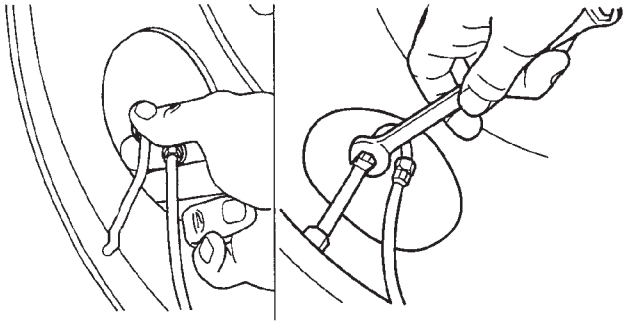


Figure 23: *Attaching tire hoses to tire valve stem*

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 23).
5. Using a 7/16 inch wrench, **tighten** the tire hose / valve stem connection an additional one-half turn (Figure 23). **Do not overtighten this connection**.

NOTE: If using a torque wrench, **Torque** to 28±2.0 in. lbs. (3±0.0 N•m).

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.

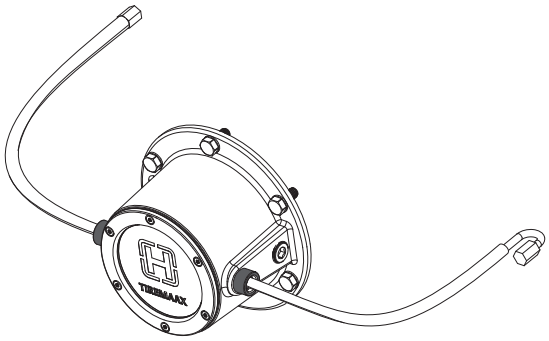


Figure 24: *Dual tire hose to hubcap connection(s)*

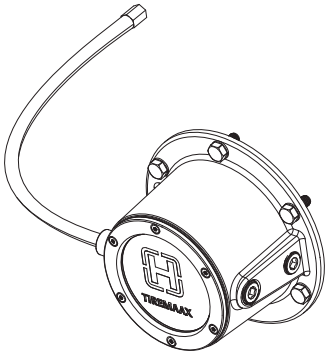


Figure 25: *Super-single tire hose to hubcap connection*

7. **Loosely connect** other end of tire hose(s) (Figure 24 for dual or Figure 25 for super-single) to the outlet port of the hubcap and check to ensure hose(s) meet criteria of Figure 21 and Figure 22.

   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 5. 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 21 and Figure 22 on page 22 for examples):

A. Route tire hoses inside rim area (Figure 21).

B. To further restrain tire hoses within rim area and take up slack,"clock" wheel rotation relative to hubcap position (Figure 22).

C. Valve stem orientation is not critical to TIREMAAX® performance as long as the hose is routed as noted in Figure 22.

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.

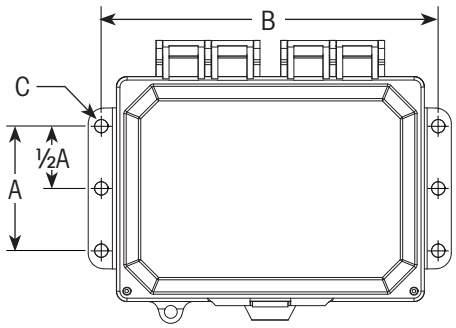
E. Super single wheels, view C of Figure 22 and Figure 25, require only one tire hose. Positioning the hubcap port 90° from the valve stem provides optimum fit. The unused port (on the side with the oil-fill plug) will be plugged.

NOTE: This plug must be tightened to prevent wheel end lubricant from leaking out of the hub.

CONTROLLER INSTALLATION

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

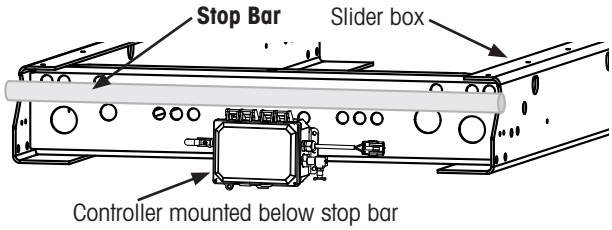
- Protect the controller and air lines from flying debris.
- Provide a secure and stable mounting surface.
- Allow access for maintenance.
- Provide easy access to a reservoir, emergency/ supply line and delivery lines.
- Mount with door hinge at top, with room to open door and (if included) petcock pointing down.
- If required, use the hole pattern shown in Figure 26.
- Use a minimum of four 5/16 inch bolts, washers and nuts.
- **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.



DIM.	INCH	MM
A	3	7.62
B	8.12	20.6
C	6x 0.32 DIA	6x 0.81 DIA

Figure 26: *Controller box hole pattern*

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



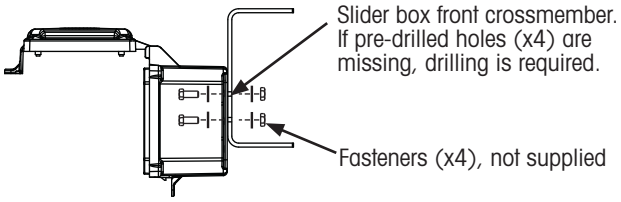


Figure 27: *Controller mounting to slider*

A. Hendrickson **K-2® slider box mounting** (Figure 27, mounted low to avoid interference with slider stop bar). Four holes (two pair) are pre-drilled in the crossmember for this purpose.

NOTICE: Failure to properly orient the controller and mounting bracket, as shown below, will result in slider stop bar interference and controller assembly damage.

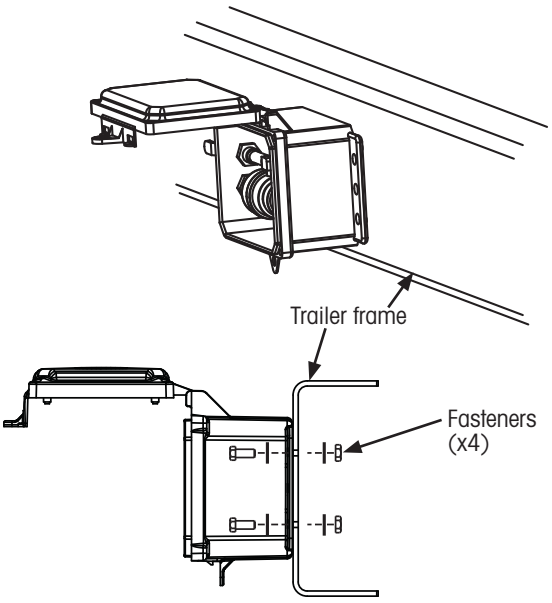
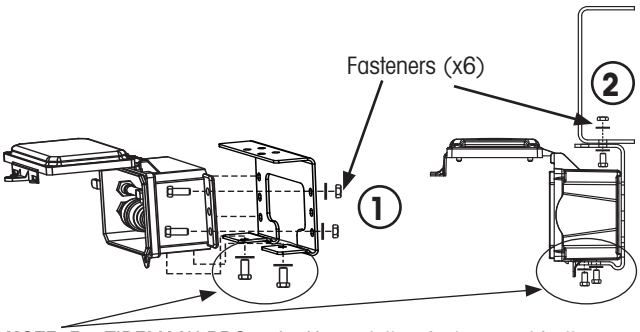


Figure 28: *Controller mounted to trailer frame*

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

- Trailer frame, Figure 28
- Use optional bracket (Figure 29, method "C")
- OE supplied bracket

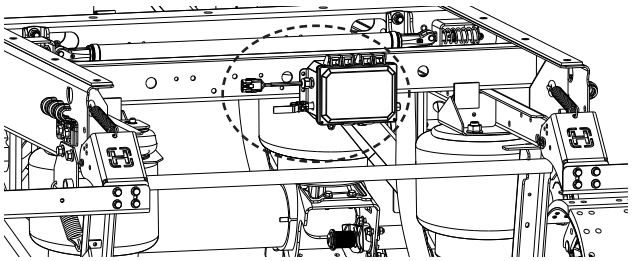


NOTE: For TIREMAAX PRO only. Use existing fasteners at bottom of controller. Remove, then replace after positioning on bracket. Torque to 60±12 in. lb. (8±2 N•m).

Figure 29: *Controller assembly installation*

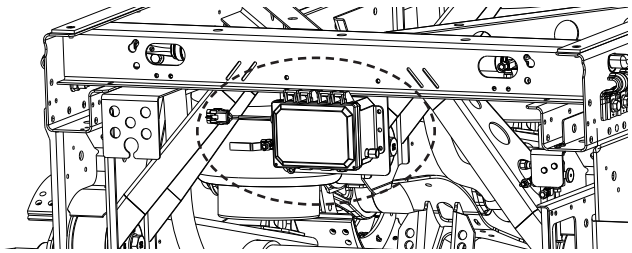
C. Hendrickson mounting bracket for optional drop-down mounting, Figure 29. Attach the controller to the bracket first, then mount the assembly to the trailer frame, as shown.

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 30 and Figure 31. Holes are also provided for various other brackets and options.



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

Figure 30: *Mounting to rear crossmember of ULTRAA-K slider (recommended)*



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

Figure 31: *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

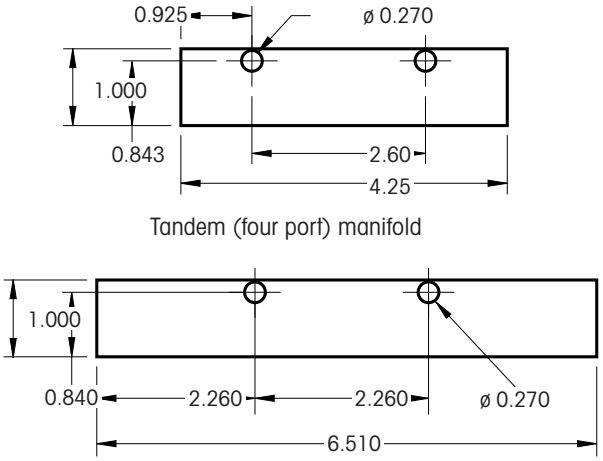
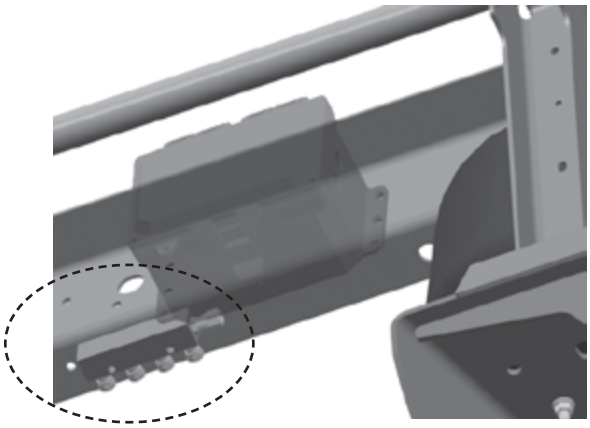
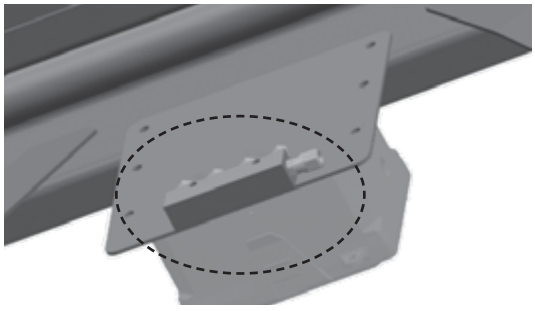


Figure 32: *Manifold mounting dimensions (inch)*

Figure 32 shows size and bolt hole patterns for a tandem and tridem manifold.



Mounted to slider rear crossmember



Mounted to back of OE controller bracket

Figure 33: *Manifold mounted on ULTRAA-K slider*

The manifold can be located on the trailer frame, slider box or on an OE bracket as shown in Figure 33.

CONTROL LINE INSTALLATION

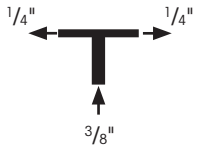
Controller line installation criteria varies with suspension type, axle type and TIREMAAX® model (CP or PRO).

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:

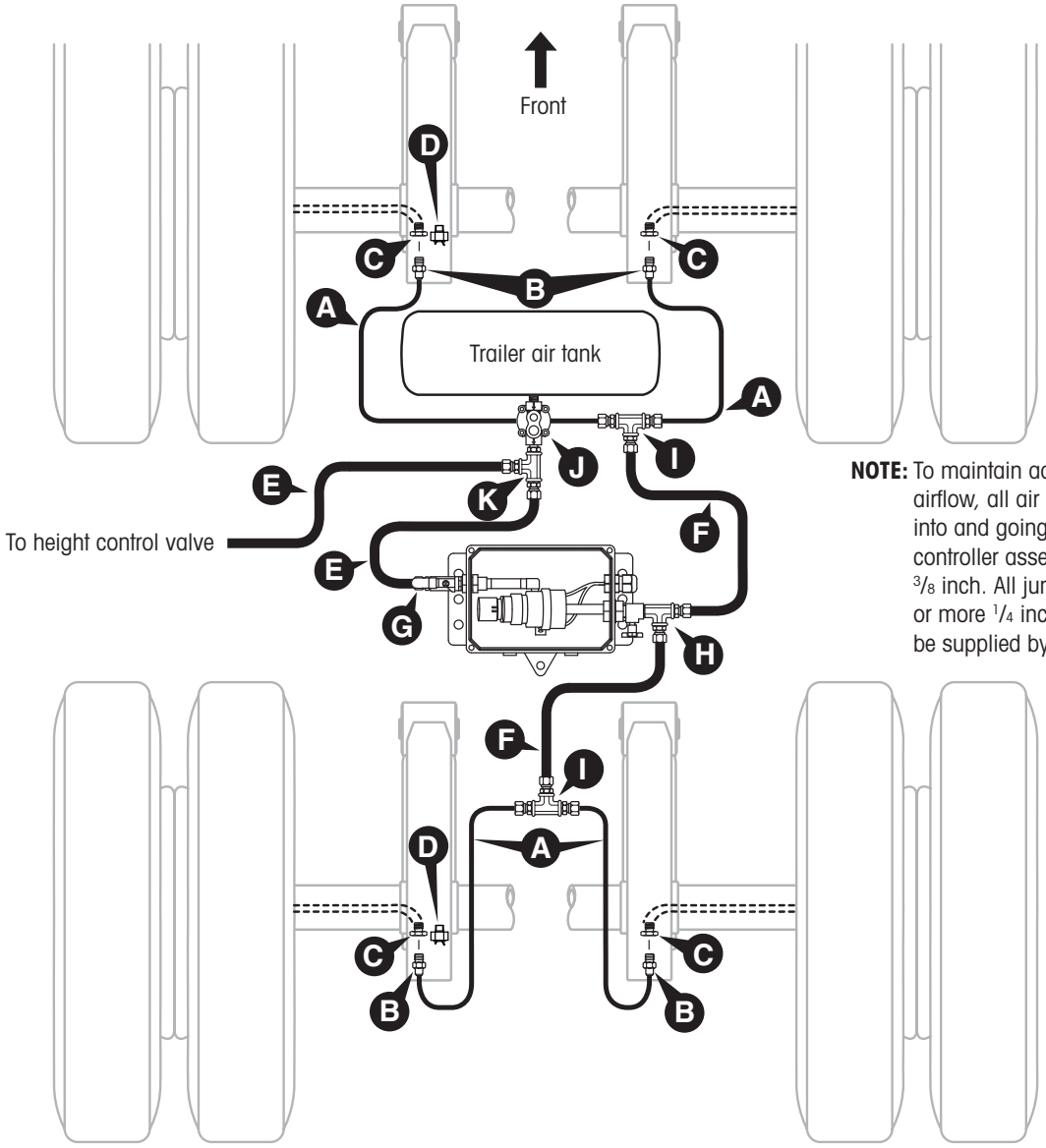
- For CP installation refer to Figure 34 to Figure 36.
- For PRO installation refer to Figure 37 to Figure 39.
- For ADDITIONAL AXLES on page 17, refer to Figure 10 to Figure 14.

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 $^3/_8$ inch.
  - $^3/_8$ inch line splits must decrease to two or more $^1/_4$ inch lines to wheel ends as shown in diagrams.



- Moisture and other contaminants collect at the bottom of the air tank. Do not install fittings on the bottom of the trailer air tank.

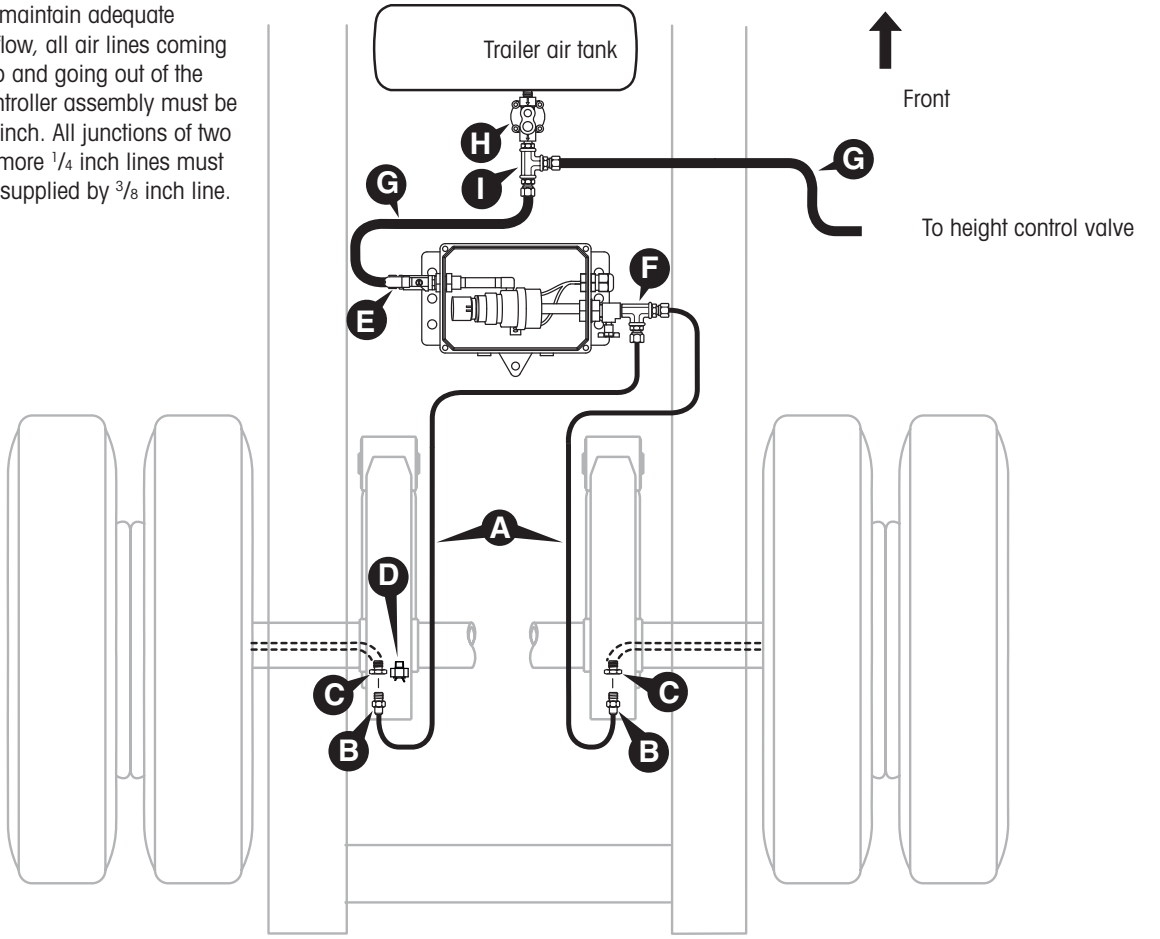


	Item	Description
Supplied with TIREMAAX®	A. Air line	1/4 inch OD nylon air brake tubing
	B. Axle connector	90 degree elbow, 1/8 inch NPT male to 1/4 inch NTA (Nylon Tubing Adapter)
	C. Axle hose fitting	1/8 inch NPT female
	D. Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	E. Air line	3/8 inch OD nylon air brake tubing
	F. Air line	3/8 inch OD nylon air brake tubing
	G. Controller IN fitting	1/4 inch NPT male to 3/8 inch NTA
	H. Controller OUT fitting	Run tee; 1/8 inch NPT male, 3/8 inch NTA, 3/8 inch NTA (gauge is optional)
	I. Tee assembly	1/4 inch NPT union tee, two 1/4 inch NTA fittings and one 3/8 inch NTA fitting (four total)
	J. Pressure protection valve (PPV) [1]	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	K. PPV OUT fitting	Run tee; 1/4 inch NPT male, 3/8 inch NTA, 3/8 inch NTA

[1] May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 34: *Typical* TIREMAAX® CP *plumbing schematic - two axles with 3/8 and 1/4 inch lines.*

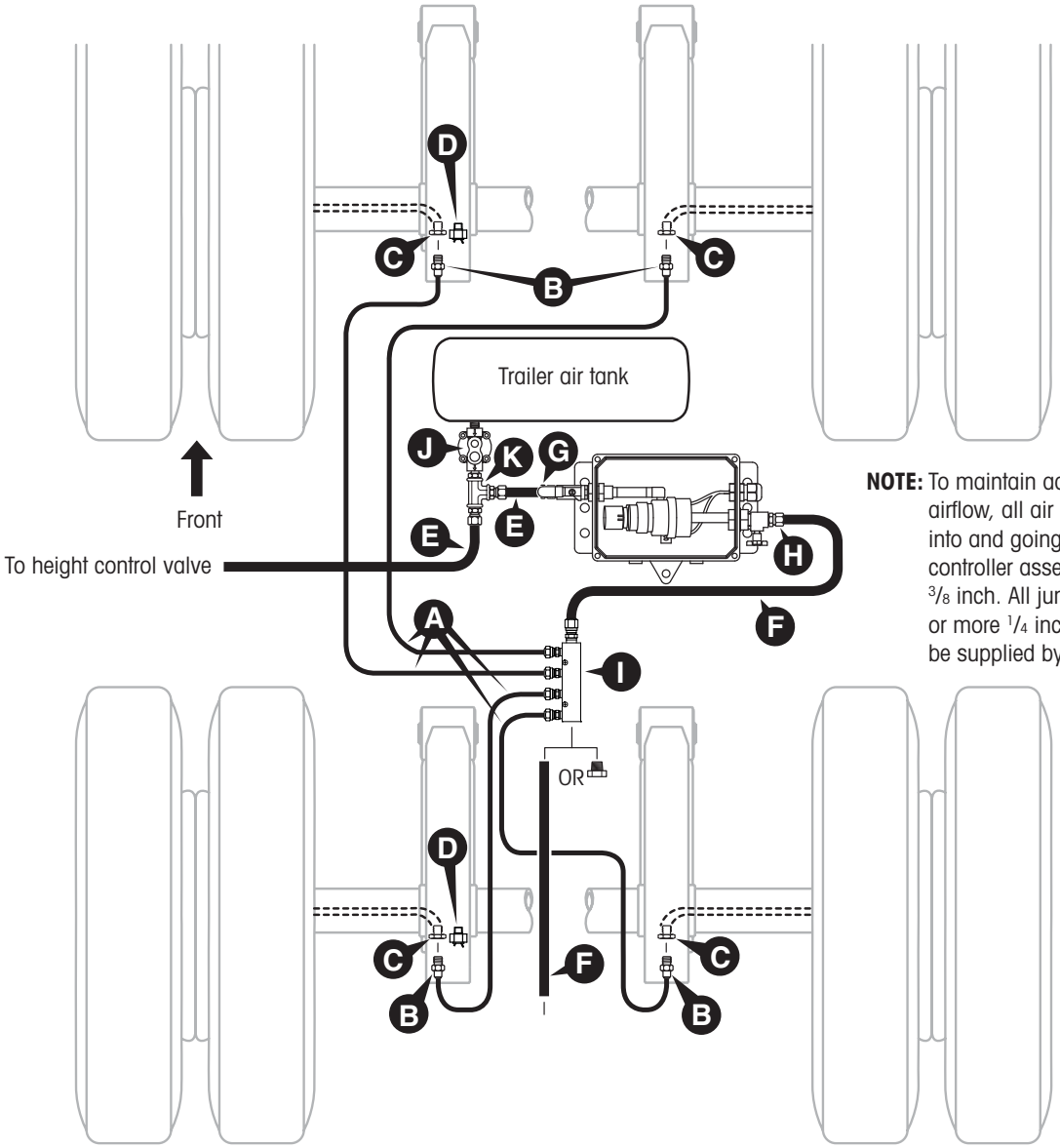
NOTE: To maintain adequate airflow, all air lines coming into and going out of the controller assembly must be 3/8 inch. All junctions of two or more 1/4 inch lines must be supplied by 3/8 inch line.



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

[1] May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 35: *Typical* TIREMAAX® CP *plumbing schematic - single axle with 3/8 and 1/4 inch lines.*



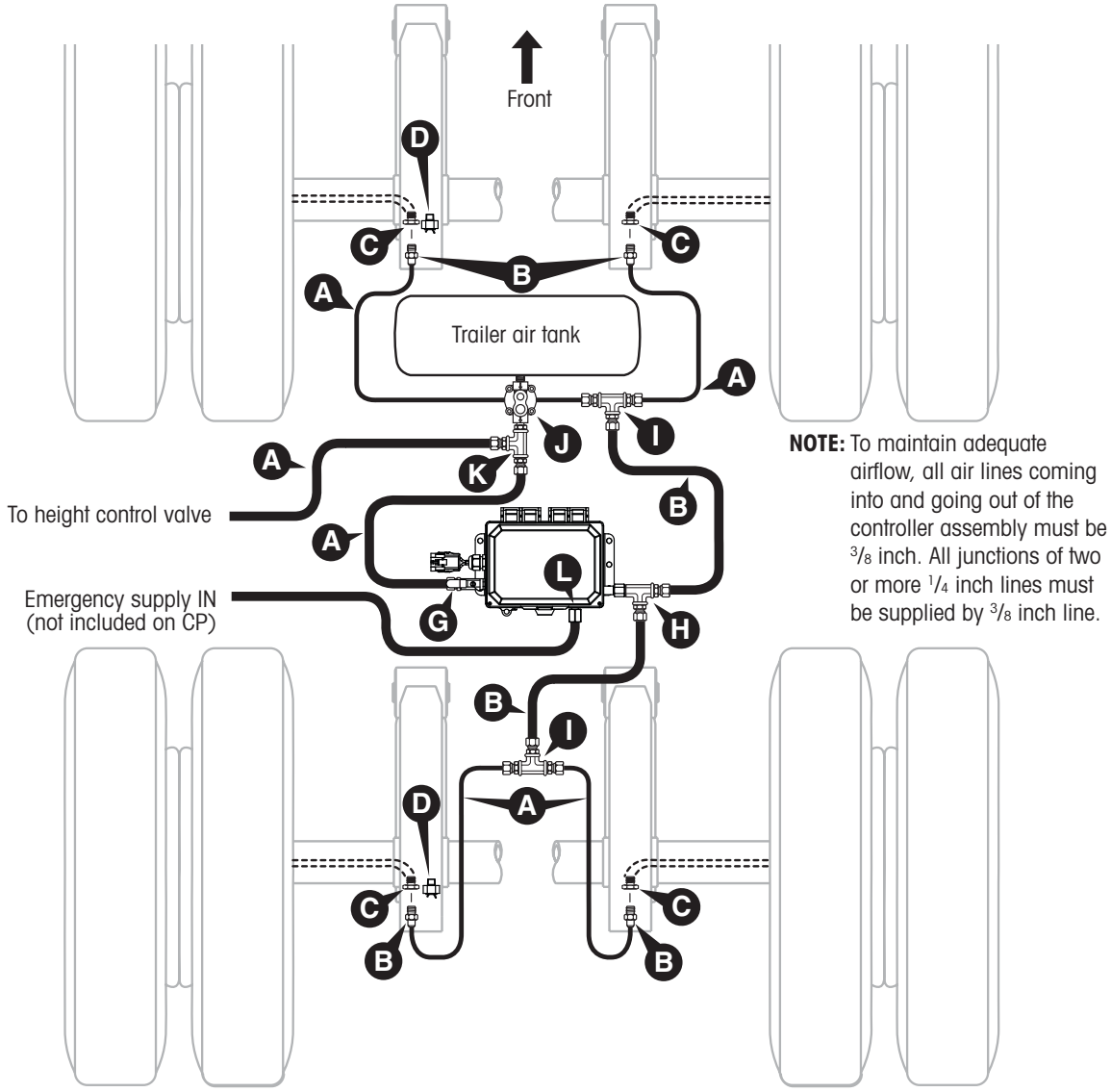
NOTE: To maintain adequate airflow, all air lines coming into and going out of the controller assembly must be 3/8 inch. All junctions of two or more 1/4 inch lines must be supplied by 3/8 inch line.

	Item	Description
Supplied with TIREMAAX®	A. Air line	1/4 inch OD nylon air brake tubing
	B. Axle connector	90 degree elbow, 1/8 inch NPT male to 1/4 inch NTA (Nylon Tubing Adapter)
	C. Axle hose fitting	1/8 inch NPT female
	D. Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	E. Air line	3/8 inch OD nylon air brake tubing
	F. Air line	3/8 inch OD nylon air brake tubing
	G. Controller IN fitting	1/4 inch NPT male to 3/8 inch NTA
	H. Controller OUT fitting	1/8 inch NPT male to 3/8 inch NTA (gauge is optional)
	I. Junction manifold [1]	3/8 inch NTA inlet, 1/4 inch NTA outlets
	J. Pressure protection valve (PPV) [2]	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	K. PPV OUT fitting	Run tee; 1/4 inch NPT male, 3/8 inch NTA, 3/8 inch NTA

1 These parts are available from Hendrickson. Refer to LITERATURE on page 6 to get part numbers.

2 May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 36: *Typical* TIREMAAX® CP *plumbing schematic - two axles with 3/8 and 1/4 inch lines and junction manifold.*

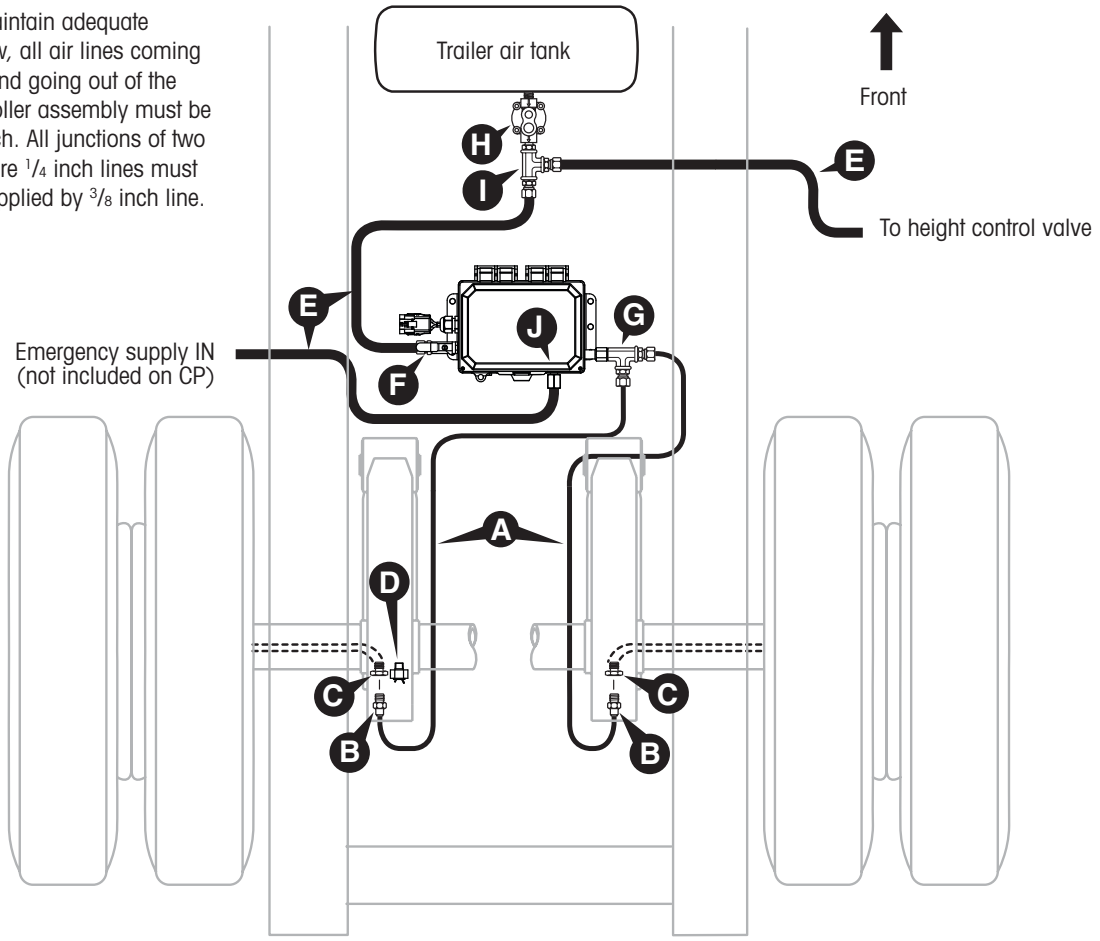


	Item	Description
Supplied with TIREMAAX®	A. Air line	1/4 inch OD nylon air brake tubing
	B. Axle connector	90 degree elbow, 1/8 inch NPT male to 1/4 inch NTA (Nylon Tubing Adapter)
	C. Axle hose fitting	1/8 inch NPT female
	D. Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	E. Air line	3/8 inch OD nylon air brake tubing
	F. Air line	3/8 inch OD nylon air brake tubing
	G. Controller IN fitting	1/4 inch NPT male to 3/8 inch NTA
	H. Controller OUT fitting	Run tee; 1/4 inch NPT male, 3/8 inch NTA, 3/8 inch NTA (gauge is optional)
	I. Tee assembly	1/4 inch NPT union tee, two 1/4 inch NTA fittings and one 3/8 inch NTA fitting (four total)
	J. Pressure protection valve (PPV) [1]	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	K. PPV OUT fitting	Run tee; 1/4 inch NPT male, 3/8 inch NTA, 3/8 inch NTA
	L. Emergency supply IN fitting	1/4 inch NPT male to 3/8 inch NTA

[1] May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 37: *Typical* TIREMAAX® PRO *plumbing schematic - two axles with 3/8 and 1/4 inch lines.*

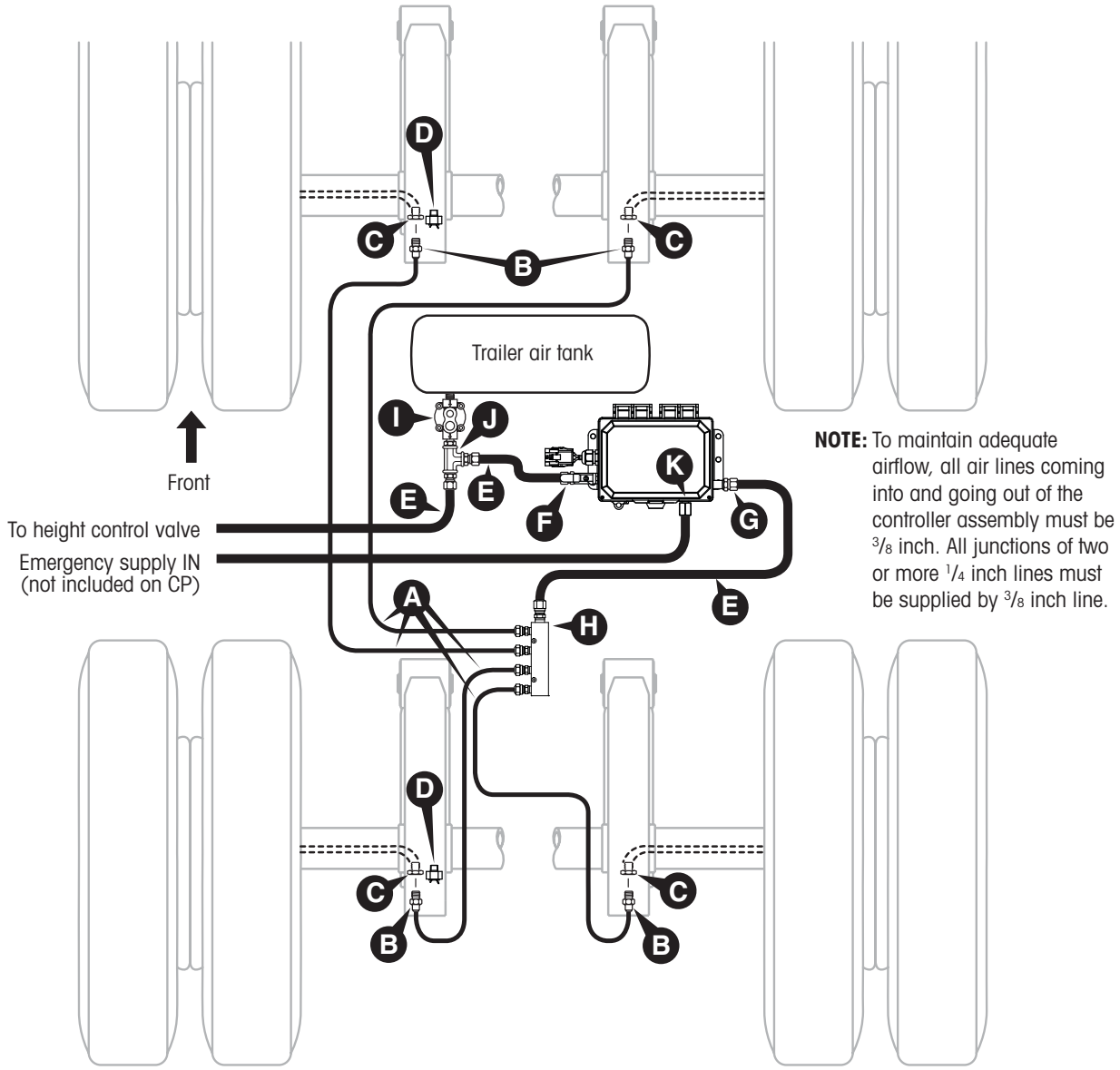
NOTE: To maintain adequate airflow, all air lines coming into and going out of the controller assembly must be 3/8 inch. All junctions of two or more 1/4 inch lines must be supplied by 3/8 inch line.



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

[1] May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 38: *Typical* TIREMAAX® PRO *plumbing schematic - single axle with 3/8 and 1/4 inch lines.*



	Item	Description
Supplied with TIREMAAX®	A. Air line	1/4 inch OD nylon air brake tubing
	B. Axle connector	90 degree elbow, 1/8 inch NPT male to 1/4 inch NTA (Nylon Tubing Adapter)
	C. Axle hose fitting	1/8 inch NPT female
	D. Axle vent fitting	High flow axle vent (includes check valve)
Provided by installer	E. Air line	3/8 inch OD nylon air brake tubing
	F. Controller IN fitting	1/4 inch NPT male to 3/8 inch NTA
	G. Controller OUT fitting	1/4 inch NPT male to 3/8 inch NTA (gauge is optional)
	H. Junction manifold [1]	3/8 inch NTA inlet, 1/4 inch NTA outlets
	I. Pressure protection valve (PPV) [2]	Required; 70 PSI minimum closing pressure; existing suspension valve can be used
	J. PPV OUT fitting	Run tee; 1/4 inch NPT male, 3/8 inch NTA, 3/8 inch NTA
	K. Emergency supply IN fitting	1/4 inch NPT male to 3/8 inch NTA

1 These parts are available from Hendrickson. Refer to LITERATURE on page 6 to get part numbers.

2 May be provided with Height Control Valve (HCV) or Dock Stabilizing Technology™ (DST®) kit.

Figure 39: *Typical* TIREMAAX® PRO *plumbing schematic - two axles with 3/8 and 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 and / 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 40 shows a typical wiring schematic for the TIREMAAX systems.
- Figure 41 shows various connections based on the options selected for the installation.

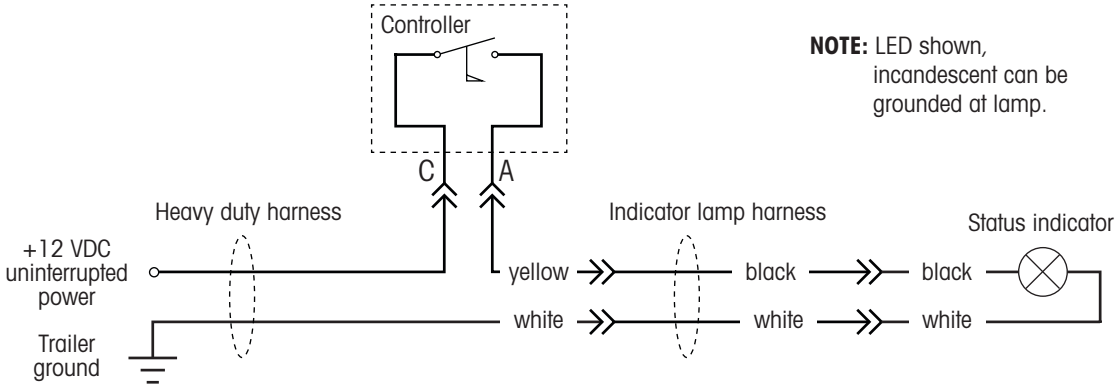
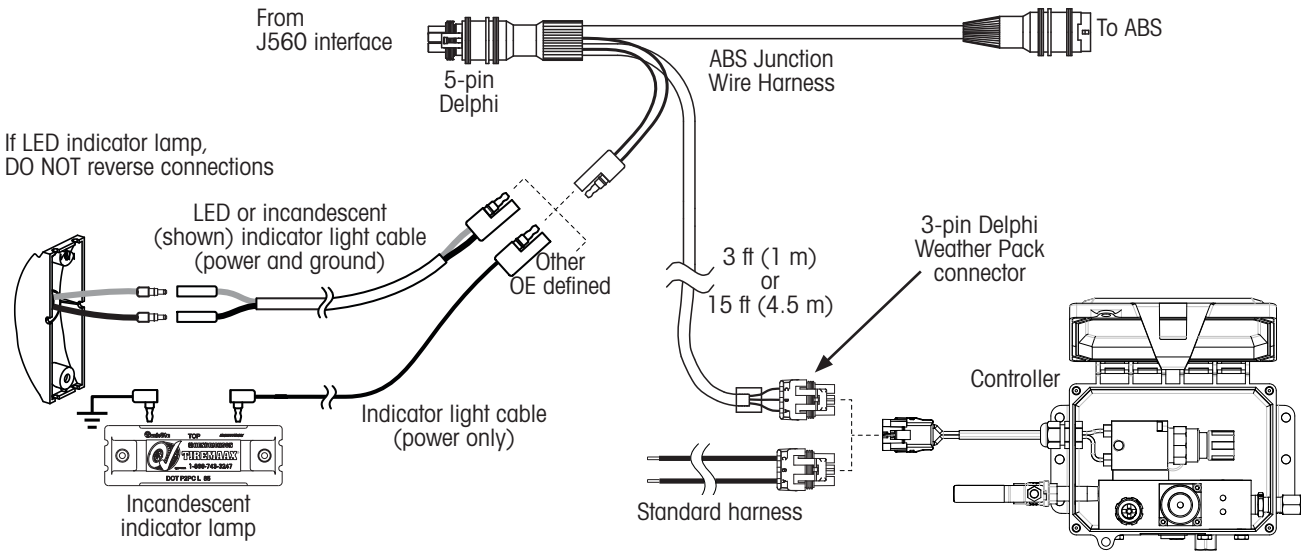


Figure 40: *Typical wiring schematic for indicator lamp*



NOTE: TIREMAAX® PRO controller shown. CP controller connector is on the right side.

Figure 41: *Wire harness and indicator lamp options*

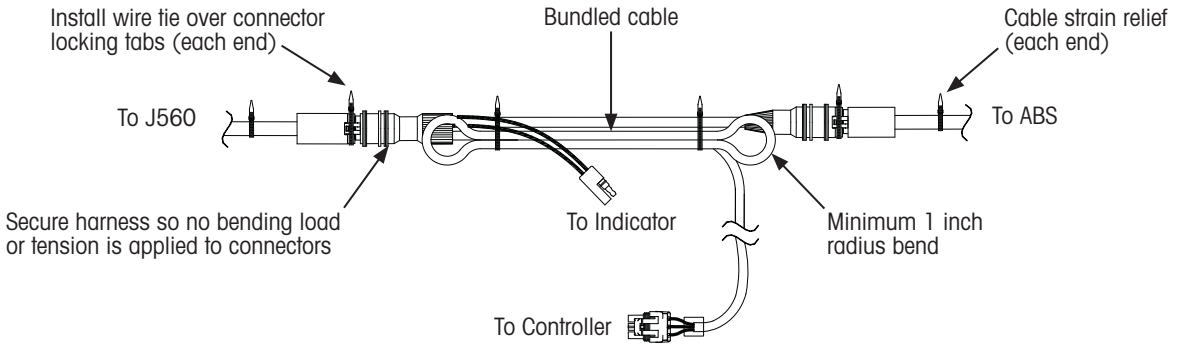


Figure 42: *Harness restraints*

STANDARD WIRE HARNESS INSTALLATION
Refer to Figure 40 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 35.

3. **Connect** other end of indicator lamp power wire and ground connection according to Figure 40.
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 41 before continuing.

1. Using Figure 41 on page 33: **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 to the controller assembly as shown in Figure 41 on page 33.
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 35.

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 OE 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 42. This places stress on the connectors and may result in loss of connection and/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 and/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 42, 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 42.

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 41 on page 33 for indicator lamp and wiring options and details. Reference 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±0.3 N•m) with a #10 machine screw.
3. **Connect** indicator lamp wires according to information provided in Figure 41 on page 33 and wire harness installation instructions on page 34.

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 emergency brakes should be as follows:

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

   Upon setting the emergency brakes, 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 - ADJUSTING CP DELIVERY PRESSURE on page 49

For PRO - ADJUSTING PRO COLD TARGET PRESSURES on page 51

DECAL LOCATION

Various decals, Table 5 are provided with TIREMAAX® systems. These decals include important information relative 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.

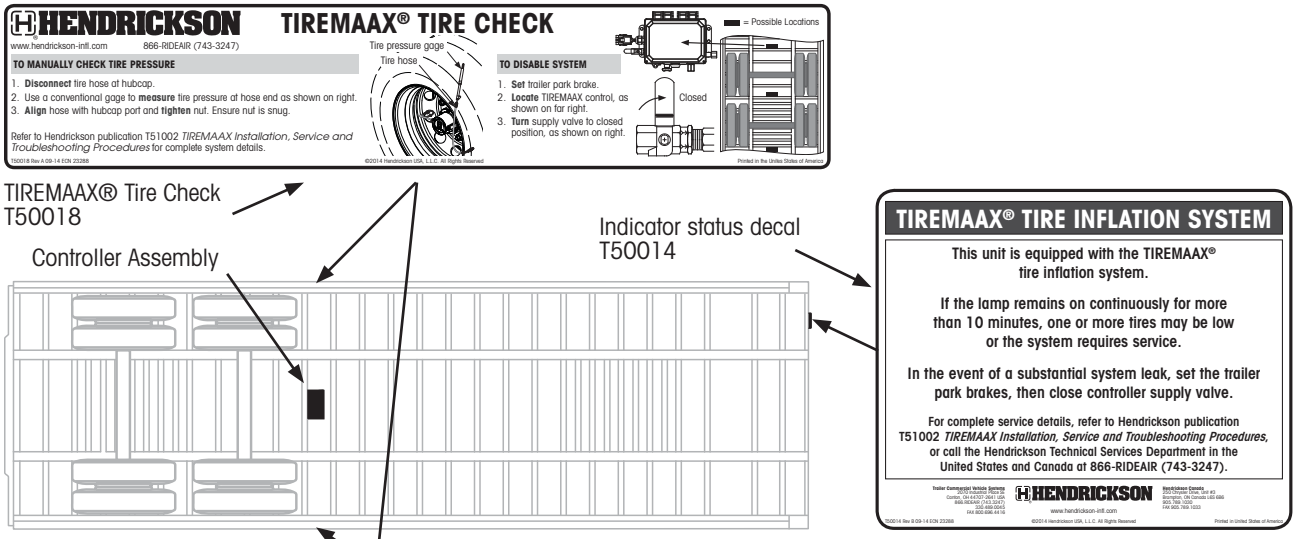


Figure 43: *Trailer decal locations*

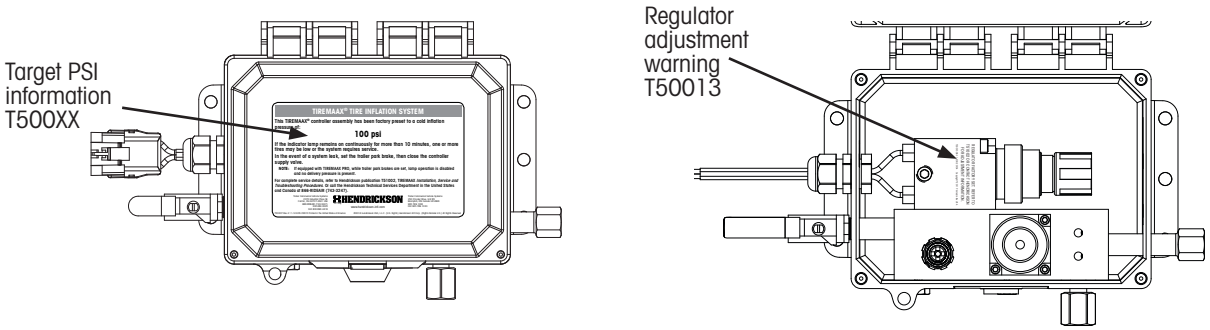


Figure 44: *Controller decal locations (Installed by Hendrickson)*

DECAL #	DESCRIPTION	LOCATION	FIGURE
T50003 - T50011	Target PSI information.	On the outside surface of the controller cover. Normally pre-applied by Hendrickson.	Figure 43 Figure 44
T50013	Regulator adjustment knob warning.	On the inside surface of the controller. Normally pre-applied by Hendrickson.	
T50014	Should the lamp remain on, this decal, includes instructions and contact information.	Depending on trailer type, locate near the indicator lamp.	Figure 43
T50018	Manually check tire pressure	Depending upon trailer type, locate on the trailer rail opposite the controller box.	Figure 43
T53002	Manual tire PSI check instructions.	Card to be included with trailer and made available for driver/operator.	

Table 5: *Decal locations*

TROUBLESHOOTING

Troubleshooting aids include:

- TROUBLESHOOTING MATRIX on page 38
- LIST OF EFFECTS WITH DESCRIPTIONS on page 39
- PROBABLE CAUSES WITH RECOMMENDED FIX on page 40

Apply each aid as needed according to the procedure.

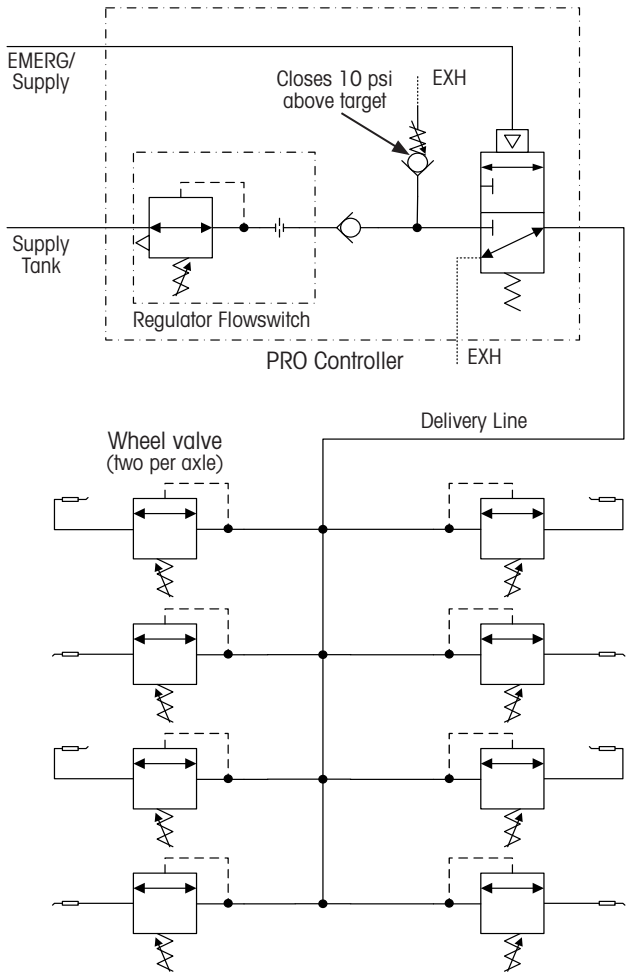


Figure 45: *TIREMAAX® air flow schematic*

IMPORTANT: In the event of a severe leak, TIREMAAX® is designed to isolate tires. Wheel valves (Figure 45) and other **check valves 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 44. Proceed to Step 2 if needed.
2. From TROUBLESHOOTING MATRIX on page 38, **select the effect (letter)** that best matches the symptoms associated with problem.

NOTE: If needed, refer to LIST OF EFFECTS WITH DESCRIPTIONS on page 39.

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 40.

   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 CONTACT HENDRICKSON on page 6.

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 39; for numbered Probable Causes, refer to page 40. If the problem is not found within this matrix, CONTACT HENDRICKSON for assistance.		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	Air exhausting from delivery dump ports	Damage to tire hose	Air exhausting from axle vent	Controller cover missing or damaged	No delivery pressure	Low delivery pressure	Controller cover will not close
Probable Causes		✔	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
System is functioning normally		1	✔										✔						
Leakage	Slow leak	2	✔					✔			✔	✔		✔	✔			✔	
	Medium leak	3		✔			✔	✔	✔		✔	✔		✔	✔			✔	
	Severe leak	4		✔	✔		✔		✔	✔		✔						✔	
	Leak at hubcap assembly	5						✔			✔		✔		✔				
	Axle hose leak	6						✔	✔						✔				
	Tire hose leak	7						✔			✔								
	Tire or rim leak	8									✔								
	Manifold leak (if included)	9					✔	✔		✔									
	Axle supply line/fitting leak	10						✔	✔		✔				✔				
	Controller component leak	11	✔	✔			✔					✔							✔
	Inflation/Deflation PSI set too close	12	✔				✔					✔	✔						
Equipment	Controller malfunction	13	✔	✔	✔	✔	✔			✔		✔	✔				✔		
	Debris (blockage) in air system	14				✔	✔	✔	✔	✔	✔						✔		
	Pinched line	15				✔	✔	✔	✔	✔	✔						✔		
	Ice in system	16				✔	✔	✔	✔	✔	✔	✔					✔		
	PPV not functioning	17				✔	✔			✔							✔		
	Tire hose not properly clocked	18												✔					
	Problem in hubcap assembly	19						✔		✔	✔				✔				
	Controller improperly mounted	20														✔			
	Cover not properly closed	21														✔			
	Insufficient air tank pressure	22				✔	✔			✔							✔	✔	
	No pressure at emergency port	23															✔		
	Low tire pressure	24																✔	
	Test port vent in wrong position	25	✔		✔							✔							✔
Electrical	No power to controller	26				✔	Not Applicable												
	Failed connection or cable	27				✔													
	Bad bulb or LED indicator	28				✔													
	Electrical short	29			✔														
	Bad ground	30				✔													
	Loose wire or connection	31	✔			✔													

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 target pressure. 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 parking brakes 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 and no indicating of inflation from 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 and/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	Air exhausting from delivery dump ports	This would be normal for a TIREMAAX PRO during deflation or for 1 to 2 seconds after applying emergency brake. Excess delivery pressure is exhausted from the delivery dump ports within the controller (Figure 52 on page 50).
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 felt and/or heard from the axle vent tube Figure 15 on page 18.
N	Controller cover missing or damaged	The controller cover is not present or is damaged in some way.
O	No delivery pressure	No air (pressure) is available at the deliver port on the controller
P	Low delivery pressure	It is normal for the delivery pressure 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.

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
1	System is functioning normally [1]	During normal operation, the indicator lamp remains off if tire pressures are at or near target pressure. 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. See effect B. Refer to HOW THE SYSTEM OPERATES on page 9.	**No action required**. If the integrity of the indicator lamp is in question, **perform** the INDICATOR LAMP TEST on page 45 and refer to the Electrical 5 section of this list.
		Leakage [2]	
2	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 target 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.
3	Medium leak	Light on more than 10 minutes and intermittent. The **leak should be audible**. This type of leak looses 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. II. If needed, **perform** SYSTEM INTEGRITY CHECK on page 35. III. **Repair** as needed.
4	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**.	I. **Check** for system damage and obvious leaks. II. If necessary, **perform** SYSTEM INTEGRITY CHECK on page 35. III. **Repair** as needed.
5	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.	**Inspect and replac**e hubcap assembly as needed. [3, 4]
6	Axle hose leak	Leaking air pressure in the axle is vented at the axle vent. Most likely the leak is at an end fitting.	I. **Refer to** Figure 17 on page 19 to help **locate and repair** leak. [3] II. Check fittings at both ends of the axle hose. [3]
7	Tire hose leak	A leak in the tire hose can be the result of: 1. Over stretching 2. Hose catching on object while driving 3. Improper installation 4. Cut O-ring or gasket Also refer to probable cause 18.	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. b. O-ring is torn, distorted or is otherwise damaged. c. Threads are damaged, in which case the hubcap may also need to be replaced.
8	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 44.
9	Manifold leak (if included)	If your system has a manifold, it is a potential source of leaks. For CP system, refer to Figure 36 on page 29. For PRO system, refer to Figure 39 on page 32.	I. **Perform** CHECKING FOR AIR LEAKS on page 44 for manifold hoses and fittings. II. **Repair or replace** as needed.
10	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 34 through Figure 36. For PRO, refer to Figure 37 through Figure 39.	I. **Perform** CHECKING FOR AIR LEAKS on page 44 for supply lines and fittings. II. **Repair or replace** as needed.

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
11	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 25. 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 47 on page 45. IV. Unless the leaky component is an external OE supplied fitting, **replace** controller.
12	Inflation/ Deflation PSI set too close	This applies to TIREMAAX® PRO only. If target pressures for inflation and deflation are set too close, air added through the regulator may be bled out by the PRM. If deflation is less than inflation, regulated air will continuously exhaust from the delivery dump ports (Figure 52 on page 50).	**Perform** SETTING TIREMAAX® PRO TARGET PRESSURE on page 50.
Equipment[4]			
13	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 delivery dump ports within the controller (Figure 52 on page 50); 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. **Repair**[4] or replace as needed. IV. Refer to probable cause 25.
14	Debris (blockage) in air system	The supply valve (Figure 49 on page 47) 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.
15	Pinched line	Air line is kinked or pinched between objects.	Make corrections as needed.
16	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.
17	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.
18	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 23 to determine if properly installed and clocked. **Make corrections** as needed.
19	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 and/or contaminants.	If contamination is suspected, **refer to** probable cause 14. **Replace** entire hubcap assembly as needed.

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
20	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 24 to verify proper controller installation and mounting.
21	Cover not properly closed	Not properly closing and securing the controller cover directly exposes internal components to the environment and flying road debris.	I. **Refer to** probable cause 25. II. **Close and secure** the controller cover with a wire tie or fastener.
22	Insufficient air tank pressure	1. Air tank pressure must be greater than 75±5 psi to open Hendrickson's PPV. See probable cause 17. 2. Tank pressure is below target pressure setting listed on front of the controller. Refer to DECAL LOCATION on page 36. 3. Compressor maximum output is below target.	I. **Check** truck air outlet and correct as needed. II. **Inspect** hoses and fittings from gladhand coupling to air tank. III. **Inspect** air tank for damage and leaks.
23	No pressure at emergency port	This applies to **TIREMAAX® PRO only** (Figure 39): While the trailer emergency brake is set, no pressure is available to the controller emergency port and delivery air is closed off from supply air.	To provide pressure at delivery port, check to **ensure**: I. Trailer emergency brake is not set. II. Emergency line is connected to emergency port. III. No blockages, breaks or kinks in emergency line.
24	Low tire pressure	One or more tires appear to be low.	Assuming all is OK, this could be a normal condition when decreased elevation or drop in temperature causes a pressure drop in the tires. Otherwise, **refer to** IN THE EVENT OF A LEAK on page 44.
25	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 INDICATOR LAMP TEST on page 45. 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.
Electrical[5]			
26	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 Figure 40 on page 33.
27	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 Figure 40 on page 33. II. **Ensure** all connectors are properly and securely connected. Refer to ELECTRICAL COMPONENT INSTALLATION on page 33.
28	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** INDICATOR LAMP TEST on page 45.
29	Electrical short	Power side of indicator lamp is shorted or flow switch is stuck on. Refer to Figure 40 and Figure 41 on page 33.	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.
30	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** Figure 40 on page 33 to trace and check all electrical wiring and connections. II. **Repair** as needed. In some cases, **sealing** connections against weather conditions may be necessary.

PROBABLE CAUSES		DESCRIPTION	RECOMMENDED FIX
31	Loose wire or connection	Loose wires can lead to no or intermittent illumination of the indicator lamp during inflation.	I. **Refer to** Figure 40 and Figure 41 on page 33 to trace and check all electrical connections. II. **Refer to** ADDING RESTRAINT TO WIRING on page 34 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 TIS 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, 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.

TOOLS REQUIRED

For a list of tools required to work TIREMAAX systems, refer to L878 TIREMAAX Parts List.

TOOL [1]	WHERE USED
CP Target Gauge VS-32344	SETTING CP TARGET PRESSURE on page 48
TIREMAAX PRO Target Gauge VS-32331	SETTING TIREMAAX® PRO TARGET PRESSURE on page 50
Tire pressure gauge	Checking tire pressures
1/8 inch hex key	Adjusting controller pressure
7/16 inch wrench	Tighten tire hose / valve stem connection

Table 6: *List of required tools*

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 delivery pressure (PRO and CP)
   B. Pressure relieving module relief 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 delivery pressure is below the target pressure.

PRO Only:

- **If a system leak is large** enough to cause the controller delivery pressure to fall below the shut-off threshold of the wheel valve:
  – The wheel valve(s) will close.
  – With the wheel valve(s) closed, tires are isolated from the controller 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® TIS on page 47.

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 PREPARING TRAILER FOR SERVICE on page 7 for details.

NOTE: If the system includes a pressure gauge, 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 (CP ONLY) 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 the target pressure.
2. (**PRO Only**) **Chock** wheels and release trailer parking brake while checking for leaks.

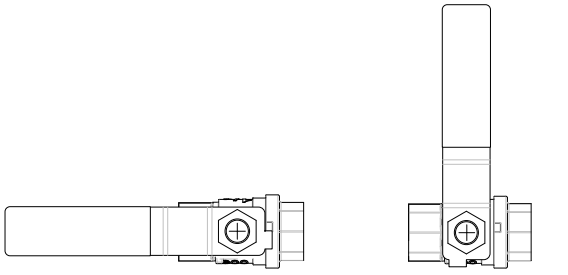


Figure 46: *Supply Valve Operation*

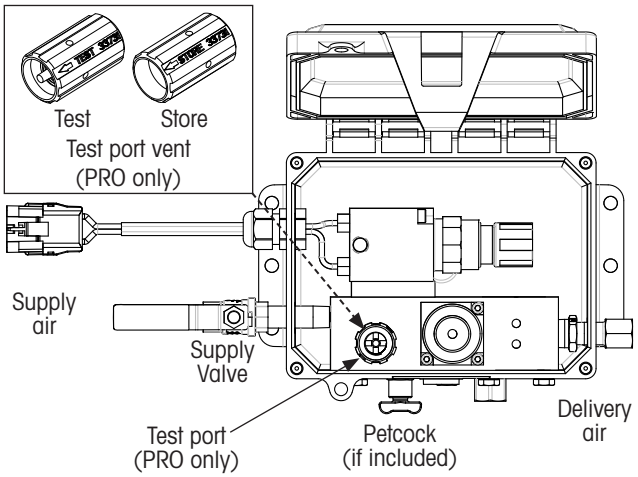


Figure 47: *TIREMAAX (PRO shown) controller valves*

3. **Ensure** TIREMAAX supply valve is in open position (Figure 46).
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, if necessary,** all 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 target pressure (refer to TIRE INFLATION on page 9).

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 emergency brake is released. If this occurs, the following steps are not required.

1. **Verify** 12 VDC power is available to trailer. Refer to Figure 40 and Figure 41 on page 33 for wiring diagrams.
2. **Enable** air flow through controller (**select** applicable method, A or B):

A. If included: The current PRO controller includes a **test port vent tool** that threads into the test port (Figure 47) in the STORE position. To perform a lamp test:

i. **Open** controller.

ii. **Unthread** the test port vent from the test port. Vent should be in STORE position.

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.

NOTE: The controller cover will not properly close if the test port vent is installed in the TEST position.

B. If included: **Open petcock** on controller (Figure 47) 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. A petcock is still present on the CP controller.

3. **Observe** indicator lamp:

A. **If illuminated**, both indicator lamp and controller 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, **reinstall** in the STORE position and **close** the controller cover.

B. 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.

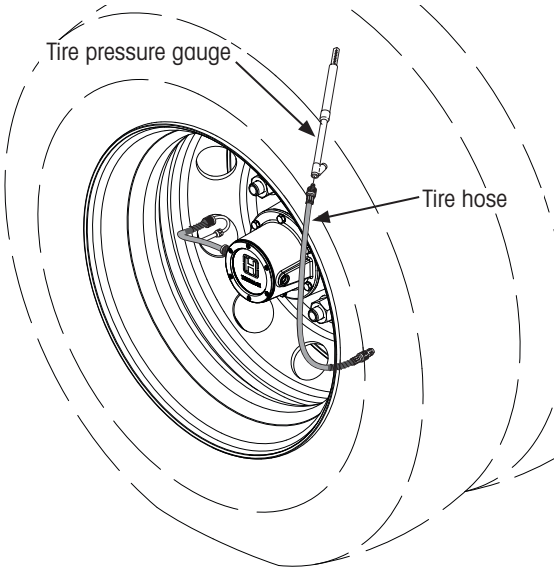


Figure 48: *Manually checking tire pressure*

To manually check tire pressure (Figure 48):

- 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. Refer to TIRE HOSE INSTALLATION on page 23 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 target 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® TIS

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

1. **Set** trailer emergency brake.

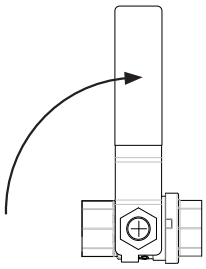


Figure 49: *Supply valve closed*

2. Located on the TIREMAAX controller, **turn** Supply valve to closed position (Figure 49).
3. At each tire:
   A. **Detach** tire hose at the hubcap.
   B. **Check** tire for correct inflate pressure. Refer to MANUALLY CHECK TIRE PRESSURE.
   C. **Completely remove** tire hose(s) from tire and store.

IMPORTANT: **Do not discard tire hoses**. They will need to be reinstalled during service.

4. **Seek service** when possible.

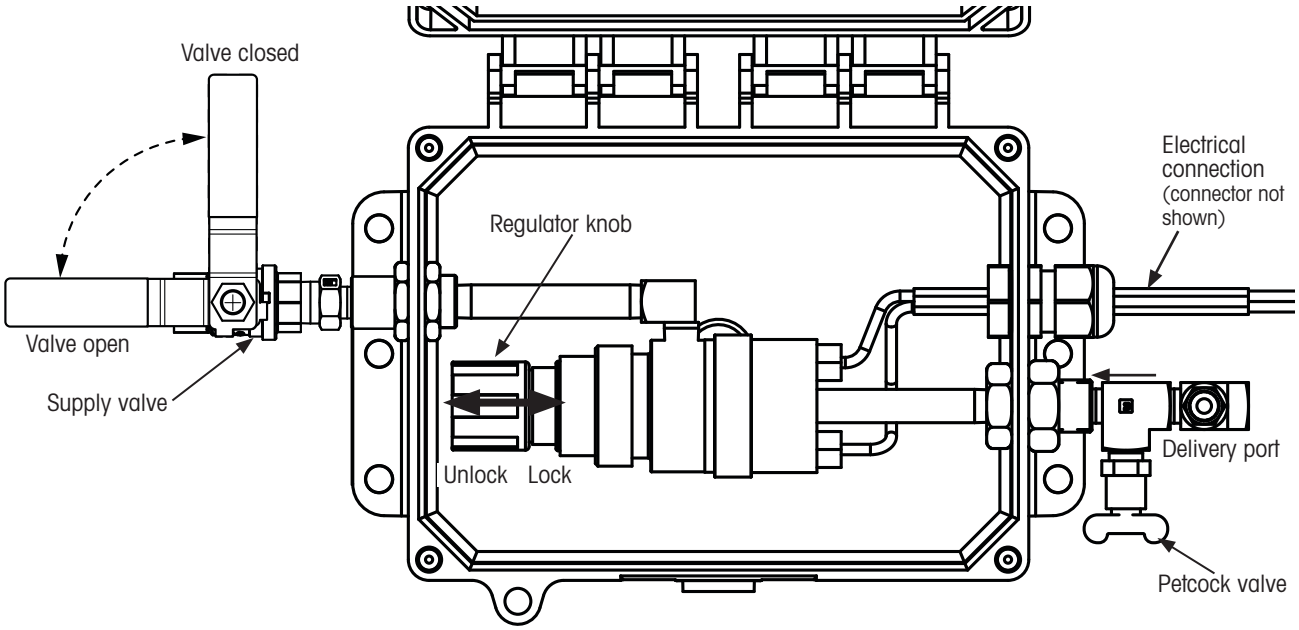


Figure 50: *Setting* TIREMAAX® CP *target pressure with IPCU*

SETTING CP TARGET 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 AND RESOURCES

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

- Clean, dry shop air supply capable of generating at least 5 psi above desired cold target pressure.
- Tire pressure gauge.
- CP target gauge. A dial or digital pressure gauge, capable of reading 5 psi above cold target pressure, may also be used.

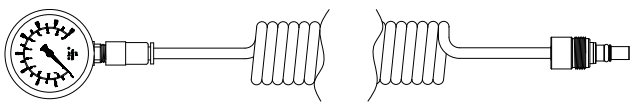


Figure 51: *CP target gauge VS-32344*

NOTE: The TIREMAAX PRO target gauge (Figure 53 on page 50) can not be used in place of the CP target gauge. Fittings are not compatible.

CHECKING CP DELIVERY PRESSURE

Follow this procedure to check pressure in the delivery line (Figure 50) for TIREMAAX CP systems.

1. **Chock** wheels or otherwise immobilize trailer.
2. Using clean, dry shop air supply, **pressurize** trailer air tank to at least 5 psi above cold target pressure.
3. **Close** controller supply valve on the supply line (Figure 50).
4. **Remove** tire hose at hubcap and **install** CP target gauge (Figure 51).

   If CP target gauge is not available:

   A. **Open** petcock valve on the delivery line to relieve pressure in system.

   B. **Remove** delivery line from the controller.

   C. **Install** temporary pressure gauge at the delivery port.
5. **Close** petcock valve on the delivery line.
6. **Open** controller supply valve on the supply line.
7. **Monitor** delivery pressure on the gauge:

   A. **Close** supply valve (Figure 50).

   B. **Observe** gauge: if pressure decreases, there may be a leak in the system, a low tire or

a tire leak. **Locate and repair** leak. Refer to CHECKING FOR AIR LEAKS on page 44.

C. **Open** supply valve and allow tires to inflate to target pressure before continuing.

NOTE: Delivery pressure **should be 5-6 psi higher than desired cold target pressure** due to the "crack pressure" (a characteristic of the check valves in tire hoses)

8. **If necessary**, continue to next procedure to **adjust** cold target pressure.

9. **Reference** procedure Step 3 to Step 6 to **remove** target gauge and **restore** system to normal operation.

ADJUSTING CP DELIVERY PRESSURE

Before making any adjustments:

A. **Perform** CHECKING CP DELIVERY PRESSURE on page 48. The target gauge should remain installed from this procedure. If not, install per previous procedure.

B. **Disconnect** all tire hoses at hubcaps. This reduces adjustment response time for changes in regulated pressure and increases accuracy.

NOTE: Delivery pressure is regulated by rotating the regulator knob either clockwise or counterclockwise (as viewed from the end of the knob). **Before the knob can be rotated, it must be unlocked.**

1. **Unlock** the regulator knob by pulling it away from the regulator body (Figure 50).

2. **From the results of the previous procedure:**

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

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

   B. **If delivery pressure is 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 cold target pressure** setting.

      iii. **Turn** knob clockwise again to the desired cold target pressure setting.

3. **Close** controller supply valve on the supply line (Figure 50).

4. **Open** petcock valve on the delivery line to vent the system.

5. **Remove** CP target gauge from hubcap port.

   If CP target gauge not used:

   A. **Remove** pressure gauge from the delivery port.

   B. **Reinstall** delivery line and close petcock valve.

6. **If decreasing target pressure, manually depress** the check valve core at the end of each tire hose to **reduce tire pressure to 5 psi below target**.

7. **Reconnect** all tire hoses to the hubcaps. Firmly hand-tighten.

8. **Open** controller supply valve on the supply line.

9. **When gauge pressure reaches target**, MANUALLY CHECK TIRE PRESSURE (using procedure on page 46) of at least two tires.

10. **If necessary, repeat** CHECKING CP DELIVERY PRESSURE on page 48 and this procedure (in that order) until the pressure at the tire hoses is at the desired cold target pressure per specifications.

RESTORE CP SYSTEM TO NORMAL OPERATION

Once cold target pressure is set:

1. **Lock** regulator knob by pushing it in toward the regulator body (Figure 50). Ensure knob will not rotate.

2. **Close and latch** controller enclosure.

3. **Update** decal on controller cover (Figure 44 on page 36), if necessary.

4. **Disconnect** shop air supply from trailer air tank.

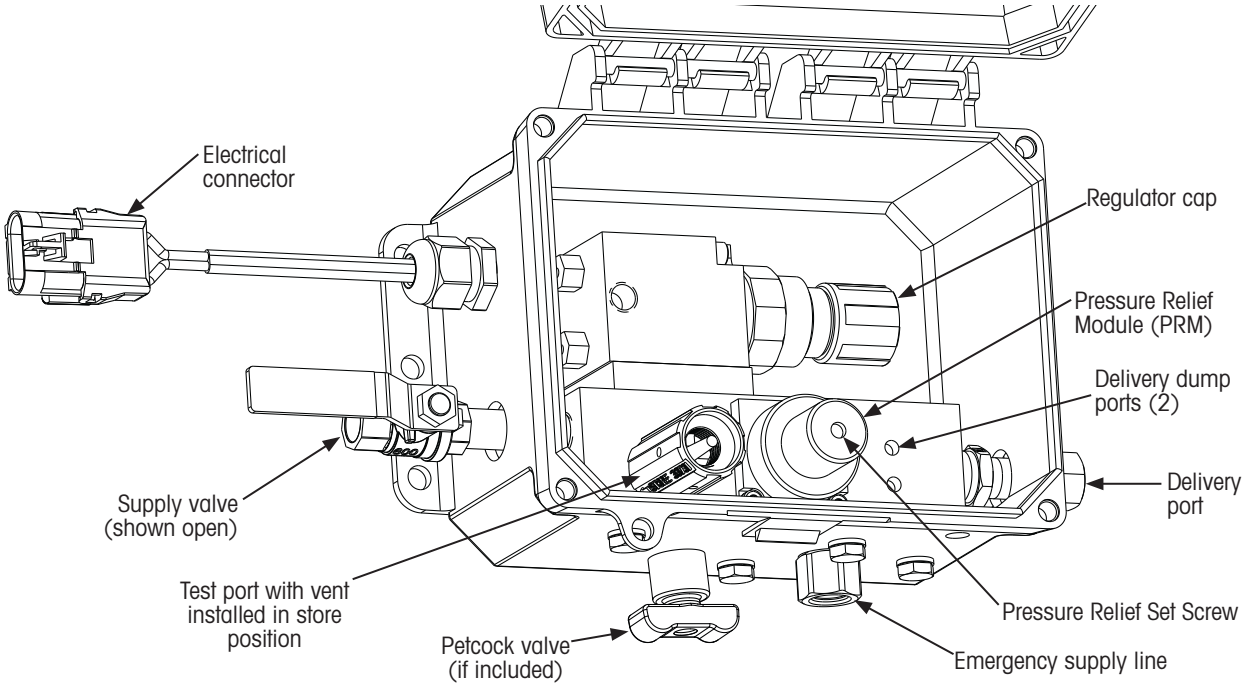


Figure 52: *Setting* TIREMAAX® PRO *target and deflation pressure adjustment*

SETTING TIREMAAX® PRO TARGET PRESSURE

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

NOTE: The following procedures assume the trailer is not connected to a truck and the system integrity is good.

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 supply port on the controller to enable TIREMAAX PRO operation. Supplying air at the emergency gladhand will also release trailer brakes.

REQUIRED TOOLS AND RESOURCES

The following tools and resources 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.

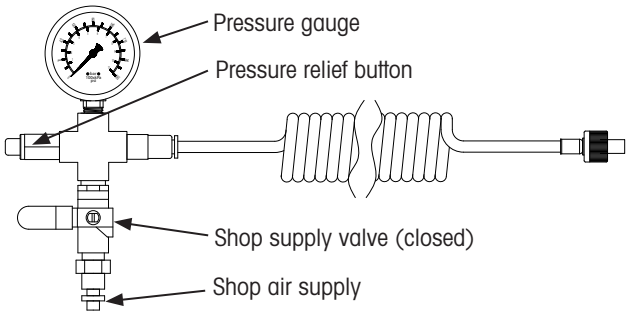


Figure 53: TIREMAAX PRO *target gauge VS-32331*

- TIREMAAX PRO target gauge (Figure 53) or equivalent.

NOTE: The target gauge might not display an accurate delivery pressure while emergency brakes are disengaged. To isolate the delivery lines from the air supply, set the emergency brakes before reading the gauge.

- $^{1}/_{8}$ inch Allen wrench.

CHECKING PRO COLD TARGET PRESSURES

Follow this procedure to check cold target pressures (Figure 52) for TIREMAAX PRO systems.

IMPORTANT: The TIREMAAX PRO target gauge (Figure 53) 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. **Chock** wheels or otherwise **immobilize trailer**.
2. **Locate** controller on the trailer. **Ensure** supply valve is in closed position. Refer to Figure 49 on page 47.
3. **Open** controller cover, **remove** test port vent, if included, and **connect** target gauge (Figure 53) to the test port (Figure 52).

IMPORTANT: Ensure target gauge shop supply valve is closed and the pressure relief button is not pressed while installing or removing target gauge.

4. **Charge** tank by connecting clean, dry **shop air supply** to emergency brake and target gauge. **Once charged, disconnect** from emergency brake gladhand (Figure 53).
5. **Check** PRO INFLATION Pressure.
   A. **Ensure** target gauge shop supply valve is closed.
   B. **Open** controller supply valve on the supply line.
   C. **Press and release** the pressure relief button.
   D. **Read and record** target gauge pressure.

NOTE: Delivery inflation pressure **should be at the specified cold target pressure** on the controller decal (Figure 44 on page 36).

6. **Check** PRO DEFLATION Pressure.
   A. **Close** the controller supply valve.
   B. **Open** the shop supply valve. You should hear air exiting the valve.
   C. **Close** the shop supply valve. Air should stop exiting after 45 to 60 seconds.
   D. **Read and record** the target gauge pressure. This is the current Deflation Pressure.
7. **Compare** measured INFLATION and DEFLATION pressure readings to desired settings.

NOTE: Delivery deflation pressure should be 10 psi higher than the specified cold target pressure on the controller decal (Figure 44 on page 36).

   A. **If** not at specified cold target pressure settings, refer to TROUBLESHOOTING on page 37.
   B. **If** adjusting target pressures, proceed to ADJUSTING PRO COLD TARGET PRESSURES.

8. **Close** controller supply valve on the supply line.
9. **Disconnect** shop air supply at target gauge.
10. **Disconnect** target gauge from controller test port.
11. **Reinstall** text port vent, if included, in store position.
12. **Close** controller cover and **open** controller supply valve to restore system to normal operation.

ADJUSTING PRO COLD TARGET PRESSURES

Two target pressures, inflation and deflation, are set for TIREMAAX PRO systems. **Deflation must be set 10 psi above inflation pressure.**

Before making adjustments, perform CHECKING PRO COLD TARGET PRESSURES on page 51 to Step 4.

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

If increasing target pressures, ADJUST PRO DEFLATION PRESSURE, then ADJUST PRO INFLATION PRESSURE.

If decreasing target pressures, ADJUST PRO INFLATION PRESSURE, then ADJUST PRO DEFLATION PRESSURE.

Adjust PRO INFLATION Pressure

Use this procedure to adjust inflation delivery pressure for TIREMAAX PRO controller.

1. **Set** the emergency brakes and open the controller supply valve.
2. **Remove** regulator cap by pulling to right side.

IMPORTANT: Should the inflation pressure be greater than the deflation pressure, the system will continuously exhaust pressure to maintain the lower delivery pressure. If the inflation pressure is to be increased during this procedure, FIRST increase the deflation pressure at the PRM (Figure 52) using Step 8 of ADJUST PRO DEFLATION PRESSURE.

3. **Use** a 1/8 Allen wrench to **adjust** controller pressure regulator until desired inflation pressure is reached:

NOTE: Adjust to desired cold inflation target pressure and always approach the inflation pressure setting from an increasing-pressure direction.

   A. **If delivery pressure is too low**, **increase** delivery pressure by rotating the regulator adjustment screw **clockwise** (as viewed from the end of the screw).

   B. **If delivery pressure is 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 53) to **lower** delivery pressure at **least 5 psi below the desired inflation pressure** setting. Close valve.

      iii. **Turn** screw clockwise again to the desired inflation pressure.

4. **Reinstall** regulator cap.

Adjust PRO DEFLATION Pressure

For proper operation, target deflation pressure must be set to 10 psi above target inflation pressure.

1. **Set** the emergency brakes.
2. **Close** controller supply valve at the controller (Figure 52 on page 50).
3. **Connect** clean, dry shop air supply to target gauge using the 1/4 inch quick connect (Figure 53 on page 50). An air supply **at least** 15 psi above cold inflation pressure is required.
4. **Open** gauge shop supply valve. The flowing air should create an audible sound that will stop when current deflation pressure is reached.
5. **Close** gauge shop supply valve.
6. **Observe** pressure gauge to ensure no leaks are present and pressure remains constant.

IMPORTANT: If the delivery dump ports constantly exhaust air, the deflation pressure is set below inflation pressure.

7. **Read and record** current deflation pressure at gauge. If not correct, go to the next step. Otherwise, go to next procedure.
8. **If adjustment is needed, use** 1/8 inch Allen wrench to **adjust** pressure relief set screw (Figure 52). (A quarter turn is approximately 5 psi.)

   A. If **deflation pressure is low**, **turn** the pressure relief set screw clockwise, then return to Step 4.

   B. If **deflation pressure is high**, **turn** the pressure relief set screw counterclockwise, then return to Step 4.

Restore PRO System to normal operation

At this point, the controller should be set to the desired inflation and deflation pressure. To restore system to normal operation:

1. **Close** controller supply valve on the supply line.
2. **Disconnect** shop air supply from target gauge.
3. **Disconnect** target gauge from controller.
4. **Close** controller, **secure** latch and **ensure** controller supply valve is open.
5. **Update** decal on controller cover (Figure 44 on page 36), if necessary.
6. At each wheel end, **ensure** all tire hoses are **installed and properly secured**.

WIRING HARNESS REPLACEMENT

As discussed in WIRE HARNESS OPTIONS AND DETAILS on page 33, 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 41 on page 33.

Removal

1. **Turn off** all power to trailer.
2. **Disconnect** the following:
   A. Five-pin ABS connector (Figure 41 on page 33).
   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 34.

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 34 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 50 on page 48
For PRO - Figure 52 on page 50

REMOVAL

1. **Exhaust** air from trailer air tank. This will cause parking brakes 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 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.
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 19 on page 21 to avoid overtightening the fittings.
4. (**PRO only**) **Repeat** Step 3 for Emergency 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** target pressure:

    For CP - CHECKING CP DELIVERY PRESSURE on page 48

    For PRO - CHECKING PRO COLD TARGET PRESSURES on page 51

WHEEL REMOVAL AND INSTALLATION

Set parking brakes and disable the system before wheel removal.

1. **Close** supply valve on the supply line to shut off pressure to the system.

2. **Turn vehicle off** and **disconnect** tire hose(s) at both ends (Figure 24 on page 23).

3. **Observe and record** wheel orientation (clocking) Refer to Figure 22 on page 22.

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.

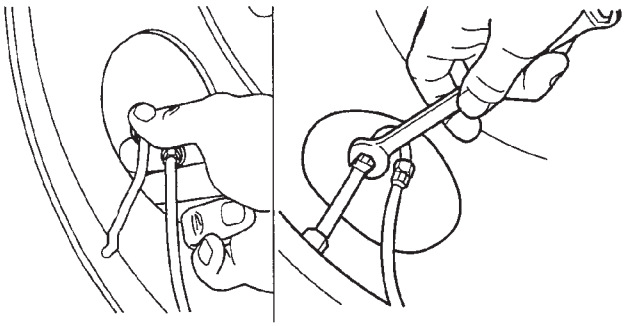


Figure 54: *Reattaching tire hoses to tire valve stem*

6. **Attach tire hose(s) to tire valve stem(s)** and tighten finger tight (Figure 54).

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

7. Using a 7/16 inch wrench, **tighten tire hose / valve stem connection** an additional one-half turn (Figure 54). **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.

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

APPENDIX A: GLOSSARY

The following terms are relative to TIREMAAX® PRO and CP systems and applied in this document:

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

Delivery pressure
Output pressure from controller that is regulated and delivered to tires.

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

IPCU
(Integrated Pressure Control Unit)
The IPCU is set with the target tire pressure and directs the system to supply air to the tires when needed. A significant amount of system air flow causes the trailer-mounted indicator lamp to illuminate.

OE or OEM
Original Equipment Manufacturer

PRM
(Pressure Relief Module)
A unit in a TIREMAAX PRO controller that allows tire deflation.

Rotary union
Rotary air seal assembly that allows air transfer from wheel end to tire(s) while vehicle is in motion. The rotary joint is always pressurized when the supply valve is open.

Target pressures
The desired tire pressure, inflation or deflation.

TIS
(Tire Inflation Systems)
A system that maintains the pressure of selected tires and activates a warning to alert the vehicle operator if there is a system or tire leak.

APPENDIX B: EXPECTED PERFORMANCE

Figure 55 charts expected tire pressure change, without a Tire Inflation System, relative to changes in ambient temperature. In the example, the trailer was at an ambient temperature of 70° F when the tires were inflated to 100 psi.

Figure 56 plots typical tire pressure changes for a cold tire inflation to 100 psi. In the chart, the tire temperature matched an ambient temperature of 70° F when the tire was inflated to 100 psi. The trailer was then driven to a location where the ambient temperature was 20° F, per the example of Figure 55.

During travel, the tire pressure dropped to 89 psi (a difference of 11 psi) when the distinction was reached.

Ambient temperature when tire pressure is measured	-40	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120
-40	100	97	-95	92	90	88	86	84	82	80	78	76	74	73	71	70	68
-30	103	100	97	95	93	90	88	86	84	82	80	78	77	75	73	72	70
-20	105	103	100	97	95	93	90	88	86	84	82	81	79	77	75	74	72
-10	108	105	103	100	98	95	93	91	89	86	85	83	81	79	77	76	74
0	111	108	105	103	100	98	95	93	91	89	87	85	83	81	79	78	76
10	114	111	108	105	102	100	98	95	93	91	89	87	85	83	82	80	78
20	116	113	110	108	105	102	100	98	95	93	91	(89)	87	85	84	82	80
30	119	116	113	110	107	105	102	100	98	95	93	91	89	87	86	84	82
40	122	119	116	113	110	107	105	102	100	98	96	94	91	90	88	86	84
50	125	121	118	115	112	110	107	105	102	100	98	96	94	92	90	88	86
60	127	124	121	118	115	112	110	107	105	102	100	98	96	94	92	90	88
70	130	127	123	120	117	115	112	109	107	105	102	**100**	98	96	94	92	90
80	133	129	126	123	120	117	114	112	109	107	104	102	100	98	96	94	92
90	136	132	129	126	122	120	117	114	111	109	107	104	102	100	98	96	94
100	138	135	131	128	125	122	119	116	114	111	109	106	104	102	100	98	96
110	141	137	134	131	127	124	122	119	116	114	111	109	106	104	102	100	98
120	144	140	137	133	130	127	124	121	118	116	113	111	109	106	104	102	100

For example: Target tire pressure is set to 100 psi in Little Rock, Arkansas, where the air temperature is 70 degrees F. The trailer is then driven to International Falls, Minnesota, where the air temperature is 20 degrees F. Instead of 100 psi, the pressure in the tires is now 89 psi, due solely to the effects of temperature on pressure.

NOTE: Temperature values in chart above are only for 100 psi target tire pressure.

Figure 55: *Ambient temperature when target tire pressure is set*

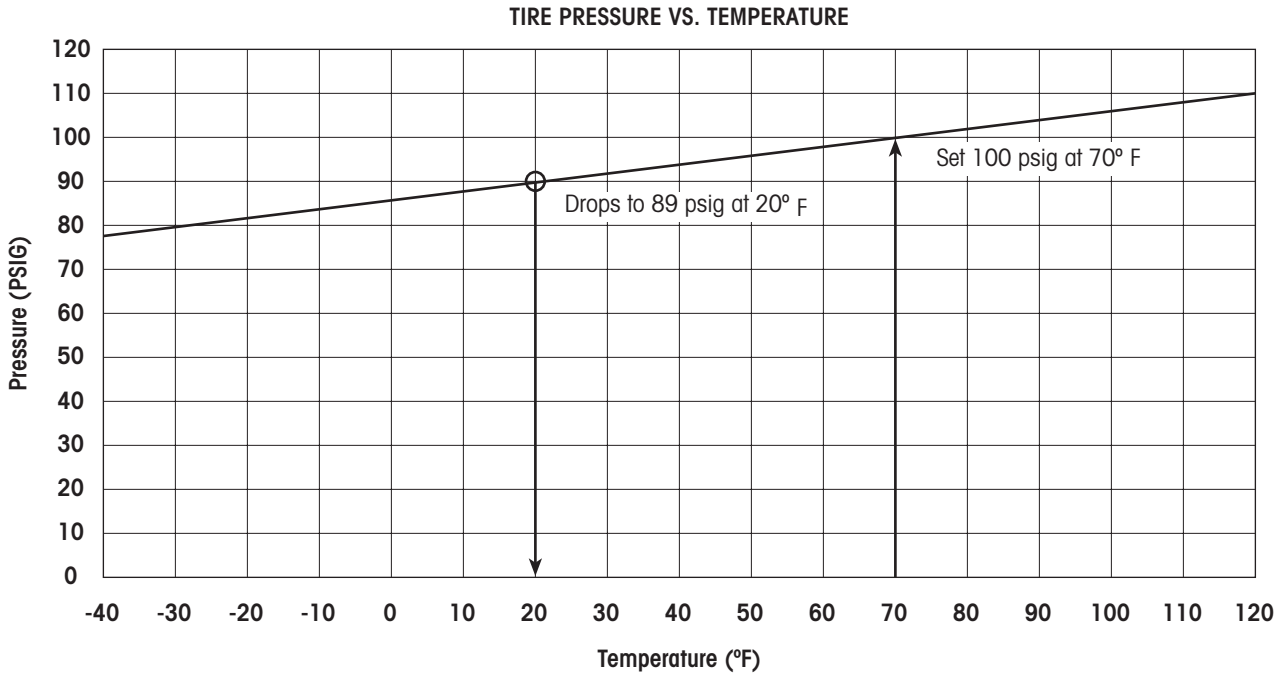


Figure 56: *Typical tire maintenance system performance at 100 psig*

NOTES:

*Call your trailer dealer or Hendrickson at **866.RIDEAIR (743.3247)** for additional information.*

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