TECHNICAL PROCEDURE

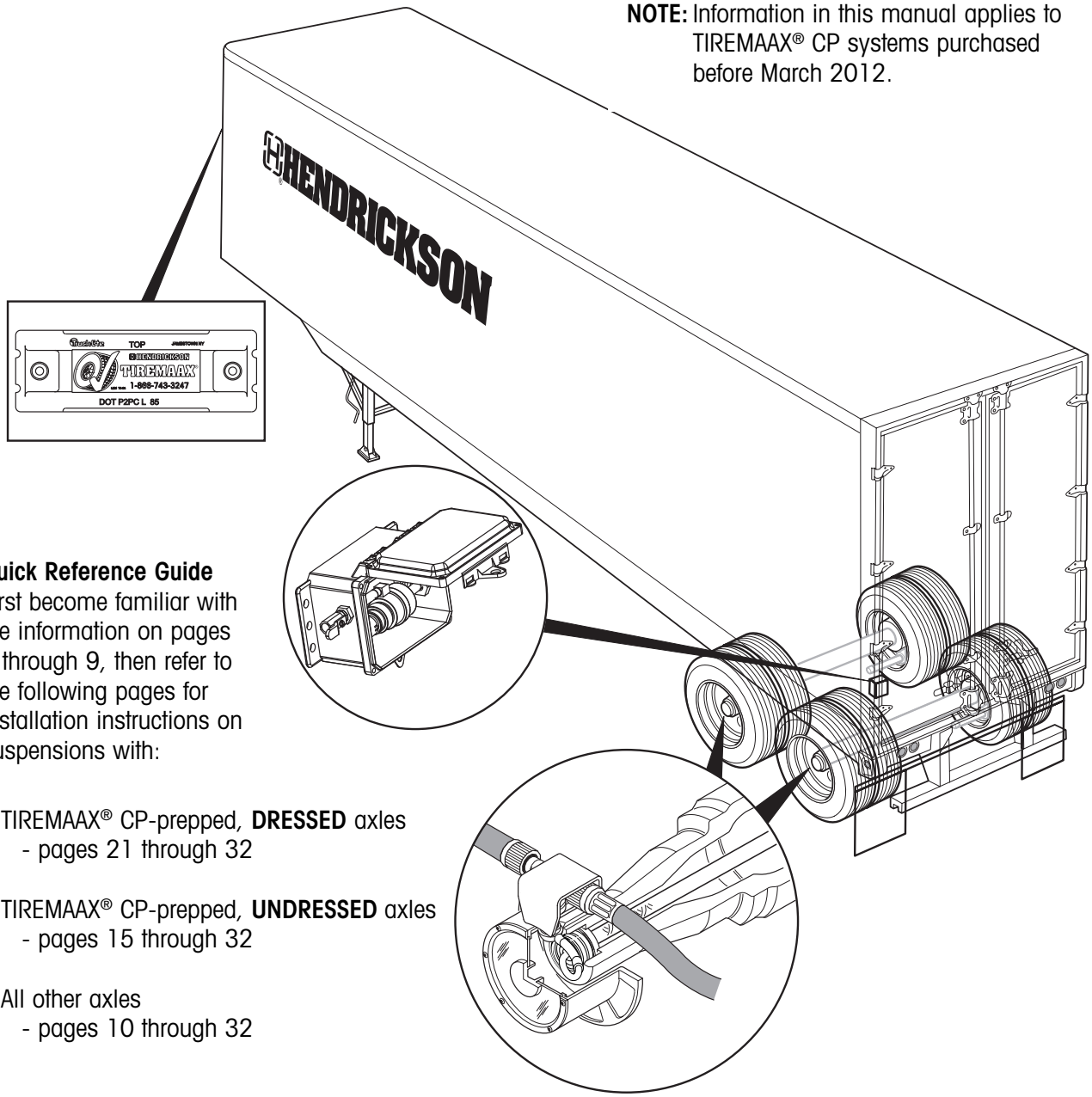
TIREMAAX® CP TIRE INFLATION SYSTEM

SUBJECT: Installation, Service and Troubleshooting Procedures

LIT NO: L995

DATE: February 2012 **REVISION A**

NOTE: Information in this manual applies to TIREMAAX® CP systems purchased before March 2012.



Quick Reference Guide
First become familiar with the information on pages 4 through 9, then refer to the following pages for installation instructions on suspensions with:

- TIREMAAX® CP-prepped, **DRESSED** axles
  - pages 21 through 32
- TIREMAAX® CP-prepped, **UNDRESSED** axles
  - pages 15 through 32
- All other axles
  - pages 10 through 32

Refer to page 32 for the system integrity check procedure

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TABLE OF CONTENTS

The Hendrickson TIREMAAX® tire inflation system is available in two versions: TIREMAAX® EC (electronic controller) and TIREMAAX® CP (constant pressure).

This document describes installation, service and troubleshooting procedures for the Hendrickson TIREMAAX CP tire inflation system. It is only applicable to TIREMAAX CP systems.

If you need installation, service and troubleshooting information for the Hendrickson TIREMAAX EC tire inflation system, please refer to Hendrickson publication L818, *TIREMAAX EC Installation, Service and Troubleshooting Procedures,* available from www.hendrickson-intl.com.

The descriptions and specifications contained in this publication are current at the time of printing.

Hendrickson reserves the right to discontinue or modify its models and/or procedures and to change specifications at any time without notice.

Any reference to brand name in this publication is made as an example of the types of tools and materials recommended for use and should not be considered an endorsement. Equivalents may be used.

IMPORTANT NOTICE

Hazard signal words (such as 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 indicate the use of these signal words as they appear throughout the publication.

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

⚠ **CAUTION: Indicates hazards or unsafe practices which could result in damage to equipment or minor personal injury.**

NOTE: Additional service information not covered in the service procedures.

Departure from the instructions, choice of tools, materials and recommended parts mentioned in this publication may jeopardize the personal safety of the service technician or vehicle operator.

Always use genuine Hendrickson replacement parts.

Every effort has been made to ensure the accuracy of all information in this publication. **However, Hendrickson makes no expressed or implied warranty or representation based on the enclosed information.**

GENERAL INFORMATION

ABOUT THIS MANUAL

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

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

SYSTEM OVERVIEW

The TIREMAAX CP tire inflation system is designed to automatically inflate tires that are below their target pressure setting using compressed air from the trailer air tank.

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

Air seals and hoses are constantly pressurized at a preset target pressure. A trailer-mounted indicator (figure 2) will turn on when the pressure in one or more tires is low, or when a system problem occurs. When the trailer-mounted indicator comes on for more than 10 minutes continuously, it is an indication of a potential system or tire leak. Refer to the Troubleshooting section on page 32 for more additional troubleshooting details. The trailer-mounted indicator will not turn on for minimal inflation requirements of less than an airflow of approximately 0.7 cfm, helping to avoid operator distraction when no action is required.

If a tire is low, the remaining tires are protected from pressure loss by integral check valves located in each tire hose.

FEATURES

- Indicator (figure 2) on when system flow exceeds approximately 0.7 cfm
- Checks tire pressure continuously
- Indicator on only when service is required
- Does not pressurize axle tube (helps prevent contamination of air seals)
- Seal and line leaks will not pressurize wheel ends
- No venting at wheel end helps prevent contamination from entering hubcap
- Check-valves located in hoses at tee fitting
- Manual pressure check or fill available at hose end
- Leaky tire detection
- Serviceable filter at supply shutoff valve helps keep lines and seals clean
- Factory set to one of 11 possible target pressures (70, 75, 80, 85, 90, 95, 100, 105, 110, 115, or 120 psi) selected by the customer
- In-axle filter prevents hub contamination and allows any wheel-end air leaks to evacuate through the axle vent

SYSTEM SPECIFICATIONS

• Tire pressure setting range:	70 to 120 psi
• Pressure accuracy:	±1%
• Pressure resolution:	0.5 psi
• Pressure check interval:	continuous
• Minimum operating voltage:	9 volts
• Indicator current range:	50mA to 1A
• Inflate capacity (one tire):	10 psi in approx. two minutes

COMPONENT WEIGHTS

• Controller assembly:	2.62 lbs.
• Misc. fittings and air line:	1 lb. per axle
• Wire harness:	1 oz. (std) 1.4 lbs. (ABS)
• Hubcap spacers (if required)	1 lb. per axle
• Wheel-end hardware	
dual wheels	1.7 lbs. per end
super single wheels	1.4 lbs. per end
• Indicator light kit	1.8 lbs.

OPERATION

SYSTEM OPERATION

The system will pressurize the lines and measure tire pressure by comparing the pressure in the lines and tires to a regulated supply pressure. If the regulated supply pressure exceeds the line pressure, the system assumes one or more tires are low and automatically starts to inflate the low tire(s) to the target pressure setting. The remaining tires are protected from pressure loss by check-valves located in each tire hose. If one or more tires are low, the indicator (figure 2) will turn on and remain on as long as the flow exceeds approximately 0.7 cfm. The system continues to inflate to the proper pressure.

If the indicator (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.

NOTE: If a hose is removed or damaged, the system will continue to inflate the other low tires.

MANUALLY CHECKING 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.

To manually check tire pressure (figure 1):

- Turn vehicle off
- Disconnect tire hose from tee at hubcap (or from elbow at hubcap if super single configuration)
- Use a conventional gauge to measure tire pressure at hose end
- Reattach and firmly hand-tighten tire hose. Using pliers, carefully and gently verify that the hose connection is tight

⚠ **CAUTION: Do not overtighten the tire hose at the tire valve stem or the internal tire hose seal may be damaged.**

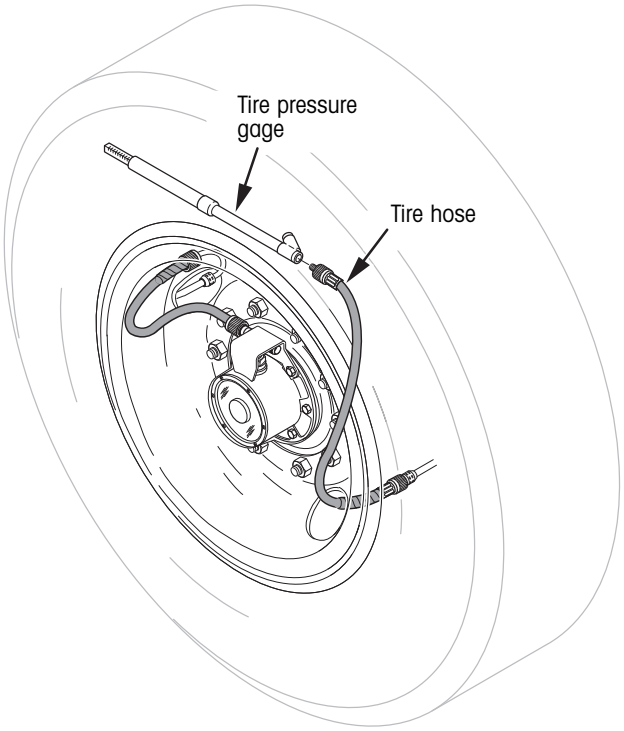


Figure 1. Manually checking tire pressure

Ensure tire hoses are not stretched or rubbing on the wheel.

INDICATOR DESCRIPTION

NOTE: The TIREMAAX® CP system utilizes the trailer's blue circuit to power the trailer-mounted indicator. Some early model tractors do not power this circuit, resulting in no power to the trailer-mounted indicator.

INDICATOR ON CONTINUOUSLY

The indicator (figure 2) will illuminate if the measured air flow exceeds approximately 0.7 cfm. The indicator will remain on until the tires are reinflated. If the indicator remains on for more than 10 minutes, the operator should stop the vehicle and check the tires for damage. Under some normal operating conditions, you may find that the indicator illuminates when no visible damage is apparent. This may be due to changes in ambient temperature while the trailer is idle. When the system is first powered on a trailer at a temperature significantly lower than when previously operated, cooling of the tires may result in a drop of pressure below the target pressure, thus illuminating the indicator. Refer to the Appendix (figure 41) for examples of temperature effects on tire pressure.

In addition, the indicator may turn on and remain on due to a significant air line leak or system failure.

HOW THE SYSTEM OPERATES

The system checks the tire pressures continuously. To measure the tire pressure, the system compares the pressure in the lines and tires to a regulated supply pressure. If the regulated supply pressure exceeds the line pressure, the system will begin to inflate the low tire(s). If the measured air flow exceeds approximately 0.7 cfm, the indicator will illuminate while the system is inflating the tire(s) to inform the driver of a potential tire leak. Once the target tire pressure is achieved, the system continuously monitors the tire pressure to maintain this target pressure.

To prevent air from leaking while tire hoses are removed at the tee or elbow fitting, a check valve (spring type valve core - 2 to 3 psi) is used in each of the tire hoses.

If the indicator remains lit for an extended period of time (more than 10 minutes), the driver should check all the tires for damage and take corrective actions if applicable.

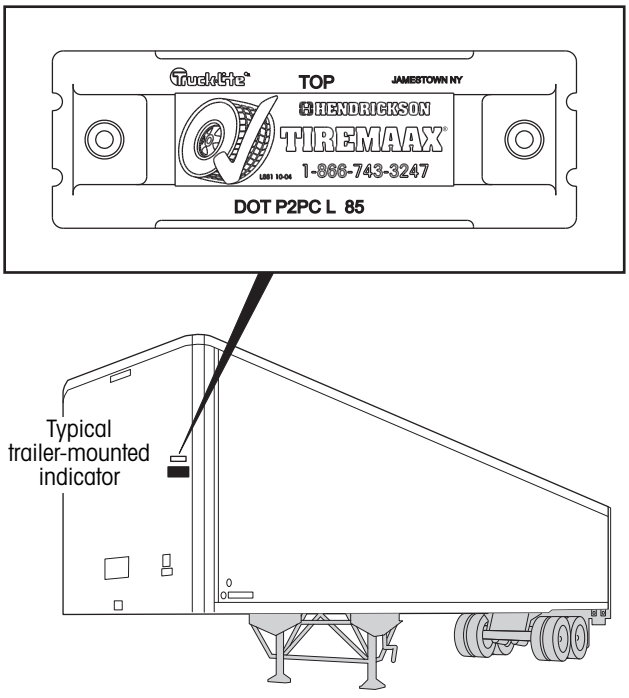


Figure 2. Trailer-mounted indicator

COMPONENTS

COMPONENT DESCRIPTION

Refer to figure 3 for major TIREMAAX® CP component illustrations. Refer to figures 21 through 28 for a complete description of air fittings and hoses.

TIRE HOSE (WITH INTEGRAL CHECK VALVE)

- Provides an air passage from the hubcap tee to the tire
- No modification to the standard valve stem or core is required
- Allows for manual pressure check and fill at the hose end

ROTARY JOINT

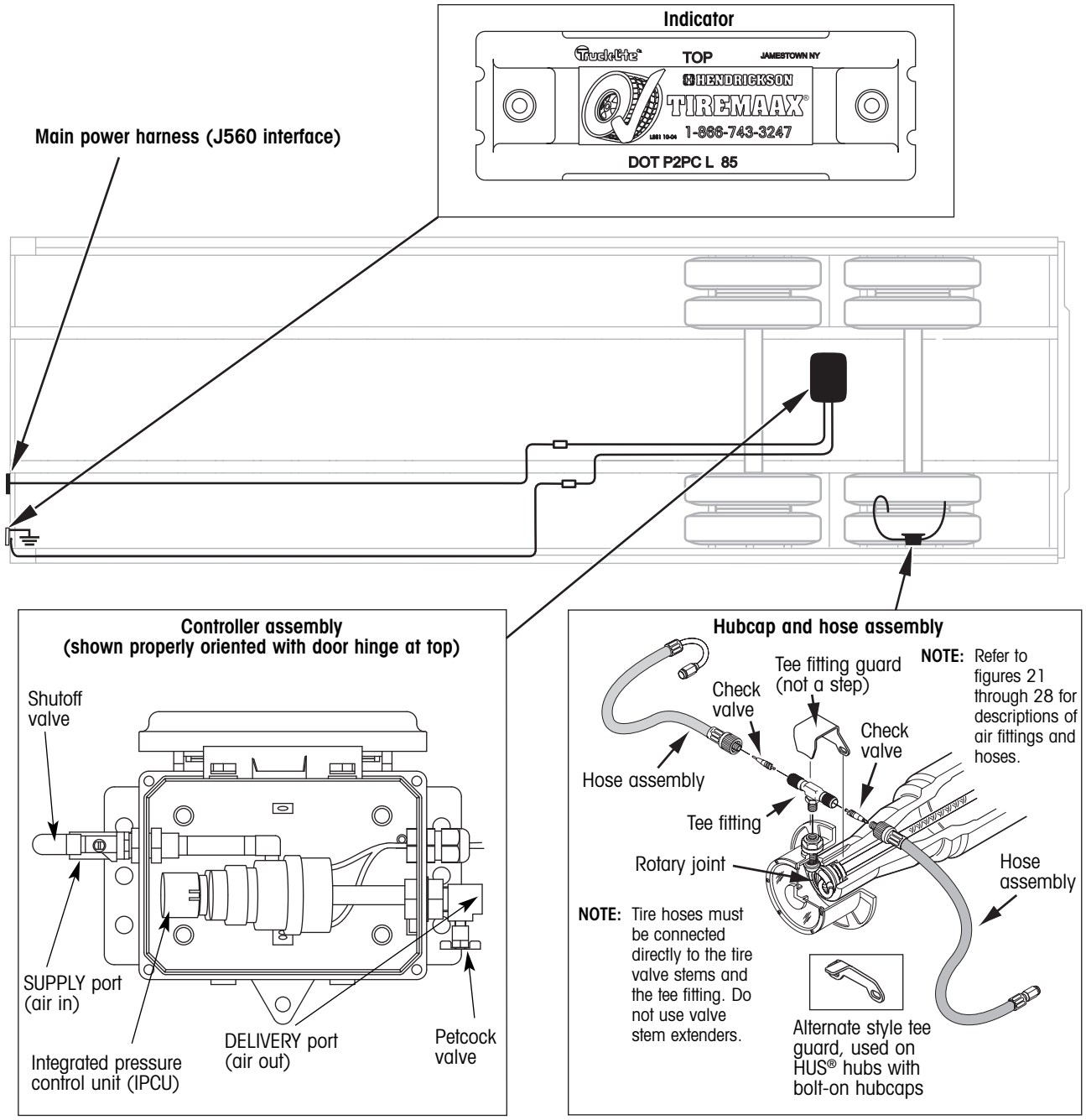
- Provides a means to allow the air to flow from a non-rotating axle spindle to the rotating hubcap
- Composed of seals and bearings — the seal prevents air leakage from the rotating shaft
- Spindle plug provides a secure surface to mount the rotary union and provides an air pressure vent in the hubcap during normal use and in the event of rotary joint damage

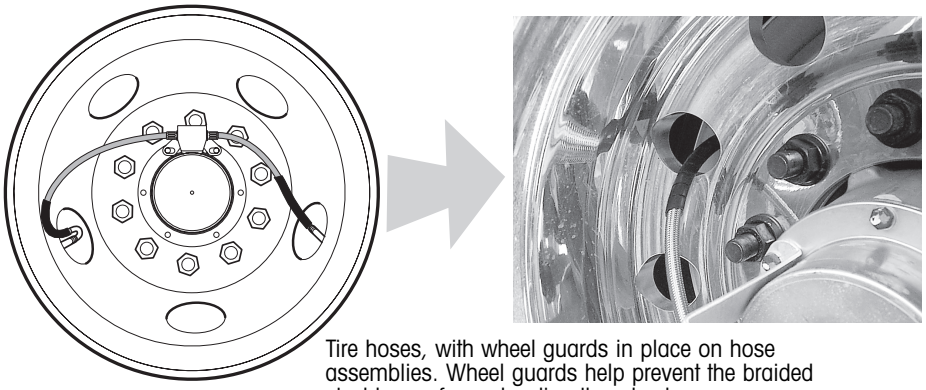
TEE FITTING

- Includes integral check valve assemblies
- Integral check valves are opened when tire hoses are connected
- Prevents air pressure from escaping while tire hoses are removed

CONTROLLER ASSEMBLY WITH INTEGRATED PRESSURE CONTROL UNIT (IPCU)

- Mounting flanges integral to Lexan® enclosure
- Integrated pressure control unit (IPCU)
  - controls the flow of air to the tires
  - has separate supply side (SUPPLY) and delivery side (DELIVERY) ports, see figure 3
  - supply pressure port has a serviceable inlet filter to reduce contamination from the air source
  - uses pressure differential between regulated supply pressure and tire pressure to control air flow, thus maintaining tire pressure
  - turns on the indicator when the measured air flow exceeds approximately 0.7 cfm
  - allows the target tire pressure to be reset using a simple procedure and common shop tools
- Shutoff valve
  - closes supply pressure to controller
  - shuts off pressure to system during maintenance
- Petcock valve allows trailer-mounted indicator functionality to be verified





Tire hoses, with wheel guards in place on hose assemblies. Wheel guards help prevent the braided steel hoses from abrading the wheel.

Figure 3. TIREMAAX® CP components

INSTALLATION

INSTALLATION MATERIALS AND SUPPLIES

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

- Spindle plug driver and handle* (figure 10), unless the spindle plugs are already installed in the axle from the factory
- Air lines and fittings (figures 21-28)
- Indicator and wire (figure 20)
- Controller assembly mounting bolts (figure 19)
- Pressure protection valve

*Components unique to TIREMAAX® CP, available only from Hendrickson

INSTALLATION INTRODUCTION

Identify the bullet item below that describes the condition of your axles and proceed as directed.

- If the TIREMAAX CP system hardware is already installed on a dressed axle, skip to the section titled *Controller Assembly Installation* on page 21.
- If the TIREMAAX CP system axle hose and spindle plugs are already installed on the axle, skip to the section titled *Rotary Joint Installation* on page 17.
- If the axles have been pre-drilled but no hardware has been installed, skip to the section titled *Component Installation* on page 13.
- For retrofit installations, start with the procedures described below.

AXLE PREPARATION

The following describes the procedure for preparing a Hendrickson axle (figure 4) for TIREMAAX CP system installation.

NOTE: The TIREMAAX CP system is not compatible with the castle (cotter pin-locked) spindle nut system. Use only the standard three-piece spindle nut system (HN or HP spindles) or the HUS® spindle locking hardware (HUS spindles) with the TIREMAAX CP system. The PRO-TORQ spindle nut system may be used, but it may also require a Hendrickson hubcap spacer kit to provide the necessary clearance between it and the rotary joint assembly.

⚠ **WARNING: BLOCK ALL WHEELS BEFORE BEGINNING THIS INSTALLATION PROCEDURE. NEVER WORK UNDER A VEHICLE SUPPORTED ONLY BY A JACK.**

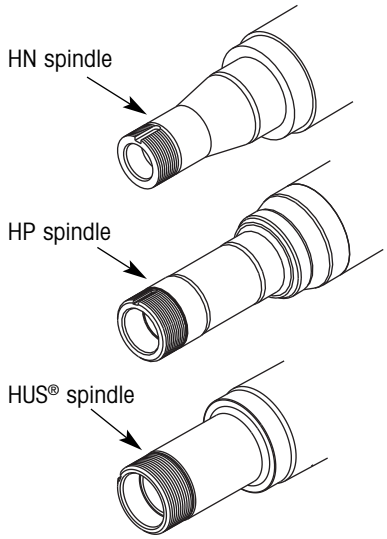


Figure 4. Axle spindle identification

1. Block the tires to keep the trailer from moving (figure 5).
2. Exhaust the trailer air system.
3. If the wheel end is oil lubricated, drain the oil from the hubcap and discard the oil.
4. Remove the hubcap bolts and hubcap.

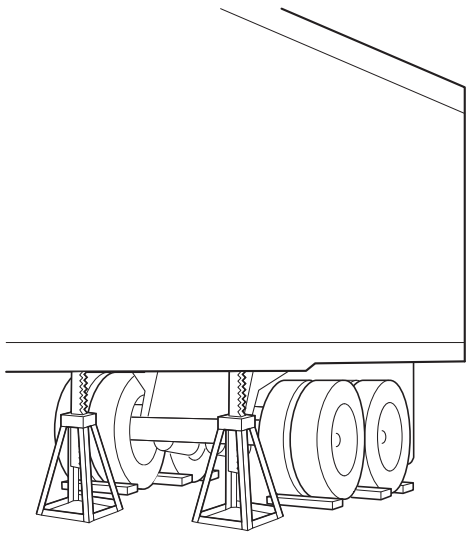


Figure 5. Trailer preparation

5. Remove the spindle plug from the spindle.

6. Remove the in-axle filter.

7. Inspect the spindle plug bore and remove any burrs or sealant.

8. Check the inside of the spindle to ensure that there is a passage through the axle to allow installation of the air line.

9. **For all INTRAAX® and VANTRAAX® suspensions** - locate the three ¼-inch pipe plugs in the axle wrap windows, remove the plugs, and proceed to the *Component Installation* section on page

13. If the axle does not have pre-drilled holes in the axle wrap windows, proceed to step 10 for hole drilling details.

    For Hendrickson Trailer Axles - locate the three ¼-inch pipe plugs in the middle of the axle, remove the plugs, and proceed to the *Component Installation* section on page 13. If the axle does not have three pre-drilled holes in the middle of the axle, proceed to step 10 for hole drilling details.

10. Using the information in figure 6 or 7, drill and tap three ¼-inch - 18 NPT holes in the axle wrap windows (on INTRAAX and VANTRAAX

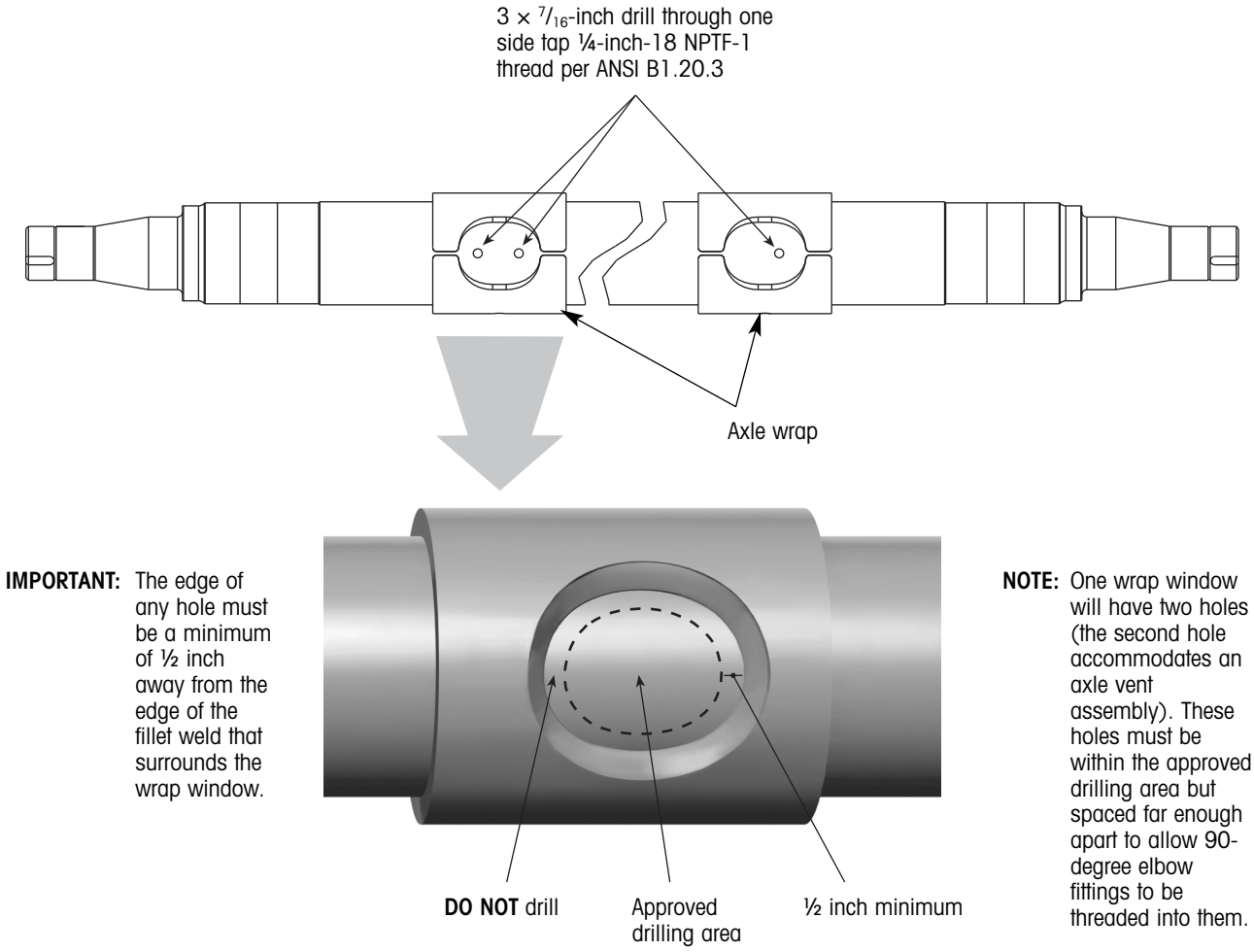


Figure 6. INTRAAX / VANTRAAX suspension axle drilling details

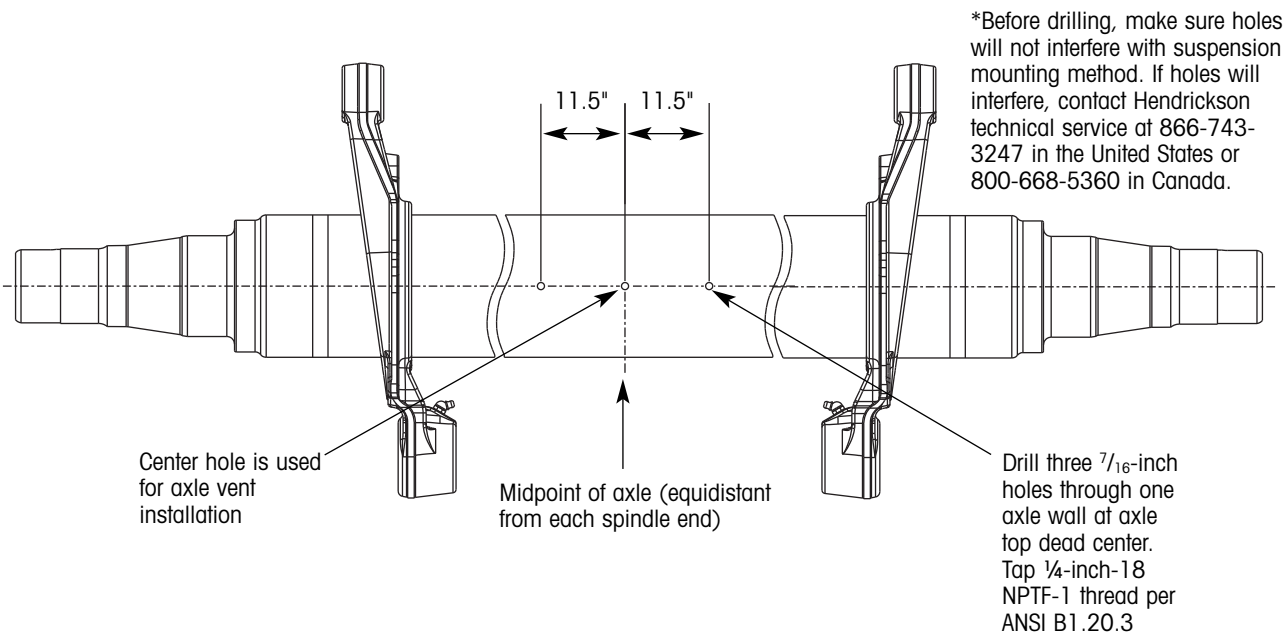


Figure 7. Hendrickson Trailer Axle drilling details

suspensions) or at the midpoint of the axle (on Hendrickson Trailer Axles) to prepare for component installation.

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), for complete slack adjuster and camshaft removal instructions.

NOTE: Remove the debris generated by the drilling and tapping operations from inside the axle before proceeding with the next step.

11. Proceed to the *Component Installation* section.

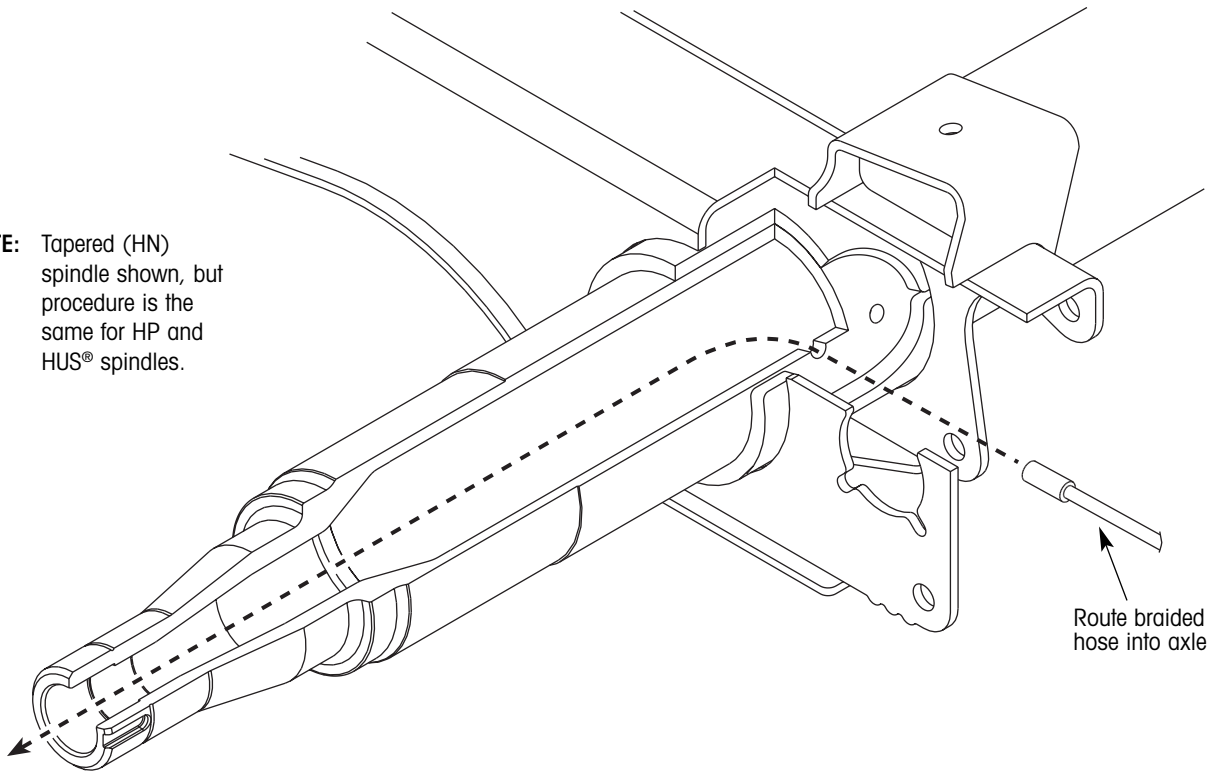


Figure 8. Routing hose in axle

COMPONENT INSTALLATION

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

- Axle hose installation
- Spindle plug installation
- Hub installation requirements
- Hendrickson hubcap spacer kit installation
- Rotary joint installation
- Hubcap assembly
- Controller assembly installation
- Wiring harness installation
- Axle vent and control line installation
- Tire hose installation

AXLE HOSE INSTALLATION

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 Trailer Axles, route the small end of the metal braided hose into the hole closest to the spindle.

2. Making sure that the hose heads toward the spindle end, continue feeding the metal braided hose into the axle tube until the small end of the hose exits the spindle end.

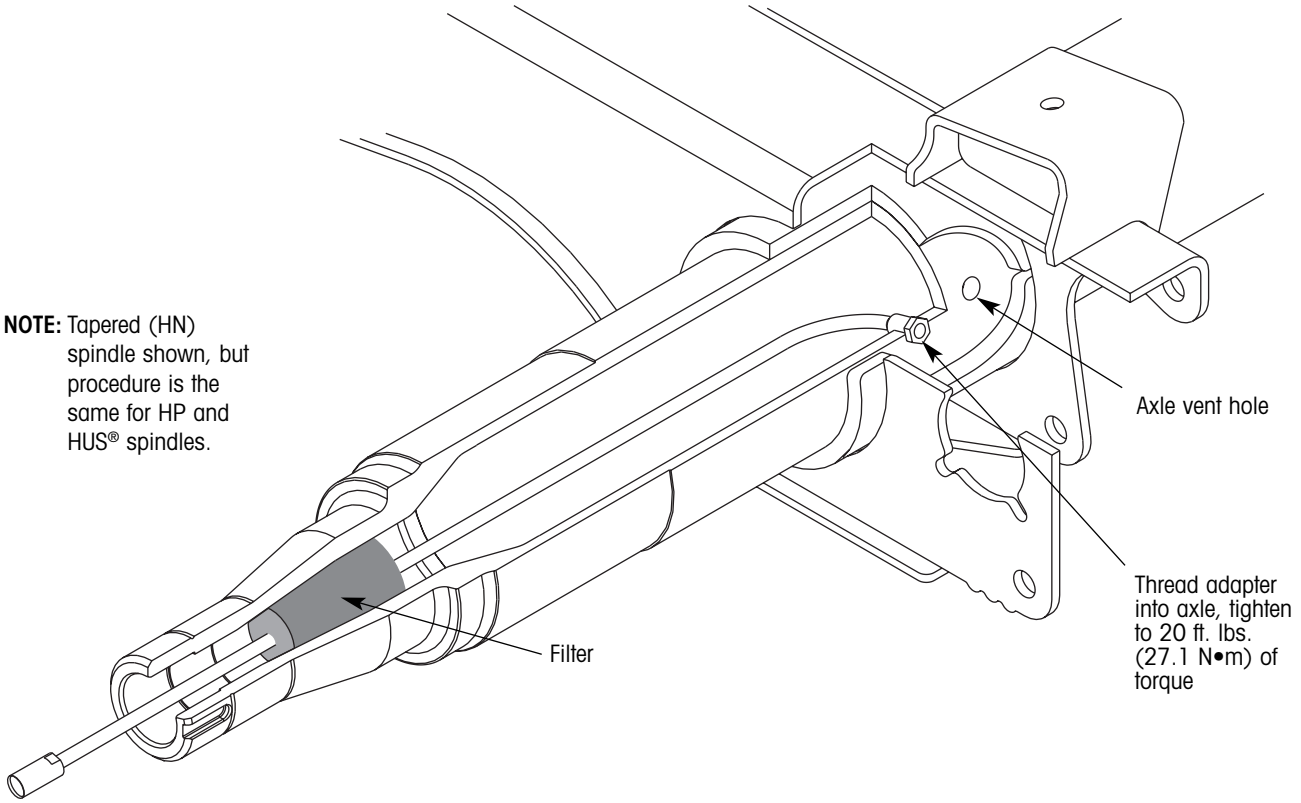


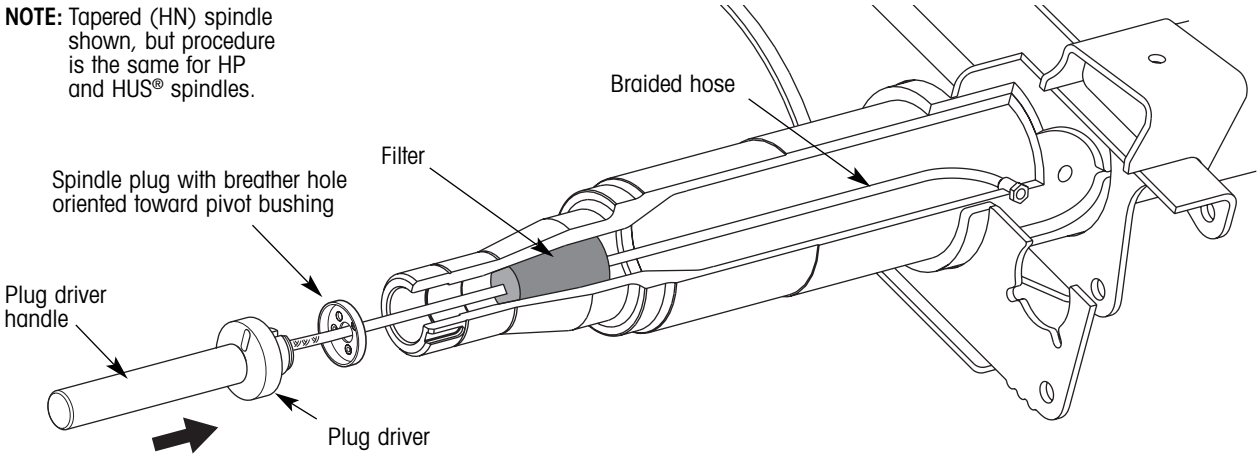
Figure 9. Installed position of hose assembly

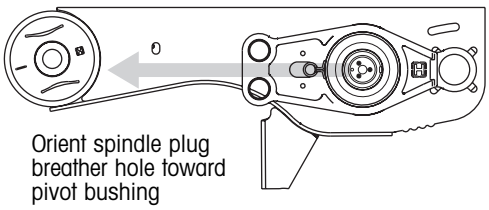
3. Thread the large adapter end of the axle hose assembly into the axle and tighten to 20 ft. lbs. (27.1 N•m) of torque (figure 9).

4. If not already present, cut an inch-wide slit in the center of the axle filter and feed the metal braided hose through the slit in the filter. Push the axle filter into the spindle cavity (figure 9).

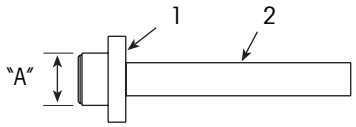
5. Remove the protective coverings from the end of the axle hose assembly and blow air through the hose assembly to remove any debris.

6. Repeat steps one through five on the other end of the axle. Leave the axle vent hole (figure 9) vacant for now. This hole will be used to accommodate the axle vent in a later installation.





Plug Driver and Handle Assembly Ordering Information



Item	Name	Part Number	"A" Dimension	Spindle Type
1	Plug driver	S-28146-1	1.75 inches	HN
1	Plug driver	S-28146-2	2.50* inches	HP*
1	Plug driver	S-28146-3	2.75* inches	HP* & HUS
2	Plug driver handle	S-27399	—	—

* Before March 28, 2003, Hendrickson manufactured HP spindles with both 2.5" and 2.75" inner bore diameters. After this date, the HP spindle bore was standardized at 2.75".

Figure 10. Spindle plug installation

SPINDLE PLUG INSTALLATION

1. On one end of the axle, route the end of the braided hose through the center of the spindle plug (figure 10).

2. With the spindle plug breather hole oriented toward the pivot bushing (figure 10), place the plug assembly against the spindle end.

3. Route the braided hose into the center of the plug driver and press the plug into the spindle end until the driver bottoms on the end of the spindle.

NOTE: The driver regulates the correct installation depth. Refer to Hendrickson publication *B113, TIREMAAX® Spindle Plug Installation Depth* (available from www.hendrickson-intl.com) for complete installation details.

4. Repeat steps one through three on the other end of the axle.

HUB INSTALLATION REQUIREMENTS

⚠ WARNING: A minimum hub bore depth is required when installing the TIREMAAX CP system (figure 11). This hub requirement helps keep the proper clearance between the rotary joint assembly and the spindle nut system (figure 11), thus preventing contact or interference between these parts which could result in wheel-end failure and severe personal injury or death.

Any hub may be used with the TIREMAAX CP system, provided a minimum hub bore depth requirement (dimension "A" in figure 12) is maintained.

If the hub bore dimension is greater than or equal to the dimension shown in the chart in figure 12, you may use the hub "as is" with the TIREMAAX CP system.

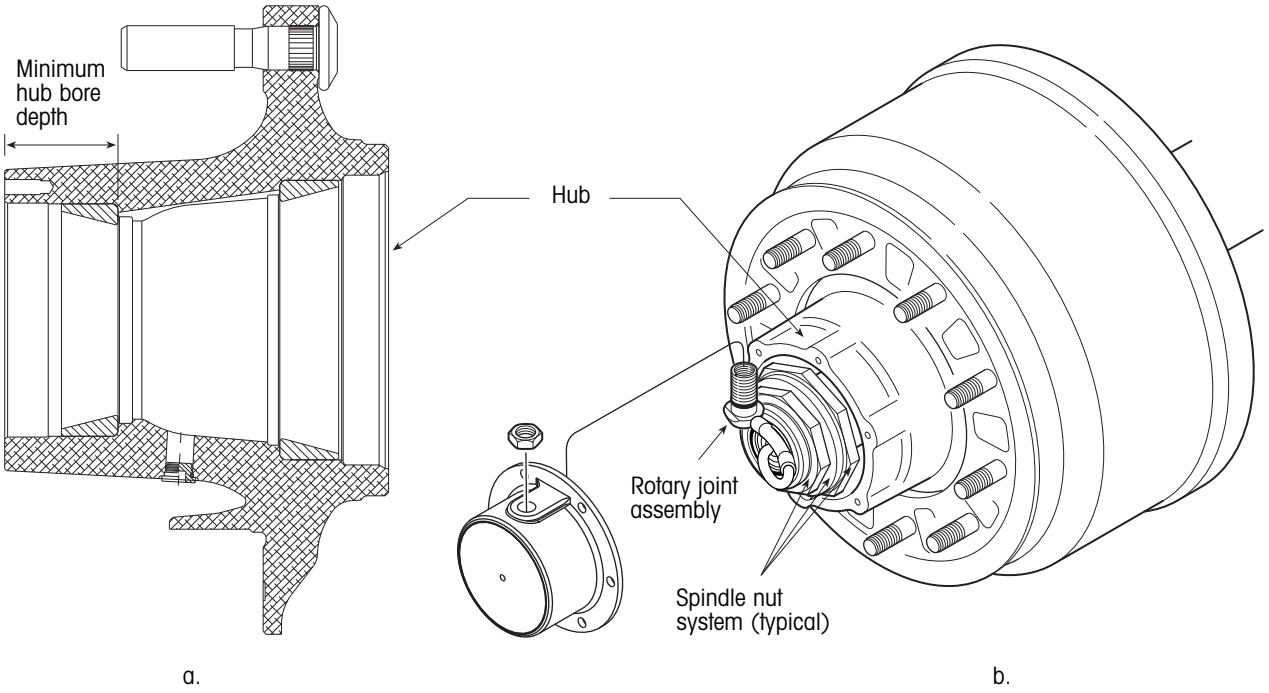
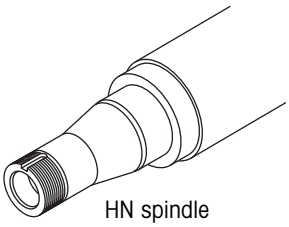
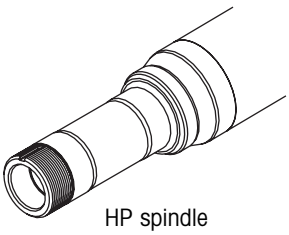


Figure 11. TIREMAAX® CP hub requirement





Dimension "A" is the minimum hub bore depth required to install the TIREMAAX CP system and is measured from the bottom of the bearing cup to the hubcap mounting surface.

SPINDLE NUT SYSTEM	"A" SPINDLE TYPE HN	HP
Standard three-piece	1.52"	1.44"
Stemco PRO-TORQ one-piece	1.69"	2.12"

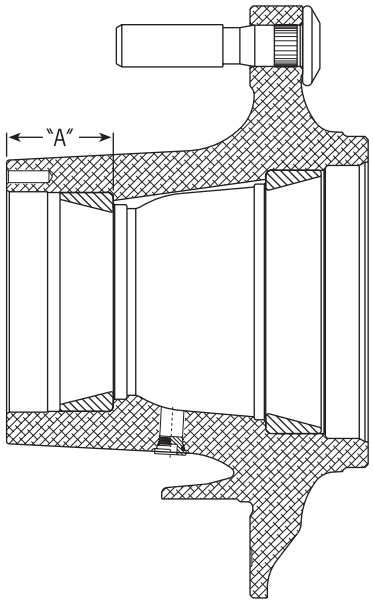


Figure 12. Minimum hub bore depth

If the hub bore dimension is less than the dimension shown in the chart in figure 12, you may still use the hub with the TIREMAAX CP system, but a Hendrickson hubcap spacer kit is required.

Hendrickson offers hubcap spacer kits for HN and HP spindles to accommodate most hubs without the required bore dimension. Each kit consists of $^3/_8$-inch spacers, gaskets, hubcap bolts and lock washers in quantities to adapt one axle. The hubcap spacer kit part numbers are:

SPINDLE TYPE	HUBCAP SPACER KIT PART NUMBER
HN	S-28040
HP	S-28093

HENDRICKSON HUBCAP SPACER KIT INSTALLATION

If the hub you intend to use does not meet the minimum hub bore depth requirement, use the following procedure to install the hubcap spacer kit.

1. Sandwich the spacer between two gaskets as shown in figure 13.

2. Install the hubcap using the bolts and lock washers provided in the kit. Tighten the hubcap bolts to 12-18 ft. lbs. (16-24 N•m) of torque.

ROTARY JOINT INSTALLATION

NOTE: The hubs and drums should be installed before installing the rotary joint assemblies.

There are two styles of rotary joint assembly (figure 14): one with a threaded axle hose connector (current production) and one with a barbed axle hose connector (earlier style). Use the procedure below that matches your rotary joint and axle hose hardware.

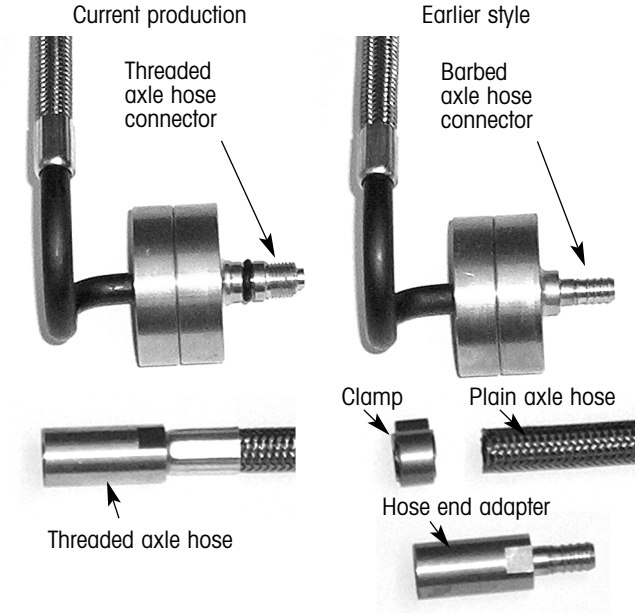


Figure 14. Rotary union / axle hose connections

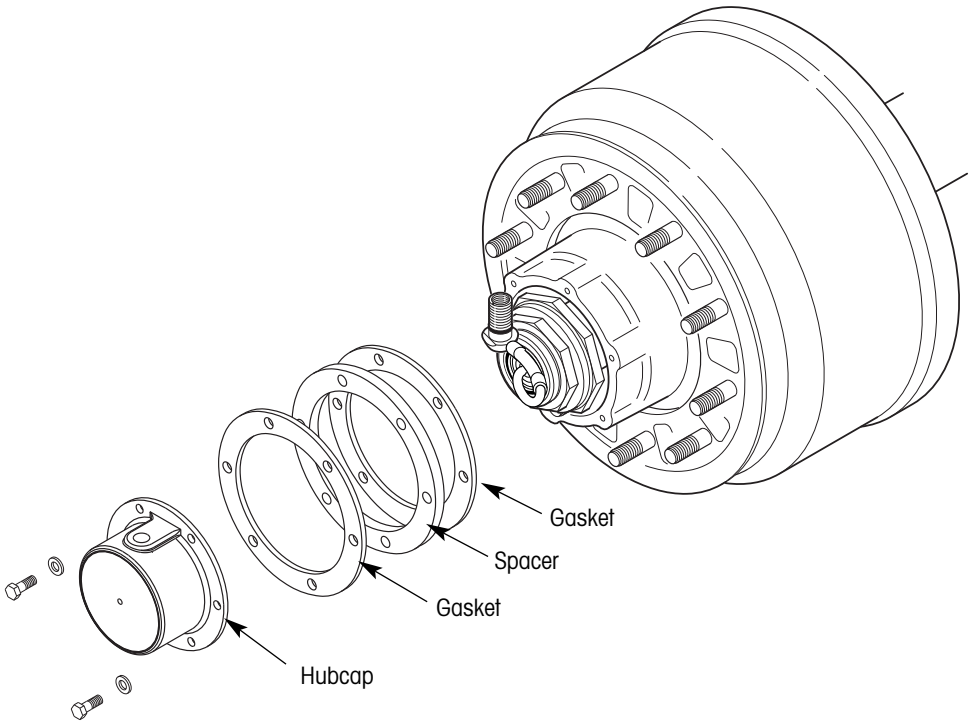


Figure 13. Hubcap spacer kit installation

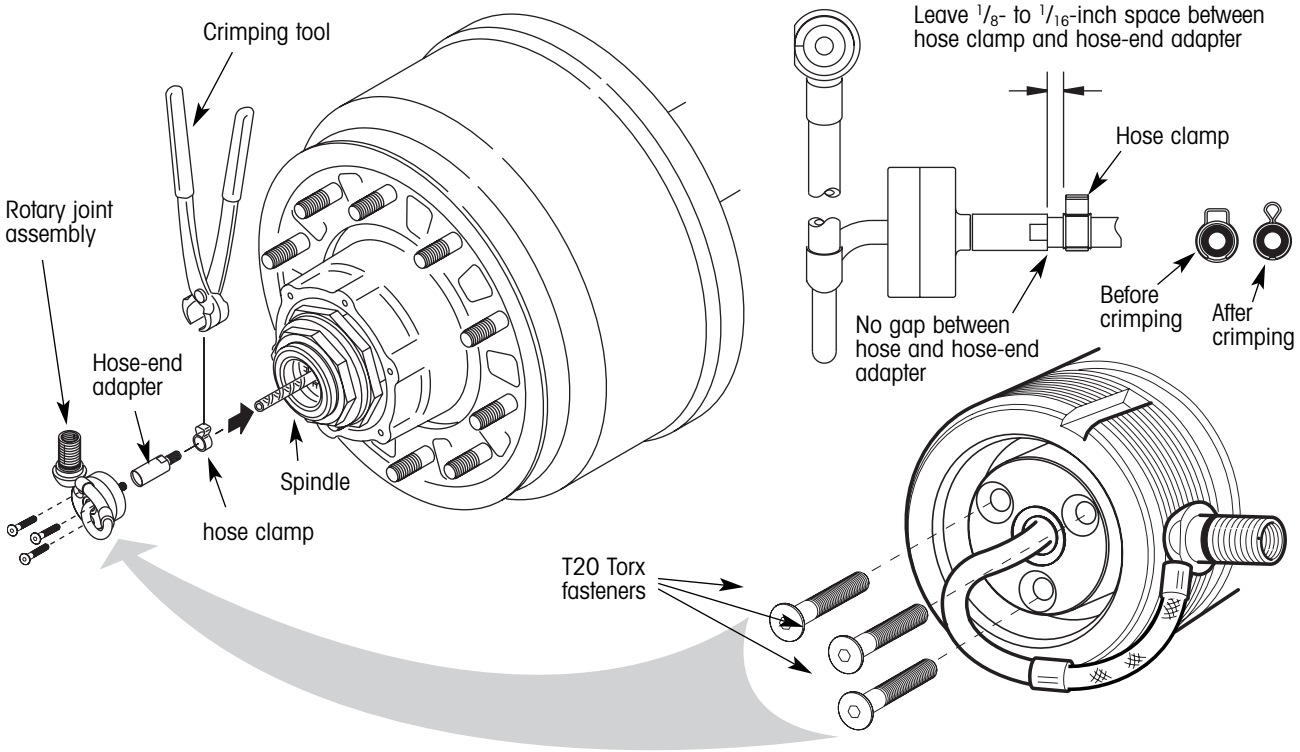


Figure 15. Rotary joint installation

If your axle hose is threaded, you will not need to install the hose-end adapter (figure 14). Continue with step 4.

If your axle hose has a plain end, you will need to install the hose-end adapter as follows:

1. On one end of the axle, place the hose clamp onto the braided axle hose sticking out of the spindle plug (figure 15).

2. Slide the barbed end of the hose-end adapter completely into the end of the braided hose assembly until the hose bottoms on the adapter. There must not be any gap between the hose and the hose-end adapter (figure 15).

3. Position the clamp over the barbed end of the hose-end adapter. Leave a 1/8- to 1/16-inch space between the clamp and the hose-end adapter as shown in figure 15. Using a crimping tool (Oetiker® pliers), squeeze the clamp to tighten the hose to the hose-end adapter. The clamp inner surfaces must touch for a proper seal (figure 15). Continue with step 4.

4. Using the rotary union spanner wrench (figure 16), screw the threaded rotary union into the threaded axle hose (or hose-end adapter) and tighten to 30 in. lbs. (3.4 N•m) of torque.

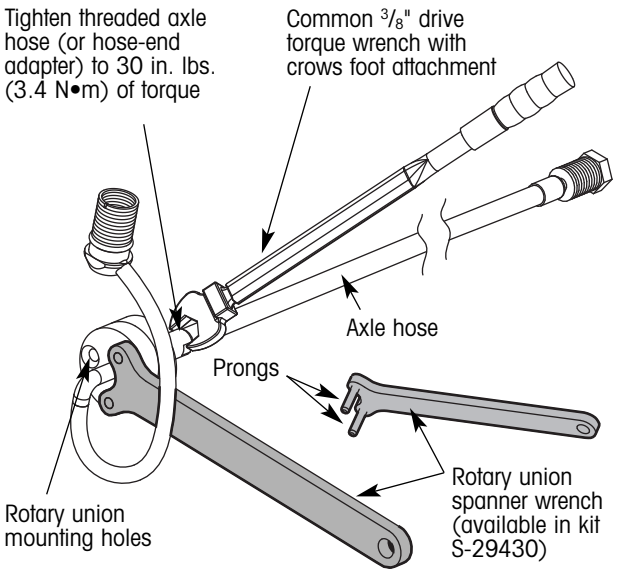


Figure 16. Rotary union spanner wrench use

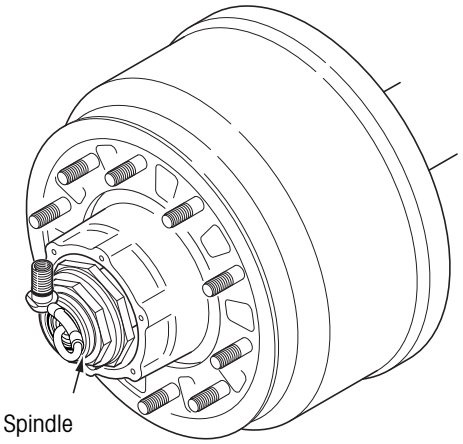


Figure 17. Completed installation of rotary joint assembly

NOTE: The rotary union spanner wrench serves two purposes. It offers a convenient way to hold the rotary union stationary while the threaded axle hose connection is tightened. And since the rotary union is manufactured in two halves, the prongs keep both halves of the rotary union from rotating while the axle hose connection is being made, thereby ensuring that the mounting holes in both halves of the rotary union stay aligned.

5. Push the rotary union / axle hose assembly into the spindle plug, aligning the holes in the rotary union with the threaded holes in the spindle plug.

IMPORTANT: To align the holes, rotate the rotary union / axle hose assembly CLOCKWISE ONLY. This ensures that the torqued connection will not loosen.

6. Insert the three T20 Torx fasteners into the rotary joint assembly and fasten to the spindle plug (figure 15). Tighten the fasteners to 45 ±5 in. lbs. (5 ±½ N•m) of torque.

7. Rotate the rotary joint assembly one full turn. Make sure that the steel air tube does not contact any part of the spindle or spindle nut system.

8. Repeat steps one through seven on the other side of the axle.

HUBCAP ASSEMBLY

1. Place a hubcap gasket over the rotary joint exit tube and bulkhead adapter.

2. Lubricate the O-ring on the rotary joint bulkhead adapter. Use the same lubricant as is used in the hub or a light film of #2 grease, white lithium grease or Vaseline®.

3. From the inside, insert the bulkhead adapter through the hole in the hubcap labeled "Air".

4. Align the flat on the bulkhead adapter with the anti-rotation flat in the hubcap (figure 18).

   Note the orientation indicator on the top of the bulkhead adapter threads (figure 18, view a). Use this indicator (some models have a dot, other models have a notch) to properly orient the bulkhead adapter in the hubcap hole. When the flat on the bulkhead adapter is properly aligned with the anti-rotation flat in the hubcap, the orientation indicator will face outboard (figure 18, view b).

⚠ **WARNING: Failure to properly align the flats as described above will result in wheel-end contamination and could lead to wheel-end failure.**

Do not use pliers or any kind of wrench to pull the bulkhead adapter up through the hole in the hubcap. This could cause the bulkhead adapter to rotate before it engages the flat in the hubcap, potentially damaging the rotary union or hubcap.

Attach the jam nut and hand tighten. When properly seated, the top of the bulkhead adapter will be flush (or higher) with the top of the jam nut when hand tightened (figure 18 view c).

NOTE: If wheels are installed, refer to figure 29 to determine the correct "clocking" of the hubcap. The wheel must be properly "clocked" to the hubcap to prevent the hoses from rubbing on the wheel. Failure to properly "clock" the wheels may result in hose failure.

5. Install the hubcap. If the hubcap is a screw-on style used on the HUS hub, tighten it to 50-100 ft. lbs. (68-137 N•m) of torque. If the hubcap is

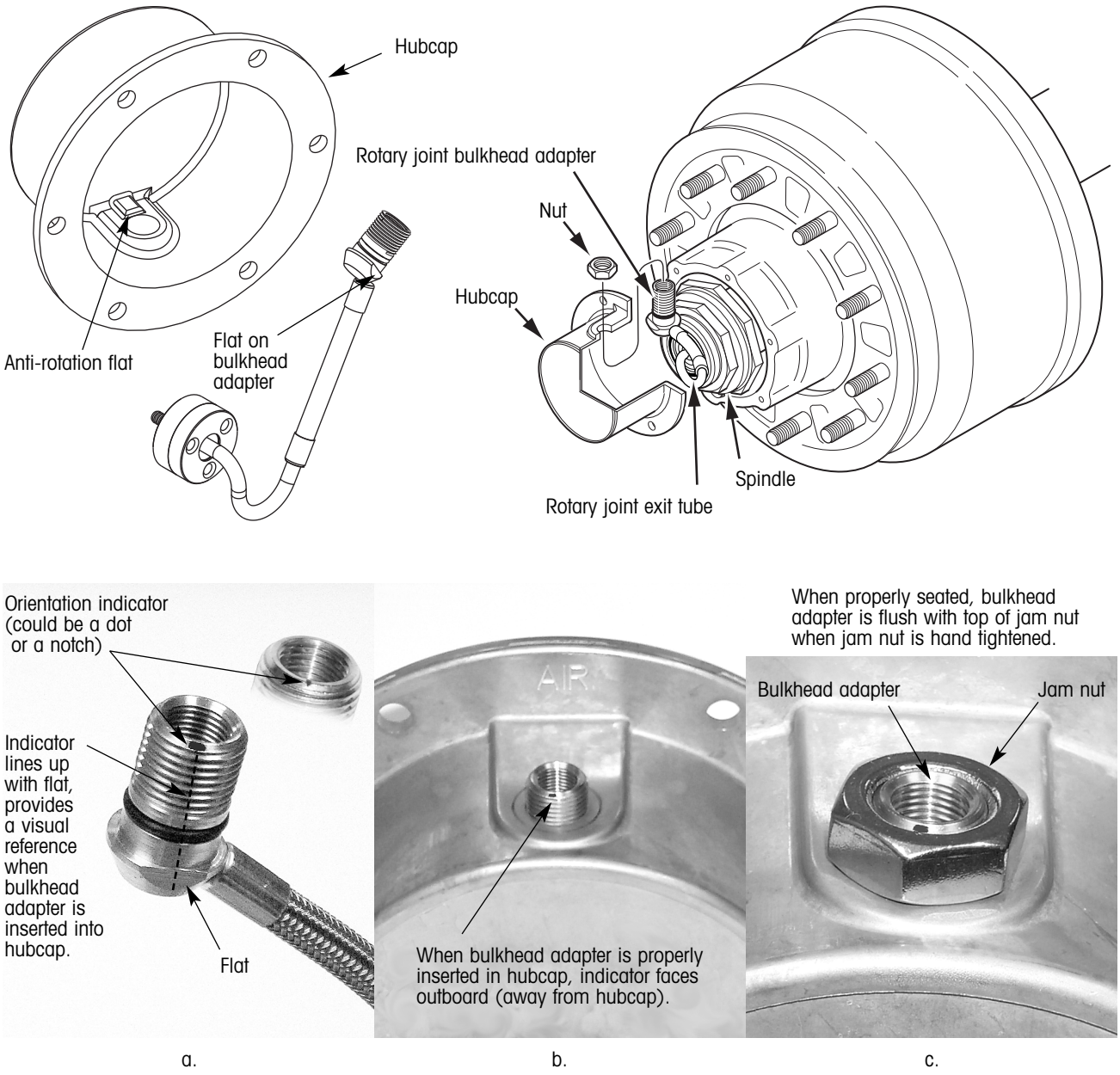


Figure 18. Hubcap to bulkhead adapter connection details

a bolt-on style used on the other hubs, tighten the hubcap bolts to 12-18 ft. lbs. (16-24 N•m) of torque.

6. Tighten the rotary joint jam nut to 15 ft. lbs. (20 N•m) of torque.

7. For oil filled hubs, install lubricant in the wheel end to the correct level.

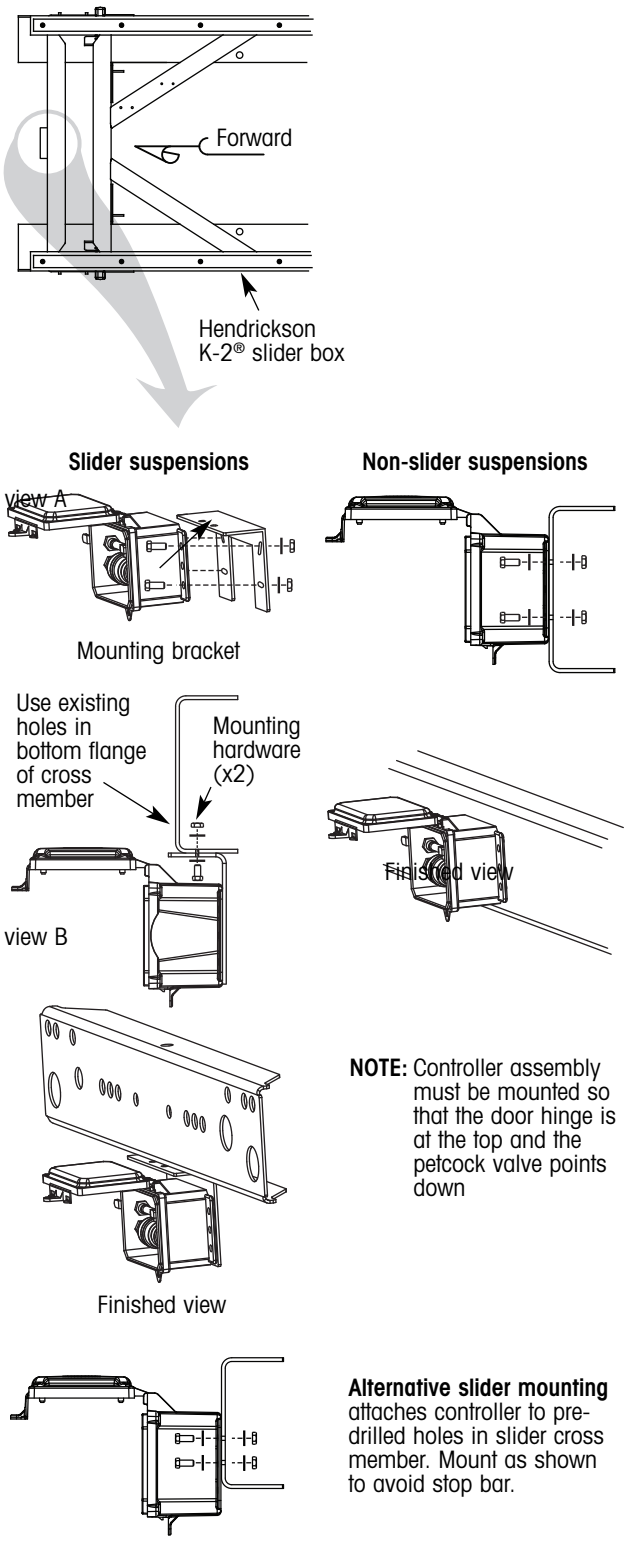


Figure 19. Controller assembly installation

CONTROLLER ASSEMBLY INSTALLATION

Hendrickson recommends the forwardmost cross member as the controller assembly mounting location (figure 19). A mounting bracket is included so the controller assembly can be mounted without drilling holes in the cross member. On slider suspensions, the bracket and controller assembly must be mounted below the cross member as shown in figure 19 to avoid interference with the slider stop bar. On non-slider suspensions, the controller can be mounted below the cross member as shown in figure 19 or flush mounted to the vertical surface of the cross member if desired, since slider stop bar interference is not an issue.

For slider suspensions

1. Attach each corner of the controller assembly to the bracket with the four $^{5}/_{16}$-inch bolts, washers and nuts as shown in figure 19, view A. Orient the enclosure so that the door hinge is at the top and the petcock valve points down.

2. Attach the controller and bracket assembly to the existing holes in the bottom surface of the cross member as shown in figure 19, view B.

⚠ **WARNING Failure to properly orient the controller and mounting bracket as shown in figure 19 and described above will result in slider stop bar interference and controller assembly damage.**

For non-slider suspensions

Use the slider assembly mounting method described above, or attach each corner of the controller assembly directly to the vertical surface of the cross member with the four $^{5}/_{16}$-inch bolts, washers and nuts (figure 19). Orient the enclosure so that the door hinge is at the top and the petcock valve points down (figure 19).

⚠ **CAUTION: The controller assembly must be mounted so that the door hinge is at the top and the petcock valve points down (figure 19).**

WIRING HARNESS INSTALLATION

TIREMAAX® CP comes standard with a two-wire, 18-inch long harness (figure 20). The red wire of this harness is the indicator power lead, it connects to the trailer-mounted indicator. The blue wire must be connected to 12 VDC vehicle power. The termination of these wires is the responsibility of the installer. Terminals and connectors must be weatherproof, and corrosion prevention compound must be used on all connectors. Refer to TMC RP 113, 114, 154 and 704 for recommended wiring practices.

A premium, 15-foot long ABS-ready harness is an available option. It plugs into the five-pin Packard connector coming from the J560 interface and provides a pass-through ABS connection. To install the wiring harness specific for TIREMAAX® CP:

1. **Standard harness** - Connect the blue wire to vehicle power.

   ABS harness - Plug the five-pin male Packard connector into the mating connector coming from the J560 interface.

2. Connect the other end of the harness to the controller assembly.

3. Mount the indicator on the front corner or side of the trailer within view of the operator's side view mirror. On tractor applications with large wind fairings, locating the indicator near the left rear wheels (near the ABS warning lamp) may be preferable. Connect one side of the indicator to ground (an internal ground, or a dedicated ground wire from the indicator to the plug that connects the trailer to the tow vehicle is recommended).

4. Route the indicator power wire (16 AWG minimum) and connect it to the red wire on the TIREMAAX CP harness or to the trailer-mounted indicator power lead on the premium, ABS-ready harness.

5. Weatherproof and secure wires and connectors as required. Refer to Technical Bulletin T51001 for instructions to secure harness.

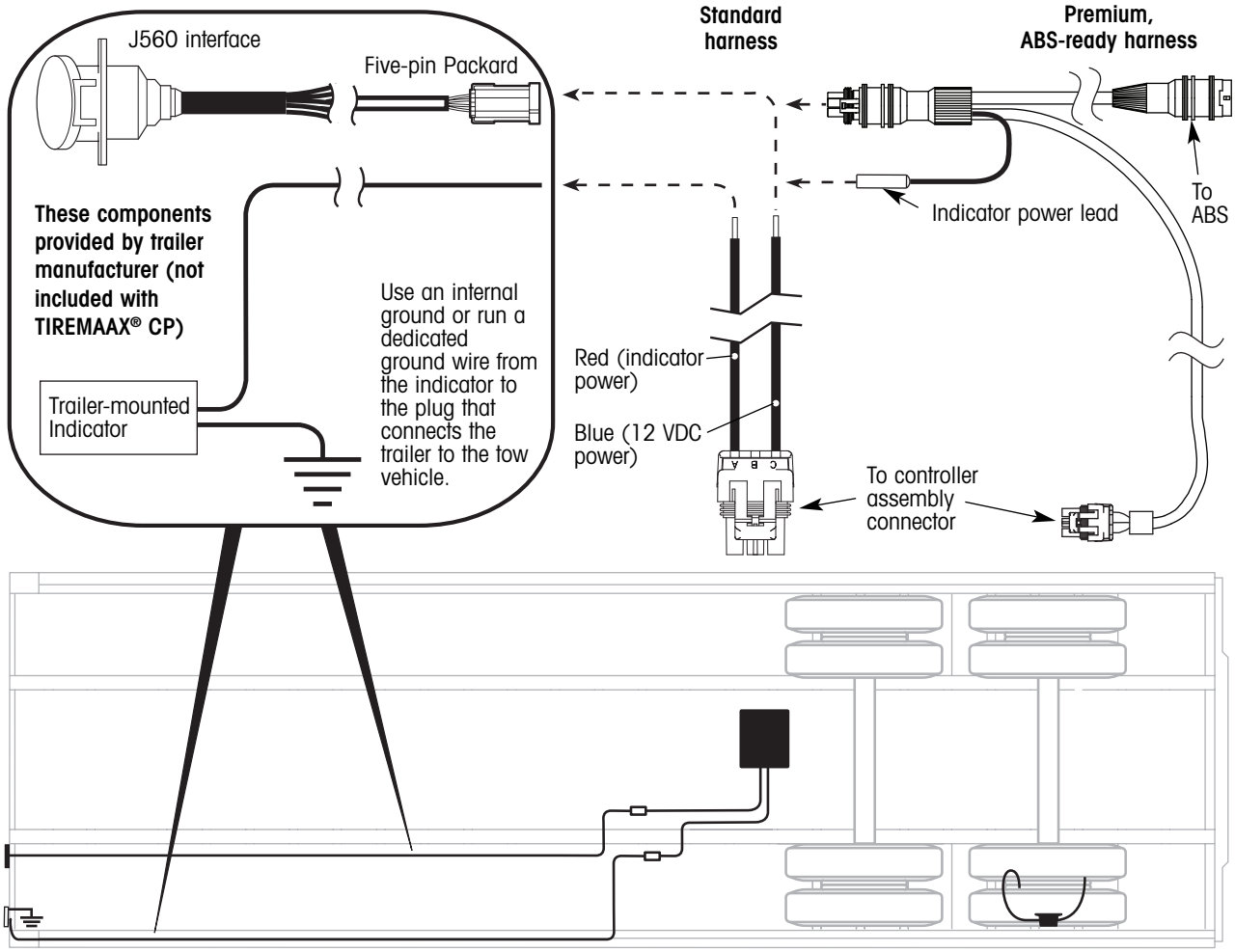


Figure 20. Trailer wiring harness installation

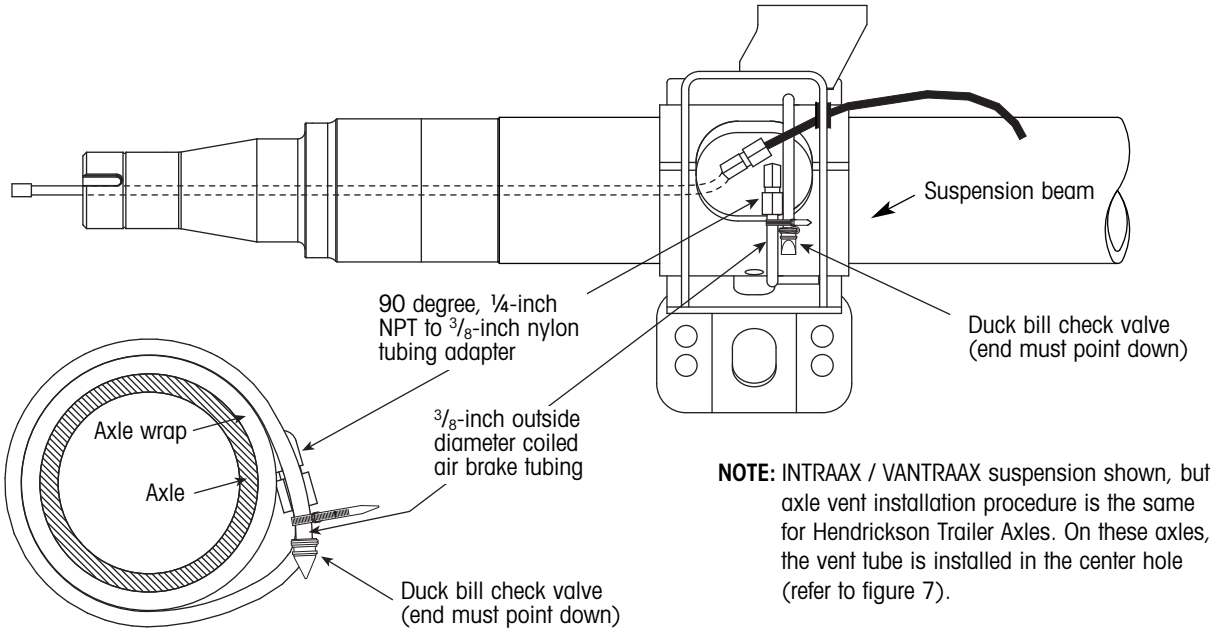


Figure 21. Typical axle vent installation

AXLE VENT INSTALLATION

1. Install a 90 degree, ¼-inch NPT male to $^3/_8$-inch nylon tubing adapter in the remaining ¼-inch threaded hole in the axle tube (figure 21).

2. Loop the $^3/_8$-inch outside diameter coiled tubing around the axle. On INTRAAX / VANTRAAX suspensions, loop the coiled tubing around the axle inside the suspension beam as shown in figure 21. If not already installed, attach the duck bill check valve to the tubing making sure the end points down to prevent contamination (figure 21). To attach the duck bill check valve, slide the duck bill check valve onto the tubing and secure with the provided clamp. Do not use glue or any other substance that could plug the duck bill valve.

⚠ **CAUTION: To prevent contamination of the axle, ensure the adapters and the duck bill check valve are securely fastened and the duck bill check valve-end points down.**

⚠ **WARNING: Failure to properly install axle vent may result in wheel-end pressurization and/or water ingestion, which could cause wheel-end failure and severe personal injury or death.**

CONTROL LINE INSTALLATION

Proper TIREMAAX® CP operation requires correct air line diameters and lengths. The following diagrams (figures 22-28) show air brake tubing lengths and sizes and associated fittings required to complete the system installation. Control line routing recommendations are also included.

⚠ **CAUTION: To prevent twisting the air line inside the axle when tightening fittings to the axle hose fitting, use a wrench to hold the axle hose fitting.**

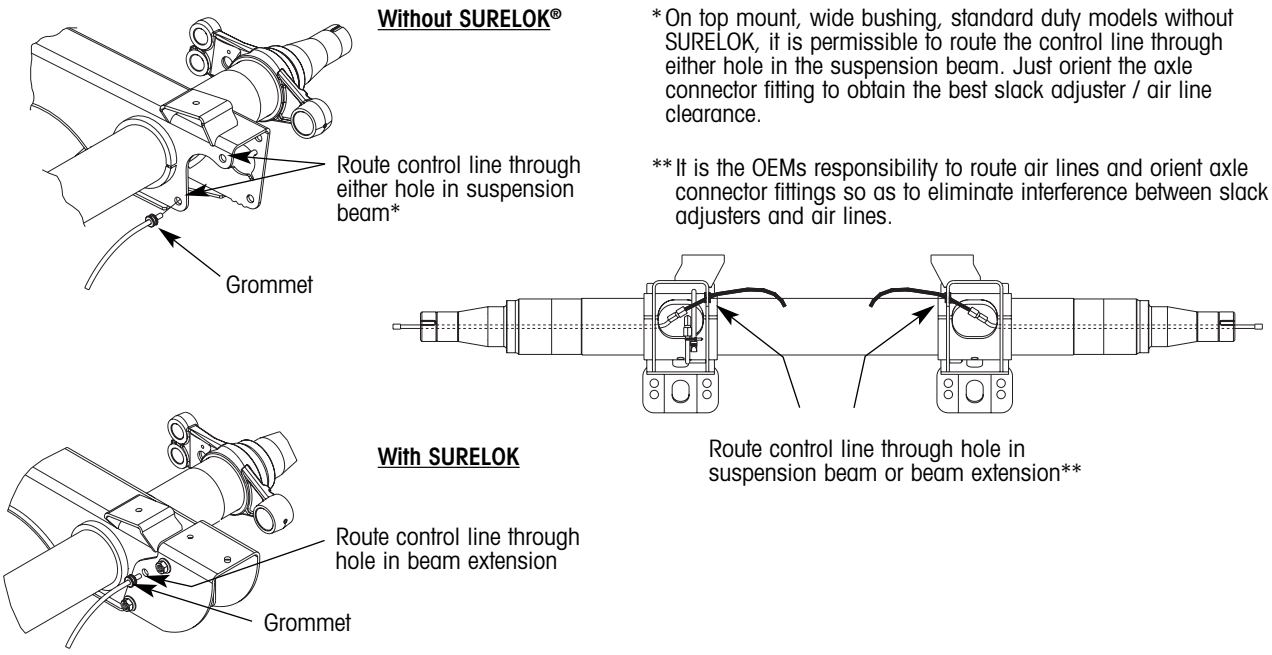
⚠ **CAUTION: Proper TIREMAAX CP operation requires correct air line diameters and lengths. Installation sizes and lengths must be within limits shown.**

⚠ **CAUTION: Proper TIREMAAX CP operation requires correct air line connections. All junctions of two or more ¼-inch lines must increase to $^3/_8$-inch line for adequate air flow.**

⚠ **CAUTION: To prevent TIREMAAX CP contamination, do not install fittings on the bottom of the trailer air tank.**

ADDITIONAL AXLES

For systems with three or four axles, observe the installation requirements as shown in the following diagrams (figures 22-28). Extend the main $^{3}/_{8}$-inch run as necessary. However, all total line lengths must still remain within the limits listed in the diagrams.



* On top mount, wide bushing, standard duty models without SURELOK, it is permissible to route the control line through either hole in the 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.

Figure 22. Suggested control line installation details for Top Mount, Wide Bushing, Standard Duty Models (AAT, HKAT)

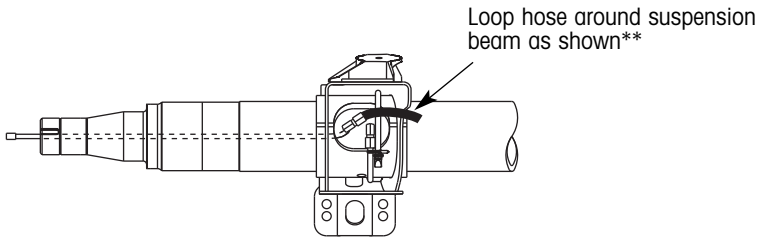


Figure 23. Suggested control line installation details for Top Mount, Narrow Bushing, Standard Duty Models (HKANT, AANT, AAZNT)

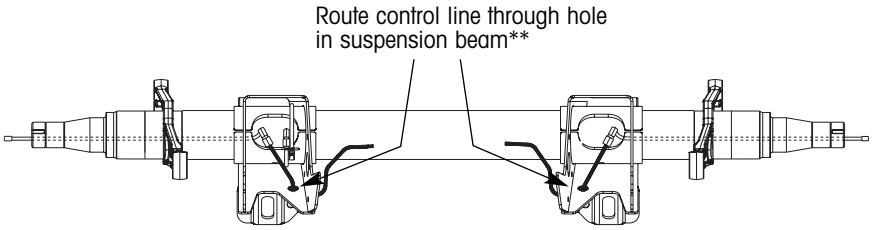


Figure 24. Suggested control line installation details for Low Ride, Wide Bushing, Standard Duty (AAL 23K, AAL 25K, AAZL, AAL 30K); Low Ride, Wide Bushing, Extreme Duty (AAEDL 30K); and Top Mount, Wide Bushing, Extreme Duty (AAEDT 30K) Models

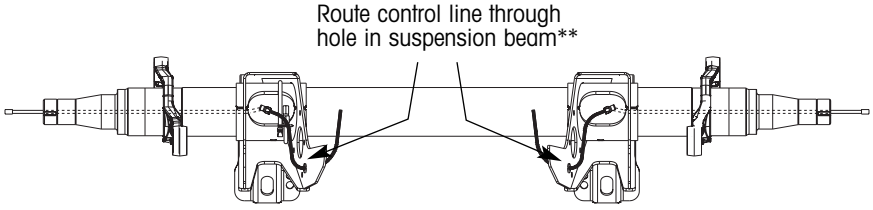


Figure 25. Suggested control line installation details for Low Ride, Short Beam, Narrow Bushing, Standard Duty Models (AANLS 20K)

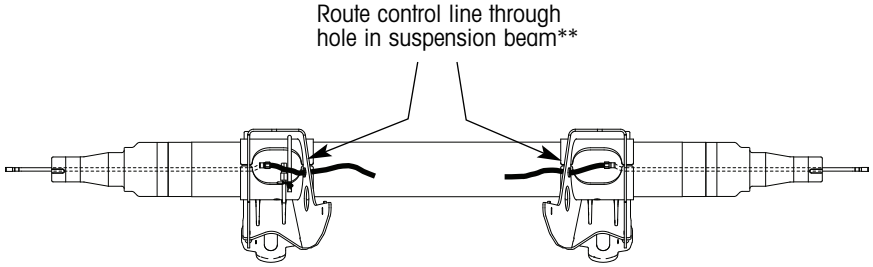
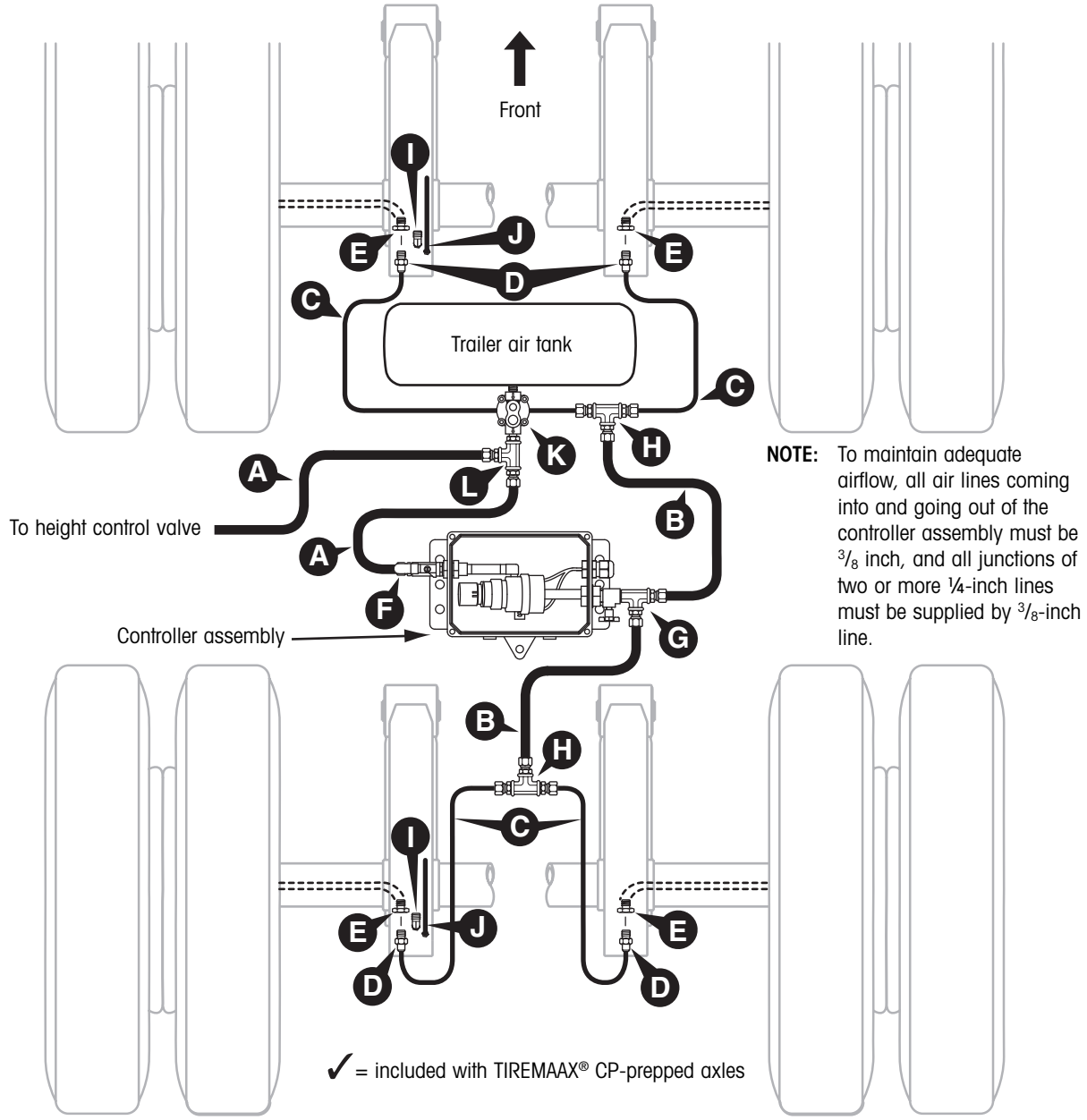


Figure 25a. Suggested control line installation details for Low Ride, Narrow Bushing, Standard Duty Models (AANL)

** 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.

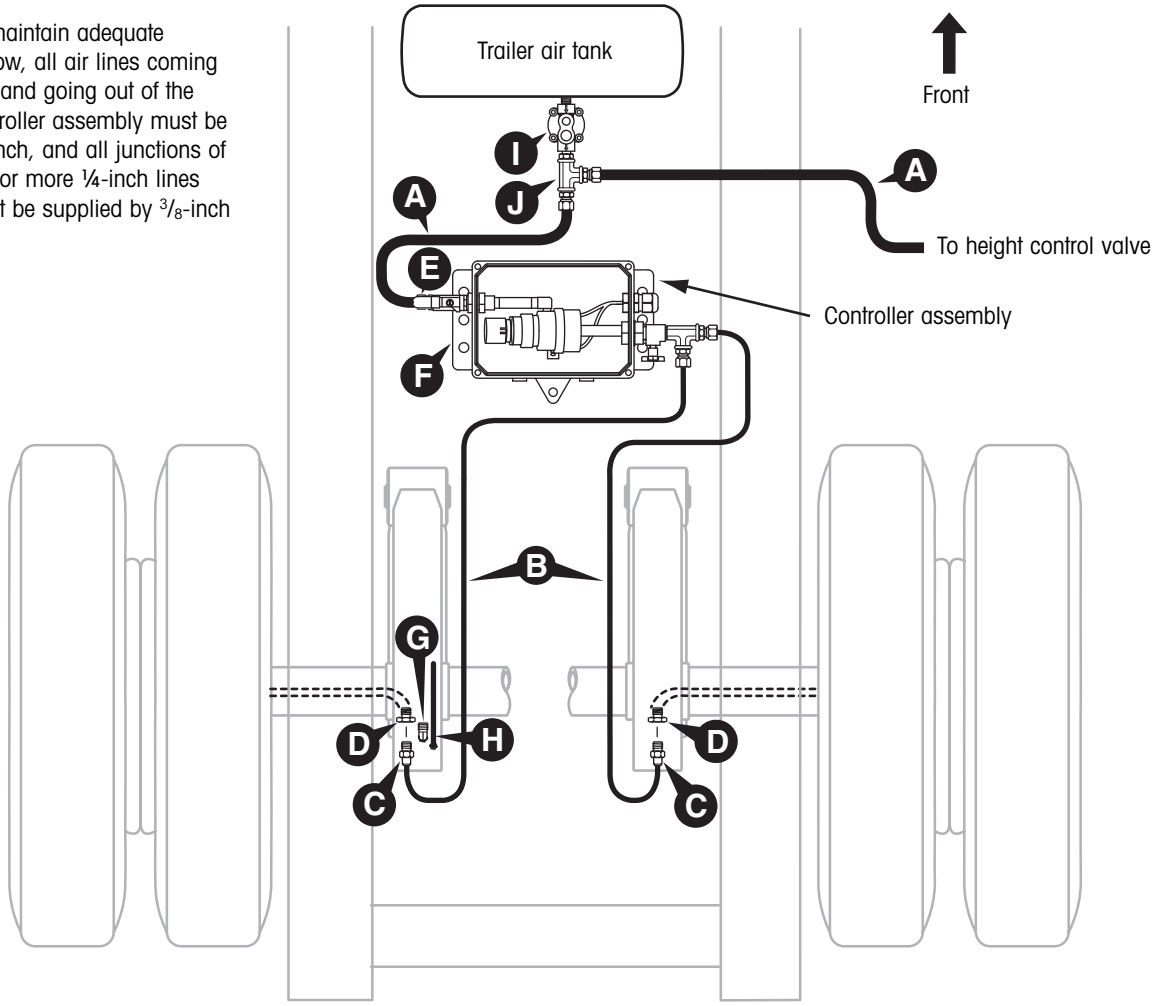


Item		Description
A	Air line	3/8-inch OD nylon air brake tubing; any length
B	Air line	3/8-inch OD nylon air brake tubing; up to 15 feet total system length
✓C	Air line	1/4-inch OD nylon air brake tubing; 30 to 50 feet total system length
✓D	Axle connector	90-degree elbow, 1/8-inch NPT male to 1/4-inch NTA
✓E	Axle hose fitting	1/8-inch NPT female
F	Controller IN fitting	1/4-inch NPT male to 3/8-inch NTA
G	Controller OUT fitting	run tee: 1/8-inch NPT male, 3/8-inch NTA, 3/8-inch NTA
H	Tee assembly	1/4-inch NPT union tee, two 1/4-inch NTA fittings and one 3/8-inch NTA fitting (four total fittings)
✓I	Axle vent fitting	90-degree elbow, 1/4-inch NPT male to 3/8-inch NTA
✓J	Air line	3/8-inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end
K	Pressure protection valve	required; 70 psi minimum closing pressure; existing suspension valve can be used
L	PPV OUT fitting	run tee: 1/4-inch NPT male, 3/8-inch NTA, 3/8-inch NTA

NTA = nylon tubing adapter

Figure 26. 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, and all junctions of two or more ¼-inch lines must be supplied by $^3/_8$-inch line.

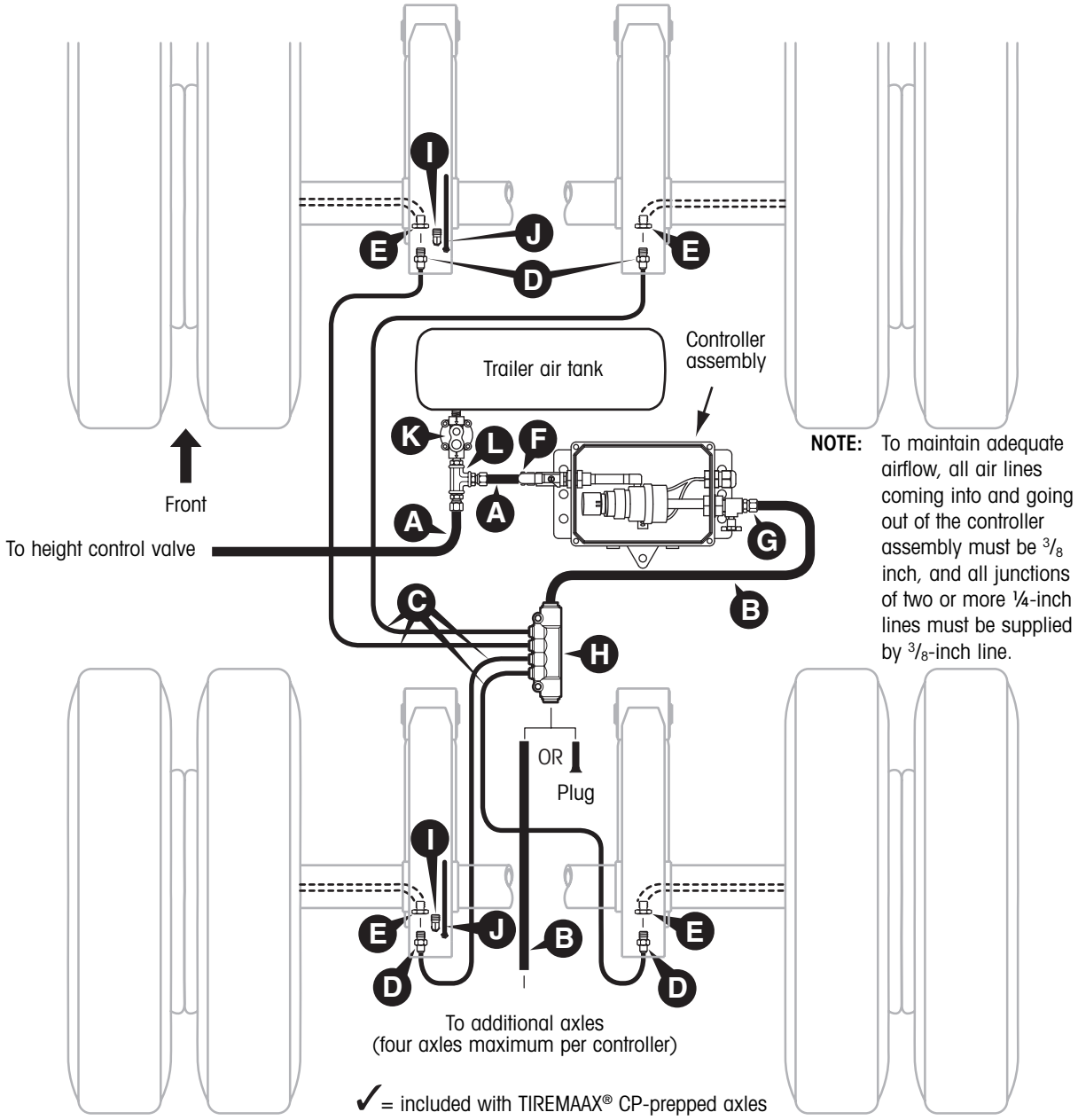


✓ = included with TIREMAAX® CP-prepped axles

NTA = nylon tubing adapter

Item		Description
	A Air line	$^3/_8$-inch OD nylon air brake tubing; any length
✓	B Air line	¼-inch OD nylon air brake tubing; 10 to 25 feet total system length
✓	C Axle connector	$^1/_8$-inch NPT male to ¼-inch NTA
✓	D Axle hose fitting	90-degree elbow, $^1/_8$-inch NPT female
	E Controller IN fitting	¼-inch NPT male to $^3/_8$-inch NTA
	F Controller OUT assembly	run tee: $^1/_8$-inch NPT male, ¼-inch NTA, ¼-inch NTA (three total fittings)
✓	G Axle vent fitting	90-degree elbow, ¼-inch NPT male to $^3/_8$-inch NTA
✓	H Air line	$^3/_8$-inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end
	I Pressure protection valve	required; 70 psi minimum closing pressure; existing suspension valve can be used
	J PPV OUT fitting	run tee: ¼-inch NPT male, $^3/_8$-inch NTA, $^3/_8$-inch NTA

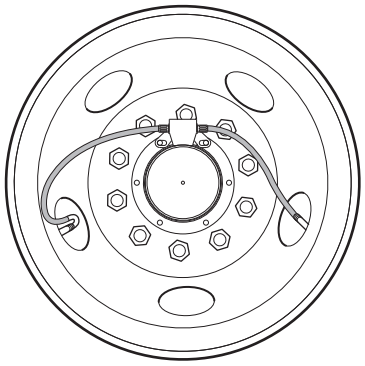
Figure 27. Typical TIREMAAX CP plumbing schematic — single axle with ¼- and $^3/_8$-inch lines



	Item	Description
	A Air line	3/8-inch OD nylon air brake tubing; any length
	B Air line	3/8-inch OD nylon air brake tubing; up to 15 feet total system length
✓	C Air line	1/4-inch OD nylon air brake tubing; 30 to 50 feet total system length
✓	D Axle connector	90-degree elbow, 1/8-inch NPT male to 1/4-inch NTA
✓	E Axle hose fitting	1/8-inch NPT female
	F Controller IN fitting	1/4-inch NPT male to 3/8-inch NTA
	G Controller OUT fitting	1/8-inch NPT male to 3/8-inch NTA
	H Junction manifold	3/8-inch NTA inlet, 1/4-inch NTA outlets
✓	I Axle vent fitting	90-degree elbow, 1/4-inch NPT male to 3/8-inch NTA
✓	J Air line	3/8-inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end
	K Pressure protection valve	required; 70 psi minimum closing pressure; existing suspension valve can be used
	L PPV OUT fitting	run tee; 1/4-inch NPT male, 3/8-inch NTA, 3/8-inch NTA

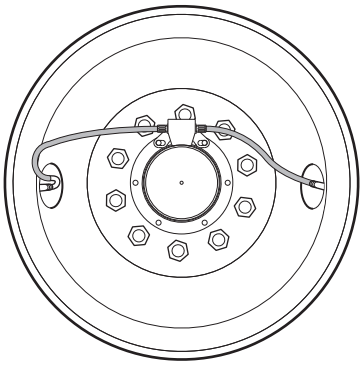
NTA = nylon tubing adapter

Figure 28. Typical TIREMAAX CP plumbing schematic — two axles with 3/8- and 1/4-inch lines and junction manifold



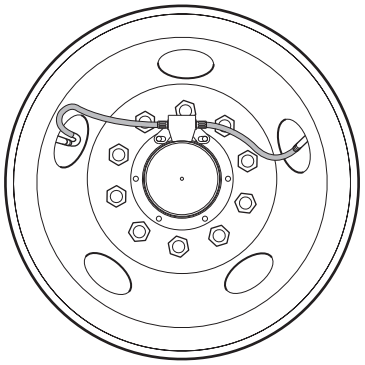
Dual wheel configuration clock "A"

For 17.5- or 22.5-inch, five-hole or five-spoked wheels



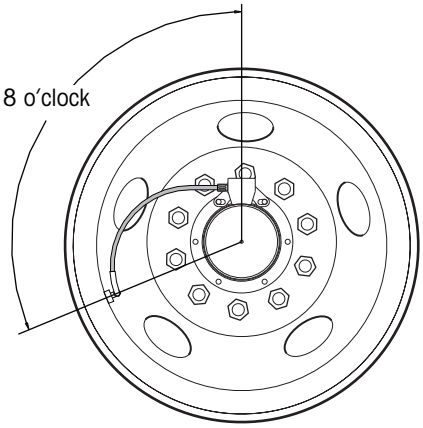
Dual wheel configuration clock "C"

For any size, two-hole or four / six-spoked wheels



Dual wheel configuration clock "B"

For 19.5- or 24.5-inch, five-hole or five-spoked wheels



Super single wheel configuration

With the bulkhead adapter in the 12 o'clock position, the valve stem should be located between 7 and 8 o'clock for most applications. When the wheel is installed, verify that the tire hose is not stretched so tightly that a strain is introduced at either the valve stem or hubcap fitting. Also make sure the tire hose is not so loose that it contacts the wheel.

This illustration shows the valve stem pointing outboard (toward the viewer). Other valve stem orientations could be supplied by the wheel manufacturer. Do not rotate or otherwise alter the orientation of the valve stem as supplied from the wheel manufacturer. Valve stem orientation is not critical to TIREMAAX performance as long as the hose is routed as noted above.

Check to ensure that no portion of the tire hose extends further outboard than the outer face of the wheel. If this occurs, contact Hendrickson for instructions on how to route the hoses to avoid this.

NOTE: For dual wheel configurations, proper clocking is particularly important since two wheels (inner and outer) must be properly oriented for proper installation.

Figure 29. Properly clocking the wheels to prevent the hoses from rubbing

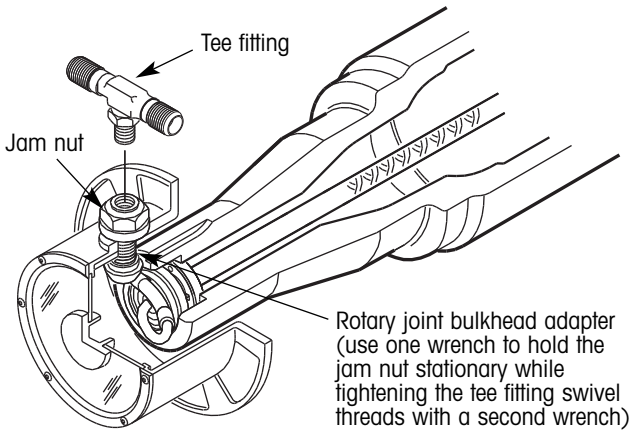
NOTE: All air lines coming into and going out of the controller assembly must be $^3/_8$ inch, and all junctions of two or more ¼-inch lines must increase to $^3/_8$-inch line to maintain adequate air flow.

TIRE HOSE INSTALLATION

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

1. Position the hubcap and wheel so the hoses will not stretch or rub on the wheel. Refer to figure 29.

⚠ **CAUTION: The wheel must be properly "clocked" to the hubcap to prevent the hoses from rubbing on the wheel (figure 29). Failure to do so may result in hose failure.**



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

Figure 30. Tee installation

2. Screw the tee fitting onto the rotary joint bulkhead adapter (figure 30) and tighten the swivel threads to 130 ±10 in.lbs. of torque. Use two wrenches to achieve the final torque value. Use one wrench to hold the jam nut on the rotary joint bulkhead adapter stationary and use the second wrench to tighten the tee fitting swivel threads to the final torque value.

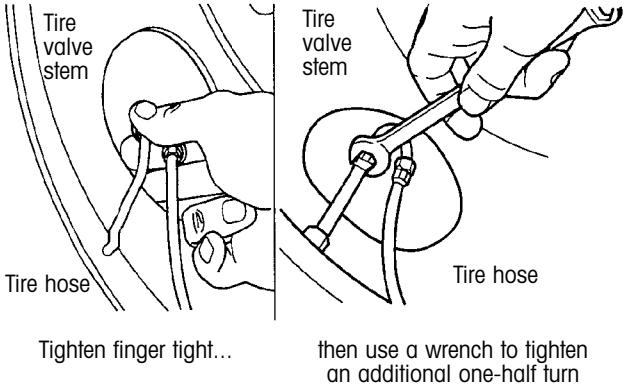


Figure 32. Attaching the tire hose to the tire valve stem

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

3. Attach the tire hose(s) to the tire valve stem(s) and tighten finger tight (figure 32).

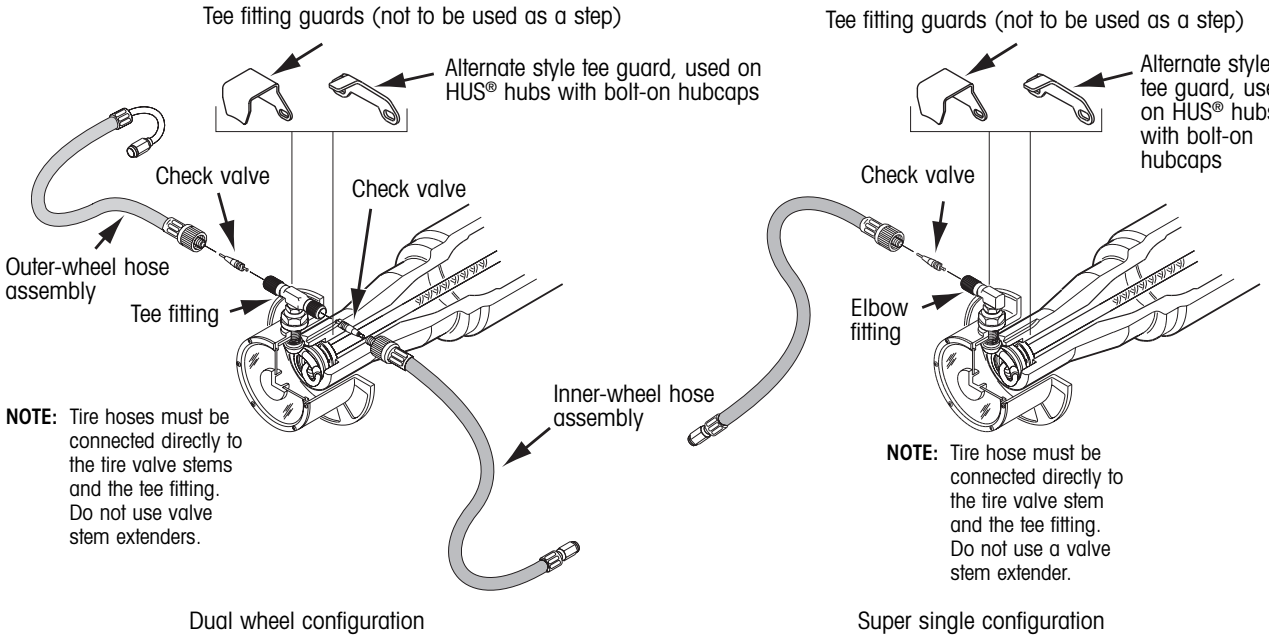


Figure 31. Tire hose, check valve and tee fitting guard installation

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

4. Using a $^{7}/_{16}$-inch wrench, tighten the tire hose / valve stem connection an additional one-half turn (figure 32). **Do not overtighten this connection.** The hose and tee connections are tight enough when moving the hose back and forth does not cause the connection to move.

5. Attach tire hose and check valve assemblies to the tee or elbow fitting and tighten finger tight (figure 31). Using pliers, carefully and gently verify that the hose connection is tight.

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

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

After assembly is complete, the tire hose / valve stem connection (and all other air system connections) will be checked for leaks using the system integrity check found on page 32.

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

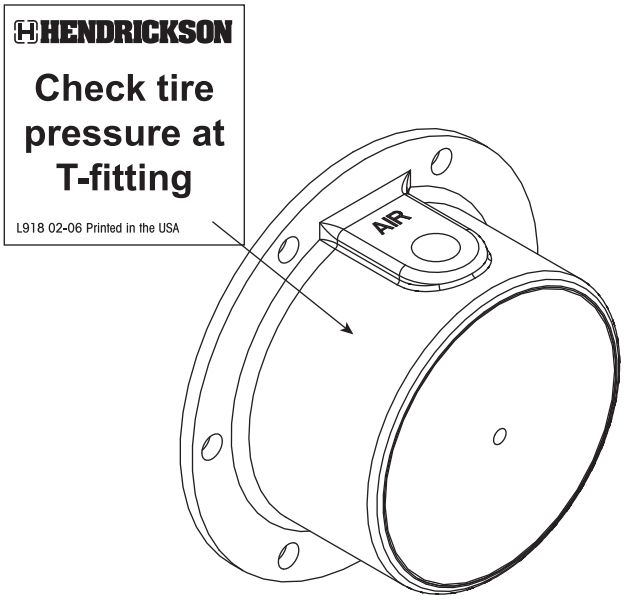


Figure 34. Recommended decal mounting location

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

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

LABEL LOCATION

1. Install indicator status decal L981 at the front of the trailer near the indicator (figure 33).

2. If decal L918 is included in the literature packet, install it on the hubcap as shown in figure 34.

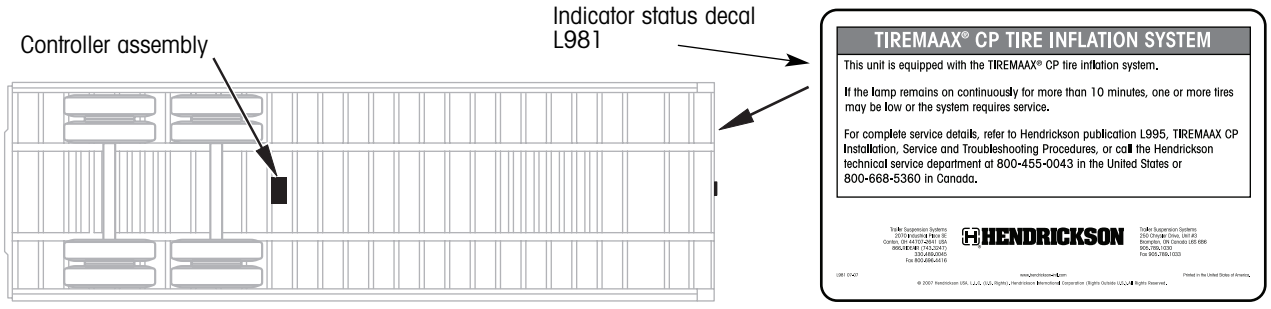


Figure 33. Recommended controller assembly mounting location and label placement

SYSTEM INTEGRITY CHECK

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

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

1. Fill the trailer air system and set all tire pressures as close to target pressure as possible without exceeding the target pressure. Manually measure pressure at each tire:

    - Disconnect tire hose from tee at hubcap (or from elbow at hubcap if super single configuration)
    - Use a conventional gauge to measure tire pressure at hose end
    - Reattach and firmly hand-tighten tire hose. Using pliers, carefully and gently verify that the hose connection is tight.

2. Ensure that the TIREMAAX CP shutoff valve is in the open position (figure 35).

3. Apply soapy water to all air-fitting connections. Bubbles in the soapy water will provide a visual indication of an air leak. Fix if necessary. **All connections must be air tight.**

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

SYSTEM SETUP

The TIREMAAX CP controller is pre-programmed from the factory, therefore no additional setup is required. To program a pressure other than the factory setting, follow the SETTING TARGET PRESSURE instructions beginning on page 33.

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

TROUBLESHOOTING

TROUBLESHOOTING INTRODUCTION

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

SERVICE PROCEDURES

SETTING TARGET PRESSURE

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

1. Using a shop air supply, pressurize the trailer air system to a level slightly higher than target pressure (desired tire inflation pressure).
2. Close the controller shutoff valve on the supply line (figure 35).
3. Open the petcock valve on the delivery line to vent the system.
4. Remove the delivery line from the controller and install a pressure gauge in the delivery port.
5. Close the petcock valve on the delivery line.
6. Open the controller shutoff valve on the supply line and monitor delivery pressure on the gauge.
7. Delivery pressure should be 5-6 psi higher than the desired target pressure due to the "crack pressure" characteristic of the check valves in the tire hoses.

   Delivery pressure is regulated by rotating the regulator knob either clockwise or counterclockwise (as viewed from the end of the knob). Before the knob can be rotated, it must be unlocked. To unlock the regulator knob, pull it away from the regulator body (figure 35). An audible "click" will be heard.

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

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

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

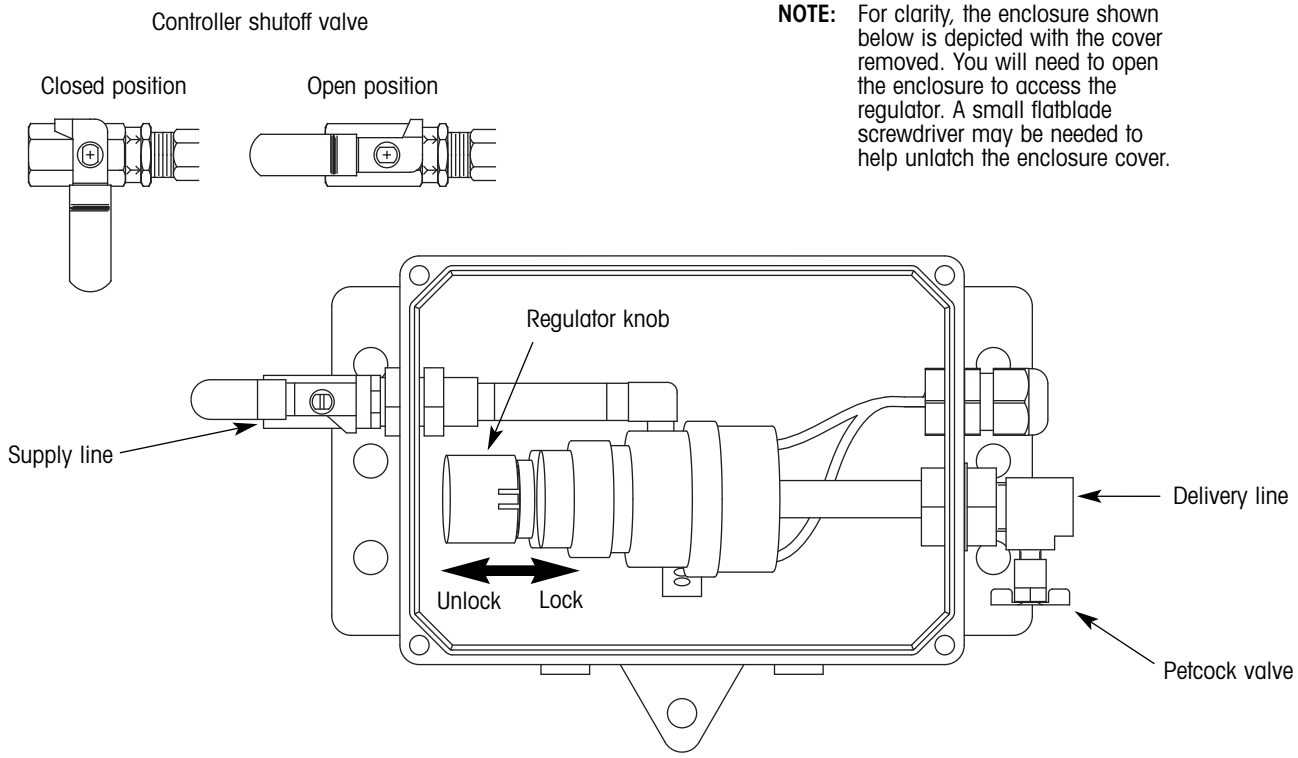


Figure 35. Setting target pressure with the IPCU

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

8. Disconnect the tire hose for each tire at the tee (or elbow) fitting and manually depress the check valve core in the tire hose to reduce the pressure in each tire by 5 to 10 psi. Reconnect each tire hose to the tee (or elbow) fitting. Using pliers, carefully and gently verify that the hose connection is tight.

9. Close the controller shutoff valve on the supply line (figure 35).

10. Open the petcock valve on the delivery line to vent the system.

11. Remove the pressure gauge from the delivery port, reinstall the delivery line and close the petcock valve.

12. Open the controller shutoff valve on the supply line. When the flow of air to the tires has stopped, use a conventional gauge to manually measure tire pressure. Tire pressure should be checked at the hose end only. Refer to the section titled MANUALLY CHECKING TIRE PRESSURE on page 6 for complete details.

13. If necessary, repeat steps 1 through 11 until the pressure at the tire hoses is at the desired target pressure.

14. Lock the regulator knob by pushing it in toward the regulator body (figure 35). An audible "click" will be heard.

15. Close and latch the controller enclosure and disconnect the shop air supply.

WIRING HARNESS REPLACEMENT

Two wiring harnesses are available specifically for TIREMAAX® CP: a standard, two-wire, 18-inch long harness and a premium, ABS-ready, 15-foot long harness.

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 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 704 for recommended wiring practices.

Use the following procedure to replace the premium wiring harness.

REMOVAL

1. Disconnect the five-pin ABS connector (figure 36).
2. Disconnect the five-pin power supply connector.
3. Disconnect the indicator connection.
4. Disconnect the controller assembly connector.

INSTALLATION

1. Connect the five-pin ABS connector.
2. Connect the five-pin power supply connector.
3. Connect the indicator connector.
4. Connect the controller assembly connector.

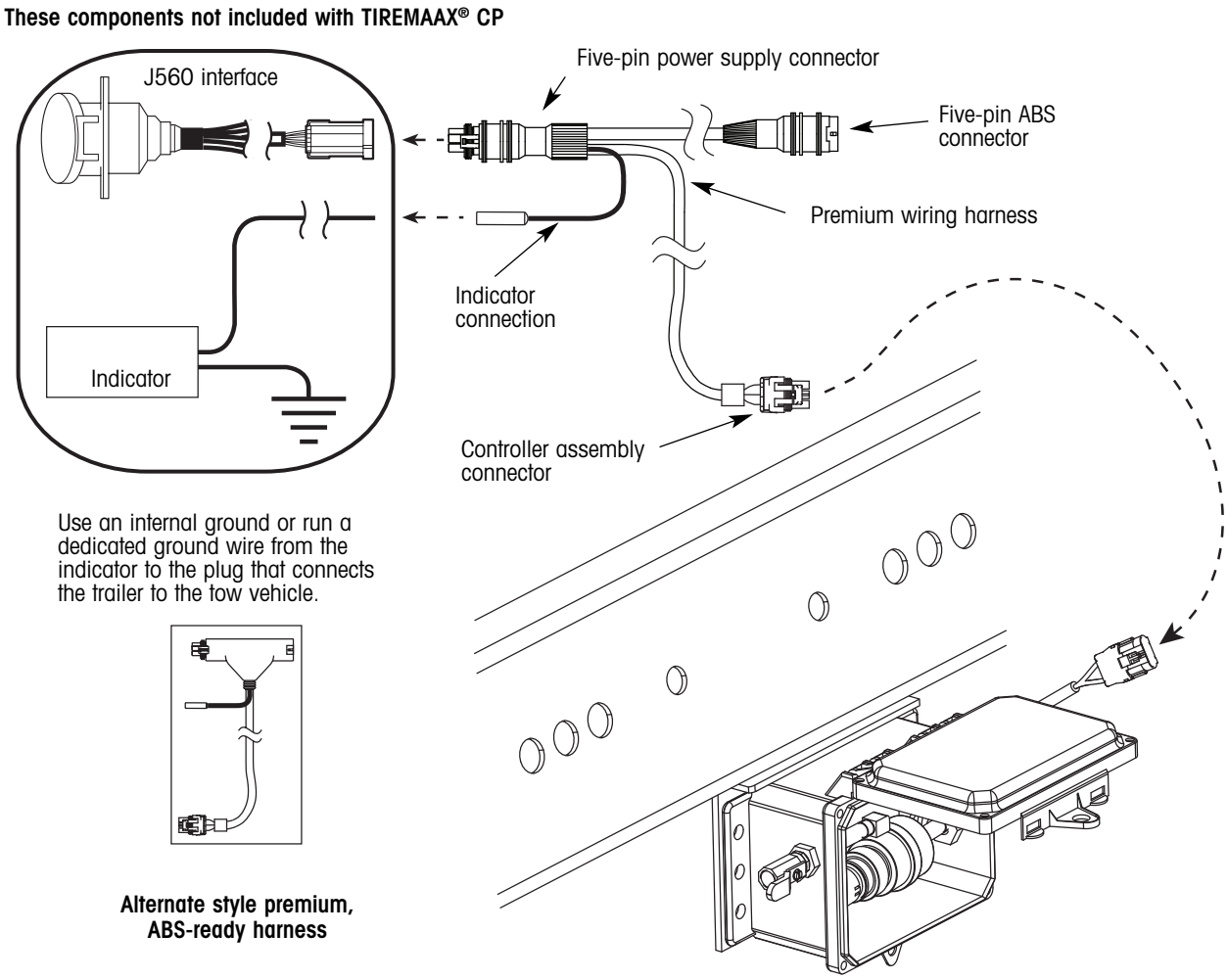


Figure 36. Premium wiring harness replacement

CONTROLLER ASSEMBLY REPLACEMENT

This procedure replaces the controller assembly as one complete unit.

REMOVAL

1. Exhaust the trailer air tank.
2. Disconnect the controller assembly connector (figure 37).
3. Disconnect the air supply line. Label the line "SUPPLY" to avoid confusion when installing the new controller assembly.
4. Disconnect the air delivery line. Label the line "DELIVERY" to avoid confusion when the new controller assembly is installed.
5. If reusing the air line fittings, remove them from the ports on the controller assembly.
6. Remove the controller assembly enclosure.

INSTALLATION

1. Install the controller assembly enclosure.
2. If necessary, apply thread sealant to air fittings.
3. Install air line fittings on supply and delivery ports. Use the two-wrench method described on page 30 to avoid overtightening the fittings.
4. Connect the air SUPPLY and air DELIVERY lines to the appropriate ports. Test for air leaks by listening or using soapy water.

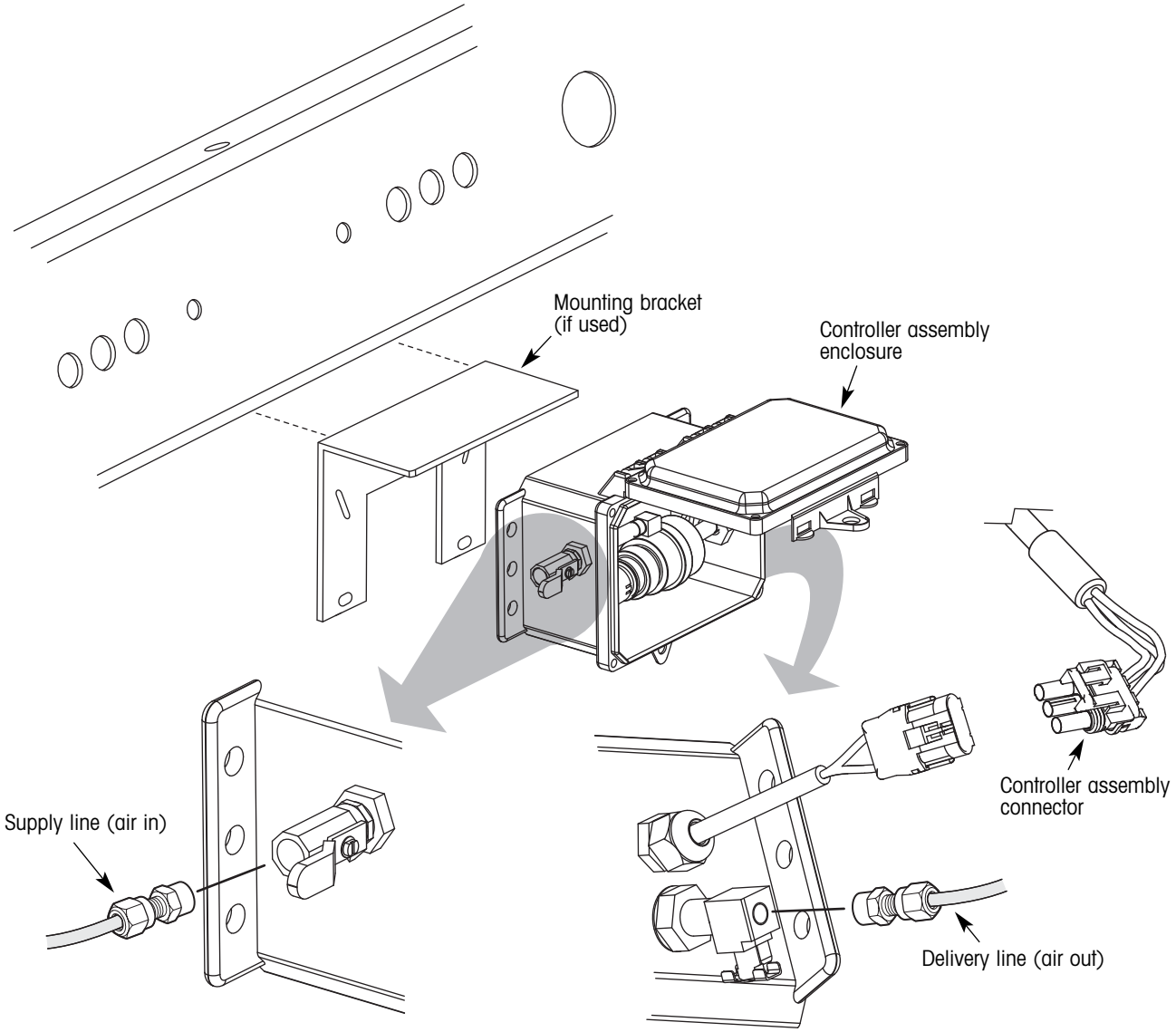
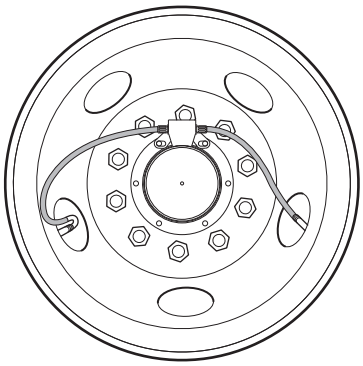


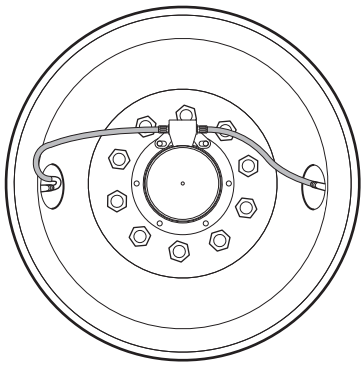
Figure 37. Controller assembly replacement

5. Connect the controller assembly connector.
6. Recharge the trailer air system.
7. Manually measure tire pressure. Refer to the section titled *Manually Checking Tire Pressure* on page 6 for complete manual tire pressure measuring instructions.



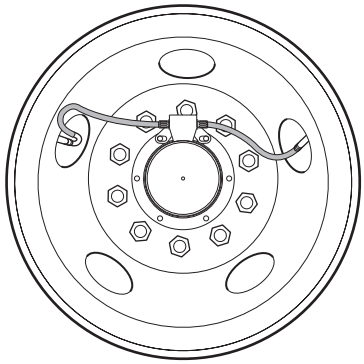
Dual wheel configuration clock "A"

For 17.5- or 22.5-inch, five-hole or five-spoked wheels



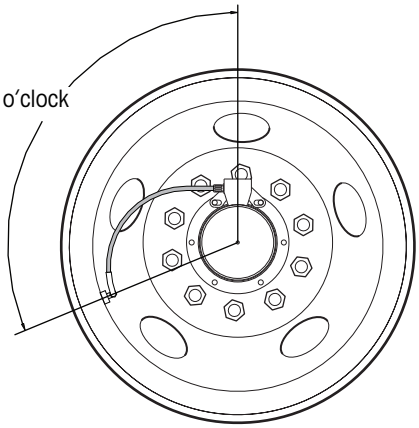
Dual wheel configuration clock "C"

For any size, two-hole or four / six-spoked wheels



Dual wheel configuration clock "B"

For 19.5- or 24.5-inch, five-hole or five-spoked wheels

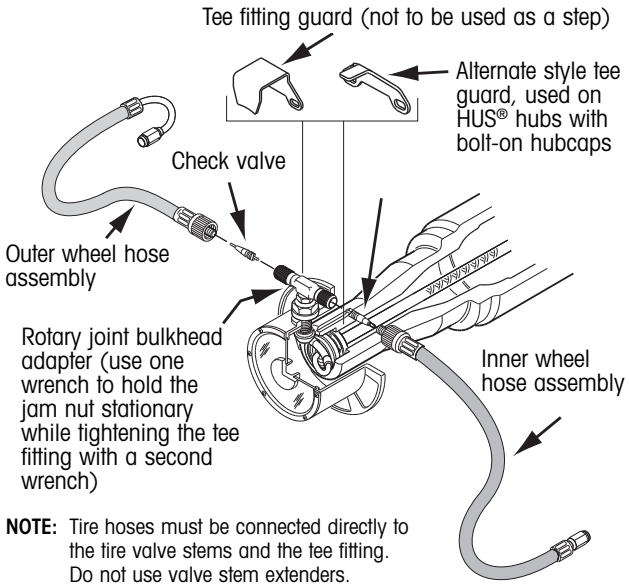


Super single wheel configuration

With the hubcap fitting in the 12 o'clock position, the valve stem should be located between 7 and 8 o'clock for most applications. When the wheel is installed, verify that the tire hose is not stretched so tightly that a strain is introduced at either the valve stem or hubcap fitting. Also make sure the tire hose is not so loose that it contacts the wheel.

This illustration shows the valve stem pointing outboard (toward the viewer). Other valve stem orientations could be supplied by the wheel manufacturer. Do not rotate or otherwise alter the orientation of the valve stem as supplied from the wheel manufacturer. Valve stem orientation is not critical to TIREMAAX performance as long as the hose is routed as noted above.

Check to ensure that no portion of the tire hose extends further outboard than the outer face of the wheel. If this occurs, contact Hendrickson for instructions on how to route the hoses to avoid this.



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

Figure 38. Tire removal and installation

8. Using the pressure adjustment procedure on page 35, verify that the target tire pressure matches the desired operating tire pressure.

WHEEL REMOVAL AND INSTALLATION

Disable the system before wheel removal. Close the shutoff valve on the supply line to shut off pressure to the system.

1. Turn vehicle off and disconnect the tire hose(s) at the tee (or elbow) on the hubcap (figure 38).

NOTE: There will be no air loss when the tire hoses are disconnected at the tee since a check valve is located in each tire hose.

NOTE: Steps 2 through 4 describe the complete removal of the tee fitting guard and tee fitting when removing the wheel. As an alternative, the wheel can be removed with the tee fitting guard and tee (or elbow) fitting still installed on the hubcap **as long as the wheel assembly is rotated so that the tee (or elbow) fitting is in the six o'clock position.** With the tee or elbow fitting in the six o'clock position, it is more protected from potential damage when the wheel assembly drops down onto the hub after clearing the wheel studs. Note that if a wheel dolly is being used, the wheel must be lowered to clear the tee or elbow fitting.

2. Remove the two hubcap bolts securing the tee fitting guard to the wheel end and remove the tee fitting guard.

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

3. Remove the tee or elbow from the hubcap fitting. Cover (plug) the hubcap fitting to prevent contamination from entering the system.

4. On dual-wheel configurations, observe and record the orientation of the wheel to the hub before removal of the wheel (clock A, B, or C. Refer to figure 38).

5. Remove and reinstall the wheel. Take care not to damage the hubcap fitting. Make sure the wheel is properly oriented to the hub as indicated in figure 38.

6. If the tee fitting was removed, reinstall the tee fitting and tighten the swivel threads to 130 ±10 in. lbs. of torque. Refer to the TIRE HOSE INSTALLATION procedure on page 29 for complete tee fitting and tire hose tightening details.

7. Reattach and firmly hand-tighten the tire hose(s) to the tee. Hand tightening will properly compress the internal rubber gasket for an airtight seal without damaging the internal gasket. Refer to step 5 of the TIRE HOSE INSTALLATION procedure on page 31 for complete tire hose to tee (or elbow) tightening details.

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

8. Attach the tire hose(s) to the tire valve stem(s) and tighten finger tight.

9. Using a $^{7}/_{16}$-inch wrench, tighten the tire hose/valve stem connection an additional one-half turn. **Do not overtighten this connection.**

10. If the tee fitting guard was removed, reinstall the tee fitting guard and tighten the hubcap bolts to 12 - 18 ft. lbs. (16 - 24 N•m). Check all air system connections for leaks using the system integrity check found on page 32.

WHEEL-END SERVICE (HUB REMOVAL)

When it is necessary to remove the hub, care must be taken to avoid damaging the rotary joint assembly:

- On HP and HUS® spindles (axles with same size inner and outer bearings), the hub may be removed with the rotary joint in place. Follow the WHEEL REMOVAL AND INSTALLATION procedure on this page to remove the wheel. Then remove the jam nut from the rotary joint bulkhead adapter and remove the hubcap. Finally, remove the hub. If necessary, refer to Hendrickson publication L496, *Wheel-End Maintenance Procedures,* for complete hub removal details.

- To remove the hub on HN spindles, the rotary joint must be detached from the spindle plug, but not completely removed from the braided axle hose. While detached from the spindle plug, the rotary joint can be moved, tipped or otherwise manipulated so the hub can clear it and be

removed. There is no need to disconnect the rotary joint from the braided axle hose. Follow the WHEEL REMOVAL AND INSTALLATION procedure on the previous page to remove the wheel, then use the following procedure to detach the rotary joint for hub removal.

ROTARY JOINT DETACHMENT (FOR HUB REMOVAL ON HN SPINDLES)

1. Remove the jam nut from the rotary joint bulkhead adapter and remove the hubcap (figure 39).

2. Remove the three fasteners holding the rotary joint assembly to the spindle plug (figure 40).

3. When detached, the rotary joint can be moved, tipped or otherwise manipulated so the spindle nuts, outer bearing and hub can clear the rotary joint and be removed. DO NOT disconnect the rotary joint from the braided axle hose.

ROTARY JOINT REATTACHMENT

1. When hub / wheel-end service is complete, reattach the rotary joint to the spindle plug by installing the three T20 Torx fasteners and tightening to 45 ±5 in. lbs. (5 ±½ N•m) of torque.

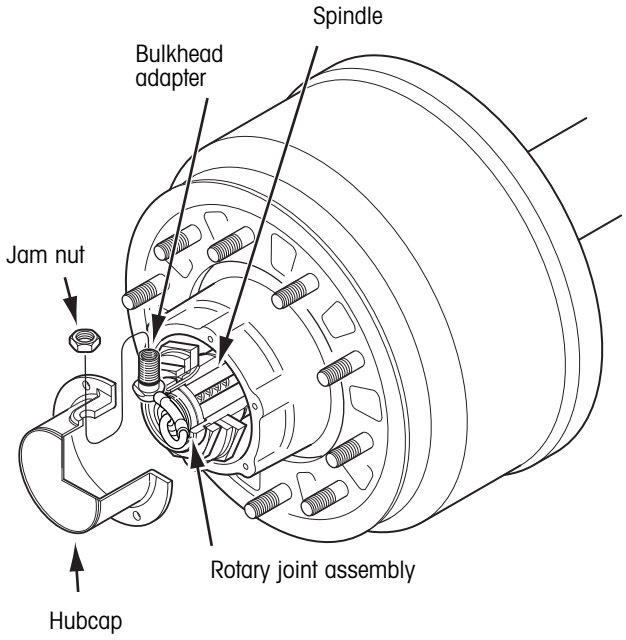


figure 39. Hubcap to bulkhead adapter removal

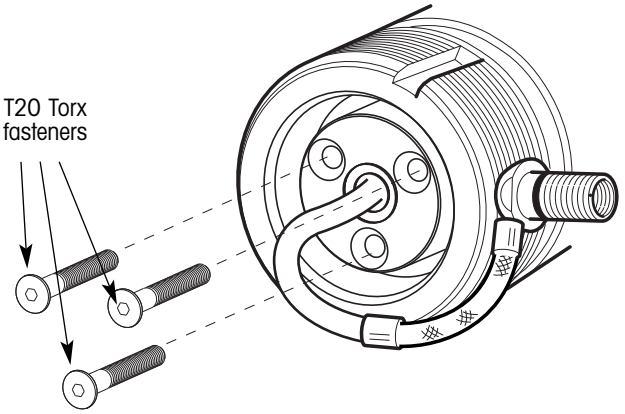


figure 40. Rotary joint removal from spindle

2. Rotate the rotary joint exit tube one full revolution. Make sure that the steel air tube does not contact any part of the spindle or spindle nut system.

HUBCAP ASSEMBLY

1. Place hubcap gasket over rotary joint exit tube and bulkhead adapter.

2. Lubricate O-ring on the rotary joint bulkhead adapter. Use the same lubricant as is used in the hub or a light film of #2 grease, white lithium grease or Vaseline®.

3. From the inside, insert the bulkhead adapter through the hole in the hubcap labeled "Air". Align the flat on the bulkhead adapter with the anti-rotation flat in the hubcap (figure 18). Note the orientation indicator on the top of the bulkhead adapter threads (figure 18, view a). Use this indicator (some models have a dot, other models have a notch) to properly orient the bulkhead adapter in the hubcap hole. When the flat on the bulkhead adapter is properly aligned with the anti-rotation flat in the hubcap, the orientation indicator will face outboard (figure 18, view b).

   Do not use pliers or any kind of wrench to pull the bulkhead adapter up through the hole in the hubcap. This could cause the bulkhead adapter to rotate before it engages the flat in the hubcap, potentially damaging the rotary union or hubcap.

   Attach the jam nut and hand tighten. When properly seated, the top of the bulkhead adapter

will be flush (or higher) with the top of the jam nut when hand tightened (figure 18, view c).

⚠ **CAUTION: Wheel must be properly "clocked" to the hubcap to prevent the hoses from rubbing on the wheel (figure 29). Failure to properly "clock" the wheels may result in hose failure.**

4. Install the hubcap. If the hubcap is a screw-on style used on the HUS hub, tighten it to 50-100 ft. lbs. (68-137 N•m) of torque. If the hubcap is a bolt-on style used on the other hubs, tighten the hubcap bolts to 12-18 ft. lbs. (16-24 N•m) of torque.

5. Tighten the rotary joint jam nut to 15 ft. lbs. (20 N•m) of torque.

6. Refer to the TIRE HOSE INSTALLATION section on page 29 to complete the reassembly.

GLOSSARY

TIREMAAX® CP Tire Inflation System — 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.

Integrated Pressure Control Unit (IPCU) — The IPCU is programmed 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 to illuminate.

Rotary Joint — 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 shutoff valve is open.

Target Tire Pressure — The desired tire pressure.

APPENDIX

Ambient temperature when the target tire pressure is set

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.

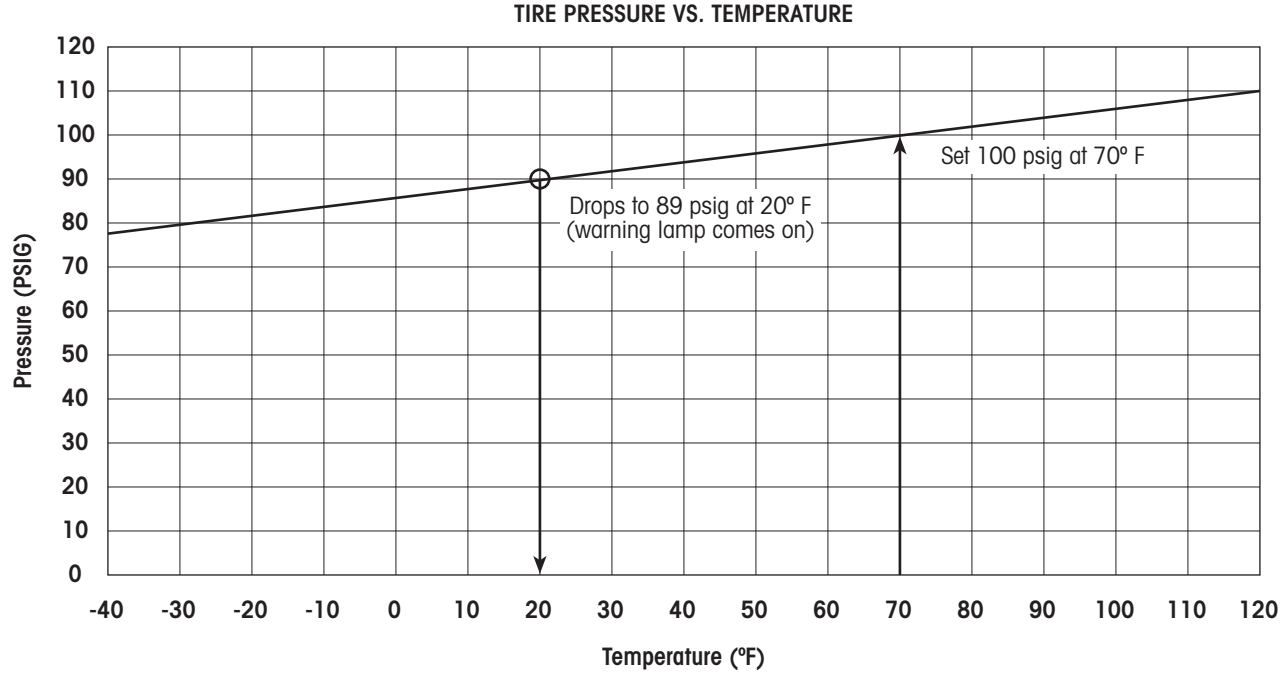


figure 41. Typical tire maintenance system performance at 100 psig

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