INSTALLATION & MAINTENANCE MANUAL

For Automatic Tire Inflation Systems On Commercial Trailers

P.S.I.® ATIS

www.psitireinflation.com

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P.S.I.™ TIRE INFLATION SYSTEM FOR TRAILERS

Service Notes

About This Manual

This manual provides installation and maintenance procedures for the P.S.I.™ Tire Inflation System for trailers. Use the procedures in this manual to install the system on either a new trailer axle at original equipment manufacturers or on in-service trailer axles.

Note: As of January 01, 2018, all systems installed on hollow spindle axles are equipped with the ThermALERT™ feature.

Before You Begin

⚠️ CAUTION: DO NOT PERFORM UNAUTHORIZED MAINTENANCE OR REPAIR PROCEDURES, OR INSTALL NON-P.S.I.™ COMPONENTS ON THE P.S.I.™ TIRE INFLATION SYSTEM. THIS WILL VOID THE WARRANTY.

1. Read and understand all instructions and procedures before service to components begins.
2. Read and observe all Warning and Caution alert messages in this publication. They provide information that can prevent personal injury, damage to components, or both.
3. Follow the P.S.I.™ maintenance, service, installation, and diagnostics guidelines.
4. Use special tools, when required, to avoid personal injury and damage to components.

Hazard Alert Messages And Torque Symbols

⚠️ WARNING:
A Warning alerts the technician to an instruction or procedure that must be followed to avoid personal injury and damage to components.

⚠️ CAUTION:
A Caution alerts the technician to an instruction or procedure that must be followed to avoid damage to components.

🔧 TORQUE REQUIRED
The torque symbol alerts the technician to tighten fasteners to a specified torque value.

Additional Information

Visit the Resource section at http://www.psitireinflation.com/resources to access and order additional information.

Call P.S.I.™ at 210.222.1926 (United States and Canada) or email techsupport@psitireinflation.com

Tools and Supplies Specified In This Manual

Contact P.S.I.™ Customer Service at 210.222.1926 to obtain P.S.I.™ tools and supplies.

For Grainger tools, visit their website at www.grainger.com to locate a branch near you.
1.0 Introduction

1.1 System Overview

Figure 1: Tire Inflation System Overview
1.2 Standard Tire Inflation System

The system uses compressed air from the trailer to inflate any tire when pressure decreases below the system air pressure setting during operation.

Air from the existing trailer air supply is routed to a control box, then into each axle. The axle acts as a conduit to distribute air through rotary union assemblies at the wheel-ends, which then distribute air to each tire as needed. If a tire is leaking, check valves in the tire hoses prevent loss of air pressure in the remaining tires. Refer to Figure 1.

The indicator light, mounted on the front of the trailer, will illuminate when the system delivers an excessive amount of air due to either a leaking tire, a leaking tire inflation system component, or a wheel-end operating at an abnormally high temperature when equipped with the ThermALERT™ system. If the indicator light illuminates during operation, immediately find a safe place to bring the tractor and trailer to a complete stop. Make sure the component that caused the air leak is repaired before returning the vehicle to service.

Note: The tire inflation system does not eliminate the need to perform tire inspections or wheel-end maintenance at scheduled intervals.

1.3 System With ThermALERT™ (standard after 1/1/18)

The P.S.I.™ Tire Inflation System with ThermALERT™ detects air escaping from the axle’s thermal screw and out through the hubcap relief valve, which occurs if a wheel-end is operating at an abnormally high temperature. The tire inflation system indicator light will illuminate to alert of the immediate need to find a safe place to bring the tractor and trailer to a complete stop.

Air that escapes from the hubcap relief valve produces an audible sound that helps to identify the wheel-end that is overheated. Do not operate the trailer until the components are repaired.

Note: The ThermALERT™ system does not eliminate the need to perform tire inspections at scheduled intervals.

1.4 System Indicator Light

The indicator light, mounted on the front of the trailer, will illuminate when the system delivers an excessive amount of air due to either a leaking tire, a leaking tire inflation system component, or a wheel-end operating at an abnormally high temperature when equipped with the ThermALERT™ system. If the indicator light illuminates during operation, immediately find a safe place to bring the tractor and trailer to a complete stop. Make sure the component that caused the air leak is repaired before returning the vehicle to service.

Trailers will have a decal installed next to the indicator light when equipped with a standard or ThermALERT™ system.

1.4.1 System Indicator Light On During Air System Charging

When air is supplied to the trailer, the system indicator light may illuminate while the system is charging. If the indicator light remains illuminated for more than 10 minutes, a tire may be losing air pressure. Inspect the tires for damage and air leaks. Repair damaged or leaking tires before returning the vehicle to service.

1.4.2 System Indicator Light On During Vehicle Operation

**WARNING:** DO NOT OPERATE THE VEHICLE IF THE THERMALERT™ SYSTEM ACTIVATES AND THE INDICATOR LIGHT ILLUMINATES. FIND A SAFE PLACE TO BRING THE TRACTOR AND TRAILER TO A COMPLETE STOP TO PREVENT PERSONAL INJURY OR DAMAGE TO THE VEHICLE.

If the ThermALERT™ system activates during vehicle operation, repair or replace the components that caused the wheel-end to overheat before returning the vehicle to service. The thermal screw is not reusable and must be removed and replaced. Otherwise, the indicator light will remain ON during vehicle operation, even though the wheel-end has been repaired.

Follow the guidelines below if the system indicator light illuminates:
1. Bring the tractor and trailer safely to a complete stop as soon as possible.
2. Inspect the trailer hubs for air leaks.
3. Listen for the ThermALERT™ system’s audible sound at the wheel-end. If a sound can be heard, the wheel-end is overheated. Do not operate the trailer until the wheel-end components are repaired. If a wheel-end overheats during operation, it can separate from the vehicle. Serious personal injury and damage to components can happen.
4. If you do not hear the ThermALERT™ system’s audible sound at the wheel-end, inspect the tires for damage. Repair damaged or leaking tires before returning the vehicle to service.

1.5 System Wheel-end Assembly

1.5.1 Axle Press Plug

The axle press plug is used in axles with hollow spindles to seal off the pressurized axle interior from the wheel-end and provide a means of holding and securing the stator.

For a comparison of the standard system axle press plug and the ThermALERT™ system axle press plug. See Figure 2.

1.5.2 Stator And Thru-tee

The stator is located inside the axle spindle and the thru-tee is attached to the hubcap. Pressurized air passes from the stationary axle interior to the rotating hub through a tube extending from the thru-tee into the stator. Dynamic seals, located in the thru-tee and stator, allow rotation without loss of air pressure.

1.5.3 Deflector Shield

The deflector shield, which is part of the thru-tee, helps to prevent contaminants such as dirt and water from entering the wheel-end.

1.5.4 Hubcaps

The hubcaps on a standard or ThermALERT™ system use vents to prevent pressure buildup in the wheel-end. Hubcaps used on oil-lubricated wheel-ends typically have a fill plug and clear sight glass.

1.5.5 Hoses

The hose assemblies include an actuator which mechanically opens the tire valve core and allows air to pass into the tire. A check valve located at the knurled end of a hose allows air to flow in one direction only, towards the tire. This protects each tire from loss of air pressure if the system, or any tire, loses air pressure during operation.
1.6 System Control Box

1.6.1 Pressure Protection Valve (PPV)

**WARNING:** USE ONLY THE P.S.I.™ PRESSURE PROTECTION VALVE (PPV) PROVIDED IN THE SYSTEM INSTALLATION KIT. DO NOT USE A NON-P.S.I.™ PPV ON ANY OF THE SYSTEMS. DAMAGE TO THE COMPONENTS CAN OCCUR.

In the event of a catastrophic system air loss, the PPV ensures that air is available for other critical trailer functions and maintains air tank pressure if a tire or a system component is damaged. Only use the PPV provided in the system kit.

1.6.2 System On/Off Valve

The system On/Off valve controls air supply to the system.

1.6.3 Particulate Filter

The particulate filter helps remove contaminants from the inflation air system.

1.6.4 System Pressure Regulator

Use the adjustment knob on the system pressure regulator to adjust the system pressure to the customer's desired tire pressure.

1.6.5 Flow Sensing Switch

**WARNING:** DO NOT INSTALL THE BLACK FLOW SENSING SWITCH ON A TIRE INFLATION SYSTEM EQUIPPED WITH THE THERMALERT™ SYSTEM. PERSONAL INJURY AND DAMAGE TO COMPONENTS MAY OCCUR.

The flow sensing switch causes the indicator light, mounted on the front of the trailer, to illuminate when the system delivers an excessive amount of air due to either a leaking tire, a leaking tire inflation system component, or a wheel-end operating at an abnormally high temperature when equipped with the ThermALERT™ system.

The control box for the standard tire inflation system can include a black flow sensing switch or a grey flow sensing switch. The control box for the ThermALERT™ system must include a grey or zinc flow sensing switch because it is more sensitive to air flow. Both control boxes mount to the trailer in the same way.

If a ThermALERT™ system has a control box with a black flow sensing switch, replace it with a control box that has a grey or zinc flow sensing switch, otherwise, the indicator light may not illuminate **ON** if a wheel-end overheats.

1.6.6 Maintenance Drain Valve

The maintenance drain valve is used to manually exhaust pressure from the tire inflation system. This enables maintenance to be performed on either the trailer axle components or the tire inflation system.

1.7 System Installation Information

The procedures in this manual shall be used to install the system on a new trailer axle during the original equipment manufacturing process or on axles already in service.

The system can be installed onto most trailer axles. Follow the maintenance instructions provided by the manufacturer when installing the system.

Trailer axles may be manufactured with either hollow or solid spindles. Some axle models may have components pre-assembled on the axle for installation of the standard tire inflation system and the ThermALERT™ system. The system installation sequence is different depending on the axle type.
1.7.1 Hollow Spindle Axle

Most hollow spindle trailer axles have a welsh plug that is pressed into a machined recess in the end of the spindle. Contact the axle manufacturer to confirm the axle type before installation. See Figure 3.

![Figure 3: Hollow Spindle](#)

1.7.2 Solid Spindle Axle

Some axles are manufactured with solid spindles. Contact the axle manufacturer to confirm the axle type before installation. See Figure 4.

![Figure 4: Solid Spindle](#)

1.7.3 Prepped Axle

A trailer axle that has been prepped has the following provisions which may vary by manufacturer:

- Threaded air inlet hole.
- Debris has been cleaned from the axle interior.
- The axle press plug and stator are installed into the axle spindle.
- If equipped with the ThermALERT™ system, the axle press plug with the thermal screw and stator are installed into the axle spindle. Make sure the thermal screw is installed at the 12 o’clock position when the axle is sitting in the running position. See Figure 5.
2.0 System Assembly And Installation

**WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. INJURY OR DAMAGE TO YOUR EYES CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

**WARNING:** THE VEHICLE MUST BE PARKED ON A LEVEL SURFACE WITH ALL TIRES ON THE GROUND. BLOCK OR CHOCK THE WHEELS TO PREVENT THE VEHICLE FROM MOVING. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.

**WARNING:** THE VEHICLE MUST BE SUPPORTED WITH SAFETY STANDS. DO NOT WORK UNDER A VEHICLE SUPPORTED ONLY BY JACKS. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.

2.1 Install The System On Non-prepped Axles

Install the system in the following sequence as applicable:

1. Install the axle air fitting. See Section 2.1.1.
2. Prepare the spindle with one of the procedures that follow:
   a. Prepare the hollow spindle and install the axle press plug. See Section 2.1.2. Or
   b. Prepare the solid spindle. See Section 2.1.3.
3. Install the stator. See Section 2.1.4.

2.1.1 Install The System Axle Air Fitting

**Note:** Top center is the preferred location for the axle fitting. This location may vary by axle manufacturer. If the manufacturer has installed a top-center hole in the axle, use the hole as a pilot to drill for the axle air fitting. Refer to the axle manufacturer's recommended drilling location before beginning.

1. Find the top center of the axle. See Figure 6.
**CAUTION:** DO NOT DRILL INTO THE AXLE AT AN ANGLE. MAKE SURE THE DRILL IS STRAIGHT. DAMAGE TO THE AXLE CAN OCCUR.

2. Drill an 11/32 inch (8.73 mm) hole into the axle at the manufacturer's recommended location. See Figure 7.

3. Use a 1/8-27 inch NPT tap to thread the drilled hole.

4. Tap the hole to leave 1/4 to 3/8 inch (6.35 to 9.53 mm) of the tap threads exposed. See Figure 8.
5. Install the air fitting hand tight. Use a wrench to tighten approximately 2-1/2 additional turns to make an airtight seal.

   **Note:** Current production fittings have sealant pre-applied to the threads. If the fitting is removed from the axle, apply sealant to the threads before installation.

### 2.1.2 Preparation For Hollow Spindle Axles

This task prepares a hollow spindle axle to install the system.

- **WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.
- **WARNING:** THE VEHICLE MUST BE PARKED ON A LEVEL SURFACE WITH ALL TIRES ON THE GROUND. BLOCK OR CHOCK THE WHEELS TO PREVENT THE VEHICLE FROM MOVING. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.
- **WARNING:** THE VEHICLE MUST BE SUPPORTED WITH SAFETY STANDS. DO NOT WORK UNDER A VEHICLE SUPPORTED ONLY BY JACKS. PERSONAL INJURY OR DAMAGE TO THE VEHICLE CAN OCCUR.
- **CAUTION:** THE HUB CAVITY MUST BE PROTECTED DURING SYSTEM MAINTENANCE AND INSTALLATION PROCEDURES. DO NOT ALLOW CONTAMINANTS OR UNWANTED MATERIAL TO ENTER THE HUB CAVITY. DAMAGE TO THE WHEEL-END COMPONENTS CAN OCCUR.

1. Put a container under the hubcap to collect the draining oil. Discard the oil.
2. Remove the bolts from the hubcap and put them to the side. See *Figure 9*.
3. Remove the hubcap gasket. Discard the gasket.
CAUTION: DO NOT SCORE THE SPINDLE BORE WHEN REMOVING THE WELSH PLUG. THE SPINDLE BORE MUST REMAIN SMOOTH. DAMAGE TO SYSTEM COMPONENTS CAN OCCUR.

4. Use the slide hammer/plug removal spear to remove the existing welsh plug. See Figure 10.

![Figure 10: Welsh Plug Removal Tool](image1)

5. Use a bore polisher to clean the spindle bore. See Figure 11 and Figure 12.

![Figure 11: Grinder and Mandrel](image2)

6. Use a round abrasive tool to remove the metal burrs and sharp edges from the spindle bore side of the cotter pin holes. See Figure 13.
CAUTION: THE AXLE INTERIOR MUST NOT CONTAIN ANY DEBRIS OR UNWANTED MATERIAL. DAMAGE TO SYSTEM COMPONENTS CAN OCCUR.

7. Connect a cleaning wand to a high-volume air supply. See Figure 14.

8. Slowly push the cleaning wand through the axle to the opposite end. This will cause a steady stream of air to blow out from the axle spindle. See Figure 15.
9. Use a flashlight to look into one end of the spindle through to the other end to make sure there is no debris or other unwanted material in the axle. See Figure 16.

10. Clean the axle again to remove any debris and other unwanted material from the opposite end of the spindle, if necessary.

11. Use Table 3 to select the correct axle press plug drive adapter. See Figure 17.

   **Note:** Current production axle press-plug drive-adapters are identified with a numerical stamp. Some previous production axle press-plug drive-adapters are not marked.

12. Install the axle press-plug drive-adapter on the drive handle. See Figure 18.
CAUTION: A NEW TOWELETTE MUST BE USED FOR EACH WHEEL-END TO PREVENT CONTAMINATION. DAMAGE TO SYSTEM COMPONENTS CAN OCCUR.

13. Clean the exposed surface of the O-ring and axle press plug outside diameter using a moist towelette. See Figure 19.

WARNING: LOCTITE® 620, 3M® RT20, AND PERMABOND® HH 004 RETAINING COMPOUNDS CAN IRRITATE THE SKIN. CLEAN LATEX GLOVES MUST BE WORN TO DO THIS PROCEDURE. PERSONAL INJURY CAN OCCUR.
CAUTION: DO NOT APPLY THE RETAINING COMPOUND TO THE INSIDE DIAMETER OF THE SPINDLE BORE, AXLE PRESS PLUG STATOR THREADS, OR AXLE SPINDLE THREADS. DAMAGE TO COMPONENTS CAN OCCUR.

15. Apply Loctite® 620, 3M® RT20, or PermaBond® HH 0040 retaining compound evenly to the outside diameter of the axle press plug. See Figure 21.

Note: The installation kit contains enough retaining compound for four wheel-ends and should be divided equally.

Note: Install the axle press plug within 10 minutes of applying the retaining compound to ensure the compound cures correctly.

![Figure 21: Retaining Compound Application](image)

CAUTION: AXLE PRESS PLUGS ARE NOT REUSEABLE. NEW AXLE PRESS PLUGS MUST BE INSTALLED. DAMAGE TO SYSTEM COMPONENTS CAN OCCUR.

16. Insert the axle press plug into the spindle bore by hand until the plug stops squarely in the bore. See Figure 22.

![Figure 22: Axle Press Plug Installation](image)

a) Install the axle press plug for the ThermALERT™ system with a thermal screw in the 12 o'clock position (±15°) when the axle is sitting in the running position. See Figure 23.
b) If installing on Holland Propar™ axles, then axle press plugs with slots must be used. Align the slots in the axle press plug with the holes on the axle. See Figure 24.

17. Make sure the axle press plug protrudes from the end of the spindle 1/8 to 1/4 inch (3.18 to 6.35 mm). See Figure 25.

**Note:** Contact customer service if the axle press plug protrudes outside the acceptable limits. Refer to Additional Information for contact details.

18. Insert the axle press-plug drive-adapter into the axle press plug. See Figure 26.
Figure 26: Using the Axle Press Plug Drive Adapter Assembly

**WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

**WARNING:** DO NOT HIT STEEL PARTS WITH A STEEL HAMMER. PIECES OF THE PART CAN BREAK OFF. PERSONAL INJURY AND DAMAGE TO COMPONENTS CAN OCCUR.

**CAUTION:** THE INSTALLED AXLE PRESS PLUG MUST BE SEATED SQUARE TO THE END OF THE SPINDLE AND INSET AT OR BELOW ANY CHAMFER IN THE AXLE SPINDLE BORE. DAMAGE TO COMPONENTS CAN OCCUR.

19. Use a four-pound brass or synthetic mallet to drive the axle press plug into the spindle bore until the drive adapter bottoms out squarely on the end of the spindle. See Figure 27.

**Note:** An axle press plug that is flush with the end of the spindle is not seated correctly. The drive adapter sets the axle press plug installation depth. The sound and feel of the hammering will change when the drive adapter bottoms out.

20. Make sure the axle press plug is seated beyond the chamfer of the spindle bore.

21. Remove excess retaining compound from the spindle and axle press plug drive adapter. See Figure 28.
22. Wait at least 30 minutes after installing the axle press plugs to pressurize the system. This will allow the retaining compound to properly cure.

2.1.3 Preparing A Solid Spindle Axle

This task prepares a solid spindle axle to install the tire inflation system.

⚠️ **WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

⚠️ **CAUTION:** DO NOT DRILL A HOLE IN THE AXLE BY HAND. DO NOT USE A DRILL JIG FROM ANOTHER MANUFACTURER OR INSTALL THE DRILL JIG AS AN ASSEMBLY. DAMAGE TO COMPONENTS CAN OCCUR.

**Note:** The ThermALERT™ system cannot be installed on a solid spindle axle.

**Note:** The P.S.I.™ solid spindle drill jig (PN 81023-00) helps to ensure the hole will be concentric to the spindle end circumference.

1. Make sure at least two full threads are exposed on the spindle to correctly support the drill jig.
2. Install the P.S.I.™ solid spindle drill jig on the spindle threads. See **Figure 29**.

⚠️ **CAUTION:** THE HUB CAVITY MUST BE COVERED WITH A CLEAN TOWEL DURING SYSTEM MAINTENANCE AND INSTALLATION PROCEDURES. DO NOT ALLOW CONTAMINANTS OR UNWANTED MATERIAL TO ENTER THE HUB CAVITY. DAMAGE TO THE BEARINGS AND SEALS CAN OCCUR.

3. Cover the hub cavity with a clean cloth. See **Figure 30**.
4. Clean the drill jig spindle installation nut and the axle spindle nut with a clean dry cloth.

5. Install a 7/16 inch X 12 inch drill bit into the drill jig. See Figure 31.

6. Thread the drill jig guide rails onto the axle spindle.

7. Use a bar to tighten the rails. See Figure 32.
8. Slide the drill motor assembly onto the guide rails. See Figure 33.

![Figure 33: Drill Motor Assembly](image1)

9. Make sure the drill bit is inserted in the drill bit guide. See Figure 34.

![Figure 34: Drill Bit Guide](image2)

10. Put the feed guide on the rails. Tighten the feed guide. See Figure 35.

![Figure 35: Feed Guide](image3)

11. Turn the advancing handle clockwise until the drill bit bottoms out on the spindle, then turn the advancing handle counterclockwise one full turn. See Figure 36.
12. Turn on the drill motor. See Figure 37.
   
   **Note:** Lubrication is not needed during the drilling procedure.

13. Turn the advancing handle counterclockwise slowly with a smooth, steady feed. See Figure 37.
14. Back off the advancing handle counterclockwise a few turns while the drill is on if the drill stalls or lags, then continue drilling.
15. Remove the drill bit from the guide periodically to remove metal shavings. See Figure 38.
16. Turn the advancing handle counterclockwise a few turns while the drill is on if the drill bottoms out or breaks through the solid spindle, then release the feed guide and pull the drill out of the hole.

17. If the 7/16 inch X 12 inch drill bit does not break through the solid spindle, use a 7/16 inch X 18 inch drill bit.

18. Do steps 6-17 again to break through the solid spindle.

19. Remove the drill jig components from the spindle.

20. Clean the axle end with a clean dry cloth.

21. Blow air through the drilled hole with shop air. See Figure 39.

22. Use Table 4 in Section 7 - System Special Tools to find the tap guide part number.

23. Install the tap guide onto the spindle.

24. Put a 1/4-18 inch NPT tap in the tap guide.

25. Apply tapping lubricant to the tap.

26. Use a 1/2 inch, 12 point socket on a 3/8 inch drive ratchet to turn the tap in the hole. See Figure 40.

27. Remove the tap guide from the spindle.

28. Clean the axle end with a clean dry cloth.

29. Remove debris from the tapped hole with shop air.
30. Install the spindle nut(s) and related hardware according to the wheel-end manufacturer's recommended procedure.
31. Make sure the wheel-end play is correct according to the wheel-end manufacturer's recommendations.

2.1.4 Install The Stator

**Note:** Current production stators have sealant pre-applied to the stator threads. If the stator is removed from the spindle, apply sealant to the threads again.

1. Apply a sealer to the stator threads, if necessary. See *Figure 41.*

![Figure 41: Stator Sealant Tape Installation](image)

2. Install the stator and hand tighten. See *Figure 42.*

![Figure 42: Stator Installation](image)

3. Use a 5/8 inch socket to tighten the stator approximately 2-1/2 turns or torque the stator to 23-28 lb-ft (31.18-37.96 Nm). See *Figure 43.*
2.2 Install The Wheel-end Components

P.S.I.™ ready hubcaps are available in bolt-on and screw on models.

Hubcaps for oil-lubricated wheel-ends typically feature a side-mounted oil fill plug, clear sight glass, and six vent holes with vent tubes located in the hubcap interior to keep oil from leaking from the hubcap vent holes. See Figure 44 and Figure 45.

Hubcaps for grease-lubricated wheel-ends have six vent holes with vent tubes, however, they typically do not have a side-mounted fill plug. See Figure 45.
2.2.1 Install The Hubcaps

**WARNING:** DO NOT BLOCK THE VENT TUBES IN A GREASED WHEEL-END WITH GREASE. BLOCKED VENT TUBE HOLES WILL PREVENT SYSTEM AIR FROM VENTING FROM THE WHEEL-END. PERSONAL INJURY OR DAMAGE TO COMPONENTS CAN OCCUR.

**Note:** Confirm that the tire valve stems are approximately 180° opposite of each other.

1. Install the hubcap with the oil fill plug at the 12 o'clock position.
2. Make sure the vent holes in a greased wheel-end are not blocked with grease. See Figure 45.
3. Make sure that the thru-tee tube extends 1/4 inch to 1/2 inch past the stator seal.
4. Install the thru-tee assembly carefully into the hubcap. It is normal to feel some resistance when the thru-tee tube is inserted in the stator and contacts the stator seal. See Figure 46.

![Figure 46: Thru-tee Installation](image)

**CAUTION:** DO NOT EXCEED 55 LB-IN WHEN TIGHTENING THE THRU-TEE. DAMAGE TO THE COMPONENT THREADS CAN OCCUR.

5. Hand tighten the thru-tee.
6. Use a torque wrench and tighten the thru-tee to 45 lb-in (5.08 Nm).
7. Confirm the thru-tee fitting aligns with the tire valve stem.
8. Set the torque wrench to 55 lb-in (6.21 Nm) and tighten the thru-tee fitting again to align it with the tire valve stem. See Figure 47.

**Note:** Ensure there is no gap between the deflector shield and hubcap.

![Figure 47: Thru-tee Assembly Torque](image)

9. Confirm that the air fitting is pointing toward the tire valve stem.
10. If necessary, reposition the hubcaps or wheels to align the thru-tee fitting with the tire valve stem.
CAUTION: DO NOT OVERTIGHTEN THE HOSE CONNECTION. THIS COULD DAMAGE THE HOSE SEAL AND CAUSE THE TIRE TO DEFlate WHEN THE TRAILER IS PARKED. DAMAGE TO COMPONENTS CAN OCCUR.

11. Connect the tire hoses to the tire valve stems by hand.

12. Use a 7/16 inch wrench to tighten the connection an additional half turn. See Figure 48.

![Figure 48: Tire Inflation Hose Installation](image)

13. Perform a system check before connecting the hoses to the thru-tee.

2.3 Install The Air System Components

2.3.1 Install The Control Box Mounting Bracket

This task installs the control box to the trailer subframe using a mounting bracket.  

WARNING: PERSONAL PROTECTIVE EQUIPMENT (PPE) MUST BE WORN WHEN USING WELDING EQUIPMENT. PERSONAL INJURY AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: REFER TO THE TRAILER OR SUSPENSION RECOMMENDED WELDING LOCATIONS AND PROCEDURES.

WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

CAUTION: WELDING EQUIPMENT SAFETY PROCEDURES AND OPERATING INSTRUCTIONS MUST BE FOLLOWED AT ALL TIMES. INJURY AND DAMAGE TO EQUIPMENT CAN OCCUR.

Note: Install the control box in a location that is accessible, free of hazards, and positioned so the control box door can be opened without interference.

Note: Install the control box to the supplied mounting bracket or directly to the trailer subframe.

Note: Make sure the control box electrical lines and air lines do not interfere with any undercarriage components.

1. Identify a suitable mounting location for the control box bracket on the trailer subframe.

   Note: The control box mounting bracket can be installed using one of two methods, either welded to the subframe or bolted to the trailer subframe.

2. Weld the control box mounting bracket to the trailer subframe. Or,

3. Use the mounting bracket as a template to drill the mounting holes.

4. Use a 5/16 inch (7.93 mm) drill bit and drill two holes on the trailer subframe. See Figure 49.
Figure 49: Control Box Mounting Bracket Installation

Note: The mounting bracket flange must contact the surface area completely.

5. Use the bolt, washers, and locknut to attach the mounting bracket to the trailer subframe. See Figure 50.

Figure 50: Control Box Mounting Bracket Hardware Installation

6. Use the bolt, washers, and locknut to attach the control box to the opposite side of the mounting flange on the mounting bracket. See Figure 51.

Figure 51: Control Box Installation Reference

2.3.2 Install The Control Box To The Trailer Subframe

This task installs the control box to the trailer subframe without the mounting bracket.

⚠️ WARNING: REFER TO THE TRAILER AND SUSPENSION RECOMMENDED DRILLING LOCATIONS.

⚠️ WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.
1. Use the supplied mounting bracket as a template to drill three 1/4 inch (6.35 mm) holes into the trailer subframe. See Figure 52.

![Figure 52: Mounting Bracket Subframe Installation](image1)

2. Discard the mounting bracket.

3. Use the bolt, washers, and locknut to attach the control box to the trailer subframe. See Figure 53 and Figure 54.

![Figure 53: Typical Fastener Location](image2)

![Figure 54: Control Box Subframe Location](image3)
2.3.3 Install the Pressure Protection Valve (PPV)

**CAUTION:** THE SYSTEM TIRE HOSES MUST NOT CONTACT THE WHEELS OR BRAKE COMPONENTS. DAMAGE TO COMPONENTS CAN OCCUR.

1. Drain the air from the trailer air system service tank.
2. Apply thread sealant to the fittings used in the PPV installation, if necessary. See Figure 55.

3. Install the PPV and fittings as close to the top of the air tank as possible.
4. Tighten the PPV and fittings by hand.
5. Using a wrench, tighten the PPV and fittings a minimum of two turns. Continue tightening until the drain hole is pointing downward. See Figure 56.

![Figure 55: Pressure Protective Valve Thread Sealant Application](image)

![Figure 56: Pressure Protective Valve Installation](image)

2.3.4 Install The System Air Lines

1. Use grommets to protect the system air lines from sharp edges at hole locations.
2. Install the air line fittings in the PPV and control box. Tighten by hand.
3. Use a wrench and tighten the fittings approximately one additional turn.
   
   **Note:** Hold the PPV to tighten the jam nut and prevent leaks between the bulkhead and the PPV. See Figure 57 and Figure 58 for hold locations.
4. Route an air line from the PPV to the control box inlet port. See Figure 57 and Figure 58.
5. Route an air line from the control box outlet port to the air line tee or directly to the axle air fitting in a single axle application.

6. Route the air lines from the tee to the axle air fittings. See Figure 59.

**Note:** Provide sufficient slack in the lines to allow for suspension movement. Use the slack in the existing trailer brake lines as a guide.

7. Use wire ties to suspend the air line tee away from the trailer brake lines to protect them from damage. See Figure 60.
2.4 Install The Electrical System Components

2.4.1 Connections To The Seven-way Box

**WARNING:** DISCONNECT THE BATTERY GROUND CABLE BEFORE WORKING ON ANY ELECTRICAL SYSTEM. ELECTRICAL SHOCK EXISTS AND SPARKS CAN IGNITE FLAMMABLE SUBSTANCES. PERSONAL INJURY AND DAMAGE TO COMPONENTS CAN OCCUR.

**Note:** The standard wire harness is shipped as a single assembly consisting of a black and white wire with spade terminals on one end that connect to the control box, and bullet terminals that connect to the indicator light.

1. Connect the indicator light to the wire harness. See Figure 61.

   ![Figure 61: Indicator Light Connections](image1)

2. Install the indicator light vertically on the roadside front of the trailer, approximately 30 inches (762 mm) from the bottom of the coupler, as close to the outside of the trailer as possible.

3. Confirm the indicator light can be seen from the roadside rear-view mirror. See Figure 62 and Figure 63.

   ![Figure 60: Air Line Slack](image2)
4. Route the wire harness from the indicator light to the trailer seven-way box.

5. Use the P-clamps to secure the wire harness to the front of the trailer. See Figure 64.

6. Cut the wire harness to a sufficient length to make the connections in the seven-way box.

7. Route the remaining wire harness through the liquid-tight seal on the control box.

8. Connect the harness to the flow sensing switch electrical contacts. See Figure 65.

**Note:** The black or white wire can be connected to either terminal on the flow sensing switch and are interchangeable.
9. Route the wire harness from the control box to the seven-way box.

10. Use grommets to protect the wire harness from contacting sharp edges.

11. Use tie wraps to secure the wire harness to the trailer subframe.

   **Note:** Provide sufficient slack in the harness to allow for suspension system movement if the trailer is equipped with a sliding subframe. Use the slack in the existing trailer brake lines and electrical lines as a guide.

12. Route the wire harness into the seven-way box and remove the excess cable. See Figure 64.

13. Connect an eye connector to the white indicator light wire in the trailer seven-way box.

14. Connect the other eye connector to the white control box wire in the trailer seven-way box. See Figure 66.

15. Connect the white control box wire connector to constant power. Typically, it is the blue wire in the seven-way box.

16. Connect the white indicator light wire connector to ground. See Figure 66.
17. Use the butt connector to connect the black indicator light wire to the black control box wire in the seven-way box. See Figure 67.

![Figure 67: Wire Connector Ends](image)

18. Connect the trailer to the tractor's electrical system, if necessary.

### 2.4.2 Optional ABS Installation 1

This task connects the ABS inside the control box.

1. Install the indicator light on the trailer.
2. Route the electrical cable from the indicator light to the control box.
3. Route the ABS electrical wire to the control box.
4. Connect the ABS blue wire connector to the flow sensing switch.
5. Connect the indicator light black wire to the flow sensing switch.
6. Connect the indicator light white wire to the ABS white wire connector. See Figure 68.

![Figure 68: ABS Optional Connection 1](image)

### 2.4.3 Optional ABS Installation 2

This task connects the ABS outside of the control box.

1. Install the indicator light on the trailer.
2. Route a length of electrical cable from the indicator light to the ABS connector.
3. Route the electrical cable from the control box to the ABS connector.
4. Use a liquid-tight connector at all connections. See Figure 69.

![ABS Connector Diagram]

**Figure 69: ABS Optional Connection 2**

5. Connect the electrical cable to the electrical contacts of the flow sensing switch.
6. Connect the control box white wire to the ABS blue wire connector.
7. Connect the control box black wire to the indicator light black wire.
8. Connect the indicator light white wire to the ABS white wire connector.

2.5 Wheel-end Oil

2.5.1 Service Hubcap Oil

⚠️ **CAUTION:** FOLLOW THE WHEEL-END MANUFACTURER’S RECOMMENDED SERVICE LEVEL REQUIREMENTS. DO NOT OVERFILL THE WHEEL-END WITH OIL. DAMAGE TO COMPONENTS CAN OCCUR.

1. Remove the fill port plug from the hubcap.
2. Add oil through the hubcap fill port. Do not overfill. Refer to the wheel-end supplier recommendations for correct oil level. See Figure 70 and Figure 71.

![Hubcap Oil Fill Port Diagram]

**Figure 70: Hubcap Oil Fill Port**
2.6 System Decals

2.6.1 Install The System Decals

1. Install an identification and hose installation decal on each side of the trailer above the suspension system. See Figure 72.

2. Install the indicator light decal near the indicator light. See Figure 73 and Figure 74.
3.0 System Operation Check

Use the following procedure to check the system for correct operation. This inspection ensures that the system is activated, the indicator light works, the hoses are installed correctly, and that the system delivers the correct pressure to the tires.

3.1 System Operation Check - Setup

⚠️ WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

1. Confirm the system On/Off valve is in the ON position. The knob aligns with the valve body.
2. Make sure the maintenance drain valve is closed. See Figure 75.

3. Pressurize the system to 20 psi (137.90 kPa) above the control box setting.
4. Allow at least 10 minutes for the air pressure source to pressurize the system.
5. Use a non-corrosive leak detecting solution to check all fittings, hose connections, and thru-tee relief valves for air leaks.
6. Connect a 12 VDC electrical power source to the trailer seven-way box. See Figure 76.

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Figure 74: ThermALERT ™ Decal Location

Figure 75: Control Box System Operation Check - Setup
7. Push a short piece of the system air line into the fitting to check all of the male hose connections at the thru-tee assemblies. Air should flow from the male hose connection. See Figure 77.

8. Open the maintenance drain valve on the control box. The indicator light will come ON. See Figure 78.

9. Close the maintenance drain valve on the control box. The indicator light will go OFF. See Figure 78.
10. Push the check valves at the ends of the hoses attached to the tires. Air should flow from the tires. See Figure 79.
11. Reduce the pressure in all tires 5-10 psi (34.47-68.95 kPa) below the pressure indicated in the control box. See Figure 80.

**Note:** A sticker located inside the control box door shows the tire pressure that the system will deliver.

12. Attach the tire hoses to the thru-tee at all tire positions. See Figure 81.

**CAUTION:** KNURLS ON TIRE HOSES ARE TO BE HAND-TIGHTENED TO THE THRU-TEE ONLY. DO NOT USE TOOLS. DAMAGE TO THE KNURLS CAN OCCUR.

13. Allow the pressure to build up in the tires.

**Note:** Depending on system pressure and other vehicle air requirements, it can take up to 30 minutes for pressure to increase.

14. Use a calibrated gauge to check the tire pressure. See Figure 82 and Figure 83.
15. After 30 minutes, if the tire pressures are not correct, check the control box setting. Refer to Section 3.2.1.

3.2 Control Box Pressure Check And Adjustment Instructions

3.2.1 Control Box Pressure Check

Note: For correct adjustment of the control box pressure, make sure that the air supply of the trailer is a minimum of 20 psi (137.90 kPa) above the target tire pressure.

Note: Use a test set consisting of a calibrated pressure gauge, a fitting or tubing to attach to the control box, and valve to bleed off pressure. See Figure 84 and Figure 85.
1. Turn the system On/Off valve to the CLOSED position. See Figure 86.

2. Open the maintenance drain valve to deplete all air pressure from the system then close the valve. See Figure 86.

3. Remove the outlet air supply line from the fitting on the air pressure outlet side of the control box.

4. Connect the system pressure test gauge to the outlet air supply fitting, ensuring the bleed-off valve is in the closed position. See Figure 86.
5. Turn the system On/Off valve to the ON position to charge the control box system. See Figure 87.

6. Confirm the pressure setting on the gauge is approximately 3 psi (20 kPa) above the target tire pressure.
7. Go to Section 3.2.2 to adjust the regulator if necessary to correct the pressure setting.
8. Turn the system On/Off valve to the OFF position.
9. Open the system pressure test gauge bleed-off valve to relieve the pressure.
10. Disconnect the system pressure test gauge.
11. Connect the outlet air supply line.
12. Turn the system On/Off valve to the ON position.

3.2.2 Control Box Adjustment Instructions

Note: During the adjustment process, the test gauge needle should react simultaneously to the regulator knob movement. If you go beyond the desired target pressure, the pressure must be returned to approximately 60 psi (413.69 kPa), then increased slowly until the desired target pressure has been reached.

1. Pull outward to unlock the regulator knob until a slight click is felt and heard. See Figure 88.
2. Turn the regulator knob counter-clockwise until the pressure on the system pressure test gauge decreases to approximately 60 psi (413.69 kPa).

3. Increase the pressure slowly by turning the regulator knob clockwise until the system pressure test gauge has reached 3 psi (20.68 kPa) above the desired target tire pressure.

4. Push the regulator knob inward until a slight click is felt and heard indicating it is locked.

5. Cycle the regulator and bleed the system pressure test gauge as follows:
   a) Close the system On/Off valve.
   b) Open the bleed-off valve to relieve the pressure. See Figure 89.

6. Charge the system pressure test gauge as follows:
   a) Close the system pressure test gauge bleed-off valve.
   b) Open the system On/Off valve to charge the system pressure test gauge. See Figure 90.
7. Observe the system pressure test gauge needle during the cycling process.

   **Note:** The test gauge needle should not move sluggishly towards the target pressure setting and should not go past the target pressure.

8. Repeat steps 1-3 again for a minimum of two times and until the system pressure test gauge pressure reading reaches the target pressure each time.

9. Turn the system On/Off valve to the **OFF** position.

10. Open the system pressure test gauge bleed-off valve to relieve the pressure.

11. Disconnect the system pressure test gauge. See Figure 89.

12. Connect the outlet air supply line. See Figure 90.

13. Turn the system On/Off valve to the **ON** position.

14. Ensure that all tire pressures are reduced 5-10 psi (34.47-68.95 kPa) below the target tire pressure.

15. Install a decal inside the control box lid to record the tire pressure change and date of change. See Figure 91.

16. Close and secure the control box lid with the lid screws. Tighten the screws.

   **CAUTION:** KNURLS ON TIRE HOSES ARE TO BE HAND-TIGHTENED TO THE THRU-TEE ONLY. DO NOT USE TOOLS. DAMAGE TO THE KNURLS CAN OCCUR.

17. Attach the tire hoses to the thru-tee at all tire positions. See Figure 92 and Figure 93.
18. Check the wheel-ends to confirm that the system hoses do not contact the wheels. See Figure 94.

19. If necessary, use a torque wrench set to 55 lb-in (6.21 Nm) to slightly rotate the thru-tee to reposition the hose away from the wheel.

3.3 System Leak Rate And Test

All pneumatic systems on commercial vehicles such as brake systems, controls, and so on, have allowable leak rates. When the system is isolated from all other trailer pneumatic components, the allowable leak rate is as follows:

For Single, Tandem, Tri-axe, and Dollies

CAUTION: THE SYSTEM VALVE STEMS AND HOSES MUST NOT CONTACT THE WHEELS AND BRAKE DRUMS. DAMAGE TO COMPONENTS CAN OCCUR.
- A 1 psi (6.89 kPa) drop in system pressure over a one minute time period is acceptable.
- A pressure loss greater than 1 psi (6.89 kPa) is not acceptable.

### 3.3.1 System Leak Rate Test

1. Disconnect all tire hoses from the thru-tees.
2. Turn the system On/Off valve at the control box assembly to the **CLOSED** position.
3. Open the maintenance drain valve to deplete all pressure from the system, then close the valve.
4. Install a 1/4 inch air line fitting tee and a small section of 1/4 inch air line to the control box outlet port. See **Figure 95**.

![Figure 95: Control Box Leak Check](image)

5. Install a system pressure test gauge to the 1/4 inch air line fitting tee. See **Figure 95**.
6. Turn the system On/Off valve to the **OPEN** position and fully charge the system.
7. Turn the system On/Off valve to the **CLOSED** position.
8. Record the pressure drop at the system pressure test gauge.
9. Apply a non-corrosive leak detecting solution to all the tire inflation system fittings outside the control box and check for leaks if the pressure drop exceeds the acceptable leak rate.

   **Note:** It is not necessary to use leak detecting solution on any of the internal control box assembly components. All control box assemblies are tested 100% by the manufacturer. Contact P.S.I.™ if leaks are suspected in the control box.

10. Look for bubbling and listen for audible air leaks.
11. Tighten or replace fittings that leak.
12. Drain the system at the system pressure test gauge bleed-off valve.
13. Remove the system pressure test gauge, the 1/4 inch air line fitting tee, and the small section of 1/4 inch air line.
14. Reinstall the air supply line to the outlet on the control box.
15. Turn the system On/Off valve to the **ON** position.

### 3.3.2 Inspection And Repair Of System Leaks At Wheel-ends

1. Spray a non-corrosive leak detecting solution on all system components and connections to check for leaks. See **Figure 96**, **Figure 97**, and **Figure 98**.
Figure 96: Air Fitting Leak Detection
2. Look for bubbling and listen for audible leaks at the connections.
3. If leaks are found, turn the system OFF using the control box system On/Off valve.
4. Drain all the air from the system using the maintenance drain valve at the control box.
5. Remove the hoses from the thru-tee.
6. Remove the thru-tee and hubcap.

**CAUTION:** THE HUB CAVITY MUST BE PROTECTED DURING SYSTEM MAINTENANCE AND INSTALLATION PROCEDURES. DO NOT ALLOW CONTAMINANTS OR UNWANTED MATERIAL TO ENTER THE HUB CAVITY. DAMAGE TO THE WHEEL-END COMPONENTS CAN OCCUR.

7. Insert the thru-tee into the stator and hold it in place.
8. Turn the system On/Off valve to the ON position.
9. Hold the thru-tee straight in the axle.
10. Spray the axle press plug area with a non-corrosive leak detecting solution. See Figure 99.
11. Look for bubbling and listen for audible leaks.
   a) Install a new thru-tee if it is leaking.
   b) If the stator is leaking at the threads, remove the stator and re-apply sealant.
   c) Reinstall the stator. Torque to 23-28 lb-ft. (31.18-37.96 Nm).
   d) If the stator is leaking in the center at the thru-tee connection, replace the stator.
   e) Install a new axle press plug if a leak is detected between the plug O.D. and spindle I.D.

   \textbf{CAUTION:} DO NOT SCORE THE SPINDLE BORE WHEN REMOVING THE AXLE PRESS PLUG. THE SPINDLE BORE MUST REMAIN SMOOTH. DAMAGE TO SYSTEM COMPONENTS CAN OCCUR.

12. Use a slide hammer fitted with the axle press plug removal tool to remove the leaking axle press plug. See \textit{Figure 100} and \textit{Figure 101}. 

\begin{center}
\textbf{Figure 99: Thru-tee Leak Detection}
\end{center}

\begin{center}
\textbf{Figure 100: Axle Press Plug Slide Hammer}
\end{center}
13. Install a new axle press plug. Refer to Section 2.1.
14. Install the wheel-end and the tire inflation system components. Refer to Section 2.2.
15. Use the steps that follow if a leak is found at the thermal screw.
   a) Use a 5/32 inch Allen-head socket to remove the thermal screw. See Figure 102.
   b) Remove the sealing washer.
   c) Inspect the sealing surface in the spindle plug area for debris.
   d) Install a new sealing washer on a new thermal screw.
   e) Install the thermal screw into the spindle plug.
   f) Torque the thermal screw to 25-30 lb-in (2.82-3.39 Nm).

4.0 System Pre-service Check

4.1 System Pre-service Check Instructions
This task ensures the tire inflation system operates correctly after receiving a trailer and before being placed in service.

⚠️ WARNING: EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

1. Confirm that the trailer has the correct air supply of 20 psi (137.90 kPa) above the control box setting. The control box setting decal is located on the inside of the control box lid.
2. Confirm the system is connected to a 12 VDC electrical power supply.
3. Confirm that the system On/Off valve is in the **ON** position.
4. Confirm that the maintenance drain valve is in the **CLOSED** position. See Figure 103.

![Figure 103: Control Box Pre-service Check](image)

5. Confirm that the indicator light comes **ON** when the maintenance drain valve is opened on the control box. See Figure 104.

![Figure 104: Indicator Light Location](image)

6. Go to **Section 6 - System Troubleshooting** if the indicator light does not come **ON**.
7. Use an accurate air pressure gauge to check the tire pressure at the tire hoses. See Figure 105 and Figure 106.

![Figure 105: Air Pressure Gauge](image)
8. Go to Section 6 - System Troubleshooting if the tire pressure is not correct.
9. Use a non-corrosive leak detecting solution to check the hose-to-valve stem connections, hose-to-thru-tee connections, and deflector shield for leaks. See Figure 107.

10. Go to Section 3 - System Operation Check to repair or replace components as necessary.

⚠️ **CAUTION:** THE SYSTEM TIRE HOSES MUST NOT CONTACT THE WHEELS AND BRAKE COMPONENTS. DAMAGE TO COMPONENTS CAN OCCUR.

11. Check the wheel-ends to verify that the tire hoses do not contact the wheels. See Figure 108.
12. Use a torque wrench set to 55 lb-in (6.21 Nm) to rotate the thru-tee slightly to position the hose away from the wheel.

**Note:** Ensure there is no gap between the deflector shield and hubcap.

### 5.0 System Inspection And Maintenance

#### 5.1 System Inspection Interval Guidelines

**WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

The tire inflation system inspection intervals vary due to the environment, mileage, and loading. For example, light-duty applications require extended inspection intervals. Container chassis service is a light-duty application, because it usually involves an on-highway environment and low mileage.

Heavy-duty applications require reduced inspection intervals. Dump trailer service is a heavy-duty application, because it usually involves an off-highway environment and heavy loading.

**Note:** Installation of a ThermALERT™ system does not eliminate the need to perform recommended wheel-end maintenance. Inspect the tire inflation system components for correct operation.

#### 5.1.1 General Inspection

Inspect the tire inflation system wheel-end components whenever a tire is removed.

The control box pressure setting must be inspected and adjusted, if necessary, after the initial 6 months of service. Refer to Section 3 - System Operation Check.

Inspect the control box pressure setting every 6-12 months of normal operation. Refer to Section 3 - System Operation Check.

Inspect the following components for correct operation at the recommended inspection intervals.

- Indicator light
- Tire hose check valves
- Tire pressure
- Tire hose-to-wheel interference
- Tire hose-to-valve stem connections
- All air fitting connections from the pressure protection valve (PPV) to the axle air fitting
- Hubcap relief valves
- Particulate filter. See Figure 109.
5.1.2 Light-duty Service Inspection
Inspect the tire inflation system every 100,000 miles or 12 months, whichever comes first.

5.1.3 Standard-duty Service Inspection
Inspect the tire inflation system every 100,000 miles or 12 months, whichever comes first.

5.1.4 Heavy-duty Service Inspection
Inspect the tire inflation system every 50,000 miles or six months, whichever comes first.

5.2 System Inspection
5.2.1 Indicator Light Inspection
During initial system charging, the indicator light will come ON and remain ON for up to 10 minutes, depending on the system pressure setting and other vehicle air requirements.

If the indicator light remains ON for more than 10 minutes during initial system charging, troubleshoot the system and tires.

Inspect the tires and system components for leaks if the indicator light comes ON during system operation. See Figure 110.

The indicator light illumination can be caused by one or more of the following conditions:
5.2.2 Tire Pressure Inspection Check

Although the system can charge a leaking tire during vehicle operation, P.S.I.™ recommends inspecting the tires for wear and damage at regular intervals, and check tire pressure at regular intervals as follows:

**Note:** If equipped with check port hoses, hose removal to check the tire pressure is not necessary. Check tire pressure at the check port hose as shown in *Figure 111* and *Figure 112*.

1. Remove the tire hose at the thru-tee fitting. See *Figure 113*. 
2. Press the pressure gauge to the tire hose and read the pressure. See Figure 114.
   a) If the tire pressure is correct, connect the hose to the thru-tee fitting.
   b) Hand tighten the knurled fitting. Do not use pliers.
   c) Troubleshoot the system if the tire pressure is not correct.

5.3 System Component Removal And Installation

5.3.1 Turn The System Off

⚠️ **WARNING:** THE SYSTEM MUST BE TURNED OFF AND DEPRESSURIZED BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. PERSONAL INJURY AND DAMAGE TO COMPONENTS CAN OCCUR.

1. Turn the system On/Off valve to the **OFF** position.
2. Open the maintenance drain valve in order to bleed the pressure from the system. See Figure 115.
5.3.2 Remove And Install The Tires

⚠️ **CAUTION:** YOU MUST FOLLOW THE MANUFACTURER’S INSTRUCTIONS, COMPANY PROCEDURE, AND SAFETY POLICY IF IT IS NECESSARY TO REMOVE OR INSTALL A TIRE FOR ANY REASON.

⚠️ **CAUTION:** A WHEEL DOLLY MUST BE USED WHEN THE TIRES ARE REMOVED OR INSTALLED. DAMAGE TO THE THRU-TEE FITTING CAN OCCUR IF ASSEMBLY IS NOT PULLED STRAIGHT OFF THE WHEEL HUB.

1. During the wheel and tire installation onto the wheel hub, ensure the following:
   a. Confirm that the thru-tee fittings point toward the valve stem.
   b. Reduce tire pressure 5-10 psi (34.5-69.0 kPa) below the cold tire pressure setting.
   c. Re-install system tire hoses and check for leaks.

5.3.3 Remove And Install The Thermal Screw

⚠️ **WARNING:** DO NOT OPERATE THE VEHICLE IF THE THERMALERT™ SYSTEM ACTIVATES. FIND A SAFE PLACE TO BRING THE TRACTOR AND TRAILER TO A COMPLETE STOP TO PREVENT PERSONAL INJURY OR DAMAGE TO THE VEHICLE. DO NOT IGNORE THE INDICATOR LIGHT.

⚠️ **WARNING:** THERMAL SCREWS ARE NOT REUSABLE. ALWAYS INSTALL A NEW THERMAL SCREW. PERSONAL INJURY OR DAMAGE TO COMPONENTS CAN OCCUR.

1. Use a 5/32 inch Allen wrench to remove the activated thermal screw. See *Figure 116*. 

---

**Figure 115: Turning the System Off**
2. Remove the sealing washer.
3. Inspect the sealing surface in the spindle plug for unwanted material and debris.
4. Install a new sealing washer on a new thermal screw.
5. Install the thermal screw into the axle plug.
6. Torque the thermal screw to 25-30 lb-in (2.82-3.39 Nm).

6.0 System Troubleshooting

**WARNING:** EYE PROTECTION MUST BE WORN WHEN PERFORMING VEHICLE MAINTENANCE OR SERVICE. EYE INJURY OR DAMAGE CAN OCCUR. GET MEDICAL ATTENTION IMMEDIATELY.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The indicator light is <strong>ON</strong>.</td>
<td>The system is delivering air during initial system charging.</td>
<td>The system is functioning correctly.</td>
</tr>
<tr>
<td></td>
<td>The system is delivering air to a leaking tire.</td>
<td>Repair the tire.</td>
</tr>
<tr>
<td></td>
<td>The system is delivering air to a leaking system component.</td>
<td>Replace the system component.</td>
</tr>
<tr>
<td></td>
<td>The system is delivering air to a cracked axle.</td>
<td>Replace the axle.</td>
</tr>
<tr>
<td></td>
<td>The system wiring is incorrect.</td>
<td>Correct the system wiring.</td>
</tr>
<tr>
<td>The indicator light is <strong>ON</strong> and air is leaking from the wheel-end thru-tee fitting.</td>
<td>The trailer is equipped with ThermALERT™ system and the wheel-end is hot.</td>
<td>The system is functioning correctly.</td>
</tr>
<tr>
<td></td>
<td>The system is delivering air to a leaking system component.</td>
<td>Repair and replace wheel-end components.</td>
</tr>
<tr>
<td></td>
<td>The thru-tee fitting is leaking.</td>
<td>Replace the thru-tee fitting.</td>
</tr>
<tr>
<td></td>
<td>The stator seal is leaking.</td>
<td>Replace the stator.</td>
</tr>
<tr>
<td></td>
<td>The stator threads are leaking.</td>
<td>Seal the stator threads.</td>
</tr>
<tr>
<td></td>
<td>The axle press plug is leaking.</td>
<td>Replace the axle press plug.</td>
</tr>
<tr>
<td>Condition</td>
<td>Action 1</td>
<td>Action 2</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>The indicator light is <strong>OFF</strong> during system operation, with air flowing through the control box.</td>
<td>The trailer is not supplied with 12 VDC electrical power.</td>
<td>Supply 12 VDC electrical power to the trailer.</td>
</tr>
<tr>
<td></td>
<td>The indicator light is inoperative.</td>
<td>Replace the indicator light.</td>
</tr>
<tr>
<td></td>
<td>The flow sensing switch is inoperative.</td>
<td>Replace the flow sensing switch.</td>
</tr>
<tr>
<td></td>
<td>The system wiring is damaged.</td>
<td>Repair the system wiring.</td>
</tr>
<tr>
<td></td>
<td>The system wiring is incorrect.</td>
<td>Correct the system wiring.</td>
</tr>
<tr>
<td>The indicator light is <strong>OFF</strong> during system operation and air is leaking from the wheel-end thru-tee fitting.</td>
<td>The trailer is equipped with ThermALERT™ system, the wheel-end is hot and the control box has an incorrect flow switch.</td>
<td>Repair and replace the wheel-end components. Replace the flow switch in the control box with a grey color flow switch.</td>
</tr>
<tr>
<td>Air is leaking from the wheel-end thru-tee fitting.</td>
<td>The thru-tee fitting is leaking.</td>
<td>Replace the thru-tee fitting.</td>
</tr>
<tr>
<td></td>
<td>The stator seal is leaking.</td>
<td>Replace the stator.</td>
</tr>
<tr>
<td></td>
<td>The stator threads are leaking.</td>
<td>Seal the stator threads.</td>
</tr>
<tr>
<td></td>
<td>The axle press plug is leaking.</td>
<td>Replace the axle press plug.</td>
</tr>
<tr>
<td>Tire pressure is low.</td>
<td>The shut-off valve is off.</td>
<td>Turn on the shut-off valve.</td>
</tr>
<tr>
<td></td>
<td>The system pressure setting is too low.</td>
<td>Increase the system pressure setting.</td>
</tr>
<tr>
<td></td>
<td>The incorrect valve cores are installed.</td>
<td>Replace the valve cores with the P.S.I™ original equipment.</td>
</tr>
<tr>
<td>Lubricant is leaking from the wheel-end vent.</td>
<td>The wheel-end is overfilled with lubricant.</td>
<td>Fill the wheel-end to the correct level.</td>
</tr>
<tr>
<td></td>
<td>A hubcap without vent extensions is installed onto an oil-lubricated wheel-end.</td>
<td>Install a hubcap with vent extensions.</td>
</tr>
<tr>
<td></td>
<td>The thru-tee fitting is leaking.</td>
<td>Replace the thru-tee fitting.</td>
</tr>
<tr>
<td></td>
<td>The stator seal is leaking.</td>
<td>Replace the stator.</td>
</tr>
<tr>
<td></td>
<td>The stator threads are leaking.</td>
<td>Seal the stator threads.</td>
</tr>
<tr>
<td></td>
<td>The axle press plug is leaking.</td>
<td>Replace the axle press plug.</td>
</tr>
<tr>
<td>Tire pressure is high.</td>
<td>The tire is manually over inflated.</td>
<td>Reduce the tire pressure. The system will inflate to the correct level.</td>
</tr>
<tr>
<td></td>
<td>The system pressure setting is too high.</td>
<td>Lower the system pressure setting.</td>
</tr>
<tr>
<td>The trailer tire deflates when parked.</td>
<td>The system hose or tire valve stem connection is leaking.</td>
<td>Correctly tighten the connection or replace the seals.</td>
</tr>
<tr>
<td></td>
<td>The hose valve core is leaking.</td>
<td>Clean or replace the hose valve core.</td>
</tr>
<tr>
<td></td>
<td>The tire is leaking.</td>
<td>Repair the tire.</td>
</tr>
</tbody>
</table>
The tire is slow to inflate or no air flows to the tire. The hose connection to the valve stem may have been overtightened, blocking air flow. Correctly tighten the connection or replace the hose or seal if it is damaged.

7.0 System Special Tools

This section provides information for tools and supplies used to service the tire inflation system. Refer to the Service Notes on page 13 section at the beginning of this document to obtain the listed tools and supplies.

Table 2: Spindle Bore Polishers

<table>
<thead>
<tr>
<th>Polisher</th>
<th>Part Number</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dana®/Eaton® D22</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Hendrickson® HN</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Holland Trade®</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Ingersoll® F-22</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Meritor™ TN/TQ/TK</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Sudisa® 12R/11M</td>
<td>3T524</td>
<td>Grainger</td>
</tr>
<tr>
<td>Dana®/Eaton® P22</td>
<td>3T534</td>
<td>Grainger</td>
</tr>
<tr>
<td>Hendrickson® HP</td>
<td>3T534</td>
<td>Grainger</td>
</tr>
<tr>
<td>Hendrickson® TP</td>
<td>3T534</td>
<td>Grainger</td>
</tr>
<tr>
<td>Holland Propar®</td>
<td>3T534</td>
<td>Grainger</td>
</tr>
<tr>
<td>Meritor™ TP/TB/WP</td>
<td>3T534</td>
<td>Grainger</td>
</tr>
</tbody>
</table>

Table 3: Axle Press Plug Drive Adapters

<table>
<thead>
<tr>
<th>Adapter</th>
<th>Part Numbers</th>
<th>Supplier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holland Propar®</td>
<td>51011-01</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Dana®/Eaton® D22</td>
<td>51011-02</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Hendrickson® HN</td>
<td>51011-02</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Meritor™ TN/TQ/TK</td>
<td>51011-02</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Sudisa® 12R</td>
<td>51011-03</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Sudisa® 11M</td>
<td>51011-04</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Holland Trade®</td>
<td>51011-05</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Hendrickson® TP</td>
<td>51011-06</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Meritor™ TP/TB</td>
<td>51011-06</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Meritor™ WP</td>
<td>51011-07</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Ingersoll® F-22</td>
<td>51011-08</td>
<td>P.S.I.™</td>
</tr>
<tr>
<td>Sudisa® 9M</td>
<td>51011-09</td>
<td>P.S.I.™</td>
</tr>
</tbody>
</table>
### Adapter Part Numbers Supplier

<table>
<thead>
<tr>
<th>Adapter</th>
<th>Part Numbers</th>
<th>Supplier</th>
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<td>AXN-Parallel</td>
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### Table 4: Specialty Tools and Supplies

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<tr>
<th>Nomenclature</th>
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<td>Control Box Test Gauge</td>
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<td>Axle Press Plug Remover</td>
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<td>3T564</td>
<td>Grainger</td>
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<td>Straight Die Grinder</td>
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