Quick Reference Guide
First become familiar with the information on pages 4 through 10, then refer to the following pages for installation instructions on suspensions with:

- TIREMAAX™-prepped, DRESSED axles  
  - pages 19 through 28

- TIREMAAX™-prepped, UNDRESSED axles  
  - pages 14 through 28

- All other axles  
  - pages 10 through 28
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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 machine 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™ tire inflation system. The manual provides the following information:
- General Information
- Operation
- Components
- Installation
- Service
- Troubleshooting
- Glossary

SYSTEM OVERVIEW
The TIREMAAX 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 to function properly, the trailer air tank pressure must be higher than the target tire pressure. TIREMAAX 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 remain non-pressurized when the system is not actively checking or inflating the tires. A trailer mounted warning lamp will turn on when one or more tire pressure(s) is low by 10 psi or more, or when a system problem occurs (when the trailer mounted warning lamp comes on, additional troubleshooting information can be obtained through blink codes flashed by the LED on the TIREMAAX controller assembly. Refer to the Blink Code Descriptions section on page 29 for more troubleshooting details). The trailer mounted warning lamp will not turn on for minimal inflation requirements of less than 10 psi, to help 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
- Warning lamp on when tires 10 psi (or more) low
- Checks tire pressure every 10 minutes
- Non-pressurized lines and seals when not inflating
- Warning lamp on only when service is required (not every inflation)
- 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 solenoid helps keep lines and seals clean
- Factory programmed to one of 13 possible target pressures (70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125 or 130 psi) selected by the customer. An optional hand-held programming device is available to program a target pressure other than the factory preset value.
- 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 130 psi
- Pressure accuracy: ±1%
- Pressure resolution: 0.5 psi
- Pressure check interval: 10 minutes
- Power requirement (at 12VDC): <20 mA idle
  1.3 A inflating
- Minimum operating voltage: 9 volts
- Warning lamp current range: 50mA to 1A
- Inflate capacity (one tire): 10 psi in approx. two minutes

COMPONENT WEIGHTS
- Controller assembly: 3 lbs.
- Wheel-end hardware: 1.5 lbs. per end
- Misc. fittings and air line: 2.0 lbs.
- Wire harness: 1 oz.
OPERATION

SYSTEM OPERATION
To ensure that the system is functioning, the operator should verify that a two-blink warning lamp bulb check occurs (one second on, one second off, one second on, then off) when the unit is powered. The system is powered from the “blue circuit” on the seven-pin trailer connector. After the warning lamp bulb check is finished, the LED on the TIREMAAX™ controller assembly (see figure 27 for LED location) flashes a code representing the present target pressure setting. The codes are as follows:

1 blink = 70 psi
2 blinks = 75 psi
3 blinks = 80 psi
4 blinks = 85 psi
5 blinks = 90 psi
6 blinks = 95 psi
7 blinks = 100 psi
8 blinks = 105 psi
9 blinks = 110 psi
10 blinks = 115 psi
11 blinks = 120 psi
12 blinks = 125 psi
13 blinks = 130 psi

After the target pressure setting code has flashed, the LED turns off for approximately six seconds to indicate the end of the code sequence, then comes back on and remains on constantly to indicate adequate electrical power to the controller assembly.

Once powered, the system will then pressurize the lines and measure tire pressure. If one or more tires are low, the system automatically inflates 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 by 10 psi or more, the warning lamp will turn on and remain on until the tire(s) are reinflated to within 10 psi of target pressure.

Once the tires are at the proper pressure, the seals and air lines will be depressurized, preventing unnecessary wear on the seals. The system rechecks tire pressure every 10 minutes by momentarily pressurizing the lines and measuring tire pressure as described above.

If the warning lamp remains on, 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.

⚠️ CAUTION: All hoses must be connected for the system to operate properly. If any of the hoses are removed or damaged, the system cannot inflate any low tire(s).

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, however, experience air flow at the open line and a low tire indication on the warning lamp if the tire hose is disconnected and the system is powered and attempts to check tire pressures.

To manually check tire pressure (figure 1):
- Turn vehicle off
- Disconnect tire hose from tee at hubcap, or from valve stem.
- Use a conventional gage to measure tire pressure at hose end or at valve stem.
- Reattach and firmly hand-tighten tire hose.

⚠️ CAUTION: Do not overtighten tire hose or the internal tire hose seal may be damaged. Ensure tire hoses are not stretched or rubbing on the wheel.

WARNING LAMP DESCRIPTION

TWO BLINKS AT POWER-UP
When +12 VDC power is applied, the warning lamp (figure 2) will blink two times (one second on, one second off, one second on, then off) as a system verification and warning lamp bulb check. If the warning lamp does not blink two times at power-up, the warning lamp bulb may be burned out or the system may not be functioning. Verify proper power is applied to the system.
NOTE: The TIREMAAX™ system utilizes the trailer’s blue circuit for power. Some early model tractors do not power this circuit, resulting in no power to the system.

LAMP ON CONTINUOUSLY
The lamp will illuminate if the measured pressure of one or more tires is 10 psi or more below the target pressure setting. The lamp will remain on until the tires are reinflated to within 10 psi of the target pressure setting. If the lamp remains on for an extended period of time, the operator should stop the vehicle and check the tires for damage.

Under some normal operating conditions, you may find that the warning lamp 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 10 psi of the target pressure, thus illuminating the lamp. Refer to the Appendix (figure 52) for examples of temperature effects on tire pressure.

In addition, the lamp may turn on and remain on due to a significant air line leak or to the system failing to depressurize.

HOW THE SYSTEM OPERATES
The system checks the tire pressures at 10-minute intervals. To measure the tire pressure, the system charges the air lines with a series of pulses. If the line pressure has not increased to the target tire pressure after a specified period of time, the system will begin to inflate the low tire(s). If the measured tire pressure is 10 psi or more below the target tire pressure, the warning lamp 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 performs an additional check to verify that the control lines have depressurized.

To prevent air from leaking while the control lines are not pressurized, a check valve (springless valve core) is used in each of the tire hoses.

If the warning lamp remains lit for an extended period of time, the driver should check all the tires for damage and take corrective actions if applicable.
COMPONENTS

COMPONENT DESCRIPTION
Refer to figure 3 for major TIREMAAX™ component illustrations. Refer to figures 18 through 22 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
- Integral check valves in the tire hoses allow the air lines and seals to remain non-pressurized when the system is not checking or inflating the tires
- 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
- Provides a vent for air pressure in the hubcap during normal use and in the event of rotary joint damage
- Under normal operation, the rotary joint will be non-pressurized for the majority of the time

CONTROLER ASSEMBLY
- Mounting bracket
- Solenoid valves
  - control the flow of air to the tires
  - supply pressure solenoid valve has a serviceable inlet filter to reduce contamination from the air source
- Pressure sensors
  - read tire pressure
  - read supply pressure (serves as a redundant function check to verify sensor operation)
- ECU

ELECTRONIC CONTROL UNIT (ECU)
- Uses input from pressure sensors to control the solenoid valves, thus maintaining tire pressure
- Performs a lamp check to inform the driver that the system is powered and operational
- Turns on the warning lamp when the measured tire pressure drops more than 10 psi below the target pressure
- Detects faults and displays service codes via the LED on the controller assembly
- Provides diagnostic support via blink codes
- Allows the target tire pressure to be reprogrammed using an optional, hand-held programming device
Figure 3. TIREMAAX™ components

NOTE: Refer to figures 18 through 22 for descriptions of air fittings and hoses.
INSTALLATION

INSTALLATION MATERIALS AND SUPPLIES
In addition to the hardware provided, the installer shall provide the following:

- Hubcap* (unless pre-installed on dressed axle)
- Spindle plug driver and handle* (figure 9), unless the spindle plugs are already installed in the axle from the factory
- Air lines and fittings (figures 18-22)
- Warning lamp and wire (figure 17)
- Optional hand-held programming device* to set target tire pressure (if a target tire pressure other than the preset value is desired)
- Controller assembly mounting bolts (figure 16)
- A regulated air supply at or below the target tire pressure (to pressurize the system for leak checks)
- An air chuck with a ¼-inch push-to-connect fitting (conveniently attaches to the exhaust tube on the controller, used to pressurize the system for leak checks)

*Components unique to TIREMAAX, available only from Hendrickson

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

- If the TIREMAAX™ system hardware is already installed on a dressed axle, skip to the section titled Controller Assembly Installation on page 19.
- If the TIREMAAX system axle hose and spindle plugs are already installed on the axle, skip to the section titled Rotary Joint Installation on page 16.
- If the axles have been pre-drilled but no hardware has been installed, skip to the section titled Component Installation on page 12.
- For retrofit installations, start with the procedures described below.

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

NOTE: The TIREMAAX 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 system.
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.

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. Locate the three ¼-inch pipe plugs in the axle wrap windows and remove. If the axle does not have the three ¼-inch pipe thread holes in the axle wrap windows, proceed to step 11.

10. Proceed to the Component Installation section.

11. Using the information in figure 6, drill and tap three ¼-inch NPT holes in the axle wrap windows to prepare for component installation.

**Figure 6. Hendrickson axle drilling details**

**IMPORTANT:** The edge of any hole must be a minimum of ½ inch away from the edge of the fillet weld that surrounds the wrap window.

**NOTE:** One wrap window will have two holes (the second hole accommodates an axle vent assembly). These holes must be within the approved drilling area but spaced far enough apart to allow 90-degree elbow fittings to be threaded into them.
NOTE: In most cases, it will be necessary to remove the slack adjuster and camshaft to gain access to the approved drilling area. Refer to Hendrickson publication L496, INTRAAX® 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.

12. Proceed to the Component Installation section.

COMPONENT INSTALLATION
Refer to the following assembly procedures to complete the installation of the TIREMAAX™ tire inflation system. Component installation procedures include:
- Axle hose installation
- 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
- In-axle filter installation
AXLE HOSE INSTALLATION

1. On the end of the axle tube with two ¼-inch holes in the wrap window, route the small covered end of the metal braided hose into the hole closest to the spindle end (figure 7).

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.

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 8).

4. 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 8).

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 8) vacant for now. This hole will be used to accommodate the axle vent in a later 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 9).

2. With the spindle plug breather hole oriented toward the pivot bushing (figure 9), place the plug assembly against the spindle end.

3. Route the braided hose through the slot in 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.

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

**HUB INSTALLATION REQUIREMENTS**

A minimum hub bore depth is required when installing the TIREMAAX™ system (figure 10a). This hub requirement helps keep the proper clearance between the rotary joint assembly and the spindle nut system (figure 10b), thus preventing contact or interference between these parts which could result in wheel-end failure.

Any hub may be used with the TIREMAAX system, provided a minimum hub bore depth requirement (dimension “A” in figure 11) is maintained.

If the hub bore dimension is greater than or equal to the dimension shown in the chart in figure 11, you may use the hub “as is” with the TIREMAAX system.

If the hub bore dimension is less than the dimension shown in the chart in figure 11, you may still use the hub with the TIREMAAX system, but a Hendrickson hubcap spacer kit is required.
Figure 10. TIREMAAX™ hub requirement

Figure 11. Minimum hub bore depth

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

<table>
<thead>
<tr>
<th>SPINDLE NUT SYSTEM</th>
<th>SPINDLE TYPE</th>
<th>&quot;A&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard three-piece</td>
<td>HN</td>
<td>1.52&quot;</td>
</tr>
<tr>
<td>Stemco PRO-TORQ one-piece</td>
<td>HP</td>
<td>1.44&quot;</td>
</tr>
<tr>
<td></td>
<td>HN</td>
<td>1.69&quot;</td>
</tr>
<tr>
<td></td>
<td>HP</td>
<td>1.87&quot;</td>
</tr>
</tbody>
</table>
Hendrickson offers hubcap spacer kits for HN and HP spindles to accommodate most hubs without the required bore dimension. Each kit consists of \( \frac{3}{8} \)-inch spacers, gaskets, hubcap bolts and lock washers in quantities to adapt one axle. The hubcap spacer kit part numbers are:

<table>
<thead>
<tr>
<th>SPINDLE TYPE</th>
<th>HUBCAP SPACER KIT PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>HN</td>
<td>S-28040</td>
</tr>
<tr>
<td>HP</td>
<td>S-28093</td>
</tr>
</tbody>
</table>

**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 12.

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.

1. On one end of the axle, place the stepless ear clamp onto the braided hose assembly sticking out of the spindle plug (figure 13).

2. Slide the barbed end of the rotary joint assembly into the end of the braided hose assembly until the hose bottoms on the rotary joint body.

3. Position the clamp over the barbed end of the rotary joint assembly. Using a crimping tool (Oetiker® pliers), squeeze the clamp to tighten the hose to the rotary joint.

4. Insert the three T20 Torx fasteners into the rotary joint assembly and fasten to the spindle plug (figure 13). Tighten the fasteners to 45 ±5 in. lbs. (5 ±½ N•m) of torque.

5. 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.

6. Repeat steps one through five on the other side of the axle.

*Figure 12. Hubcap spacer kit installation*
Figure 13. Rotary joint installation

Figure 14. Completed installation of rotary joint assembly
**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”. Align the flat on the bulkhead adapter with the anti-rotation flat in the hubcap (figure 15). 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.

**NOTE:** If wheels are installed, refer to figure 23 to determine the correct “clocking” of the hubcap.

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

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.
CONTROLLER ASSEMBLY INSTALLATION

On Hendrickson K-2® slider box suspensions, mounting holes for the controller assembly are already provided on the forward cross member (figure 16). On other suspensions without mounting holes, a location must be selected and holes drilled to mount the controller assembly.

1. Pick a mounting location for the controller assembly so that it can be conveniently connected to the trailer air tank. Rigidly mount (no rubber insulator) the controller in a location that is accessible and free of hazards. For example, inboard of the trailer frame rails and away from the tires.

2. Drill two holes on 2¼-inch centers to accommodate the mounting bracket. Attach the controller assembly with two 3/8-inch fasteners (figure 16). Orient the controller so that it is protected within the cross member and the ECU points rearward (figure 16).

⚠️ CAUTION: The controller assembly must be mounted vertically with the solenoid vent tube pointing down (figure 16). This properly orients the exhaust port to prevent damage.

⚠️ CAUTION: Do not weld on the controller assembly mounting bracket without first removing the ECU and solenoid valves from the bracket. Refer to the Service Procedures section beginning on page 40 for ECU and solenoid valve removal instructions.

⚠️ CAUTION: Cover controller assembly prior to painting or undercoating the trailer to prevent plugging of pressure sensors and ECU ports.

WIRING HARNESS INSTALLATION

TIREMAAX™ comes standard with a three-wire, 18-inch long harness (figure 17). The red wire of this harness is the warning lamp power lead. The white wire must be connected to vehicle ground (the
ground return system is recommended) and 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, 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 TIREMAAX wiring harness:

1. **Standard harness** - Connect the blue wire to vehicle power and the white wire to vehicle ground (the ground return system is recommended).

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

3. Connect the other end of the harness to the ECU.

4. Mount the warning lamp on the front corner or side of the trailer within view of the operators side view mirror. On tractor applications with large wind fairings, locating the warning lamp near the left rear wheels (near the ABS warning lamp) may be preferable. Connect one side of the warning lamp to ground (the ground return system is recommended).

5. Route the warning lamp power wire (16 AWG minimum) and connect it to the red wire on the TIREMAAX harness.

6. Secure harness and wires as required.

---

**Figure 17. Trailer wiring harness installation**
**AXLE VENT INSTALLATION**

1. Install a 90 degree, ¼-inch NPT male to ⅜-inch nylon tubing adapter in the remaining ¼-inch threaded hole in the axle tube (figure 18).

2. Loop the ⅜-inch outside diameter coiled air brake tubing around the axle but inside the suspension beam. If not already installed, attach the duck bill check valve to the tubing making sure the end points down to prevent contamination (figure 18). To attach the duck bill check valve, put a small quantity of silicone glue on the tubing and slide the duck bill check valve onto the tubing. Ensure that the glue does not plug the duck bill check valve.

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

⚠ **CAUTION:** Failure to properly install axle vent may result in wheel-end pressurization and/or water ingestion which could cause wheel-end failure.

**CONTROL LINE INSTALLATION**

Proper TIREMAAX™ operation requires correct air line diameters and lengths. The following diagrams (figures 19-22) 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 operation requires correct air line diameters and lengths. Installation sizes and lengths must be within limits shown.

⚠ **CAUTION:** Proper TIREMAAX operation requires correct air line connections. All junctions of two or more ¼-inch lines must increase to ⅜-inch line for adequate air flow.

⚠ **CAUTION:** To prevent TIREMAAX 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 19-22). Extend the main ⅜-inch run as necessary. However, all total line lengths must still remain within the limits listed in the diagrams.
Loop hose under suspension beam as shown

**Top Mount, Narrow Bushing Models (HKANT, AANT)**

Route control line through hole in suspension beam

Grommet

Route control line through hole in suspension beam

**Top Mount, Wide Bushing Models (AAT, AAEDT, HKAT)**

Loop hose under suspension beam as shown

**Low Ride, Wide Bushing, Standard Duty (AAL 23K, AAL 25K, AAL 30K); Low Ride, Wide Bushing, Extreme Duty (AAEDL 30K); and Top Mount, Wide Bushing, Extreme Duty (AAEDT 30K) Models**

Route control line through hole in suspension beam

**Low Ride, Short Beam, Narrow Bushing Models (AANLS 20K)**

Route control line through hole in suspension beam

Grommet

Figure 19. Control line installation details
**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 ¼-inch OD nylon air brake tubing; 30 to 50 feet total system length |
D | Axle connector 90-degree elbow, ¼-inch NPT male to ¼-inch NTA |
E | Axle hose fitting ½-inch NPT female |
F | Controller IN fitting ½-inch NPT male to ½-inch NTA |
G | Controller OUT fitting run tee: ½-inch NPT male, ½-inch NTA, ½-inch NTA |
H | Tee assembly ¼-inch NPT union tee, two ¼-inch NTA fittings and one ½-inch NTA fitting (four total fittings) |
I | Axle vent fitting 90-degree elbow, ¼-inch NPT male to ½-inch NTA |
J | Air line ½-inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end required; 70 psi minimum closing pressure; existing suspension valve can be used run tee: ¼-inch NPT male, ½-inch NTA, ½-inch NTA |
K | Pressure protection valve |
L | PPV OUT fitting |

NTA = nylon tubing adapter

*Figure 20. Typical TIREMAAX™ plumbing schematic — two axles with ½-inch and ¼-inch lines*
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 1/8-inch NPT male to 3/8-inch NTA

F Reservoir 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 Reservoir 10 to 20 cubic inch capacity; Hendrickson part number A-22357

J Bushing ½-inch NPT male to ¼-inch NPT

K Fitting 1/8-inch NPT male to 3/8-inch NTA

L Air line 3/8-inch OD nylon air brake tubing; two feet maximum length

M Pressure protection valve required; 70 psi minimum closing pressure; existing suspension valve can be used

N PPV OUT fitting run tee: ¼-inch NPT male, 3/8-inch NTA, 3/8-inch NTA

Figure 21. Typical TIREMAAX™ plumbing schematic — single axle with ¼- or 3/8-inch lines
### Item Description

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Air line ¾-inch OD nylon air brake tubing; any length</td>
</tr>
<tr>
<td>B</td>
<td>Air line ⅛-inch OD nylon air brake tubing; up to 15 feet total system length</td>
</tr>
<tr>
<td>C</td>
<td>Air line ¼-inch OD nylon air brake tubing; 30 to 50 feet total system length</td>
</tr>
<tr>
<td>D</td>
<td>Axle connector 90-degree elbow, ⅛-inch NPT male to ¼-inch NTA</td>
</tr>
<tr>
<td>E</td>
<td>Axle hose fitting ⅛-inch NPT female</td>
</tr>
<tr>
<td>F</td>
<td>Controller IN fitting ⅛-inch NPT male to ⅛-inch NTA</td>
</tr>
<tr>
<td>G</td>
<td>Controller OUT fitting ⅛-inch NPT male to ⅛-inch NTA</td>
</tr>
<tr>
<td>H</td>
<td>Junction manifold ⅛-inch NTA inlet, ¼-inch NTA outlets</td>
</tr>
<tr>
<td>I</td>
<td>Axle vent fitting 90-degree elbow, ¼-inch NPT male to ⅛-inch NTA</td>
</tr>
<tr>
<td>J</td>
<td>Air line ⅛-inch OD nylon air brake tubing; one loop around axle with duck bill check valve on end</td>
</tr>
<tr>
<td>K</td>
<td>Pressure protection valve required; 70 psi minimum closing pressure; existing suspension valve can be used</td>
</tr>
<tr>
<td>L</td>
<td>PPV OUT fitting run tee; ¼-inch NPT male, ⅛-inch NTA, ⅛-inch NTA</td>
</tr>
</tbody>
</table>

**NTA = nylon tubing adapter**

---

*Figure 22. Typical TIREMAAX™ plumbing schematic — two axles with ⅛-inch and ¼-inch lines and junction manifold*
NOTE: All junctions of two or more ¼-inch lines must increase to ½-inch line to maintain adequate air flow.

TIRE HOSE INSTALLATION
1. Position the hubcap and wheel so the hoses will not stretch or rub on the wheel. Refer to figure 23 and the table on this page.

⚠️ CAUTION: For dual wheel configurations, the wheel must be properly “clocked” to the hubcap to prevent the hoses from rubbing on the wheel (figure 23). Failure to do so may result in hose failure.

2. Apply a small amount of thread sealant to the tee fitting swivel threads and screw the tee fitting onto the rotary joint bulkhead adapter. Tighten finger tight then use a wrench to tighten an additional one-half turn (figure 23).

3. Attach tire hose and check valve assemblies to the tee fitting and tighten finger tight. For super single configurations, apply a small amount of thread sealant to the tee fitting cap and screw the cap on the unused side of the tee fitting (figure 24).

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

⚠️ CAUTION: DO NOT use a wrench or pliers to tighten the tire hose to the valve stem or tee fitting. Doing so may damage the internal gasket, causing a leak or decreased performance. Both ends of each tire hose must be finger tightened only.

<table>
<thead>
<tr>
<th>Wheel Size</th>
<th>Hole Configuration</th>
<th>Tire Position Clocking</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5&quot;</td>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>19.5&quot;</td>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>22.5&quot;</td>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>24.5&quot;</td>
<td>2</td>
<td>C</td>
</tr>
<tr>
<td>Super single 22.5&quot;</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Figure 23. Tee and tire hose installation - dual wheel configuration
5. Attach the tee fitting guard. Remove the two hub cap bolts closest to the rotary joint bulkhead adapter, place the tee fitting guard over the rotary joint bulkhead adapter and reinstall the hub cap 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.

**LABEL LOCATION**
1. Install warning lamp status decal L861 at the front of the trailer near the warning lamp (figure 25).

---

**TIREMAAX™ TIRE INFLATION SYSTEM**

This unit is equipped with the TIREMAAX™ tire inflation system. When power is applied, the warning lamp will blink two times as a system verification and warning lamp bulb check. If the lamp remains on continuously, one or more tires may be low by 10 psi or more or the system requires service.

For complete service details, refer to Hendrickson publication L818, TIREMAAX Installation, Service and Troubleshooting Procedures, or call the Hendrickson technical service department at 800-455-0043 in the United States or 800-668-5360 in Canada.
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 manually pressurizing the system from a shop air supply and applying soapy water to all air connections. A hissing sound or bubbles in the soapy water will provide audio and visual indications of air leaks.

The TIREMAAX™ system can be manually pressurized without applying electrical power. An air chuck with a ¼-inch push-to-connect fitting can be attached to the vent tube on the delivery solenoid valve, conveniently allowing shop air to pressurize the system. The push-to-connect fitting also has the added benefit of being easy to install and remove from the vent tube. Manually pressurize the TIREMAAX system as follows:

1. Connect an air chuck with a ¼-inch push-to-connect fitting to the vent tube on the delivery solenoid valve (figure 26).
2. Connect a regulated shop air supply to the air chuck. Regulate the air supply pressure so it is at or below the desired target pressure.

The shop air supply provides a constant source of air pressure to the system, overriding the 10 minute pressure check intervals provided by the controller assembly. This allows one person to thoroughly check all air-fitting connections for leaks.

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).

⚠️ CAUTION: Potential overinflation hazard. When performing the system integrity check, the shop air supply MUST NOT be higher than the target pressure setting.

If the shop air supply is higher, the tires will overinflate during the system integrity check. No method exists to exhaust the overinflated tires, other than disconnecting the tire hoses and manually depressing the valve stem core at each tire.
SYSTEM SETUP
The TIREMAAX™ controller is pre-programmed from the factory, therefore no additional setup is required. To program a pressure other than the factory setting, use the optional hand-held programming device (available from Hendrickson) and follow the instructions beginning on page 31.

NOTE: For TIREMAAX to function properly, the trailer air tank pressure must be higher than the target tire pressure. TIREMAAX 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 certain fault conditions and reports them by illuminating the trailer mounted warning lamp. The operator is informed whenever a tire is low enough to require service (10 psi or more) or there is a fault in the system. When the warning lamp is on, additional troubleshooting information can be obtained through blink-codes flashed by the LED on the controller assembly ECU (figure 27). The blink codes are only displayed while the controller is powered and the control program is active. If the cause of a fault has been satisfactorily corrected, the controller will recognize the correction on the next reset cycle (10 minutes later in most cases) and turn off the warning lamp. If the system had been powered down to correct an issue, the controller will not show a fault when powered back up unless it finds the same fault again or a different fault.

The last six faults are stored in memory and can be displayed with the optional hand-held programming device. No more than six faults are stored. If more than six faults occur, the newest fault simply overwrites the oldest.

BLINK-CODE DESCRIPTIONS
Blink codes provide a means to determine what possible faults exist without using any special tools. The following troubleshooting chart gives the LED blink code, the associated trailer mounted warning lamp response, a general description and possible causes and issues associated with the blink code.

Figure 27. Location of LED on controller assembly ECU
## TIREMAAX™ LED Blink Codes

<table>
<thead>
<tr>
<th>LED</th>
<th>Warning Lamp</th>
<th>Description</th>
<th>Possible Cause and Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off</td>
<td>Off</td>
<td>No system power</td>
<td>Low battery, disconnected wire or no trailer power.</td>
</tr>
<tr>
<td>Constantly on</td>
<td>Off</td>
<td>System OK</td>
<td>Functioning normally. Adequate electrical power to controller. No tire less than 10 psi below target value.</td>
</tr>
<tr>
<td>1 blink</td>
<td>On</td>
<td>Tire 10 psi low</td>
<td>One or more tires are more than 10 psi below target value. Possible significant leak. Check all tires before system attempts to inflate tires. Could be leaky tire hose fitting, leaky tire hose check valve, fire puncture, corroded tire bead seat, significant temperature drop or trailer has been idle for extended period of time.</td>
</tr>
<tr>
<td>2 blinks</td>
<td>On</td>
<td>Check valve leak</td>
<td>Tire hose check valve not seated. Contamination is preventing the check valve from seating and system is unable to reseat check valve. <strong>System is powering the delivery solenoid valve to seal the exhaust vent, keeping the rotary union pressurized. Tire will deflate when electrical power is turned off.</strong> A less likely possibility is a leaking supply solenoid valve.</td>
</tr>
<tr>
<td>3 blinks</td>
<td>On</td>
<td>Line/tire leak</td>
<td>Air line is leaking between controller and tire hoses (program unable to enter tire pressure check and fill mode). Other possibilities are ruptured air line, tire off rim, ruptured tire hose, loose air fittings, no delivery pressure sensor signal or separated rotary union.</td>
</tr>
<tr>
<td>4 blinks</td>
<td>Off</td>
<td>No pressure signal/low trailer air tank</td>
<td>Low or no trailer air tank pressure, supply pressure sensor failed at 0 psi or supply pressure sensor not receiving power. Trailer air tank pressure lower than target tire pressure. Trailer just hooked up, weak compressor or target tire pressure higher than air system capability. Pressure protection valve may not be functioning properly.</td>
</tr>
<tr>
<td>5 blinks</td>
<td>On</td>
<td>Solenoid/pressure sensor malfunction</td>
<td>Supply or delivery pressure sensor or supply or delivery solenoid valve not responding. Loose, damaged or corroded connectors or wires. Welding possibly occurred on trailer without first disconnecting the system or establishing proper ground.</td>
</tr>
</tbody>
</table>
HAND-HELD PROGRAMMING DEVICE OPERATION

INTRODUCTION
The optional hand-held programming device is used to:
- Program a target pressure setting other than the factory preset value
- Run diagnostics
- Display fault code history

NOTE: The hand-held programming device is not required to identify the fault that caused the trailer mounted warning lamp to illuminate. Before power is removed from the trailer, the LED on the controller assembly will blink a code associated with the fault that caused the warning lamp to illuminate (refer to the blink code descriptions on page 30 for more details). However if the blink code was not observed before power was removed from the trailer, the hand-held programming device will be needed to reveal the last fault code stored before power was removed.

To use the hand-held programming device for any of these tasks, it must first be connected to the TIREMAAX™ controller assembly, between the pressure sensors and the ECU. When connected, the hand-held programming device will be powered from the trailer power circuit and is ready for use. No additional power supplies or on/off switches are required to use the hand-held programming device.

Use the following procedure to connect the hand-held programming device to the controller assembly.

IMPORTANT: Do not vary the connection order from what is presented in the following steps. The last connection made must be the four-pin trailer power cable into the hand-held programming device.

HAND-HELD PROGRAMMING DEVICE CONNECT PROCEDURE
1. Power the trailer.

The hand-held programming device derives power from the trailer, so the trailer must be powered for the hand-held programming device to function.

NOTE: Do not plug the four-pin trailer power cable into the hand held programming device at this time. This connection must be the last one made in order for the hand-held programming device to properly enter the target pressure setting mode.

2. Pressurize the trailer air tank (optional).

If you wish to run the diagnostics to functionally check the solenoid valves and pressure sensors, the trailer must have enough air pressure (90 psi) to open the pressure protection valve on the trailer air tank. If you do not wish to run the diagnostics, this step can be skipped.

⚠️ CAUTION: Potential overinflation hazard. When performing diagnostics, the trailer air tank pressure MUST NOT be higher than the target pressure setting.

If the trailer air tank pressure is higher, the tires will overinflate when both supply and delivery solenoid valves are opened at the same time. No method exists to exhaust the overinflated tires, other than disconnecting the tire hoses and manually depressing the valve stem core at each tire.
3. Unplug the four-pin trailer power cable from the controller assembly ECU (figure 28).

NOTE: To unplug the connectors, insert the tip of a small flat blade screwdriver into the slot on the connector tab and GENTLY push down on the screwdriver to disengage the tab from the interlocking pin (figures 29 and 30). With the tab disengaged, gently pull the connector apart (figure 30). DO NOT overbend the tab. Even though the connector is made of a resilient plastic, it is possible to damage the connector if excessive force is used.

4. Unplug the six-pin sensor cable from the controller assembly ECU (figure 28).

5. Plug the four-pin connector from the hand-held programming device into the open four-pin socket on the controller assembly ECU (connection A, figure 31, the four-pin socket next to the LED).

6. Plug the six-pin connector from the hand-held programming device into the open six-pin socket on the controller assembly ECU (connection B, figure 31).

7. Plug the six-pin sensor cable from the controller assembly into the six-pin socket on the hand-held programming device (connection C, figure 31).

8. Plug the four-pin trailer power cable into the four-pin socket on the hand-held programming device (connection D, figure 31).
Figure 31. Connecting the hand-held programming device to the controller assembly ECU
When connected as described, the hand-held programming device will automatically enter the tire pressure setting mode. The tire pressure setting mode displays the present target pressure setting in the upper right corner of the display (figure 32).

If you don’t see this screen on the hand-held programming device, unplug everything and reconnect the hand-held programming device in the order previously described. Make sure the last connection made is the four-pin trailer power cable to the hand-held programming device.

The hand-held programming device has three operational modes:
- target pressure setting mode
- diagnostic test mode
- fault code history mode

The target pressure setting mode is always the first mode entered when the hand-held programming device is powered. To navigate to the other operational modes, use the TEST button, BACK FAULTS or FWD FAULTS arrows, and the +PSI or -PSI arrows as shown in figure 33.

**TARGET PRESSURE SETTING**

The target pressure setting mode is used to program a different tire pressure setting into the TIREMAAX™ controller.

**NOTE:** For TIREMAAX to function properly, the trailer air tank pressure must be higher than the target tire pressure. TIREMAAX 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.

When the target pressure setting mode is entered, the display shows the present target pressure setting (figure 32). This screen provides a visual indication that you are in the target pressure setting mode.

1. To select a different pressure setting:

   Press the +PSI arrow on the direction pad to increase the target pressure setting or the -PSI arrow on the direction pad to decrease the target pressure setting (figure 34).

   Each time the +PSI or -PSI arrow is pressed, the target pressure setting is raised or lowered by five psi and the display shows the newly selected pressure setting (figure 34). Possible target pressure settings are 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125 and 130.
2. Press the TEST button to cancel or reset the new target pressure setting. The lower right corner of the display will clear and the upper right corner of the display will revert to the present (or saved) target pressure setting (the same pressure setting that was in effect when the target pressure setting mode was first entered).

In the target pressure setting mode, before the CH/SAVE button is pressed, one press of the TEST button, BACK FAULTS or FWD FAULTS arrow acts as a “reset” or “do over” function. A second press of the TEST button changes focus to the diagnostic mode, and a second press of the BACK FAULTS or FWD FAULTS arrow changes focus to the fault code history mode.

3. Press the CH/SAVE (change/save) button to save the new target pressure setting (figure 35).

The display will show the newly selected pressure setting in the upper right corner of the display as the present target pressure setting.

4. Disconnect the hand-held programming device or go to one of the other operational modes.

If you wish to disconnect the hand-held programming device, refer to the disconnect procedure on page 39 (the four-pin trailer power cable must be the first one disconnected from the hand-held programming device and the last one connected to the controller assembly ECU).

If you wish to go to the diagnostic test mode, press the TEST button.

If you wish to go to the fault code history mode, press either the BACK FAULTS or FWD FAULTS arrow on the direction pad.
DIAGNOSTIC TEST OPERATION

The diagnostic test mode can be used to toggle the trailer mounted warning lamp and controller assembly LED, the delivery solenoid valve and the supply solenoid valve on and off to see if these components respond properly. The diagnostic test mode also displays delivery and supply pressure sensor outputs in psi.

NOTE: Temporarily disconnect (unscrew) a wheel hose at the tee fitting on the wheel after entering the diagnostic test mode. This will prevent inadvertent tire overinflation during solenoid valve response testing when both supply and delivery solenoids are opened at the same time.

When the diagnostic test mode is entered, the display shows the supply and delivery pressure sensor outputs and the current state of the trailer mounted warning lamp (figure 36). This screen provides a visual indication that you are in the diagnostic test mode.

1. To test the trailer mounted warning lamp and controller assembly LED response:

   Figure 36. Initial diagnostic test mode display

   ![Figure 36. Initial diagnostic test mode display](image)

   Display toggles with each press of the CH/SAVE button

   Toggles warning lamp

   Figure 37. Testing the trailer mounted warning lamp and controller assembly LED response

   Press the CH/SAVE (change/save) button to toggle the trailer mounted warning lamp and LED from off to on (figure 37). Press the CH/SAVE button again to toggle from on to off.

   The trailer mounted warning lamp and controller assembly LED will remain in the last state chosen (either on or off) when the diagnostic focus is changed in the next step.

   Figure 38. Testing the supply solenoid valve (SUP) response

   ![Figure 38. Testing the supply solenoid valve (SUP) response](image)

   Display toggles with each press of the CH/SAVE button

   Toggles supply solenoid valve (SUP) on or off

   1. Shifts focus to supply solenoid (SUP)
   2. Toggles supply solenoid valve (SUP) on or off
2. To test the supply solenoid valve response, press the TEST button (figure 38). The diagnostic focus shifts from the warning lamp to the supply solenoid valve.

Press the CH/SAVE (change/save) button to toggle the supply solenoid valve from off to on. Press the CH/SAVE button again to toggle the valve from on to off (figure 38).

**CAUTION:** Potential overinflation hazard. When performing diagnostics, the trailer air tank pressure MUST NOT be higher than the target pressure setting.

If the trailer air tank pressure is higher, the tires will overinflate when both supply and delivery solenoid valves are opened at the same time. No method exists to exhaust the overinflated tires, other than disconnecting the tire hoses and manually depressing the valve stem core at each tire.

The supply solenoid valve will remain in the last state chosen (either on or off) when the diagnostic focus is changed in the next step.

3. To test the delivery solenoid valve response, press the TEST button (figure 39). The diagnostic focus shifts from the supply solenoid valve to the delivery solenoid valve.

Press the CH/SAVE button to toggle the delivery solenoid valve from off to on. Press the CH/SAVE button again to toggle the valve from on to off (figure 39).

The delivery solenoid valve will remain in the last state chosen (either on or off) when shifting to another mode of operation.

When warning lamp and solenoid valve response testing is complete, set all responses to the OFF state and reconnect the wheel hose at the tee fitting.

4. Disconnect the hand-held programming device or go to one of the other operational modes.

If you wish to disconnect the hand-held programming device, refer to the disconnect procedure on page 39 (the four-pin trailer power cable must be the first one disconnected from the hand-held programming device and the last one connected to the controller assembly ECU).

If you wish to go to the target pressure setting mode, press the +PSI or -PSI arrow on the direction pad.

If you wish to go to the fault code history mode, press the BACK FAULTS or FWD FAULTS arrow on the direction pad.
FAULT CODE HISTORY OPERATION

The fault code history mode is used to review fault codes that have been stored in the TIREMAAX™ controller.

When the fault code history mode is entered, the display will show the last recorded fault (figure 40). This screen provides a visual indication that you are in the fault code history mode.

There are five possible fault codes that can be displayed in the fault code history mode (figure 41). The upper right corner of the fault code display shows the fault code number. This number will match the number of times the LED on the controller assembly blinks when a fault is detected. The bottom line of the display contains a brief description of the fault. Refer to the Blink Code Descriptions section on page 29 for additional fault details.

1. Press the BACK FAULTS arrow on the direction pad to go back through the six most-recently recorded faults (figure 42).

2. Press the FWD FAULTS arrow on the direction pad to go forward through the six most-recently recorded faults (figure 42).

   The upper left corner of the display identifies the fault by its relationship to the last fault (figure 42).

After reviewing the fault code history, the nature of the fault can be identified and the following steps can be taken to correct the fault:

a. Disconnect the hand-held programming device and reconnect the proper cables to the ECU on the controller assembly, but do not apply power to the trailer.

b. Fix the fault and pressurize the trailer air tank to at least five psi above the target pressure.

c. After the trailer air tank is adequately pressurized, apply power to the trailer.
When the controller is repowered, it will go into its normal operating mode. As the controller proceeds through its system routines, it will assume the fault has been corrected.

If the fault was not fixed, the controller will detect it and the LED on the controller assembly will blink the fault code. This LED blink code will be adequate to diagnose issues until resolved, without needing to re-attach the hand-held programming device. Every time power is removed from the controller and then reapplied, it will assume the fault has been corrected and will not repeat a fault code unless it detects the same one again.

A fault code will not be stored as a repeated code unless the same fault is the first one recorded after a power up. If the same fault is displayed in two consecutive locations in the fault code history, the fault was redetected after controller power was reconnected.

It is not possible to clear faults from the register. When a new fault is detected, it becomes the last fault and all pre-existing faults shift one location. The last location, the sixth fault, gets overwritten.

3. Disconnect the hand-held programming device or go to one of the other operational modes.

If you wish to disconnect the hand-held programming device, refer to the following disconnect procedure (the four-pin trailer power cable must be the first one disconnected from the hand-held programming device and the last one connected to the controller assembly ECU).

If you wish to go to the target pressure setting mode, press the +PSI or -PSI arrow on the direction pad.

If you wish to go to the diagnostic test mode, press the TEST button twice. Pressing the TEST button once takes you to the target pressure setting mode. The second press will take you to the diagnostic test mode.

HAND-HELD PROGRAMMING DEVICE DISCONNECT PROCEDURE

1. Unplug the four-pin trailer power cable from the hand-held programming device. Do not plug this connector back into the controller assembly ECU at this time, it will be reconnected in step six.

2. Unplug the six-pin sensor cable from the hand-held programming device.

3. Unplug the hand-held programming device six-pin connector from the controller assembly ECU.

4. Unplug the hand-held programming device four-pin connector from the controller assembly ECU.

5. Plug the six-pin sensor cable back into the six-pin connector on the controller assembly ECU.

6. Plug the four-pin trailer power cable back into the four-pin connector on the controller assembly ECU.

7. Observe the LED on the controller assembly. Make sure it does not blink a fault code associated with loose or leaking tire hoses.
SERVICE PROCEDURES
WIRING HARNESS REPLACEMENT

Two wiring harnesses are available with TIREMAAX™: a standard, three-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 warning lamp power lead, the white wire is vehicle ground 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 43).
2. Disconnect the five-pin power supply connector.
3. Disconnect the warning lamp connection.
4. Disconnect the ECU connector.

INSTALLATION
1. Connect the five-pin ABS connector.
2. Connect the five-pin power supply connector.
3. Connect the warning lamp connector.
4. Connect the ECU connector.

Figure 43. 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 ECU power connector (figure 44).
3. Disconnect the air supply line. Label the line "IN" to avoid confusion when installing the new controller assembly.
4. Disconnect the air delivery line. Label the line "OUT" to avoid confusion when the new controller assembly is installed.
5. If reusing the air line fittings, remove them from the tee fittings on the controller assembly.
6. Remove the two bracket-to-frame mounting bolts.

INSTALLATION
1. Install the two bracket-to-frame mounting bolts.
2. If necessary, apply thread sealant to air fittings.
3. Install air line fittings on tee fittings.
4. Connect the air IN and air OUT lines to the appropriate ports. Test for air leaks by listening or using soapy water.

Figure 44. Controller assembly replacement
5. Connect the ECU connector.

6. Recharge the trailer air system.

7. Manually measure tire pressure. Refer to the section titled *Manually Checking Tire Pressure* on page six for complete manual tire pressure measuring instructions.

8. Verify that the target tire pressure matches the desired operating tire pressure.

**Solenoid Valve Replacement**

**Removal**

1. Exhaust the trailer air tank.

2. Disconnect the two connectors from the pressure sensors (figure 45).

3. Disconnect the four-pin solenoid valve connector (labeled VALVES) from the ECU.

4. Cut the cable tie that holds the wiring in a neat bundle at the side of the mounting bracket.

5. Disconnect the air supply line. Label the line "IN" to avoid confusion when installing the new valve.

6. Disconnect the air delivery line. Label the line "OUT" to avoid confusion when installing the new valve.

7. Remove the four screws holding the entire solenoid valve/pressure sensor assembly to the mounting bracket, and remove the entire solenoid valve/pressure sensor assembly.

![Diagram of solenoid valve replacement](image)

*Figure 45. Solenoid valve replacement*
8. With the entire solenoid valve/pressure sensor assembly removed, the desired solenoid valve can be removed by unscrewing it from the connecting pipe nipples.

INSTALLATION
1. Screw on new solenoid valve and reassemble as shown in figure 45. If necessary, apply thread sealant to pipe nipples.

2. Attach solenoid valve/pressure sensor assembly to bracket with four screws.

3. Connect the air IN and air OUT lines to the ports on the appropriate pressure sensors. If necessary, apply thread sealant to air fittings.

4. Connect the two pressure sensor connectors.

5. Connect the four-pin solenoid valve connector (labeled VALVES) to the ECU.

6. Secure the wiring to the bracket in a neat bundle with a new cable tie.

7. Recharge the trailer air system. Test for air leaks by listening or using soapy water.

8. Apply power to the trailer (blue circuit on the seven-pin trailer connector).

AIR FILTER SCREEN REPLACEMENT
The system uses an air filter screen (located in the inlet port of the supply solenoid valve) to prevent contamination. A contaminated or partially contaminated filter will increase inflation times and reduce the life of the system. To reduce the effects of contamination, regular maintenance is required every 12 months.

Use the following procedure to replace the air filter.

⚠️ WARNING: THE TRAILER AIR TANK MUST BE EXHAUSTED BEFORE DISCONNECTING THE AIR LINE FROM THE SUPPLY PRESSURE SENSOR.

1. Using steps one through eight of the Solenoid Valve Replacement removal procedure, remove the entire solenoid valve/pressure sensor assembly from the mounting bracket.

2. Unscrew the pressure sensor and pipe nipple from the assembly (figure 46). Use a screwdriver or similar tool to carefully remove the filter from the supply solenoid port (figure 46).

3. Inspect the inlet port for contamination and clean as required.
4. Clean or install a new filter into the solenoid port.

5. Reassemble the pressure sensor and pipe nipple. Using steps one through eight of the Solenoid Valve Replacement installation procedure, install the entire solenoid valve/pressure sensor assembly to the mounting bracket.

**ELECTRONIC CONTROL UNIT (ECU) REPLACEMENT**

**REMOVAL**

1. Disconnect trailer from power source.

2. Disconnect all three ECU connectors (figure 47).

3. Remove the two ECU-to-bracket mounting bolts and remove the ECU.

**INSTALLATION**

1. Install the replacement ECU and secure with the two ECU-to-bracket mounting bolts.

2. Connect the ECU connectors.

3. Apply power to the trailer (blue circuit on the seven-pin trailer connector). The replacement ECU comes from the factory with a pre-set target pressure. No further programming is required unless a target pressure setting other than the factory setting is desired. In that case a hand-held programming device, available from Hendrickson, can be used to program a new target pressure setting.

![Figure 47. ECU replacement](image-url)
PRESSURE SENSOR REPLACEMENT

REMOVAL
1. Disconnect trailer from power source.
2. Exhaust the trailer air tank.
3. Disconnect the pressure sensor connector (figure 48).
4. Unscrew the pressure sensor from the tee fitting.

INSTALLATION
1. If necessary, apply thread sealant to the replacement pressure sensor threads.

IMPORTANT: DO NOT use thread sealant tape. This material may contaminate the air system.

2. Install the replacement pressure sensor on the tee fitting. Tighten to 10 - 12 ft. lbs. (13 - 16 N•m) of torque.
3. Connect the pressure sensor connector.
4. Ensure adequate air pressure at trailer (pressure in trailer air tank must be above target setting).
5. Apply power to the trailer (blue circuit on the seven-pin trailer connector).
6. Verify warning lamp operation (warning lamp blinks twice when power is applied).
WHEEL REMOVAL AND INSTALLATION
Disable the system before wheel removal. This will eliminate potential faults if the system attempts to check tire pressure while the tire hoses are disconnected.

1. Turn vehicle off and disconnect the tire hose(s) at the tee on the hubcap (figure 49).

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.

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™ systems. For example, it is not used on HUS™ hubs.

3. Remove the tee 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 49).

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 49.

6. Reinstall the tee fitting and tighten the inverted flare nut finger tight. Using a wrench, tighten the nut an additional one-half turn.

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 gasket.

CAUTION: DO NOT use a wrench or pliers to tighten the tire hose to the valve stem or tee assembly. Doing so may overtighten the assembly causing the end of the valve stem to cut through the gasket, resulting in an air leak.

8. Reinstall the tee fitting guard and tighten the hub cap bolts to 12 - 18 ft. lbs. (16 - 24 N•m).

Figure 49. Tire removal and installation
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 the previous 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 50).
2. Remove the three fasteners holding the rotary joint assembly to the spindle plug (figure 51).
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, re-attach 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.
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 labeled “Air” in the hubcap. Attach the jam nut and hand tighten (figure 50).

⚠️ **CAUTION:** Wheel must be properly “clocked” to the hubcap to prevent the hoses from rubbing on the wheel (figure 23). 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 26 to complete the reassembly.

**GLOSSARY**

**TIREMAAX™ Tire Inflation System** — A system that maintains the pressure of selected tires and activates a warning to alert the vehicle operator if the pressure drops by more than 10 psi.

**Electronic Control Unit (ECU)** — The ECU is programmed with the target tire pressure and directs the system to supply air to the tires when needed. A significant drop in tire pressure causes the ECU to illuminate the warning lamp.

**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 only pressurized while the system is checking tire pressure or inflating.

**Target Tire Pressure** — The desired tire pressure.
APPENDIX

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.