

Installation and Operation Manual

SAF-HOLLAND® Tire Pilot™ Plus System

TIRE  **PILOT™**
PLUS



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Introduction

This manual provides information necessary for the installation of the SAF-HOLLAND Tire Pilot Plus tire inflation system.

The Tire Pilot Plus uses air drawn from the tractor to pressurize the system.

Read this manual in its entirety before installing this product. Updates to this manual, which are published as necessary, are available on the internet at www.safholland.us.

When replacement parts are required, SAF-HOLLAND highly recommends the use of only SAF-HOLLAND Original Parts. A list of technical support locations that supply SAF-HOLLAND Original Parts and an Aftermarket Parts Catalog are available on the internet at www.safholland.us or contact Customer Service at 888-396-6501.

Warranty

Refer to the complete warranty for the country in which the product will be used. A copy of the written warranty is included with the product or available on the internet at www.safholland.com.

Notes, Cautions, and Warnings

Before starting any work on the unit, read and understand all the safety procedures presented in this manual. This manual contains the terms “NOTE”, “IMPORTANT”, “CAUTION”, and “WARNING” followed by important product information. These terms are defined as follows:

NOTE: Includes additional information to enable accurate and easy performance of procedures.

IMPORTANT: Includes additional information that if not followed could lead to hindered product performance.

CAUTION Used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

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

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

1. Safety Instructions

General and Servicing Safety Instructions

- Read and observe all Warning and Caution hazard alert messages. The alerts provide information that can help prevent serious personal injury, damage to components, or both.

⚠ WARNING Failure to follow the instructions and safety precautions in this manual could result in improper servicing or operation leading to component failure which, if not avoided, could result in death or serious injury.

- All maintenance should be performed by a properly trained technician using proper/special tools, and safe procedures.

NOTE: In the United States, workshop safety requirements are defined by federal and/or state Occupational Safety and Health Act (OSHA). Equivalent laws could exist in other countries. This manual is written based on the assumption that OSHA or other applicable employee safety regulations are followed by the location where work is performed.

- Properly support and secure the vehicle from unexpected movement when servicing the unit.

⚠ WARNING Failure to properly support and secure the vehicle and axles prior to commencing work could create a crush hazard which, if not avoided, could result in death or serious injury.

- Installation should be performed on an unloaded trailer if possible.

Operational and Road Safety Instructions

- Before operating vehicle, ensure that the maximum permissible axle load is not exceeded and that the load is distributed equally and uniformly.
- Observe the operating recommendation of the trailer manufacturer for off-road operation of the installed axles.

IMPORTANT: The definition of OFF-ROAD means driving on non-asphalt/non-concrete routes, e.g. gravel roads, agricultural and forestry tracks, on construction sites and in gravel pits.

IMPORTANT: Off-road operation of axles beyond the approved application design could result in damage and impair suspension system performance.

- In the event of suspension component failure, quickly reduce speed as safely as possible and remove the vehicle from traffic. If unable to remove vehicle from traffic, follow DOT safety requirements regarding emergency situations.
- Contact a qualified towing and/or service company to assist in repairing the vehicle or to move it to a qualified repair facility.

2. Tire Pilot Plus Identification

In order to identify a parts list for your system the following information is required:

- Number of axles
- Tire pressure setting
- Single Tires or Dual Tires
- Suspension Serial number(s)
- Tapered or Parallel Spindle

2.1 Sliding Suspension Model Identification

The sliding suspension serial tag is located on the rear crossmember (**Figure 2**).

NOTE: This manual applies to all suspension models. However, determine your specific model number, write that information below and refer to it when obtaining information or replacement parts (**Figure 3**).

2.2 Fixed Frame Model Identification

The fixed frame suspension serial tag is located on the frame bracket (**Figure 4**).

NOTE: This manual applies to all suspension models. However, determine your specific model number, write that information below and refer to it when obtaining information or replacement parts (**Figure 3**).

The Tire Pilot Plus Regulator Assembly also has a serial number tag inside the control box, and a part number tag located on the outside as illustrated in **Figure 1**.

Figure 1

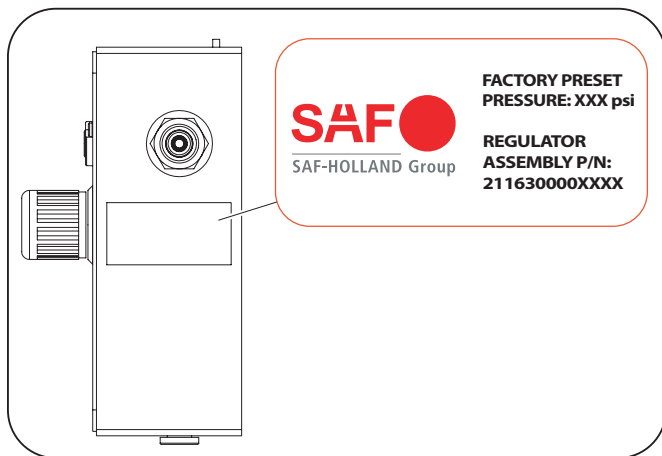


Figure 2

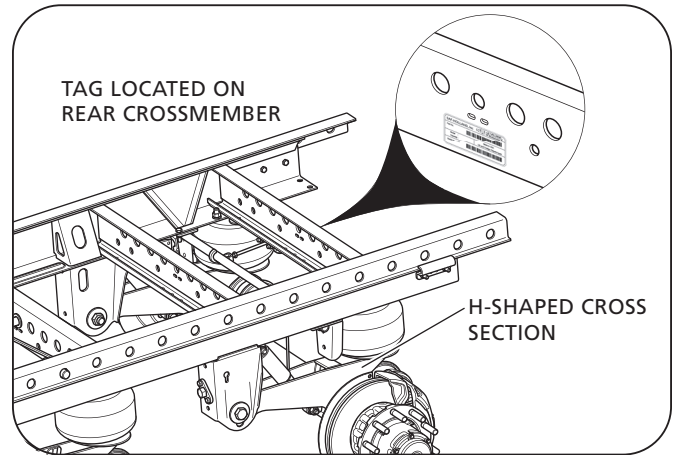


Figure 3

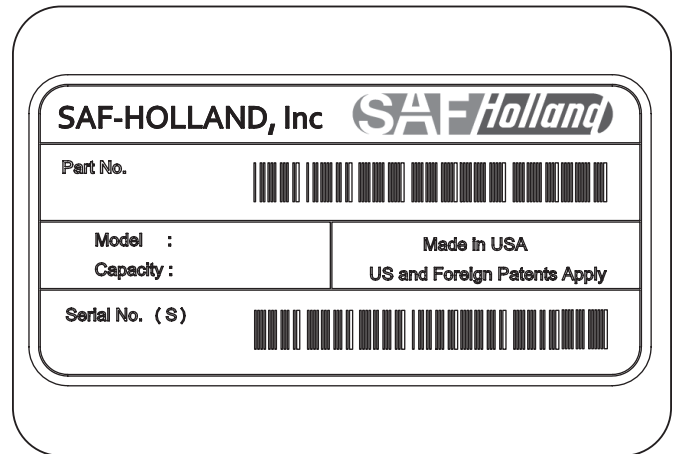
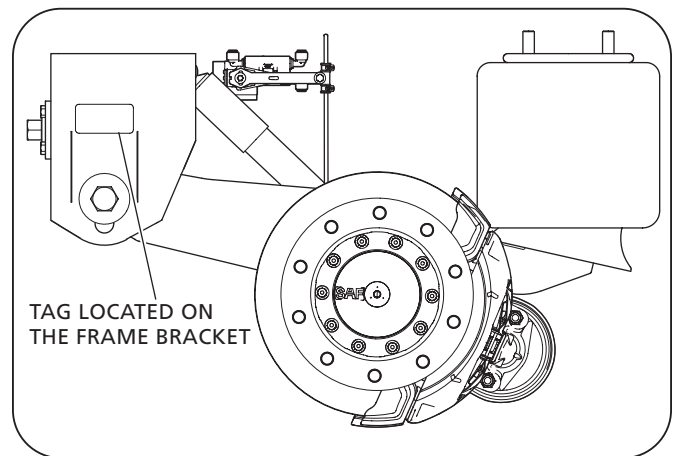


Figure 4



3. Installation Instructions

NOTE: If your axles are prepped from SAF-HOLLAND with spindle plugs and vents skip to number 8. If your axle does not have a tapped hole, one will need to be drilled. If a tapped hole is present skip to number 3.

1. On the top dead center or 12 o'clock position of the axle mark the centerline. At this centerline mark, use an 'R' drill bit to drill a hole using tap fluid or light cutting oil. While drilling, periodically clean away metal shavings. Use a telescoping magnet to go inside of the axle tube and clear any remaining metal shavings (**Figure 5**).

NOTE: An axle drilling fixture is available if required. Contact SAF-HOLLAND customer service for details.

2. Using a 1/8" - 27 NPSF tap and cutting oil, tap the hole drilled in step 1.
3. Insert 1/4" DOT tubing through the center hole in the axle. Feed the air line through the axle and out of the curbside spindle end. Leave approximately 6" of air line outside the spindle. Alternatively, a weld liner, fish tape, or other method can be used to pull the tubing from one spindle end to the center hole (**Figures 6 and 7**).

NOTE: Leave enough air line out of the center hole to reach desired location for the regulator assembly and account for suspension travel.

CAUTION

Protective loom (not shown) should be used over the air line within the axle. Failure to install a protective loom could result in chaffing the air line which, if not avoided could shut down the Tire Pilot Plus system.

continued

Figure 5



Figure 6

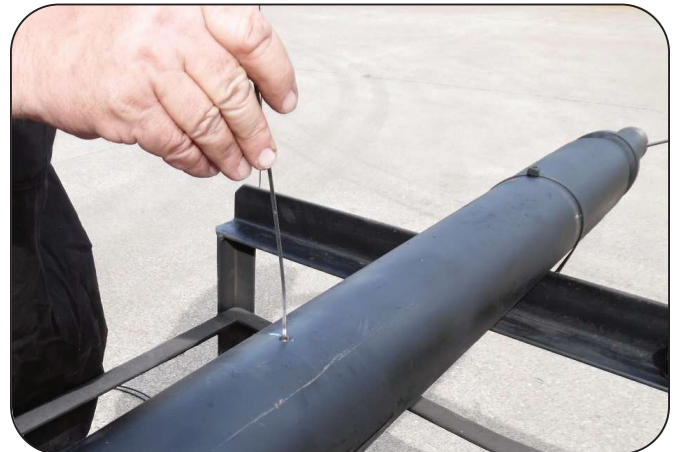


Figure 7



3. Installation Instructions *continued*

4. Insert 1/4" DOT tubing through from the curbside to the roadside spindle. Leave approximately 6" of air line outside of both spindles (**Figure 8**).

NOTE: Use of an 1/8" metal rod to assist in getting the 1/4" tubing across the axle could be necessary (**Figure 8**).

CAUTION

Protective loom (not shown) should be used over the air line within the axle. Failure to install a protective loom could result in chaffing the air line which, if not avoided could shut down the Tire Pilot Plus system.

5. Start on the curbside of the axle install the dual outlet spindle plug assembly. Ensure that both pieces of 1/4" tubing have been cut squarely. Trim off excess air line as necessary. Push 1/4" air line into fitting until it bottoms out in the push-to-connect fitting. Complete for both air lines and fittings (**Figure 9**). Repeat this step for roadside single fitting spindle plug. Pressurize air lines and check for leaks with a non-corrosive solution (soap and water) prior to installing axle plug.

Figure 8



Figure 9



- Insert the cylinder plug assembly into the axle. Align the vent notch to the 12 o'clock position (**Figure 10**). Insert the spindle plug into the axle until the shoulder contacts the spindle bore. Drive the spindle plug into the axle unit fully seated against the face of the spindle. Check for gaps with a 0.050" feeler gauge. Repeat this step for the roadside spindle with the single fitting spindle plug (**Figure 11**).

NOTE: If the axle is a parallel spindle with cross drilled holes, take care to locate the cross drilled holes in the windows of the spindle plug.

CAUTION

Axle vents must be installed, due to the Tire Pilot Plus system not venting through the wheel end. Failure to do so could cause build up of pressure which, if not avoided, could create wheel end lube leaks.

- Apply pipe thread compound to the vent fitting threads if not present. Remove the compression brass nut and O-ring from the vent. Slide vent fitting, brass nut and O-ring over the air line coming out of the center hole in the axle. Feed the excess air line through the vent. Thread the vent fitting body into the axle hand tight plus additional rotation until the vent is parallel to the axle (**Figure 13**). Tighten the compression nut by hand and then use a wrench to tighten an additional 1/2 turn (**Figures 12 and 13**).

CAUTION

Leave 12-18 inches of slack in the tube through the vent assembly to allow for suspension travel. Failure to do so could cause excessive stress on the air lines which, if not avoided, can damage air lines.

continued

Figure 10

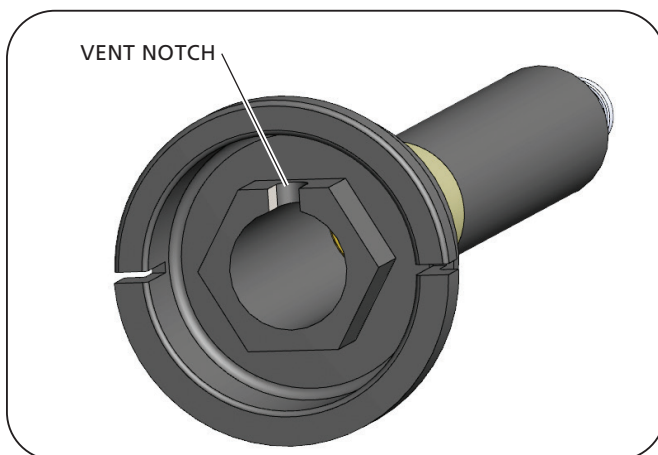


Figure 11



Figure 12

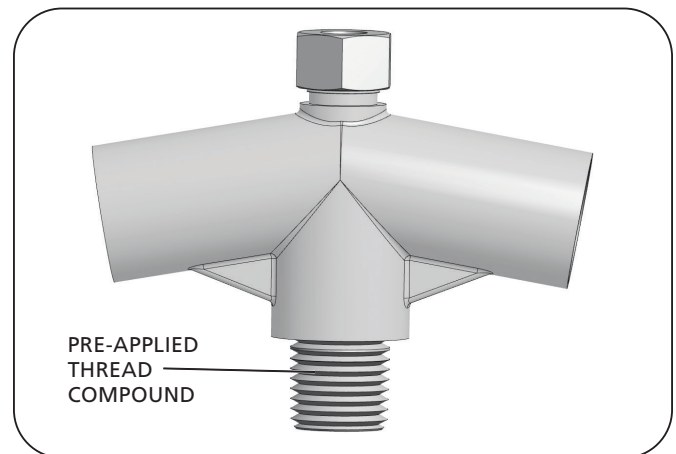
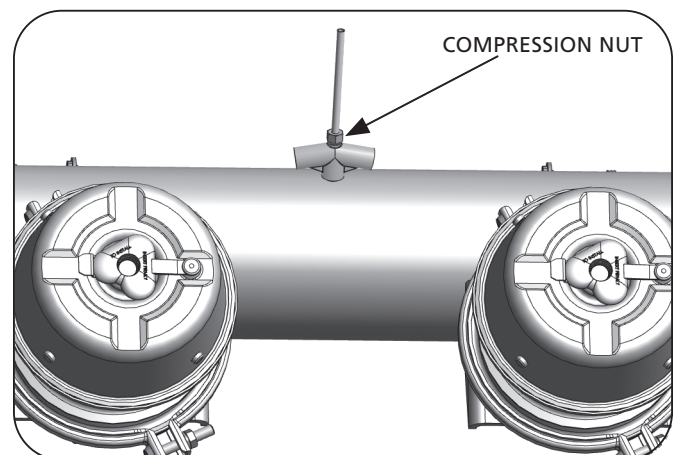


Figure 13



3. Installation Instructions *continued*

8. Install the pressure protection valve to the air tank. Take care to insure the 'in' side of the valve is connected to the air tank.
9. Locate a secure location for mounting the regulator assembly. Use the mounting holes provided. Recommended location on sliding suspensions is the front or rear crossmembers. On fixed frame suspensions, the recommended location is the main trailer beam either in front of the suspensions, or just behind the suspensions (**Figure 14**).
10. Connect each axle air line together with a push to connect (**Figure 15**) T-fitting.
11. Connect air tank pressure protection valve air line to the regulator input in the control box (**Figure 16**).

Figure 14

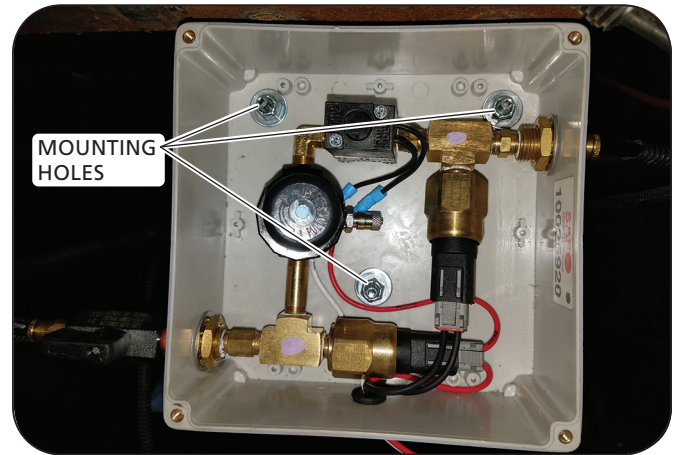


Figure 15

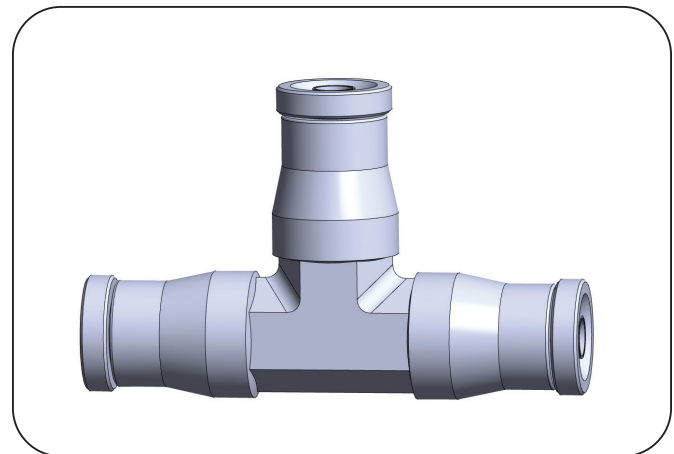
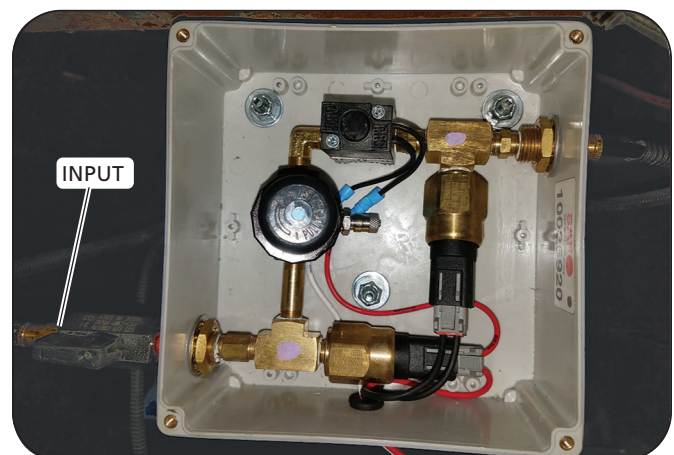


Figure 16



12. Connect each axle T-fitting to the regulator output in the control box (**Figure 17**).
13. Secure air lines between axles, air tank, and regulator control box with 6" cable ties. Securing the air lines to the brake hoses is recommended.

NOTE: Wire loom is recommended to protect air line from sharp corners on the trailer sub-frame.

CAUTION

Protective loom (not shown) should be used over the air line. Failure to install a protective loom could result in chaffing the air line which, if not avoided could shut down the Tire Pilot Plus system.

14. Locate the ABS power cable and disconnect as illustrated in **Figure 18**.
15. Install power adapter as illustrated in **Figure 19**. Use dielectric grease in the connections.
16. Secure the ABS power adapter using a cable tie as illustrated in **Figure 20**.
17. Route the wiring harness through the trailer cross rails to connect the wiring to the regulator control box.

CAUTION

If the regulator control box is located on a sliding suspension, be sure to leave enough wiring loose to route along the factory coiled wires and hoses at the stinger bracket.

continued

Figure 17

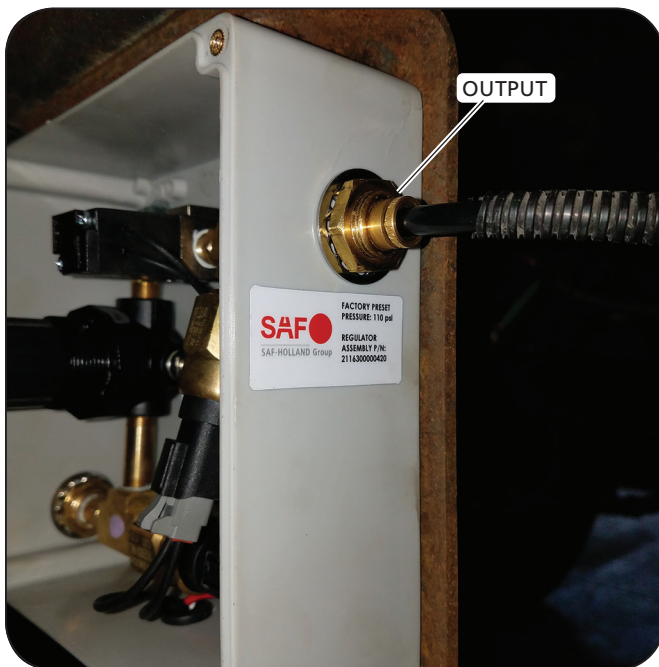


Figure 18

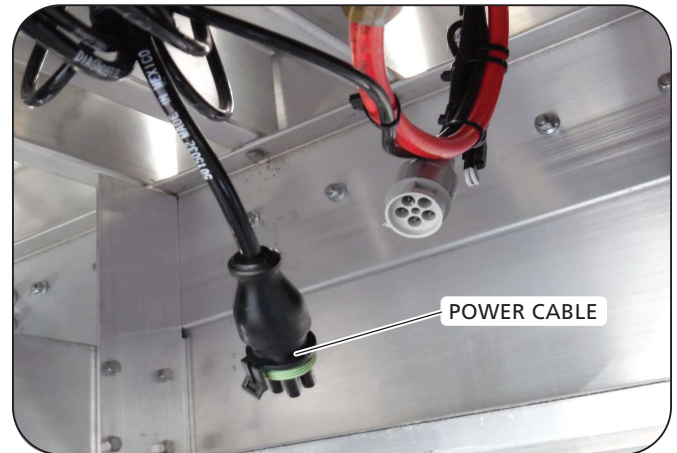


Figure 19



Figure 20



3. Installation Instructions *continued*

18. Run the wires for the trailer mounted warning light through the trailer crossmembers. Use cable ties to secure the wiring (**Figure 21**).
19. Mount the warning light on the roadside approximately six feet from the bottom of the trailer. Use appropriate water proof sealant on warning light screw holes if surface mounted. If a flush mount light is desired with hidden wires, push the LED light out of the plastic housing. Use the rubber grommet in a 3/4" diameter hole in the trailer to install grommet and light. Flush mount illustrated. (**Figures 22 and 23**). Connect wiring harness to light matching the wire colors. Use dielectric grease in the connectors.
20. Install the warning light decal directly above the warning light (**Figures 22 and 23**).

Figure 21

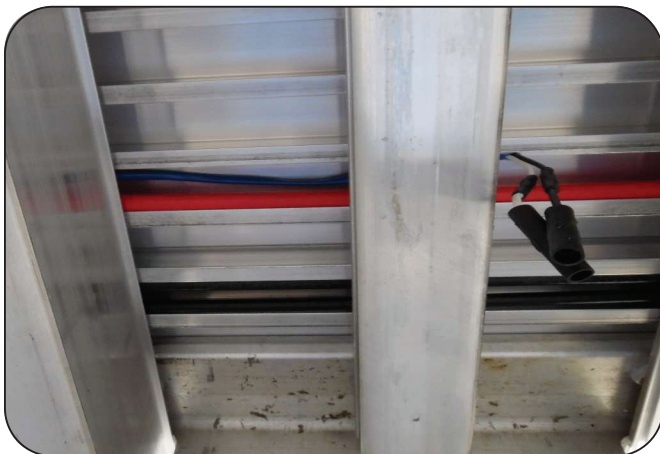
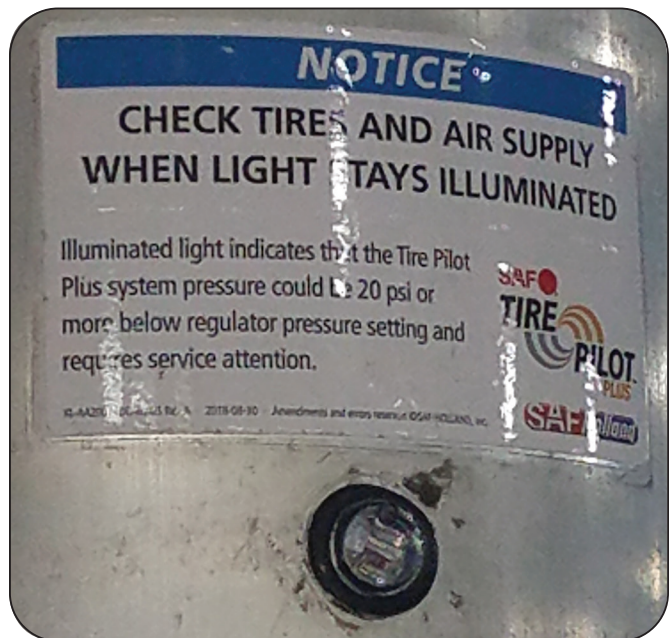


Figure 22



Figure 23



21. Install hubcaps to hubs if not pre-installed to your axles. Torque hubcap bolts in a opposing pattern to 12-16 ft-lbs.
22. Install tire hoses by connecting the tire side first. Fittings only need to be hand tight. Over-tightening can cause damage to the seals inside the fittings and possible leaks.

CAUTION

Be certain to pay attention to the orientation of the hubcap, rim, and valve stem locations. If the orientation of the rim to hubcap is incorrect, premature failure of the tire hoses and/or damage to the rims can occur. **Figure 24** shows the proper orientation for a dual steel wheel application with 5 hand hole rims. **Figure 25** shows the proper orientation for an aluminum wide base single application. The hubcap fitting position is 90 degrees relative to the valve stem in **Figure 25**.

4. Multi-Axle Trailer Installation

1. For trailers with more than 3 axles or for systems that require 2 different tire pressure settings, multiple regulator assemblies are required.
2. To install multiple regulators follow the steps in Section 3 with the following exceptions:
 - Install ABS Y-adapter cables in series for each regulator assembly (male connector on ABS adapter #1 to female connector on ABS adapter #2, **Figure 26**).
 - Install Led light for each regulator assembly.

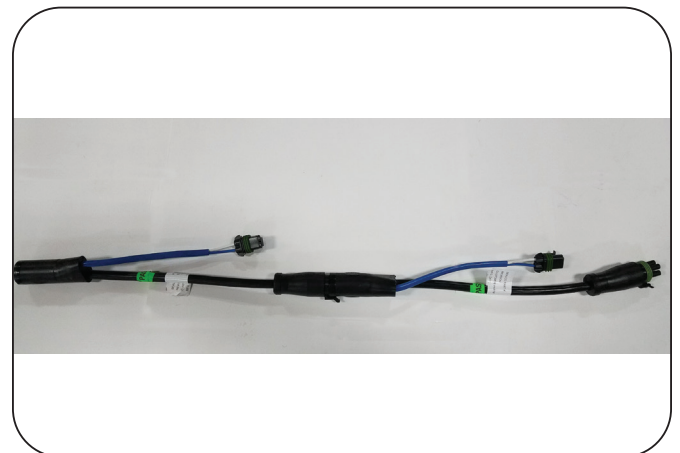
Figure 24



Figure 25



Figure 26



5. System Inspection

1. Confirm 12 volt power supply and air supply to trailer. ABS system cycles with key to confirm power to the trailer.
2. Confirm 4 pin electrical connector on the regulator assembly is connected to the wiring harness.
3. Confirm air line input and output are connected to the regulator assembly and the 1/4 turn valve on the input side is open.
4. Confirm system warning light is off.
5. Check for air leaks with a non-corrosive (soap/water) leak test solution at the following areas:
 - Pressure Protection valve
 - Air input to regulator assembly
 - Air output from regulator assembly
 - Tire hose connections
 - Axle inlet/vent assembly
6. Be certain to regularly drain the air tank of moisture. Build up of moisture in the air system can cause premature failure of the Tire Pilot Plus system. A water separator or other moisture control measures may be necessary in excessively humid or moist locations.
7. Install the Regulator box cover and secure with the four (4) provided screws.

IMPORTANT: Tire pressure must be at or below regulator setting prior to system start-up. Failure to correctly set tire pressure prior to system start-up will result in reduced product performance.

6. Performance Testing

1. Make sure air and power are being supplied to the Tire Pilot Plus system. Voltage should be a minimum of 12 volts. Air pressure needs to be greater than the Tire Pilot Plus regulator setting. The minimum recommended air pressure is 10% above the regulator setting.
2. To check function of the light, verify air and power to the system and shut the 1/4 turn valve at the inlet of the regulator box assembly and remove the output air line from the control box. The light should illuminate.
3. To leak check the system, verify air and power are present and install a pressure gauge on the outlet of the control box. Shut the 1/4 turn valve. Leak rate should be less than 1 psi per minute.
4. To check the regulator setting, verify air and power to the system. Install a pressure gauge on the Schrader valve located on the side of the regulator body. Regulated pressure should be within +/- 5psi of the indicated setpoint.
5. To verify air flow from system, first verify air and power to the system. Check air flow by disconnecting the output line from the regulator box assembly. Alternatively, remove the tire hose from the hubcap. Depress the check valve at the hubcap fitting with a small screwdriver to confirm air flow. Light should illuminate during this test.

Refer to electrical diagram part number 42210013 and air schematic part number 42210012 for further help with system function or installation questions.

7. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Tire Pressure LOW and Warning Light ON	Damaged tire, rim, and/or valve stem	Repair/replace tire, rim and/or valve stem
	Air system valve closed	Open valve
	Inadequate supply pressure	Supply pressure must be a minimum of 10psi greater than the desired tire pressure. Correct as necessary.
	Inadequate supply voltage	Supply voltage must be a minimum of 12V DC. Correct as necessary.
	Defective Pressure Protection Valve	Replace pressure protection valve Note: System cannot use the same PPV as the air suspension. A dedicated port on the air tank is required with a dedicated pressure protection valve.
	Defective pressure switch	Replace pressure switch
	Defective solenoid valve	Replace control box assembly
	Regulator out of adjustment	Adjust regulator
	Defective regulator	Replace control box assembly
	Corroded butt connectors at solenoid	Replace butt connectors
	Loose/leaking air lines or fittings	Spray all air lines and fittings with soapy water and repair leaks as needed
	Leaking rotary union	Replace rotary union
	Leaking tire hoses	Replace tire hoses
Tire Pressure LOW and Warning Light is OFF	Regulator out of adjustment	Adjust regulator
	Inadequate supply pressure	Supply pressure must be a minimum of 10psi greater than the desired tire pressure. Correct as necessary.
	Inadequate supply voltage	Supply voltage must be a minimum of 12V DC. Correct as necessary
	Leaking rotary union	Replace rotary union
	Leaking tire hoses	Replace tire hoses
	Tractor does not have constant power to the center pin of the 7way connector (constant blue)	Update tractor wiring to have constant power to the center pin of the 7way connector (ABS constant blue)
Tire Pressure HIGH and Warning Light is ON	Low supply pressure	Incoming pressure must be greater than 100psi, or desired tire pressure +10psi (whichever value is higher). Correct as necessary.
	Low supply voltage	Incoming voltage must be greater than 12V DC. Correct as necessary.
	Defective Pressure Protection Valve	Replace pressure protection valve Note: System cannot use the same PPV as the air suspension. A dedicated port on the air tank is required with a dedicated pressure protection valve.
	Regulator out of adjustment	Adjust regulator
	Defective pressure switch	Replace pressure switch
	Defective solenoid valve	Replace control box assembly
	Corroded butt connectors at solenoid	Replace butt connectors
	Loose and/or leaking air lines and/or fittings	Spray all air lines and fittings with soapy water and repair leaks as needed
	Leaking rotary union	Replace rotary union
Leaking tire hoses	Replace tire hoses	

PROBLEM	POSSIBLE CAUSE	POSSIBLE REMEDY
Tire Pressure HIGH and Warning Light is OFF	Low supply pressure	Incoming pressure must be greater than 100psi, or desired tire pressure +10psi (whichever value is higher). Correct as necessary.
	Above Mechanical Limits of system	System is designed to relieve tire pressure up to a maximum of 4psi above the regulator setting. If tire pressure is more than 4psi above regulator setting, excess tire pressure must be manually relieved.
Tire Pressure in-spec and Warning Light is ON	Air system valve closed	Open valve
	Inadequate supply pressure	Supply pressure must be a minimum of 10psi greater than the desired tire pressure. Correct as necessary.
	Inadequate supply voltage	Supply voltage must be a minimum of 12V DC. Correct as necessary
	Defective Pressure Protection Valve	Replace pressure protection valve Note: System cannot use the same PPV as the air suspension. A dedicated port on the air tank is required with a dedicated pressure protection valve.
	Defective pressure switch	Replace pressure switch
	Defective solenoid valve	Replace control box assembly
	Defective indicator light switch	Replace indicator light switch Note: If regulator setting is changed from the factory setting, a new indicator light switch may be required for proper functionality. Reference installation manual for additional details.
	Regulator out of adjustment	Adjust regulator
	Defective regulator	Replace control box assembly
	Corroded butt connectors at solenoid	Replace butt connectors
	Loose/leaking air lines or fittings	Spray all air lines and fittings with soapy water and repair leaks as needed
	Leaking rotary union	Replace rotary union
Tire Pressure in-spec and Warning Light is OFF	System is working as designed, no issue	
Air Leak from axle vent	Damaged/loose airlines or connections inside the axle	Remove spindle plug assemblies, inspect air line connections and repair as necessary
	Leaking rotary union	Replace rotary union
	Loose and/or leaking air lines and/or fittings	Spray all air lines and fittings with soapy water and repair leaks as needed
Air Leak from Tire Hose	Overtightened connections	Tire hose fittings should be hand tightened. Over-tightened fittings can damage the o-rings inside the fitting. Inspect o-rings for damage and replace as necessary.
Brake air tank de-pressurized or low pressure	Defective pressure protection valve	Replace pressure protection valve Note: System cannot use the same PPV as the air suspension. A dedicated port on the air tank is required with a dedicated pressure protection valve.
	Air leak between air tank and pressure protection valve	Spray all air lines and fittings with soapy water and repair leaks as needed



From fifth wheel rebuild kits to suspension bushing repair kits, SAF-HOLLAND Original Parts are the same quality components used in the original component assembly.

SAF-HOLLAND Original Parts are tested and designed to provide maximum performance and durability. Will-fits, look-alikes or, worse yet, counterfeit parts will only limit the performance potential and could possibly void SAF-HOLLAND's warranty. Always be sure to spec SAF-HOLLAND Original Parts when servicing your SAF-HOLLAND product.

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