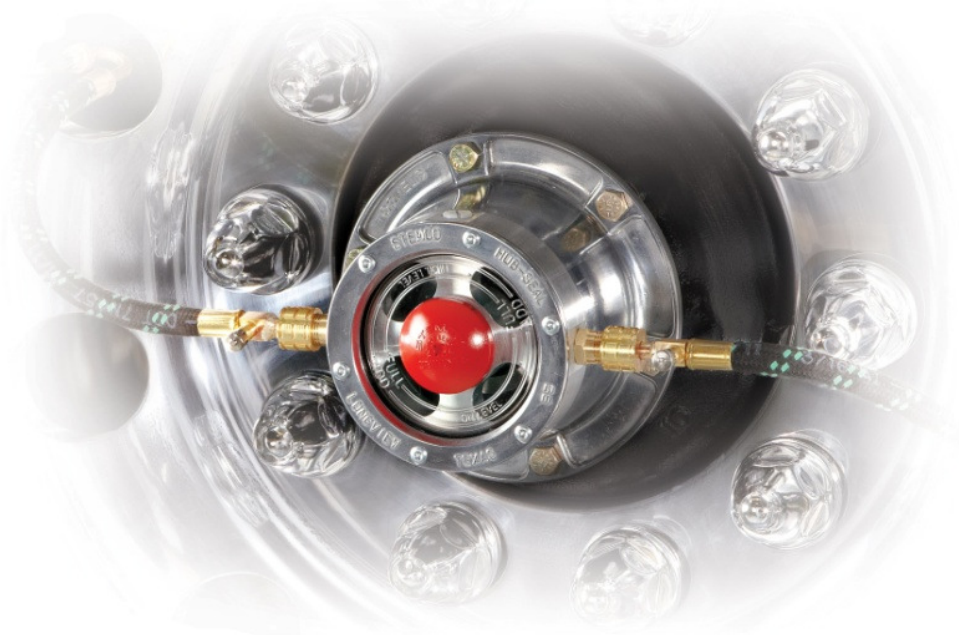


STEMCO Aeris Troubleshooting Manual

Part Number: 01-571-8301

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Rev: A



Aeris™ by STEMCO, an advanced automatic tire inflation system based on patented rotary sealing technology and precision electronic airflow detection. The system is designed to keep commercial trailer tires properly inflated using air pressure from the trailer's air system.

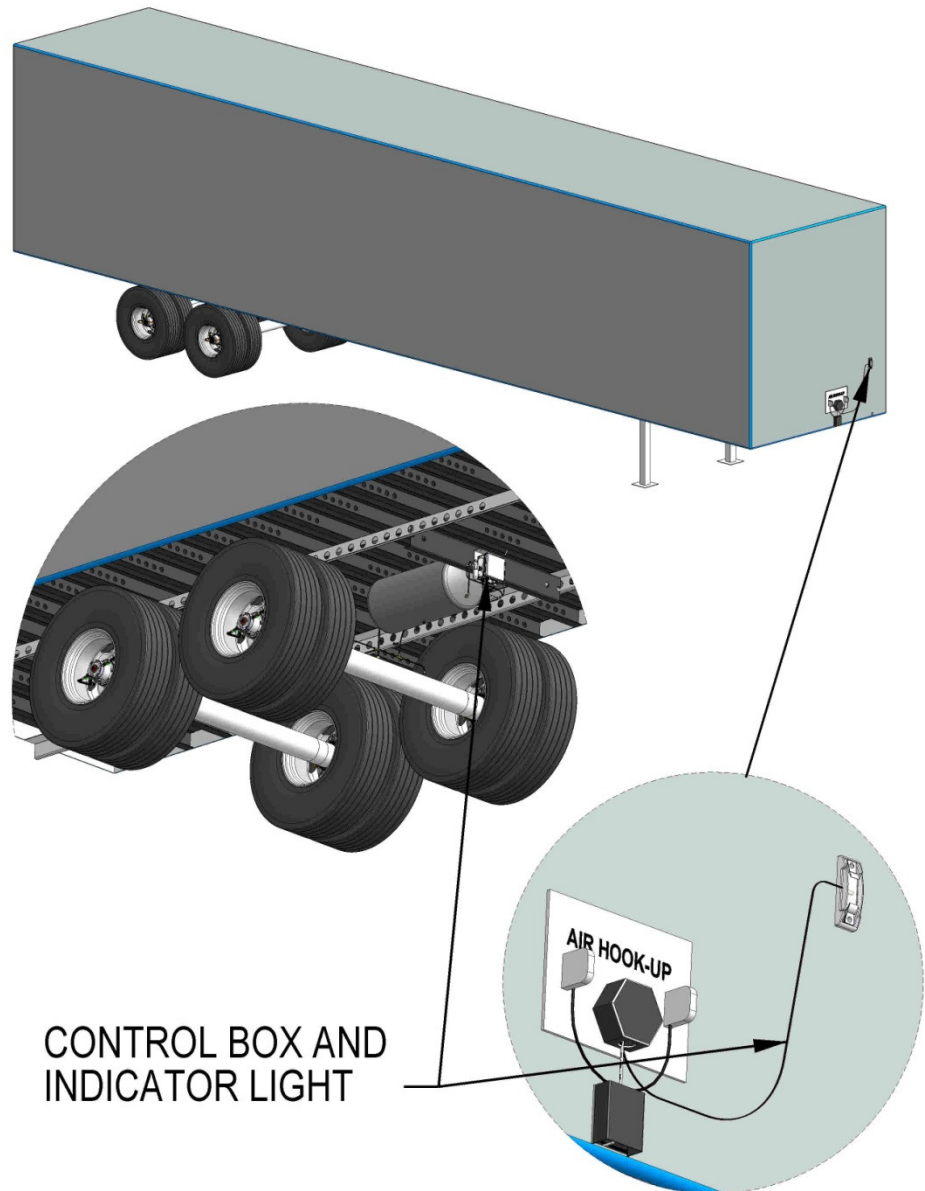
Aeris™ by STEMCO includes a high resolution electronic flow detection technology capable of informing the driver whether the system is making a minor adjustment to tire pressure or if a major leak is present. An additional safety feature is a pressure protection valve to protect the integrity of the air brake system in the case of a major and continuous air leak such as a blow out or other catastrophic tire failure.

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General Information

General View of Aeris Components Installed



About This Manual

This manual is provided to support the STEMCO Aeris tire inflation system. The manual provides the following information needed to service and troubleshoot the Aeris system.

Explanation of Words

Please pay attention to special symbols used through this manual to convey important information.

Hazard signal words such as DANGER, WARNING, CAUTION, or NOTICE are used throughout this manual. Information accented by these words indicates a point of emphasis and importance. The following definitions comply with ANSI Z535.4 and indicate the use of signal words as they appear within this manual.

! **DANGER:** Indicates immediate hazards which will result in severe personal injury or death.

! **WARNING:** Indicates hazards or unsafe practices which could results in severe personal injury or death.

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

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

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

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

IMPORTANT: Please pay special attention to the information supplied in the Explanation of Words section. These words are used to help prevent immediate hazards, unsafe practices, severe personal injury or death and damage to machines or equipment.

Important Safety Notices

- Proper maintenance, service and repair are important to the operation and reliability of the trailer suspension system and its components. The procedures recommended by STEMCO as described in this manual are methods of performing maintenance, inspection, repair and service. All warnings and cautions should be read carefully to help prevent personal injury and to help assure proper installation methods are used.
- Improper maintenance, service and repair can result in personal injury, vehicle damage, property damage, unsafe operating conditions or void the manufacturer's warranty.
- Carefully read, understand and follow all safety related information in this manual.
- ! **WARNING: DO NOT modify or rework parts. Use only STEMCO Aeris authorized replacement parts. Use of substitute, modified or replacement parts not authorized by STEMCO may not meet STEMCO's specifications. This may cause the part to fail which could result in loss of vehicle control and possible personal injury or property damage. Do not modify parts without STEMCO's authorized written permission.**
- ! **WARNING: Always wear proper PPE when installing and performing maintenance repair, servicing equipment or cleaning tractor or trailer components.**
- ! **WARNING: Solvent cleaners can be flammable, poisonous and can burns or serious injury. To help avoid serious personal injury, carefully follow the manufacturer's product instructions and guidelines. Please follow the procedures below:**
 - Wear proper eye protection
 - Wear proper protective clothing to protect your skin
 - Always work in well ventilated area
 - Do **NOT** use gasoline, or solvents that contain gasoline. Gasoline can explode and cause serious personal injury or death.
 - Hot tank solutions or alkaline solutions must be used correctly. Follow the manufacturer's product instructions and guidelines.
- ! **WARNING: Avoid creating dust from brakes when cleaning around any brake components. Dust from brake pads and/or parts are a possible cancer and lung disease hazard.**

General Service Information

Before starting any work or installation, read, understand and comply with the following:

- Read all instructions and procedures.
- Company's service, maintenance, installation and troubleshooting procedures.
- Manufacturer's vehicle safety instructions when working on the vehicle.
- Manufacturer's vehicle instructions not detailed in this service manual.
- Follow all local safety regulations and best safety practices when installing.

General Service Installation Notes

- Work must be performed by trained personnel.
- Use all recommended tools required to help avoid personal injury and damage to components.
- Be aware of potential power release of tensioned springs on brake chamber or the brake return springs. The release of tension can cause injury.

System Overview

- The Aeris tire inflation system is designed to automatically inflate tires that are below the target pressure setting. The system uses air from the trailer's compressed air tank. The compressed air tank pressure setting must be higher than the targeted tire pressure setting. Failure to have the air tank pressure above the target tire pressure prevents proper operation of the inflation system.

System Features

- Tire pressure is continuously monitored and adjusted automatically to the target tire pressure.
- Adjustable air pressure regulator is used for setting desired tire pressure target.
- An indicator light will illuminate when air is flowing to the tires.
- Does not pressurize axle tube (prevent contamination of seals).
- Rotary seal air leakage will not enter the wheel end, preventing oil contamination on the hubcap.
- Each wheel end has dual venting paths to prevent wheel end pressurization.
- Checks tire pressure constantly.
- Integrated check valves in the hoses isolate tires from system if a tire is damaged or leaking.
- Tire pressure check ports are integrated into each hose, eliminating the need to remove the hose to check the tire pressure.
- An air filter is provided on the inlet air line to prevent particulates from clogging the system.

Aeris Specifications

- Tire pressure setting range: 70-120 psi
- Pressure check interval: Continuously supplies air to tires
- System power requirements at 12VDC: < 12W.
- Minimum power voltage requirement to operate: 9 VDC
- Indicator light current range: 50 mA to 600 mA
- Tire inflation capacity (per tire): 10 psi in 2-3 minutes
- The indicator light provides the following system information:
 - No light: System is good or does not power
 - Power up: Light blinks three times
 - No pressure: Long flash followed by 2 blinks repeating.
 - Low volume flow: Constantly on
 - High volume flow: Blinking constantly

System Operation

How System Works

- The Aeris tire inflation system is designed to continuously supply filtered, regulated compressed air to each tire on the trailer. There is no operation required of the driver for the system to function normally. The only requirement of the driver is to verify the indicator lamp is functioning and to monitor the system periodically.
- The Aeris system is preset to maintain a specific tire pressure in each tire. The pressure in the trailer's air tank must be maintained above the targeted pressure to allow the controller to continuously supply and maintain the preset tire pressure to all tires.

IMPORTANT: For Aeris controller to operate properly the air tank pressure must be greater than the tire pressure target. The controller cannot supply tire pressure above the air tank pressure.

- When the system is operating properly, the air tank will supply pressurized air to the Aeris controller. The controller will supply regulated compressed air to the air lines going to each tire. If a tire is low, air from the trailer air tank will inflate the tire until the targeted tire pressure is achieved. Regulated air flowing from the controller to the air lines and tires may cause the indicator light to remain on until the target pressure is reached. Constant pressure remains and is maintained in air lines and tires at the targeted pressure.
- If a tire is leaking or there is a leak in the lines, the indicator light may illuminate and stay on. If the indicator light stays on for more than 15 minutes, the system is attempting to inflate the tire or trying to correct for the air line loss to the targeted air pressure. If this happens, the operator should stop and check the tires manually to determine if it's safe to continue to operate the vehicle. Operator should seek service at the next available opportunity.
- Remaining tires are protected from pressure loss by check valves integrated into each tire hose.

Aeris System Troubleshooting

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Condition	Possible Causes	Actions
The Driver Warning Lamp is ON. (See Aeris System Function Test on Page 10 If NO Leak is Found)	The system is delivering air during initial system charging for a slow leak on tire of 2-3 psi The system is delivering air to a leaking tire. The system is delivering air to a leaking system component. The system wiring is incorrect. Lamp circuit board is defective	The system is functioning correctly. Repair the tire. Repair the system component. Correct the system wiring. Replace control box
The Driver Warning Lamp is flashing ON & OFF (See Aeris System Function Test on Page 10 If NO Leak is Found)	The system is delivering air to a tire with a fast leak of 4-6 psi or more. The system is delivering air to a leaking tire at 4-6psi or more. The system is delivering air to a leaking system component. The system wiring is incorrect. Lamp circuit board is defective	The system is functioning correctly. Repair the tire. Repair the system component. Correct the system wiring. Replace control box
The Driver Warning Lamp is ON and air is leaking from the wheel-end hubcap or Axle vent	The system is delivering air to a leaking system component. The delivery hose in axle is damaged Hubcap RUA has face seal leaking Hose seal or gasket defective	Repair the system component. Replace DOT 1/4" airline in axle tube Replace hubcap assembly Replace hose or install new seal
The Driver Warning Lamp is OFF during system operation (See Aeris System Function Test on Page 10 If Power & Ground Supply to Trailer is good)	The trailer is not supplied with 12-volt power or ground The Driver warning lamp is inoperative. Lamp circuit board is defective The system wiring is damaged. The system wiring is incorrect.	Supply 12-volt power & ground to the trailer. Replace the Driver warning lamp. Replace control box Repair the system wiring. Correct the system wiring.
Tire pressure is low (See Aeris System Function Test on Page 10 for Troubleshooting)	The shut-off valve is off. The system pressure setting is too low. Defective pressure protection valve in air tank Kinked or Damaged 1/4" air line to wheel end The incorrect valve cores are installed or damaged hose check valve. The wheel end is overfilled with lubricant.	Turn on the shut-off valve. Increase the system pressure setting at Control box regulator Replace Pressure protection valve Repair 1/4" air line to wheel end position that is not getting air supply. Replace hose assemblies
Lubricant is leaking from the wheel-end vent.	The wheel end is overfilled with lubricant.	Fill the wheel end to the correct level.
Tire pressure is high.	The tire is manually over inflated. The system pressure setting is too high.	Reduce the tire pressure. The system will inflate to the correct level. Lower the system pressure setting at control box regulator.
The trailer tire deflates when parked.	The system hose or tire valve stem connection is leaking. The hose valve core is leaking. The tire is leaking.	Correctly tighten the connection or replace the seals. Clean or replace the hose valve core. Repair the tire.

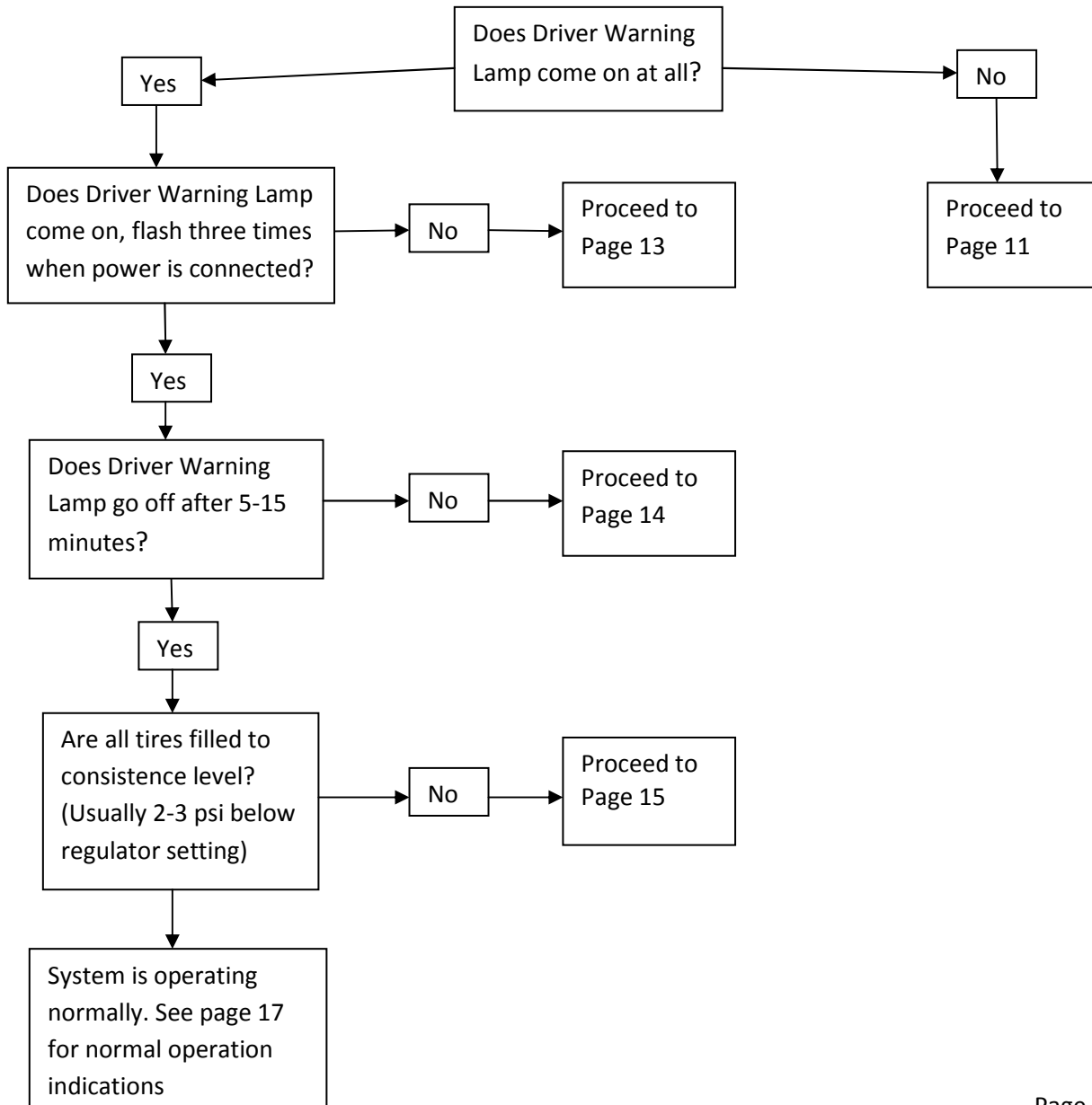
Aeris System Function Test

THIS MUST BE COMPLETED BEFORE BEGINNING SYSTEM TROUBLESHOOTING

Power on Test – This is referenced throughout the troubleshooting procedures and consist of connect air and power supply to the trailer while watching Driver Warning Lamp on the nose of the trailer

Important initial steps: **Initially do not connect air supply or power until instructed below**

- Verify valve on control box is open and pressure regulator is set to desired pressure
- Deflate all tires to at least 5 psi below regulator setting
- Connect air supply and power to the trailer and observe Driver Warning Lamp for the following conditions



Condition: Driver Warning Lamp does not come on at all

Possible Causes: Loose, broken or corroded connection or wires, bad bulb or bad control box circuit board

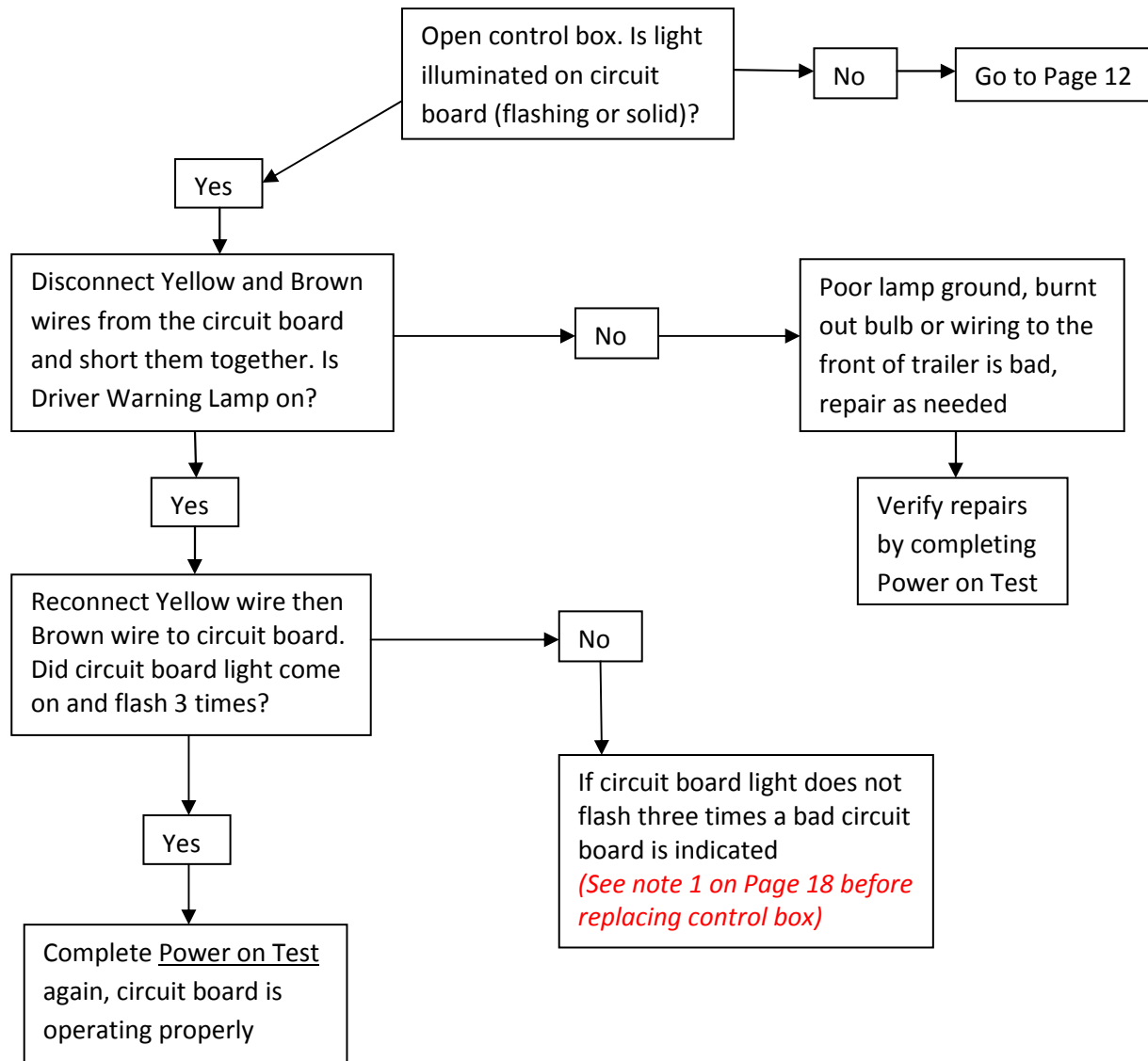
Before starting this section

Verify power and ground connections supplying the trailer

Verify control box is wired correctly (see figure 3 on page 18)

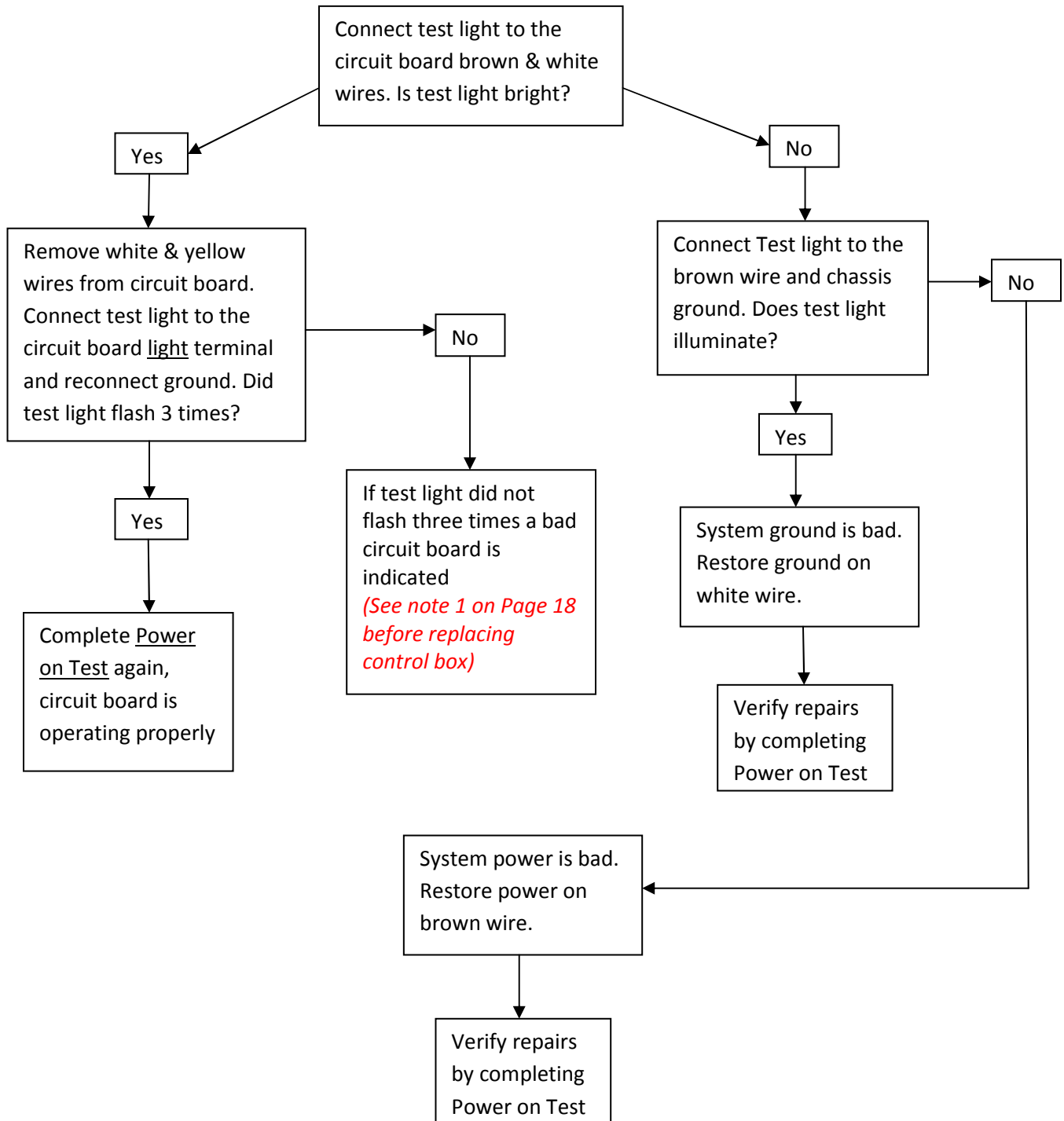
CAUTION: DO NOT SHORT CONTROL BOX WIRES TOGETHER WHILE THEY ARE CONNECTED TO THE CIRCUIT BOARD. CONTROL UNIT DAMAGE MAY RESULT

(Note: Do not use a volt meter to conduct these tests. A test light is required)



Continued from Page 11

Condition: Driver Warning Lamp does not come on at all & Circuit board light is off

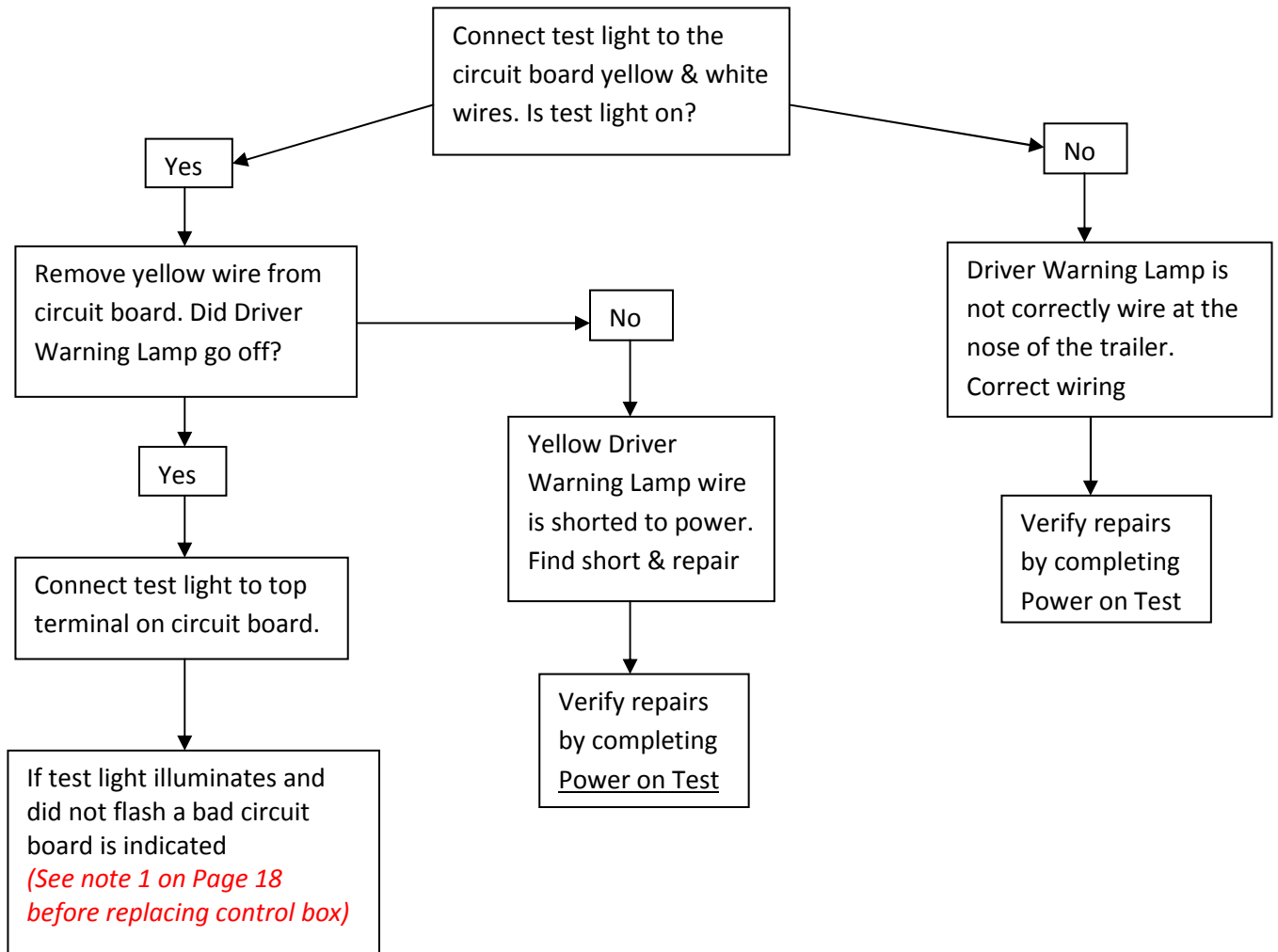


Condition: Driver Warning Lamp comes on but does not flash three times and does not go off

Possible cause: Driver Warning Lamp has constant power

Before starting this section

Verify the wires are attached to control unit circuit board as shown in *figure 3 on page 18*
(Note: Incorrect attachment of wires may cause circuit board damage)

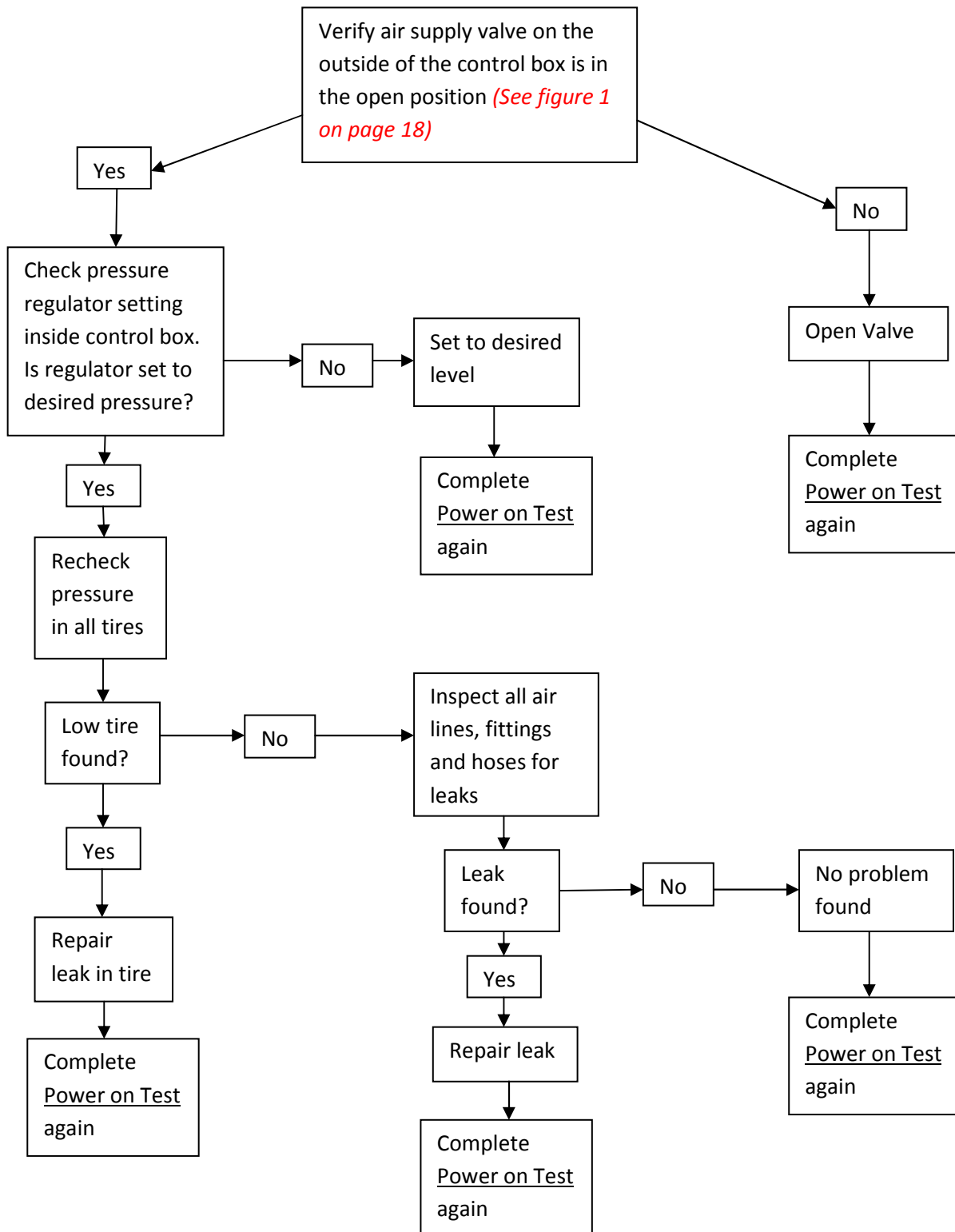


Aeris System Troubleshooting

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Condition: Light stays on after 3 flashes at power up (flashing or steady Driver Warning Lamp) and does not go off

Possible causes: System has detected air flow or has no air supply (check air supply to trailer before continuing)

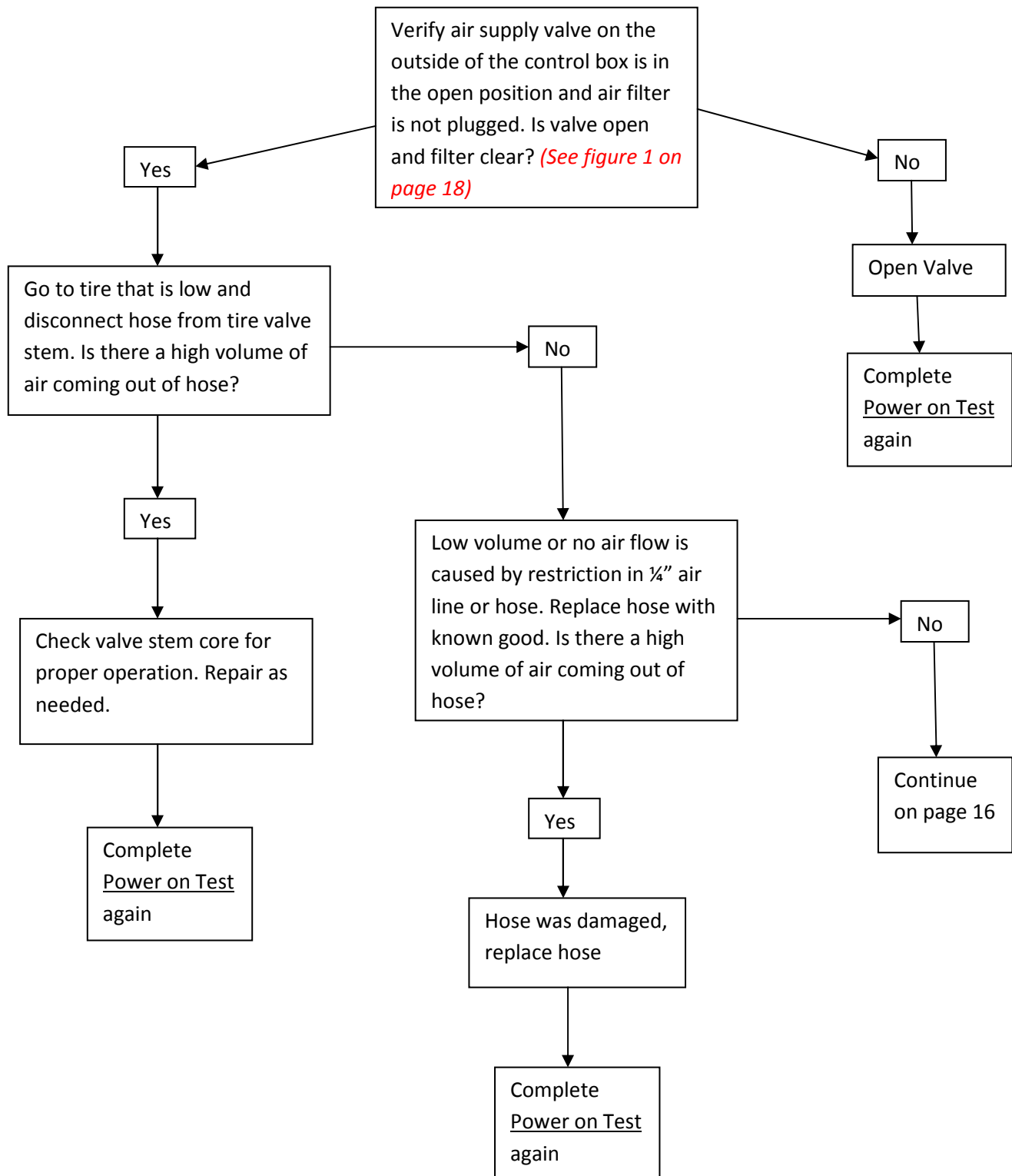


Aeris System Troubleshooting

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Condition: Tires are not within a few PSI of each other after light goes off after power up.

Possible causes: Kinked or damaged ¼ inch air line. Incorrect valve core in hose or damage hose check valve.

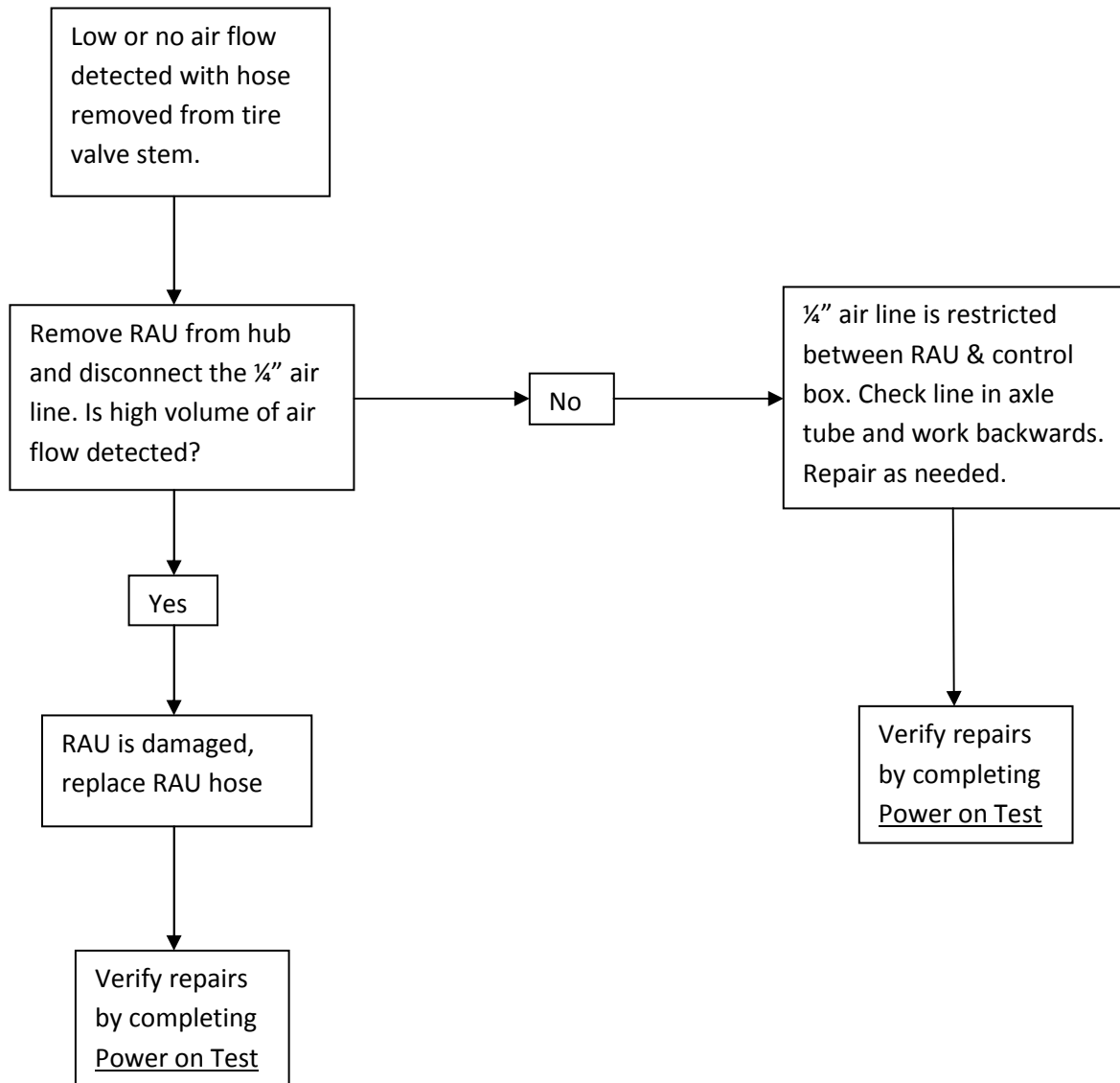


Continued from Page 15

Condition: Tires are not within a few PSI of each other after light goes off after power up.

Possible causes: Kinked or damaged ¼ inch air line. Incorrect valve core in hose or damage hose check valve.

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Section 4

Normal conditions that maybe observed on power up

1. Driver Warning Lamp comes on, flashes three times and goes off
 - a. *Indicates system is working and no air flow is being detected*
2. Driver Warning Lamp comes on, flashes three times but light flashes every other second (It may take several minutes for light to stop flashing if a tire is being filled)
 - a. *Indicates system is working and is adding air at high volume*
 - i. *Light may become solid and then variable after a period of time before no longer illuminating (this could take up to 15 minutes if tires are low and no air leak is present)*
 - ii. *If light does not go off after 15 minutes large air leak is present*
3. Driver Warning Lamp comes on, flashes three times but light remains on as a steady light for a period of time (It may take several minutes for light to go off if a tire is being filled)
 - a. *Indicates system is working and is adding air at low volume (light may become variable after a period of time before no longer illuminating)*
 - i. *If light does not go off after 15 minutes large air leak is present*
4. Driver Warning Lamp comes on, flashes three times but light remains on as a variable light for a period of time (It may take several minutes for variable light to stop flashing if a tire is being filled)
 - a. *Indicates system is working and is adding air at very low volume*
 - i. *If light does not go off after 15 minutes large air leak is present*

Aeris System Troubleshooting

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Note 1:

Before replacing control box verify condition by completing Power on Test again and verify you are connecting test light to the top terminal marked "light". Recheck all trailer and control box connections

Figure 1

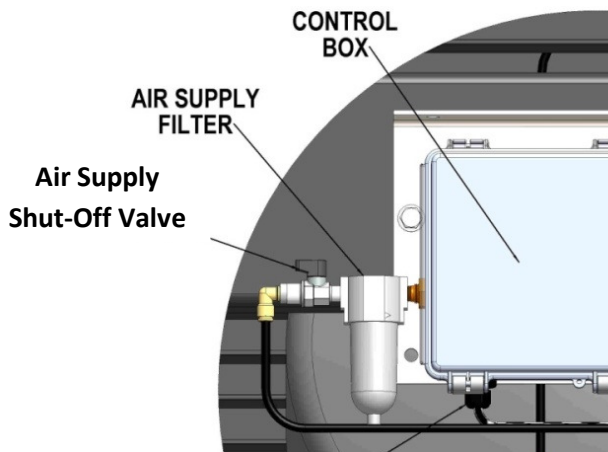


Figure 2

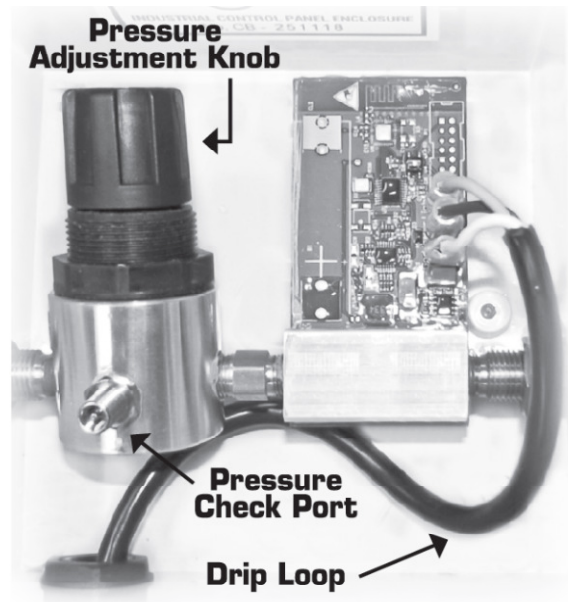


Figure 3



Yellow Wire is power to Driver Warning Lamp at nose of trailer 12 volts when light is on

Brown Wire is 12 volt supply at 7 pin connector at nose of trailer

White Wire is Ground wire at 7 pin connector at nose of trailer