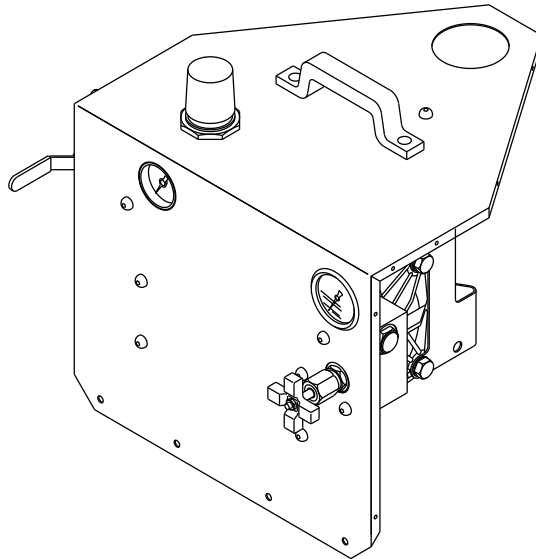




# OPERATION & SERVICE MANUAL



## **Model: 18-4201-1010 Pneumatic Nitrogen Booster**

11/2023 - Rev. 06

REVISION	DATE	TEXT AFFECTED
05	01/2005	Modified model number throughout
06	11/2023	Major revision



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# Nitrogen Booster

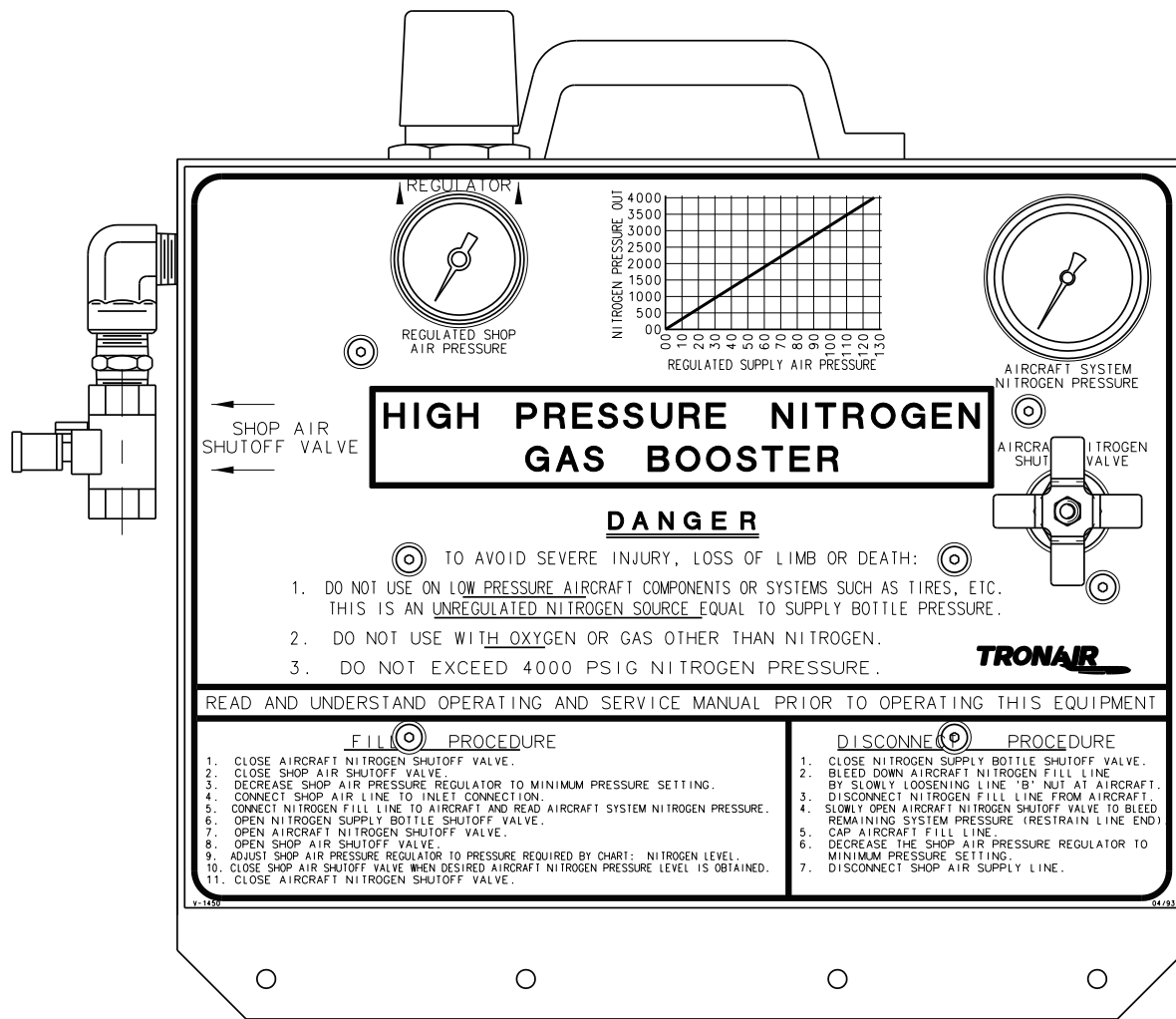


FIGURE 1

## Exploded View of Nitrogen Booster

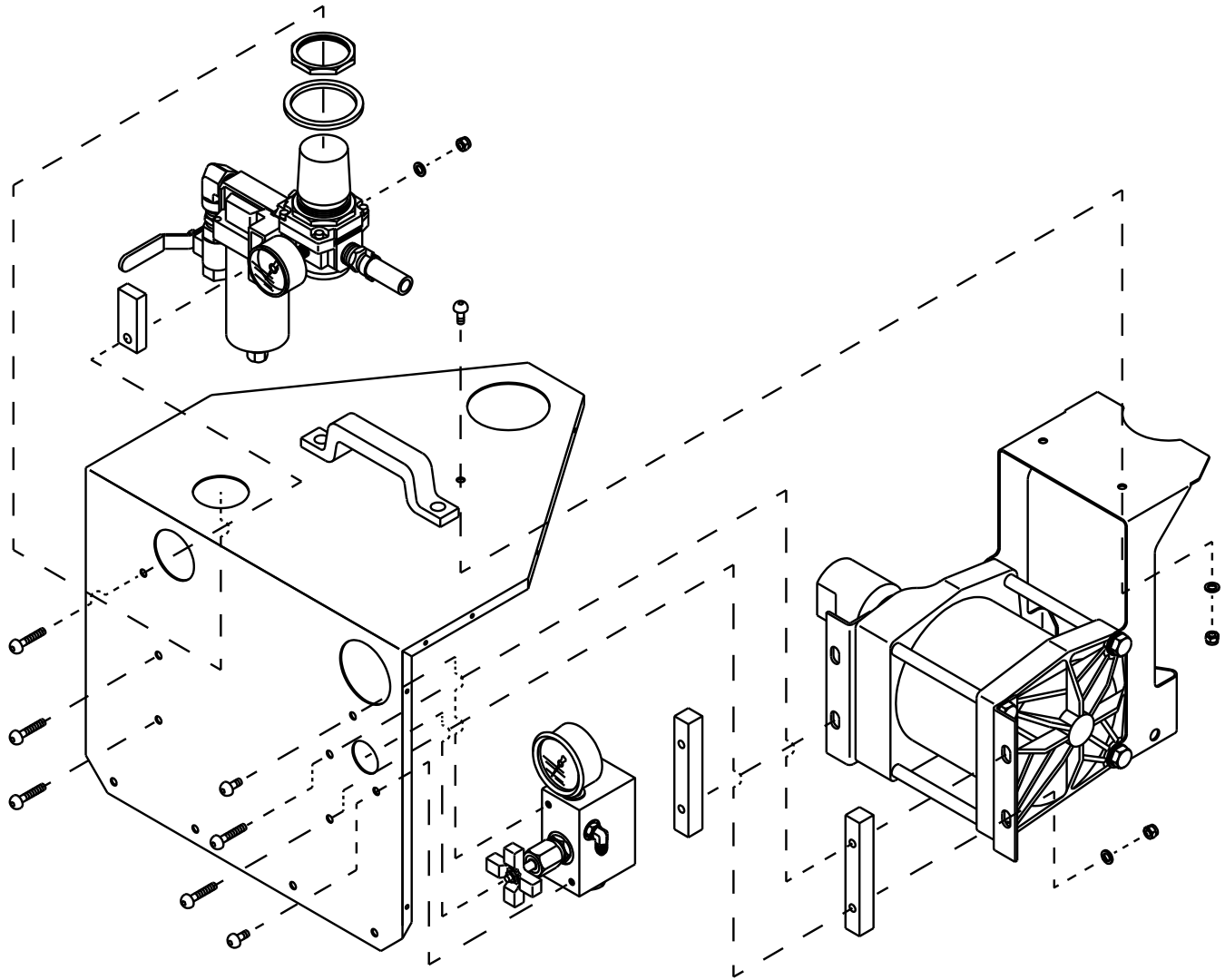


FIGURE 2

## Schematic & Component Location

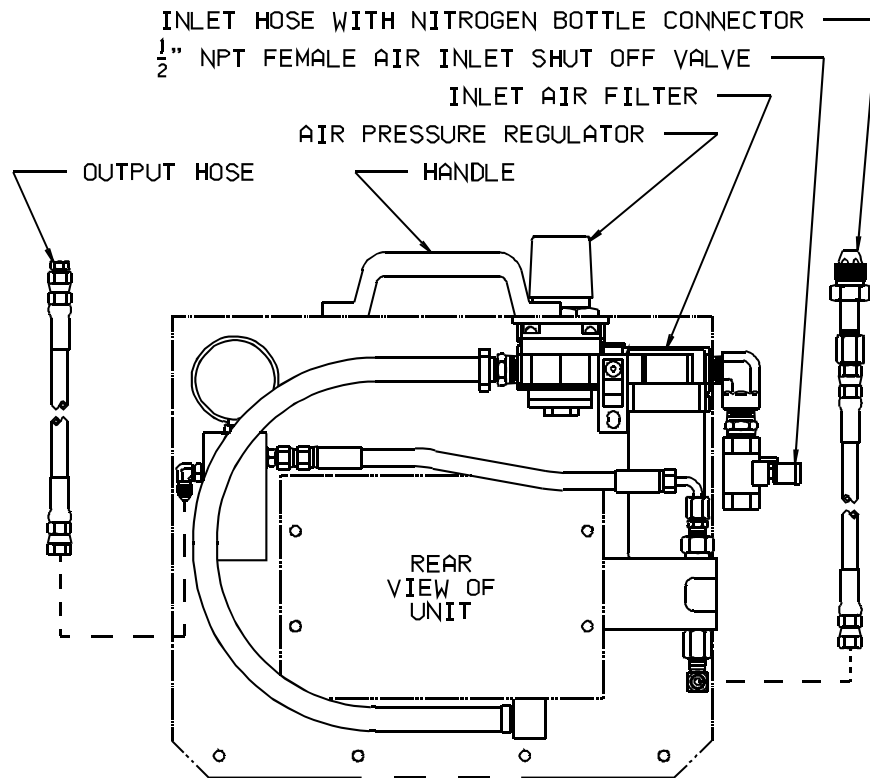
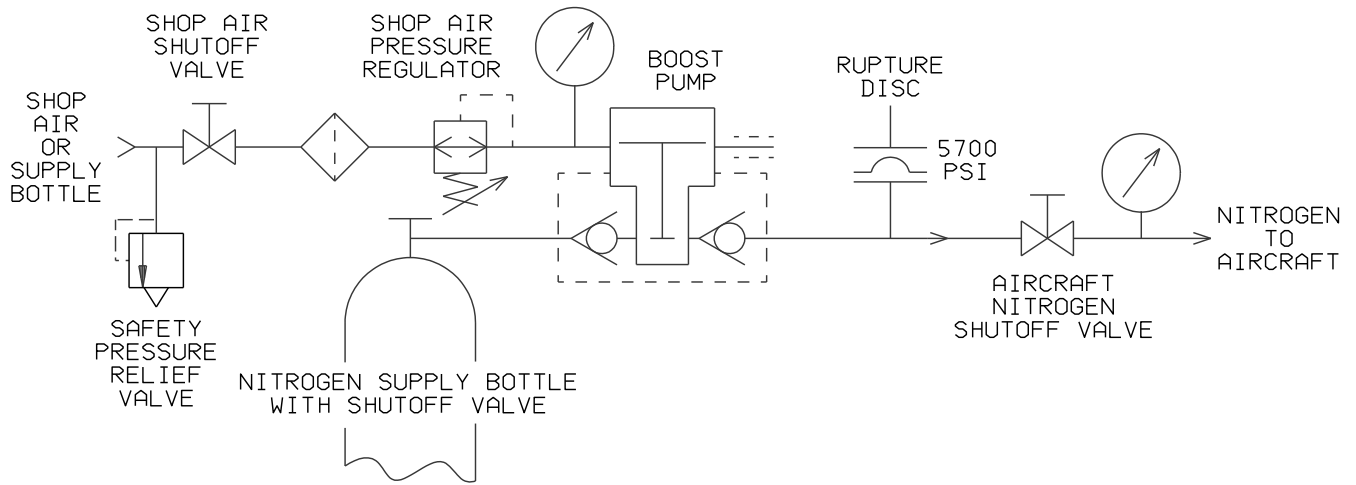


FIGURE 3

This product can not be modified without the written approval of Tronair, Inc. Any modifications done without written approval voids all warranties and releases Tronair, Inc., its suppliers, distributors, employees, or financial institutions from any liability from consequences that may occur. Only Tronair OEM replacement parts shall be used.

## 1.0 PRODUCT INFORMATION

### 1.1 DESCRIPTION



#### CAUTION!

**It is mandatory that this instruction manual be read and understood by all persons operating this high pressure Nitrogen booster.**

The Tronair Model 18-4201-1010 Pneumatic Nitrogen Booster provides the capability of boosting remaining lower pressure Nitrogen from supply bottles to the required higher aircraft system pressure; up to 4,000 psig maximum.

This Nitrogen Booster incorporates an air driven pressure amplifier which cycles automatically with 150 psig (10.3 bars) maximum air pressure input at 80 SCFM volume.



#### WARNING!

##### TO AVOID SERIOUS INJURY, LOSS OF LIMB OR DEATH:

1. **DO NOT use on LOW PRESSURE aircraft components or systems such as tires, etc. This is an UNREGULATED NITROGEN SOURCE equal to supply pressure.**
2. **DO NOT use with OXYGEN or gas other than Nitrogen.**
3. **DO NOT exceed 4,000 psig (276 bars) Nitrogen pressure.**

### 1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

### 1.3 MANUFACTURER

**TRONAIR, Inc.**

1 Air Cargo Pkwy East  
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301

Fax: (419) 867-0634

E-mail: sales@tronair.com

Website: www.tronair.com

### 1.4 SPECIFICATIONS/FEATURES

Length ..... 20 in (50.8 cm)

Width ..... 20 in (50.8 cm)

Height ..... 15 in (38.1 cm)

Weight ..... 45 lb (20.4 kg)

Output Hose ..... 15 ft (4.6 m) long with #4, 37° JIC (female 37° flared swivel fitting) at aircraft hook-up end

Nitrogen Output Rating ..... 4,000 psig (276 bar) Maximum. (Do Not Exceed)

Minimum Supply Bottle Pressure ..... 500 psig (34.5 bar)

Shop Air Input ..... 80 SCFM at 150 psig (10.3 bar) Maximum

Shop Air Input Connection ..... 1/2 in (1.27 cm) Female NPT

Temperature Range ..... 0° to 200°F (17.7° to 93.3° C)

Unit mounts on Nitrogen supply bottle or Tronair Bottle Cart, Part Number 12-3104-0000

System pressure relief is provided by a non-resettable, 5,700 psi (393 bar) rupture disc assembly

## 2.0 SAFETY INFORMATION

### 2.1 USAGE AND SAFETY INFORMATION

To ensure safe operations please read the following statements and understand their meaning. Also refer to your equipment manufacturer's manual for other important safety information. This manual contains safety precautions which are explained below. Please read carefully.



#### WARNING!

Warning is used to indicate the presence of a hazard that can cause **severe personal injury, death, and/or substantial property damage** if the Warning Notice is ignored.



#### CAUTION!

Caution is used to indicate the presence of a hazard, which will or can cause **minor personal injury or property damage** if the Caution Notice is ignored.

**3.0 TRAINING****3.1 TRAINING REQUIREMENTS**

The employer of the operator is responsible for providing a training program sufficient for the safe operation of the unit.

**3.2 TRAINING PROGRAM**

The employer provided operator training program should cover safety procedures concerning use of the unit in and around the intended aircraft at the intended aircraft servicing location.

**3.3 OPERATOR TRAINING**

The operator training should provide the required training for safe operation of the unit.

**NOTE: Maintenance and Trouble Shooting are to be performed by a skilled and trained technician.**

**4.0 PREPARATION FOR USE****CAUTION!**

**It is mandatory that this instruction manual be read and understood by all persons operating this high pressure Nitrogen booster.**

**4.1 SAFETY INSTRUCTIONS****A. General**

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance and trouble shooting which should be read, understood, and followed for the safe and effective use of this equipment.

**B. Safety**

The operation, maintenance, and trouble shooting of this high pressure Nitrogen booster requires practices and procedures which ensure personal operator safety and the safety of others. Therefore, this equipment is to be operated and maintained only by qualified persons in accordance with this manual and all applicable local codes.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words "**WARNING**" and "**CAUTION**" which identify different levels of hazard.

**WARNING!**

**Denote practices which if not carefully followed, could result in serious personal injury or death, and/or minor personal injury or damage to this equipment.**

**4.2 ASSEMBLY**

**Unpacking:** This Nitrogen booster has been thoroughly inspected and tested prior to packaging and shipment. After opening the shipping container and removing the Booster, inspect it thoroughly for shipping damage.

Nitrogen equipment must be kept clean and free from contaminants at all times. It is imperative that all installation, inspection, maintenance, testing and servicing of Nitrogen system components be done by trained and qualified personnel using approved procedures.

System pressure relief is provided by a 5700 psi (393 bar) non-resettable rupture disc assembly. When the Nitrogen booster is installed onto a Nitrogen supply bottle, the rupture disc assembly is safely directed toward the ground. Care should be taken to keep the area below the Nitrogen booster clear at all times in case of rupture disc rupture. The rupture disc itself is a non-fragmenting single use disc, and under normal operation, provides a long service life.

1. Position Nitrogen Booster onto a secured Nitrogen supply gas bottle.
2. Clean out Nitrogen supply gas bottle valve outlet and install the Nitrogen booster inlet brass fitting and hose. Stop and inspect any indication of cross-threading or galling.
3. Generally, check unit and assure the tightness of all fittings, nuts and bolts.

**5.0 OPERATION****5.1 PREPARATION FOR OPERATION****WARNING!**

- **Do not attempt to circumvent the rupture disc assembly.**
- **If the rupture disc fails, it is imperative that an approved replacement rupture disc be installed and maintained for proper operation of this equipment.**
- **To ensure safety, only install approved rupture discs, breaking rings and O-rings in the pressure relief cavity. See Illustrated Parts List for replacement components.**

1. Never operate this Nitrogen booster if rupture disc is not in place.
2. Be sure all valves and controls are in the closed or "OFF" position.
3. Decrease air pressure regulator to the minimum pressure setting. The regulator adjustment knob is the locking type. Pull the knob away from regulator body until the orange band is visible. Counter-clockwise rotation reduces pressure.
4. Connect Nitrogen fill line loosely to aircraft and purge line by **slowly** cracking open Nitrogen supply bottle shutoff valve.

**WARNING!**

**Be sure fill line is secured prior to purging the unit. This will prevent the hose from "whipping" about if too much Nitrogen is allowed to flow through the unit.**

5. Tighten Nitrogen fill line connection at aircraft.
6. Connect shop air line to air inlet connection.
7. The high pressure Nitrogen booster is now ready to charge an aircraft Nitrogen system.

**5.2 CHARGING THE AIRCRAFT NITROGEN SYSTEM**

1. After the Nitrogen booster has been properly installed, **slowly** open Nitrogen supply bottle shutoff valve. This will charge both the Nitrogen booster and the aircraft Nitrogen system to supply bottle pressure. If the Nitrogen supply bottle pressure is lower than the aircraft Nitrogen system pressure, check valves in the Nitrogen booster will prevent back flow from the aircraft.
2. **Slowly** open shop air shutoff valve to start pump in the Nitrogen booster.
3. Adjust the shop air pressure regulator to obtain desired output Nitrogen pressure required by the chart. The regulator adjustment knob is the locking type. Pull the knob away from regulator body until the orange band is visible. Adjust as necessary and push the knob back into its locked position to prevent accidental changes. Clockwise rotation increases pressure, and counter-clockwise rotation reduces pressure. Since the Nitrogen booster pump compression ratio is 30:1, 140 psig (9.7 bar) of shop air inlet will develop approximately 4,000 psig (276 bar) of output Nitrogen pressure.
4. Close shop air shut off valve when desired aircraft Nitrogen pressure level is obtained.

**CAUTION!**

**Continued operation of this Nitrogen booster at pressures above 4,100 psi may result in premature disc rupture.**

**5.3 IF RUPTURE DISC RUPTURES**

The pressure relief incorporated in this unit is provided by a rupture disc assembly. If the Nitrogen system pressure exceeds 5,700 psi (393 bar)  $\pm$  05%, the disc will rupture. If rupture occurs, the following will result:

1. The onboard aircraft Nitrogen tank will bleed down until empty.
2. The Nitrogen supply bottle will bleed down until the supply valve is shut off.
3. The Nitrogen booster will remain inoperable until a replacement rupture disc is installed in the unit, since the rupture disc cannot be reset. See Section 5.1 Rupture Disc Replacement.

**5.4 DISCONNECTING NITROGEN BOOSTER FROM AIRCRAFT**

1. **Slowly** close Nitrogen supply bottle shut off valve. This will stop inlet Nitrogen flow.
2. Decrease the shop air pressure regulator to minimum pressure setting. This will stop the booster pump from compressing existing Nitrogen.
3. **Slowly** loosen, bleed down, and disconnect aircraft Nitrogen fill line from aircraft.
4. Cap aircraft Nitrogen fill line to prevent contamination.
5. Disconnect Nitrogen supply bottle line from supply bottle.
6. Cap Nitrogen supply bottle line to prevent contamination.
7. Disconnect shop air supply line.

**6.0 PACKAGING AND STORAGE****6.1 STORAGE**

Store the unit in a clean, dry area when not in use.

Be sure that all hoses are capped and the unit is covered for the duration of unit storage to ensure Nitrogen system cleanliness for future aircraft system recharging.

**7.0 TROUBLESHOOTING**

<b>TROUBLE</b>	<b>PROBLEM CAUSE</b>	<b>REMEDY</b>
Will not run at low drive pressures (10-25 psig)	Excess friction of spool O-rings 568017	Re-lubrication or replacement of O-rings
Booster will not cycle, or slow cycling.	Leakage of flow and/or pilot tubes	Replace O-rings on flow or pilot tubes
	Indications that one or both pilot valves are malfunctioning	Remove pilot valves, inspect and/or replace
	Buildup of residue in muffler	Remove muffler and clean
	Nitrogen inlet pressure too low	Increase inlet pressure to 350 psig (24.1 bar) minimum
"False" or double cycling, or continuous exhaust bleeding (air drive)	Small inlet supply line, restriction not allowing drive seals to function properly	Increase air drive piping to 1/2 inch (1.27 cm) ID and test system and/or replace O-rings in the following order: a. 56015 inside hex exhaust port b. 568017 spool O-rings c. 568020 sleeve O-ring
	Rod seal leakage	Replace rod seals and O-ring
Unit will not "dead head" or stalls	Check valves contaminated	Remove, inspect, clean or replace as necessary
	Insufficient pressure at gas inlet	Increase inlet pressure to 350 psig (24.1 bars) minimum
	High pressure piston leakage	1. Shut off air drive and remove muffler and cycling spool completely 2. Apply pressure to inlet port 3. If leakage is audible out of Nitrogen seal vent port, replace gas piston seals
Excessive moisture or liquid outside of muffler	Air filter full of water	Drain air filter
Nitrogen will not flow through gas section with air drive "Off"	Nitrogen filters plugged or contaminated	Clean or replace filter elements

**8.0 MAINTENANCE**

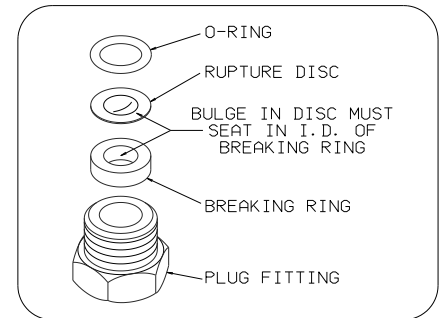
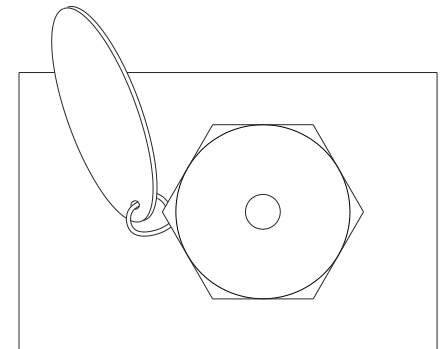
- All maintenance performed on this high pressure Nitrogen booster shall be conducted in accordance with all applicable codes governing the handling, operation, installation and trouble shooting for high pressure Nitrogen operation. Maintenance is to only be done by qualified persons.
- See Appendix I for Air Driven Gas Booster Compressor Maintenance Instructions.
- Twice a year, or sooner if driven with Nitrogen or used heavily, the air cycling valve (Part Number 17567) in the Booster Pump should be lubricated. The air cycling valve is separate from the Nitrogen side of the pump and can be serviced without danger of Nitrogen system contamination. Reference Appendix I, Air Valve Maintenance Section and Air Cycling Valve Seals Kit (Part Number 16771).
- The gauges on this unit should be inspected and calibrated annually to maintain and ensure accuracy.
- The inlet shop air filter element should be inspected and replaced annually or when a pressure drop of 15 psig (1.03 bar) is reached.
- Generally, keep the entire unit clean and free from any contaminants. Visually inspect for any system leaks or damage. Correction of any problems prior to unit operation is imperative for safe operation.

**WARNING!**

**Never apply high pressure gas to the high pressure section of this booster whenever the air driven section of this unit is disassembled, or when maintenance is being performed on unit.**

**8.1 RUPTURE DISC REPLACEMENT**

1. Close all valves, decrease air pressure regulator to minimum pressure setting, and **slowly** disconnect unit from supply bottle and aircraft.
2. Remove unit from supply bottle (optional.)
3. Locate replacement rupture disc and rupture disc identification tag. **See Figures 4 & 5.**
4. Locate rupture disc port on bottom of cartridge block.
5. Remove old identification tag from plug fitting and discard wire and old rupture disc identification tag.
6. Remove plug, breaking ring, and failed rupture disc.
7. Inspect O-ring in port, replace if necessary (see Parts List.)
8. Place new rupture disc on O-ring in port with "bulge" facing the breaking ring.
9. Re-install breaking ring over rupture disc and replace plug.
10. Tighten plug to 100 in-lb (11.3 N-m) torque.
11. Wire identification tag included with new rupture disc to fitting. **See Figure 5.**
12. Unit is now ready to resume operation.

**FIGURE 4 - Rupture Disc****FIGURE 5  
Identification Tag and Wire****9.0 PROVISION OF SPARES****9.1 SOURCE OF SPARE PARTS**

Spare parts may be obtained from the manufacturer:

<b>TRONAIR, Inc.</b>	Telephone: (419) 866-6301 or 800-426-6301
1 Air Cargo Pkwy East	Fax: (419) 867-0634
Swanton, Ohio 43558 USA	E-mail: sales@tronair.com
	Website: www.tronair.com

For Spare Parts, Operations & Service Manuals or Service Needs:  
Scan the QR code or visit [Tronair.com/aftermarket](http://Tronair.com/aftermarket)

**9.2 RECOMMENDED SPARE PARTS LISTS**

Reference the following page(s) for Replacement Parts and Kits available.

See Air Driven Gas Booster Compressor manufacturer for Replacement Parts.





## 10.0 GUARANTEES/LIMITATION OF LIABILITY

Tronair products are warranted to be free of manufacturing or material defects for a period of one year after shipment to the original customer. This is solely limited to the repair or replacement of defective components. This warranty does not cover the following items:

- a) Parts required for normal maintenance
- b) Parts covered by a component manufacturers warranty
- c) Replacement parts have a 90-day warranty from date of shipment

If you have a problem that may require service, contact Tronair immediately. Do not attempt to repair or disassemble a product without first contacting Tronair, any action may affect warranty coverage. When you contact Tronair be prepared to provide the following information:

- a) Product Model Number
- b) Product Serial Number
- c) Description of the problem

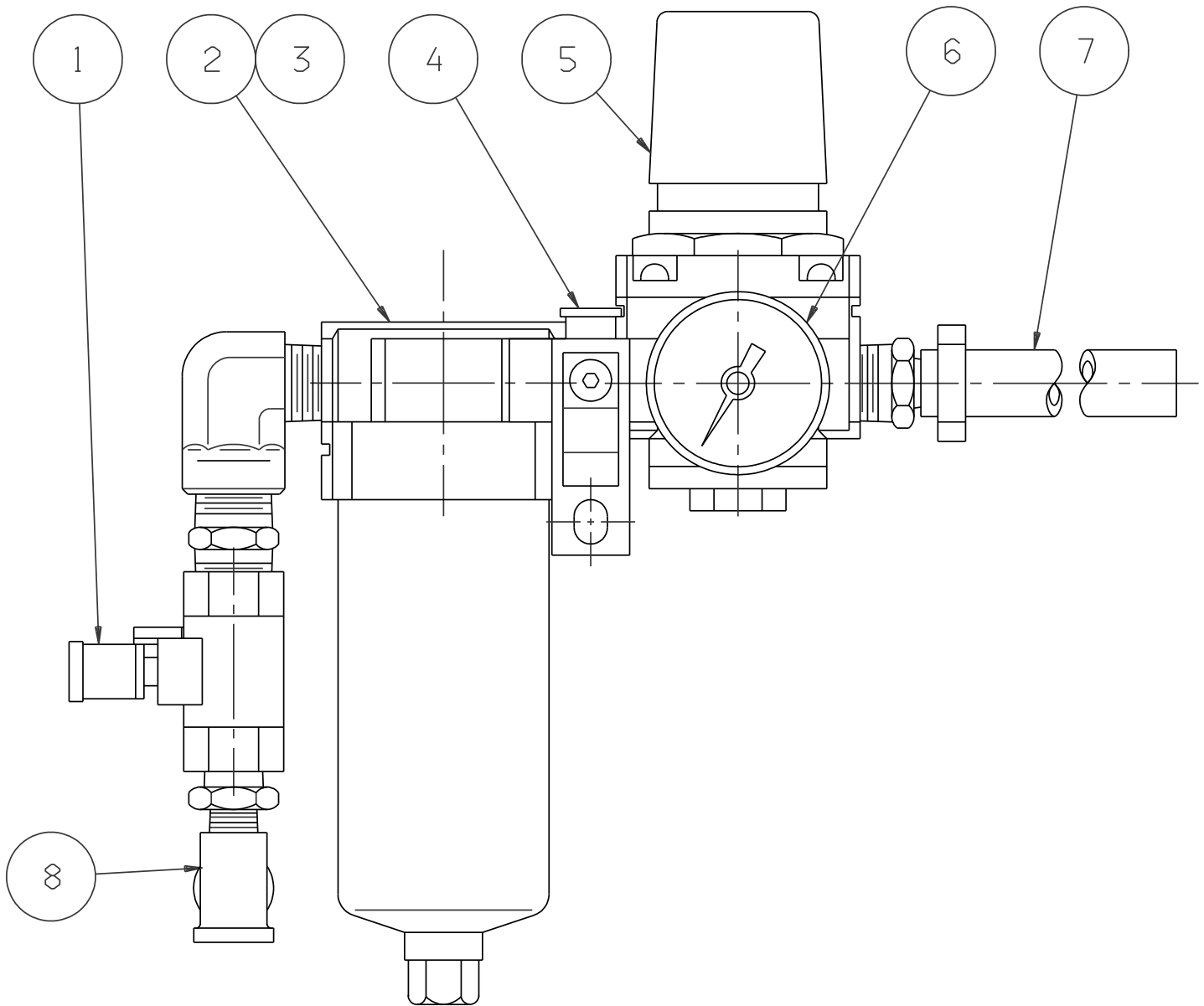
If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA in advance of returning an item will result in a service fee. A decision on the extent of warranty coverage on returned products is reserved pending inspection at Tronair. Any shipments to Tronair must be shipped freight prepaid. Freight costs on shipments to customers will be paid by Tronair on any warranty claims only. Any unauthorized modification of the Tronair products or use of the Tronair products in violation of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied.

The obligations of Tronair expressly stated herein are in lieu of all other warranties or conditions expressed or implied. **Any unauthorized modification of the Tronair products or use of the Tronair products in violations of cautions and warnings in any manual (including updates) or safety bulletins published or delivered by Tronair will immediately void any warranty, express or implied and Tronair disclaims any and all liability for injury (WITHOUT LIMITATION and including DEATH), loss or damage arising from or relating to such misuse.**

## 11.0 APPENDICES

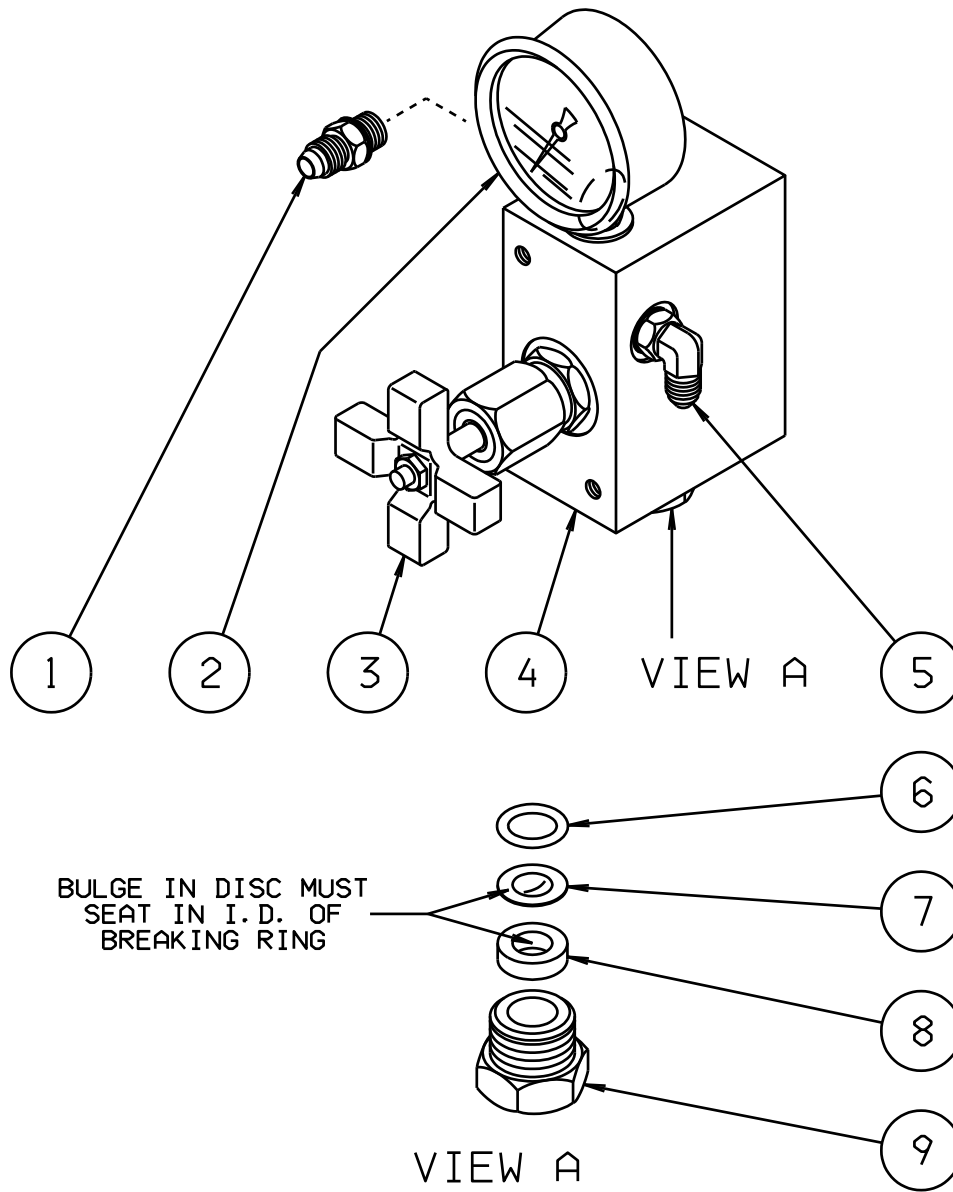
APPENDIX I Instrument Certification Notice

### Parts List



Item	Part Number	Description	Qty
1	HC-1137	VALVE, ½" NPT BRASS BALL	1
2	PC-1032	FILTER	1
3	PC-1043	ELEMENT, REPLACEMENT FILTER	1
4	PC-1035-M	BRACKET, L-TYPE	1
5	PC-1034	REGULATOR	1
6	HC-1831	GAUGE, PRESSURE	1
7	K-2144	HOSES, REPLACEMENT AIR	1
8	PC-1017-02-150	VALVE, SAFETY	1

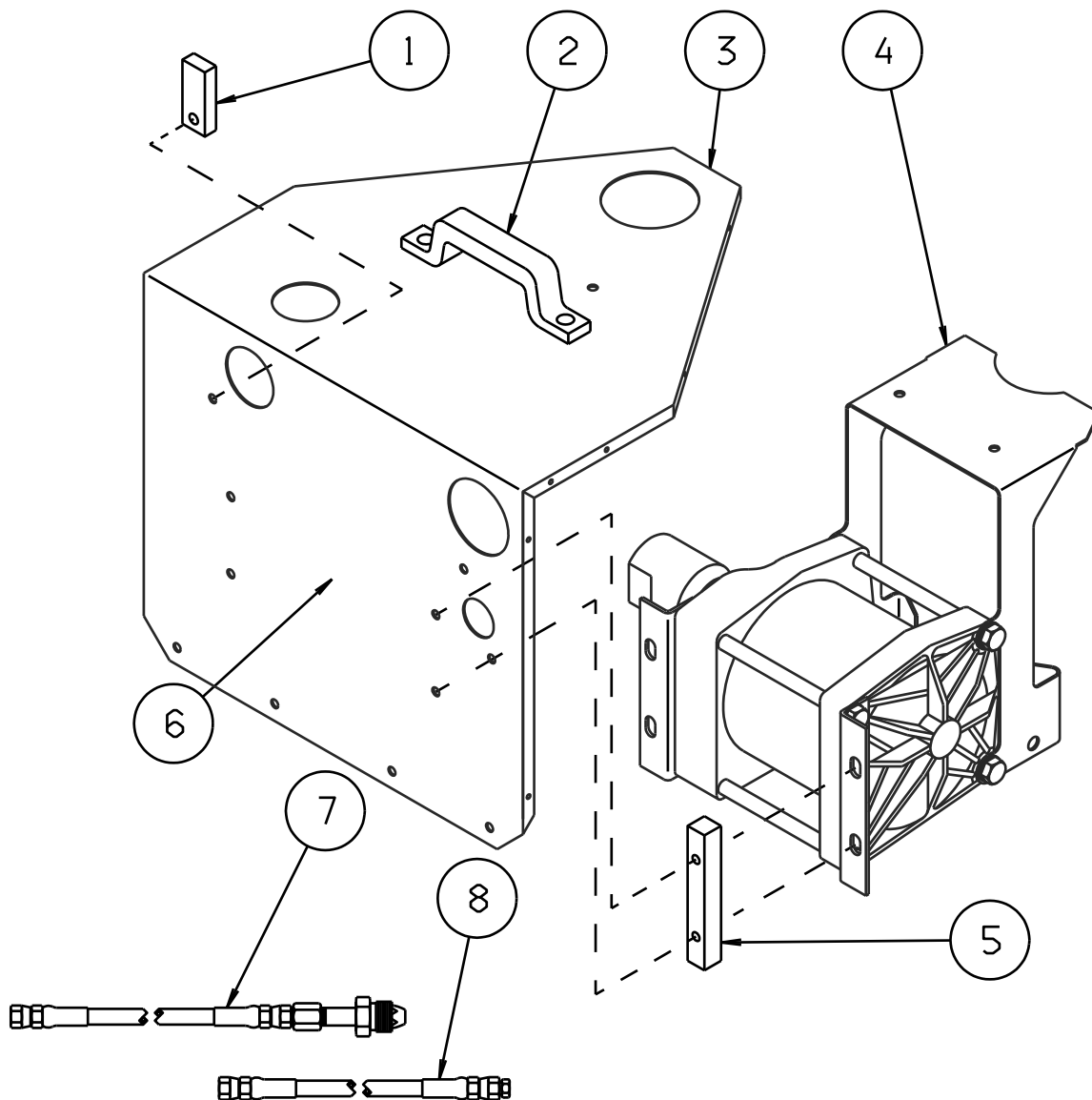
### Parts List



Item	Part Number	Description	Qty
1	N-2007-03-S-B	CONNECTOR, STRAIGHT THREAD, #4 X 1/4" JIC 37°	1
2	HC-1644	GAUGE, PRESSURE	1
3	HC-1254	VALVE, NEEDLE	1
4	J-2036	BLOCK, CARTRIDGE	1
5	N-2001-03-S-B	ELBOW, STRAIGHT THREAD, #4 X 1/4" JIC 37°	1
6	HC-2000-208	O-RING	1
7	H-1830-02	◆ DISC, RUPTURE (5,700 PSI/393 BARS)	
8	H-1831	RING, BREAKING	1
9	N-2065	PLUG, MODIFIED	1

◆ Working pressure is 70% of burst pressure.

### Parts List



Item	Part Number	Description	Qty
1	J-2038	SPACER, BRACKET	1
2	H-1780	HANDLE, GRAB	1
3	S-1385-01	PANEL	1
4	Z-2512-00	ASSEMBLY, PUMP	1
5	J-2037	SPACER, PUMP	2
6	V-1450	LABEL, NITROGEN BOOSTER (NOT SHOWN)	1
7	Z-2540-00	ASSEMBLY, INLET HOSE (36 IN/91.44 CM LONG)	1
8	Z-2541-00	ASSEMBLY, OUTPUT HOSE (180 IN/4.6 M LONG)	1





## **APPENDIX I**

### **Instrument Certification Notice**





## Instrument Certification Notice

The gauge Certificates of Calibration supplied for the gauge(s) on this unit contain the calibration data for the actual instrument calibrated, along with the calibration date of the **STANDARD** used to perform the calibration check.

The due date for re-calibration of the instrument should be based upon the date the instrument was placed in service in your facility. Re-calibration should be done on a periodic basis as dictated by the end user's quality system or other overriding requirements.

Note that Tronair, Inc. does not supply certificates of calibration on flow meters or pyrometers unless requested at the time of placed order. These instruments are considered reference indicators only and are not critical to the test(s) being performed on the aircraft.