# Operation & Service Manual

# Model: K-3836
# Four Bottle
# Nitrogen Cart with
# Manifold/Regulator

# ***

# Upgrade Kit

02/2004 - Rev. OR

**Includes Illustrated Parts List**


***Tronair, Inc.***
*1740 Eber Road*
*Holland, Ohio 43528-9794*
*USA*
*Telephone: (419) 866-6301 • 800-426-6301*
*Fax: (419) 867-0634*
**Web Site: www.tronair.com E-mail: sales@tronair.com**

**K-3836**
**Four Bottle Nitrogen Cart with**
**Booster and Manifold/Regulator Upgrade Kit**

## TABLE OF CONTENTS

**PAGE**

**K-3836**
**Four Bottle Nitrogen Cart with**
**Booster and Manifold/Regulator Upgrade Kit**

## 1.0 GENERAL DESCRIPTION

The Tronair Four Bottle Cart with manifold and low pressure regulator Upgrade Kit is designed to retrofit the Tronair Model 12-3104-0000.

The Tronair Four Bottle Cart is designed to transport Nitrogen bottles which are used in the aviation industry. The system contains a low pressure regulator which is for operating servicing needs of 0 – 500 psi (34.5 bars).

**WARNING!**

**To Avoid Serious Injury, Loss of Limb, or Death:**

1. **DO NOT use High Pressure Nitrogen on Low Pressure aircraft components or systems such as tires, etc.**
2. **DO NOT use with Oxygen or gases other than Nitrogen.**
3. **DO NOT exceed 3000 psig (276 bars) Inlet Nitrogen pressure.**
4. **Servicing and maintenance if nitrogen systems shall be done by only trained and qualified personnel using approved procedures.**

## 2.0 SPECIFICATIONS/FEATURES

**Dimensions: (After Kit is installed on Tronair Model 12-3104-0000)**

- Height: 36-7/16 inches (92.5 cm)
- Length: 80-1/8 inches (203.5 cm)
- Width: 30-1/8 inches (77.5 cm)
- Weight: 300 lbs (136 kg)

**Cart:**

- Easy loading
- Use with all standard nine inch (9 in/22.9 cm) diameter Nitrogen bottles; CGA 580 connection
- Adjustable bottle stop
- Bottles fully captured
- Pneumatic tires
- Parking brake
- Hose compartment
- Instrument Panel

**Low Pressure Regulator:**

- 0-500 psi (34.5 bars) output
- 15 foot (4.6 m) service hose

## 3.0 SAFETY INSTRUCTIONS

### 3.1 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.

### 3.2 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.

*3.2 Safety continued on following page.*

3.2 SAFETY *(continued)*

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.

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

WARNING: Denote practices which, if not carefully followed, could result in serious personal injury and/or death.

CAUTION: Denote practices which, if not carefully followed, could result in minor personal injury or damage to this equipment.

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

## 4.0 PREPARATION FOR USE/ASSEMBLY INSTRUCTION

4.1 KIT INSTALLATION

a. Assemble Item 1, Instrument Panel Assembly, To Tronair Model 12-3104-0000, 4 Bottle Cart, using Mounting Hardware Item 2,3,4,5, And 6 (See Figure 1).
b. Attach Nitrogen Labels, Item 7, To The Cart (See Figure 2).

**CAUTION!**

**Only use bottles for which this unit was designed: Nine (9) inch (22.9 cm) diameter, 3000 psig (207 bars) maximum pressure with CGA 580 connection.**

1. Install bottles by removing bottle stop pin and sliding bottle stop toward rear.
2. Place bottles in cart, slide bottles forward against front stop. If using only one or two bottles load the lower bottle compartment, this will prevent the cart from becoming too top heavy.
3. Slide bottle stop securely against the back of the bottles and install bottle stop pin.

4.1 KIT INSTALLATION *(continued)*

**CAUTION!**
**Maximum towing speed is 10 mph (16 km/h).**

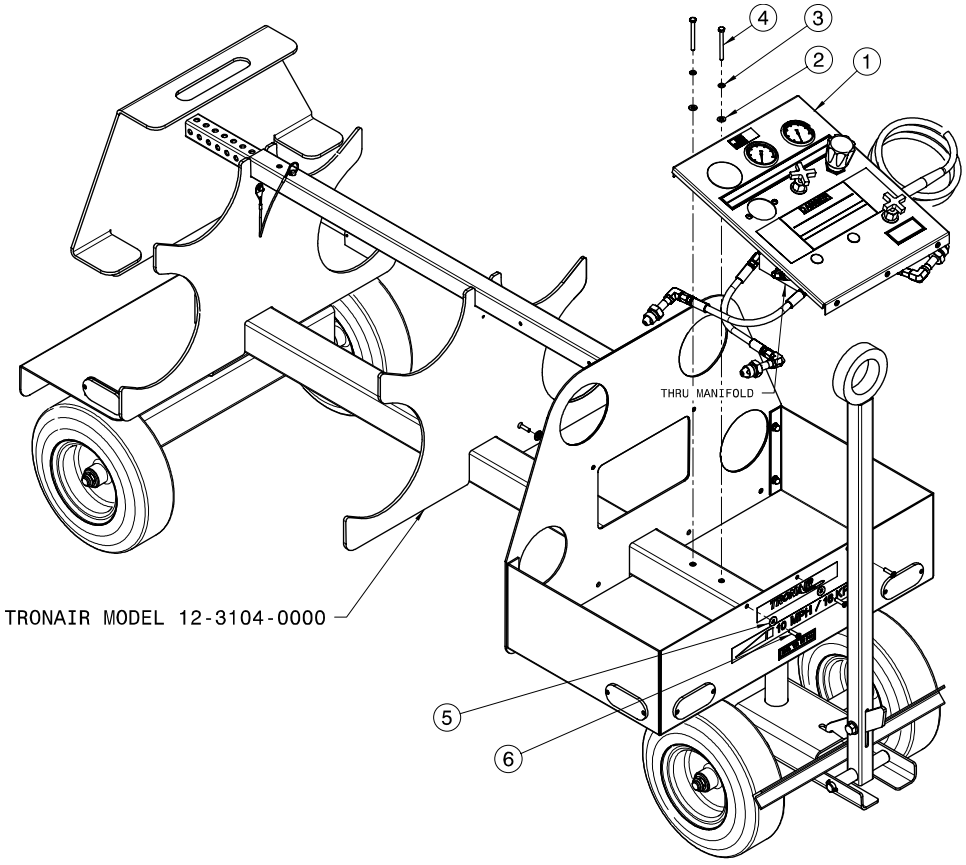



**FIGURE 1: Tronair Model 12-3104-0000**

4.1 Lit installation continued on following page

4.1 KIT INSTALLATION *(continued)*

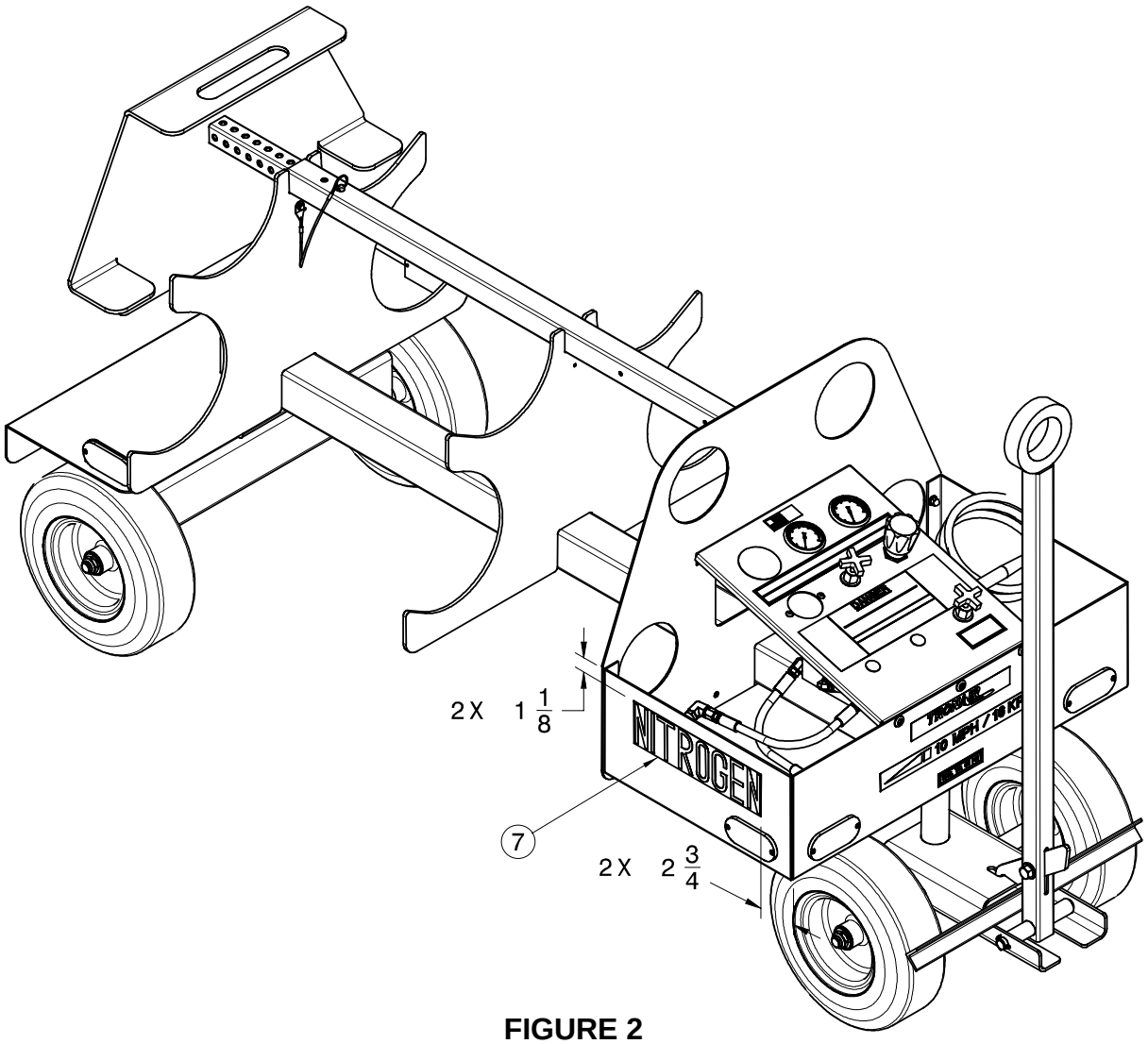
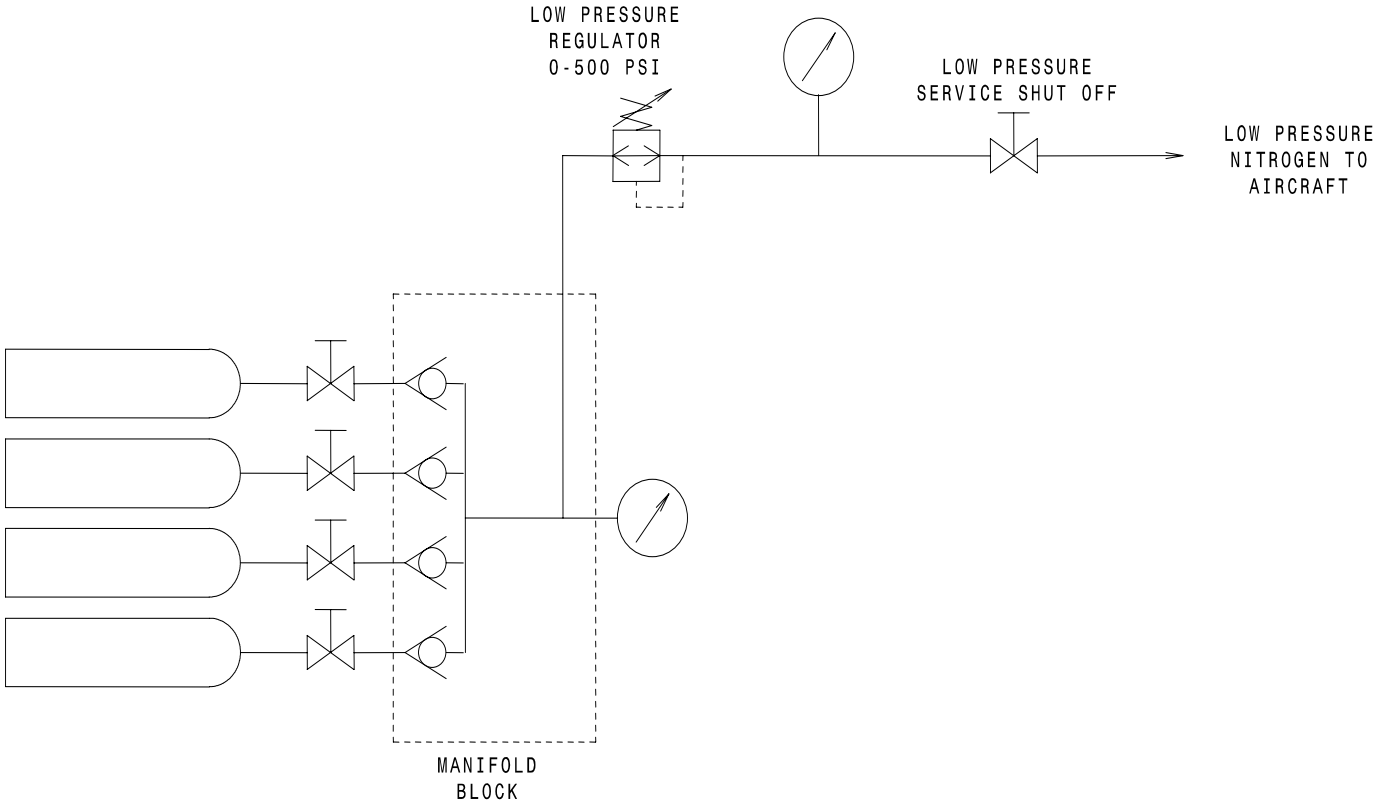



**FIGURE 2**

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | ---------- | Assembly, Instrument Panel | 1 |
| 2 | G-1250-1050N | Flatwasher, ¼ Narrow | 2 |
| 3 | G-1251-1050R | Lockwasher, ¼ Regulator | 2 |
| 4 | G-1100-105026 | Bolt, Hex Head, Grade 5, ¼ - 20 x ¾"Long | 2 |
| 5 | G-1489 | Washer, Finish | 5 |
| 6 | G-1158-106110 | Screw, Machine ¼ 20 x 1" Long | 5 |
| 7 | V-1464 | Label, Nitrogen | 2 |

**4.0 PREPARATION FOR USE/ASSEMBLY INSTRUCTION** *(continued)*

# Figure 3
# Schematic



## 5.0 OPERATION OF NITROGEN 4-BOTTLE CART

**WARNING!**

**To Avoid Serious Injury, Loss of Limb, or Death:**

1. **DO NOT use high pressure Nitrogen on aircraft components designed for low pressure Nitrogen.**
2. **DO NOT use with oxygen or gas other than Nitrogen.**
3. **DO NOT exceed 3000 psi (207 bars) inlet pressure.**
4. **Servicing and maintenance of Nitrogen systems shall be done by only trained and qualified personnel using approved procedures.**

**General:** Information presented in this manual and on various labels on this unit pertains to equipment Specifications, Installation, Operation, Maintenance and Trouble Shooting which should be read, understood and followed for the safe and effective use of this equipment.

**Training:** Read this entire manual prior to operation of the unit. We encourage our customers to call Tronair to discuss any operating or testing requirements. Telephone 419-866-6301 or 800-426-6301.

### 5.1 GENERAL SAFETY REQUIREMENTS

**Pressures:** Gasses under pressure are a potential hazard in the form of stored energy. Accidents can occur when this energy is improperly handled. Be sure that all equipment used is compatible and designed to control the pressures encountered.

**Nitrogen:** Nitrogen is chemically stable, nonflammable, and does not support combustion.

**Handling:** Nitrogen handling must be done with care. The rapid expansion of Nitrogen gas from a high pressure source to an area of low pressure, can produce cryogenic temperatures which cause severe burns.

### 5.2 BOTTLE CONNECTION INSTRUCTIONS

1. Rotate the Nitrogen supply bottles so that the manifold inlet hoses may be easily connected to the bottles. Make sure the hoses are not kinked or damaged.
2. Check that Nitrogen supply bottle shut off valve is closed. Recheck all fittings for tightness.
3. Clean out Nitrogen supply gas bottle valve outlet on one bottle and install Nitrogen booster inlet brass fitting and hose. Stop and inspect any indication of cross-threading or galling. Repeat for the remaining three (3) bottles.
4. If less than four (4) bottles are used, plug or cover unused inlet hoses to ensure Nitrogen system cleanliness.

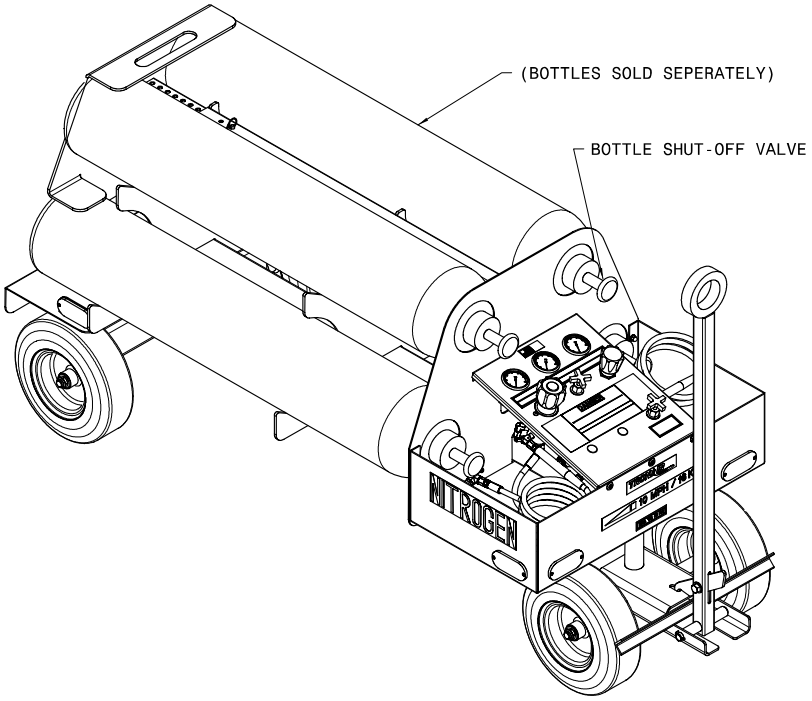
### 5.3 TO READ INDIVIDUAL BOTTLE PRESSURE

1. Open a bottle shutoff valve.
2. Read pressure on bottle pressure gauge.
3. Close bottle shutoff valve.
4. Open manifold bleed valve to relieve pressure.
5. close manifold to bleed valve.
6. Repeat procedure for other bottles.

## 5.0 OPERATION OF NITROGEN 4-BOTTLE CART *(continued)*

### 5.4 EFFICIENT USE OF SYSTEM

(Reference ***Figure 7***)
Maximum Nitrogen may be removed from supply bottles if aircraft are serviced from the lowest pressure bottle first. In this manner, the most Nitrogen may be removed from each bottle. Even bottles with relatively low pressures may be used to service aircraft if the aircraft has a depleted system.



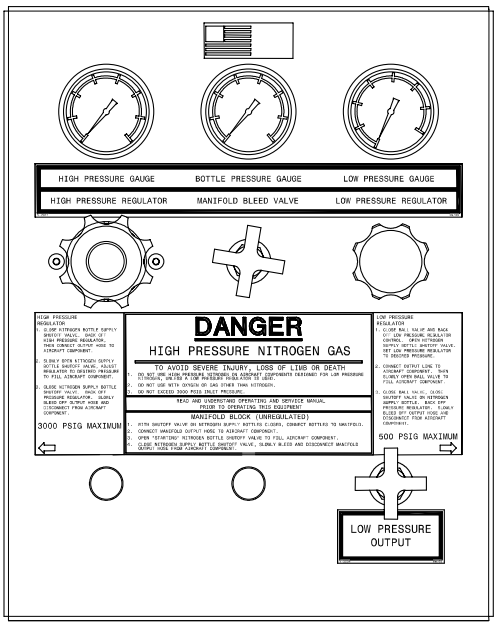




**FIGURE 2 & 3 - Efficient Bottle Usage**

### 5.5 NITROGEN SYSTEM CONNECTION

**WARNING!**

**If there are any differences between the following instructions and the aircraft maintenance manual, the aircraft maintenance manual will take precedence.**

**Reference Illustrated Parts Lists for replacement components.**

1. Be sure all valves and controls are in the closed or “Off” position.
2. Decrease all pressure regulators to the minimum pressure setting. The regulator adjustment knobs are the rotating type. Clockwise rotation of the knob increases pressure and counter-clockwise rotation reduces pressure.
3. Connect Nitrogen fill line loosely to aircraft and purge line by slowly cracking open Nitrogen supply bottle shutoff valve.
4. Tighten Nitrogen fill line connection at aircraft.
5. Generally check unit and assure the tightness of all fittings, nuts and bolts.

*5.5 Nitrogen system connection continued on following page.*

5.5 NITROGEN SYSTEM CONNECTION *(continued)*

**WARNING!**

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

5.6 CHARGING THE AIRCRAFT NITROGEN SYSTEM (Low Pressure)

(Reference ***Figure 8***)

1. Ensure that all valves and controls are in the closed or "Off" position.
2. Ensure that all pressure regulators are decreased to minimum pressure settings.
3. Connect the "BLUE" low pressure output hose to the low pressure application.
4. ***Slowly*** open the Nitrogen supply bottle valve.
5. Slowly increase the low pressure regulator to obtain desired low pressure output. (Clockwise rotation increases pressure).
6. ***Slowly*** close Nitrogen supply bottle shut-off valve.
7. Decrease low pressure regulator to minimum pressure setting after completing low pressure charge. (Counter-clockwise rotation decreases pressure).
8. ***Slowly*** loosen, bleed down, and disconnect aircraft Nitrogen fill line from aircraft.
9. Cap aircraft Nitrogen fill line to prevent contamination.

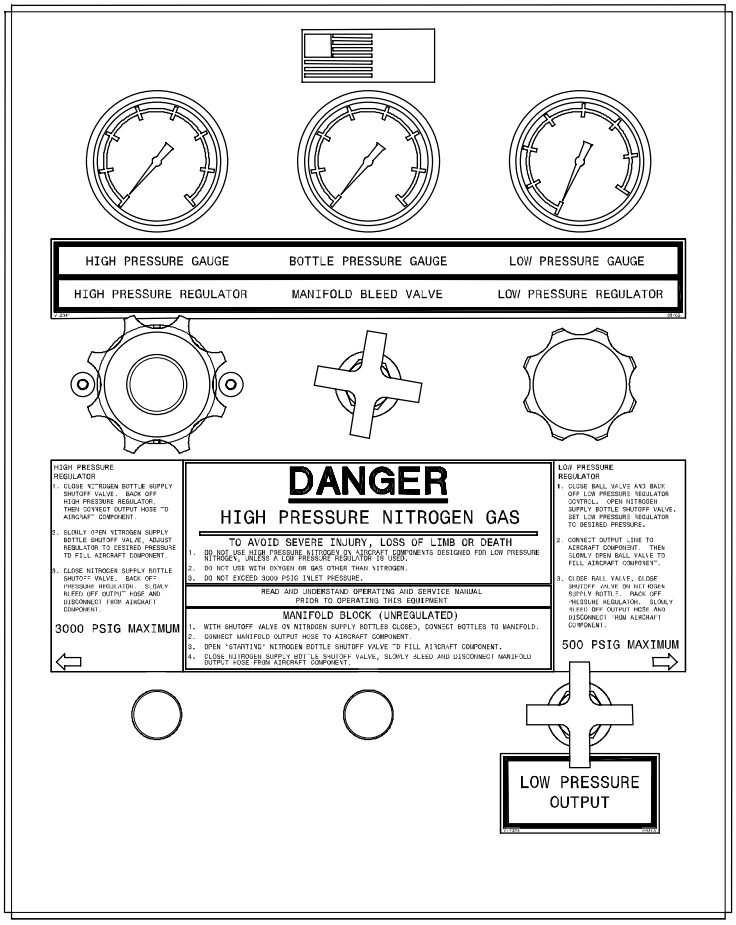



**Figure 3: Instrument Panel**

## 6.0 MAINTENANCE

- Maintain 45 to 50 psi (3.1 to 3.4 bars) tire pressure.
- Grease wheel bearings quarterly.
- All maintenance performed on this Nitrogen 4-Bottle Cart 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.
- The gauges on this unit should be inspected and calibrated annually to maintain and ensure accuracy.
- Manifold inlet hoses should be inspected weekly for signs of cracking or kinking, replace as necessary.
- Inspect Nitrogen output hoses prior to each use for signs of cracking or kinking, replace as necessary.
- 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.

### 6.1 STORAGE

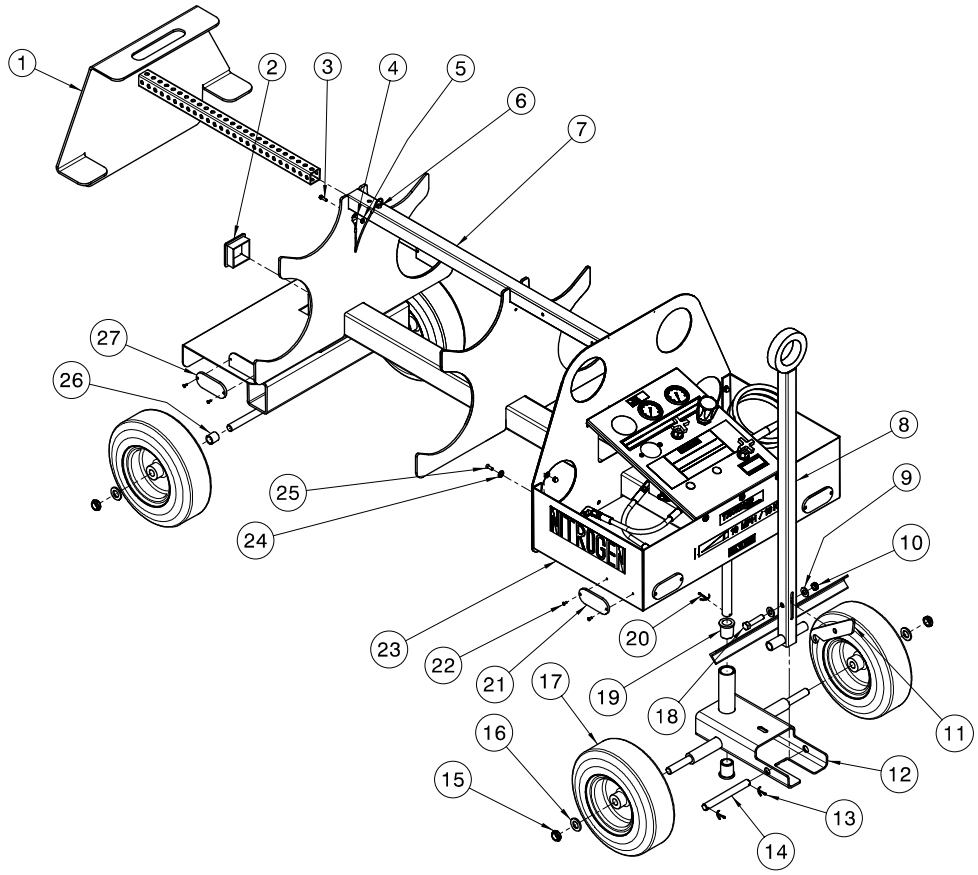
Store the unit in a clean, dry area when not in use.

Ensure that all hoses are capped. The unit should be covered for the duration of unit storage to ensure Nitrogen system cleanliness for future aircraft system recharging.

**K-3836**
**Four Bottle Nitrogen Cart with**
**Booster and Manifold/Regulator Upgrade Kit**

# Parts List

**WHEN ORDERING REPLACEMENT PARTS/KITS, PLEASE SPECIFY MODEL & SERIAL NUMBER OF YOUR UNIT.**




| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | Z-5585-01 | Weldment, Back Stop | 1 |
| 2 | H-2649-18 | Cap | 1 |
| 3 | G-1150-103506 | Screw, Hex Head Machine, #10-32 x ¾" long | 1 |
| 4 | H-1026*12.0 | Assembly, Lanyard | 1 |
| 5 | G-1202-1035 | Elastic Stopnut, #10-32 | 1 |
| 6 | G-1307-0618 | Pin, Aerofast | 1 |
| 7 | Z-5582-01 | Weldment, Bottle Cart | 1 |
| 8 | Z-5884-01 | Weldment, Towbar | 1 |
| 9 | G-1250-1090N | Flatwasher, ½ narrow | 2 |
| 10 | G-1203-1095 | Elastic Jamnut, ½ - 20 | 1 |
| 11 | J-3427 | Lever | 1 |
| 12 | Z-5580-01 | Weldment, Front Truck | 1 |
| 13 | G-1301-02 | Pin, Cotter | 2 |
| 14 | R-2096 | Pin, Towbar | 1 |
| 15 | G-1203-1115 | Elastic, Jamnut ¾ - 16 | 4 |
| 16 | G-1250-1110N | Flatwasher, ¾ narrow | 4 |
| 17 | U-1041 | Wheel, Pneumatic | 4 |
| 18 | G-1100-109522 | Bolt, Hex Head Grade 5, ½ - 20 x 2-1/4" long | 1 |

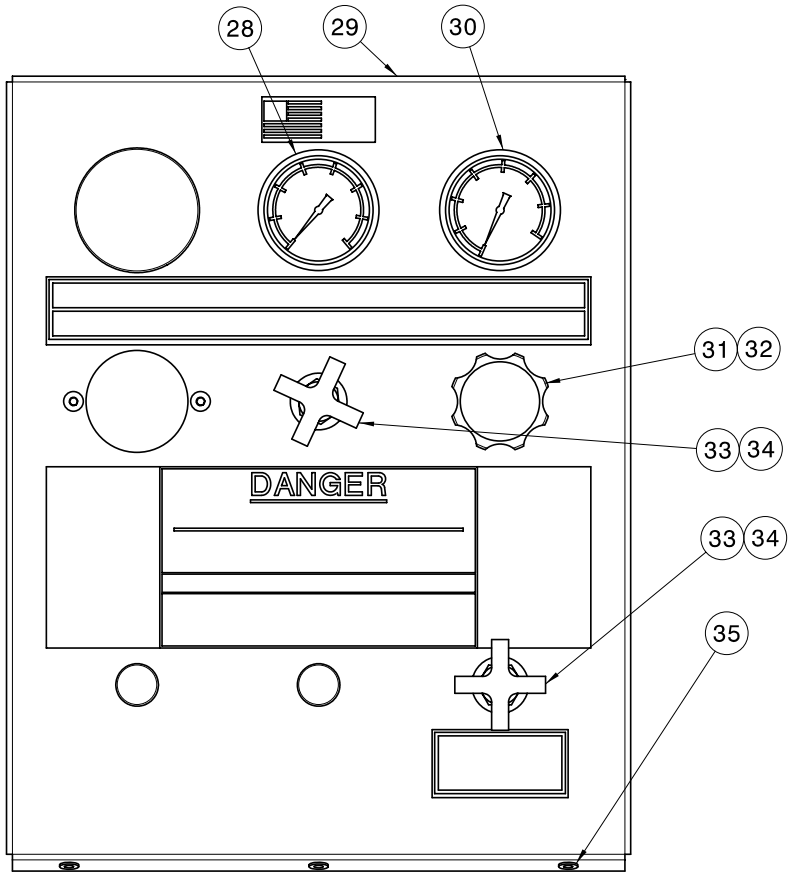
# Parts List

**WHEN ORDERING REPLACEMENT PARTS/KITS, PLEASE SPECIFY MODEL & SERIAL NUMBER OF YOUR UNIT.**

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 19 | H-2019-76 | Bearing, Flange | 2 |
| 20 | G-1301-03 | Pin, Cotter | 1 |
| 21 | H-1427-02 | Reflector, Amber | 4 |
| 22 | G-1352-17 | Rivet, Pop | 16 |
| 23 | S-1866-01 | Shelf, 4-bottle cart | 1 |
| 24 | G-1489 | Washer, Finish | 4 |
| 25 | G-1158-106106 | Screw, Machine, ¼ - 20 x ¾" long | 4 |
| 26 | TR-1813 | Spacer, Wheel | 2 |
| 27 | H-1427-01 | Reflector, Red | 4 |

# Parts List

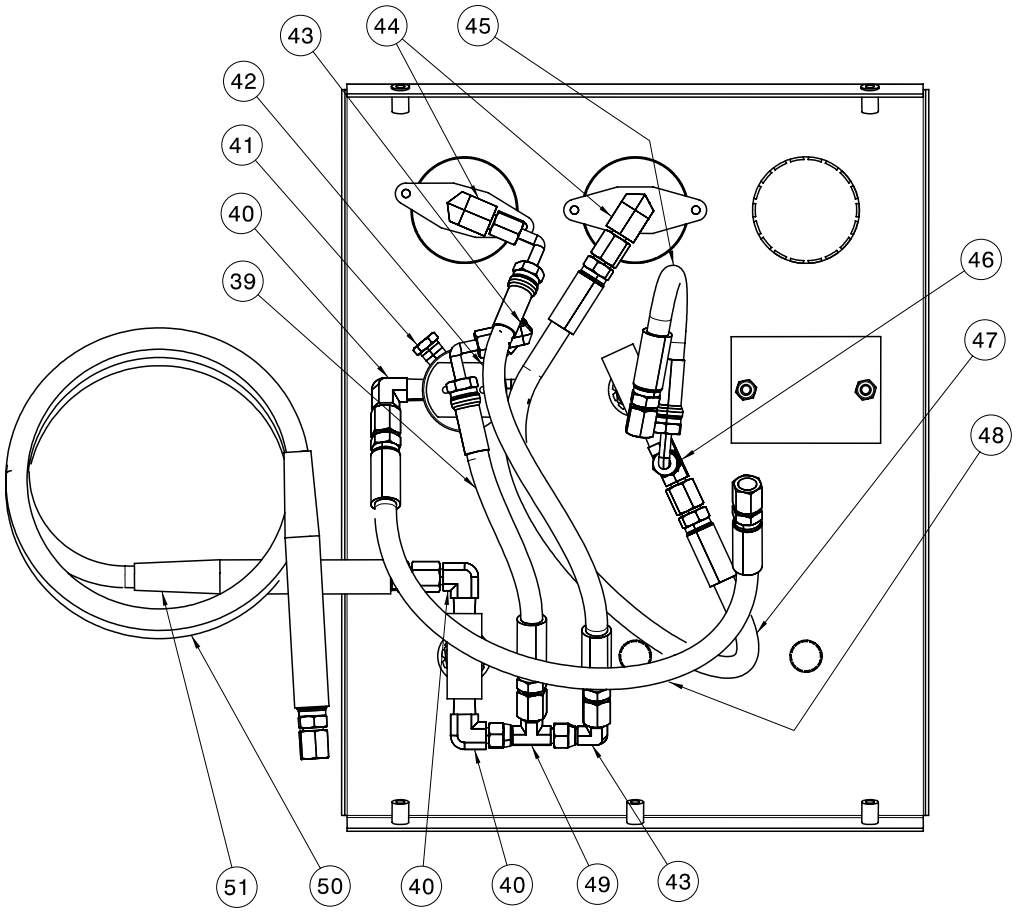
**WHEN ORDERING REPLACEMENT PARTS/KITS, PLEASE SPECIFY MODEL & SERIAL NUMBER OF YOUR UNIT.**




| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 28 | HC-2238 | Gauge, Pressure 0-5000 psi | 2 |
| 29 | S-1906-01 | Panel, Instrument | 1 |
| 30 | HC-2239 | Gauge, Pressure 0-600 psi | 1 |
| 31 | PC-1089-01 | Regulator, Low Pressure | 1 |
| 32 | H-2259 | Locknut | 1 |
| 33 | HC-1081-01 | Valve, Needle | 4 |
| 34 | HC-1122 | Kit, Panel Mounting | 4 |
| 35 | G-1439-1050-S | Nutsert, ¼ - 20 | 5 |

# Parts List

**WHEN ORDERING REPLACEMENT PARTS/KITS, PLEASE SPECIFY MODEL & SERIAL NUMBER OF YOUR UNIT.**

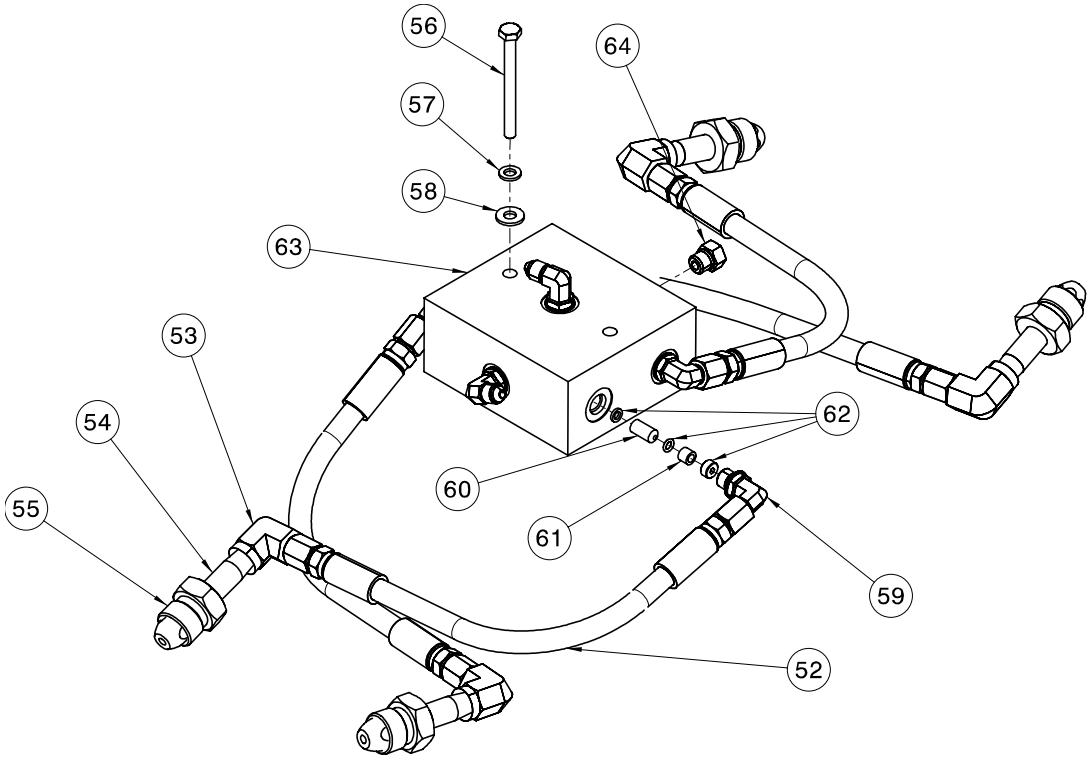



| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 39 | TF-1043-11*01.8 | Assembly, Hose | 1 |
| 40 | N-2005-04-S | Elbow, 90º, ¼ NPT x #4 JIC | 7 |
| 41 | N-2206-03-S | Plug, ¼ NPT | 3 |
| 42 | TF-1043-11*11.8 | Assembly, Hose | 1 |
| 43 | N-2002-03-S | Elbow, 90º , #4 JIC | 2 |
| 44 | N-2006-04-S | Elbow, 90º, ¼ NPT x #4 JIC | 2 |
| 45 | TF-1043-11*20.0 | Assembly, Hose | 1 |
| 46 | N-2017-04-S | Tee, Male Run, ¼ NPT x #4 JIC | 1 |
| 47 | TF-1043-07*21*0 | Assembly, Hose | 1 |
| 48 | TF-1043-07*21.0 | Assembly, Hose | 1 |
| 49 | N-2016-03-S | Tee, Run, #4 JIC | 1 |
| **50 | TF-1043-07*180 | Assembly, Hose | 1 |
| **51 | EC-1057-05*12.0 | Tubing, Blue Heat Shrink | 2 |

** When ordering a replacement of TF-1043-07*180 Low Pressure Output Hose, order EC-157-05*120 (qty. or 2) in addition.

# Parts List

**WHEN ORDERING REPLACEMENT PARTS/KITS, PLEASE SPECIFY MODEL & SERIAL NUMBER OF YOUR UNIT.**




MANIFOLD ASSEMBLY

**REPLACEMENT PARTS**

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| 52 | TF-1043-07*21.0 | Assembly Hose | 4 |
| 53 | N-2006-04-S | Elbow, 90º , ¼ NPT x #4 JIC | 4 |
| 54 | PC-1000 | Nipple, Inlet | 4 |
| 55 | PC-1001 | Nut | 4 |
| 56 | G-1100-105026 | Bolt, Hex Head Grade 5, ¼ - 20 x 2 ¾" long | 2 |
| 57 | G-1251-1050R | Lockwasher, ¼ regular | 2 |
| 58 | G-1250-1050N | Lockwasher, ¼ narrow | 2 |
| 59 | N-2001-03-S-B` | Elbow, 90º , #4 SAE x #4 JIC | 6 |
| 60 | HC-1585-01 | Insert, Check Valve | 4 |
| 61 | H-2650 | Spacer | 4 |
| 62 | HC-1586-01 | Kit, Check Valve Installation | 4 |
| 63 | J-2040 | Manifold | 1 |
| 64 | N-2053-03-S-B | Plug, O-Ring Hex Head | 1 |

# Parts List

Refer to the Parts Illustration on Page 14.

## REPLACEMENT KITS

| ITEM | PART NUMBER | DESCRIPTION | QTY |
|---|---|---|---|
| | ♦ **K-2146** | **Kit, Check Valve;** *consists of:* | |
| 62 | | O-Ring, Series 3 | 2 |
| 62 | | Screw, Retaining | 2 |
| 62 | | Seal, O-Ring | 2 |
| 61 | | Spacer, Nylon Malleable | 2 |
| | ♦♦ **K-2147** | **Kit, CGA 580 Fittings;** *consists of:* | |
| 53 | | Elbow, Female (4-DTX-S) | 1 |
| 54 | | Nipple, Inlet | 1 |
| 55 | | Nut | 1 |
| | ♦♦♦ **K-2145** | **Kit, CGA 677 Fittings;** *consists of:* | |
| 53 | | Elbow, Female (4-DTX-S) | 1 |
| 54 | | Nipple, Inlet | 1 |
| 55 | | Nut | 1 |

♦ **Each kit contains enough parts to install two (2) check valves.**
♦♦ **Standard Nitrogen bottle fittings.**
♦♦♦ **Optional high pressure Nitrogen bottle fittings**.

## REPAIR KITS

| ITEM | PART NUMBER | DESCRIPTION |
|---|---|---|
| | **K-3262** | **Kit, Low Pressure Regulator Standard Repair,** *for:* |
| 31 | PC-1089-01 | (Non-Metallic and Metallic Parts) |
| | **K-3263** | **Kit, Low Pressure Regulator Soft Goods Repair,** *for:* |
| 31 | PC-1089-01 | (Non-Metallic Parts) |

TRONAIR

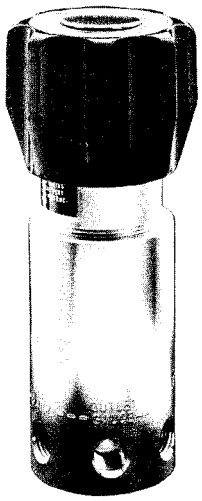
# APPENDIX I

## TESCOM

**44-1100 Series Regulator Operation & Service Instructions**

**Piston Sensed Pressure Reducing Regulators Operation & Service Manual**

**Safety, Installation & Operation Precautions**



# OPERATION AND SERVICE INSTRUCTIONS FOR

TESCOM CORPORATION

# REGULATOR 44-1100 SERIES

## GENERAL

The TESCOM 44-1100 SERIES REGULATOR is a self-contained direct-acting, spring loaded pressure reducing regulator. This unit incorporates a piston sensor with integral, adjustable vent valve. The regulator utilizes a soft-seated main valve to provide bubble tight service for dead end applications. The adjusting mechanism is designed with high-load needle bearings to produce excellent setting sensitivity while maintaining a low-operating torque of approximately 40 in.-lbs. (.46 cm-kg.).

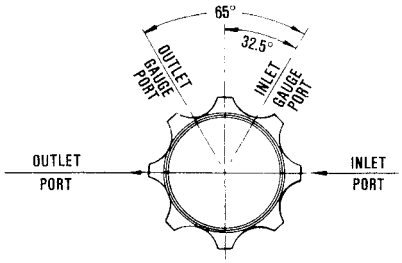
## MATERIALS

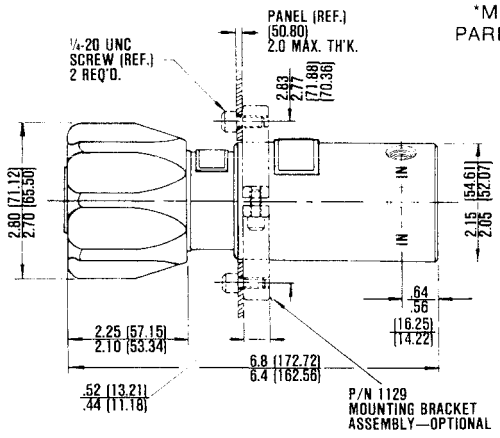
Standard materials of contruction are as follows:

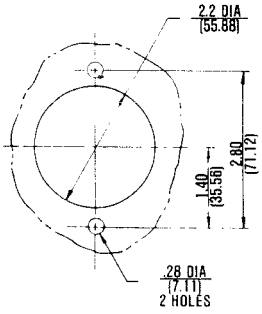
| | |
|---|---|
| BODY and BONNET | BRASS or 303 SST |
| MAIN VALVE TRIM and SENSOR ASSEMBLY | 300 SERIES STAINLESS STEEL |
| SEALS & BACK-UP RINGS | BUNA-N & TEFLON® |
| SEAT VENT VALVE | KEL-F-81® |
| SEAT MAIN VALVE | VESPEL® |

## ENVELOPE DIMENSIONS

*METRIC EQUIVALENTS IN PARENTHESIS (MILLIMETERS)




PANEL CUT-OUT

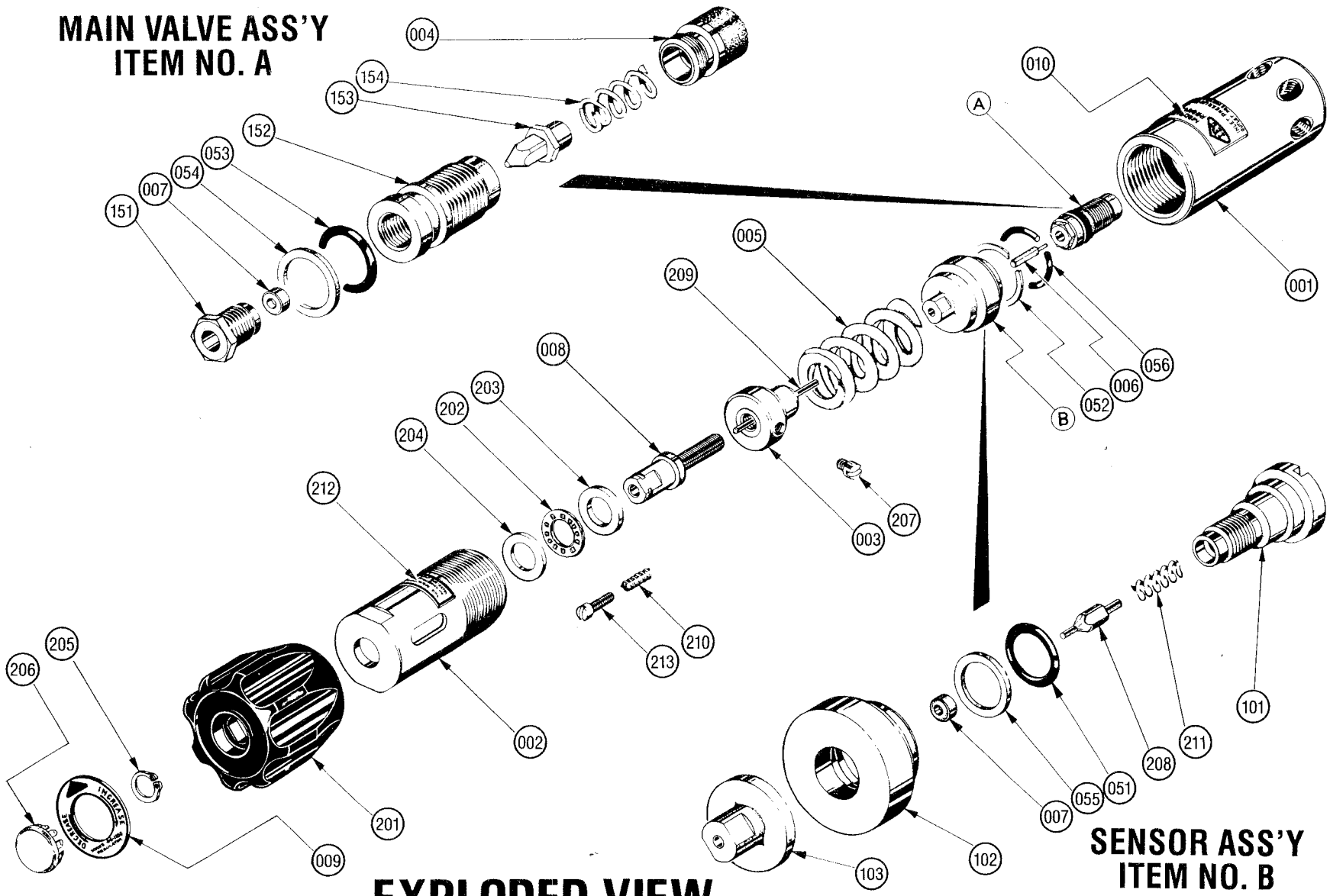
## OPERATION

Control pressure settings are obtained in the TESCOM 44-1100 SERIES REGULATOR by adjusting the control knob. Pressure INCREASES are made by a CLOCKWISE rotation while a DECREASE is obtained by a COUNTERCLOCKWISE adjustment. All final adjustments should be made in the "INCREASE" direction in order to insure the most accurate set point. The venting action of the regulator can be accomplished by approximately one-half turn in the "DECREASE" direction from the set point, if venting does not occur within the half turn see VENT VALVE ADJUSTMENT procedure in the MAINTENANCE SECTION.

These regulators will operate using any media which is compatible with the wetted parts. The units are equipped with an internal filter; however, if excessive dirt is a problem, a larger filter should be provided on the supply side of the regulator. When using a gaseous media, it is necessary that all moisture be removed since "icing" will occur at the high expansion ratios during the regulation process.

**UNDER NO CIRCUMSTANCE SHOULD THESE REGULATORS BE USED WITH OXYGEN, WITHOUT BOTH THE REGULATOR AND THE ASSOCIATED SYSTEM, BEING PROPERLY CLEANED FOR OXYGEN SERVICE.**

Teflon® and Vespel® are registered trademarks of DuPont
Kel-F-81 is a registered trademark of 3M




# EXPLODED VIEW
## 44-1100 SERIES

## MAINTENANCE

**REPAIR KITS:** Basic Models only.

Standard Repair Kit ..... P/N 389-1449
(metallic & non-metallic parts)

Non-Metallic Spare Parts Kit . P/N 389-1275

## RECOMMENDED TOOLS

Tools necessary for complete Regulator disassembly are listed below. All are standard.

Screwdriver, 3/16" blade
Screwdriver, 1/2" blade
Wrench, 1-5/8" open end
Wrench 1/2" open end
Wrench, 1/2" socket
Pliers, snap ring
Pliers

### VENT VALVE ADJUSTMENT

The Vent Valve is set at the factory during assembly and usually will not need adjustment. If adjustment becomes necessary, it may be done in the following manner:

Remove Hole Plug (206); turn some pressure on the outlet of the Regulator; turn Screw (213) clockwise until gas can be heard escaping through Relief Valve; back Screw off until gas flow stops.

### SERVICE PROCEDURE

The Regulator may be serviced for O-Ring, Seat and Seal replacement without removal from the line. The following steps outline the basic disassembly operations necessary to repair the majority of all malfunctions.:

1. Remove Plug (206) with screwdriver.
2. Using external snap-ring pliers, remove Snap Ring (205) and Control Knob (201).
3. With 1-5/8 open-end wrench, remove Bonnet by turning counterclockwise. (Note: Spring (005) and Vent Rod (209) are free and may fall if care is not taken.)
4. Remove Sensor Assembly (B) with pliers if necessary.
5. Remove Main Valve Assembly (A) with 1/2" socket wrench.

The following paragraphs describe the procedures for the servicing of the individual subassemblies.

### SENSOR DISASSEMBLY

Step 1: Unscrew Spring Pad (103) from Sensor (101) using a 1/2" open-end wrench or a vise jaw to hold Spring Pad (103) and a 1/2" wide screwdriver (or a 1" open-end wrench, depending upon Sensor) to loosen Sensor (101). Sensor and Sensor back-up are then merely pushed apart.

Step 2: To expose Relief Valve (208) and Relief Valve Spring (211) it is necessary to forcefully remove Relief Valve Seat (007) which quite possibly will cause permanent damage to this Seat and require its replacement. The removal can be made with any sharp-pointed instrument.

### SENSOR REASSEMBLY

Step 1: If Sensor O-Ring requires lubricant apply Krytox 240 AC or other suitable non-hydrocarbon grease.

Step 2: Reassemble O-Ring (051), Back-up Ring (055), Sensor Back-up (102) and Sensor (101).

Step 3: If Seat (007) has been removed, put Spring (211) and Valve (208) into Sensor. Place new Seat—with chamfer toward Valve Stem into Sensor.

Step 4: Hold both members in a vertical position carefully thread Spring Pad (103) onto Sensor (101) and tighten. Recommended maximum torque is 75-90 in. lbs.

### MAIN VALVE DISASSEMBLY

Step 1: Clamp Valve Body (152) in smooth jawed vise or hold with pliers. Clamping is dfone on shoulders that hold O-Ring (053) and Back-up Ring (054). If pliers are used, a protecting cover should be placed over jaws. Remove Seat Retainer (151) with 1/2" wrench—left hand thread.

Step 2: To remove Spring (154) and Main Valve (153), unscrew Filter Assembly (004) from Body (152). This is a finger-tight engagement.

Step 3: Remove Seat (007) with a sharp-pointed tool.

### MAIN VALVE REASSEMBLY

Step 1: Install new Seat (007) in Retainer (151) with chamfer of Seat toward Valve (153).

Step 2: Seat Retainer (151) is replaced and tightened to a recommended 100-110 in.-lbs.

Step 3: Replace Valve Spring (154) and Filter Assembly (004).

### ADJUSTING SCREW (008) SERVICING

If the Adjusting Screw (008) or Spring Cap (003) should need lubrication or replacement, the following procedure may be followed:

Step 1: Refer to SERVICE PROCEDURE steps 1 through 4.

Step 2: Remove Screw (207) and the Adjusting Screw Assembly and Thrust Bearing (202) will drop out.

Step 3: Lubricate and reassemble, paying attention to Step 4 of the REASSEMBLY OF MAJOR SUBASSEMBLIES SECTION.

# PARTS LIST

| ITEM NO. | DESCRIPTION | NO. REQ'D. | BASIC MODEL NUMBERS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 44-1111-24<br>44-1121-24 | 44-1112-24<br>44-1122-24 | 44-1113-24<br>44-1123-24 | 44-1114-24<br>44-1124-24 | 44-1115-24<br>44-1125-24 | 44-1116-24<br>44-1126-24 |
| 206 | PLUG, BUTTON | 1 | 5432 | 5432 | 5432 | 5432 | 5432 | 5432 |
| 205 | RING, RETAINING | 1 | 5427 | 5427 | 5427 | 5427 | 5427 | 5427 |
| 212 | LABEL, VENT | 1 | 5153 | 5153 | 5153 | 5153 | 5153 | 5153 |
| 204 | WASHER, THRUST | 1 | 5426 | 5426 | 5426 | 5426 | 5426 | 5426 |
| 202 | BEARING, THRUST | 1 | 5424 | 5424 | 5424 | 5424 | 5424 | 5424 |
| 203 | WASHER, THRUST | 1 | 5425 | 5425 | 5425 | 5425 | 5425 | 5425 |
| 008 | SCREW, ADJUSTING | 1 | 5947-1 | 5947-1 | 5947-1 | 5947-1 | 5947-1 | 5947-1 |
| 209 | ROD, VENT VALVE | 1 | 5948-2 | 5948-2 | 5948-2 | 5948-2 | 5948-2 | 5948-2 |
| 005 | SPRING, LOAD | 1 | 1049 | 1050 | 1051 | 1051 | 1050 | 1051 |
| A | ASS'Y., MAIN VALVE | 1 | 1010-100 | 1010-100 | 1010-100 | 1010-100 | 1010-100 | 1010-100 |
| | Consists of: | 1 | 1010-200 | 1010-200 | 1010-200 | 1010-200 | 1010-200 | 1010-200 |
| 151 | RETAINER, SEAT | 1 | 1035-2 | 1035-2 | 1035-2 | 1035-2 | 1035-2 | 1035-2 |
| 007 | SEAT, MAIN VALVE | 1 | 1036-7 | 1036-7 | 1036-7 | 1036-7 | 1036-7 | 1036-7 |
| 054 | RING, BACK-UP | 1 | 5475-113 | 5475-113 | 5475-113 | 5475-113 | 5475-113 | 5475-113 |
| 053 | O-RING | 1 | 5200-001137 | 5200-001137 | 5200-001137 | 5200-001137 | 5200-001137 | 5200-001137 |
| 152 | BODY, MAIN VALVE | 1 | 1038-2 | 1038-2 | 1038-2 | 1038-2 | 1038-2 | 1038-2 |
| 153 | VALVE, MAIN | 1 | 1037-2 | 1037-2 | 1037-2 | 1037-2 | 1037-2 | 1037-2 |
| 154 | SPRING | 1 | 1437 | 1437 | 1437 | 1437 | 1437 | 1437 |
| 004 | ASS'Y., FILTER | 1 | 1011 | 1011 | 1011 | 1011 | 1011 | 1011 |
| 004 | ASS'Y., FILTER | 1 | 6666 | 6666 | 6666 | 6666 | 6666 | 6666 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 010 | PLATE, DATA | Brass | 1 | 5728-4 | 5728-5 | 5728-6 | 5728-7 | 5728-8 | 5728-9 |
| | | SST. | | 5728-11 | 5728-12 | 5728-13 | 5728-14 | 5728-15 | 5728-16 |
| 001 | BODY, REGULATOR | | | | | | | | |
| | | Brass | 1 | 5950-2411 | 5950-2411 | 5950-2411 | 5950-2411 | 5950-2411 | 5950-2411 |
| | | SST. | | 5950-2421 | 5950-2421 | 5950-2421 | 5950-2421 | 5950-2421 | 5950-2421 |
| 056 | O—RING | | 1 | 5200-001227 | 5200-001227 | 5200-001227 | 5200-001227 | 5200-001227 | 5200-001227 |
| 006 | CONNECTOR | | 1 | 1034-2 | 1034-2 | 1034-2 | 1034-2 | 1034-2 | 1034-2 |
| 052 | RING, BACK-UP | | 1 | NONE | NONE | NONE | 5476-11220 | 5476-11220 | 5476-11220 |
| B | ASS'Y., SENSOR | | 1 | 1009-20 | 1009-20 | 1009-20 | 1008-20 | 1007-20 | 1007-20 |
| | Consists of: | | | | | | | | |
| 103 | Pad, Spring | | 1 | 1021-1 | 1021-1 | 1021-1 | 1021-1 | 1021-1 | 1021-1 |
| 102 | BACK-UP, SENSOR | | 1 | 1033-2 | 1033-2 | 1033-2 | 1032-2 | 1031-2 | 1031-2 |
| 007 | SEAT, VENT VALVE | | 1 | 1036 | 1036 | 1036 | 1036 | 1036 | 1036 |
| 055 | RING, BACK-UP | | 1 | NONE | NONE | NONE | 5475-116 | 5475-014 | 5475-014 |
| 051 | O-RING | | 1 | 5200-001209 | 5200-001209 | 5200-001209 | 5200-001167 | 5200-000147 | 5200-000147 |
| 208 | VALVE, VENT | | 1 | 1023-2 | 1023-2 | 1023-2 | 1023-2 | 1023-2 | 1023-2 |
| 211 | SPRING | | 1 | 1022 | 1022 | 1022 | 1022 | 1022 | 1022 |
| 101 | SENSOR | | 1 | 1027-2 | 1027-2 | 1027-2 | 1026-2 | 1025-2 | 1025-2 |
| 207 | SCREW, LIMIT | | 1 | 5401-21088 | 5401-21088 | 5401-21088 | 5401-21088 | 5401-21088 | 5401-21088 |
| 003 | ASS'Y., SPRING CAP | | 1 | 1130-3 | 1130-3 | 1130-3 | 1130-3 | 1130-3 | 1130-3 |
| 210 | SPRING | | 1 | 2776 | 2776 | 2776 | 2776 | 2776 | 2776 |
| 213 | SCREW | | 1 | 5401-14288 | 5401-14288 | 5401-14288 | 5401-14288 | 5401-14288 | 5401-14288 |
| 002 | BONNET | Brass | 1 | 5945-1 | 5945-1 | 5945-1 | 5945-1 | 5945-1 | 5945-1 |
| | | SST. | | 5945-0 | 5945-0 | 5945-0 | 5945-0 | 5945-0 | 5945-0 |
| 201 | HANDKNOB | | 1 | 5397-6 | 5397-6 | 5397-6 | 5397-6 | 5397-6 | 5397-6 |
| 009 | PLATE, DATA | | 1 | 5435-2 | 5435-2 | 5435-2 | 5435-2 | 5435-2 | 5435-2 |

**NOTE:** Operation & Service Instructions are applicable for all Basic Models (8 digits) and most Modified Models (11 digits).
The complete Parts List, however, may not be applicable for all Modified Models.
See attached Engineering Modification Drawings for appropriate part numbers.

## REASSEMBLY OF MAJOR SUBASSEMBLIES

Reassembly of the major subassemblies if the reverse of steps 1 through 5 of the SERVICE PROCEDURE. The following precautions are to be observed:

Step 1: Sensor O-Ring (052) and Back-up Ring (056) should be on Sensor Assembly.

NOTE: The Back-up Ring is necessary only if regulated pressure is to be in excess of 1500 PSI. (100 bar).

Step 2: If any O-Rings appear dry, lubricate lightly with Krytox 240 AC or other suitable non-hydrocarbon.

Step 3: Screw in Valve Assembly (A) until it bottoms. Hand tighten.

Step 4: When assembling Bonnet to Body, put Load Spring (005) into Bonnet (002).

Relief Valve Rod (209) partially into hole in Adjusting Screw (008). Tighten bonnet to 50 ft.-lbs. torque.

## TROUBLE SHOOTING

When performing necessary corrective action in the following operations, refer to the MAINTENANCE section for the necessary procedure.

PROBLEM

The regulated pressure continues to increase after lock-up and without change in Control Knob position.

Possible Cause

1. Valve Seat (007) needs replacement.
2. Sensor Assembly needs cleaning and Seal replacement.

PROBLEM

Continuous leakage through Bonnet with outlet pressure on the Regulator.

Possible Cause

1. Vent Valve needs adjustment.
2. Vent Valve Seat (007) needs replacement.
3. Sensor O-Ring (051) worn and leaking.

PROBLEM

Regulated pressure drops off sharply when flow is within Regulator capabilities.

1. Check inlet Filter (004) and clean if necessary.
2. Main Valve Seat (007) needs replacement.

ESCOM CORPORATION

12616 Industrial Boulevard
Elk River, Minnesota 55330
(612) 441-6330 Telex: 290488

PRESSURE CONTROLS DIVISION

(Rev. 4/86) Form No. 1119

# OPERATION AND SERVICE MANUAL for TESCOM CORPORATION

# Piston Sensed Pressure Reducing Regulators

**General**
Tescom's piston sensed pressure reducing regulators are specifically engineered for applications requiring dependable pressure regulation. These regulators are especially appropriate for installations where high system pressures (up to 20,000 psi) must be reduced to levels suitable for actuating low pressure (0 to 20,000 psi) instruments and related equipment.

**Pressure Activation Methods**
Tescom uses three basic types of activation methods. The activation method provides the means by which the operator can set the force that determines the outlet pressure of a regulator

Control Knob: Delivery pressure is increased by turning the control knob. The control knob applies a load through a spring to the piston.

Dome Load: Delivery pressure is increased by applying pressurized gas or liquid to the dome of a regulator at a pressure equal to the outlet pressure desired. This dome pressure is normally provided by a second regulator called the pilot regulator.

Combination Spring and Dome: Delivery pressure is increased by applying a spring force as well as the introduction of pressurized gas or liquid.

**Materials of Construction**
Standard materials of construction contacting the fluid media can be any of the following:

Regulator Body: 300 Series SST, Brass, Hastelloy®, Monel®, Aluminum
Seats: Teflon®, PCTFE, Vespel®, Peek®, Soft Goods (O-rings & back-up Rings) Teflon®, BUNA-N, Viton A®

Trim: 300 Series SST, Brass, Hastelloy, Monel, Aluminum

The official material of construction and pressure activation method for your pressure reducing regulator depends on series number and modification ordered.

**Operation (Control Knob Adjustment)**
Controlled outlet pressure settings are obtained using Tescom pressure reducing regulators by adjusting the control knob. Rotating the knob clockwise raises the outlet pressure while a counterclockwise rotation, coupled with venting of the downstream side of the regulator plumbing, lowers the outlet pressure. Final adjustments should be made in the direction of increasing pressure to obtain the most accurate set point.

Tescom regulators will operate with any liquid or gaseous media compatible with the wetted materials. Some series/modifications come with an internal filter that only are designed to stop random contamination resulting from the installation of the regulator. An auxiliary upstream filter is recommended for use in all but the cleanest media. Gaseous media should be free of excessive moisture to prevent icing of the regulator at high flow rates.

**WARNING** *A REGULATOR IS NOT INTENDED TO BE USED AS A SHUTOFF DEVICE. WHEN THE REGULATOR IS NOT IN USE, THE INLET SUPPLY SHOULD BE TURNED OFF. AS A SAFETY PRECAUTION, A PRESSURE RELIEF DEVICE SHOULD BE INSTALLED DOWNSTREAM OF THE REGULATOR.*

**Maintenance**

The following procedures are provided to enable the customer to perform all normal maintenance and repair operations. These operations are more easily performed with the regulator removed from the line. However, in some cases repair may be accomplished without removal of the regulator body as long as the inlet and outlet pressure have been vented.

The following steps outline the disassembly of pressure reducing regulators for maintenance and repair. Up-to-date assembly drawings and bills of material are available from the factory.

1. Clamp the regulator in a vise by the flats on the bottom and/or side of the regulator body.

2. Turn control knob and/or spring adjustment mechanism counterclockwise to insure removal of all spring force on the diaphragm.

   *NOTE (Dome loaded regulators): All pressurized gas or liquid must be vented from dome before disassembly.*

3. Remove upper portion of regulator (bonnet and/or dome). Some models require the mounting bracket to be removed first.

   *NOTE: Upper portion of regulator may also include spring button, load spring back-up plate, and piston sensor, etc. Review correct drawing to ensure that all parts have been disassembled.*

   *NOTE: (Two-Stage Regulator) Tescom Model Series BB-5 is a two-stage regulator that has portions on both ends of the regulator body that must be removed. It is Tescom's recommendation that two-stage regulators be returned to the factory for repair.*

**Maintenance (continued)**

4. The valve parts can now be removed from the regulator body by turning the seat retainer and/or back cap counter-clockwise until it is free of the regulator body.

   WARNING *TESCOM MODELS 26-1000 AND 44-1100 VALVE PARTS ARE HELD IN PLACE BY THE USE OF LEFT-HANDED THREADS.*

   *NOTE: If necessary, valve seat may be removed from the seat retainer using a sharp instrument.*

   **CAUTION:** When removing valve parts from a regulator that has a back cap, care must be taken to insure the main valve stem remains vertical. If the main valve stem is not removed correctly, parts may remain in the regulator.

5. To disassemble main valve assembly and/or valve, clamp valve in smoothed jaw vice or hold with pliers. Clamping should be done on flats.

   **CAUTION:** Care must be used to not damage valve. A special fixture may be ordered from the factory to aid in the disassembly of the main valve assembly found in Tescom Regulator Models 26-1000 and 44-1100.

   *NOTE: Several of Tescom's regulators are supplied with internal filters. They will be located either in the inlet port or in the main valve area of the regulator. In each case, they should be removed and replaced before reassembly.*

**Reassembly**

The regulator is reassembled in the reverse order of disassembly, observing the following precautions. Please reference the Bill of Material and assembly drawing for the correct location of replacement parts and correct torque specifications.

**Reassembly (continued)**

1. Inspect all parts and replace those worn or damaged with Tescom replacement parts.

2. All parts should be cleaned to the cleanliness level required for safe operation with the media and system they will be used in. All parts in the flow stream must be free of particles which could prevent proper seating of the main valve.

3. Apply a thin uniform coating of fluorocarbon grease to any or all of the following parts: indentation of spring bottom, threaded portion of adjusting screen, entire threaded area of the bonnet, all O-rings, all threaded parts internal to regulator.

   *NOTE: Do NOT apply fluorocarbon grease to any of the inlet or outlet connections.*

4. Valve seats must be installed with the chamfered side towards the main valve.

5. Standard Regulator with Control Knobs - The body and bonnet are best joined by holding the bonnet assembly open end up and dropping all required items into place one at a time. The last item to be placed in the body of most all of Tescom regulators is the piston sensor. Place all O-rings and back-up rings that are external to the piston sensor in the body before placing the sensor in place. O-rings should always be installed before back-up rings. The bonnet and body may now be attached. This is best done by holding the body in one hand and the bonnet in the other. Tilt the body at a 45° angle and then attach the bonnet by screwing it into the body firmly, hand tight. Regulator should then be placed in vise and bonnet retorqued to correct specifications. See print.

**Reassembly (continued)**

6. Dome/Spring Combination and Dome Loaded Regulators are more easily reassembled by holding regulator firmly in vise and reinstalling dome.

7. Self-Venting Regulator - If your regulator has an adjustable relief valve mechanism, it is set on final assembly at the factory and usually will not require further adjustment. If adjustment becomes necessary, use the following procedure after regulator has been installed:

   Step 1. Remove hole plug.
   Step 2. Using control knob, apply 10 to 15 psi on downstream side.
   Step 3. Turn in vent adjusting screw (located under hole plug) until media can be heard escaping through relief valve.
   Step 4. Back off screw until media flow stops, usually 1/2 turn. Replace hole plug.

8. Reinstalling wire mesh inlet filter - Insert filter into primary inlet port. It must then be expanded to fit correctly. This can be accomplished by inserting a metal tool the same size as the port and then lightly tapping it with a hammer.

**WARNING** *AFTER REGULATOR HAS BEEN REASSEMBLED, IT SHOULD BE CONNECTED TO A PRESSURE SOURCE WITH MEDIA COMPATIBLE WITH THE USE OF THE REGULATOR AND PRESSURIZED TO CHECK FOR INTERNAL AND EXTERNAL LEAKAGE AND OPERATING CHARACTERISTICS.*



Form No. 1886 Printed 5/00 15M

# PRODUCT WARRANTY

Tescom Corporation ("Tescom") warrants to the initial purchaser ("Initial Purchaser", as defined below) of products manufactured and sold by its Industrial Controls Division ("ICD") and Electronic Controls Division ("ECD") that such products are free from defects in materials and workmanship under normal use and service for a period of 180 days from the date of initial purchase or one year from the date of delivery of the products, whichever comes first ("Warranty Period"). This warranty applies only to the Initial Purchaser, that is someone who purchases products for initial use directly from Tescom, its affiliates or authorized distributors or representatives. This warranty is not transferable to subsequent purchasers or users of the products.

During the Warranty Period, Tescom will, in its sole discretion, repair or replace, free of charge at its factory in Minnesota, any product or part thereof that is found by Tescom, after reasonable notification by the Initial Purchaser, to have been defective in materials or workmanship. The Initial Purchaser must pay all shipping costs for warranty service and is responsible for risk of loss or damage of products during shipment. Tescom does not warrant, and will not pay for, any repairs or replacement made during the Warranty Period by anyone other than personnel authorized by Tescom, ICD or ECD to make such repairs or replacement.

THE ABOVE WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES. TESCOM, ICD AND ECD MAKE NO OTHER EXPRESS OR IMPLIED WARRANTY, AND IN PARTICULAR AND WITHOUT LIMITATION MAKE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. The Initial Purchaser's only remedy under this warranty is repair or replacement of the products during the Warranty Period. This warranty does not apply to any product which has been damaged by accident, abuse, misuse, modification or lack of proper maintenance. NEITHER TESCOM, ICD NOR ECD WILL BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL OR INDIRECT DAMAGES, INCLUDING WITHOUT LIMITATION, LOST PROFITS.

TESCOM
CORPORATION
INDUSTRIAL CONTROLS DIVISION
ELECTRONIC CONTROLS DIVISION
12616 Industrial Boulevard
Elk River, MN 55330
1-800-447-1250
Fax: (763) 241-3224
e-mail: icd@tescom.com
www.tescom.com

# Safety, Installation, & Operation Precautions

TESCOM
CORPORATION

INDUSTRIAL CONTROLS DIVISION

**DO NOT ATTEMPT TO SELECT, INSTALL, USE, OR MAINTAIN THIS REGULATOR, VALVE, OR ACCESSORY UNTIL YOU HAVE READ AND FULLY UNDERSTAND THESE INSTRUCTIONS.**

**BE SURE THIS INFORMATION REACHES THE OPERATOR AND STAYS WITH THE PRODUCT AFTER INSTALLATION.**

**DO NOT PERMIT UNTRAINED PERSONS TO INSTALL, USE, OR MAINTAIN THIS REGULATOR, VALVE, OR ACCESSORY.**


**IMPROPER SELECTION, IMPROPER INSTALLATION, IMPROPER MAINTENANCE, MISUSE, OR ABUSE OF REGULATORS, VALVES, OR RELATED ACCESSORIES CAN CAUSE DEATH, SERIOUS INJURY, AND/OR PROPERTY DAMAGE.**

**Possible consequences include but are not limited to:**

- High velocity fluid (gas or liquid) discharge
- Parts ejected at high speed
- Contact with fluids that may be hot, cold, toxic, or otherwise injurious
- Explosion or burning of the fluid
- Lines/hoses whipping dangerously
- Damage or destruction to other components or equipment in the system


## SAFETY PRECAUTIONS:

1. Inspect the regulator, valve, and accessories before each use.
2. Never connect regulators, valves, or accessories to a supply source having a pressure greater than the maximum rated pressure of the regulator, valve, or accessory.
3. Refer to product label (modification specific) for maximum inlet pressures. If this rated pressure cannot be found, contact your local Tescom representative for the rated pressure prior to installation and use. Verify the designed pressure rating of all equipment (e.g., supply lines, fittings, connections, filters, valves, gauges, etc.) in your system. All must be capable of handling the supply and operating pressure.
4. Clearly establish flow direction of the fluid before installation of regulators, valves, and accessories. It is the responsibility of the user to install the equipment in the correct direction.
5. Do not tighten fittings, gages, or components in pressurized systems.
6. Never turn regulator or valve body. Instead hold regulator or valve body and turn fitting nut.
7. If a regulator or valve leaks or malfunctions, take it out of service immediately.
8. Do not modify equipment or add attachments not approved by the manufacturer.
9. Apply pressure to the system gradually, avoiding a sudden surge of fluid or pressure shock to the equipment in the system.

## WARNING SAFETY PRECAUTIONS (Continued):

10. Regulators are not shut-off devices. Install a pressure relief device downstream of the regulator to protect the process equipment from operating pressure increases. Shut off the supply pressure when the regulator is not in use.
11. Periodic inspection and scheduled maintenance of your equipment is required for continued safe operation.
12. The frequency of servicing is the responsibility of the user based on the application.
13. Never allow problems or lack of maintenance to go unreported.
14. Read and follow precautions on compressed gas cylinder labels.
15. It is important that you analyze all aspects of your application and review all available information concerning the product or system. Obtain, read, and understand the Material Safety Data Sheet (MSDS) for each fluid used in your system.
16. Oxygen service requires special expertise and knowledge of system design and material compatibility in order to minimize the potential for death, serious injury, and/or property damage.
17. Never use materials for regulators, valves, or accessories that are not compatible with the fluids being used.
18. Users must test under normal operating conditions to determine suitability of materials in an application.
19. Vent fluids to a safe environment, and in an area away from employees. Be sure that venting and disposal methods are in accordance with Federal, State, and Local requirements. Locate and

WARNING SAFETY PRECAUTIONS (Continued):

construct vent lines to prevent condensation or gas accumulation. Make sure the vent outlet is not obstructed by rain, snow, ice, vegetation, insects, birds, etc. Do not interconnect vent lines; use separate lines if more than one vent is needed.

20. Do not locate regulators, valves, or accessories using flammable fluids near open flames or any other source of ignition.
21. Some fluids when burning do not exhibit a visible flame. Use extreme caution when inspecting and/or servicing systems using flammable fluids to avoid death or serious injury to employees. Provide a device to warn employees of these dangerous conditions.
22. Many gases can cause suffocation. Make certain the area is well ventilated. Provide a device to warn employees of lack of oxygen.
23. Never use oil or grease on these regulators, valves, or accessories. Oil and grease are easily ignited and may combine violently with some fluids under pressure.
24. Have emergency equipment in the area if toxic or flammable fluids are used.
25. Upstream filters are recommended for use with all fluids.
26. Do not bleed system by loosening fittings.
27. Prevent icing of the equipment by removing excess moisture from the gas.
28. Always use proper thread lubricants and sealants on tapered pipe threads.

## INSTALLATION

Inspect the regulator, valve, and accessories for physical damage and contamination. Do not connect the regulator, valve, or accessory if you detect oil, grease, or damaged parts. If the regulator, valve, or accessory is damaged, contact your local Tescom representative to have the regulator cleaned or repaired.

WARNING **Make sure that the components and materials used in the fluid handling system are compatible with the fluid and have the proper pressure rating.**

## REPAIR SERVICE

If a regulator or valve leaks or malfunctions, take it out of service immediately. You must have instructions before doing any maintenance. Do not make any repairs you do not understand. Have qualified personnel make repairs. Return any equipment in need of service to your equipment supplier for evaluation and prompt service. Equipment is restored to the original factory performance specifications, if repairable. There are flat fee repair charges for each standard model. The original equipment warranty applies after a complete overhaul.

WARNING **Safe Component Selection**

1. Consider the total system design when selecting a component to ensure safe, trouble-free performance.
2. The user is responsible for assuring all safety and warning requirements of the application are met through his/her own analysis and testing.

WARNING **Safe Component Selection** (continued)

3. Tescom may suggest material for use with specific media upon request. Suggestions are based on technical compatibility resources through associations and manufacturers. Tescom does NOT guarantee materials to be compatible with specific media -- THIS IS THE RESPONSIBILITY OF THE USER!
4. Component function, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system user.

WARNING **Do not modify equipment or add attachments not approved by the manufacturer.**

**ASSEMBLY/INSTALLATION DRAWINGS & BILLS OF MATERIAL Drawings and parts lists for your product may be obtained by calling the number below. Tescom will provide these by fax or mail. Your local Tescom representative can provide additional assistance.**

**Call (800) 447 - 1250**
**for assembly/installation drawings & bills of material. Be sure to have your complete model number ready.**

TESCOM
CORPORATION
INDUSTRIAL CONTROLS DIVISION
12616 Industrial Boulevard
Elk River, MN 55330

Form No. 1891 Printed 5/00 40M

FORM 1329

TESCOM
CORPORATION
INDUSTRIAL CONTROLS DIVISION
12616 Industrial Boulevard
Elk River, Minnesota 55330-2491

# CAUTION

# CLEANING NOTICE

This equipment has been cleaned to a high commercial standard. When installing, care must be taken to prevent unit from becoming contaminated with particles in excess of 50 micron size. Such contamination may cause malfunctioning of the unit.

---Open in a clean area.

---Install in a properly cleaned system.

10M REV. 8/93 PRINTED IN U S A

# APPENDIX III

## 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.


***Tronair, Inc.***

*1740 Eber Road*
*Holland, Ohio 43528-9794*
*Phone: (419) 866-6301 ! 800-426-6301*
*Fax: (419) 867-0634*
Web Site: www.tronair.com E-mail Address: mail@tronair.com