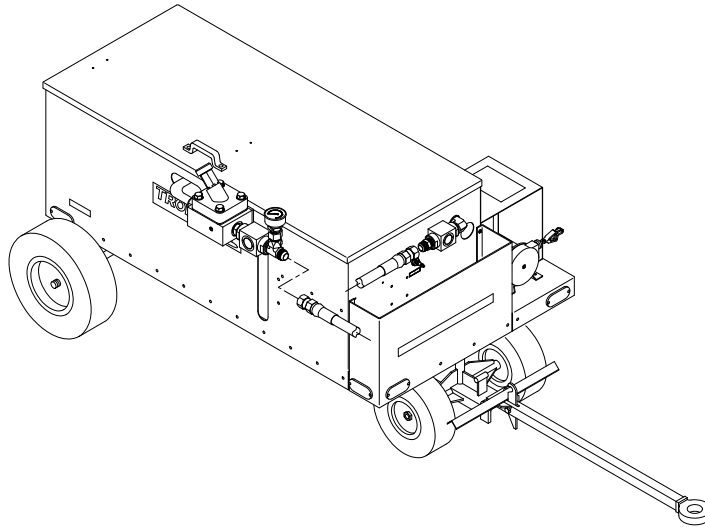




Operation & Service Manual



Model: 06-5089-9B00 Reservoir Servicing Unit

07/2016 – Rev. 02

REVISION
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02

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02/2015
07/2016

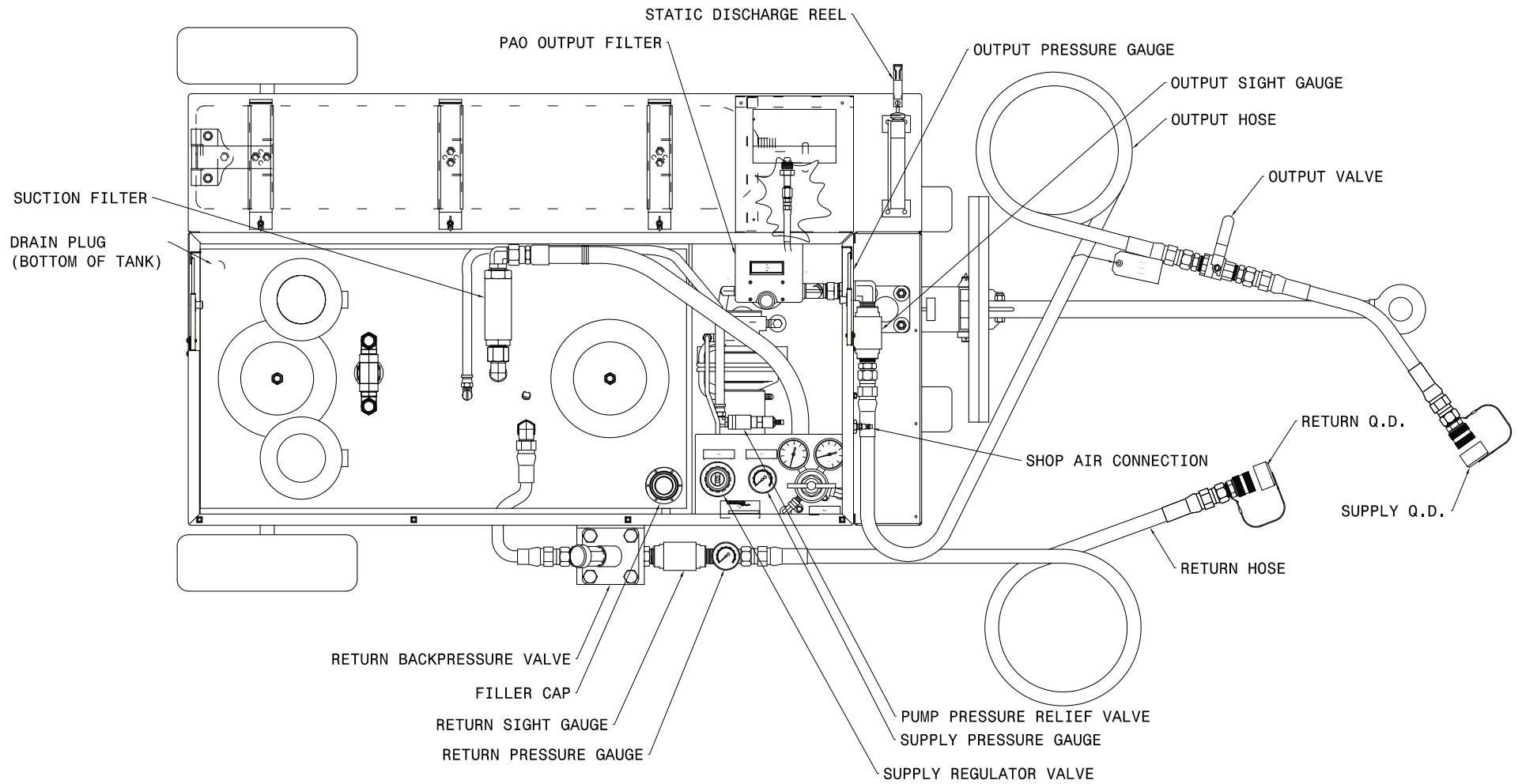
TEXT AFFECTED
Original Release
Modified General Component Locations and Parts List

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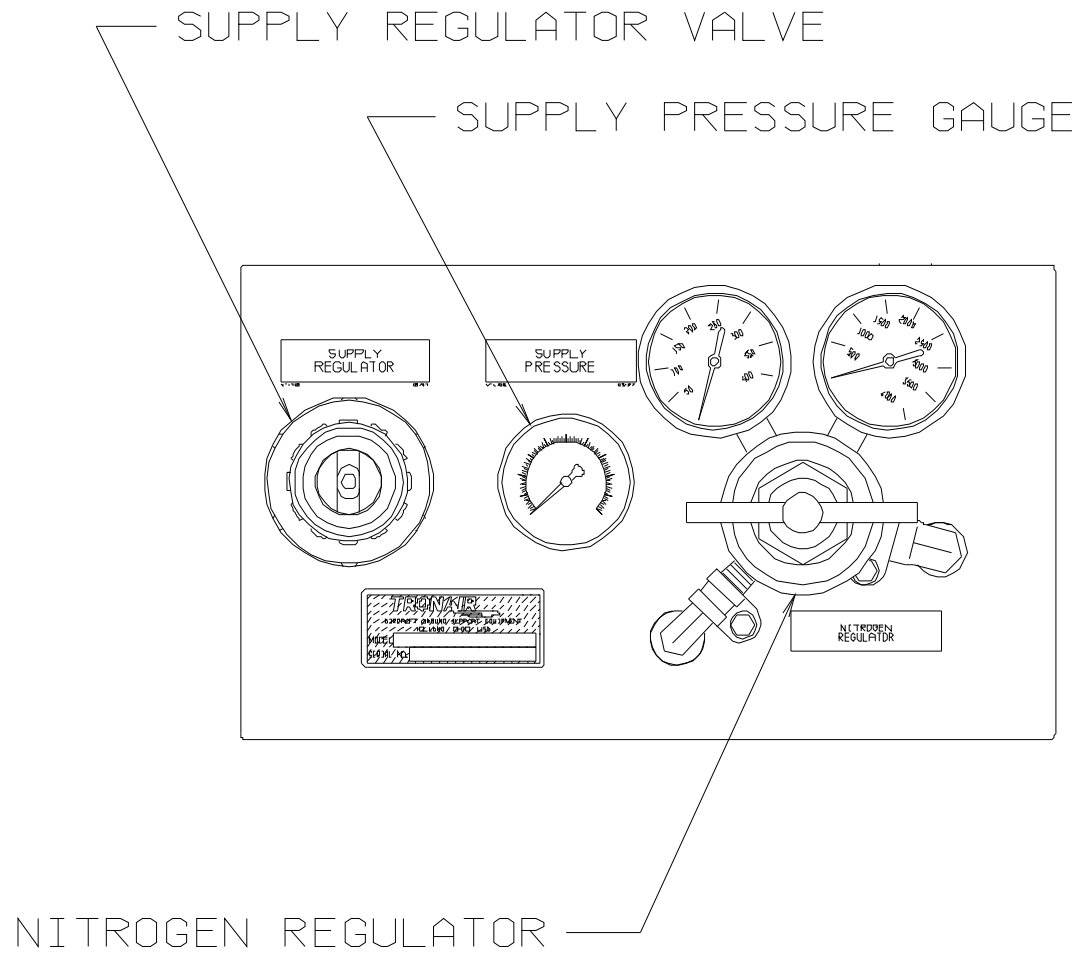
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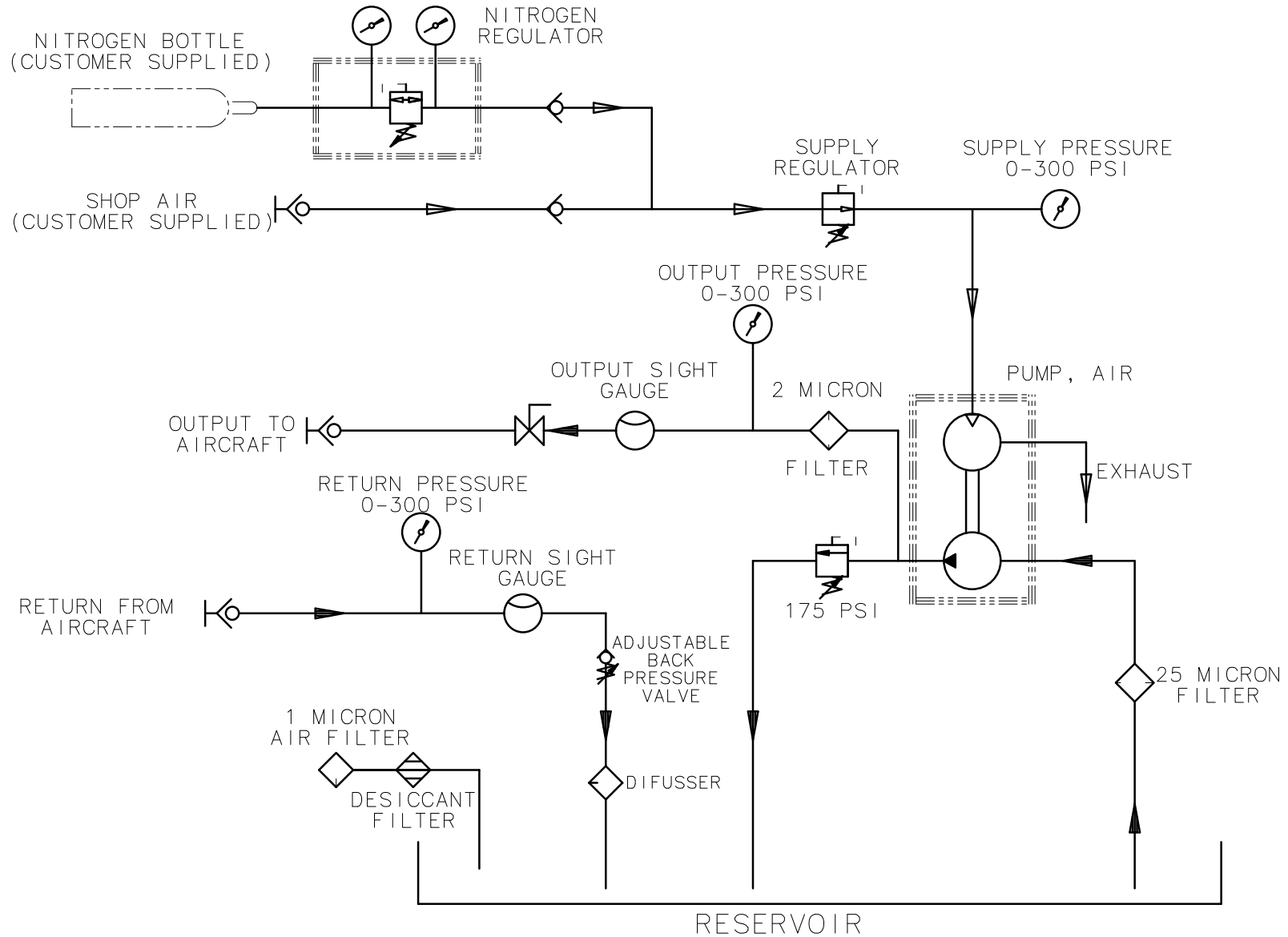
General Component Locations



Regulator Panel Controls



Hydraulic Schematic



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

The Tronair Reservoir Servicing Unit (RSU) is a compact unit primarily designed to provide a source of clean, pressurized fluid for filling reservoirs.

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

TRONAIR, Inc.
1740 Eber Road
Holland, Ohio 43528-9794 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

Fluid: MIL-C-87252
Max. Pressure: 175 PSI
Filtration: 2 Micron
Dimensions: Length: 73 in (185.42 cm)
Width: 50 in (127 cm)
Height: 50 in (127 cm)
Weight: 390 lbs (176.9 kg)
Pump Displacement: 10.0 GPM @ 100 PSI

1.5 FEATURES

- 15 ft (4.6 cm) output and return hoses
- 2 micron main filter
- Adjustable pressure regulator
- 58 gal (219.6 l) fluid reservoir
- Hose compartment
- Pneumatic tires
- Parking brake
- Easy loading of nitrogen bottle
- Pneumatic Pump driven by customer supplied 230 cu. ft. Nitrogen bottle or shop air
- Adjustable back-pressure return system valve and pressure gauge
- Output system pressure gauge
- Fluid output and return sight gauge
- Reservoir Air and desiccant filter
- Adjustable output pressure relief valve

2.0 SAFETY INFORMATION

2.1 USAGE AND SAFETY INFORMATION

To insure 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, or substantial property damage** if the warning notice is ignored.

CAUTION! — Caution is used to indicate the presence of a hazard that **will or can cause minor personal injury or property damage** if the caution notice is ignored.

3.0 PREPARATION FOR USE



CAUTION!

Maximum towing speed is 10 MPH.

The unit is shipped fully assembled, and only the following steps are required to make it operational:

1. Install standard 230 cu. ft. Nitrogen bottle onto unit (See Section 5.0 Nitrogen Bottle Installation steps and Figure below).
2. Fill reservoir with MIL-C-87252 fluid.
3. Pump one (1) quart of fluid prior to use to rinse hoses.

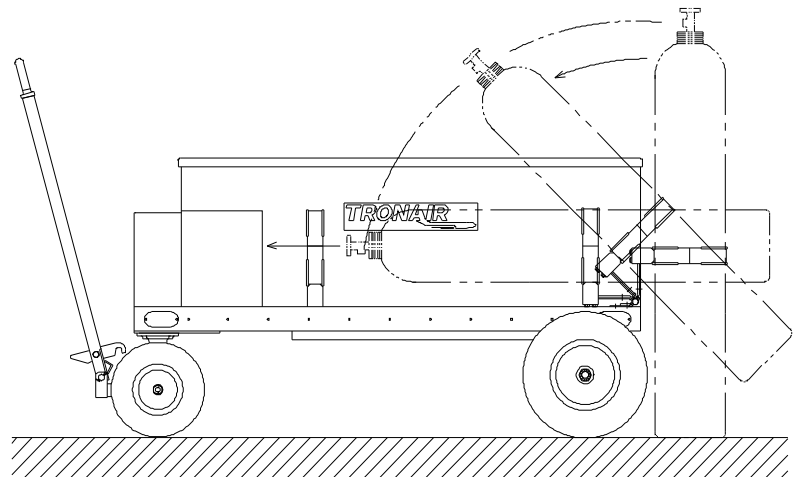


CAUTION!

Only use the type of fluid for which the unit is designed. Using other fluids will cause contamination and seal deterioration.

4.0 NITROGEN BOTTLE INSTALLATION

1. Position nitrogen bottle in front of bottle clamp.
2. Rotate bottle clamp to vertical position and clamp securely around standard 230 cu. ft. nitrogen bottle.
3. Rotate bottle to horizontal position on bottle supports.
4. Relieve clamp pressure and slide nitrogen bottle toward front of cart until bottle rests against the front stop. Rotate bottle until output valve is in line with cart nitrogen input line.
5. Re-secure bottle clamp.



Nitrogen Bottle Installation

5.0 AIRCRAFT FILL PROCEDURE

1. Make sure ball valve at aircraft end of output hose is closed.
2. Connect output and return hoses to aircraft reservoir.
3. Fill reservoir with MIL-C-87252 fluid.

Note: The PAO service cart may be powered by either a Nitrogen bottle or pressurized shop air.

- a. **Nitrogen Bottle:** Open nitrogen bottle valve. If required, set low pressure valve on Nitrogen regulator to same pressure as shop air (80-100 PSI).
 - b. **Shop Air:** Connect shop air to fitting on PAO service cart.
4. As required, adjust supply regulator until the desired maximum output pressure is achieved (0-175 PSI). The SUPPLY pressure will be between 0-25 PSI. **Do not exceed 30 PSI maximum.**
 5. Open ball valve at aircraft end of output hose to fill the aircraft reservoir.
 6. Close ball valve when aircraft reservoir is full.
 7. Close nitrogen bottle valve (leave nitrogen regulator as is) disconnect or shut off shop air.

6.0 BACK-PRESSURE VALVE OPERATION

The return system back-pressure valve is used to maintain pressure in the return line during operation (assuming there is fluid returning to the PAO service cart).

1. Rotate knob on back-pressure valve counter-clockwise to fully open the valve.
2. With fluid returning to the PAO service cart, adjust the knob clockwise on the back-pressure valve to increase pressure in the return line.
3. View return pressure on the return line pressure gauge; set to desired pressure.



CAUTION!

Pressure must be removed from the output and return lines before disconnecting hoses from the aircraft.

7.0 OPEN LOOP OPERATION

The PAO service cart can be used to remove entrapped air and circulate the fluid through the filter for contamination removal.

1. Attach the output and return hoses to the aircraft.
2. Set the valves on the aircraft so fluid can circulate through the aircraft.
3. Begin pumping fluid to the aircraft from the PAO service cart while allowing fluid to return to the cart. This open loop cycling removes entrapped air and cleans the fluid.



CAUTION!

Pressure must be removed from the output and return lines before disconnecting hoses from the aircraft.

8.0 MAINTENANCE

Maintain 45-50 PSI tire pressure and grease wheel bearings quarterly.

8.1 FILTERS

The 2 micron hydraulic fluid filter is non-bypass. This means that, if the filter becomes clogged, no fluid will pass through it to the output hose. If this happens, service the filters. DO NOT increase the input pressure as damage to components could result.

The main filter is replaceable and should be serviced annually or as necessary based on existing operating environment.

9.0 PROVISION OF SPARES

9.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

TRONAIR, Inc.

1740 Eber Road

Holland, Ohio 43528-9794 USA

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

Fax: (419) 867-0634

E-mail: sales@tronair.com

Website: www.tronair.com

9.2 RECOMMENDED SPARE PARTS LISTS

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

10.0 IN SERVICE SUPPORT

Contact Tronair, Inc. for technical services and information. See Section 1.3 – Manufacturer.

11.0 GAURANTEES/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.**

12.0 APPENDICES

APPENDIX I	Wilkerson Manual Desiccant Dryer Installation and Maintenance Data
APPENDIX II	MSDS Hydraulic Fluid
APPENDIX III	Harris Regulator Instruction Manual
APPENDIX IV	Teledyne Sprague pump Parts List

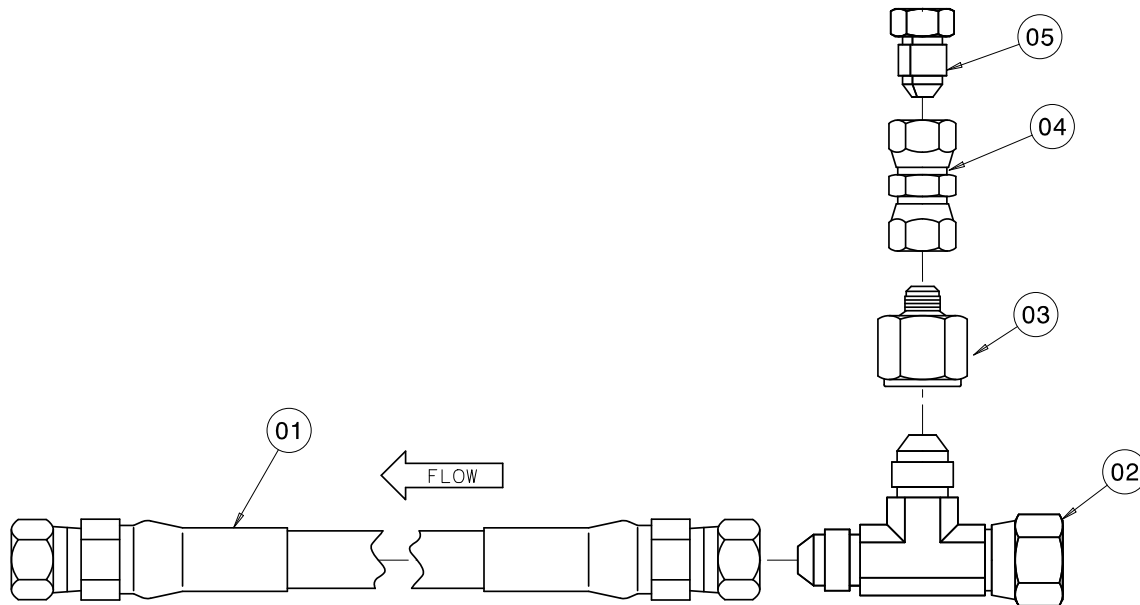
Internal & External Hoses

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Part Number	Location
TF-1107-02*18.0	Pump to Filter
TF-1107-03*16.0	Filter to Pressure Gauge
TF-1105-06*3.0.	Air Regulator to Pump
TF-1105-06*14.0	Air Regulator to Pressure Gauge
TF-1105-06*06.0	Pump Exhaust
TF-1107-01*48.0	Reservoir to Pump Inlet
TF-1199	Front Panel to Ball Valve (Output Hose)
TF-1107-01*48.0	Ball Valve to Aircraft
TF-1079-04	Nitrogen Regulator to Nitrogen Bottle
TF-1199	Aircraft to Back-Pressure Valve
TF-1105-04*48.0	Desiccant Filter to Reservoir
TF-1107-02*48.0	Pressure Relief Valve to Reservoir
TF-1105-06*14.0	Shop Air to Check Valve

Output Hose Assembly

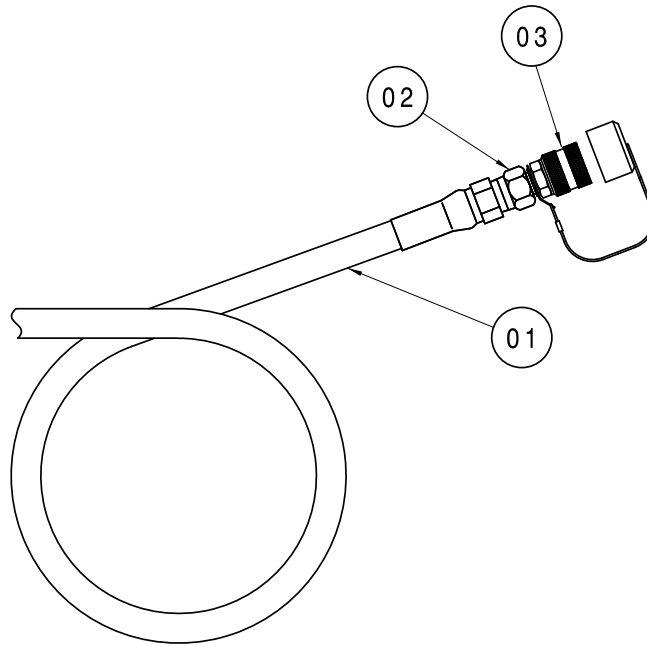
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	TF-1199	Assembly, Hose, #16 FJIC, 198" Long	1
2	N-2016-10-S	Tee, Run Swivel #16	1
3	N-2055-18-S	Reducer, Tube #16-8	1
4	N-2697-03-S	Union, Swivel Nut #8	1
5	N-2014-06-S	Plug, #8	1

Return Hose Assembly

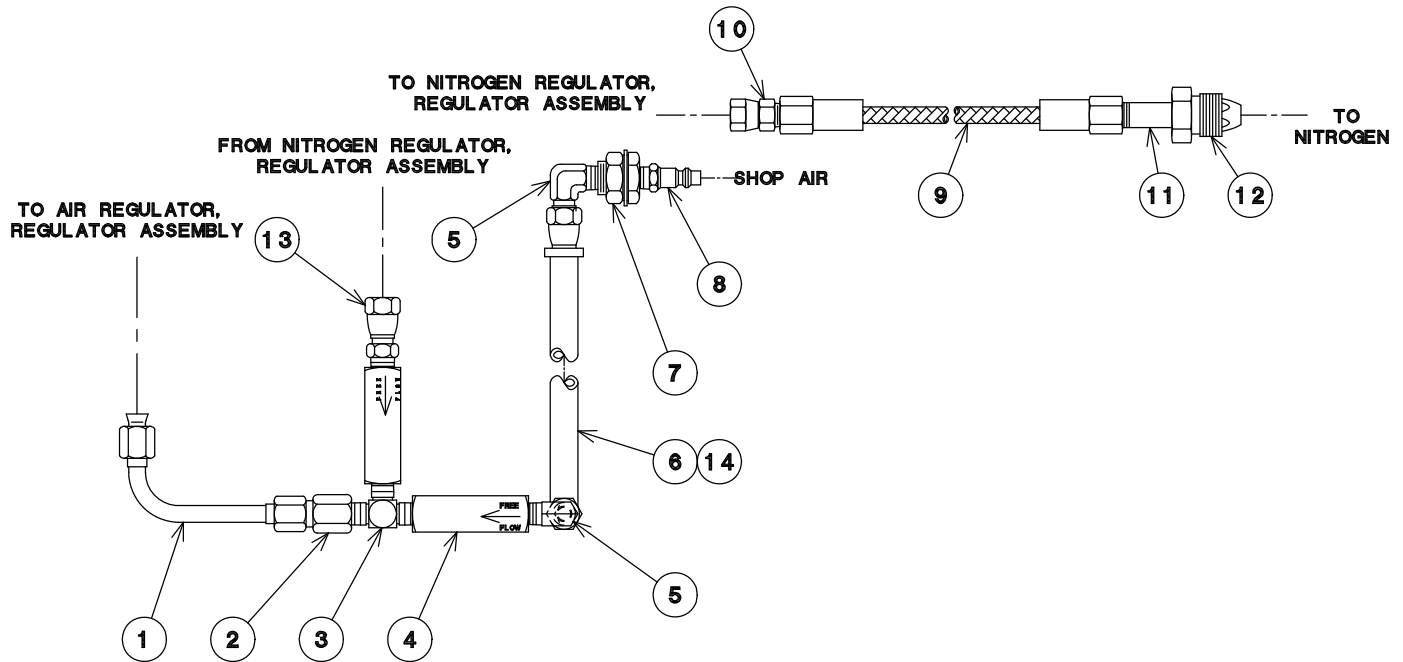
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	TF-1199	Assembly, Hose, #16 FJIC, 198" Long	1
2	N-2055-26-S	Reducer, Tube	1
3	N-2806	Coupling, Quick Disconnect	1

Check Valve Assembly

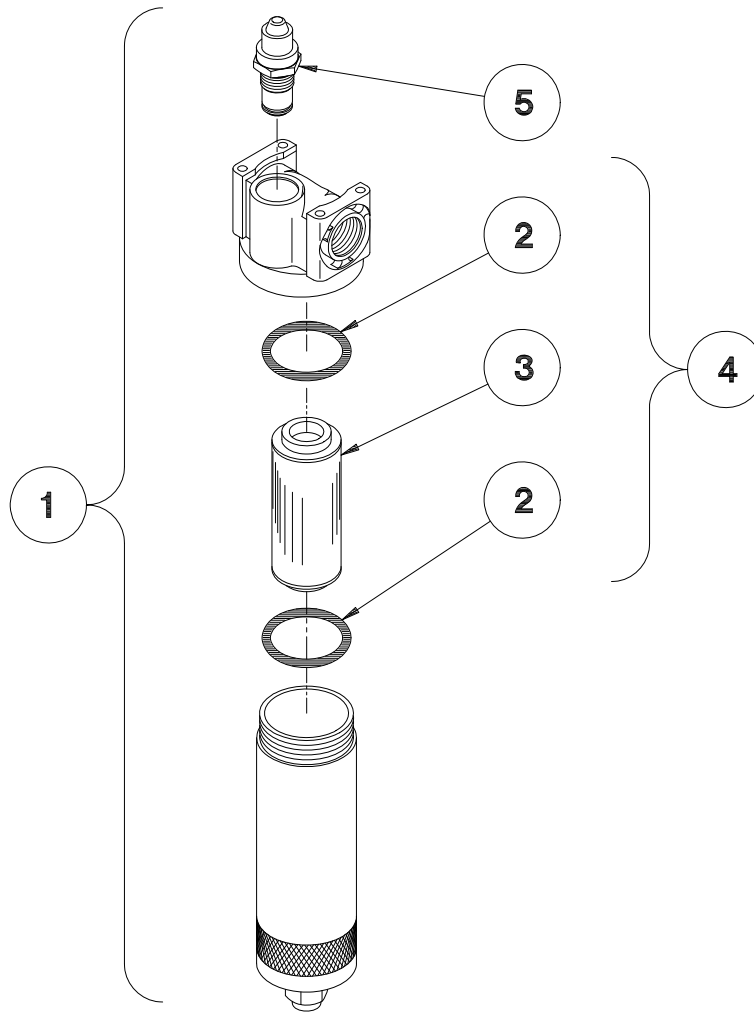
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	Z-3787	Assembly, Tube	1
2	N-2010-07-S	Connector, Female (6 GTX-S)	1
3	N-2211-04-S	Tee, Male Pipe (1/4 RRS-S)	1
4	HC-1080	Valve, Check	2
5	N-2005-08-S	Elbow, Male, #6 JIC x 1/4 NPT	2
6	TF-1105-06*14.0	Assembly, Hose #6 JIC x 14" long	1
7	N-2218-03	Connector, Anchor, 1/4 NPT	1
8	PC-1058	Fitting, Quick Disconnect Air, 1/4 NPT	1
9	TF-1079-04	Assembly, Hose #4, 1/4" NPT x 36" long	1
10	N-2030-01-S	Swivel, Female, #4 JIC x 1/4 NPT	1
11	PC-1000	Nipple, Inlet	1
12	PC-1001	Nut	1
13	N-2030-03-S	Swivel, Female, #6 JIC x 1/4 NPT	1
14	N-2026-03-B	Swivel, Female, #6 JIC x #6 Hose	2

Pressure Filter Assembly

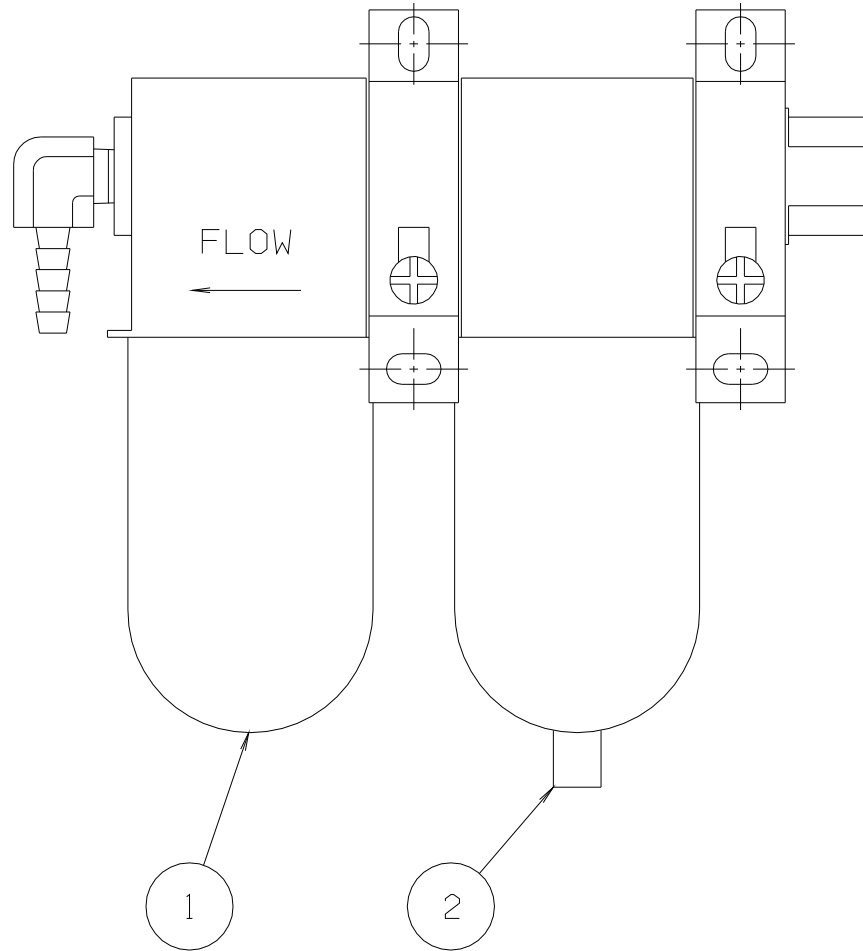
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	HC-1756	Filter, #12 * 800 PSI	1
2	HC-2026-142	O-ring, Series 2 (Fluorosilicone)	2
3	HC-1886	Filter Element	1
4	K-3242	Kit, Replacement Element	1
5	HC-1839	Indicator, Clogging	1
Not Shown	K-3101	Kit, O-ring	1

Desiccant Filter Assembly

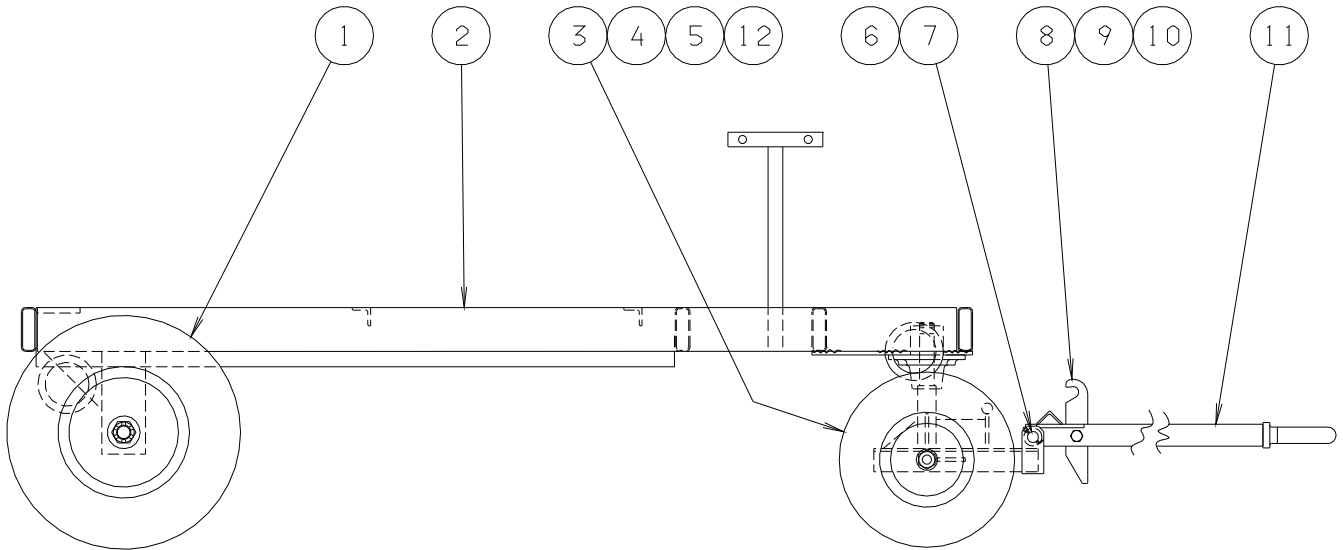
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	PC-1053	Dryer, Desiccant	1
	PC-1056	Desiccant (Three ¼ lb bags)	1
2	PC-1052	Filter, Air	1
	PC-1059	Element, Filter (5 micron element)	1

Frame Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

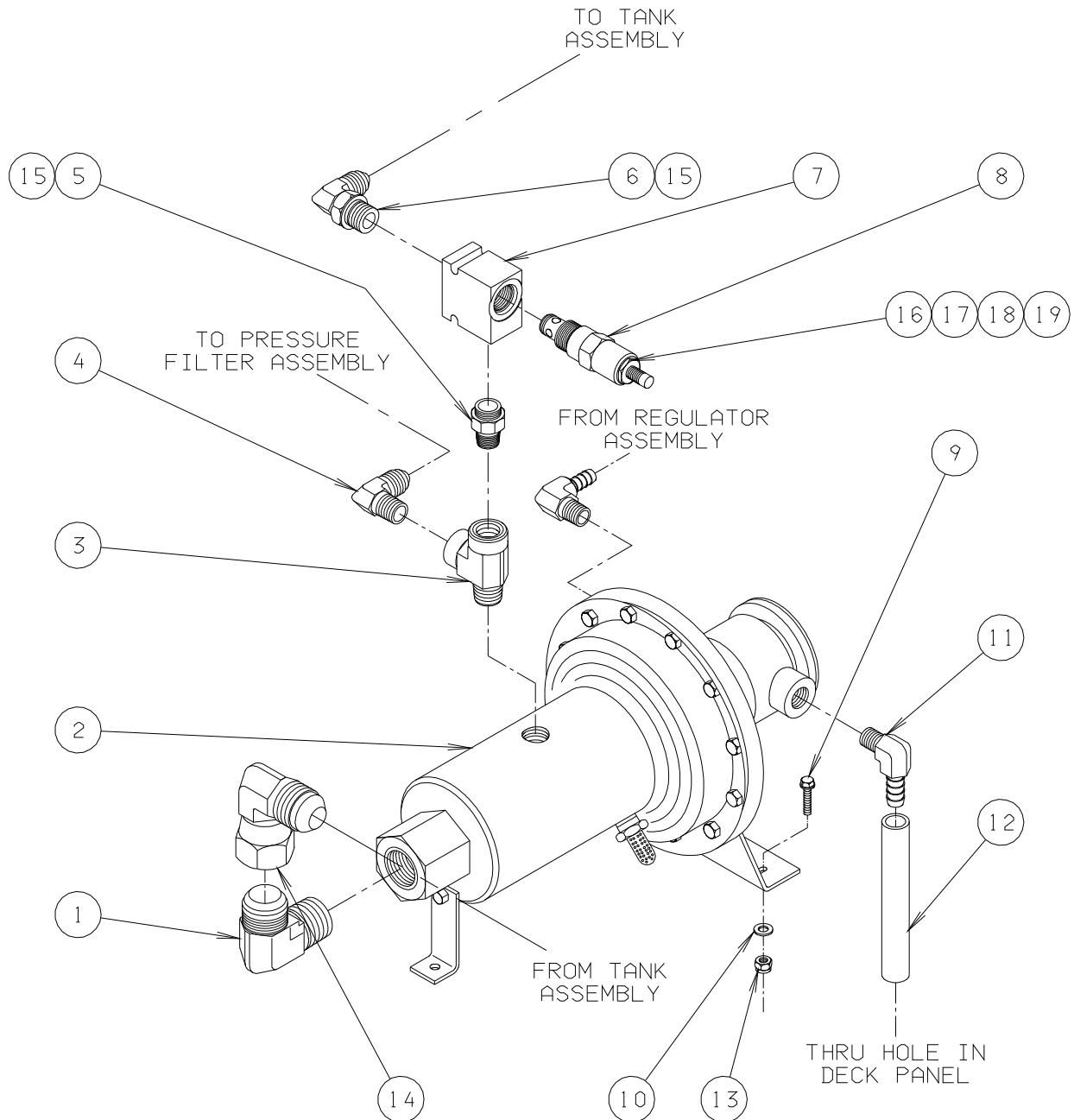


Item	Part Number	Description	Qty
1	Z-1217	Assembly, Wheel Tire and Bearing	2
2	Z-3980-02 (Specify color)	Weldment, Reservoir Servicing Unit Frame	1
3	U-1041	Wheel, Pneumatic Tire	2
4	G-1203-1115	Elastic Jamnut, 3/4-16	2
5	Z-4835 (Specify color)	Assembly, Steer Axle	1
6	R-1122	Pin	1
7	G-1301-03	Pin, Cotter, 1/8" diameter x 11/2" long	2
8	J-1626	Lever	1
9	G-1100-109522	Bolt, Hex Head, Grade 5, 1/2-20 x 2 1/4" long	1
10	G-1202-1095	Stopnut, 1/2-20 Elastic	1
11	Z-2451-02 (Specify color)	Weldment, Towbar	1
12	G-1250-1110N	Flatwasher, 3/4 Narrow	2

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Pump & Valve Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	N-2005-23-S	Elbow, Male, #16 JIC x 1.0 NPT	1
2	PC-1075	Pump, Air, 12 GPM, 650 PSI	1
3	N-2209-10-S	Tee, Street, 1/2 NPT	1
4	N-2005-14-S	Elbow, Male, #8 JIC x 1/2 NPT	1
5	N-2517-08-S-B	Thread Adapter, #8 SAE x 1/2 NPT	1
6	N-2001-11-S-B	Elbow, Straight Thread, #8 SAE x JIC	1
7	HC-1757	Body, Valve (Cartridge)	1
8	HC-1710	Valve, Pressure Relief	1
9	G-1150-103504	Screw, Hex Head Machine, #10-32 x 1/2" long	3
10	G-1250-1030N	Flatwasher, #10 Narrow	3

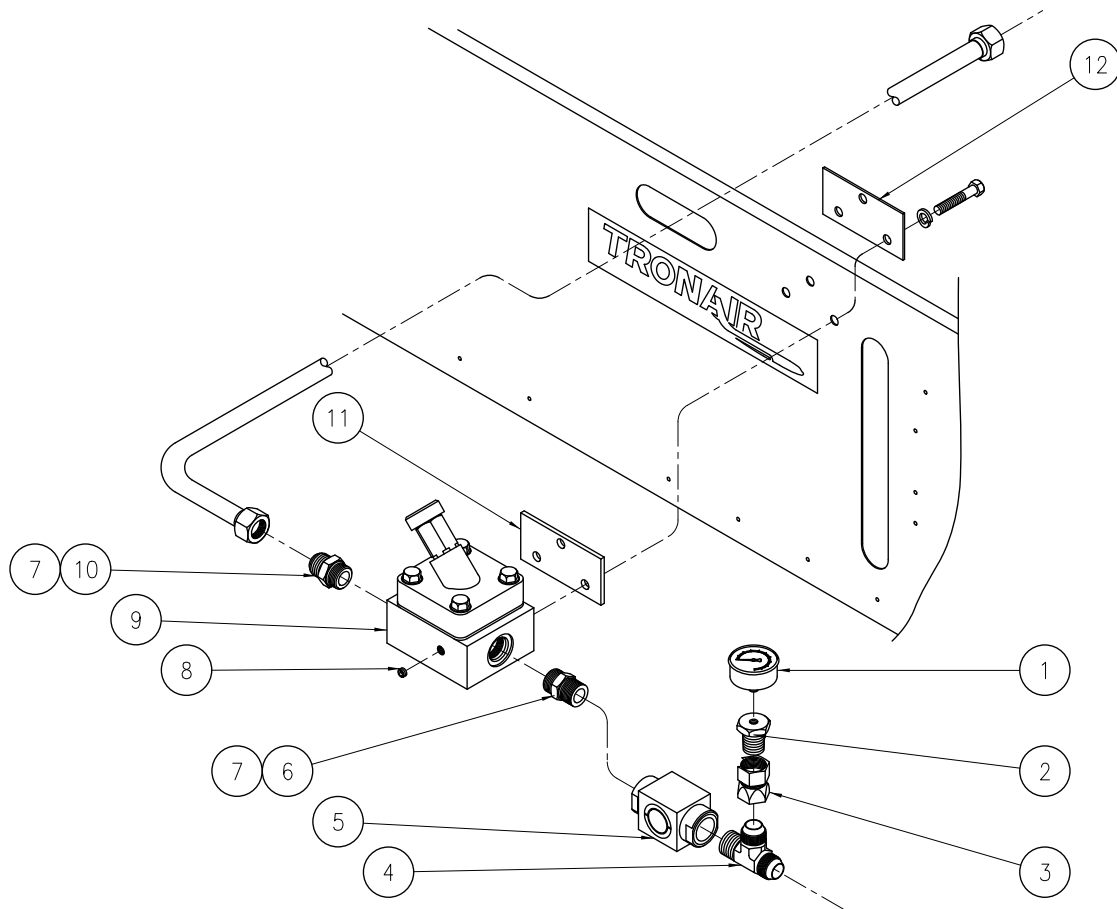
Pump & Valve Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
11	N-2410-08	Elbow, Male, 1/2 NPT x 3/8 Hose	2
12	TF-1105-06*06.0	Hose, Push Lok, 3/8" diameter x 6" long	1
13	G-1202-1035	Stopnut, Elastic, #10-32	3
14	N-2002-10-S	Elbow, Swivel Female, #16 JIC	1
15	HC-2027-908	O-ring, Series 3 (Fluorosilicone)	2
16	HC-2026-011	O-ring, Series 2 (Fluorosilicone)	1
17	HC-2026-014	O-ring, Series 2 (Fluorosilicone)	1
18	HC-2026-015	O-ring, Series 2 (Fluorosilicone)	1
19	HC-2027-910	O-ring, Series 3 (Fluorosilicone)	1

Return Back Pressure Valve Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

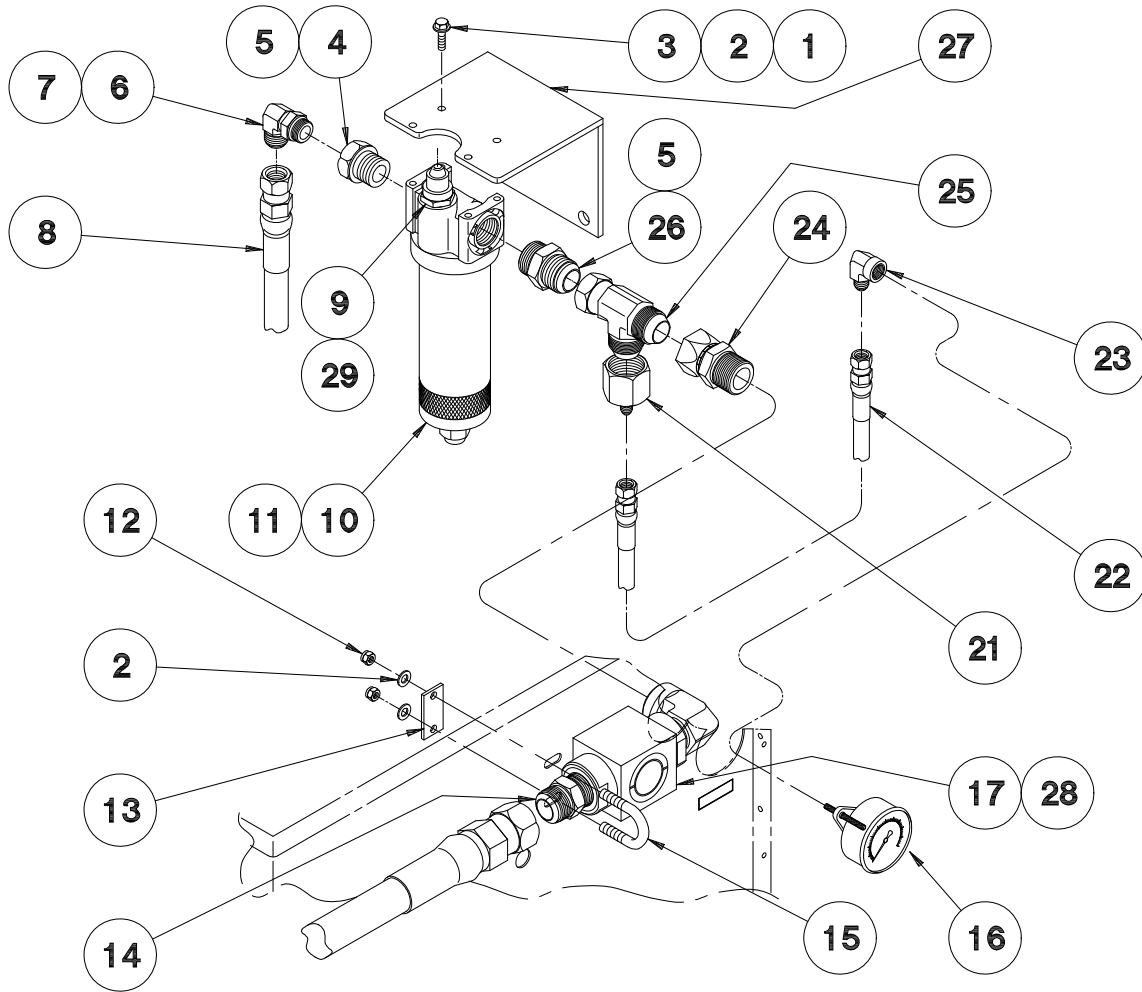


Item	Part Number	Description	Qty
1	HC-1622	Gauge, Pressure, 2.50 x 300 PSI	1
2	N-2210-27-S	Bushing, Reducer	1
3	N-2558-16	Adapter, Swivel Nut	1
4	N-2017-23-S	Tee, Male Run	1
5	HC-1792	Gauge, Sight, 1" NPT	1
6	HC-2027-916	O-ring, Series 3 (Fluorosilicone)	2
7	N-2514-08-S-B	Adapter, Male	1
8	N-2205-03-S	Plug	1
9	Z-4073-02	Assembly, Valve	1
10	N-2007-24-S-B	Connector, Male, #16 SAE x JIC	1
11	J-2827-02	Spacer	1
12	J-2818	Plate	1

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Output Filter & Sight Gauge Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	G-1251-1050R	Lockwasher, 1/4 Regular	4
2	G-1250-1050N	Flatwasher, 1/4 Narrow	6
3	G-1100-105006	Bolt, Hex Head, Grade 5, 1/4-20 x 3/4" long	4
4	N-2463-10-S-B	Elbow, Male, #8 SAE x JIC	1
5	HC-2027-912	O-ring, Series 3 (Fluorosilicone)	2
6	N-2001-11-S-B	Elbow, Male, #8 SAE x JIC	1
7	HC-2027-908	O-ring, Series 3 (Fluorosilicone)	1
8	TF-1107-02*18.0	Assembly, Hose, #8 x 18" long	1
9	HC-2027-910	O-ring, Series 3 (Fluorosilicone)	1
10	HC-1756	Filter, #12 SAE x 800 PSI	1
11	HC-2026-142	O-ring, Series 2 (Fluorosilicone)	2
12	G-1202-1050	Stopnut, 1/4-20 Elastic	2
13	J-2790	Strap, Sight Gauge/U-Bolt	1
14	N-2009-23-S	Connector, Male, #16 JIC x 1" NPT	1
15	G-1009-12	U-Bolt, 1/4-20	1
16	HC-1622	Gauge, Pressure, 2.5 x 300 PSI	1
17	HC-1792	Sight Gauge, 1" NPT	1

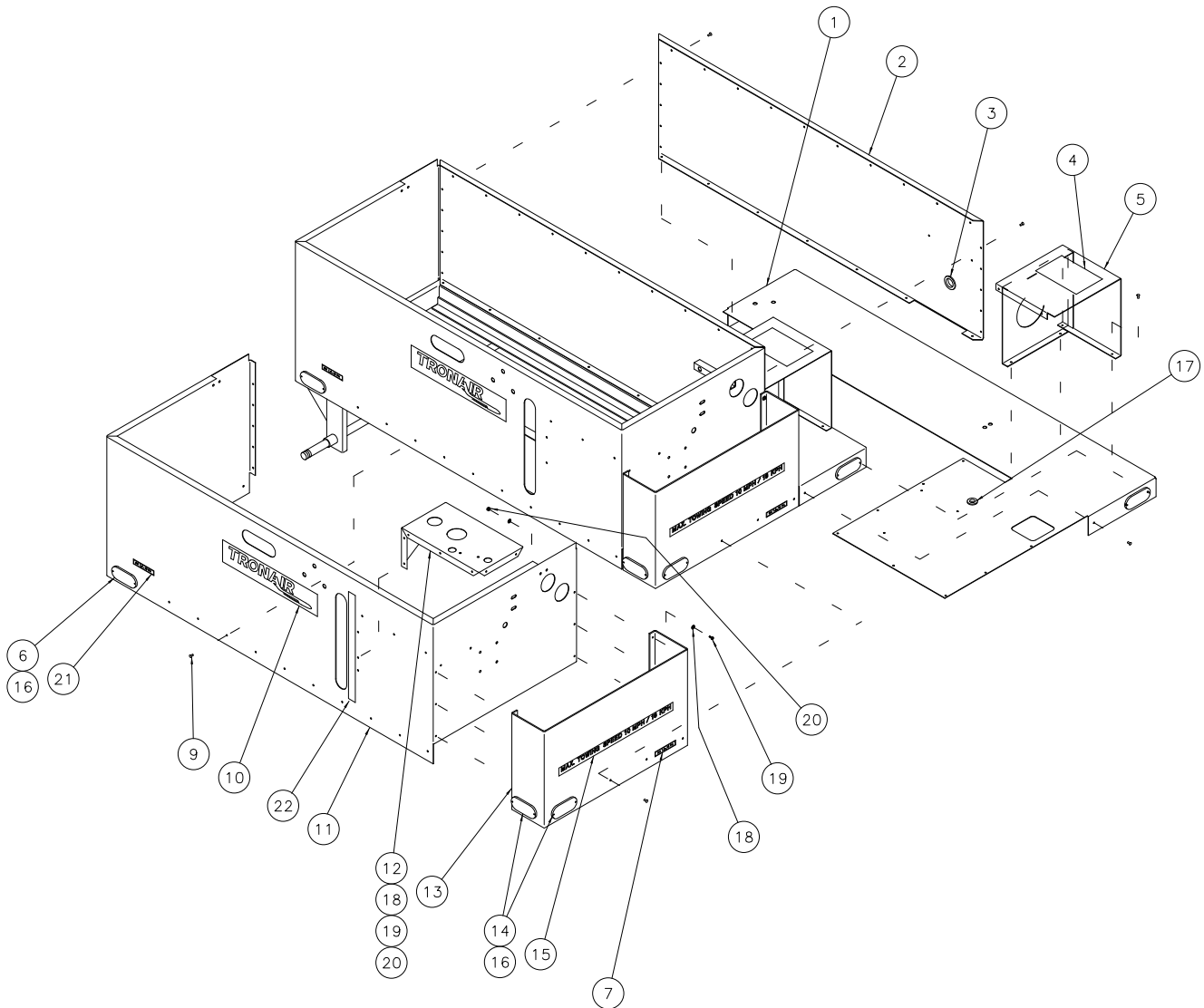
Output Filter & Sight Gauge Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
18	N-2200-18-S	Elbow, Street, 1/4" NPT	1
21	N-2055-16	Reducer, Tube End, #16 JIC x #4 JIC	1
22	TF-1107-03*16.0	Assembly, Hose, #4 x 16" long	1
23	N-2006-04-S	Elbow, Female, #4 JIC x 1/4 NPT	1
24	N-2030-11-S	Swivel, Female, #16 JIC x 1" NPT	1
25	N-2016-10-S	Tee, Run Swivel, #16 JIC	1
26	N-2007-25-S-B	Connector, Male, #12 SAE x #16 JIC	1
27	Z-4301-02	Weldment, Filter Bracket (Specify color)	1
28	HC-2026-129	O-ring, Series 2 (Fluorosilicone)	2
29	HC-2675	O-ring, Viton	1

Sheet Metal Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	S-1646-02	Panel, Main Deck, (RSU) (Specify color)	1
2	S-1517-02	Panel, Back (Specify color)	1
3	H-1901-28	Grommet, 1 1/2" diameter hole	2
4	V-1401-02	Label, "Danger"	1
5	Z-4645-02	Weldment, Bottle Guide (Specify color)	1
6	H-1427-01	Reflector, Red	4
7	V-1341-02	Label, "Max. Tire Pressure 85 PSI"	1
8	Z-4636	Assembly, Frame (Specify color)	1
9	G-1351-18	Rivet, 3/16 Open End Steel	60
10	V-1340-02	Label, "Tronair"	2
11	S-2763-SP	Panel, Main Body, (RSU) (Specify color)	1
12	S-1547-02	Shelf, Regulators & Gauge (RSU) (Specify color)	1
13	S-1335-02	Compartment, Hose (Specify color)	1
14	H-1427-02	Reflector, Amber	4

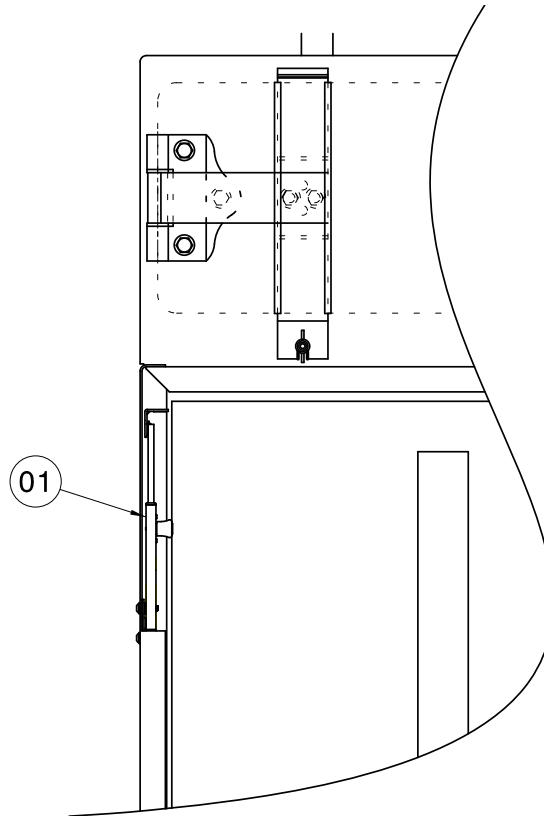
Sheet Metal Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
15	V-1303-02	Label, "Max. Towing Speed 10 MPH"	1
16	G-1352-19	Rivet, 5/32 Open End Aluminum	16
17	H-1901-23	Grommet, 1" diameter hole	1
18	G-1250-1030N	Flatwasher, #10 Narrow	26
19	G-1159-103504	Screw, Round Head Cross Recess Machine#10-32 x 1/2" long	13
20	G-1202-1035	Stopnut, #10-32 Elastic	13
21	V-1392-02	Label, "Max. Tire Pressure 50 PSI"	2
22	V-2281	Label, Tank Fluid Leak	1

Latch

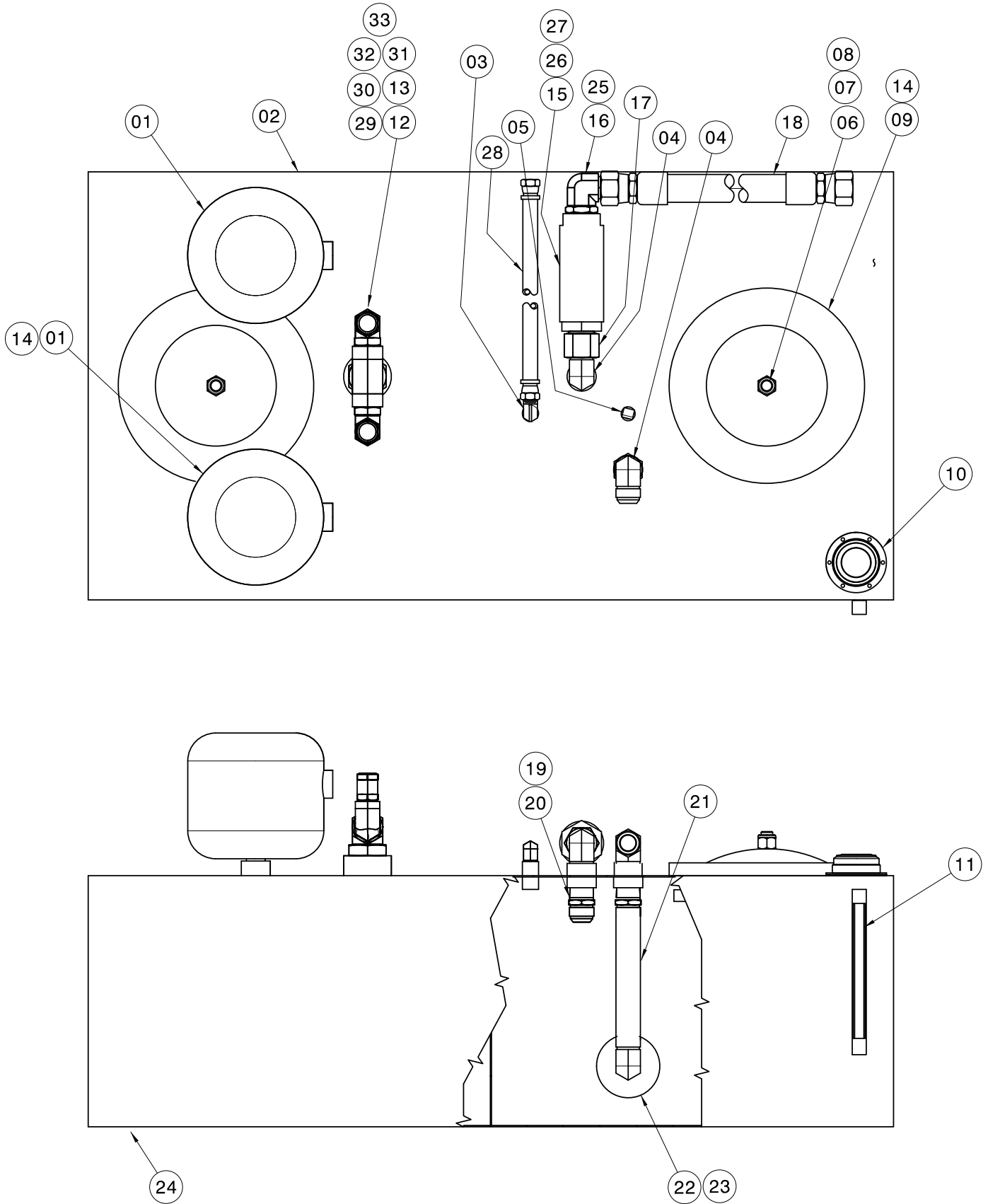
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	H-3113	Latch, Stay (Both Sides)	2

Reservoir Tank Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.



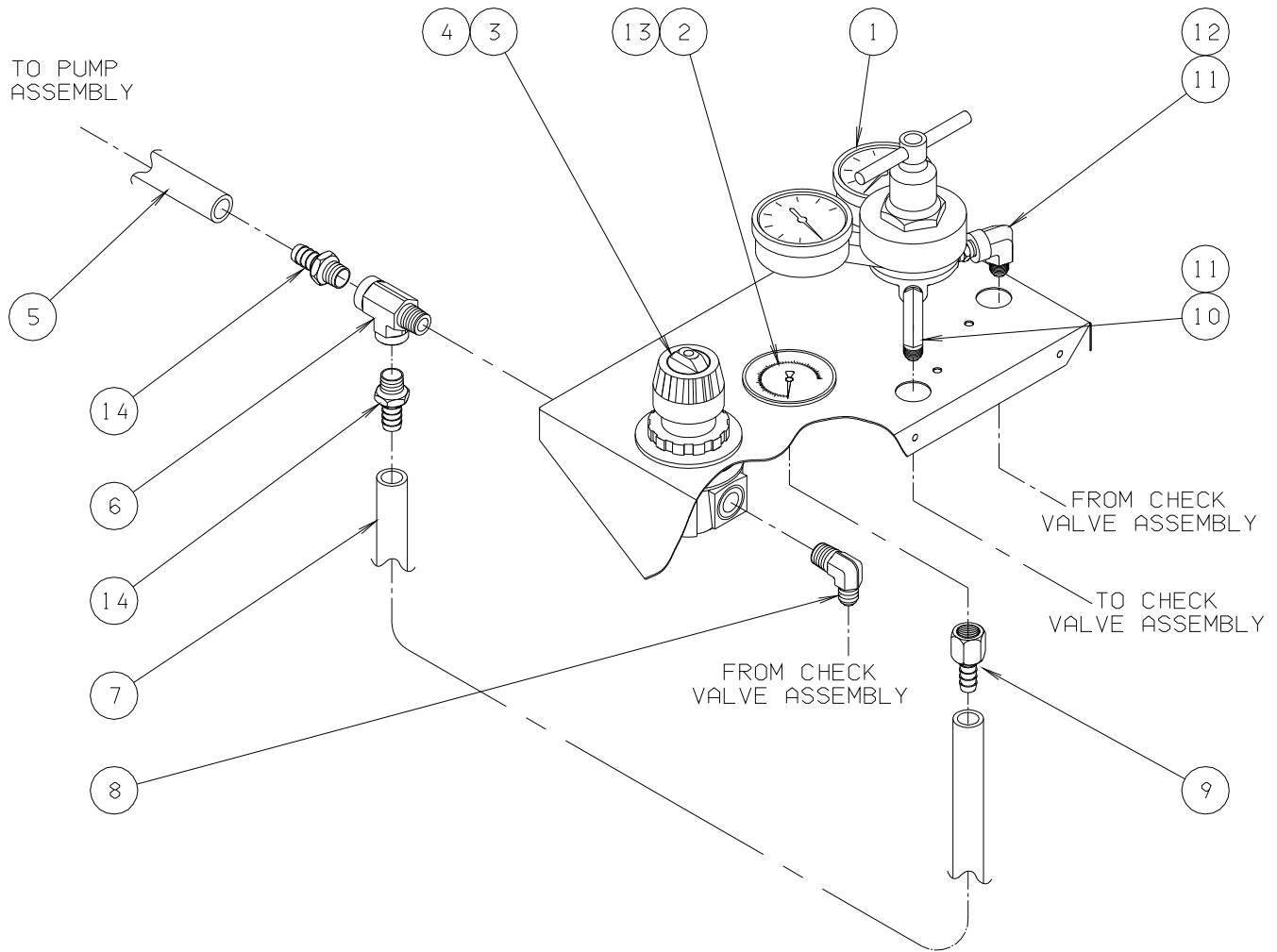
Reservoir Tank Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Item	Part Number	Description	Qty
1	H-3812	Filter, Exhaust	2
2	H-3811	Tank, Weldment	1
3	N-2005-23-S	Connector, Male #8	1
4	N-2005-23-S	Elbow, Male #8	2
5	N-2206-03-S	Plug, Hex Head, ¼ NPT	1
6	Z-2199	Weldment, Clamp	1
7	H-1735-02	Washer, Nylon	1
8	G-1202-1100	ESN, ⅝ - 11	1
9	H-1740	Assembly, Cover	1
10	HC-1030-01	Filler, Breather (Non-Vented)	1
11	HC-1382-08	Gauge, Sight (MB)	1
12	N-2208-18-S	Tee, Male Branch	1
13	N-2210-22-S	Reducer, Pipe Thread 1 ½ x 1	1
14	H-1550-14	Clamp, Snaplock Hose	2
15	HC-1814	Filter, In-Line	1
16	N-2001-24-S-B	Elbow, Male #16 JIC x SAE	1
17	N-2202-15-S-B	Adapter, Female Pipe	1
18	TF-1107-01*47.0	Assembly, Hose, #16	1
19	N-2019-10-S	Sleeve, 1" Tube	1
20	N-2000-10-S	Nut, #16 JIC	1
21	HC-1800	Assembly, Return Diffuser Tube (PAO)	1
22	N-2005-24-S	Elbow, Male, #16 JIC x ¾ NPT	1
23	HC-1029	Diffuser, ¾ NPT	1
24	N-2206-05-S	Plug, Hex Head, ½ NPT	1
25	HC-2027-916	O-Ring, Series 3	1
26	HC-2027-924	O-Ring, Series 3	1
27	HC-2026-218	O-Ring, Series 3	1
28	TF-1107-02*47.0	Assembly, Hose, #8	1
29	N-2210-17-S	Reducer, Pipe Thread 1 x ¾	1
30	N-2200-14-S	Elbow, Street ¾	1
31	HC-2712	Valve, Vent Relief	1
Not Shown	HC-2166	Filler-Breather	1
Not Shown	G-1658-19	Washer, w/Neoprene ⅝	1

Regulator Assembly

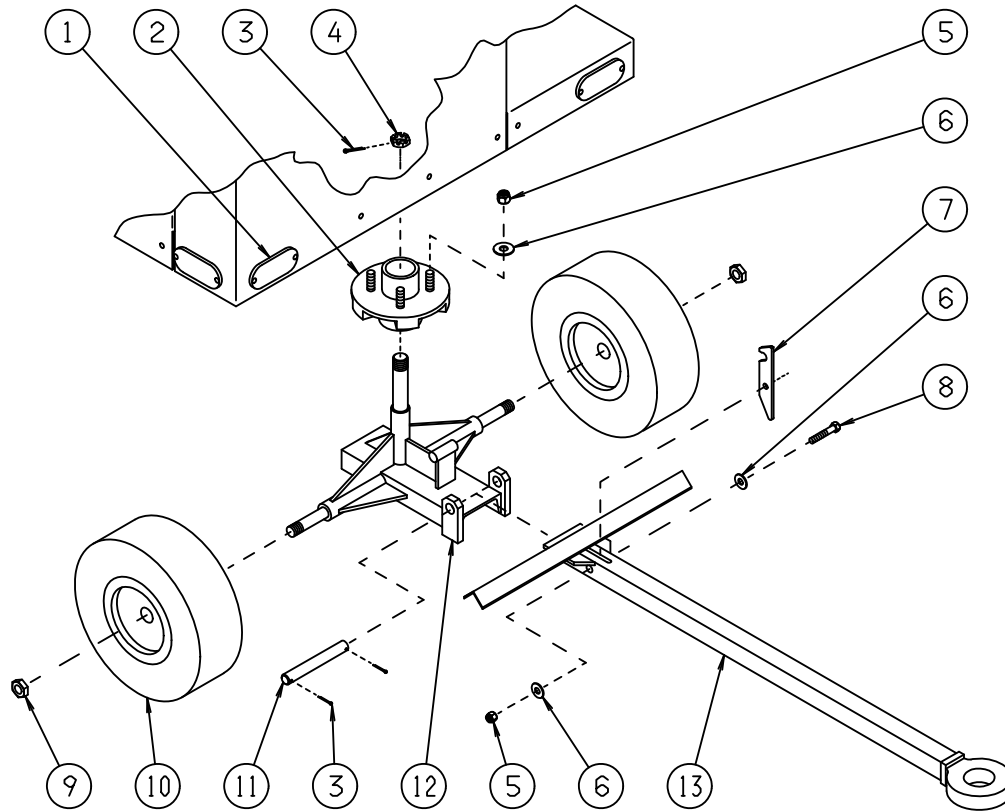
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	H-1677	Regulator	1
2	HC-1444	Gauge, Pressure 2.50 x 60 PSI	1
3	PC-1071	Regulator	1
4	N-2205-03-S	Plug, Hollow Hex, 1/4 NPT	1
5	TF-1105-06*30.0	Hose, 3/8 x 30" long	1
6	N-2209-06-S	Tee, Street, 3/8 NPT	1
7	TF-1105-06*14.0	Hose, 3/8 x 14" long	1
8	N-2005-10-S	Elbow, Male, #6 JIC x 3/8 NPT	1
9	N-2457-05	Connector, Female, 1/4 NPT x 3/8 Hose	1
10	N-2004-06-S	Elbow, Male, Extra Long, #4 JIC x 1/4 NPT	1
11	H-1721-02	Clamp, Electrical	2
12	N-2006-04-S	Elbow, Steel, #4 JIC x 1/4 NPT	1
13	K-4267	Kit, Gauge Panel Mount	1
14	N-2412-11	Connector, Straight, 3/8 NPT x 3/8 Hose	2

Truck & Wheel Assembly

When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
12	Z-2449-02	Weldment, Truck (Specify color)	1
13	Z-2451-02	Weldment, Tongue (Specify color)	1
	K-1249	Kit, Pin Replacement; consist of:	
3	G-1301-03	Pin, Cotter, 1/8" diameter x 11/2" long	2
11	R-1122	Pin	1
	K-1255	Kit, Hub Replacement; consist of:	
2	H-1335	Hub, Idler	1
3	G-1301-03	Pin, Cotter, 1/8" diameter x 11/2" long	1
4	G-1230-01	Nut, Axle, 1"-14 UNS Thread	1
5	G-1202-1095	Stopnut, 1/2-20 Elastic	4
6	G-1250-1090N	Flatwasher, 1/2 Narrow	4
	K-1320	Kit, Lever Replacement; consist of:	
5	G-1202-1095	Stopnut, 1/2-20 Elastic	1
6	G-1250-1090N	Flatwasher, 1/2 Narrow	1
7	J-1626	Lever	1
8	G-1100-109522	Bolt, Hex Head, Grade 5, 1/2-20 x 2 1/4" long	1
	K-2084	Kit, Tire Replacement; consist of:	
9	G-1203-1115	Jamnut, 3/4-16 Elastic	1
10	U-1041	Wheel, Pneumatic Tire	1
	K-2086	Kit, Red Reflector Replacement; consist of:	
Not Shown	H-1427-01	Reflector, Red	1
Not Shown	G-1352-17	Rivet, 5/32 Open End Aluminum	2
	K-2087	Kit, Amber Reflector Replacement; consist of:	
1	H-1427-02	Reflector, Amber	1
Not Shown	G-1352-17	Rivet, 5/32 Open End Aluminum	2

Replacement Kits

When ordering replacement parts/kits, please specify model, serial number and color of your unit.

Part Number	Description	Qty
K-2286	Kit, Pillow Block Replacement; consist of:	
G-1100-106510	Bolt, Hex Head, Grade 5, 5/16-24 x 1" long	2
G-1250-1060N	Flatwasher, 5/16 Narrow	2
G-1251-1060R	Lockwasher, 5/16 Regular	2
Z-2750	Weldment, Pillow Block	1
K-2449	Kit, Lid Restraint; consist of:	
G-1100-105010	Bolt, Hex Head, Grade 5, 1/4 20 x 1" long	2
G-1203-1050	Jamnut, 1/4-20 Elastic	4
G-1250-1050N	Flatwasher, 1/4 Narrow	4
G-1254-09	Washer, 1/4 Fender	4
Z-3016	Assembly, Cable	1
K-3212	Kit, Hinge Replacement; consist of:	
G-1100-107514	Bolt, Hex Head, Grade 5, 3/8-24 x 1" long	3
G-1202-1075	Stopnut, 3/8-24 Elastic	3
G-1250-1070N	Flatwasher, 3/8 Narrow	6
Z-4640	Assembly, Bottle Clamp	1
K-3213	Kit, Bottle Clamp Replacement; consist of:	
G-1100-106520	Bolt, Hex Head, Grade 5, 5/16-24 x 2" long	2
G-1202-1065	Stopnut, 5/16 Elastic	2
G-1250-1060N	Flatwasher, 5/16 Narrow	4
H-2359	Clamp, Bottle	1



APPENDIX I

**Wilkerson
Manual Desiccant Dryer
Installation and Maintenance
Data
&
MSDS: Desiccant Gel**

INSTALLATION AND MAINTENANCE SHEET

Manual Desiccant Dryer Models X06, X03, X04 AND X25 With Variations and Accessories

WARNING

Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Description

Wilkinson manual dryers are intended to remove water vapor from the compressed air system. Atmospheric dew points as low as -100°F (-73°C) are achievable when operated within rated unit specifications.

General Safety Information

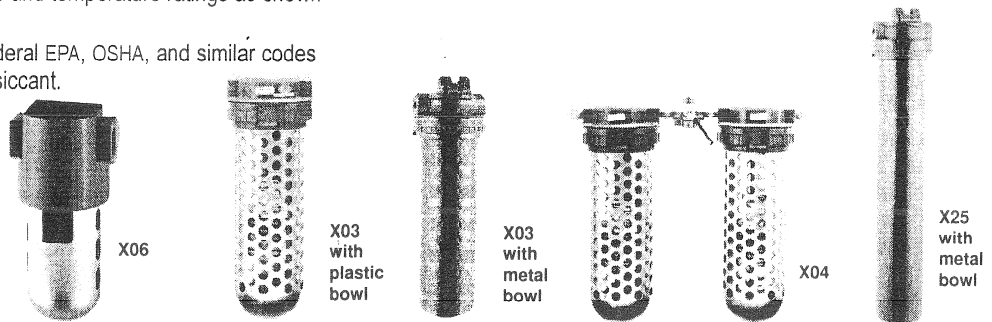


- **RELEASE ALL AIR PRESSURE FROM INTENDED AIRLINE BEFORE INSTALLATION.**
- Install unit in air line before opening desiccant container. After unit installation, add desiccant following steps in desiccant replacement instructions on page 2.
- Always make sure bowl, bowl guard, and clamp ring are in place and the clamp ring is securely locked before pressurization.
- DO NOT exceed the pressure and temperature ratings as shown in the specifications.
- Follow all local, state and federal EPA, OSHA, and similar codes regarding disposal of old desiccant.

Installation

1. Refer to warning (on page 6).
2. Install as close as possible to the point where the air is being used.
3. Install unit with the airflow going in the direction of the arrow. For the X04, install with airflow entering at the bottom center port of the 4-way valve and exiting at the center port of the shuttle valve.
4. Install unit on air line before opening desiccant container. After installation, add desiccant. Shake and tap bowl while filling to settle desiccant. Fill Model X25 and X03/X04 to 1/8" below inner shoulder of bowl. Fill Model X06 bowl to within 1/2" of top.
5. Replace bowl and bowl guard, or metal bowl, and clamp ring onto the unit. Be sure clamp ring is securely locked in place before pressurizing unit.
6. Most manual desiccant dryer users will achieve optimal results when installing the dryer as close to the equipment or process being protected as possible in the compressed air system. Most users, especially those with high quality air requirements, should protect their system and the manual dryer with one or more of the following types of components: **Please see page 4 for exact model recommendations.**

- **Liquid Separator:** Should be used prior to the manual desiccant dryer in any system where large slugs of liquid water are anticipated. The manual desiccant dryer silica gel or mole sieve can be destroyed by large amounts of liquid moisture. Most systems which have an aftercooler and separator, and/or a refrigerated air dryer, will not require a liquid separator. An alternative is to use a particulate filter/separator, described on page 2.



Specifications	X06	X03 plastic bowl	X03 metal bowl	X04	X25 metal bowl
Maximum Pressure	150 psig (10,3 bar)	150 psig (10,3 bar)	150 psig (10,3 bar)	150 psig (10,3 bar)	150 psig (10,3 bar)
Maximum Temperature	125°F (52°C)	125°F (52°C)	150°F (66°C)	125°F (52°C)	150°F (66°C)
Atmospheric Dewpoint*	000 Model: -45°F (-43°C)	000 Model: -45°F (-43°C)	M00 Model: -45°F (-43°C)	000 Model: -45°F (-43°C)	000 Model: -45°F (-43°C)
U00 Model: 4A Molecular Sieve	U00 Model: -100°F (-73°C)	U00 Model: -100°F (-73°C)	MU0 Model: -100°F (-73°C)	U00 Model: -100°F (-73°C)	U00 Model: -100°F (-73°C)
Maximum Continuous Airflow*	5 scfm (2,3 dm³/s)	10 scfm (4,7 dm³/s)	10 scfm (4,7 dm³/s)	10 scfm (4,7 dm³/s)	25 scfm (11,8 dm³/s)
Total Airflow*	600 scf (283 dm³)	4400 scf (2076 dm³)	4400 scf (2076 dm³)	4400x2 scf (2076x2 dm³)	11,000 scf (5191 dm³)
Total Min. of Operation @ Max Continuous Airflow	120 min.	440 min.	440 min.	880 min.	440 min.
Unit Weight With Desiccant	1.13 lbs. (0,51 kg)	7.4 lbs. (3,4 kg)	6.8 lbs. (3,1 kg)	15.0 lbs. (6,8 kg)	11.2 lbs. (5,1 kg)
Desiccant Weight (Alone)	0.25 lbs. (0,11 kg)	1.8 lbs. (0,8 kg)	1.8 lbs. (0,8 kg)	35 lbs. (3,6 kg)	4.4 lbs. (2,0 kg)
Pipe Connections	1/4" NPT (BSPP)	1/4", 1/2" NPT (BSPP)	1/4", 1/2" NPT (BSPP)	1/4", 1/2" NPT (BSPP)	1/2" NPT (BSPP)

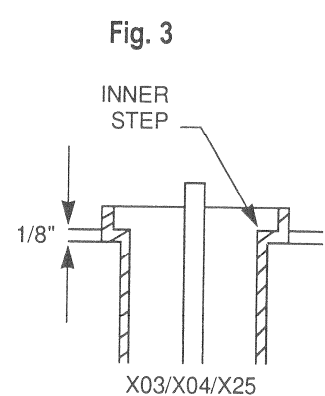
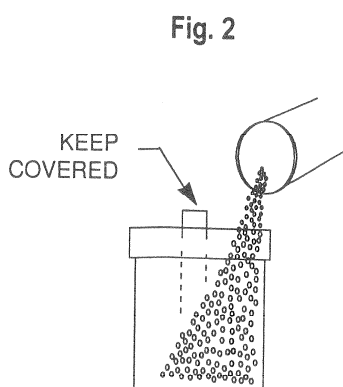
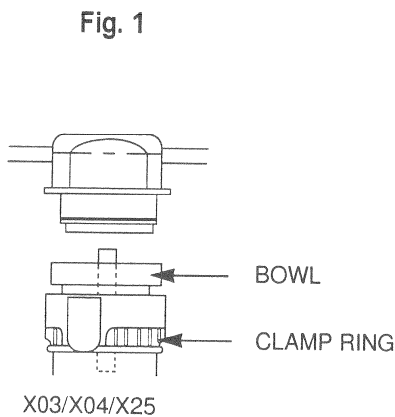
*With Dry Desiccant at 100 psig (7 bar) and 70°F (21°C)

MODELS X06, X03, X04, AND X25

- **Particulate Filter/Separator:** Should be used prior to the manual desiccant dryer in any system where significant amounts of dirt, pipe scale, etc. and/or liquid water, is present, in order to prevent clogging the manual dryer or harming the desiccant. A particulate filter/separator should be used prior to a coalescing filter to extend the life of the coalescing element.
- **Coalescing Filter:** Should be used prior to the manual desiccant dryer in any lubricated compressor system which does not utilize a system coalescing filter. The coalescing filter removes oil from the compressed air, which prevents the oil from coating the silica gel or mole sieve and destroying its ability to dry the air. Oil contaminated desiccant must be replaced and disposed of properly, as it cannot be regenerated.
- **Afterfilter:** Should be used after the manual desiccant dryer in any system where any amount of desiccant dust, however insignificant, is undesirable. The afterfilter prevents the very slight desiccant dusting, which occurs over time, from proceeding downstream into the compressed air system.
- **Pre-Dryers:** Both the silica gel and mole sieve manual desiccant dryers can have their drying lives extended through the use of a pre-dryer. The silica gel ("000"/"M00") models will typically last over three times as long if a refrigerated air dryer is placed in the compressed air system prior to it. (A plant air system refrigerated dryer will provide the same extended life.) The mole sieve ("U00"/"MU0") models will typically last three times as long if a silica gel ("000"/"M00") model dryer installed prior to the mole sieve dryer. (A plant air system desiccant dryer will provide the same extended life.) Users of either type of manual desiccant dryer who expect a high air flow demand may wish to consider using a pre-dryer. **Please see page 4 for exact model recommendations.**

Operation

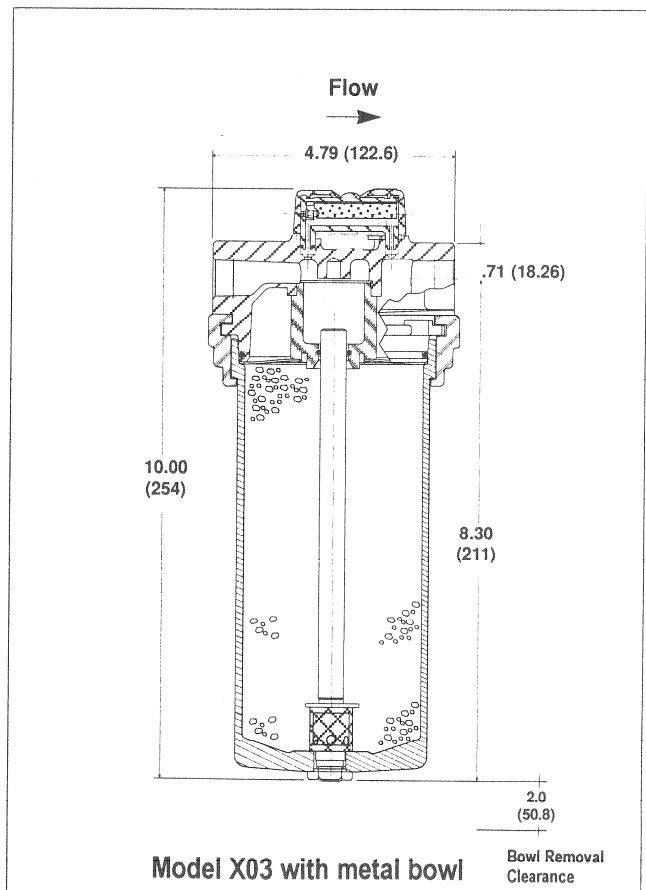
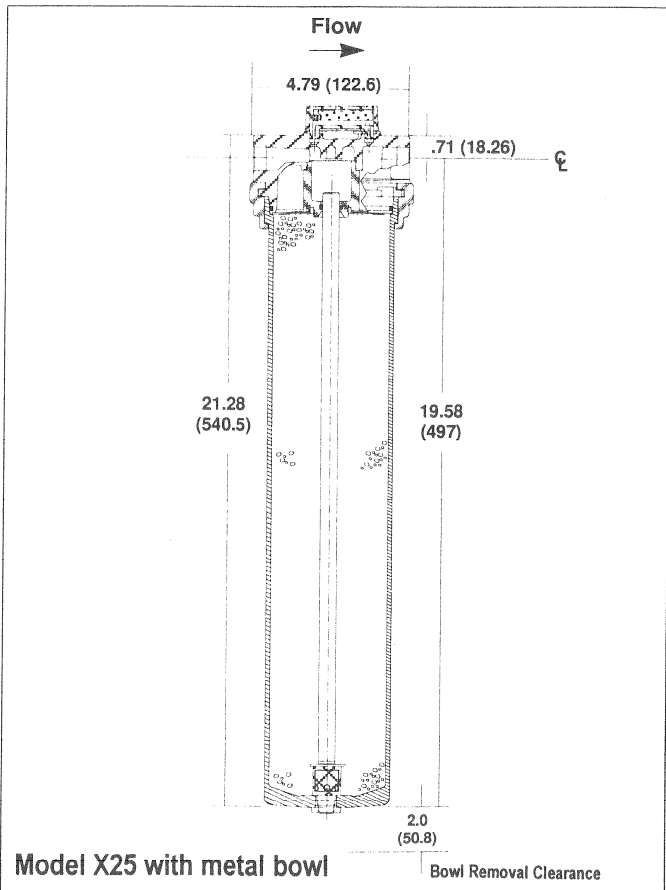
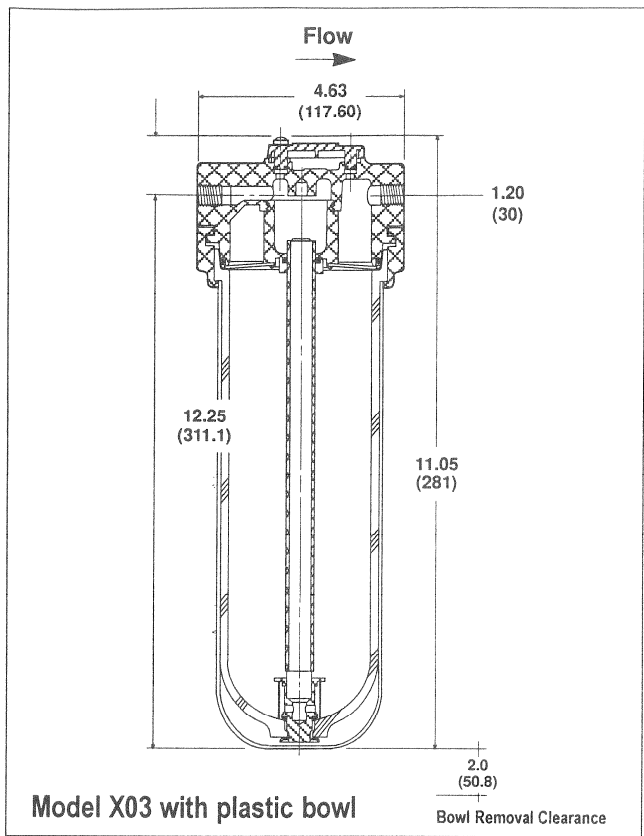
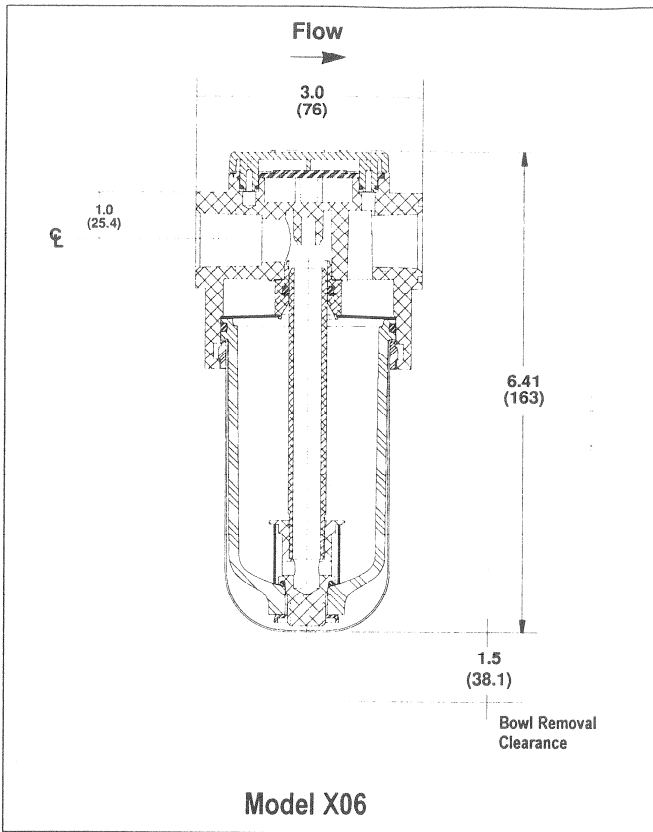
1. The silica gel desiccant, when visible through the clear polycarbonate plastic bowl, contains a color indicator. It changes from Blue (meaning dry) to Pink (meaning wet) to indicate the need to replace or regenerate the desiccant. (An X05-02-000 moisture indicator can be used with 4A molecular sieve units to perform the same function.) On units with metal bowls, a moisture indicator mounted on the cover performs the same color changing function.



2. The 4 A molecular sieve does not change color. For moisture indication an X05-02-000 is recommended. See page 4.
3. By installing two or more units in parallel, higher dry airflows can be achieved.

Maintenance

1. The only servicing required for silica gel units is when the desiccant color or moisture indicator has changed from Blue (meaning dry) to Pink (meaning wet). Should this color change occur:
 - a. **Turn off and depressurize the line containing the dryer unit.**
 - b. Loosen the clamp ring and remove the bowl from the top housing. (Fig. 1) Proceed to step 2 or 3, as required.
2. Desiccant replacement:
 - a. Pour out used desiccant.
 - b. Open new container and refill bowl. (Fig. 2)
 - c. Shake or tap bowl to settle desiccant. Add or remove sufficient quantity to fill Model X03 and X25 unit bowl to 1/8" below inner step, and for Model X06 fill bowl to within 1/2" of the top. (Fig. 3)
 - d. See replacement parts list for specifics on kit numbers for replacement desiccant.
3. Desiccant regeneration:
 - a. — **For silica gel ("000") units: Pour out used Pink desiccant onto flat pan. Place Pink desiccant in 350°F (176°C) oven for approximately three hours or until the desiccant color has changed back to Blue.**
 - **For 13x molecular sieve ("X00") units cannot be regenerated. See page 5 for replacement kits.**
 - **For 4A molecular sieve ("U00") units: Pour out used desiccant onto flat pan. Place desiccant in 600°F (316°C) oven for up to a maximum of 3 hours.**
 - b. Remove desiccant from oven and allow to cool down to ambient temperature.
 - c. Pour desiccant back into unit bowl, periodically shaking and tapping to settle the desiccant.
4. Replace bowl and bowl guard, or metal bowl, and clamp ring onto the unit. Be sure clamp ring is securely locked in place before repressurizing the unit.

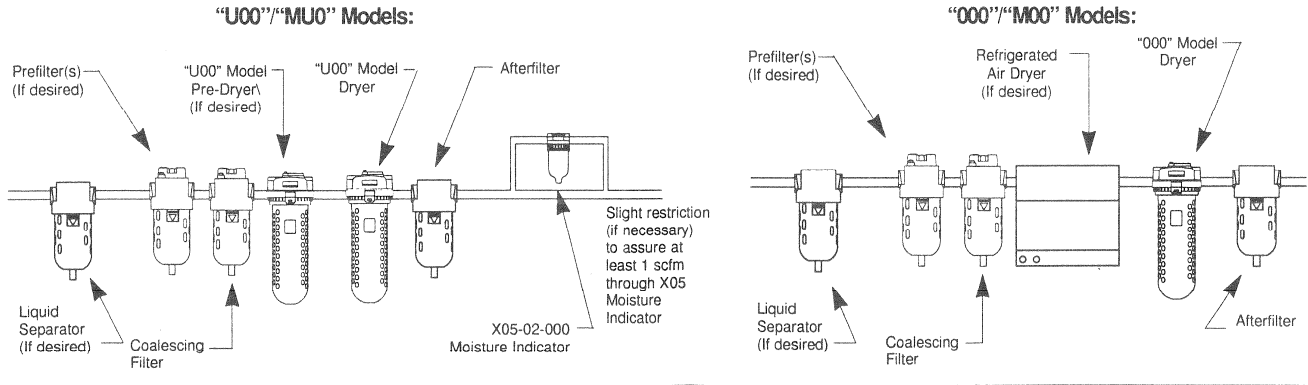


Recommended Liquid Separators, Filters and Pre-Dryers

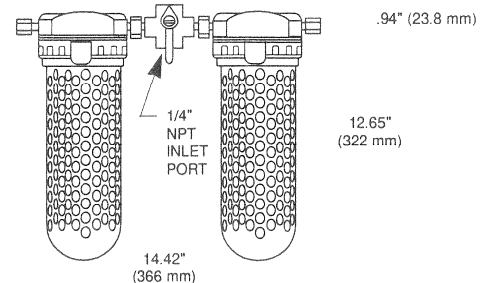
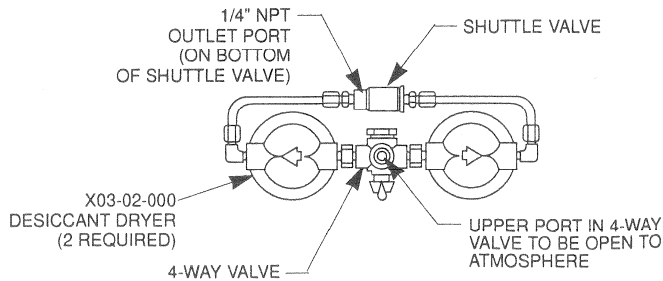
(use as necessary for specific system requirements)

Manual Desiccant Dryer Model Used	Liquid Separator	Particulate Filter/Separator (5 micron)	Coalescing Filter (0.5 micron)	Afterfilter (0.5 micron)	Pre-Drying Manual Desiccant or Refrigerated Air Dryer, For Extended Life	Total Desiccant Life if Pre-Drying Dryer Used
Silica Gel For -45°F (-42°C) Atmospheric Dewpoint:						
X06-02-000	WSA-02-FM0	F16-02-F00	M16-02-FS0	AF1-02-S00	WRA-0010	2200 SCF
X03-XX-000/M00	WSA-XX-FM0	F16-XX-F00/M00	M16-XX-FS0/MS0	AF1-XX-S00	WRA-0010	16,000 SCF
X04-02-000	WSA-02-FM0	F16-02-F00	M16-02-FS0	AF1-02-S00	WRA-0010	32,000 SCF (16,000x2)
X25-04-000	WSA-04-FM0	F26-04-FM0	M26-04-FMS	AF2-04-S00	WRA-0025	40,000 SCF
Type 4A Molecular Sieve For -100°F (-73°C) Atmospheric Dewpoint:						
X06-02-U00	WSA-02-FM0	F16-02-F00	M16-02-FS0	AF1-02-S00	X06-02-000	1800 SCF
X03-XX-U00/MU0	WSA-XX-FM0	F16-XX-F00/M00	M16-XX-FS0/MS0	AF1-XX-S00	X03-XX-000/M00	13,200 SCF
X04-02-U00	WSA-02-FM0	F16-02-F00	M16-02-FS0	AF1-02-S00	X04-02-000	26,400 SCF (13,200x2)
X25-04-U00	WSA-04-FM0	F26-04-FM0	M26-04-FMS	AF2-04-S00	X25-04-000	33,000 SCF

Typical Installation Arrangement For Manual Dryers



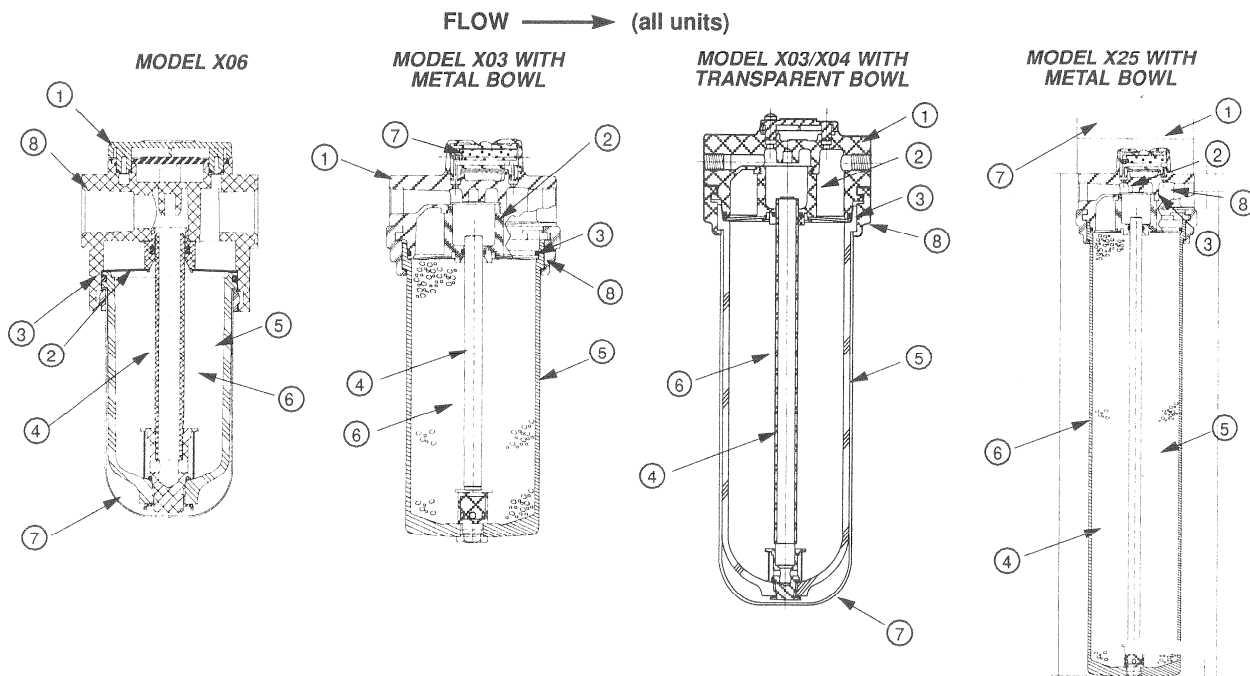
X04-02-000 DRYER



Replacement Parts List — TRANSPARENT BOWL Units with Bowl Guards

	Description	Part No. X06	Qty.	Part No.	X03 Qty.	X04 Qty.
1	Cover	NNR	—	NNR	—	—
2	Screen Assembly	NNR	—	NNR	1	2
3	Bowl O-Ring	GRP 95-259	1	GRP-95-256	1	2
4	Tube Assembly w/screen	N/A	1	DRP-96-435	1	2
5	Transparent Bowl	N/A	1	GRP 95-871	1	2
6	Silica Gel (000)	DRP-95-303	3 Charges ¹	DRP-85-059	4 Charges ¹	2 Charges ¹
	4A Molecular Sieve (U00)	DRP-95-304	3 Charges ¹	DRP-85-060	4 Charges ¹	2 Charges ¹
	13x Molecular Sieve (X00)	DRP-95-305	3 Charges ¹	DRP-85-061	4 Charges ¹	2 Charges ¹
7	Bowl Guard	GRP-95-846	1	DRP-95-810	1	2
8	Clamp Ring	NNR	—	GRP-96-404	1	2

¹ Note: One charge equals one refill of desiccant for unit specified.



Replacement Parts List – METAL BOWL Units with Moisture Indicators

	Description	Part No. X03	Qty.	Part No. X25	Qty.
1	Cover	NNR	—	NNR	—
2	Screen Assembly	GRP-96-434	1	GRP-96-434	1
3	Bowl O-Ring	GRP 95-256	1	GRP-95-256	1
4	Tube Assembly w/Screen	DRP-96-451	1	DRP-95-622	1
5	Metal Bowl	DRP-96-450	1	NNR	—
6	Silica Gel (000)	DRP-85-059	4 Charges ¹	DRP-85-280	3 Charges ¹
	4A Molecular Sieve (U00)	DRP-95-060	4 Charges ¹	DRP-95-624	3 Charges ¹
	13x Molecular Sieve (X00)	DRP-95-061	4 Charges ¹	N/A	—
7	Moisture Indicator **	DRP-95-623	1	DRP-95-623	1
8	Clamp Ring	GRP-96-404	1	GRP-96-404	1

¹ Note: One charge equals one refill of desiccant for unit specified.

NNR: Not normally replaced

** The moisture indicator contains a weep orifice to provide an air sample to the moisture indicating paper. Air leakage from this indicator is necessary and normal.

WILKERSON WARRANTY

Wilkerson products are warranted to be free from defects in material and workmanship, under proper use, installation, application and maintenance in accordance with Wilkerson's written recommendations and specification for a period of one year from the date of shipment from the factory (refrigerated dryers are warranted for 2 years). Wilkerson's obligation under this warranty is limited to, and the sole remedy for any such defect shall be, the repair or replacement (at Wilkerson's option) of unaltered products returned to Wilkerson and proven to have such defect, provided such defect is promptly reported to Wilkerson within said one-year period.

This is the only authorized Wilkerson Warranty and is in lieu of all other express or implied warranties or representations, including any implied warranties of merchantability or fitness, or of any other obligations on the part of Wilkerson.

Warranty claims must be submitted and shall be processed in accordance with Wilkerson's established warranty claim procedure. In no event will Wilkerson be liable for business interruptions, loss of profits, personal injury, costs of delay or for any other special, indirect, incidental or consequential losses, cost or damages.

WARNING: USE LIMITATIONS

Wilkerson's warranties are void, and Wilkerson assumes no responsibility for any resulting cost, loss, injury or any other damages whatsoever, with respect to any plastic bowl unit for which a bowl guard is standard equipment if the unit is placed in service without the bowl guard and, except as otherwise specified in writing by Wilkerson, with respect to any Wilkerson products which are used in other than compressed air service. Specific warnings with respect to these and other use limitations appear elsewhere in this catalog.

Wilkerson maintains a policy of ongoing product development and improvement. We therefore reserve the right to change dimensions specification and design without notice.

DO NOT PLACE PLASTIC BOWL UNIT IN SERVICE WITHOUT BOWL GUARD INSTALLED

Plastic bowl units are sold only with bowl guards with the exception to miniature units (C04, F00, L00, & M00). To minimize the danger of flying fragments in the event of plastic bowl failure, the bowl guards should not be removed. If the unit is in service without the bowl guard installed, manufacturer's warranties are void, and the manufacturer assumes no responsibility for any resulting loss.

If the unit has been in service and does not have a bowl guard, order one and install before placing back in service.

CAUTION

Certain compressor oils, chemicals, household cleaners, solvents, paints and fumes will attack plastic bowls and can cause bowl failure. Do not use near these materials. When bowl becomes dirty replace bowl or wipe only with a clean, dry cloth. Reinstall bowl guard or buy and install a bowl guard. Immediately replace any crazed, cracked, damaged or deteriorated plastic bowl with a bowl or a new plastic bowl and bowl guard.

CAUTION

Except as otherwise specified by the manufacturer, this product is specifically designed for compressed air service, and use with any other fluid (liquid or gas) is a misapplication. For example, use with or injection of certain hazardous liquids or gases in the system (such as alcohol or liquid petroleum gas) could be harmful to the unit or result in a combustible condition or hazardous external leakage. Before using with fluids other than air, or for non-industrial applications, or for life support systems, consult Wilkerson Corporation for written approval.

SOME OF THE MATERIALS THAT WILL ATTACK POLYCARBONATE PLASTIC BOWLS.

Acetaldehyde	Chlorobenzene	Methylene chloride
Acetic acid (conc.)	Chloroform	Methylene salicylate
Acetone	Cresol	Milk of lime (CaOH)
Acrylonitrile	Cyclohexanol	Nitric acid (conc.)
Ammonia	Cyclohexanone	Nitrobenzene
Ammonium fluoride	Cyclohexene	Nitrocellulose lacquer
Ammonium hydroxide	Dimethyl formamide	Phenol
Ammonium sulfide	Diozane	Phosphorous hydroxy chloride
Anaerobic adhesives and sealants	Ethane tetrachloride	Phosphorous trichloride
Antifreeze	Ethyl acetate	Propionic acid
Benzene	Ethyl ether	Pyridine
Benzoic acid	Ethylamine	Sodium hydroxide
Benzyl alcohol	Ethylene chlorohydrin	Sodium sulfide
Brake fluids	Ethylene dichloride	Styrene
Bromobenzene	Ethylene glycol	Sulfuric acid (conc.)
Butyric acid	Formic acid (conc.)	Sulphural chloride
Carbolic acid	Freon (refrig. & Propell.)	Tetrahydronaphthalene
Carbon disulfide	Gasoline (high aromatic)	Tiophene
Carbon tetrachloride	Hydrazine	Toluene
Caustic potash solution	Hydrochloric acid (conc.)	Turpentine
Caustic soda solution	Lacquer thinner	Xylene
	Methyl alcohol	Perchlorethylene & Others

TRADE NAMES OF SOME COMPRESSOR OILS, RUBBER COMPOUNDS AND OTHER MATERIALS THAT WILL ATTACK POLYCARBONATE PLASTIC BOWLS.

Atlas "Perma-Guard"	National Compound #N11
Buna N	"Nylock" VC-3
Cellulube #150 and #220	Parco #1306 Neoprene
Crylex #5 cement	*Permbond 910
*Eastman 910	Petron PD287
Garlock #98403 (polyurethane)	Prestone
Haskel #568-023	Pydraul AC
Hilgard Co.'s hil phene	Sears Regular Motor Oil
Houghton & Co. oil #1120, #1130 & #1055	Sinclair oil "Lily White"
Houtosafe 1000	Stauffer Chemical FYRQUEL #150
Kano Kroil	Stillman #SR 269-75 (polyurethane)
Keystone penetrating oil #2	Stillman #SR 513-70 (neoprene)
*Loctite 271	Tannergas
*Loctite 290	Telar
*Loctite 601	Tenneco anderol #495 & #500 oils
*Loctite Teflon-Sealant	Titon
Marvel Mystery Oil	*Vibra-tite
Minn. Rubber 366Y	Zerex

*When in raw liquid form.

We cannot possibly list all harmful substances, so check with Mobay or the General Electric office for further information on polycarbonate plastic.

The trade names "EconOmist" and "Flow-Guide" are registered at the United States Patent Office. "Auto-Fill", "Dial-Air", "Flex-Drain", "Mainliner" and "Whirl-Flo" are tradenames of the Wilkerson Corporation.

WILKERSON PRODUCTS ARE PROTECTED BY THE FOLLOWING U.S. PATENT AND PATENTS IN OTHER COUNTRIES, ADDITIONAL PATENTS ARE PENDING.

3,631,878	3,667,493	3,762,224	4,215,790
4,215,790	3,793,803	4,718,245	3,793,803
3,858,403	D-292-310	D-229-629	4,215,790
4,289,335	4,352,511	4,559,065	4,631,073
4,689,969	4,696,320	3,889,484	3,945,465
4,631,073	D-234-848		

WILKERSON
CORPORATION[®]

For further assistance contact:
1201 W. Mansfield Ave.
Englewood, CO 80110

Phone (303) 761-7601
Fax (303) 783-2300
Sales Support (888) 223-5126
Applications (888) 223-5146
Engineering



APPENDIX II

**Material Safety
Data Sheet
(MSDS)
Hydraulic Fluid**

MATERIAL SAFETY DATA SHEET
BRAYCO MICRONIC 889
SPD

A. Chemical Product And Company Identification

Product Name: BRAYCO MICRONIC 889
 General Use: See Product Data Sheet
 Product Description: See Product Data Sheet
 MSDS Code: 27019A
 Synonyms/Trade Names: Same as product name

Manufacturer: Castrol Industrial North America, Inc.
 Address (Line 1): 1001 West 31st Street
 Address (Line 2): Downers Grove, IL 60515-1280
 Emergency Phone: 1-800-424-9300 (CHEMTREC)

Information Phone: 1-800-621-2661 Regulatory Questions, Safety, Health & Environmental Affairs,
 Product Chemistry/Application Questions, Technical Support

B. Composition/Information On Ingredients

Ingredient Name	CAS Number	%				
Contains no ingredients now known to be hazardous by OSHA						
313 Listed Chemicals						
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">CAS Number</th> <th style="text-align: left;">Exposure Guideline</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="border-top: 1px dashed black; height: 20px;"> </td> </tr> </tbody> </table>			CAS Number	Exposure Guideline		
CAS Number	Exposure Guideline					

C. Hazards Identification

***** EMERGENCY OVERVIEW *****

Appearance:
 CLEAR, COLORLESS TO LIGHT YELLOW FLUID/MILD ODOR

NFPA: Health 0 Flammability 1 Reactivity 0 Special

Potential Health Effects

Eye: May cause eye irritation.
 Skin Contact: Concentrate may cause skin irritation.
 Skin Absorption: No acute effects expected.
 Ingestion: This product may cause gastrointestinal distress with symptoms of nausea, vomiting, diarrhea, and abdominal pain.
 Inhalation: Inhalation of high concentrations of mists may produce irritation and damage to the respiratory tracts.
 Chronic Effects: A review of the literature does not show obvious long term hazard.
 Routes of Exposure: Skin contact, Eye contact, Inhalation

D. First Aid Measures

Eye: In case of contact, flush eyes with plenty of water. Get medical attention if irritation occurs.
Skin: In case of contact, wash skin with plenty of soap and water. Remove contaminated clothing. Get medical attention if irritation persists. Wash clothing before reuse. Use skin cream for defatted areas.
Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe damage. Do not leave victim unattended. If vomiting occurs, or if comatose or lethargic, place on the left side with the head down. Seek immediate medical attention.
Inhalation: Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

E. Fire Fighting Measures

Flammable Properties

Flash Point (degrees F/C): 310° F 154° C Method: (COC)
Upper Flammable Limit: ND
Lower Flammable Limit: ND
Autoignition Temperature: Not determined
Hazardous Products of Combustion: Irritating or toxic fumes: CO and CO².
Properties That Could Increase Fire Or Explosion Hazard: None known.
Extinguishing Media: Water, dry chemical, CO², or alcohol foam.
Fire Fighting Instructions: Contact with water will cause spattering and may generate enough heat to ignite combustible materials.

F. Accidental Release Measures

Large spills: Wear appropriate protective clothing. Stop source of leak if possible. Dike, contain spill and recover free liquid. Prevent entry into waterways. Soak up residue with an inert absorbent such as clay, sand or other suitable materials. Store and dispose of properly. Flush area with water. Where feasible and appropriate, remove contaminated soil. **Small spills:** Neutralize and/or soak up spill with inert absorbent. Store in a closed container and dispose of properly.

G. Handling and Storage

Maintain ambient temperature. Avoid prolonged/repeated breathing of vapors, mists, fumes. Keep container tightly closed. Do not store near heat, flame, strong oxidants. Maintain adequate ventilation.

H. Exposure Controls/Personal Protection

Personal Protective Equipment (PPE)

Eye/Face Protection: Safety glasses with side shield or chemical goggles.
Skin Protection: Use neoprene type gloves when handling this product.
Respiratory Protection: Use NIOSH/MSHA approved respirator with organic vapor cartridge if vapor concentrations exceeds permissible exposure limit. Provide sufficient mechanical, general, and/or local exhaust to maintain exposure below TLV. Greater than 60f3/Min recommended.
Other: Impervious protective clothing and chemical resistant safety shoes should be worn to minimize contact. Wash contaminated clothing with soap and water and dry before reuse. Emergency shower and eyewash facility should be provided in all areas in which this product is handled.
Exposure Guidelines: See information provided in Section B, Ingredients.

Revised 11/12/97
Replaces 08/20/97
Printed 03/05/98

I. Physical and Chemical Properties

Appearance/Odor:

CLEAR, COLORLESS TO LIGHT YELLOW FLUID/MILD ODOR

pH (conc):	Not applicable	pH at:	Not applicable
Vapor Pressure (mm Hg):			ND
Vapor Density (Air = 1):			NA
Boiling Point (degrees F/C):			→550° F/→287° C
Freezing Point (degrees F/C):			Not determined
Melting Point (degrees F/C):			Not known/Not known
Solubility in Water:			SLIGHT
Specific Gravity at 60 degrees F (H2O = 1):	0.8020 ±		
Density:			Not calculated
Softening Point (degrees F):			Not determined
Evaporation Rate (n-Butyl Acetate = 1):			ND
Viscosity:			Not available
Bulk Density:			Not determined
% Volatile:			NA
VOC: Not tested lbs/gallons	Method:		Not tested
Octanol/Water Partition Coefficient:			Not determined
Saturated Vapor Concentration:			Not determined
Molecular Weight:			Not applicable

J. Stability and Reactivity

Chemical Stability:	Stable under normal conditions.
Conditions to Avoid:	Strong oxidizers, heat and sources of ignition.
Hazardous Decomposition Products:	Irritating or toxic fumes; CO and CO ² .

K. Toxicological Information

Eye Effects:	May cause eye irritation.
Skin Effects, Contact:	Concentrate may cause skin irritation.
Skin Effects, Absorption:	No acute effects expected.
Acute Oral Effects (Ingestion):	This product may cause gastrointestinal distress with symptoms of nausea, vomiting, diarrhea, and abdominal pain.
Acute Inhalation Effects:	Inhalation of high concentrations of mists may produce irritation and damage to the respiratory tract.
Chronic Effects:	A review of the literature does not show obvious long term hazard.

L. Ecological Information

Ecotoxicological Information:	No specific ecological data are available for this product.
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M. Disposal Considerations

U.S. EPA Hazardous Water Numbers:

This product as purchased does not fall under current U.S. EPA RCRA definition of hazardous waste. Under RCRA it is the generator's responsibility to determine the status of the waste at the time of its disposal.

General Disposal Considerations:

Dispose of in accordance with local, state and federal regulation.

continued

Revised 11/12/97
 Replaces 08/20/97
 Printed 03/05/98

M. Disposal Considerations, continued...

Disposal of this material to the land may be banned by federal law (40 CFR 286).

May be disposed of by controlled incineration.

N. Transport Information

Hazardous Materials Description/Proper Shipping Name:

Not regulated (if shipped by land in non bulk packaging)

Hazard Class: Same as above

Identification Number (UN or NA Number): Same as above

Packing Group: Same as above

Telephone Number for Transport Instructions: 1-800-621-2661, SHEA Department

O. Regulatory Information

U.S. Federal Regulations:

Hazardous per OSHA 29 CFR 1910.1200: Yes

CERCLA/EPCRA:

Section 302 Extremely Hazardous Substances (EHS):

No listed ingredients are present on the 302 list.

Section 311/312 Hazard Class(es):

Immediate: NO Delayed: NO Fire: NO Reactivity: NO Sudden Release of Pressure: NO

Section 313 Toxic Chemicals:

There are no 313 chemicals present above threshold values.

Other U.S. Federal Regulations: This product is a mixture and is not listed in the TSCA Inventory.
The individual ingredients in the product are listed in the TSCA Inventory.

P. Other Information

No component present in this product at >0.1% is presently listed as a carcinogen by IARC, NTP or OSHA.

Q. Disclaimer

Information presented herein has been compiled from information provided to us by our suppliers and other sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. Nothing herein is to be construed as recommending any practice or the use of any product in violation of any patent or in violation of any law or regulation. It is the user's responsibility to determine the suitability of any material for a specific purpose and to adopt such safety precautions as may be necessary. We make no warranty as to the results to be obtained in using any material and since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any materials supplied by us.



APPENDIX III

**Harris
Regulator
Instruction Manual**

HARRIS

Instruction Manual Manuel d' Instruction Manual de Instruccion

Industrial Single Stage & Multi-Stage® Compressed Gas Regulators
Reguladores Industriales de Gas Comprimido de Una Etapa y de Etapas Múltiples®
Détendeur industriel de gaz comprimé à un étage et à plusieurs étages®

IMPORTANT

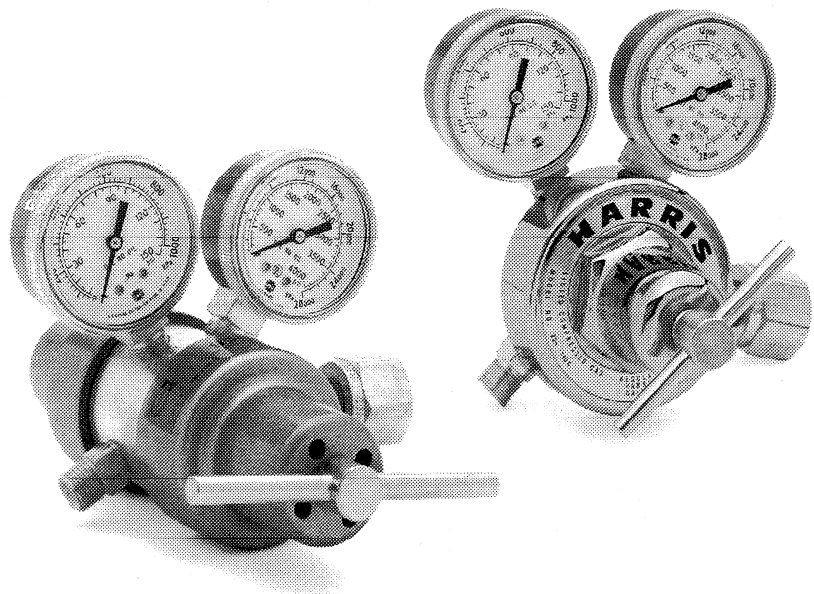
For your own safety, read these instructions. Failure to do so could lead to serious injury.

IMPORTANT

Pour votre propre sécurité, veuillez à lire ces instructions. Omettre de les lire peut entraîner des blessures graves.

IMPORTANTE

Por su propia seguridad lea estas instrucciones. El no seguir estas instrucciones podría resultar en lesiones severas.



Introduction

These instructions are for experienced operators. It is essential that you keep your equipment free of oils, greases, and flammable materials. For further information, refer to the following publications:

AWS C-4.2-78 "Operator Manual for Oxy-Fuel Gas Cutting" American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126

ANSI Z49.1 "Safety in Welding and Cutting" American National Standards Institute, 1430 Broadway, New York, NY 10018

Compressed Gas Association (CGA), 1235 Jefferson-Davis Highway, Arlington, VA 22202

- **Safety Bulletin SB-8** - "Use of Oxy-Fuel Gas Welding and Cutting Apparatus"
- **Pamphlet E-1** - "Standard Connections for Regulator Outlets"
- **CGA Standard V-1** - "Compressed Cylinder Valve Inlet and Outlet Connections"

Description

Note: Each type of regulator is designed and assembled for specific gases and for definite inlet and delivery pressure ranges.

Multi-Stage Regulators

Multi-stage regulators are two regulators in series using a common body. The first stage (high pressure) reduces the inlet pressure approximately 90% and is preset at the factory. The second stage (low pressure) is adjustable to the desired delivery pressure.

Single-Stage Regulator

A cylinder regulator reduces the cylinder pressure to the delivery pressure and maintains a constant pressure to assure an accurate flow rate.

Pipeline Regulator

A pipeline regulator operates from a source of lower pressure, usually 200 PSI or less; and normally has only one gauge, which indicates the outlet pressure. Pipeline regulators must not be used on or with high pressure gas cylinders.

Gaugeless Regulators

Gaugeless regulators are used where rough use and gauge damage are a problem. The cylinder (inlet)

pressure is shown by the piston-type indicator. The delivery pressure is set by the adjusting knob and shown by the calibrations marked on the bonnet.

Clockwise rotation of the adjusting knob (or key) increases the delivery pressure. Counterclockwise rotation decreases the delivery pressure.

The regulator inlet connections are designed for the gas to be used in accordance with CGA Standard V-11. The threaded outlet connections are 9/16"-18 male CGA Standard O22 (R.H.) and O23 (L.H.) (formerly Class B)2. Fuel gas threads are left hand.

1 CGA Standard V-1 "Compressed Gas Cylinder Valve Inlet and Outlet Connections"

2 CGA Pamphlet E-1 "Standard Connections for Regulator Outlets"

Safety Instructions

1. Handle cylinder with care. Chain or otherwise secure cylinders to a permanent fixture. Take care when moving. To transport cylinders (except when in cylinder carts), remove regulators and replace with valve cap. Never use any cylinder in other than an upright position.
2. Use "good housekeeping" in work areas. Keep sparks and flame away from combustibles. Prepare your work area before welding or cutting.
3. Do not oil or grease equipment. The equipment does not require lubrication. Oil or grease is easily ignited and burns violently with oxygen.
4. "Crack" cylinder valve before installing regulator. Open valve slightly and then close. This will clear valve of dust or dirt which may be carried to the regulator and cause damage or accident. Do not discharge flow of gas at any person or flammable material.
5. Be sure all connections are tight. Don't force connections. Never test for leaks with a flame. Use a soapy water solution to check for leaks.
6. Use recommended pressure settings. Improper pressures are wasteful. Extreme pressure build up in regulators is a warning they need repair.
7. Do not work with damaged or leaking equipment. Use soapy water when checking for leaks. Do not use frayed or damaged hose.
8. Handle equipment with care. Its continued good service and your safety depend upon it.

9. Keep work area well ventilated. Flammable materials burn violently in an oxygen atmosphere. Flames and glowing materials (tobacco smoking) must be avoided.
10. When working with acetylene, never use at pressures over 15 PSIG (Pounds Per Square Inch Gauge).
11. DO NOT FORCE connectors and threads. The differences are intentional for the various gases.

NOTE: SAVE THESE INSTRUCTIONS

Set-Up Instructions

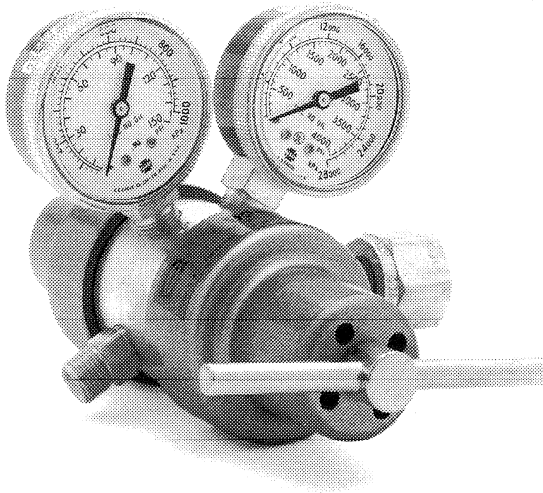
1. Secure gas cylinder in a vertical position; valve end up.
2. Remove cylinder valve cap.
3. Open cylinder valve momentarily to blow out any dust and dirt. Do not discharge flow of gas at any person, flames or flammable material.
4. Attach regulator to cylinder using proper CGA connection.
5. Properly connect equipment to outlet connection of regulator.

6. Close off all valves downstream of the regulator.
7. Turn the pressure adjusting knob (or key) counterclockwise until it feels free. The regulator outlet is now closed.
8. Slowly open the supply valve. When full inlet pressure is indicated, open line valve or non-flammable cylinder valve wide. Fuel gas cylinder valves should not be opened more than one turn. Hand wheels or valve wrenches should be kept on the valve to permit quick emergency shutdown.
9. Slowly turn the regulator adjusting knob (or key) clockwise to obtain the desired delivery pressure.
10. Tests for gas leakage should be made at this time. Use a soapy water solution at all connections and check for bubbles. Tighten connections as required and wipe off the soap solution.

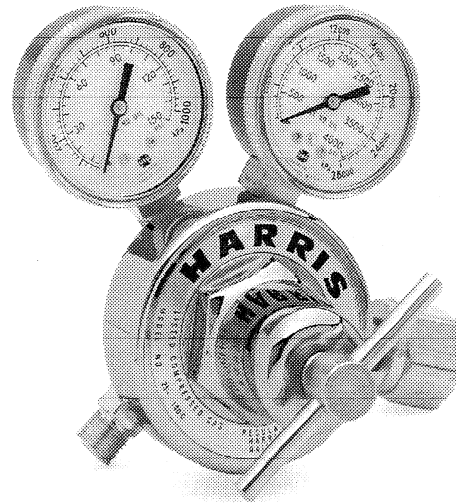
Functional Test of Regulator

An internal leak may be detected as follows:

1. Close the regulator by turning the adjusting key counterclockwise.
2. Close cylinder valve.



Multi-Stage™ Regulator



Single Stage Regulator

3. Drain downstream line.
4. The low pressure gauge will indicate zero. The cylinder (high pressure) gauge will read full pressure. Any pressure drop will indicate leakage. Repair before use, or replace with a properly functioning unit.
5. A gauge should read zero when all the pressure is removed. If it does not, it may be damaged. Locate and correct the cause of the damage and replace the gauge.

Shutdown

1. Close downstream valves.
2. Close supply valve on the cylinder or line.
3. Bleed off gases - oxygen first, then close downstream valves.
4. Turn pressure adjusting key counterclockwise until free.
5. Remove regulator from cylinder.

Maintenance Instructions

1. When not in use, store the regulator in a clean and safe place.
2. Inspect and test at least every 6 months after first use.
3. Have only qualified repairmen service, test and clean the regulator.
4. The gauge lenses are made of Lexan¹. Use only soapy water to clean, then wipe dry using soft cloths. DO NOT USE SOLVENTS.
5. Use thread sealants that are compatible with the gas being used.

1A General Electric Polycarbonate

Repair

Have only qualified repairmen service, test and clean the equipment.

Extra Copies

Extra copies of these instructions are available. Call your distributor or contact Harris Calorific.

Introduction

Les consignes suivantes sont à l'attention des utilisateurs expérimentés. Il est essentiel que vous conserviez votre équipement exempt d'huile, de graisse ou de tout élément inflammable. Pour de plus amples informations, veuillez consulter les ouvrages suivants :

AWS C-4.2-78 « Operator Manual for Oxy-Fuel Gas Cutting » (Manuel de l'opérateur pour l'oxycoupage) - American Welding Society, 550 N.W. LeJeune Rd., Miami, Florida, 33126

ANSI Z49.1 - « Safety in Welding and Cutting » (Sécurité en soudage et découpage) - American National Standards Institute, 1430 Broadway, New York, NY 10018

Compressed Gas Association (CGA), 1235 Jefferson-Davis Highway, Arlington, VA 22202

- **Safety Bulletin SB-8** - « Use of Oxy-Fuel Gas Welding and Cutting Apparatus » (Utilisation de matériel d'oxycoupage et de soudage aux gaz)

- **Brochure CGA E-1** - « Standard Connections for Regulator Outlets » (Raccords standards pour sorties de détendeurs)

- **Norme CGA V-1** - « Compressed Cylinder Valve Inlet and Outlet Connections » (Raccords d'entrée et de sortie pour robinets de bouteilles de gaz comprimé)

Description

REMARQUE : Chaque type de détendeur est conçu et assemblé pour des gaz définis ainsi que pour des amplitudes précises de pressions d'alimentation et de détente.

Détendeurs à plusieurs étages

Les détendeurs à plusieurs étages sont faits de deux détendeurs en série montés sur un même corps. Le premier étage (haute pression) réduit la pression d'alimentation d'approximativement 90% et est réglé en usine. Le deuxième étage (basse pression) est réglable selon le niveau de pression désiré.

Détendeur à un étage

Un détendeur réduit la pression d'alimentation à la pression de détente et maintient une pression constante afin d'assurer un débit précis.

Détendeur de canalisation

Un détendeur de canalisation fonctionne à partir d'une source de faible pression, généralement inférieure ou

égale à 200 PSI (livres par pouce carré) et ne dispose normalement que d'une jauge indiquant le niveau de pression de détente. Les détendeurs de canalisation ne doivent pas être utilisés sur ou en combinaison avec des bouteilles de gaz à haute pression.

Détendeurs sans jauge

Les détendeurs sans jauge sont utilisés dans les cas où une utilisation brutale et les dégâts qu'elle inflige aux jauges représente un problème. La pression d'alimentation (en amont) est indiquée par le témoin à pistons. La pression de détente est établie en réglant le bouton poignée. Elle est indiquée par l'étalonnage figurant sur le capuchon.

Une rotation du bouton poignée (ou clef) dans le sens des aiguilles d'une montre augmente la pression de détente. Sa rotation dans le sens inverse des aiguilles d'une montre diminue la pression de détente.

Les arrivées de gaz du détendeur sont conçues pour les gaz qu'il est prescrit d'utiliser conformément à la Norme V-1 de la CGA. Les raccords de détente filetés sont de 9/16 " - 18 mâles Norme CGA 022 (R.H.) et 023 (L.H.) (anciennement Classe B). Les filets de gaz de combustion sont inversés.

Consignes de sécurité

1. Manipulez la bouteille avec soin. Enchaînez ou assurez l'ancrage des bouteilles à un élément fixe. Déplacez avec précaution. Lors du transport des bouteilles (exception faite des chariots à bouteilles), ôtez les détendeurs et remplacez-les par des chapeaux de valve. Utilisez toujours les bouteilles en position verticale.
2. Veillez à ce que les zones de travail soient en bon ordre et en bon état d'entretien. Protégez les combustibles de toute étincelle ou flamme. Préparez votre zone de travail avant de souder ou de découper.
3. Ne huilez pas et ne graissez pas le matériel. Ce matériel ne nécessite aucune lubrification. Huile et graisse prennent feu rapidement et flambent violemment au contact de l'oxygène.
4. Entrouvrez le robinet de la bouteille avant d'installer le détendeur. Ouvrez le robinet légèrement et fermez-le aussitôt. Cette opération débarrassera le robinet des poussières ou saletés qui pourraient être acheminées jusqu'au détendeur et causer ainsi dégâts et accidents. Ne dirigez pas le

débit de gaz vers une personne ou un objet incandescent.

5. Assurez-vous que tous les raccords sont bien serrés. Ne forcez pas le serrage de ces raccords. Ne recherchez jamais les fuites à l'aide d'une flamme. Utilisez une solution savonneuse pour détecter les fuites éventuelles.
6. Utilisez les réglages de pression recommandés. Les pressions incorrectes sont sources de gaspillages. Des accumulations de pressions extrêmes dans les détendeurs indiquent que leur réparation s'impose.
7. Ne travaillez pas avec un équipement endommagé ou non étanche. Utilisez de l'eau savonneuse pour détecter les fuites éventuelles. N'utilisez pas de tuyaux éraillés ou endommagés.
8. Manipulez le matériel avec soin. Sa longévité et votre sécurité en dépendent.
9. Assurez-vous de la bonne ventilation de la zone de travail. Les éléments inflammables flambent violemment dans une atmosphère oxygénée.

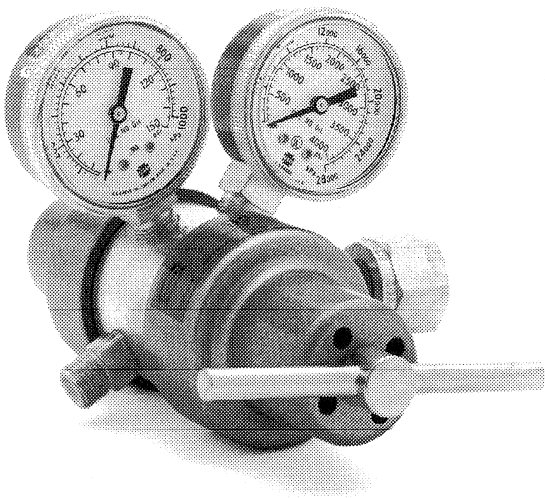
Flammes et objets incandescents (tabac en combustion) doivent être proscrits.

10. Lors de travaux avec de l'acétylène, n'opérez pas à des pressions supérieures à 15 PSIG (Livres par pouce carré/jauge).
11. Ne forcez pas les raccords et filets. Les différences sont spécifiques à chaque gaz.

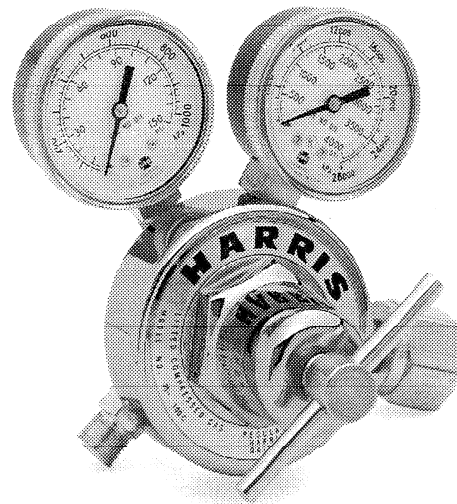
REMARQUE: CONSERVEZ CES CONSIGNES

Consignes d'installation

1. Assurez la position verticale de la bouteille de gaz; le robinet au sommet.
2. Ôtez le chapeau de valve de la bouteille.
3. Ouvrez brièvement la valve de la bouteille afin de chasser poussières et saletés éventuelles. Ne dirigez pas le débit de gaz vers une personne, une flamme ou une matière inflammable.
4. Attachez le détendeur à la bouteille au moyen du raccord CGA approprié.
5. Raccordez correctement le matériel au raccord de détente du détendeur.



Détendeur de gaz comprimé à plusieurs étages.



Détendeur de gaz comprimé à un étage

6. Fermez tous les robinets en aval du détendeur.
 7. Tournez le bouton poignée (ou clef) de réglage de pression dans le sens inverse des aiguilles d'une montre jusqu'à ce qu'il tourne librement. La sortie du détendeur est actuellement fermée.
 8. Ouvrez lentement le robinet d'admission. Lorsque la pleine pression d'admission est indiquée, ouvrez à fond le robinet du conduit ou de la bouteille ininflammable. Les robinets de la bouteille de gaz combustible ne devraient pas être ouverts au-delà d'un tour. Des volants de manœuvre ou des clés de robinet devraient être maintenus sur le robinet pour permettre de le fermer rapidement en cas d'urgence.
 9. Tournez lentement le bouton poignée (ou clef) de réglage du détendeur dans le sens des aiguilles d'une montre pour obtenir le débit de sortie souhaité.
 10. La détection de fuites devrait être effectuée à ce moment. Utilisez une solution d'eau savonneuse sur tous les raccords et voyez si des bulles apparaissent. Resserrez les raccords au besoin et essuyez la solution de savon.
3. Purgez les gaz - l'oxygène en premier - avant de fermer les robinets en aval.
 4. Tournez la clef de réglage de pression dans le sens contraire des aiguilles d'une montre jusqu'à ce qu'elle tourne librement.
 5. Ôtez le détendeur de la bouteille.

Consignes d'entretien

1. Lorsque le détendeur n'est pas utilisé, conservez-le dans un endroit propre et sûr.
2. Inspectez et vérifiez au moins tous les 6 mois après la première utilisation.
3. Ne faites appel qu'à des techniciens qualifiés pour entretenir, tester et nettoyer le détendeur.
4. Le verre des jauge est fait de Lexan. Ne le nettoyez qu'au moyen d'eau savonneuse avant de l'essuyer convenablement avec un chiffon doux. N'UTILISEZ PAS DE SOLVANTS.
5. N'utilisez que des agents d'étanchéité de raccord compatibles avec les gaz utilisés.

Réparation

Ne faites appel qu'à des techniciens qualifiés pour entretenir, tester et nettoyer ce matériel.

Copies supplémentaires

Des exemplaires supplémentaires de ces consignes sont disponibles. Appelez votre distributeur ou contactez Harris Calorific.

FAITES EN SORTE QUE CHAQUE OPÉRATEUR LISE ET COMPRENNE CES CONSIGNES. OMETTRE DE SUIVRE CES CONSIGNES PEUT ENTRAÎNER DES BLESSURES CORPORELLES GRAVES.

Essai de fonctionnement du détendeur

Un fuite interne peut être détectée de la manière suivante:

1. Fermez le détendeur en tournant la clef de réglage dans le sens inverse des aiguilles d'une montre.
2. Fermez le robinet de la bouteille.
3. Purgez les conduits en aval.
4. La jauge de basse pression indiquera zéro. La jauge de la bouteille (haute pression) indiquera pleine pression. Toute chute de pression signifiera une fuite. Réparez avant usage ou remplacez par une unité en bon état de marche.
5. Toute jauge devrait indiquer zéro lorsque toute la pression est évacuée. Si tel n'est pas le cas, il est possible qu'elle soit endommagée. Localisez et corrigez la cause de ces dégâts et remplacez la jauge.

Fermeture

1. Fermez les robinets en aval.
2. Fermez le robinet d'alimentation sur la bouteille ou le conduit.

Introducción

Estas instrucciones son para operadores con experiencia. Es importante que mantenga su equipo limpio; sin aceites, grasas ni otros materiales inflamables. Para mayor información, refiérase a las publicaciones siguientes:

AWS C-4.2-78 "Manual del Operador para Cortaduras con Oxígeno-Gas combustible" - Sociedad Americana de Soldadores, 550 N.W. Le-Jeune Rd., Miami, Florida, 33126

ANSI Z49.1 - "Seguridad en Soldaduras y Cortaduras" - Instituto Americano de Estándares Nacionales, 1430 Broadway, Nueva York, NY 10018.

Asociación de Gas Comprimido (CGA), 1235 Jefferson-Davis Highway, Arlington, VA 22202

- **Boletín de Seguridad SB-8** - "Uso de Equipo para Soldadura y Cortadura con Oxígeno-Gas combustible".
- **Folleto E-1** - "Conexiones Estándares para Salidas de Reguladores".
- **CGA Estándar V-1** - "Conexiones de Entradas y Salidas de Válvula del Cilindro de Gas Comprimido".

Descripción

NOTA: Los reguladores están diseñados y ensamblados, según su tipo, para gases específicos y para límites definidos de presión de entrega y de entrada.

Reguladores de Etapas Múltiples

Los reguladores de etapas múltiples son dos reguladores en serie usando un cuerpo común. La primera etapa (presión alta) reduce la presión de entrada en aproximadamente 90% y es pre-ajustada en la fábrica. La segunda etapa (presión baja) se ajusta a la presión de entrega deseada.

Reguladores de Una Etapa

Un regulador de cilindro reduce la presión del cilindro a la presión de entrega y mantiene una presión constante para asegurar un gasto de flujo exacto.

Reguladores de Gasoducto

Un regulador de gasoducto funciona desde una fuente de presión baja, comúnmente de 200 PSI o menos y normalmente sólo tiene un manómetro que indica la presión de salida. Los reguladores de gasoductos no deben usarse sobre ni con cilindros de gas de presión alta.

Reguladores Sin Manómetro

Los reguladores sin manómetro son utilizados cuando el uso de manómetros no es conveniente ya que pueden dañarse fácilmente. La presión del cilindro (de entrada) se muestra por medio del indicador de tipo de pistón. La presión de entrega se ajusta por medio de la manija y se muestra por medio de las calibraciones marcadas en el casquete.

La presión de entrega aumenta al girar la manija de ajuste (o llave) en el sentido de rotación de las manecillas del reloj. La presión de entrega disminuye al girar la manija de ajuste en el sentido de rotación contrario al de las manecillas del reloj.

Las conexiones de entrada del regulador han sido diseñadas de acuerdo al gas a ser usado, según el CGA Estándar V-11. Las conexiones roscadas de la salida son de 9/16" - 1B macho CGA estándar O22 (a la derecha) y O23 (a la izquierda) (anteriormente clase B)2. Las roscas del gas combustible son a la izquierda.

- 1 CGA Estándar V-1 "Conexiones de Entradas y Salidas de Válvula del Cilindro de Gas Comprimido".
- 2 CGA Folleto E-1 "Conexiones Estándares para Salidas de Reguladores".

Instrucciones de Seguridad

1. Manipule el cilindro con cuidado. Coloque una cadena alrededor de los cilindros o asegúrelos a un accesorio permanente. Tenga cuidado al mover los. Cuando transporte cilindros (excepto cuando sea en un carro para cilindros), quite los reguladores y reemplácelos por tapas de válvulas. Los cilindros deben usarse solamente en posición vertical.
2. Practique sus "Hábitos de Limpieza" en las áreas de trabajo. Mantenga chispas y llamas alejadas de los combustibles. Antes de comenzar a soldar o cortar prepare el área de trabajo.
3. No engrase ni aceite el equipo. El equipo no necesita de lubricación. El aceite y la grasa son inflamables y se encienden violentamente con el oxígeno.
4. Antes de instalar el regulador, "abra" la válvula del cilindro. Abra la válvula lentamente y luego ciérrela. Esto limpiará la válvula de polvo o suciedad que pueda haber llegado al regulador y que pueda causar cualquier daño o accidente. No descargue el flujo de gas en una persona o material inflamable.

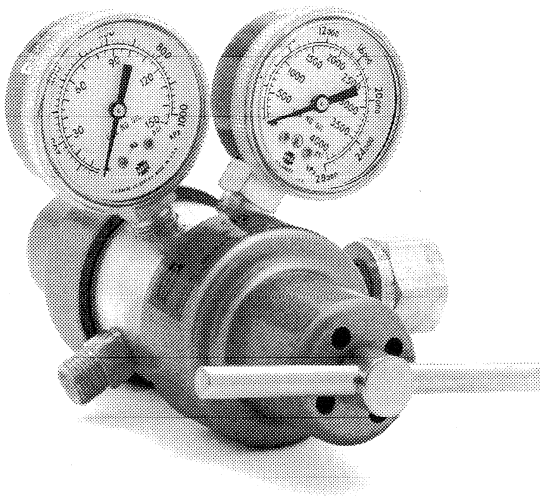
5. Asegúrese que todas las conexiones estén apretadas. No fuerce las conexiones. Nunca use llama para revisar si hay fugas de gas. Use una solución de agua con jabón para revisar si hay alguna fuga de gas.
6. Use los ajustes de presión recomendados. Las presiones inapropiadas causan gastos innecesarios. El aumento en extremo de la presión en los reguladores indica que deben ser reparados.
7. No trabaje con equipo dañado o que tenga fugas. Use agua jabonosa para revisar si hay fugas. No use mangueras raídas o estropeadas.
8. Manipule el equipo con cuidado. El servicio continuo adecuado y su seguridad dependen de ello.
9. Mantenga el área de trabajo bien ventilada. Los materiales inflamables se encienden violentamente en una atmósfera de oxígeno. Deben evitarse las llamas y los materiales incandescentes (fumar).
10. Cuando trabaje con acetileno, nunca lo use a presiones mayores de 15 PSIG (Libras sobre pulgadas cuadradas leídas en el manómetro).

11. No fuerce los conectores ni las roscas. Las diferencias son intencionales para los diversos gases.

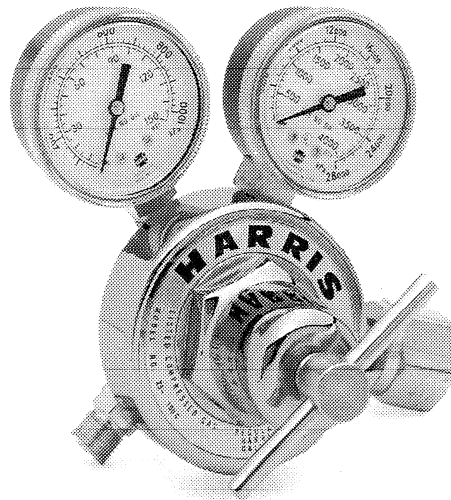
NOTA: GUARDE ESTAS INSTRUCCIONES

Instrucciones para la Instalación

1. Asegure el cilindro del gas en posición vertical; el extremo de la válvula hacia arriba.
2. Quite la tapa de la válvula del cilindro.
3. Abra, por un momento, la válvula del cilindro para permitir escapar cualquier partícula de polvo o suciedad. No descargue el flujo de gas sobre una persona, llamas o material inflamable.
4. Coloque el regulador en el cilindro utilizando la conexión recomendada por CGA.
5. Conecte apropiadamente el equipo a la conexión de salida del regulador.
6. Cierre todas las válvulas corriente abajo del regulador.
7. Gire la manija de ajuste de presión (o llave) en el sentido de rotación contrario al de las manecillas del reloj hasta que la manija se sienta libre. La sali



Regulador de Gas Comprimido de Etapas Múltiples



Regulador de Gas Comprimido de Una Etapa

da del regulador está ahora cerrada.

8. Abra lentamente la válvula de suministro. Cuando se indique que la presión de entrada está al máximo, abra ampliamente la válvula del conducto o la válvula del cilindro no-inflamable. Las válvulas del cilindro de gas combustible no deben abrirse más de una vuelta. Los volantes o llaves para válvula deben mantenerse en la válvula para permitir su cierre inmediato en caso de emergencia.
9. Gire lentamente la manija (o llave) de ajuste del regulador en el sentido de rotación de las manecillas del reloj para obtener la presión de entrega deseada.
10. La inspección para averiguar si hay o no fugas de gas debe realizarse en este momento. Aplique una solución de agua y jabón en todas las conexiones y vea si hay burbujas. Apriete las conexiones apropiadamente y seque la solución jabonosa.

Prueba Funcional del Regulador

Una fuga interna puede ser descubierta de la siguiente manera:

1. Cierre el regulador girando la llave de ajuste en el sentido de rotación contrario al de las manecillas del reloj.
2. Cierre la válvula del cilindro.
3. Purgue el conducto de corriente abajo.
4. El manómetro de presión baja debe indicar cero. El manómetro del cilindro (de presión alta) indicará que la presión está al máximo. Cualquier caída de presión indicará que hay fuga de gas. Repare antes de usar, o reemplace por un equipo que funcione apropiadamente.
5. Cuando no hay presión, el manómetro debe indicar cero. Si no marca cero, podría estar averiado. Encuentre y corrija la causa de la avería y reemplace el manómetro.

Suspensión del Trabajo

1. Cierre las válvulas de corriente hacia abajo.
2. Cierre la válvula de suministro en el cilindro o el conducto.
3. Purgue los gases, comenzando por el oxígeno, luego cierre las válvulas de corriente hacia abajo.
4. Gire la llave de ajuste de presión en el sentido de rotación contrario al de las manecillas del reloj,

hasta que esté libre.

5. Quite el regulador del cilindro.

Instrucciones de Mantenimiento

1. Cuando no use el regulador guárdelo en un lugar limpio y seguro.
2. Inspeccione y pruebe el regulador por lo menos cada 6 meses después de usarlo por primera vez.
3. El servicio de mantenimiento, las pruebas y la limpieza del regulador debe asignarlo solamente a personas calificadas para ello.
4. Los lentes del manómetro son elaborados de Lexán¹. Para limpiarlos use solamente agua y abón, luego séquelos con un paño suave. **NO USE SOLVENTES.**
5. Use selladores para rosca que sean compatibles con el gas que se esté usando.

1 Policarbonato de la General Electric.

Reparación

El servicio de mantenimiento, las pruebas y la limpieza del regulador debe asignarlo solamente a personas calificadas para ello.

Copias Extras

Si necesita copias extras de estas instrucciones, llame a su distribuidor o comuníquese con la división Harris Calorific.

ASEGURESE QUE TODO OPERADOR LEA Y ENTIENDA ESTAS INSTRUCCIONES. NO SEGUIR ESTAS INSTRUCCIONES PODRIA RESULTAR EN LESIONES PERSONALES SEVERAS.



APPENDIX IV

**Teledyne Sprague
Pump
Parts List**