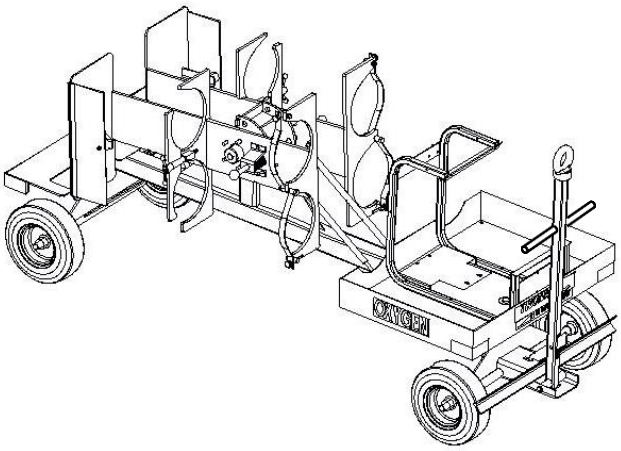
OPERATION & SERVICE MANUAL



Model: 20-4524-0000
Four Cylinder Tiltable Oxygen Cart Conversion Kit

CE

11/2018 - Rev. 02

****CAUTION****

It is MANDATORY that this instruction manual be read and understood by all persons operating this High Pressure Oxygen Booster.

Tronair, Inc.
1 Air Cargo Pkwy East
Swanton, OH 43558

Phone: (419) 866-6301 | 800-426-6301
Web: www.tronair.com
Email: sales@tronair.com

REVISION	DATE	TEXT AFFECTED
01	11/2013	Original release
02	11/2018	Major revision

TABLE OF CONTENTS

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.

CAUTION!

It is MANDATORY that this instruction manual be read and understood by all persons operating this cart.

1.0 PRODUCT INFORMATION

1.1 DESCRIPTION

The Tronair Four Cylinder Cart is designed to minimize the handling of oxygen cylinders in loading, transporting and servicing process.

The high pressure regulator is for regulating booster output pressure from 15 - 2250 psi (115 bar).

The transport cart allows a single operator to load full oxygen cylinders and transport them to service the aircraft, without ever having to lift the cylinders. The unique quality of this cart is the operator never has to lift a cylinder, which can weigh between 120 and 175 lbs., onto the cart. The cart has a very narrow footprint and a tight turning radius allowing for easy maneuverability.

Cart may be used to supply either internal aircraft systems or portable aircraft bottles.

DANGER!

TO AVOID SERIOUS INJURY, LOSS OF LIMB OR DEATH:

1. **DO NOT use on LOW PRESSURE aircraft systems.**
2. **DO NOT use with ANY GAS OTHER THAN OXYGEN.**
3. **DO NOT exceed 2250 PSIG inlet oxygen bottle pressure into booster.**
4. **All components used in the oxygen system shall be clean, dry and free of all contamination per SAE SPEC. AIR 1176.**
5. **Servicing and/or maintenance of oxygen systems shall be done by trained and qualified personnel using approved procedures per SAE SPEC. ARP 1532.**

1.2 MODEL & SERIAL NUMBER

Reference nameplate on unit

1.3 MANUFACTURER

TRONAIR, Inc.
1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301
Fax: (419) 867-0634
E-mail: sales@tronair.com
Website: www.tronair.com

1.4 SPECIFICATIONS/FEATURES

Dimensions:

- Height: 46 11/16 in (118.58 cm)
- Length: 92 13/16 in (235.74 cm)
- Width: 35 13/16 in (90.96 cm)
- Weight: 564 lbs (255.8 kg)

Rotating Cylinder Loader/Un-Loader:

- Stable and efficient rotational motion guidance under variable weights, speeds and high load conditions keeping the cylinders in the correct location
- Struts control the rotating of the cylinders from the vertical and horizontal positions
- Accommodates cylinders ¾ , 56” talland weighing less than 150 lbs
- Manufactured of high strength materials to ensure the cylinders are secure
- Locks into horizontal or vertical position by a spring loaded plunger
- M

1.4 SPECIFICATIONS/FEATURES *(continued)*

Cart:

- CE Marked
- Easy, one person loading/unloading
- Use with ¾ , 56" talland weighing less than 150 lbs oxygen cylinders; CGA 540 connection with check valves, 3000 psi max
- Cylinders fully captured
- Pneumatic tires/tapered wheel bearings
- Narrow width
- Very low profile, fits under most aircraft wings
- Parking brake
- Hose compartment storage tray
- Instrument Panel
- Powder coated heavy duty steel construction
- compact frame allows for a tight turning radius

Temperature Range:

- 0º to 200ºF (17.7º to 93.3º C)

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, and/or substantial property damage*** if the Warning Notice is ignored.

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

2.2 SAFETY INSTRUCTIONS

CAUTION!

It is mandatory that this instruction manual be read and understood by all persons operating this cart.

2.3 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.

2.4 SAFETY

The operation, maintenance, and trouble shooting of this cart 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!

TO AVOID SERIOUS INJURY OR DEATH OBSERVE THE FOLLOWING:

1. **All components used in the oxygen system must be clean, dry, and free of all contamination per SAE SPEC AIR 1176.**
2. **DO NOT use this equipment with nitrogen or gas other than oxygen.**
3. **DO NOT exceed 2250 PSIG bottle inlet pressure into booster.**
4. **Servicing and maintenance of the system should only be done by trained and qualified personnel using approved procedures.**
5. **It is mandatory that this instruction manual be read and understood by all persons operating this oxygen manifold.**

2.4 Safety continued on following page.

2.4 SAFETY *(continued)*

Pressures: Gases 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.

Oxygen: Oxygen is an oxidizing gas and is chemically stable and nonflammable. However oxygen does support combustion. High concentrations can accelerate the combustion of flammable materials up to and including an explosion. It is important to understand that spontaneous combustion of organic materials can occur in oxygen rich atmospheres.

Handling: Oxygen handling must be done with care to avoid any association with hydro-carbons. Especially where fuels and lubricants are present in aircraft service areas. It is imperative that oxygen systems be handled properly. Be sure to keep all protective caps in position on equipment as long as possible, and replace them as soon as possible.

Velocity: Oxygen flowing at a high velocity in a piping system can propel any foreign material particles with such force that the impact friction can raise the particles temperature to a possible ignition point. It is, therefore, imperative that a high degree of cleanliness be maintained in the oxygen system at all times.

Oxygen Servicing: The following list contains additional general safety precautions that should be adhered to during the servicing process. However, always refer to the manufacturer's procedure for the airplane being serviced.

1. Always ground the system to be serviced and the servicing equipment before connecting the filler adapter.
2. Close the oxygen bottle manual shutoff valve.
3. Ensure that all aircraft electrical power is off. Do not operate electrical switches, or connect or disconnect ground power generators during the oxygen charging operation.
4. Do not service the oxygen system if fueling or other flammable fluid servicing is in process.
5. Do not charge the system too fast. Rapid charging can create a dangerous overheating condition.

SAE AIRCRAFT OXYGEN SPECIFICATION INFORMATION
For more information concerning specific SAE aircraft oxygen equipment specifications, contact:
Society of Automotive Engineers
400 Commonwealth Drive
Warrendale, PA 15096-0001

3.0 PREPARATION FOR USE

CAUTION!

Only use cylinders for which this unit was designed: 9 – 9 ¾ inch diameter, 2250 psig (155 bar) maximum pressure with CGA 540 connection.

CAUTION!

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

3.1 LOADING/UNLOADING CYLINDERS

3.1.1 Loading Cylinders

WARNING!

This cart is designed to carry 4 cylinders simultaneously. Failure to install all 4 cylinders will create an unstable condition. Cart must be fully loaded/unloaded before transporting.

CAUTION!

Do NOT transport cart with cradles in upright position. Always store cradles in horizontal position.

1. Place cart on flat, level surface
2. Ensure Towbar is in upright position
3. Rotate both cylinder cradles to upright position (empty cradles will require assistance to move into position), ensure locking mechanism is engaged
4. Lower bottom ramp
5. Remove bottom clamping handle assembly
6. Loosen only one top clamping knob and rotate strap away from cradle
7. Walk cylinder up ramp and into cradle, position cylinder valve outlet port to face directly forward, toward towbar
8. Rotate strap against cylinder and tighten top clamping knob
9. Repeat steps 6-8 for second cylinder
10. Install bottom clamping handle assembly and tighten
11. Raise bottom ramp into upright position and click into place
12. Repeat steps 6-11 for cylinders on opposite side
13. all fours are rotate cradles to horizontal position. Ensure locking mechanism is engaged
14. Attach 4 input hosed to cylinders

3.1.2 Unloading Cylinders

WARNING!

This cart is designed to carry 4 cylinders simultaneously. Failure to install all 4 cylinders will create an unstable condition. Cart must be fully loaded/unloaded before transporting.

CAUTION!

Do NOT transport cart with cradles in upright position. Always store cradles in horizontal position.

1. Place cart on flat, level surface
2. Ensure Towbar is in upright position
3. Close cylinder valves and disconnect input hoses
4. Rotate both cylinder cradles to upright position, ensure locking mechanism is engaged
5. Lower bottom ramp
6. Remove bottom clamping handle assembly
7. Loosen only one top clamping knob and rotate strap away from cradle
8. Walk cylinder down ramp
9. Repeat steps 7 & 8 for second cylinder
10. Repeat steps 5-8 for cylinders on opposite side

4.0 TRAINING

4.1 TRAINING REQUIREMENTS

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

4.2 TRAINING PROGRAM

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

4.3 OPERATOR TRAINING

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

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

5.0 PACKAGING AND STORAGE

5.1 STORAGE

- Store the unit in a clean, dry area when not in use.
- Be sure that all hoses are capped and the unit is covered with lint free covering for the duration of unit storage to ensure complete oxygen system cleanliness for future aircraft system recharging.

6.0 MAINTENANCE

The operation, maintenance, and trouble shooting of this unit require 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. Maintenance is only to be done by qualified persons.

All maintenance personnel must be familiar with the cautions and warnings associated with high pressure oxygen and high pressure oxygen systems as outlined in *Section 3 - Safety* of this manual prior to performing any maintenance on the unit.

6.1 TRAILER

- Maintain pressure listed on tires.
- Grease wheel bearings quarterly.
- Generally keep the entire unit clean and free from contaminants. Visually inspect for any system leaks or damage. Correction of any problems prior to unit operation is imperative for safe operation.

7.0 PROVISION OF SPARES

7.1 SOURCE OF SPARE PARTS

Spare parts may be obtained from the manufacturer:

TRONAIR, Inc.
1 Air Cargo Pkwy East
Swanton, Ohio 43558 USA

Telephone: (419) 866-6301 or 800-426-6301
Fax: (419) 867-0634
E-mail: sales@tronair.com
Website: www.tronair.com

7.2 RECOMMENDED SPARE PARTS LISTS

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

8.0 IN SERVICE SUPPORT

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

9.0 GUARANTEES/LIMITATION OF LIABILITY

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

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

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

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

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

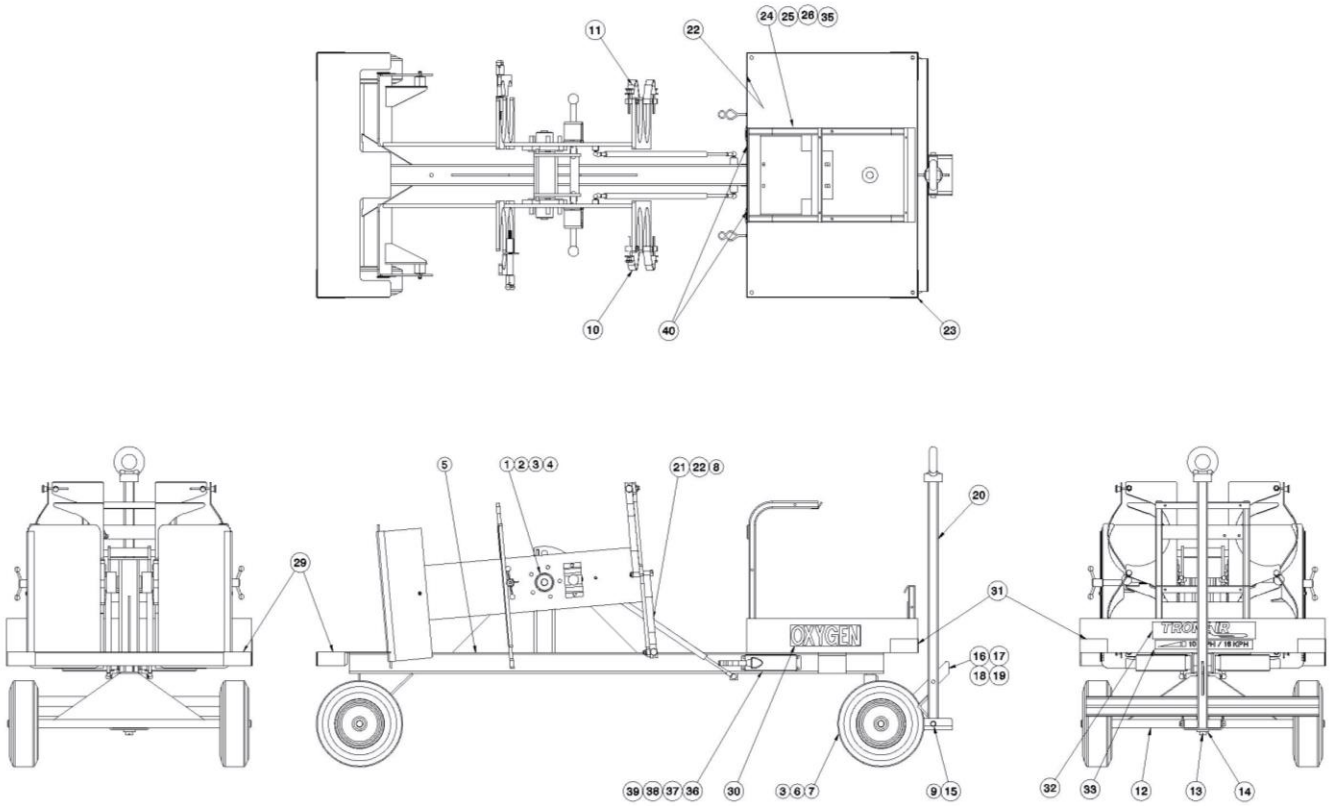
The obligations of Tronair expressly stated herein are in lieu of all other warranties or conditions expressed or implied. **Any unauthorized modification of the Tronair products or use of the Tronair products in violations of cautions and warnings in any manual (including updates) or safety bulletins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

10.0 APPENDICES

APPENDIX I Declaration of Conformity

Parts List

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



Item	Part Number	Description	Qty
1	H-3424	Hub, Bearing	2
2	G-1230-01	Nut, Axle 1 ¼	2
3	G-1283	Washer, Spindle 1”	6
4	G-1301-11	Pin, Cotter 3/16 x 1 ½	2
5	Z-8233-01	Weldment, 4-Bottl Oxygen Cart	1
6	U-1144	Assembly, Wheel w/Seal	4
7	G-1203-1120	Elastic Jamnut, 1 ¼	4
8	H-3668	Clips, Retaining	4
9	G-1301-02	Pin, Cotter 3/16 x 1 ½	2
10	Z-8237	Assembly, Left Cylinder Support	1
11	Z-8236	Assembly, Right Cylinder Support	1
12	Z-8099-01	Weldment, Front Truck	1
13	G-1301-03	Pin, Cotter ⅛ x 1 ½	1
14	H-2019-76	Bearing, Flange	2
15	R-2096	Pin, Towbar	1
16	J-5501	Lever	1
17	G-1503-1090N	Flatwasher, ½ Narrow, SST	2
18	G-1112-105022	Bolt, HH SST, ¼ - 20 x 2 ¼ Long	1
19	G-1203-1095	Elastic Jamnut, ½ - 20	1
20	Z-8173-01	Weldment, Towbar	1
21	H-3687	Dampner	2

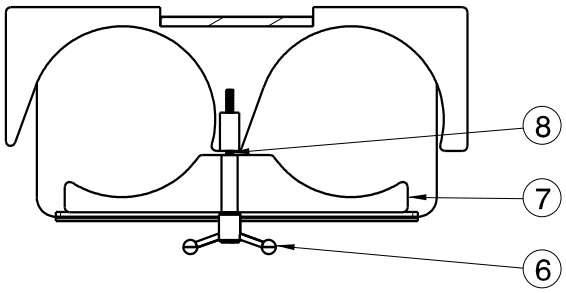
Parts List

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

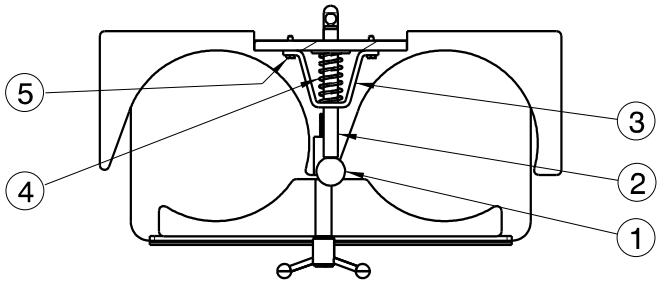
22	H-3666	Stud, Ball 5/16 – 18	2
23	S-2625-01	Hose Tray	1
24	Z-7654-01	Weldment, Frame	1
25	G-1112-105020	Bolt, HH SST, ¼ - 20 X 2 Long	2
26	G-1501-1050	ESN, SST, ¼ - 20	2
27	V-1779	Label, Serial Number	1
29	H-2807*004.00	Tape, Reflective (Red)	4
30	V-1489	Label, Oxygen	2
31	H-2806*004.00	Tape, Reflective (Amber)	4
32	V-1850	Label, Tronair, Inc.	1
33	V-1033	Label, Max Towing	1
35	G-1503-1050N	Flatwasher, SST, ¼ Narrow	4
36	H-1186	Reel, Static Discharge	2
37	G-14450-1060-S	Nutsert, 5/16 – 18 Open End	8
38	G-1112-106006	Bolt, HH SST, 5/16 – 18 x ¾ Long	8
39	G-1503-1060N	Flatwasher, SST, 5/16 Narrow	8
40	V-1999	Label, ISO Crush Hazard	2

Parts List

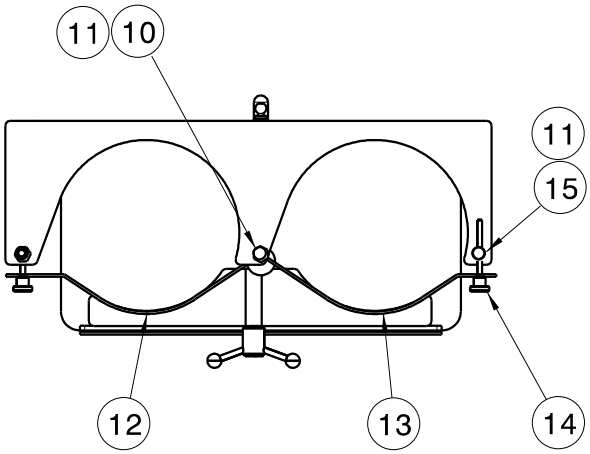
When ordering replacement parts/kits, please specify model, serial number and color of your unit.

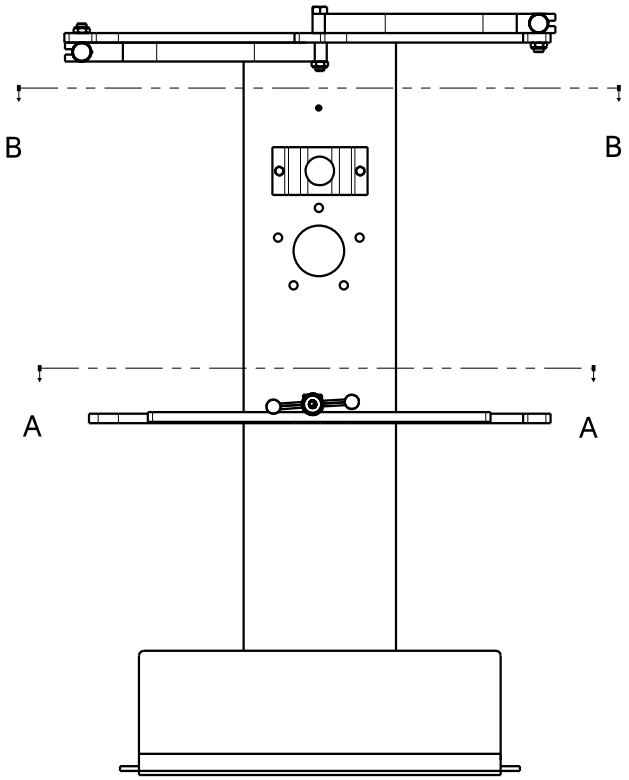


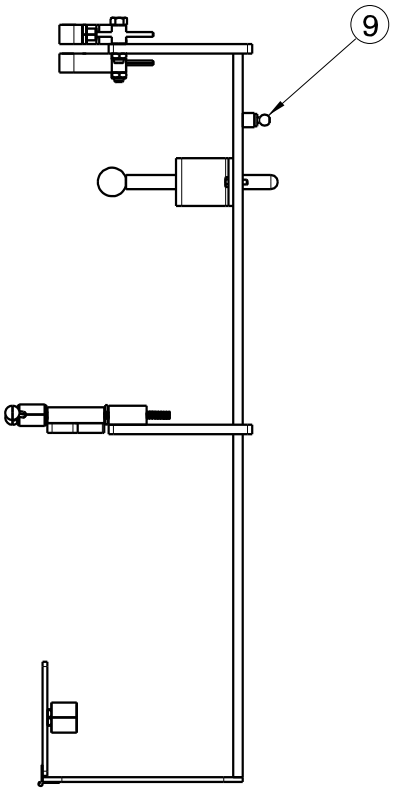
Section view A-A



Section view B-B







Parts List

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

Item	Part Number	Description	Qty
1	H-3673	Knob, Ball	1
2	Z-8171-01	Weldment, Pin	1
3	S-2626-01	Bracket, Cradle Stop	1
4	H-3674	Spring	1
5	G-1112-105010	Bolt, HH SST, ¼ - 20 x 1 Long	2
6	Z-8188-01	Machining, Clamping Handle	1
7	Z-8103-01	Weldment, Cylinder Support Handle	1
8	G-1303-13100	Pin, Roll SST, ⅛ x 1 Long	1
9	H-3666	Stud, Ball 5/16 – 18	2
10	G-1112-109030	Bolt, HH SST, ½ - 13 X 3 Long	1
11	G-1203-1090	Elastic Jamnut, ½ - 13	3
12	S-2629-01	Strap	1
13	S-2628-01	Srap	1
14	H-2677-08	Assembly, Knurled Knob, SST	2
15	R-2800	Threaded Pivot	2

TRONAIR®

APPENDIX I

Declaration of Conformity

DECLARATION of CONFORMITY

The design, development and manufacture is in accordance with European Community guidelines

20-4524-0000

Relevant provisions complied with by the machinery:
2006/42/EC

Relevant standards complied with by the machinery:
EN ISO 12100-1

Identification of person empowered to sign on behalf of the Manufacturer:

Patrick Finch

Quality Assurance Representative

Tronair, Inc.
1 Air Cargo Pkwy East
Swanton, OH 43558

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Web: www.tronair.com
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