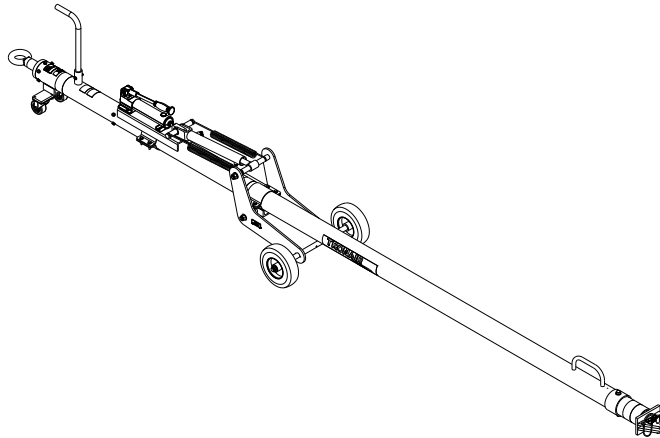




Operation & Service Manual



**Models: 01-1354-0100
01A1354-0100
Gulfstream Custom Towbar
G150, G200, G280**



03/2010 – Rev. 02

Includes Illustrated Parts Lists

REVISION
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Appendix I Maintenance Schedule

Tronair towbars/heads must only be used with matching Tronair heads/towbars, and Tronair shear pins.

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 DESCRIPTION

The Tronair Model 01-1354-0100 and 01A1354-0100 custom Towbars are designed for towing Gulfstream G150, G200 and G280 Aircraft manufactured by Gulfstream Aerospace Corporation.

The custom towbar has an aircraft attachment on the towing head to the nose landing gear tow point. There is a handle and an eyebolt with a shock dampener at the end of the towbar for towing.

1.1 SPECIFICATIONS

Aircraft Applications: Gulfstream G150, G200 and G280 manufactured by Gulfstream Aerospace Corporation

Maximum Aircraft Gross Weight: 40,000 lbs (18.1 Metric tons)

Dimensions:

Length from eyebolt centerline to aircraft attachment centerline:

177 ¾ in (451 cm) 01-1354-0100

177 ¾ in (451 cm) 01A1354-0100

Width 23-11/16 in (60.2 cm)

Height 7-3/4 in (19.7 cm) From ground to aircraft attachment centerline

Weight: 160 lbs (72.6 kg) 01-1354-0100

164.4 lbs (74.6 kg) 01A1354-0100

Finish: Blue Powder Coat

2.0 SAFETY INFORMATION

2.1 GENERAL

The Tronair Model 01-1354-0100 and 01A1354-0100 custom Towbars are to be used for moving the Gulfstream G150, G200 and G280 aircraft.

To ensure safe operation, please read the following statements and understand their meaning. This manual contains safety precautions which are explained as follows. Please read carefully.



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

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



WARNING!

A damaged or bent towbar should not be used. Towbar should be repaired or replaced.



WARNING!

Tronair recommends the use of a towbar with a category 1 or category 2 tug and aircraft not exceeding 75,000 lbs gross weight. Using the towbar with aircraft weighing in excess of this specific limitation may result in excessive loads and stresses being applied to the towbar and/or the aircraft. These excessive loads may cause failure of the towbar which could cause damage (INCLUDING WITHOUT LIMITATION to the aircraft) and/or personal injury OR DEATH. **TRONAIR MAKES NO REPRESENTATION, WARRANTY OR GUARANTEE AS TO SUCH MISUSE AND DISCLAIMS ANY AND ALL LIABILITY FOR INJURY, LOSS OR DAMAGE ARISING FROM OR RELATING TO SUCH MISUSE.**

3.0 OPERATION

3.1 LANDING GEAR ASSEMBLY

Place landing gear assembly in desired location. Torque clamp nuts to 35 ft-lbs (47.5 N-m).

3.2 TOWBAR CHECKLIST

- Check towing eye for bending, excessive wear and/or deformity. Contact Tronair for repair/replacement if towing eye is bent, excessively worn or deformed.
- Check towing eye mounting bolts. Ensure fasteners are not loose or missing. Tighten to 25 ft-lbs or replace as required.
- Ensure that the towing eye does not turn; if the towing eye can turn it indicates that the centering pin within the shock assembly may have been broken and repairs are needed.
- Check the shock assembly for preload on the spring by pulling on the towing eye. If the shock can be moved by hand it indicates that the spring is worn out and Tronair should be contacted for repairs.
- Inspect the towbar tube for cracks, gouges greater than 1/16 inch, and bends or deformities. A damaged or bent towbar should not be used. Contact Tronair for replacement.
- Check the casters for damage; ensure the swivels operate freely and the bearings are not missing. Replace if needed.
- Ensure that the caster mounting fasteners are not loose or missing. Tighten or replace as required.
- Check the caster mounting plate and channel. If the caster mounting plate is bent or broken contact Tronair for repairs. If the channel welds are broken, contact Tronair for repairs.
- Inspect the lifting handle at the towing eye end. Replace or repair the handle if it is missing or damaged. Ensure the mounting fasteners are not loose or missing. Tighten or replace as required.
- Check hydraulic lines. Ensure hydraulic fluid is not leaking from fitting connections or hose.
- Inspect towing head attachment fasteners. Verify that the factory supplied bolt is used; contact Tronair for replacement if required. Do not substitute without Tronair approval.
- Inspect the towing head for any weld cracks or deformed members. Replace if required.
- Check ball loc pin on the towing head for bending, excessive wear and deformation. Contact Tronair for replacement if ball loc pin is bent, worn or deformed. Do not substitute without Tronair approval.

3.3 USAGE PROCEDURE

3.3.1 Aircraft Attachment



CAUTION!

It is recommended that your towbar be attached to the aircraft first, and then connected to the tug to avoid possible aircraft damage.

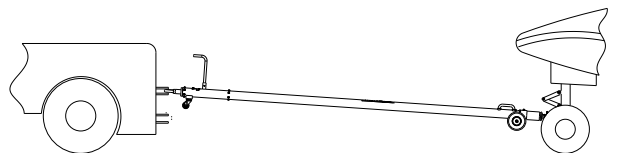
3.3.2 Tug Attachment

- Use a pintle height so that the towbar is as level as possible during towing. Also, the pintle hook height should prevent contact of the towbar with the ground during towing.



CAUTION!

Damage to the towbar or aircraft can result from an excessive towbar angle during towing operations. Reference Figure 1.



**Incorrect
Excessive Towbar Angle**



Correct

Figure 1

3.3 Usage procedures continued on the following page.

3.3 USAGE PROCEDURE (continued)

3.3.3 Couplers

CAUTION!



Damage to the towbar or aircraft can result while towing with the following types of couplers:

- Lift Head
- Standard Duty Latch
- Vertical Side Swing Latch
- Swivel Hook

The couplers listed above are known to cause binding and failure in the eyebolt. Indicators of binding are wear on outside diameter of the eyebolt and indentation on the inside diameter of the eyebolt. **Reference Figure 2.**

Tronair recommends a telecoupler pintle hook arrangement. This arrangement is known to eliminate binding. Tronair offers a Standard Telecoupler, Model Number 01-1950-5000, for use on tugs. **Reference Figure 3.**

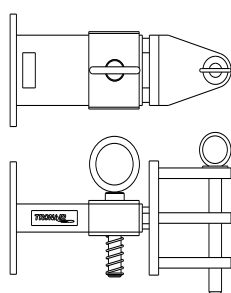


FIGURE 3
01-1950-5000 Standard Telecoupler

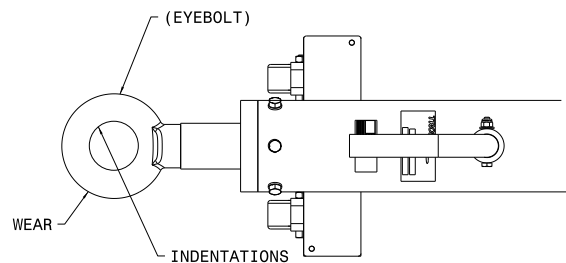


FIGURE 2

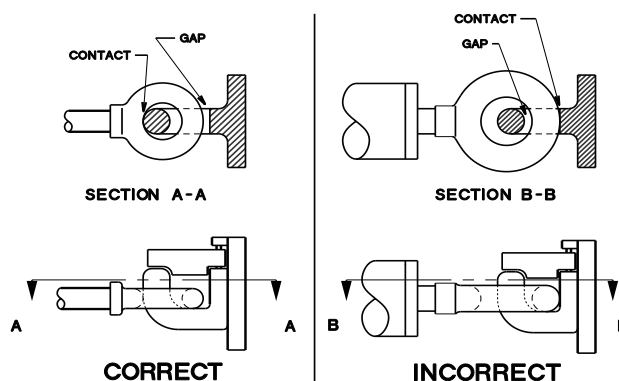


FIGURE 4

Damage to the towbar and/or aircraft can result by towing or pushing an aircraft with an incorrect size eyebolt or pintle pin. A correct size eyebolt will make contact with the pintle pin. A gap between the eyebolt outside diameter and the coupler face plate should be easily seen. An eyebolt which is too large will cause the eyebolt to make contact with the face plate of the coupler. When the eyebolt is too large for the coupler, a gap between the inside diameter of the eyebolt and the coupler face plate will be seen. **Reference Figure 4.**

To ensure proper towing and pushing, check to make sure the pintle pin diameter is not too long for the eyebolt's inside diameter. An approximate one-half inch ($\frac{1}{2}$ ") gap between the pin diameter and the eyebolt should be seen. If any of these conditions are not met, please contact Tronair for information to obtain a new coupler.

3.3.4 Towing Operation

Damage to the towbar or aircraft can result from pushing an aircraft while maintaining too sharp of an angle between the tug and the aircraft. Contact between the towbar weldment and the tug must be avoided. It is recommended that the angle between the tug and towbar not exceed 90°. **Reference Figure 5**

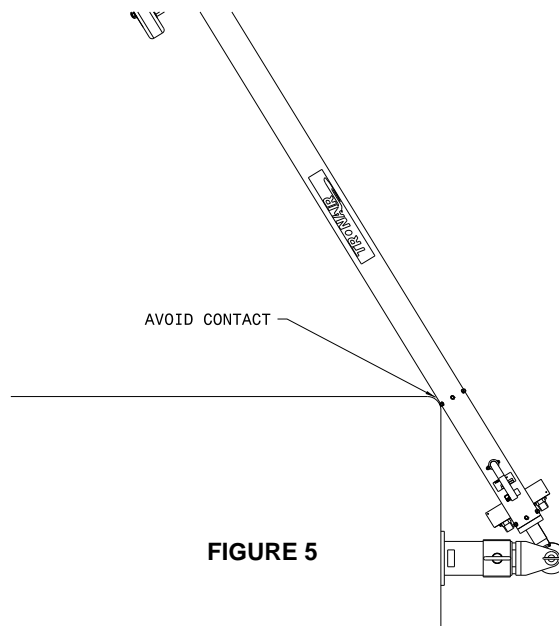


FIGURE 5

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 towbar.

4.2 TRAINING PROGRAM

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

4.3 OPERATOR TRAINING

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

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

5.0 PROVISION OF SPARES

5.1 SPARE PARTS

When ordering Replacement Parts/Kits & Spare Parts, please specify Model & Serial Number of your product.

Spare parts may be obtained from the manufacturer:

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

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

5.2 PARTS LIST AND ILLUSTRATIONS

Reference following pages for ordering information of Replacement Parts and Kits.

6.0 IN-SERVICE SUPPORT

Contact Tronair for technical services and information.

7.0 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:

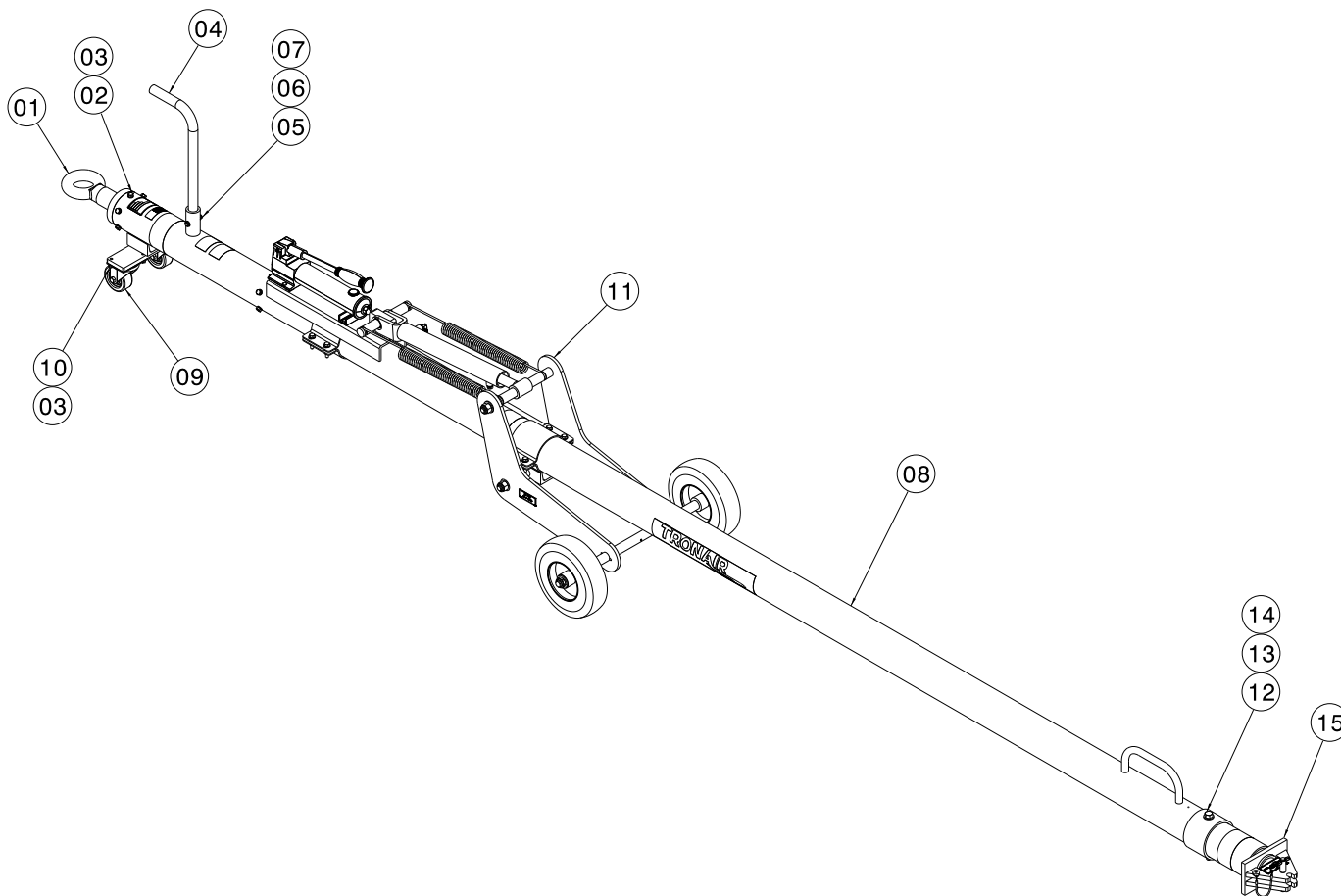
- a) Product Model Number
- b) Product Serial Number
- c) Description of the problem

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.**

Parts List

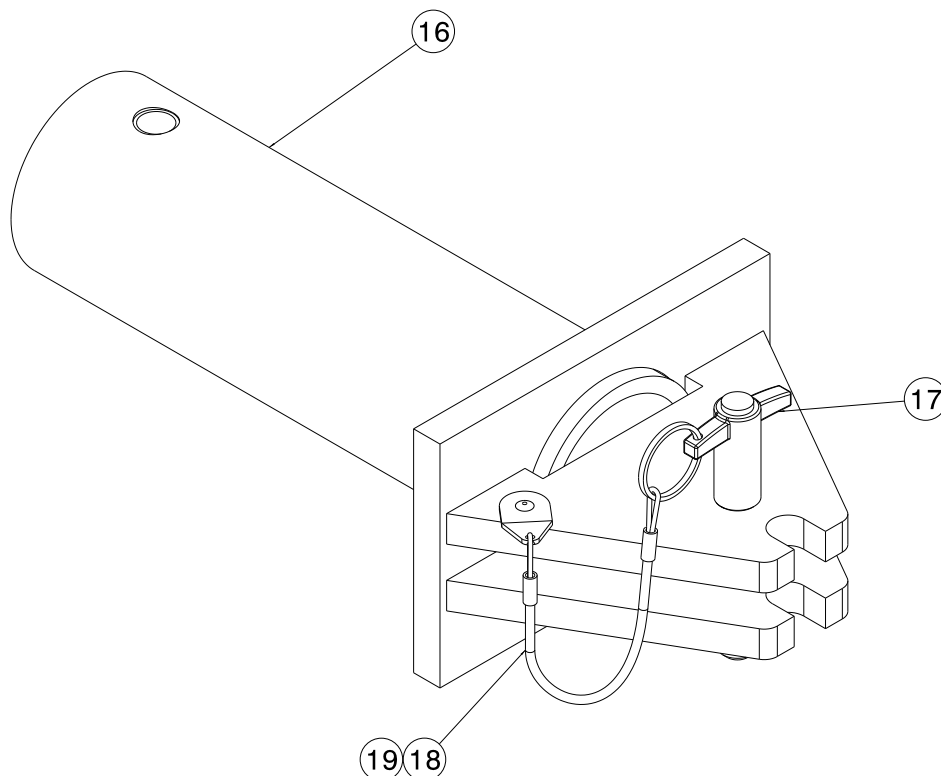
When ordering Replacement Parts/Kits, please specify Model & Serial Number of your product.



Item	Part Number	Description	Qty
1	Z-3999	Assembly, Shock (01-1354-0100)	1
	Z-4137	Assembly, Shock (01A1354-0100)	1
2	G-1420-106006	Bolt, Hex Head, Grade 8, 5/16 – 18 3/4" long	12
3	G-1251-1060R	Lockwasher, 5/16 Regular	16
4	TR-1857-01	Tube, Handle	1
5	G-1100-105520	Bolt, Hex Head, Grade 5, 1/4 - 28 x 2" long	1
6	G-1250-1050N	Flatwasher, 1/4 Narrow	1
7	G-1202-1055	Stopnut, 1/4 - 28 Elastic	1
8	Z-6514-01	Machining, Towbar	1
9	U-1000	Caster, Swivel	2
10	G-1100-106005	Bolt, Hex Head, Grade 5, 5/16 – 18 x 5/8" long	4
11	Z-6644	Assembly, Hydraulic Lift	1
12	G-1100-109554	Bolt, Hex Head, Grade 5, 1/2 - 20 x 5 – 1/2" long	1
13	G-1250-1090N	Flatwasher, 1/2 Narrow	2
14	G-1203-1095	Jamnut, 1/2 - 20 Elastic	1
15	X-1048	Assembly, Head	1

Parts List

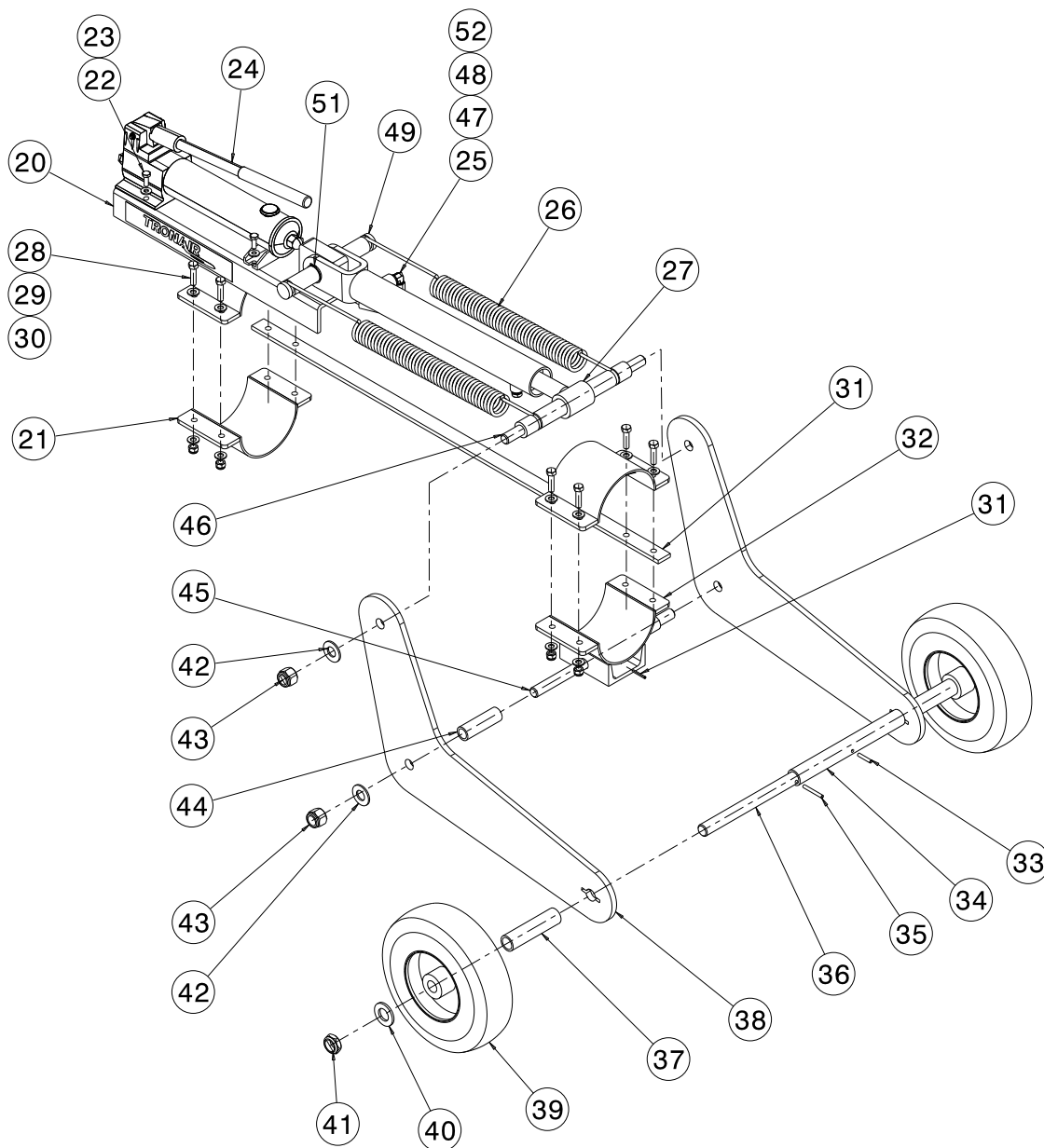
When ordering Replacement Parts/Kits, please specify Model and Serial Number of your Unit.



Item	Part Number	Description	Qty
16	Z-5574	Machining, Head	1
17	G-1310-0920	Pin, Ball Lok-T	1
18	H-1026*07.0	Assembly, Lanyard	1
19	G-1351-04	Rivet, Pop	1

Parts List

When ordering Replacement Parts/Kits, please specify Model & Serial Number of your product.



Item	Part Number	Description	Qty
20	Z-6646-01	Weldment, Pump Mount	1
21	H-3293	Weldment, Strap Clamp	1
22	G-1250-1050N	Flatwasher, ¼ ID Narrow	4
23	G-1100-105506	Bolt, HH, GR 5, ¼ - 28 x ¾ LG	4
24	H-2945	Pump, Hydraulic	1
25	N-2001-03-S-B	Elbow, STR Thread	1
26	H-2664	Spring, Extension	2
27	HC-2119	Cylinder, Hydraulic	1
28	G-1250-1060N	Flatwasher, 5/16 Narrow	16
29	G-1100-106514	Bolt, HH, GR 5, 5/16 – 24 x 1 ½ LG	8
30	G-1202-1065	ESN, 5/16 – 24	8
31	J-4082-01	Bar, Connector	1

Parts List

Item	Part Number	Description	Qty
32	Z-6645-01	Bracket, Axle	1
33	G-1300-19100	Roll Pin, 3/16" diameter x 1" long	1
34	TR-1796-01	Tube, Landing Gear	1
35	G-1300-19140	Roll Pin, 3/16" diameter x 1" long	1
36	R-2086	Axle, Landing Gear	1
37	TR-1795-01	Spacer, Wheel	2
38	J-3435-01	Landing Gear Plate	2
39	U-1096	Wheel, Pneumatic Tire	2
40	G-1250-1110N	Flatwasher, ¾ Narrow	2
41	G-1203-1115	Jamnut, ¾ - 16 Elastic	2
42	G-1250-1100N	Flatwasher, 5/8 Narrow	4
43	G-1202-1105	Stopnut, 5/8 Elastic	4
44	TR-1819-01	Spacer, Wheel	2
45	R-2099	Axle, Landing Gear	1
46	R-2097	Pin, Pivot	1
47	N-2005-04-S	Elbow, Male #4-6	1
48	TF1043-18*21.0	Assembly, Hose (#4 MB)	1
49	R-2084	Pin, Cylinder	1
50	G-1300-13100	Roll Pin, 1/8" diameter x 1" long	1
51	G-1392-100-S	Ring, Retaining	2
52	N-2002-3-S	Elbow, Swivel Nut	1



APPENDIX - I

Declaration of Conformity



DECLARATION of CONFORMITY

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

Custom Towbars
01-1354-0100
01A1354-0100

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

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

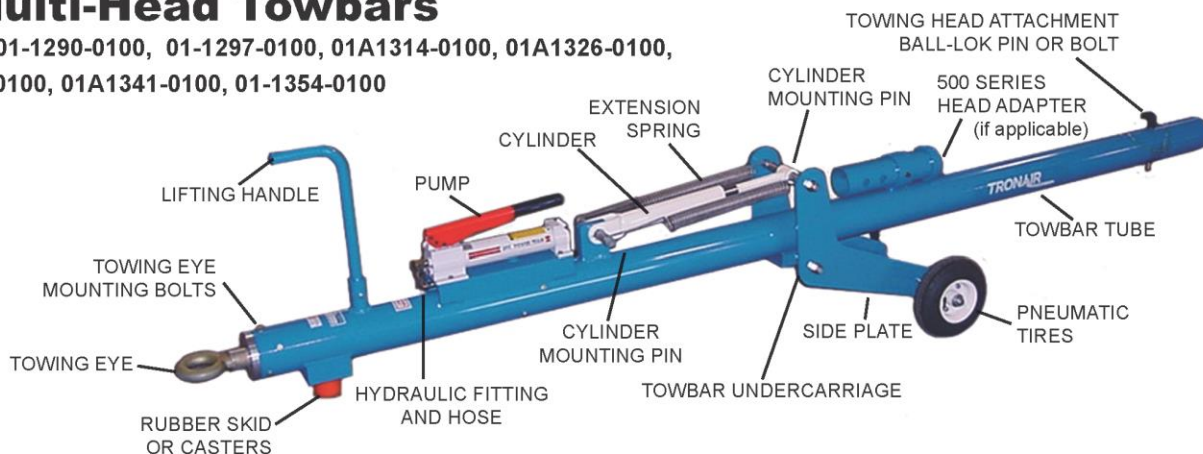
Identification of person empowered to sign on behalf of the Manufacturer:

A handwritten signature in black ink that reads "Patrick Finch". The signature is written in a cursive, flowing style. It is positioned above a solid horizontal line that spans the width of the signature.

Quality Assurance Representative

Heavy Duty Universal Multi-Head Towbars

Models: 01-1290-0100, 01-1297-0100, 01A1314-0100, 01A1326-0100,
01-1336-0100, 01A1341-0100, 01-1354-0100



Tronair recommends towbar inspections at least once a week.

- ☐ Check towing eye for bending, excessive wear and deformity. If any are located, remove towbar from service and contact Tronair for repair.
- ☐ Check towing eye mounting bolts. Ensure the fasteners are tight and not missing. Tighten to 25 ft-lbs or replace as required.
- ☐ Ensure the towing eye does not move or turn by hand; if the towing eye can turn this may indicate that the centering pin within the shock assembly may be broken and repairs are needed. Contact Tronair for repairs.
- ☐ Check the shock assembly for preload on the spring by pulling on the towing eye. If the shock can be moved by hand this may indicate the spring is worn out, contact Tronair for repairs.
- ☐ Check the rubber skid or casters at the towing eye end. Ensure that all fasteners are tight and not missing. Tighten or replace as required. If the bumper is split or excessively worn, contact Tronair or your Tronair distributor for replacement.
- ☐ Inspect the lifting handle for damage. Contact Tronair or your Tronair distributor for repair or replacement if required.
- ☐ Inspect the towbar tube for cracks, gouges greater than 1/16", and bends or deformities. If any are located, remove towbar from service and contact Tronair for repair.
- ☐ Inspect the pump for hydraulic leaks. Replace seals if any leaks exist. Contact Tronair or your Tronair distributor for replacement.
- ☐ Inspect the pump fluid level. Before adding MIL-PRF-5606 hydraulic fluid, ensure that the undercarriage is collapsed.
- ☐ Inspect hydraulic fittings and hose for leaks. If any hydraulic leaks exist, contact Tronair or your Tronair distributor for replacement.
- ☐ Inspect cylinder for hydraulic leaks. If any hydraulic leaks exist, contact Tronair or your Tronair distributor for replacement seals.
- ☐ Check extension springs. Extend cylinder to full stroke and open relief valve on pump. The extension springs should retract the cylinder completely. If not, contact Tronair or your Tronair distributor for replacement.
- ☐ Inspect cylinder mounting pins for bending or damage. Ensure the springs are engaged on them. If pins are bent or damaged, contact Tronair or your Tronair distributor for replacement.
- ☐ The undercarriage allows towing by a tow vehicle of speeds up to 6 mph (10 km/h)
- ☐ Check the towbar undercarriage for unusual wear or damage. Inflate the pneumatic tires to the proper pressure; repair any air leaks or replace if needed. Ensure the wheels can rotate freely, and wheel rims and tire axle are not bent. Ensure mounting fasteners are tight and not missing. Tighten or replace as required. Grease tire axle every 90 days.
- ☐ Inspect towbar undercarriage side plates for bending or damage. If any exist, contact Tronair or your Tronair distributor for replacement.
- ☐ Inspect head adapter (if applicable) for Tronair 500 series towing heads. Ensure it is not damaged or missing. Contact Tronair or your Tronair distributor for replacement if required.
- ☐ Inspect towing head attachment ball-loc pin or bolt for bending or unusual wear. Verify the factory supplied pin or bolt is used. Contact Tronair for replacement if required. Use only Tronair specified ball-loc pins/fasteners.
- ☐ Ensure the towing head attachment ball-loc pin is connected to the towbar via its lanyard. Replace lanyard if missing.
- ☐ Inspect all steel components for signs of rust. Touch up with paint as required.

INS-1792

www.tronair.com

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