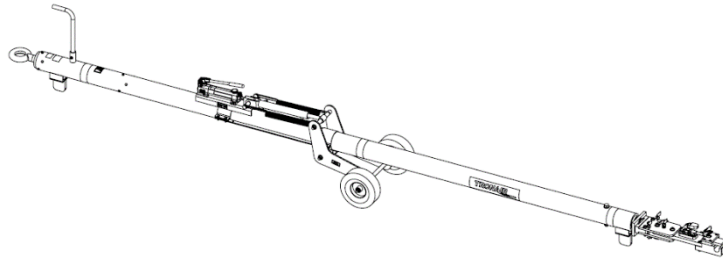




# OPERATION & SERVICE MANUAL



**Model: 01B1399-0100**  
**Custom Towbar**  
**Embraer E190-E2/E195-E2**



02/2024 – Rev. 04

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



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04	02/2024	Major revision

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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 PRODUCT INFORMATION

### 1.1 DESCRIPTION

The Tronair Model 01B1399-0100 Custom Towbar is designed for towing the E190-E2/E195-E2 Aircraft manufactured by Embraer.

The custom towbar includes a hydraulic operated landing gear to raise and lower the towing head. The aircraft is attached by connecting a machined jaw and slide block on the towing head to the nose landing gear tow fitting. There is a handle and an eyebolt at the end of the towbar for towing. The eyebolt incorporates a compression spring to dampen shock loads during towing.

### 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

Aircraft Application ..... E190-E2/E195-E2 manufactured by Embraer  
Aircraft MTOW ..... 140,000 lbs (63.5 metric ton)  
Length ..... 213-1/8 in (541.3 cm) From eyebolt centerline to aircraft attachment centerline  
Width ..... 23-11/16 in (60.2 cm)  
Height ..... 31-1/4 in (80.7 cm)  
Weight ..... 368 lbs (166.9 kg)  
Towbar Finish ..... Blue Powder Coat  
Towing Head Finish ..... Zinc Plating

## 2.0 SAFETY INFORMATION

### 2.1 GENERAL

The Tronair Model 01B1399-0110 Custom Towbar is used for moving the Embraer E190-E2/E195-E2 Aircraft only.

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.

#### **WARNING!**

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

### 2.2 PRECAUTIONS

- Keep feet clear of the towbar during all operations
- Keep hands and feet clear of moving parts during all operations
- Walk around the towbar, never over it
- Never crawl under a towbar that is loaded
- Observe appropriate towing speeds

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

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

**3.2 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.

**3.3 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.**

**4.0 OPERATION****4.1 PRELIMINARY CHECKLIST****4.1.1 Towbar**

- Check landing gear assembly for damage
- Check weld between towbar and handles for cracks
- Check hydraulic connections for leaks
- Check all fastener connections to ensure they are not loose or missing

**4.1.2 Towing Head**

- Check welds between head plate and connector tube for cracks
- Check shear pin to ensure it has not broken; replace if necessary
- Check fastener connection of towing head to towbar. Ensure the connection is not loose or missing
- Check shear pin bushings. Ensure they are not cracked or chipped
- Check hooks on towing head for bending or excessive wear
- Check pivot bolt. Ensure connection is secure
- Check slide assembly; ensure slide does not bind and locking pin is present. Lubricate as needed
- Check all fastener connections to ensure they are not loose or missing

**4.2 USAGE PROCEDURE****4.2.1 Aircraft Attachment****CAUTION!**

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

1. Align the towbar with the aircraft centerline, directly in front of the nose landing gear.
  2. Disconnect the towbar from the tow tractor.
  3. Ensure the towbar head jaw clamp is open by removing ball-lock T-pin, then by pulling up and back on the clamp handle to pull the slide block toward the lunette.
  4. Operate the hydraulic hand pump to raise the towbar, including the head assembly to locate nearer to the landing gear tow fitting. Open the hydraulic pump release valve to lower the towbar.
  5. Manually adjust the towbar head assembly until it is directly in contact with the aircraft tow fitting.
  6. Close the towbar head jaw clamp by pushing the clamp handle and sliding the slide block over the aircraft tow fitting.
- Ensure the slide block is locked in place and ball-lock T-pin is installed properly.
7. Raise or lower the towbar using the hydraulic pump so the towbar lunette eye bolt is aligned with the tow tractor hitch. Connect the tow tractor hitch to the towbar lunette eye hook.
  8. Retract towbar wheels by opening the release valve on the hydraulic hand pump.
- Ensure landing gear or towbar wheels are fully retracted during push back operations to prevent damage.

## 4.2.2 Tug Attachment



### CAUTION!

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

- 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.

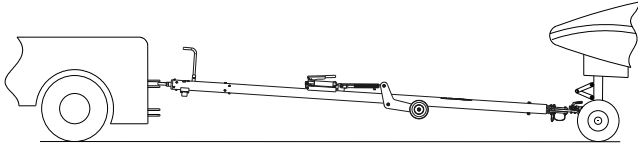


FIGURE 1 – Incorrect

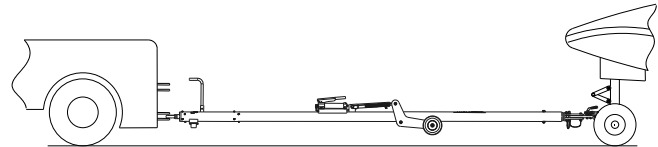


FIGURE 2 – Correct

## 4.2.3 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 towing eye. Indicators of binding and wear on outside diameter of the eyebolt and indentation on the inside diameter of the eyebolt. **Reference Figure 3.**

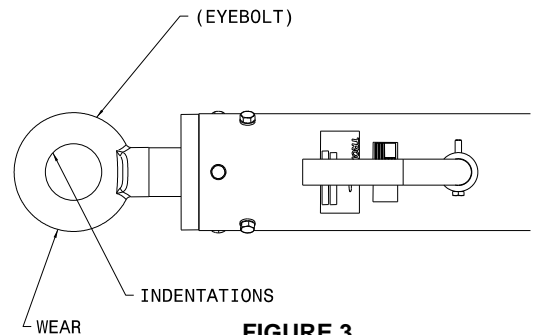


FIGURE 3

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 4.**

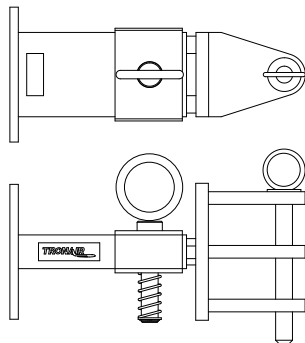


FIGURE 4

01-1950-5000 Standard Telecoupler

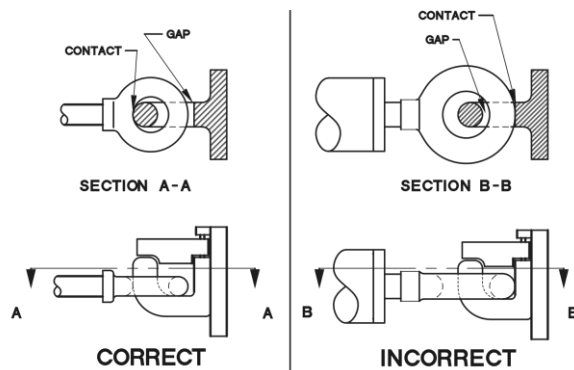


FIGURE 5

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 5.**

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 (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.

## 4.2.4 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 6.**
- Towing speed:
  - 9.3 mph (15 kmph) max - forward towing - day/good weather
  - 3.1 mph (5 kmph) max - forward towing - night/inclement weather
- Operate between -4° and 122° F (-20° and 50° C)

## 4.2.5 Aircraft Disengagement

1. Ensure hydraulic hand pump release valve is closed.
2. Operate the hydraulic hand pump to lower the landing gear towbar wheels until weight is removed from the towbar.
3. Disconnect the lunette eye bolt from the tow tractor. Move the tow tractor away from the towbar.
4. Ensure the towbar head jaw clamp is open by removing ball-lock T-pin, then by pulling up and back on the clamp handle to pull the slide block toward the lunette.
5. Manually adjust the towbar head assembly to remove from the aircraft tow fitting and move towbar clear of the aircraft.

## 4.2.6 Transportation of Towbar Without Aircraft

Connect the towbar lunette eye hook to the tow tractor hitch and adjust the towbar landing gear wheels by operating the hydraulic hand pump so the towbar is at level height for transportation.

- Ensure towbar head does not interfere with ground during transportation

## 5.0 MAINTENANCE

### 5.1 SERVICE

To ensure efficient and reliable operation, the towbar must be maintained through regular preventive maintenance practices. These practices include inspection, cleaning, and lubrication. All preventive maintenance must be performed at least once every six months. More frequent maintenance is recommended in conditions of heavy service or extreme weather. Replace any parts that do not meet inspection standards and cannot be repaired in the field.

1. Clean towbar assembly per section 5.1.1 Cleaning
2. Inspect towbar using the included maintenance schedules (INS-1792 and INS-2223)

#### 5.1.1 Cleaning

1. Clean complete assembly with mild detergent solution, followed by clean water rinse
2. Dry all parts using clean cloth or low pressure compressed air

#### 5.1.2 Lubrication

- Every 6 months grease wheel axle in axle lift assembly
- Every 90 days grease axle pivot tie-rod in wheel assembly
- Lubricate sliding block in head assembly with high quality silicon liquid or spray

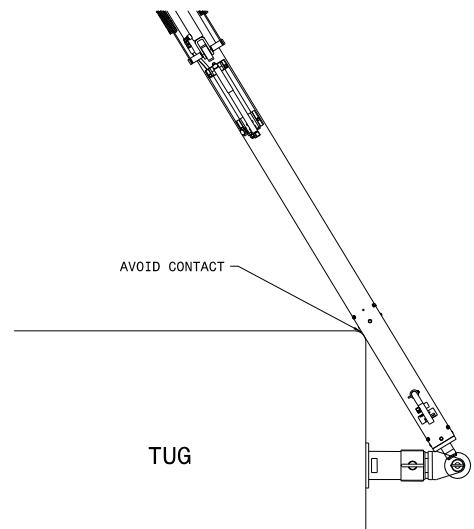
#### 5.1.3 Shear Pin Failure

The Tronair towbar is equipped with a shear pin. Designed to break under excessive load, the shear pin will break before damage to aircraft can occur. Shear pin failure is indicated by a sudden jerk of the tow vehicle and by an audible snap. Ensure the shear pin is replaced with the correct shear provided from the towbar manufacturer.



### CAUTION!

**Never tow an aircraft without proper shear pin in place.**



**FIGURE 6**

**6.0 PROVISION OF SPARES****6.1 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](mailto:sales@tronair.com)

Website: [www.tronair.com](http://www.tronair.com)

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

**6.2 PARTS LISTS & ILLUSTRATIONS**

Reference the following pages for Replacement Parts and Kits available.

Recommended Spares to be kept on hand:

G-1300-19100 ..... Roll Pin, 1" LG

G-1300-19140 ..... Roll Pin, 1-1/2" LG

G-1702 ..... Ball-Lock T-Pin

Z-8584 ..... Shear Pin

**7.0 IN-SERVICE SUPPORT**

Contact Tronair for technical services and information.

**8.0 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 manufacturer's 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

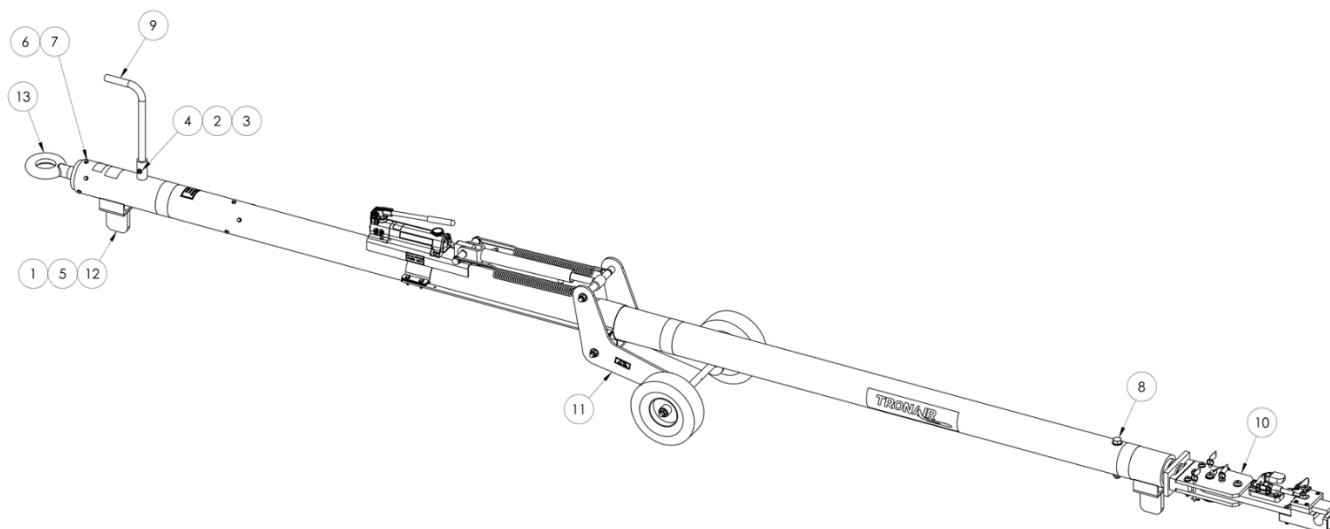
If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA 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 Lists

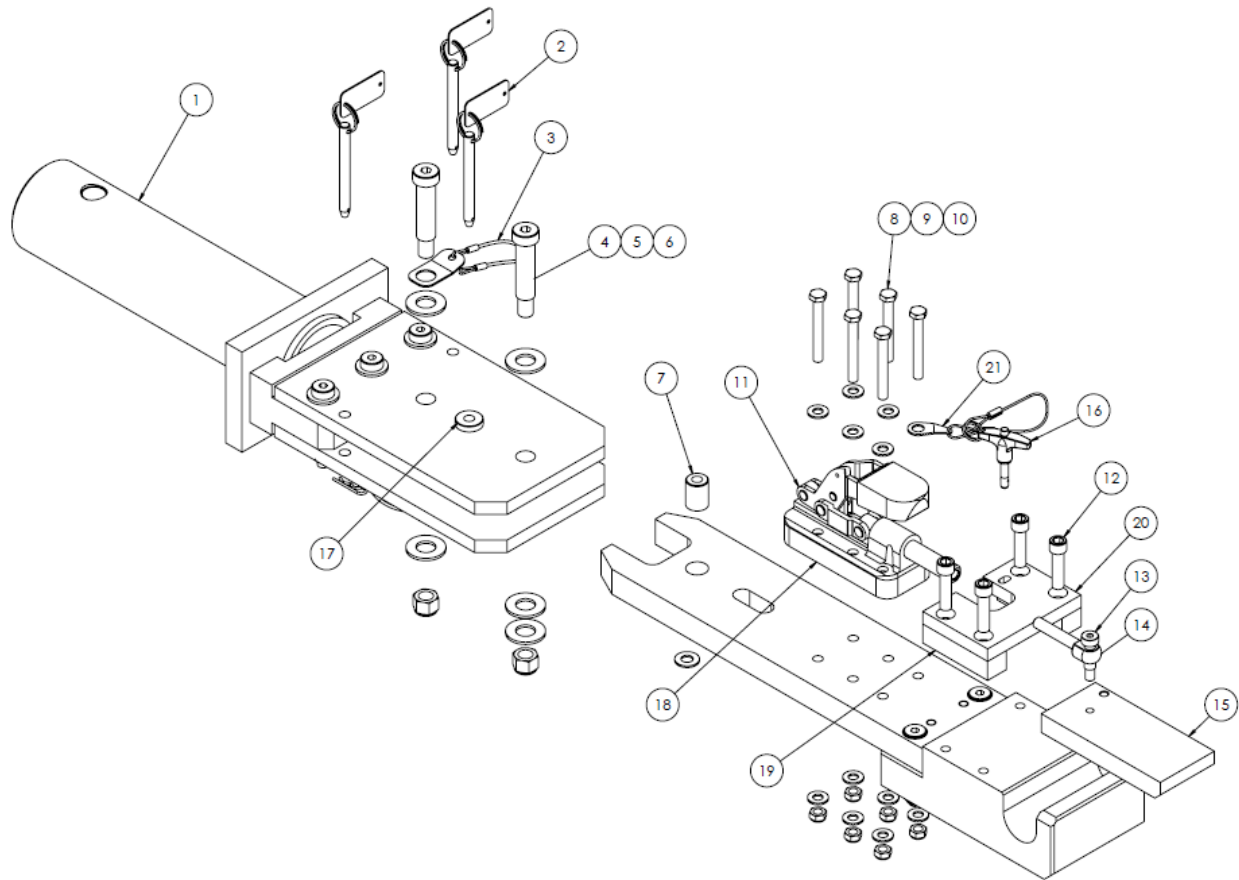
When ordering replacement parts/kits, please specify model, serial number and color of your unit.



Item	Part Number	Description	Qty
1	G-1100-105006	BOLT, 1/4-20 X 3/4" LG HEX HD GR 5	8
2	G-1100-105520	BOLT, 1/4-28 X 2.0" LG HEX HD GR 5	1
3	G-1202-1055	STOPNUT, 1/4-28 ELASTIC	1
4	G-1250-1050W	FLATWASHER, 1/4 WIDE	1
5	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	8
6	G-1251-1060R	LOCKWASHER, 5/16 REGULAR	12
7	G-1420-106012	BOLT, 5/16-18 X 1-1/4" LG. HEX HD GR 8	12
8	K-5357	BOLT KIT	1
9	TR-1857-00	TUBE, HANDLE (P)	1
10	X-1260	ASSEMBLY. HEAD	1
11	Z-12249	ASSEMBLY, 5" DIA. HYDRAULIC LIFT	1
12	Z-12250	WELDMENT, TOWBAR BUMPER	2
13	Z-8596	ASSEMBLY, SHOCK 3.0 (76.20)	1
14	Z-8680-00	WELDMENT, TOWBAR (P)	1

## Parts Lists

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

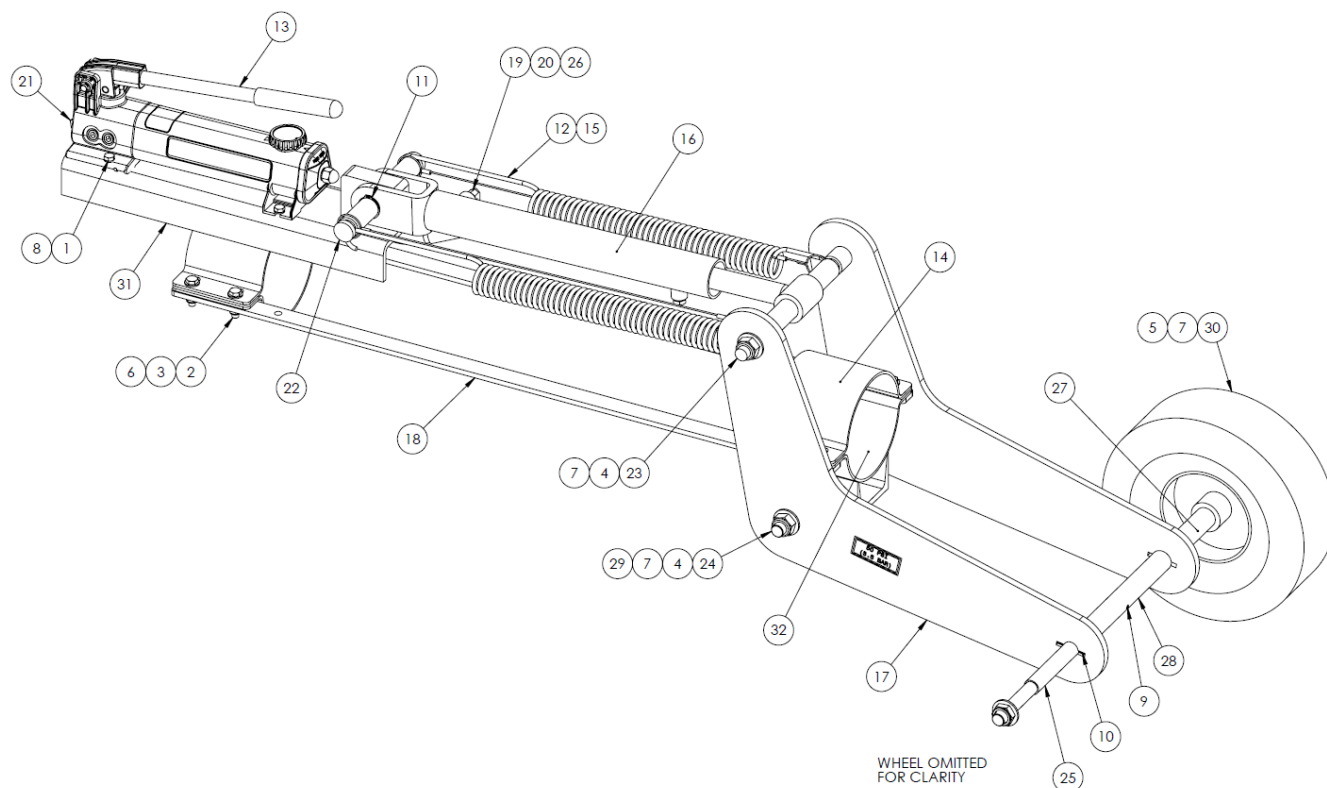


Item	Part Number	Description	Qty
1	Z-10763-00	MACHINING, SHEAR PLATE	1
2	Z-8584	ASSEMBLY, SHEAR PIN	3
3	H-3221-07.0	ASSEMBLY, LANYARD	2
4	G-1155-109222	SCREW, 5/8 X 2-1/4" LG SOCKET HD SHOULDER	2
5	G-1250-1100N	FLATWASHER, 5/8 NARROW	4
6	G-1202-1090	STOPNUT, 1/2-13 ELASTIC	2
7	H-1725-33	BUSHING	1
8	G-1100-106524	BOLT, HEX HEAD GRADE 5, 5/16-24 X 2-1/2" LONG	6
9	G-1250-1060N	FLATWASHER, 5/16 NARROW	12
10	G-1207-1065	STOPNUT, 5/16 - 24 ELASTIC	6
11	H-2923	CLAMP, TOGGLE	1
12	G-1151-107214	SCREW, CAP, 3/8 - 16 X 1-1/2" LONG	4
13	G-1155-106210	SCREW, SHOULDER, 3/8" DIAMETER	1
14	H-2943	ROD END	1
15	J-8186	PLATE, SLIDER	1
16	G-1702	BALL-LOCK T-PIN	1
17	H-1724-25	BUSHING	2
18	J-4487	SPACER	1
19	J-8644	GUIDE, SLIDE	2
20	J-8643	PLATE, SLIDE BLOCK	1
21	H-4393	LANYARD	1

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## Parts Lists

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



## Parts Lists

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

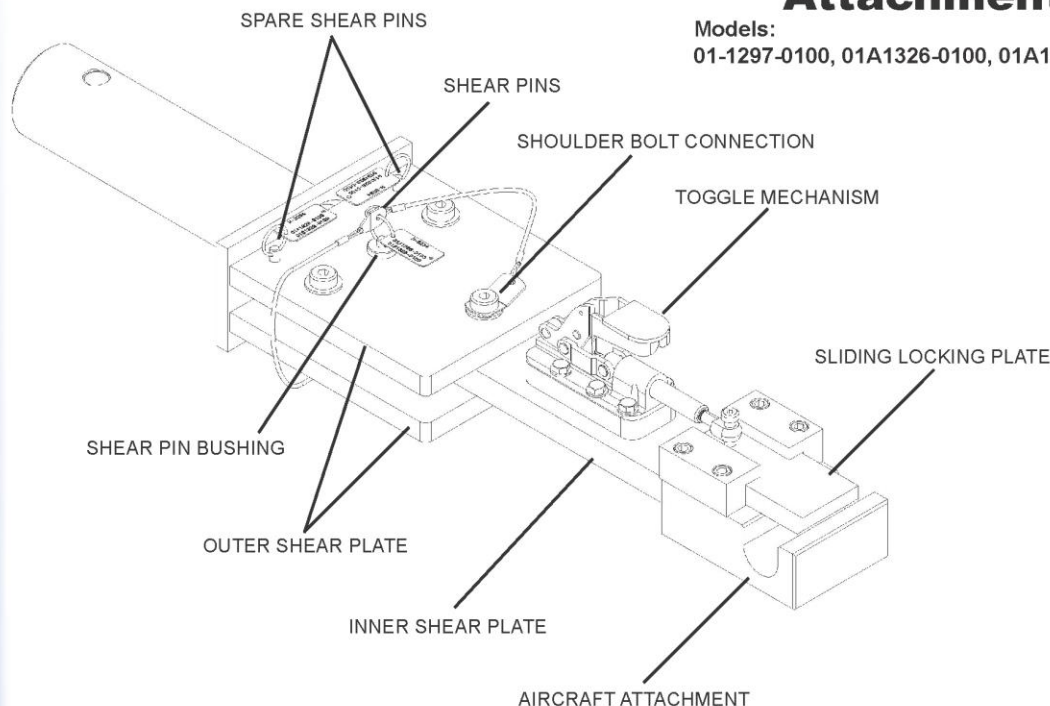
Item	Part Number	Description	Qty
1	G-1100-105506	BOLT, 1/4-28 X 3/4" LG HEX HD GR 5	4
2	G-1100-106512	BOLT, 5/16-24 X 1-1/4" LG. HEX HD GR 5	8
3	G-1202-1065	STOPNUT, 5/16-24 ELASTIC	8
4	G-1202-1105	STOPNUT, 5/8-18 ELASTIC	4
5	G-1203-1105	JAMNUT, 5/8-18 ELASTIC	2
6	G-1250-1060N	FLATWASHER, 5/16 NARROW	16
7	G-1250-1100N	FLATWASHER, 5/8 NARROW	6
8	G-1251-1050R	LOCKWASHER, 1/4 REGULAR	4
9	G-1300-19100	PIN, 3/16" X 1.0" LG ROLL	1
10	G-1300-19140	PIN, 3/16" X 1-1/2" LG ROLL	1
11	G-1392-100	RING, EXTERNAL RETAINING	2
12	H-2664	SPRING, EXTENSION	2
13	H-2945	PUMP, MODIFIED HAND	1
14	H-3256-00	BRACKET, TUBE	1
15	H-3784	CABLE, SPRING SAFETY	2
16	HC-2119	CYLINDER, HYDRAULIC	1
17	J-3435-00	PLATE, LANDING GEAR	2
18	J-8605-00	BAR, CONNECTOR, EXT (P)	2
19	N-2001-03-S-B	ELBOW 90°, -04 M SAE ORB X -04 M JIC	1
20	N-2002-03-S	ELBOW, SWIVEL NUT	1
21	N-2005-04-S	ELBOW, MALE	1
22	R-2084	PIN, CYLINDER	1
23	R-2097	PIN, PIVOT	1
24	R-2099	AXLE, LANDING GEAR	1
25	R-2872	AXLE, LANDING GEAR	1
26	TF-1043-18-21.0	ASSEMBLY, HOSE (#4 MB)	1
27	TR-1795-01	SPACER, WHEEL (P)	1
28	TR-1796-01	TUBE, LANDING GEAR (P)	1
29	TR-1819-00	SPACER, WHEEL	2
30	U-1021	WHEEL	2
31	Z-12248-00	WELDMENT, PUMP MOUNT (P)	1
32	Z-7140-00	BRACKET, AXLE (P)	1



### Heavy Duty Clamp Style Attachment Heads

Models:

01-1297-0100, 01A1326-0100, 01A1332-0100, 01-1336-0100



#### Tronair recommends towbar inspections at least once a week.

- ☐ Inspect for weld cracks. If found remove the towbar multi-head from service and contact Tronair for repair.
- ☐ Inspect the side rails, head rail, and head plate for bending. If found remove the towbar multi-head from service and contact Tronair for repair.
- ☐ For towbar multi-heads with shear, inspect the shear plates for bending. If found remove the towbar multi-head from service and contact Tronair for repair.
- ☐ Inspect the sliding locking plate and the toggle mechanism for bending, cracks, and excessive wear. If found remove the towbar multi-head from service and contact Tronair or your Tronair distributor for replacement.
- ☐ Ensure the sliding locking plate can move freely within its housing. If any binding occurs, inspect the sliding locking plate for bending and the housing for flatness. If either condition exists, contact Tronair for repair options.
- ☐ For towbar multi-heads with shear, check the shoulder bolt connections through the shear plates. Verify they are not clamping the shear plates together. There should not be any clamping force applied to the shear plates so the assembly functions properly. If required, back the stopnut off to remove any clamping force applied.
- ☐ For towbar multi-heads with shear, inspect the shear pin. If the shear pin is bent, broken, or missing contact Tronair or your Tronair distributor for replacement. Tronair recommends purchasing spare shear pins for rapid replacement, use only Tronair specified shear pins.
- ☐ For towbar multi-heads with shear, inspect the shear pin bushings. If the shear pin bushings are cracked or chipped, contact Tronair or your Tronair distributor for replacement, use only Tronair specified shear pin bushings.
- ☐ Inspect all steel components for signs of rust. Touch up with paint as required.

INS-2223

[www.tronair.com](http://www.tronair.com)

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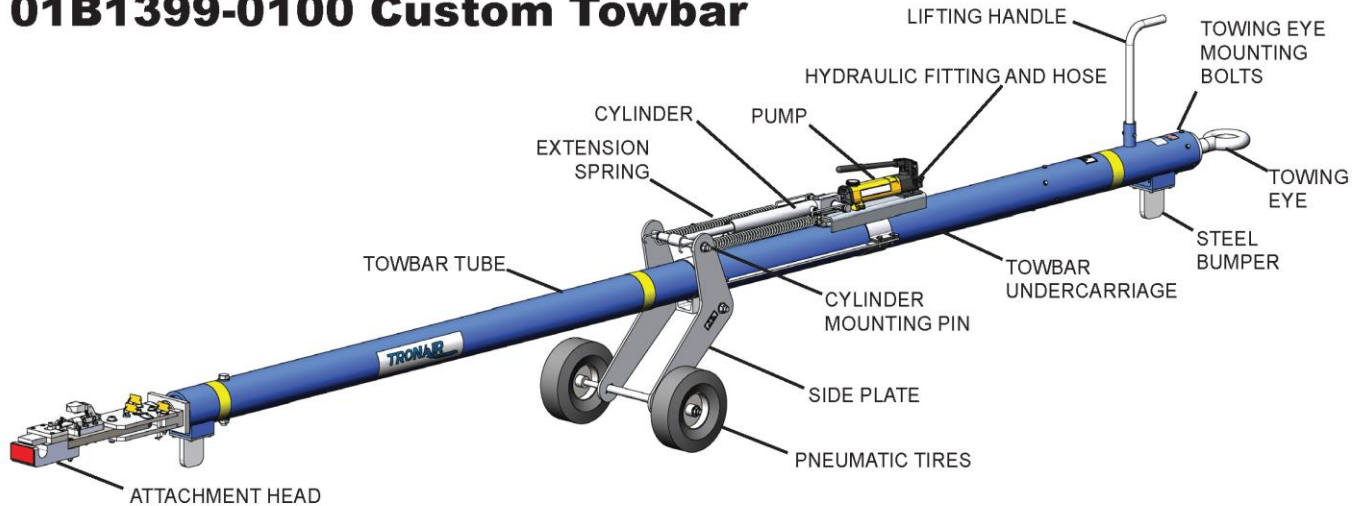
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### 01B1399-0100 Custom Towbar



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.
- ☐ Check the shock assembly for preload on the spring by pulling on the towing eye. Note: the towing eye is intended to rotate freely, but may not be pulled out of the tube by hand. If the shock can be moved by hand this may indicate the spring is worn out, contact Tronair for repairs.
- ☐ Check the steel bumpers at each. Ensure that all fasteners are tight and not missing. Tighten or replace as required. If the bumper is damaged 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.
- ☐ 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 towing attachment head for damaged or missing components. Ensure it is not damaged or missing. Contact Tronair or your Tronair distributor for replacement if required.
- ☐ Inspect towing head attachment bolt for bending or unusual wear. Verify the factory supplied bolt is used. Contact Tronair for replacement if required. Use only Tronair specified fasteners.
- ☐ Inspect all steel components for signs of rust. Touch up with paint as required.

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