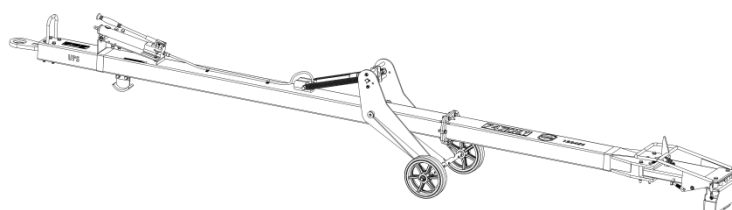




OPERATION & SERVICE MANUAL



Model: A212580D
UPS Boeing 747 Towbar

08/2017 – Rev. 02

REVISION

01

02

DATE

12/2014

08/2017

TEXT AFFECTED

Original release

Modified Parts Lists

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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

This towbar is designed to push or pull all Boeing 747 aircraft equipped with a standard nose gear. The following operational instructions are only intended to familiarize the operator with the basic functions of the towbar. They are not intended to teach actual pushback procedures or techniques.

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

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.

2.2 SHEAR BOLTS

The towbar is also equipped with shear bolts that are designed to shear when the design limits of the aircraft nose gear are reached. One set of spare shear bolts has been provided with the towbar.

WARNING!



NEVER use other bolts in place of factory supplied shear bolts, aircraft damage may result! In the event that the shear bolts should fail during operation, carefully inspect all parts of the towbar for damage before replacing the shear bolts and returning the towbar to service.

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 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 a skilled and trained technician.

4.0 OPERATION

4.1 RAISING AND LOWERING

The towbar is equipped with a hand-operated hydraulic pump/tank which supplies a flow of hydraulic oil to a single acting hydraulic cylinder. This cylinder raises or lowers the wheel carriage assembly to which the tires are attached.

To raise the towbar:

1. Make sure the fill cap on the tank is in the "vent" position and the small control valve located on the side of the pump is in the complete closed (clockwise) position
2. Actuate the pump handle until the desired elevation is achieved
3. To lower the unit, turn the control valve handle counter-clockwise until hydraulic oil flows back into the tank and allows the cylinder to retract
4. Close the valve when the towbar has reached the desired elevation

4.0 OPERATION (continued)

4.2 ATTACHING TO AIRCRAFT

The towbar is equipped with a pin type attachment head. When attached properly it will allow the aircraft to be pushed or pulled safely.

To attach the towbar to the aircraft:

1. Raise or lower the towbar so that it is level to the ground and at the same height as the nose gear attachment point
2. Open the pins by disengaging the safety latch and pulling up on the large handle crossbar
3. Position the upper and lower head plates on the nose gear and secure the head by pushing down on the crossbar until the safety catch is latched

4.3 ATTACHING TO TRACTOR

The towbar is equipped with a towing eye that swivels to eliminate any possible binding due to irregular terrain or camber changes in the aircraft nose gear during pushback or towing operations.

To attach the towbar to the tractor:

1. Raise or lower the towbar so that it is level with the ground and at the same height as the tractor hitch point
2. Position the lunette eye into the hitch opening and secure the hitch pin according to the tractor manufacturer's instructions



CAUTION!

The towbar can be safely towed on typical ramp surfaces up to 15 MPH. Exceeding this speed may result in damage to the towbar

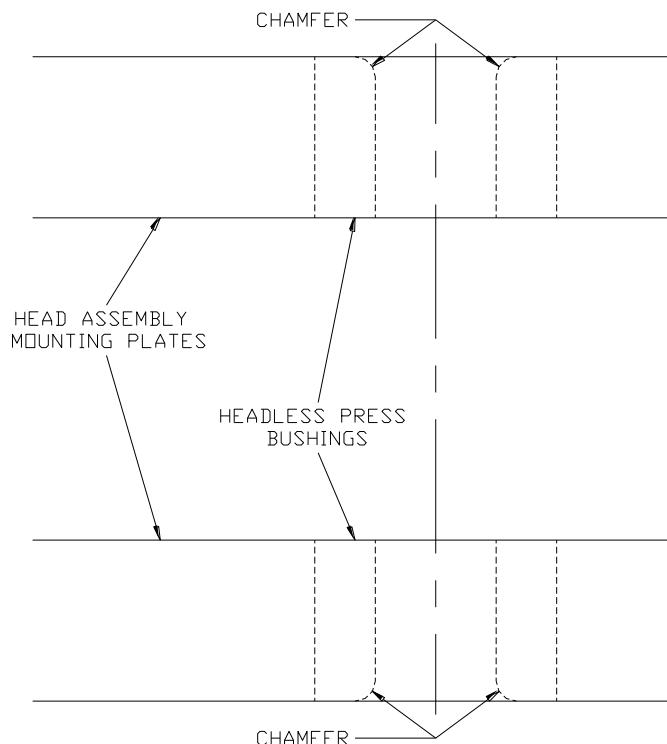
5.0 MAINTENANCE

5.1 GENERAL

Towbar maintenance should be done at least once every three months or sooner depending on usage.

1. Check shear bolts for wear or a partial shear and replace if necessary. Check bolts by rotating them and looking for movement of the shear plates at the same time
2. Check shear plates for seizing from corrosion and apply a fresh coating of Permatex anti-seize lubricant or equivalent when installing a new head assembly or shear bolts
3. Check tire pressure and inspect for wear or damage
4. Check the hydraulic fluid in the reservoir and maintain the correct level
5. Check for hydraulic leaks
6. Check all nuts, bolts and screws for tightness
7. Check the unit overall for wear or damage
8. Grease hubs through zerk provided in hub

Note: When pressing in new headless press bushings for the shear bolts, assure the chamfer is as shown.



6.0 PROVISION OF SPARES

6.1 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

6.2 RECOMMENDED SPARE PARTS LISTS

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

7.0 IN SERVICE SUPPORT

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

8.0 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

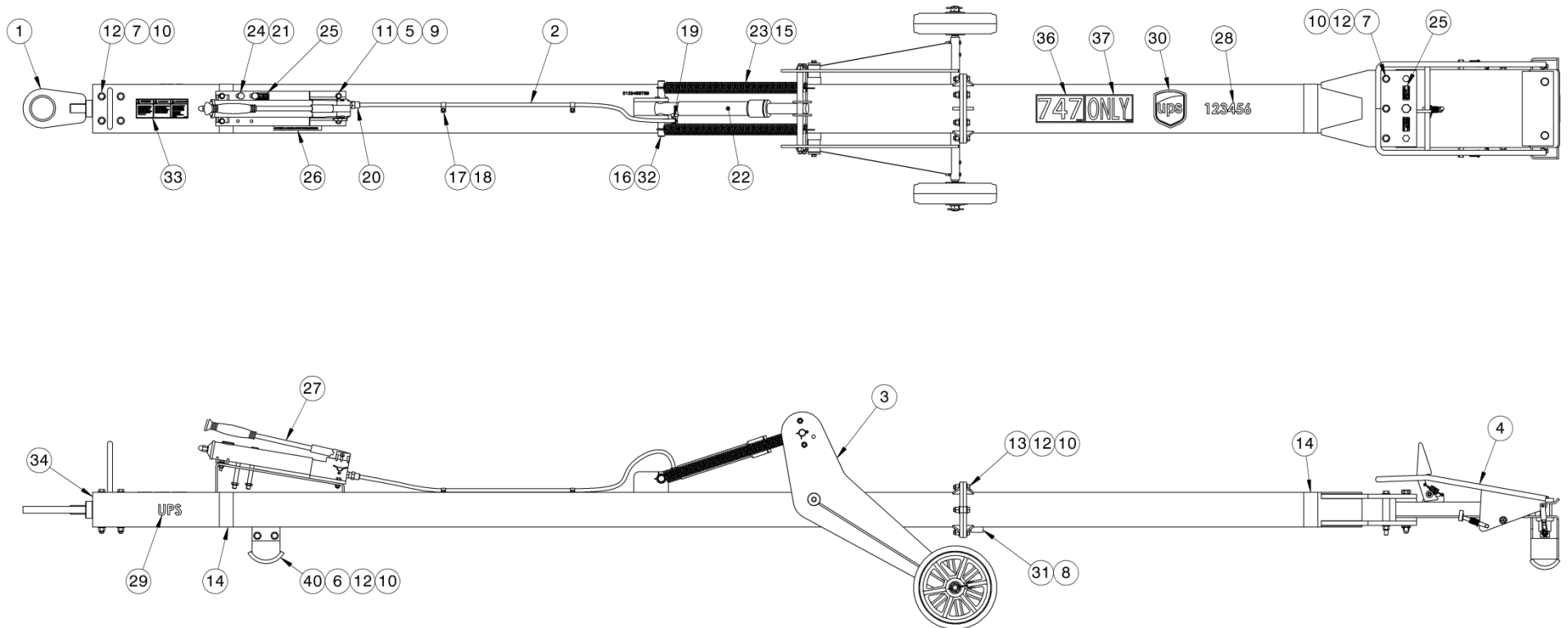
If warranty coverage is approved, either replacement parts will be sent or the product will have to be returned to Tronair for repairs. If the product is to be returned, a Return Material Authorization (RMA) number will be issued for reference purposes on any shipping documents. Failure to obtain a RMA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

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Parts List

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



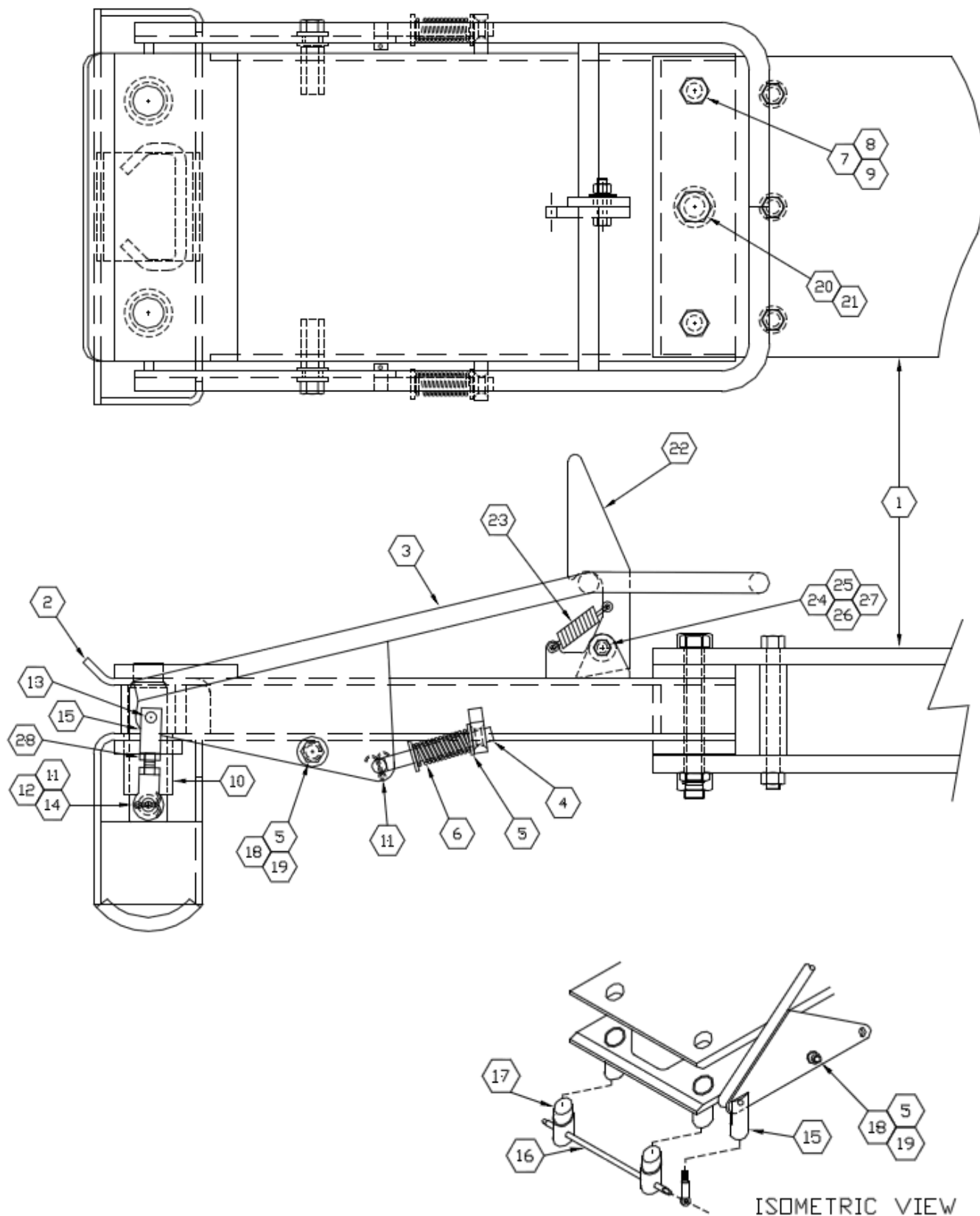
Parts List

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

Item	Part Number	Description	Qty
1	A002574A	SWIVEL LUNETTE ASSEMBLY	1
2	A002646A	HOSE ASSEMBLY, .25 X 50.00	1
3	A003683A	WHEEL CARRIAGE ASSEMBLY	1
4	A004075B	TOWING PIN HEAD ASSEMBLY	1
5	G-1100-107012	BOLT, 3/8-16 X 1-1/4" HEX HD GR 5	4
6	G-1100-109016	BOLT, 1/2-13 X 1-3/4" HEX HD GR 5	2
7	G-1100-109060	BOLT, 1/2-13 X 6.0" HEX HD GR 5	7
8	G-1151-105206	SCREW, 1/4-20 X 3/4" LG SOCKET HD CAP	4
9	G-1202-1070	STOPNUT, 3/8-16 ELASTIC	4
10	G-1202-1090	STOPNUT, 1/2-13 ELASTIC	15
11	G-1250-1070N	FLATWASHER. 3/8 NARROW	8
12	G-1250-1090N	FLATWASHER. 1/2 NARROW	30
13	G-1420-109020	BOLT, 1/2-13 X 2.00" HEX HD GR 8	6
14	H-2806*024.00	REFLECTOR, YELLOW	2
15	H-3784	CABLE, SPRING SAFETY	2
16	H001148	PIN, COTTER, .188 X 1.50, ZP	2
17	H001300	CLAMP, .500, COV-0911, VINYL C	2
18	H001311	SCREW, TEK, SELF-DRILL, .25 NC	2
19	H001445	HYD SWIVEL ELBOW, 1501-4-4	1
20	H002112	HYD SWIVEL ADAPTER, 1404-6-4	1
21	H002722	NUT, NYLOK JAM, .563 NF, ZP	2
22	H005115	CYLINDER, HYD. BLACK	1
23	H005116	SPRING, PRE-PLATED GALV. WIRE	2
24	H005198	SHEARBOLT, 9/16" N.F. X 5.50" LG.	2
25	H005871	DECAL, SHEAR BOLT	3
26	H005872	DECAL, OPEN VALVE BEFORE TOWIN	1
27	H006322	PUMP, HYD HAND	1
28	H007369	DECAL SET(2), 6 DIGIT ASSET, 1	1
29	H007370	DECAL, ASSET LETTERS, UPS, 1.5	2
30	H007373	DECAL, UPS SHIELD, 5 IN NON RE	1
31	H010525	BUMPER, RUBBER, .75 X 1 X 1.75	2
32	P054191A	CYL. MOUNT PIN, 1.00	1
33	P056211A	DECAL, WARNING, TO AVOID INJ..	1
34	P057367A	SPACER FLAT (P)	2
35	P061548A	SPACER TUBE (P)	3
36	P064825A	DECAL, 747, BLACK ON WHITE	1
37	P065280A	DECAL, ONLY, BLACK ON WHITE	1
38	W212586B	REAR CHASSIS WELDMENT	1
39	W212593B	FRONT CHASSIS WELDMENT (P)	1
40	Z-9092-00	WELDMENT, TOE GUARD	1

Parts List

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



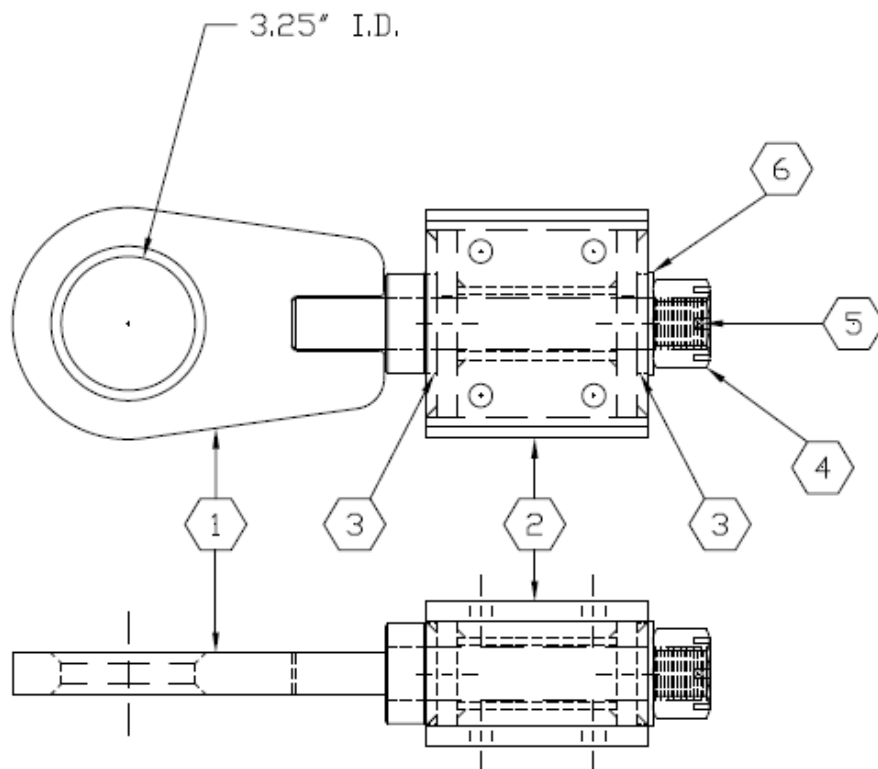
Parts List

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

Item	Part Number	Description	Qty
	A004075B	Towing Pin Head Assembly; consists of:	
1	W005218B	Chassis Tube Weldment	REF
2	W005356B	Head Weldment	1
3	W005357A	Handle Weldment	1
4	W005358A	Overcentering Rod Weldment	2
5	H001421	1/2" SAE Washer	6
6	H001136	Spring	2
7	H005198	9/16" NF x 5-1/2" Lg. Shear Bolt	2
8	H002722	9/16" NF Nylok Jam Nut	2
9	H005882	9/16"x 7/8" x 3/4" Lg. Headless Press Bushing	4
11	H002242	1/8" x 1" Lg. Cotter Pin	4
12	P061657A	3/8" NF Female Rod End	2
13	H002830	3/8" x 1" Lg. Roll Pin	2
14	P054543A	3/8" NF Threaded Stud	2
15	P057179A	Guide Clevis	2
16	P054545A	Towing Pin Control Rod	1
17	P054546A	Towing Pin	2
18	H001104	1/2" NC x 1-1/4" Lg. Nylok Capscrew	2
19	P060375A	Bushing Tube	2
20	P201323A	3/4" NC x 5-1/2" Lg. Retaining Bolt	1
21	H004942	3/4" NC Nylok Jam Nut	1
22	P060982A	Latch Flat	1
23	P050754A	Spring	1
24	H001073	3/8" NC x 1-1/2" Lg. Capscrew	1
25	H001010	3/8" NC Nylok Nut	1
26	H001008	3/8" Flat Washer	1
27	P059761A	Spacer Tube	1
28	H001403	3/8" NF Nut	4

Parts List

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

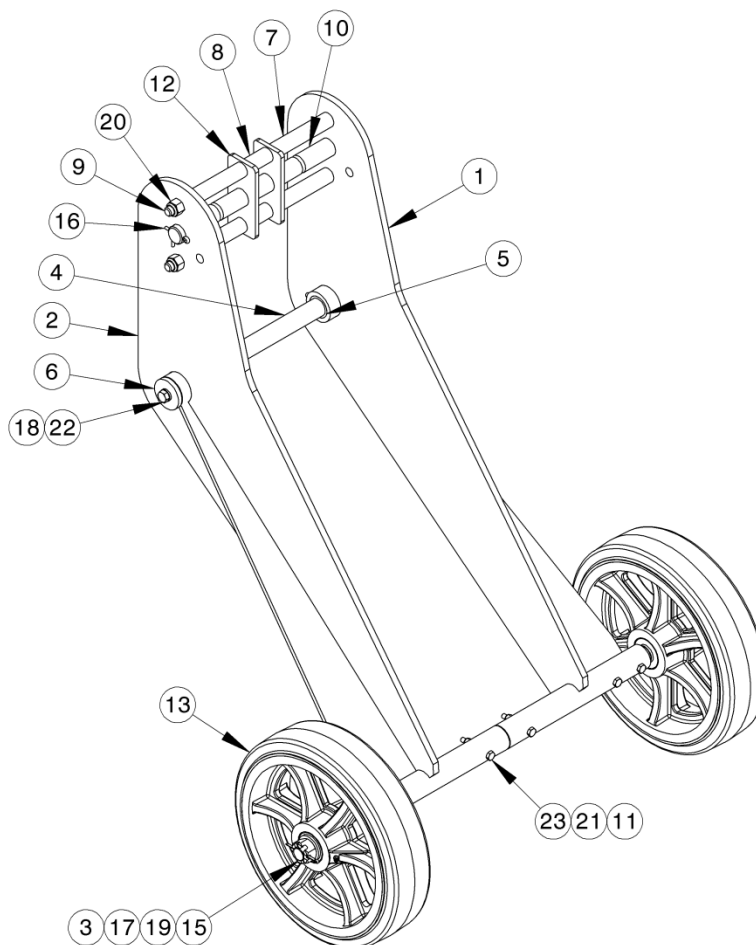


Item	Part Number	Description	Qty
	A002574A	Swivel Lunette Assembly; consists of:	
1	W003887A	Hitch Pin Weldment	1
2	W003888A	Pin Block Weldment	1
3	P054190A	Pivot Washer	2
4	H001177	1-1/4" NF Slotted Nut	1
5	H001219	3/16" x 2" Lg. Cotter Pin	1
6	H004701	1-1/4" SAE Washer	1

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Parts List

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



Item	Part Number	Description	Qty
1	Z-8604-01	WELDMENT, WHEEL PLATE	1
2	Z-8603-00	WELDMENT, WHEEL PLATE	1
3	P059732A	ROUND SPINDLE	2
4	P054200A	WHEEL ASSEMBLY MOUNT ROD	1
5	P054199A	BUSHING, 1.003 X 1.253 X 1.750	2
6	P054198A	WHEEL WASHER	2
7	P054197A	SPACER TUBE	4
8	P054196A	SPACER TUBE	2
9	P054195A	SPACER MOUNT ROD	2
10	P054194A	CYL. MOUNT PIN	1
11	P054193A	SPINDLE TUBE CONNECTOR	1
12	P054192A	HYD. CYL. MOUNT PLATE	2
13	H006193	WHEEL, 12 X 3, #RIT-1230-12	2
14	H001296	3/16" DRIVE ZERK	2
15	H001286	NUT, SLOTTED, .75 NF, GR 5, ZP	2
16	H001148	PIN, .188 X 1.5, ZP	2
17	H001005	PIN, COTTER, .125 X 2.00, ZP	2
18	G-1251-1070R	LOCKWASHER, 3/8 REGULAR	2

Parts List

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

Item	Part Number	Description	Qty
19	G-1250-1110N	FLATWASHER, 3/4 NARROW	2
20	G-1202-1090	STOPNUT, 1/2-13 ELASTIC	4
21	G-1202-1050	STOPNUT, 1/4-20 ELASTIC	6
22	G-1100-107012	BOLT, 3/8-16 X 1-1/4" HEX HD GR 5	2
23	G-1100-105020	BOLT, 1/4-20 X 2.0" LG HEX HD GR 5	6