

MODEL
601
CARGO HOOK

Maintenance
&
Overhaul Manual

Rev. D, 10/7/2016

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LIST OF REVISIONS

<u>DATE</u>	<u>DESCRIPTION</u>	<u>REV</u>
1/4/2012	CHANGED PARTS BREAKDOWN	A
10/9/2013	ADDED OVERHAUL INTERVAL	B
5/19/2016	CHANGED SECTION I, SUBSECTION 8.1 AND 11.2	C
10/6/2016	UPDATED DRAWINGS AND PARTS BREAKDOWN LIST	D

PRE-OPERATING PROCEDURES

A pre-flight visual check shall be performed prior to conducting sling operations, on at least a daily basis. Unless the cargo hook passes the following minimum inspection, it should not be used.

1. Check hook for secure attachment to suspending line.
2. Check hook electrical connectors and wiring for frayed wire or loose connections.
3. Functionally check electrical release.
4. Functionally check manual release.
5. Check load beam for binding.
6. Visually check the load beam and hook frame for cracks, unusual wear and latch engagement.
7. Inspect keeper on hook. If damaged beyond repair, replace.
8. Check return springs and arms for serviceability.
9. Check hook body for loose or missing hardware. Except as noted in section 1-15(E). Tighten or replace as necessary before use.
10. Check hook load beam bumper for serviceable condition. Replace if necessary before lift operations – VERY IMPORTANT!!!

- DISCLAIMER -  WARNING

Helicopter external cargo load operations are in the best of conditions dangerous work. Mechanical Specialties, LLC cannot be in any way held responsible for injury or death due to accidents resulting directly or indirectly from this type of work.

The user of this hook understands and accepts this liability.

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**TABLE I.
PARTICULARS**

CAPACITY (MAX.)	6,000 LBS.
GUARD DIAMETER	14.5 INCHES
HEIGHT	13 INCHES
WEIGHT	29 LBS.
VOLTAGE	24 - 28 VDC
CURRENT (MAX)	14 AMPS
ELECTRICAL CONNECTOR	USER SUPPLIED
MINIMUM OPENING WEIGHT	15 LBS.

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1.0 SCOPE

- 1.1 This manual contains the overhaul instructions and test procedures for CARGO HOOK ASSEMBLY. Model No. 601, manufactured by MECHANICAL SPECIALTIES, LLC, OLYMPIA, WA 98501.

2.0 PURPOSE OF EQUIPMENT

- 2.1 The cargo hook is designed for use as a remote or long line hook attached to the helicopter by means of a certified belly hook. The 601 hook is never to be attached to the helicopter unless it is attached to a certified belly hook. The 601 hook is not certified for any aircraft, and is never to be used as a primary or belly hook. The hook is designed to provide a way to engage, lift, transport, and unload external loads from a long line suspended below the helicopter. Cargo release can be accomplished manually or electrically. In the event of hook failure or emergency, the 601 hook along with the suspending cable can be released with the helicopters belly hook.

3.0 DATA SHEETS

- 3.1 Section I of this manual contains overhaul and test instructions for the 601 hook. Section II is a parts breakdown and catalog.

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SECTION I

OVERHAUL INSTRUCTIONS

OVERHAUL INTERVAL -

Operator may determine overhaul interval based on total usage and operating environment. **The overhaul interval (TBO) shall not exceed 5 years.**

4.0 TOOLS AND SPECIAL EQUIPMENT

4.1 The following hand tools are required to overhaul the hook:

- A. Socket and Wrench Sizes: 3/16", 1/4", 9/16", 3/4", 15/16"
- B. #3 Phillips and 1/4" Slotted Screwdrivers

4.2 The following special test equipment is required to overhaul the hook:

- A. 28 VDC 14 Amp Power Supply
- B. Load Test Cell

5.0 DISASSEMBLY

5.1 Remove the three bolts, nuts and washers (part #76 and #74) from the guard. Pull hook out of guard. Remove the four screws (#45) and remove the solenoid cover (#46). Remove the set screw from the manual release knob (#60) and remove knob. Remove all the remaining bolts, nuts and screws (#71, 77, 72, 82, 73, 75). Place the hook on a bench with the solenoid facing down. The front cover may now be lifted off to service the internal parts. If the loadbeam (#68) is to be removed, remove the spring pin from the return arm (#83), then pull the return arm (#83) off the trunnion (#67).

6.0 CLEANING

6.1 Clean all parts in cleaning solvent and dry with compressed air not to exceed 35 PSI.

7.0 INSPECTION

7.1 Inspect the cargo hook in accordance with the following chart:

<u>ITEM</u>	<u>METHOD OF INSPECTION</u>	<u>REMARKS</u>
All threaded surfaces	Visual	Check for cross, deformed or broken threads.
Springs (#25, 31, 86, 34)	Visual	Check for broken coils, deformed ends, or permanent set.
Bearings (#9, 29, 70, 58, 59)	Visual	Check for freedom of rotation, binding, and excessive wear.
Load Beam (#68)	Visual	Check for wear, twisting, or bending. Check for brinelling where load beam contacts roller (#20).
Latch & Roller (#61, 64)	Visual	Check for excessive wear and for brinelling where latch contacts bearing (#29), and where load beam contacts roller (#20).
Lever (#8)	Visual	Check for wear or bending.
Shaft & Arm Assembly (#54)	Visual	Check for wear or bending.
Pins (#6, 55, 57, 62, 26, 27, 69)	Visual	Check for wear or bending.
Link (#5)	Visual	Check for wear in holes.

8.0 REASSEMBLY

- 8.1 Reassemble the hook in the reverse order of disassembly, noting the following procedures:
- A. Apply LUBRIPLATE 130AA (or equivalent) to the following parts before assembly: #5, 12, 14, 15, 61, 66.
 - B. If bearing #9 is to be replaced, press out. Press in new bearing using Loctite RC/609 and press on the outer race only. It must be staked using new locations for staking.
 - C. Check that the head of screw #75 is flush or slightly below the side plate (#51).
 - D. Tighten the 5/8 NAS bolt so that the nut just touches the side plate and the bolt can be easily turned in the side plates using a short wrench. Over tightening this bolt will cause the latch to drag on the side plates, thus causing improper opening and closing.

9.0 OVERHAUL TEST PROCEDURE

9.1 This procedure details the overhaul test requirements for the Model 601 Cargo Hook.

10.0 ELECTRICAL CHECK

10.1 Place the leads of an ohm-meter across the solenoid leads and verify that electrical continuity exists.

10.2 Place one lead of an ohm-meter on one of the solenoid leads and the other ohm-meter lead on the hook side plate (#1) and verify that electrical continuity DOES NOT EXIST. (Make sure the other solenoid lead is not touching the hook).

11.0 OVERHAUL LOAD TESTING

11.1 Place the hook in the load test cell apparatus. Gradually apply load until a load of 12,000# is being applied to the load beam of the hook.

DO NOT RELEASE THE HOOK AT THIS LOAD

Hold this load for one minute and then gradually reduce the load.

11.2 Conduct the following releases:

<u>NO. OF CYCLES</u>	<u>LOAD</u>	<u>RELEASE METHOD</u>
1	1,500#	22 VDC
1	6,000#	28 VDC
1	6,000#	Manual Knob

SECTION II

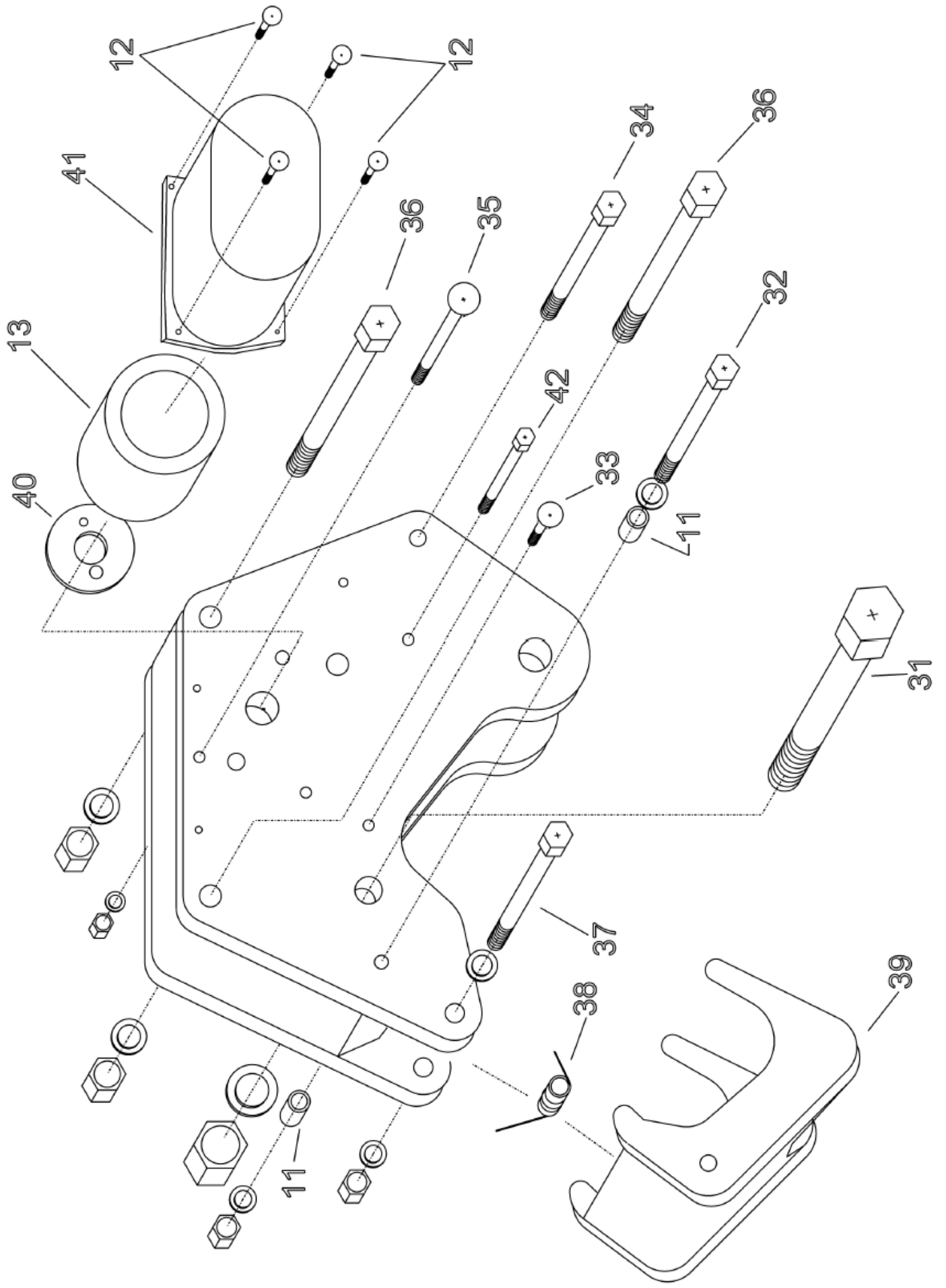
PARTS BREAKDOWN

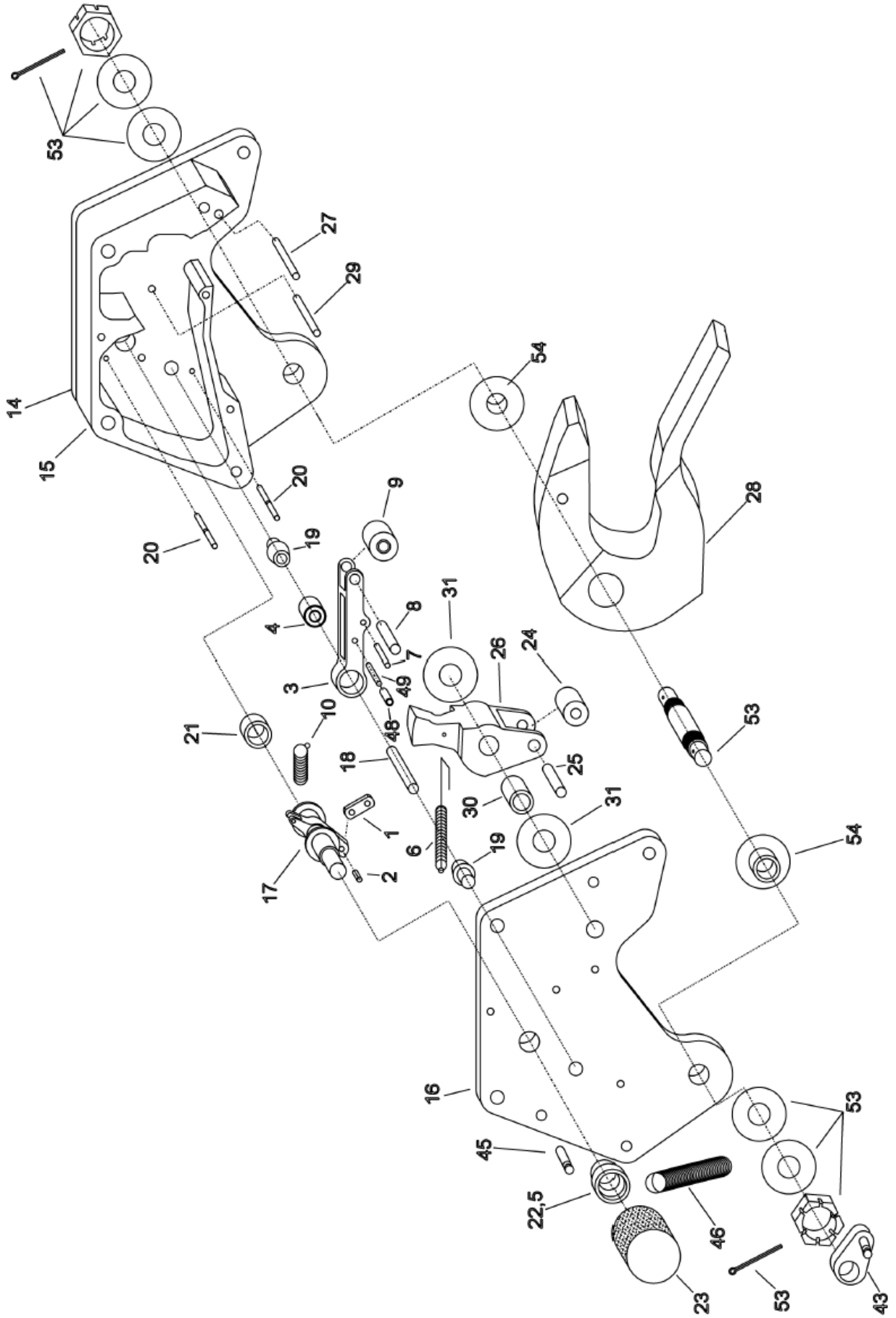
<u>DRAWING #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1.....	5.....	Link
2.....	6.....	Pin
3.....	8.....	Lever
4.....	9.....	Bearing
5.....	15.....	Seal
6.....	25.....	Latch Spring
7.....	26.....	Pin
8.....	27.....	Shaft
9.....	29.....	Bearing
10.....	31.....	Spring
11.....	43.....	Keeper Stop (x2)
12.....	45.....	(AN502-10-8) (x4)
13.....	47.....	Solenoid
14.....	51.....	Sideplate (Solenoid Side)
15.....	52.....	Spacer
16.....	53.....	Sideplate (Non Solenoid Side)
17.....	54.....	Shaft and Arm Assembly
18.....	55.....	Pin
19.....	56.....	Boss (x2)
20.....	57.....	Spring Retaining Pin (x2)
21.....	58.....	Bushing
22.....	59.....	Bushing/Seal Housing
23.....	60.....	Manual Release Knob
24.....	61.....	Roller
25.....	62.....	Roller Pin
26.....	64.....	Latch
27.....	65.....	Latch Bumper
28.....	68.....	Load Beam
29.....	69.....	Lever Stop Pin
30.....	70.....	Bearing
31.....	71.....	(NAS 6210-24) (AN960-1016L) (x3) (MS21083-N10)
32.....	72.....	(AN6-27A) (AN960-616) (x2) (MS21044N6)

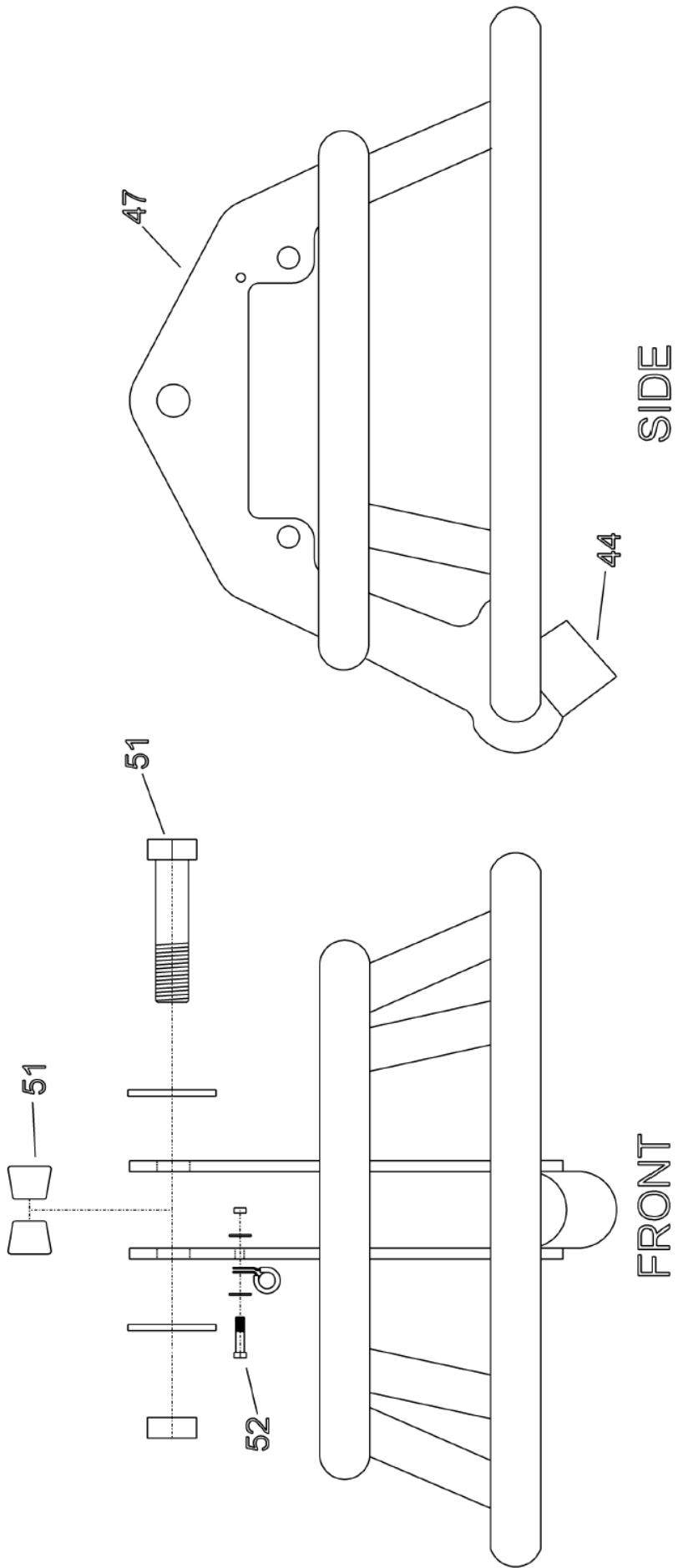
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PARTS BREAKDOWN *CONTINUED*

<u>DRAWING #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
33.....	73.....	(MS24694S97) (x2)
34.....	74.....	(AN6-25A) (AN960-616) (MS21044N6)
35.....	75.....	(MS24694S118) (AN960-416) (MS21044N4)
36.....	76.....	(AN8-26A) (x2) (AN960-816) (x2) (MS21044N8) (x2)
37.....	77.....	(AN6-25A) (AN960-616L) (x2) (MS21044N6)
38.....	78.....	Keeper Spring
39.....	79.....	Keeper
40.....	80.....	Solenoid Spacer
41.....	81.....	Solenoid Cover
42.....	82.....	(AN4-17A) (AN960-416) (MS21044N4)
43.....	83.....	Load Beam Return Arm
44.....	84.....	Load Beam Bumper (3/8-16 NYLOC)
45.....	85.....	Load Beam Return Spring Post (AN960-416L)
46.....	86.....	Load Beam Return Spring
47.....	87.....	Guard
48.....	88.....	Bushing
49.....	117.....	Pin
51.....	148.....	Guard Spacer (x2) (3/4-10 x 3 1/4 Grade 8) (3/4-10 NYLOC) (3/4" Flat Washer) (x2)
52.....	153.....	(MS21919WDG6) (MS21044N3) (AN3-6A) (AN960-10) (x2)
53.....	352.....	Load Beam Trunnion (AN320-12) (x2) (AN960-1216L) (x4) (MS24665-372) (x2)
54.....	355.....	Load Beam Bushing (x2)







LIMITED WARRANTY

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WARRANTY DOES NOT APPLY TO DEFECTS DUE TO MISUSE, ABUSE, FAULTY ELECTRICAL SYSTEMS, NEGLIGENCE, ACCIDENTS, PRODUCTS BROKEN OR WORN IN THE COURSE OR NORMAL HOOK OPERATIONS, REPAIRS OR ALTERATIONS OUTSIDE OUR FACILITY OR TO A LACK OF MAINTENANCE. THIS WARRANTY DOES NOT COVER CONSEQUENTIAL DAMAGE OR INJURY.

TO TAKE ADVANTAGE OF THIS WARRANTY, THE PRODUCT OR PART MUST BE RETURNED TO THE FACTORY FOR EXAMINATION, AT WHICH TIME AN EVALUATION WILL BE MADE AS TO WHETHER OR NOT A WARRANTY REPLACEMENT IS JUSTIFIED.

MECHANICAL SPECIALTIES, LLC RESERVES THE RIGHT TO DECIDE WHAT A WARRANTY REPAIR OR REPLACEMENT IS.

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