

MODEL 301 CARGO HOOK

Maintenance & Overhaul Manual

Rev. B, 10/8/2013

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LIST OF REVISIONS

<u>DATE</u>	<u>DESCRIPTION</u>	<u>REV.</u>
7/11/2012	REVISED ADDRESS	A
10/8/2013	ADDED OVERHAUL INTERVAL	B

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 8.1 (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.)	3,000 LBS.
GUARD DIAMETER	9.5 INCHES
HEIGHT	10 INCHES
WEIGHT	13 LBS.
VOLTAGE	24 - 28 VDC
CURRENT (MAX.)	10 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. 301, 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 301 hook is never to be attached to the helicopter unless it is attached to a certified belly hook. The 301 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 301 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 301 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 No special tools are required to overhaul the cargo hook. The following special test equipment is required:

- A. 28 VDC 14 AMP Power Supply
- B. Box with switch and connectors
- C. Pull test machine

5.0 DISASSEMBLY

5.1 Remove the three bolts, nuts and washers (part #133 and #135) from the guard. Pull hook out of guard. Remove the four screws (#140) and remove the solenoid cover (#105). Remove the set screw from the manual release knob (#126) and remove knob. Remove all the remaining bolts, nuts and screws. 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 load beam (#140) is to be removed, remove the spring pin from the return arm (#112), then pull the return arm off the trunnion (#122).

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 (#31, 97, 144, 129)	Visual	Check for broken coils, deformed ends or permanent sets.
Bearings & Bushings (#109, 119, 121, 125, 107)	Visual	Check for freedom of rotation, binding, and excessive wear.
Load Beam (#104)	Visual	Check for wear, twisting, or bending. Check for brinelling where load beam contacts roller (#123).
Latch & Roller (#103, 123)	Visual	Check for excessive wear and for brinelling where latch contacts bearing (#119), and where load beam contacts roller (#123).
Lever (#100)	Visual	Check for wear or bending.
Shaft & Arm Assembly (#101)	Visual	Check for wear or bending.
Pins (#99, 117, 118, 120, 124, 111)	Visual	Check for wear or bending.
Link (#110)	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. Use Loctite RC/609 to secure the following parts: #109, 121, 125, 107.
- B. Apply MOBIL 28 Grease to the following parts before assembly: #122, 101, 127, 110, 123, 124.
- C. If bearing #109 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.
- D. Check that the head of screw #136 and #138 is flush or slightly below the side plate (#108).

CAUTION CAUTION CAUTION CAUTION CAUTION CAUTION

- E. Tighten bolts #133 and #136 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 these bolts will cause the latch or lever 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 301 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 (#108) 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 a pull test machine. Gradually apply load until a load of 6,000# 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>	<u>REMARKS</u>
1	10#	22 VDC	***
1	10#	Manual Knob	***
1	1,000#	22 VDC	Hold 2 Min.
1	1,500#	22 VDC	Hold 2 Min.
1	2,000#	22 VDC	Hold 2 Min.
1	3,000#	28 VDC	Hold 2 Min.
1	3,000#	Manual Knob	Hold 2 Min.

SECTION II

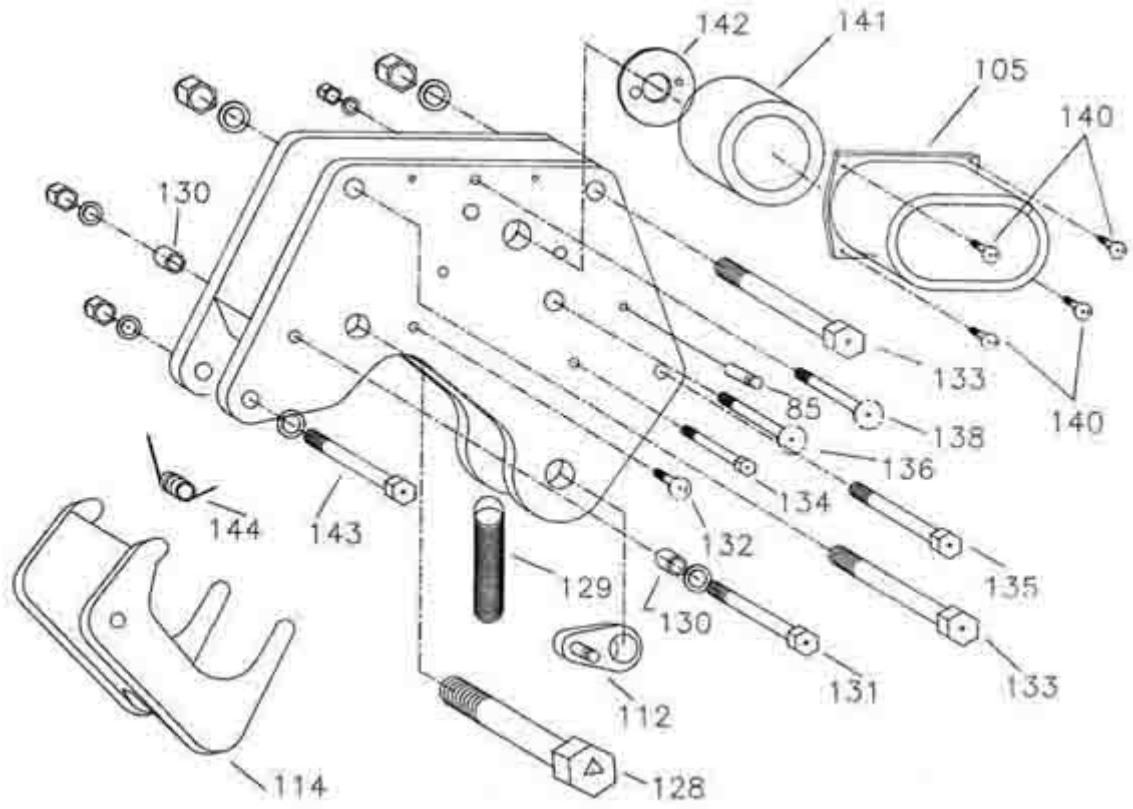
PARTS BREAKDOWN

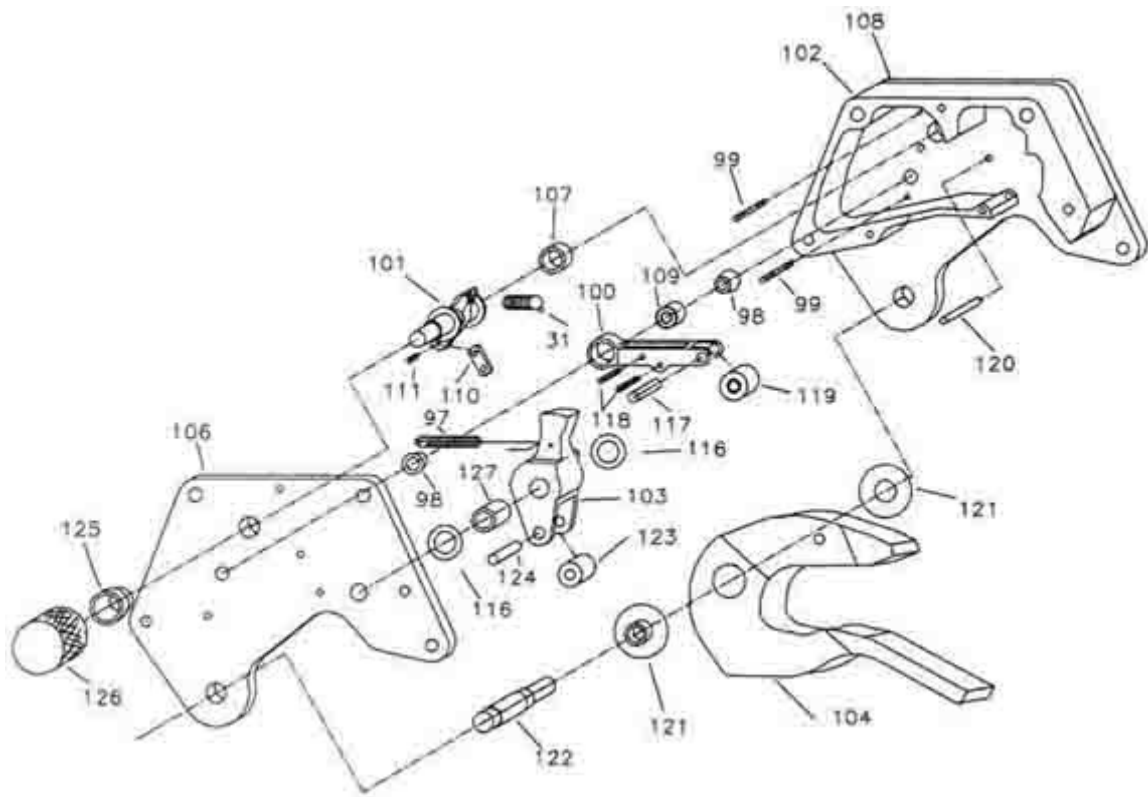
<u>DRAWING #</u>	<u>DESCRIPTION</u>
31.....	Spring
85.....	Post, Load Beam Return
97.....	Spring, Latch
98.....	Bearing Spacer
99.....	Pin, Spring Retaining
100.....	Lever
101.....	Shaft and Arm Assembly
102.....	Spacer
103.....	Latch
104.....	Load Beam
105.....	Solenoid Cover
106.....	Side Plate (non solenoid side)
107.....	Bushing
108.....	Side Plate (solenoid side)
109.....	Bearing
110.....	Link
111.....	Pin, Link
112.....	Lever, Load Beam Return Spring
113*.....	Bumper (not shown)
114.....	Keeper
115*.....	Guard (not shown)
116.....	Shim
117.....	Pin
118.....	Pin
119.....	Bearing
120.....	Pin, Lever Stop
121.....	Bushing, Load Beam
122.....	Trunnion
123.....	Roller
124.....	Pin
125.....	Bushing

continued on next page

PARTS BREAKDOWN *CONTINUED*

126.....	Knob, Manual Release
127.....	Bearing
128.....	Bolt
129.....	Spring, Load Beam Return
130.....	Bushing, Keeper Stop
131.....	Bolt
132.....	Screw
133.....	Bolt
134.....	Bolt
135.....	Bolt
136.....	Screw
138.....	Screw
139.....	Bolt
140.....	Screw
141.....	Solenoid
142.....	Spacer, Solenoid
143.....	Bolt
144.....	Spring, Keeper





LIMITED WARRANTY

MECHANICAL SPECIALTIES, LLC MAKES EVERY EFFORT TO ASSURE THAT ITS PRODUCTS MEET HIGH QUALITY AND DURABILITY STANDARDS AND WARRANTS TO THE PURCHASER OF OUR PRODUCTS THAT EACH PRODUCT BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR 12 MONTHS FROM DATE OF PURCHASE TO ORIGINAL PURCHASER ONLY.

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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