

# **MECHANICAL SPECIALTIES, INC.**

## **MODEL 606 CARGO HOOK**

**OPERATING AND MAINTENACE MANUAL  
MSI-MNL003 REVISION B**

*5/16/12*

# LIST OF REVISIONS

<u>DATE</u>	<u>DESCRIPTION</u>	<u>REVISION</u>
7/25/97	Initial release	A
5/16/12	Changed overhaul interval, paragraph 6.1 Added paragraph 2.5	B

# **OPERATING AND MAINTENANCE INSTRUCTIONS**

## **CARGO HOOK--MODEL 606 (CAPACITY 6,000 LBS.)**

### **1.0 GENERAL**

1.1 THE MODEL 606 CARGO HOOK PROVIDES A MEANS TO ENGAGE, LIFT AND TRANSPORT EXTERNAL LOADS. THE HOOK ASSEMBLY HAS AN ELECTRICAL RELEASE AS WELL AS A MANUAL EMERGENCY RELEASE SYSTEM, IN ORDER TO ALLOW RELEASES TO BE CONDUCTED BY THE PILOT IN THE COCKPIT. A MANUAL RELEASE KNOB LOCATED ON THE SIDE OF THE HOOK ASSEMBLY ALLOWS CARGO RELEASE TO BE CONDUCTED BY GROUND CREW PERSONNEL.

THE LOAD BEAM IS EQUIPPED WITH A RETURN SPRING, TO PROVIDE AUTOMATIC RELATCHING OF THE LOAD BEAM AFTER RELEASE OF A LOAD. A MINIMUM LOAD OF 10# MUST BE APPLIED TO LOAD BEAM TO INSURE OPENING EITHER ELECTRICALLY OR MANUALLY.

**BECOME FAMILIAR WITH YOUR FLIGHT MANUAL REGARDING  
EXTERNAL LOAD OPERATIONS.**

### **2.0 OPERATION**

2.1 THE LOAD SLING MEMBER OR RING IS GUIDED INTO PLACE ON THE LOAD BEAM (24). THE KEEPER (64) IS SPRING LOADED TO CLOSE AFTER LOADING TO RETAIN LOAD.

#### **2.2 GROUND CREW RELEASE -**

MANUAL RELEASE OF THE LOAD BEAM MAY BE ACCOMPLISHED BY TURNING THE MANUAL RELEASE KNOB (45) IN THE COUNTER-CLOCKWISE DIRECTION. THE LOAD BEAM RETURN SPRING (48) RETURNS THE LOAD BEAM TO THE LATCHED POSITION.

**NOTE:** ALWAYS INSURE LOAD BEAM IS LATCHED AND LOCKED PRIOR TO FLIGHT.

#### **2.3 ELECTRICAL RELEASE -**

BY USE OF A PUSH BUTTON SWITCH LOCATED IN THE COCKPIT, THE PILOT MAY RELEASE THE LOAD ELECTRICALLY.

#### **2.4 MANUAL CABLE RELEASE -**

EMERGENCY RELEASE IS ACCOMPLISHED BY A CABLE CONTROL SYSTEM CONNECTED TO THE RELEASE ARM (37) LOCATED INSIDE THE MANUAL RELEASE HOUSING (39,41).

**2.5 A FUNCTIONAL CHECK OF ELECTRICAL AND MANUAL RELEASE SYSTEMS TO BE PERFORMED DAILY PRIOR TO COMMENCING LIFTING OPERATIONS.**

### **3.0 ELECTRICAL SYSTEM**

3.1 THE TWO SOLENOID WIRES ARE CONNECTED TO THE CONNECTOR (44), AND THE CIRCUIT IS CLOSED AT THE PUSH BUTTON SWITCH LOCATED IN THE COCKPIT. ACTUATING THE SWITCH ENERGIZES THE SOLENOID AND ALLOWS THE LOAD BEAM TO OPEN. FOR DETAILS ON ELECTRICAL RELEASE SYSTEM, REFER TO BHT-SI204-3 OR BHT-SI212-5.

#### 4.0 INSTALLATION

- 4.1 THE MODEL 606 CARGO HOOK REPLACES THE REDUNDANT A60LT CARGO RELEASE ASSEMBLY, AND ATTACHES IDENTICALLY TO THE PRIOR INSTALLATION, WITH THE FOLLOWING EXCEPTIONS:
- 1) THE ELECTRICAL CONDUIT HOUSING THE ELECTRICAL RELEASE WIRING MUST BE REMOVED AND TRANSFERRED TO THE OPPOSITE SIDE OF THE SUSPENSION ASSY. TO ALLOW CONNECTION OF EXISTING ELECTRICAL WIRE HARNESS AND CONNECTOR TO ELECTRICAL CONNECTOR ON MODEL 606 CARGO HOOK.
  - 2) P/N 204-072-928-1 LEVER ASSY. MUST BE REPLACED WITH MECHANICAL SPECIALTIES P/N 6093-1 UPPER RELEASE ARM, UTILIZING THE EXISTING HARDWARE FOR REASSEMBLY. READJUST UPPER AND LOWER RELEASE CABLES PER APPLICABLE SERVICE INSTRUCTIONS (BHT204-3, BHT212-5).

REFER TO MECHANICAL SPECIALTIES DRAWING 606200 FOR FURTHER INSTALLATION INSTRUCTIONS.

#### 5.0 MAINTENANCE INSTRUCTIONS

- 5.1 TOOLS AND EQUIPMENT -  
NO SPECIAL TOOLS ARE REQUIRED TO DISASSEMBLE OR REASSEMBLE THE CARGO HOOK. HOWEVER THE FOLLOWING TEST EQUIPMENT IS REQUIRED:

- A) 28 VDC 14 AMP POWER SUPPLY
- B) PULL TEST FIXTURE
- C) VOLT OHM METER

#### 5.2 DISASSEMBLY

- 5.2.1 REMOVAL OF BUMPER RING-  
REMOVE EXTERNAL URETHANE BUMPER. REMOVE BOLTS (2 EA.) SECURING RING TO CARGO HOOK.

- 5.2.2 ACCESS TO MAIN LATCHING MECHANISM-  
REMOVE BUMPER RING (REFER TO SECTION 5.2.1).  
REMOVE SAFETY WIRE FROM THE FOUR SOLENOID COVER SCREWS (46),  
REMOVE SCREWS AND COVER (45). REMOVE LOAD BEAM RETURN SPRING (37)  
FROM LOAD BEAM RETURN ARM (32). REMOVE ROLL PIN (39), THE LOAD BEAM  
RETURN ARM MAY NOW BE REMOVED. REMOVE KEEPER (62), USING CAUTION AS  
AS KEEPER SPRING (59) IS UNDER LOAD. REMOVE ALL REMAINING NUTS AND  
SCREWS. BOLT (61) SHOULD BE LEFT IN PLACE UNTIL SIDEPLATE (29) IS  
REMOVED, TO RETAIN INTERNAL MECHANISM ALIGNMENT. SIDEPLATE (29) MAY  
NOW BE REMOVED TO EXPOSE INTERNAL LATCHING MECHANISM.  
**NOTE:** IF FURTHER DISASSEMBLY OF COMPONENTS IS NECESSARY, THE UNIT  
SHOULD BE RETURNED TO MANUFACTURER.

6.0 **SERVICE AND INSPECTION**

6.1 OVERHAUL OF UNIT TO BE ACCOMPLISHED EVERY 3 YEARS

6.2 INSPECTION-  
CLEAN ALL PARTS IN CLEANING SOLVENT AND DRY WITH AIR. INSPECT THE CARGO HOOK PARTS IN ACCORDANCE WITH TABLE 1.

7.0 **REASSEMBLY**

7.1 REASSEMBLE THE HOOK IN THE REVERSE ORDER OF DISASSEMBLY, NOTING THE FOLLOWING PROCEDURES:

\*ASSEMBLE ALL MOVING PARTS WITH MIL-G-81322D OR EQUIVALANT GREASE.

\*INSURE THAT THE HEADS OF SCREWS (52) ARE FLUSH OR SLIGHTLY BELOW THE SURFACE OF THE SIDEPLATES (1, 29).

\***WARNING-TIGHTEN BOLT (61) SO THAT THE NUT JUST CONTACTS THE SIDEPLATE, AND THE BOLT CAN BE EASILY TURNED USING A SHORT WRENCH. (OVER TIGHTENING OF THESE BOLTS MAY CAUSE BINDING OF LATCHING MECHANISM, WHICH COULD CAUSE IMPROPER OPERATION OF HOOK.) IMPROPER ASSEMBLY OF THE CARGO HOOK CAN RESULT IN INJURY OR DEATH OF PERSONNEL.**

7.0 **TESTING**

7.1 ELECTRICAL CHECK-  
PLACE THE LEADS OF A VOLT-OHM METER ACROSS THE LEADS OF THE SOLENOID, VERIFY THAT ELECTRICAL CONTINUITY EXISTS.

ATTACH ONE LEAD OF A VOLT-OHM METER TO ONE OF THE SOLENOID LEADS, AND THE OTHER OHM METER LEAD ON SIDEPLATE (1, 29) AND INSURE THAT CONTINUITY **DOES NOT** EXIST.

7.2 LOAD TESTING-  
PLACE HOOK IN PULL TEST CELL, APPLY LOAD OF 9,000 LBS TO LOAD BEAM. **DO NOT RELEASE HOOK AT THIS LOAD.** HOLD THIS LOAD FOR ONE MINUTE, GRADUALLY REDUCE THIS LOAD.

PERFORM THE FOLLOWING RELEASES:

<u>LOAD</u>	<u>RELEASE METHOD</u>	<u>REMARKS</u>
10 LBS.	22 VDC	*****
10 LBS.	MANUALLY	*****
3000 LBS.	22 VDC	HOLD 1 MINUTE
3000 LBS.	MANUALLY	“
6000 LBS.	22 VDC	“
6000 LBS.	MANUALLY	“

**TABLE 1**

<u>ITEM</u>	<u>METHOD OF INSPECTION</u>	<u>REMARKS</u>
BOLTS	VISUAL	CHECK FOR CROSS, DEFORMED, OR BROKEN THREADS.
SPRINGS (17, 21, 37, 59)	VISUAL	CHECK FOR BROKEN COILS, DEFORMED ENDS.
BEARINGS (9, 14)	VISUAL	CHECK FOR FREEDOM OF ROTATION, BINDING, EXCESSIVE WEAR.
BUSHINGS (8, 16)	VISUAL	CHECK FOR EXCESSIVE WEAR. (SEE NOTE 1, 2)
LOAD BEAM (26)	VISUAL	CHECK FOR WEAR, TWISTING, AND BENDING. CHECK FOR BURRS WHERE LOAD BEAM CONTACTS ROLLER (24). (SEE NOTE 3)
LATCH & ROLLER (24, 25)	VISUAL	CHECK FOR EXCESSIVE WEAR, AND BURRS WHERE LATCH (24) CONTACTS BEARING (9), AND WHERE ROLLER (25) CONTACTS LOAD BEAM (26). (SEE NOTE 3) INSURE THE ROLLER (25) ROTATES FREELY.
LEVER (15)	VISUAL	CHECK FOR WEAR OR BENDING.
SHAFT & ARM ASSY. (19)	VISUAL	CHECK FOR WEAR OR BENDING.
PINS (3, 11, 13, 18)	VISUAL	CHECK FOR WEAR OR BENDING.
TRUNNION ( 27 )	VISUAL	CHECK FOR WEAR OR BENDING. (SEE NOTE 4)

**TABLE 1 NOTES**

NOTE 1-- BUSHING (16) BORE DIAMATER TOLERANCES.  
ACCEPTABLE-----.751-.760

NOTE 2-- BUSHING (8) BORE DIAMATER TOLERANCES.  
ACCEPTABLE-----.751-.760

NOTE 3-- IF NECESSARY A VERY LIGHT SMOOTHING WITH FINE EMERY CLOTH OR FILE  
IS PERMISSIBLE.

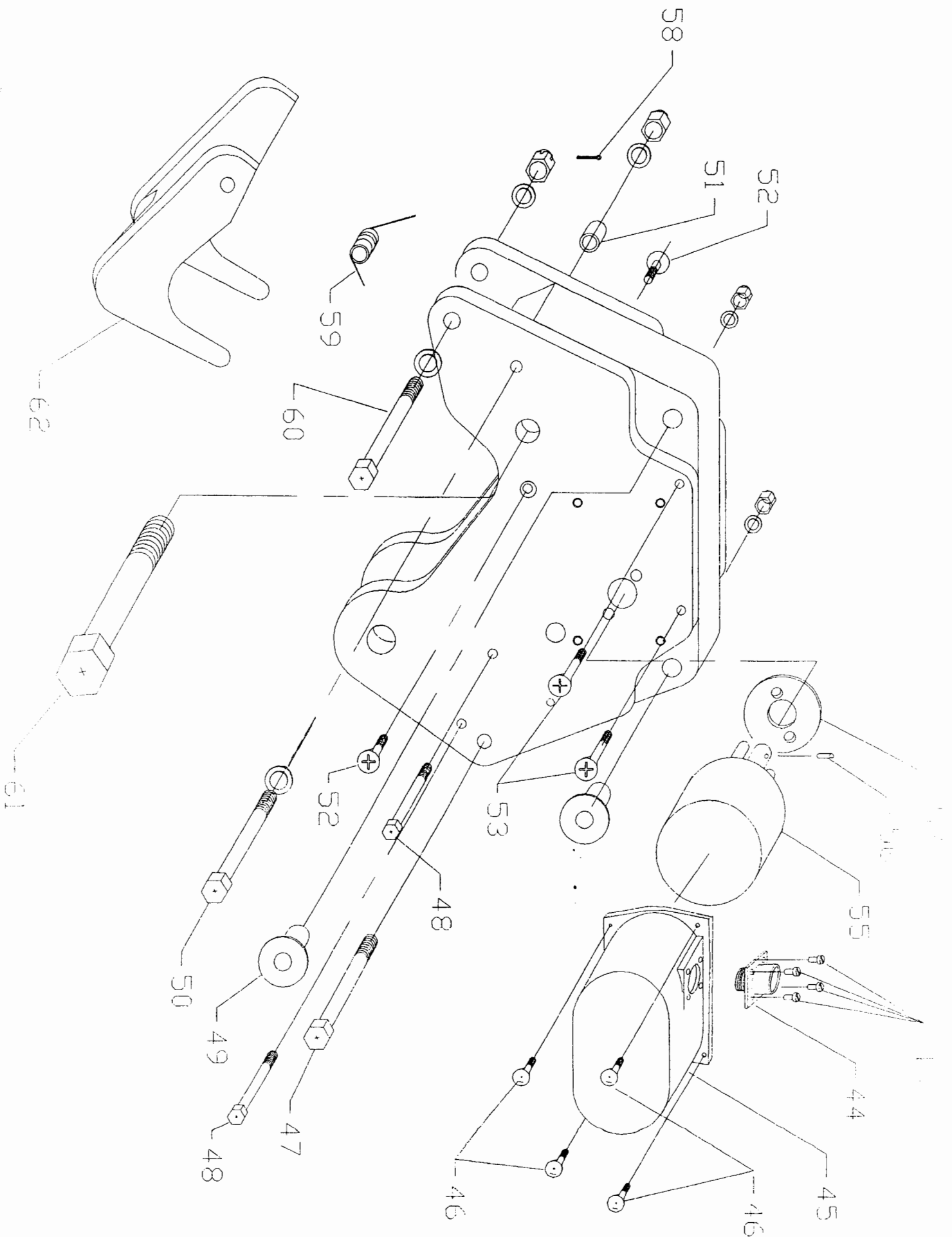
NOTE 4-- TOLERANCE WHERE TRUNNION (27) MATES WITH BUSHING (8).  
ACCEPTABLE-----.736-.749

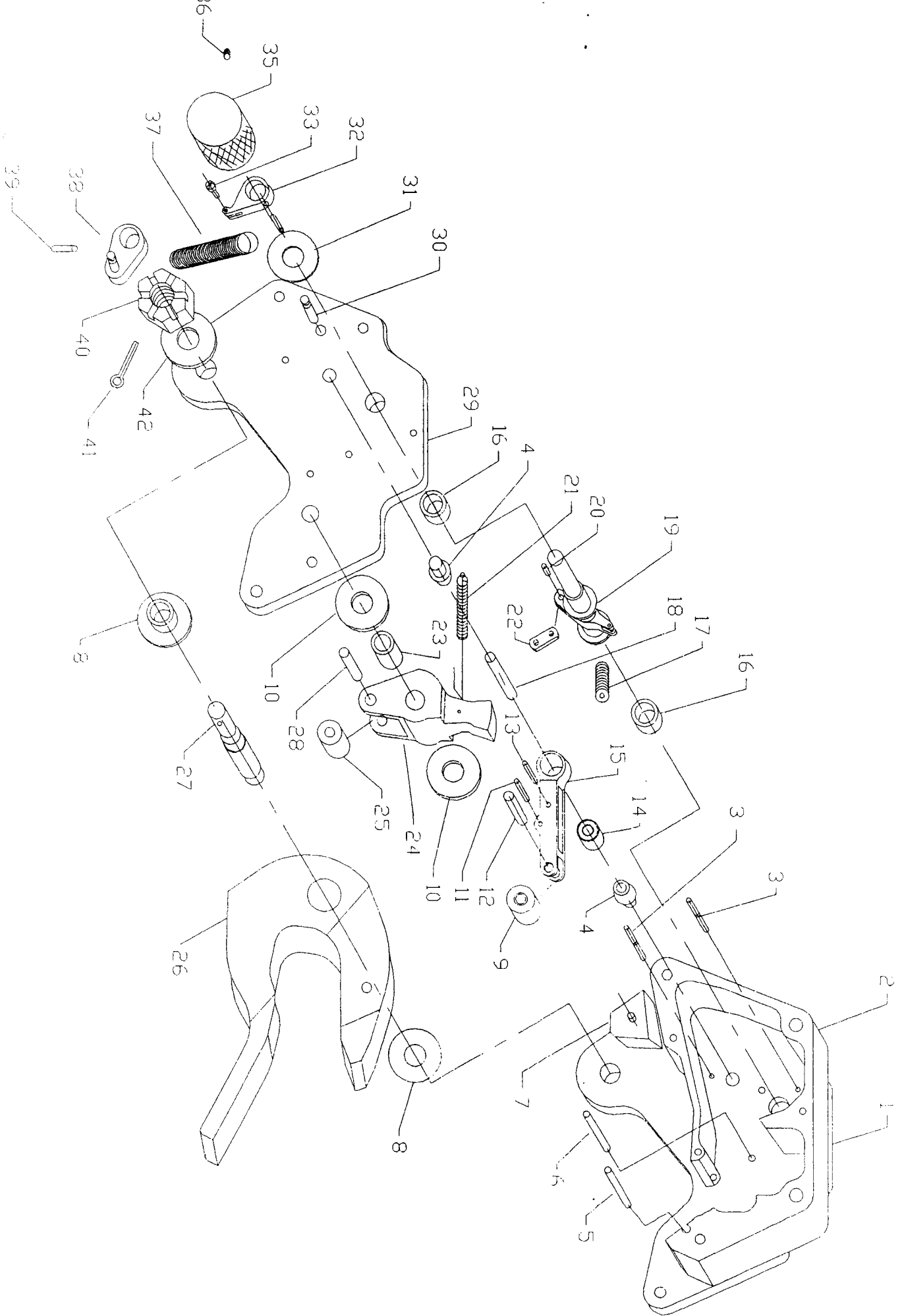
PARTS BREAKDOWN

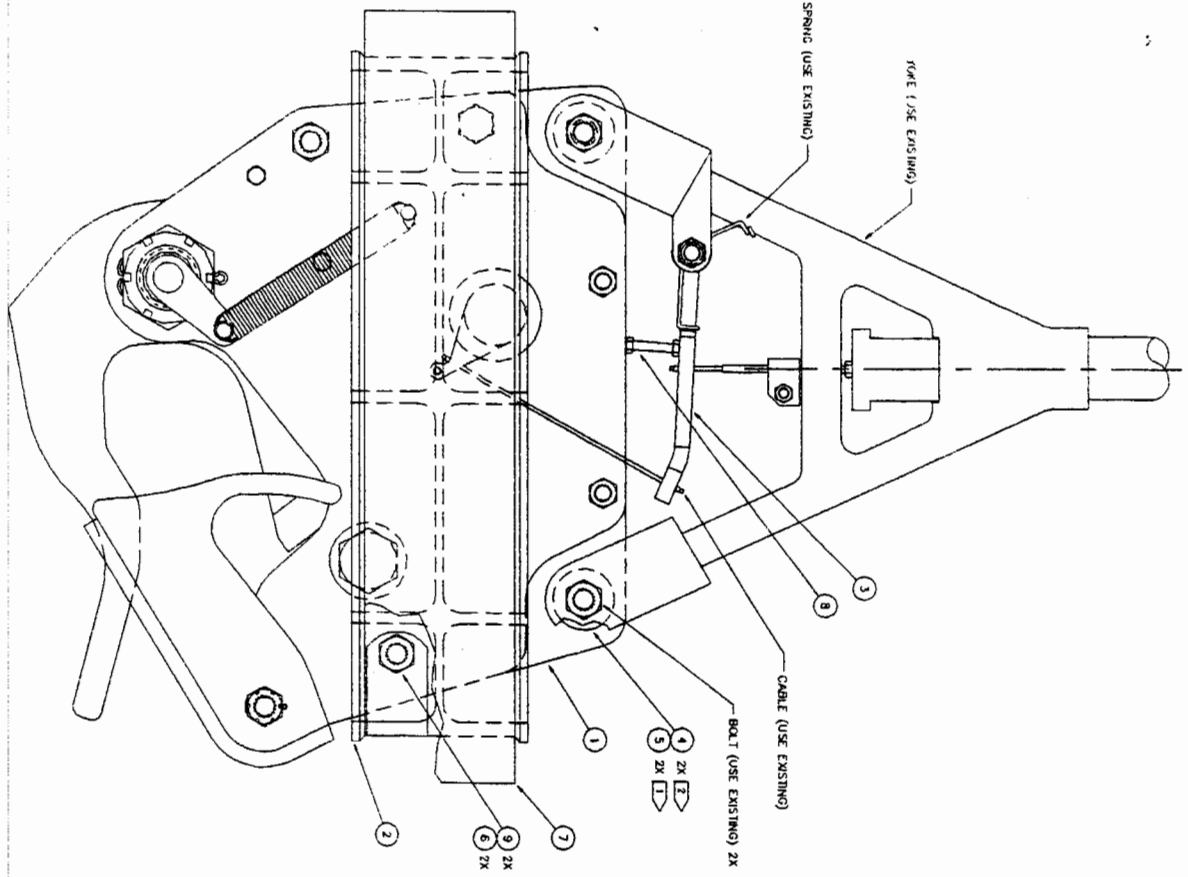
<u>INDEX NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	6051-1	SIDEPLATE (SOLENOID SIDE)
2	6052-1	SPACER
3	6057-1	PIN (2 REQUIRED)
4	6056-1	BOSS
5	6065-1	LATCH BUMPER
6	6069-1	PIN
7	6158-A1	BUMPER
8	6066-1	BUSHING, LOAD BEAM (2 REQUIRED)
9	6NBC914YZP	BEARING
10	AN960-1016L	WASHER (2 REQUIRED)
11	6061-1	PIN
12	6027-1	PIN
13	3117-1	PIN
14	6NBF817YJ	BEARING
15	6008-1	LEVER
16	6058-1	BUSHING (2 REQUIRED)
17	3031-1	SPRING
18	6055-1	PIN
19	6054-A1	SHAFT AND ARM ASSY.
20	191-51	ROLL PIN
21	6025-1	SPRING
22	6005-1	LINK
23	6070-1	BUSHING
24	6064-1	LATCH
25	6064-2	ROLLER
26	6068-1	LOAD BEAM
27	6067-1	TRUNNION
28	6064-3	PIN
29	6053-1	SIDEPLATE (NON SOLENOID SIDE)
30	3085-1	POST, LOAD BEAM RETURN
31	AN960-1216L	WASHER
32	6148-1	LOWER RELEASE ARM
33	MS35265-42	SCREW
34	247-51	ROLL PIN
35	6060-1	KNOB, MANUAL RELEASE
36	1/4-20 X 3/8"	SET SCREW
37	5874	SPRING
38	6083-A1	ARM
39	241-51	ROLL PIN
40	MS21083N10	NUT
41	MS24665-253	COTTER PIN
42	AN960-1216L	WASHER (4 REQUIRED)
43	MS35265-30	SCREW
44	MS3102R16S-5P	ELECTRICAL CONNECTOR
45	6081-1	SOLENOID COVER
46	AN520-10-8	SCREW
47	AN6-22A, AN960-616, AN365-624	BOLT, NUT, WASHER



<u>INDEX NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
48	AN4-17A, AN960-416, AN365-428	BOLT, NUT, WASHER
49	6090-1 6091-1	BUSHING (204, 205 INSTL'N) (2 REQUIRED) BUSHING (212, 412 INSTL'N) (2 REQUIRED)
50	AN6-27A AN960-616L (2) AN365-624	BOLT, NUT WASHER (2 REQUIRED)
51	6043-1	BUSHING (2 REQUIRED)
52	AN509-416R9	SCREW (2 REQUIRED)
53	AN509-416R29 AN960-416 AN365-428	SCREW, NUT, WASHER (2 REQUIRED)
55	6047-1	SOLENOID
56	6113-1	SOLENOID PIN
57	6080-1	SPACER, SOLENOID
58	AN380-3-3	COTTER PIN
59	6078-1	SPRING, KEEPER
60	AN6-27 AN960-616L (2) AN310-6	BOLT, WASHER, NUT
61	NAS1110-24 AN960-1016L(3) MS21083N10	BOLT, WASHER, NUT
62	6079-A1	KEEPER







ASSEMBLY (A1)

- NOTES: UNLESS OTHERWISE SPECIFIED
- 1 USE BUSHING (ITEM #5 / P/N 6091-1) FOR 212, 412 & 412EP INSTALLATION.
  - 2 USE BUSHING (ITEM #4 / P/N 6090-1) FOR 2018, 205A & 205A-1 INSTALLATION.
  - 3 VERIFY OPERATION OF THE MECHANICAL AND ELECTRICAL RELEASE UPON COMPLETION OF INSTALLATION.
  - 4 THE MODEL 606 HOOK REPLACES THE FOLLOWING CONFIGURATIONS:

BREEZE CUSTOMER MODEL NUMBER	BREEZE SYSTEM PART NUMBER	BELL HELICOPTER PART NUMBER	APPLICABLE BELL HELICOPTER NUMBER
A-604T	SP-7109-11	264-072-924-1	2048, 2054, 2094, 412, 412EP
A-604T	SP-7109-12	264-072-924-3	2048, 2054, 2094, 412, 412EP
A-604T	SP-7109-62	264-072-924-7	2048, 2054, 2094, 412, 412EP

ITEM	QTY	DESCRIPTION	REVISION
1	1	BOLT WASHER, NUT, AN6-27A, AN690-6161 (2), AN35-624	
2	1	BOLT, JAW NUT, AN316-3, AV3-10A	
3	1	BUSHING	
4	1	BUSHING	
5	1	BUSHING	
6	1	BUSHING	
7	1	BUSHING	
8	1	BUSHING	
9	1	BUSHING	
10	1	UPPER RELEASE ARM	
11	1	BUSHING	
12	1	BUSHING	
13	1	BUSHING	
14	1	BUSHING	
15	1	BUSHING	
16	1	BUSHING	
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606 CARRO HOOK INSTALLATION

REVISIONS

DATE

BY

APPROVED

606-200

# Supplemental Type Certificate

Number **SR00632SE**

*This certificate, issued to*

**Mechanical Specialties, Inc.  
7822 Highway 99 SE, Suite A  
Olympia, WA 98501**

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part \* of the \* Regulations.*

*Original Product—Type Certificate Number:*

See attached Approved Model List (AML)

*Make:*

No. SR00632SE for list of approved rotorcraft

*Model:*

models and applicable airworthiness regulations

*Description of the Type Design Change:* Fabrication of Mechanical Specialties, Inc. Model 606 cargo hook in accordance with FAA approved Mechanical Specialties Master Drawing List No. 606 MDL, Revision "C," dated August 6, 1998, or later FAA approved revision; and installation of this cargo hook in accordance with Section 4.0 of FAA approved Mechanical Specialties Operating and Maintenance Manual No. MSI-MNL003, Revision "A," dated July 25, 1997, or later FAA approved revision. Inspect this cargo hook in accordance with Section 5 of Mechanical Specialties Operating and Maintenance Manual No. MSI-MNL003, Revision "A," dated July 25, 1997, or later FAA approved revision.

*Limitations and Conditions:* Approval of this change in type design applies to only those Bell model rotorcraft listed on AML SR00632SE, dated October 13, 1998, or later FAA approved revision, which were previously equipped with an FAA approved installation of one of the cargo hooks listed in the table presented on page 3 of 3 of this STC. This approval should not be extended to helicopters of these models on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that helicopter.

(See Continuation Sheet page 3)

*This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.*

*Date of application:* September 20, 1997

*Date reissued:*

*Date of issuance:* October 13, 1998

*Date amended:*



*By direction of the Administrator*

*Adrian Pas...*

(Signature)

Acting Manager, Seattle Aircraft  
Certification Office

(Title)

*Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.*

*This certificate may be transferred in accordance with FAR 21.47.*

# Supplemental Type Certificate

(Continuation Sheet)

*Number* SR00632SE

*Limitations and Conditions continued:*

Rotorcraft modified in accordance with this STC must be operated in accordance with an FAA approved copy of the Rotorcraft Flight Manual Supplement (RFMS), Mechanical Specialties Document No. MSI-FMS-606-01, dated October 13, 1998, or later FAA approved revision. A copy of the Certificate, Continuation Sheet No. SR00632SE, AML No. SR00632SE, and FAA approved Rotorcraft Flight Manual Supplement must be maintained as part of the permanent records of the modified helicopter.

The MSI Model 606 cargo hook will replace the following existing cargo hook installations:

Breeze Eastern Model	Breeze Eastern Part Number	Bell Helicopter Part Number	Applicable Bell Helicopter
A-60LT	SP-7109-11	204-072-924-1	204B, 205A, 205A-1, 212, 412, 412EP
A-60LT	SP-7109-12	204-072-924-3	204B, 205A, 205A-1, 212, 412, 412EP
A-60LT	SP-7109-62	204-072-924-7	204B, 205A, 205A-1, 212, 412, 412EP

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of the permission.

- END -

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*Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.*

**FAA APPROVED MODEL LIST (AML) SR00632SE  
FOR  
MECHANICAL SPECIALTIES, INC.**

ISSUE DATE: OCTOBER 13, 1998

ITEM	AIRPLANE MAKE	AIRPLANE MODEL	TYPE CERTIFICATE NUMBER	CERTIFICATION BASIS FOR ALTERATION	FAA SEALED DRAWING LIST		RFM SUPPLEMENT NO. AND DATE	AML AMENDED DATE
					NUMBER	REV		
1	BELL	204B, 205A, 205A-1	HISW	CAR 7, dated 8/1/56 and Amendments 7-1 through 7-4, Category B	606 MDL	Rev. C 8/6/98	MSI-FMS-606-01 10/13/98	
2	BELL	212, 412, 412EP	H4SW	FAR Part 29, dated 2/1/65 and Amendments 29-1 and 29-2. See TCDS H4SW for additional requirements	606 MDL	Rev. C 8/6/98	MSI-FMS-606-01 10/13/98	



FAA APPROVED: Chris Davis  
Acting Manager, Seattle Aircraft Certification Office

DATE: Oct 13, 1998

**FAA APPROVED  
ROTORCRAFT FLIGHT MANUAL SUPPLEMENT**

BELL HELICOPTER MODELS  
204B, 205A, 205A-1, 212, 412, 412EP

**INTRODUCTION**

This supplement must be attached to the appropriate FAA approved Bell Rotorcraft Flight Manual when a Mechanical Specialties, Inc. Model 606 cargo hook is installed in accordance with Supplemental Type Certificate (STC) NO. STC SR00632SE. The information contained in this supplement compliments or supersedes the basic manual only in those areas listed. For limitations, procedures, and performance information not contained in this supplement consult the basic Rotorcraft Flight Manual.

**1. LIMITATIONS:**

The basic Flight Manual remains applicable. The Model 606 cargo hook (cargo hook only) has a rating of 6,000 pounds. However, the maximum cargo load limits set forth in the basic Rotorcraft Flight Manual for the specific helicopter must not be exceeded.

**2. PERFORMANCE:**

The basic Flight Manual remains applicable.

**3. PROCEDURES:**

**The following procedures must be performed daily, prior to first flight.**

- A) Swing cargo hook suspension assembly throughout it's full range of movement to assure cargo hook manual release rigging does not cause the hook to release inadvertently.
- B) Perform functional check of mechanical release system.
- C) Perform functional check of electrical release system.
- D) Visually inspect cargo hook for security of all hardware and electrical connections.

AIRCRAFT R/N \_\_\_\_\_ AIRCRAFT S/N \_\_\_\_\_

FAA APPROVED:   
Manager, Special Certification Branch  
Seattle Aircraft Certification Office

DATE: Oct 13, 1988  
REV. \_\_\_\_\_

MECHANICAL SPECIALTIES, INC.  OLYMPIA, WA	ROTORCRAFT FLIGHT MANUAL SUPPLEMENT	DOCUMENT NUMBER  MSI-FMS-606-01
	MODEL 606 CARGO HOOK	PAGE 1 OF 6



THE FOLLOWING ILLUSTRATIONS ARE TO PROVIDE GUIDANCE IN:

A) IMPLEMENTING PROPER RIGGING TECHNIQUES (FIGURE 1)

B) OFFER RECOMMENDED PRIMARY RING OR SHACKLE SIZES TO BE USED DURING SLING LOAD OPERATIONS.

THERE HAVE BEEN DOCUMENTED OCCURENCES OF THE PRIMARY SLING LOAD RING OR SHACKLE FAILING TO COMPLETELY DISENGAGE FROM THE LOAD BEAM WHEN THE CARGO HOOK IS RELEASED DUE TO IMPROPER RIGGING PRACTICES (FIGURES 2A, 2B) OR THE USE OF PRIMARY RINGS OR SHACKLES THAT ARE TOO SMALL (FIGURE 3A, 3B). THIS IS A POTENTIALLY HAZARDOUS SITUATION DUE TO THE INABILITY TO FREE THE HELICOPTER FROM THE LOAD BEING CARRIED.

ON CERTAIN OCCASIONS A PRIMARY RING OR SHACKLE USED THAT WAS TOO LARGE CREATED A SITUATION THAT ALLOWED THE PRIMARY RING OR SHACKLE TO SWING UP PAST THE TIP OF THE LOAD BEAM AND BECOME DISENGAGED FROM THE CARGO HOOK CAUSING AN INADVERTENT RELEASE OF THE LOAD BEING CARRIED (FIGURE 4).

**PRIMARY RING SIZE (I.D.):**

MAXIMUM: 4.0"

MINIMUM: 3.1"

**SECONDARY RING CROSS SECTION:**

3.0 - 3.1"-----5/8"

>3.1"-----3/4"

# CORRECT RIGGING

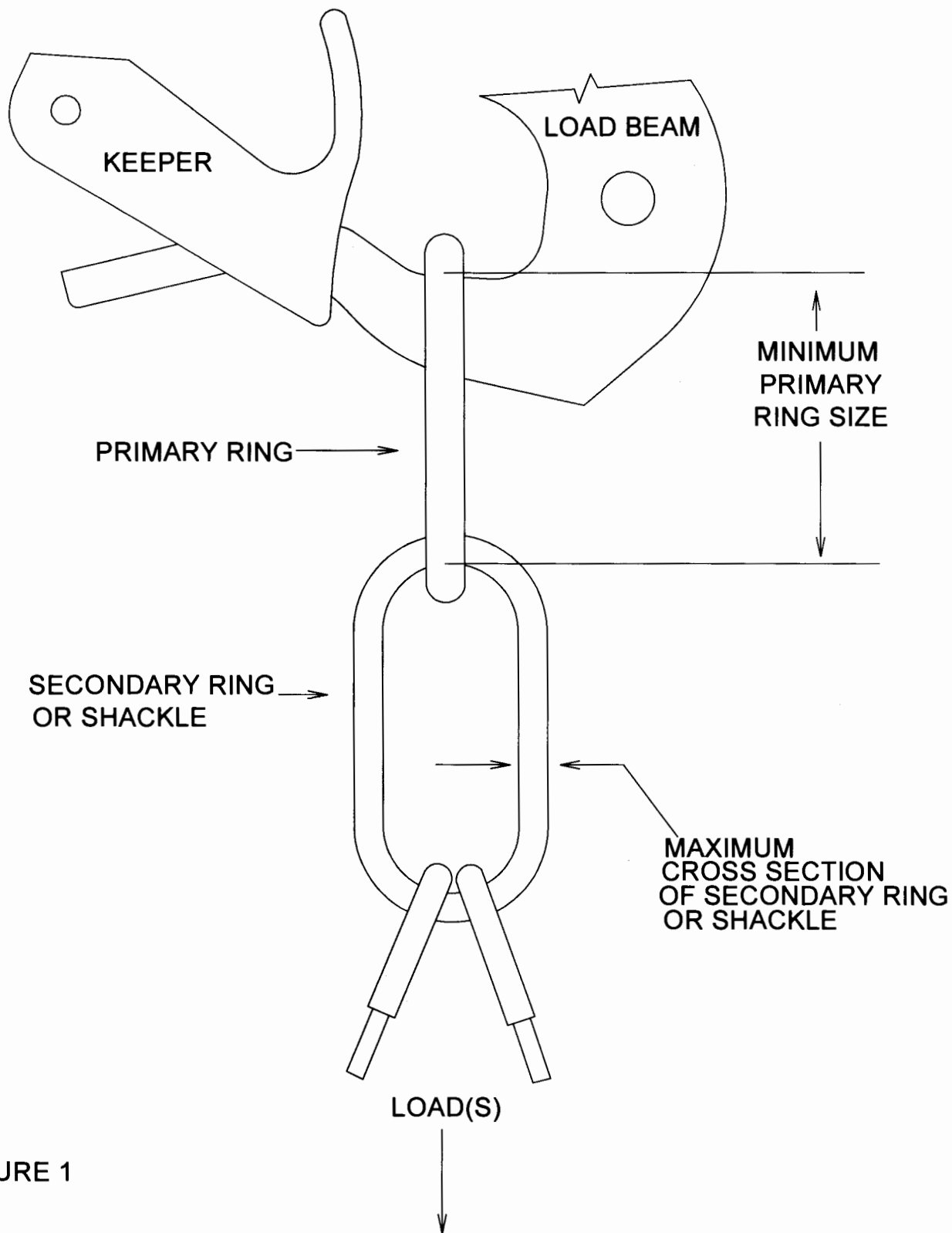


FIGURE 1

# INCORRECT RIGGING

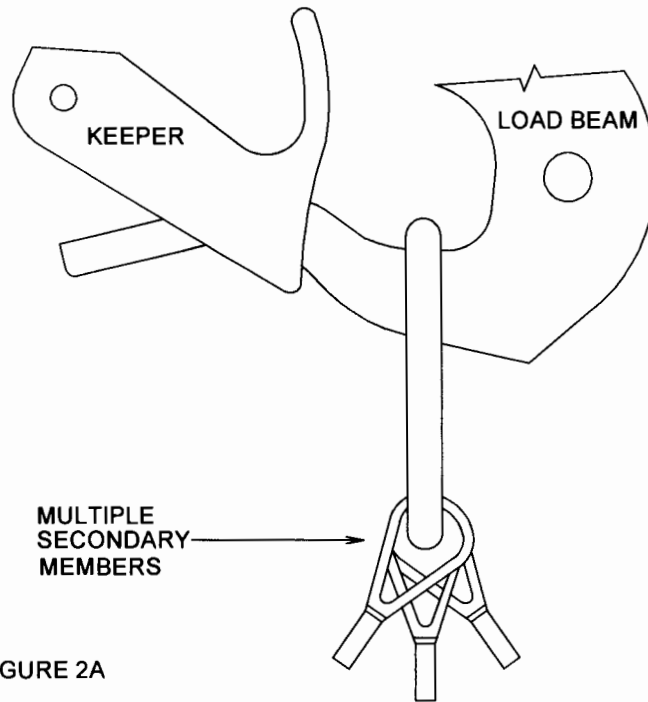


FIGURE 2A

# INCORRECT RIGGING

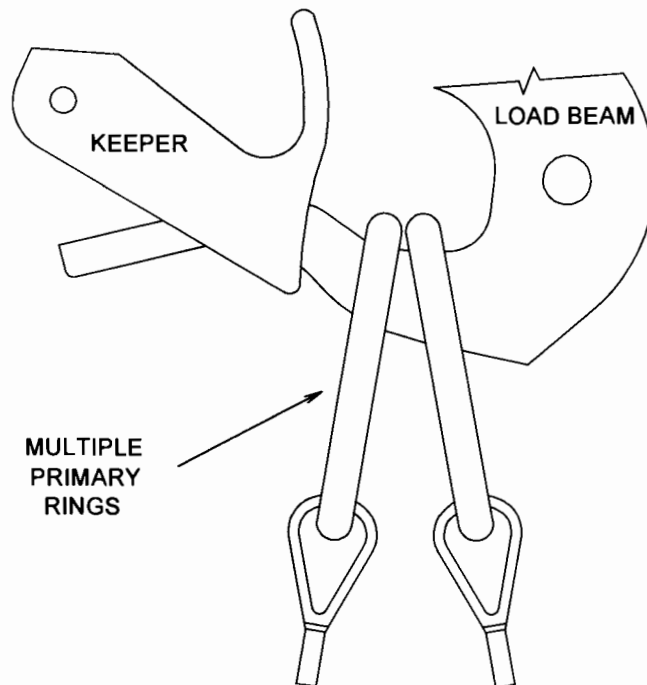
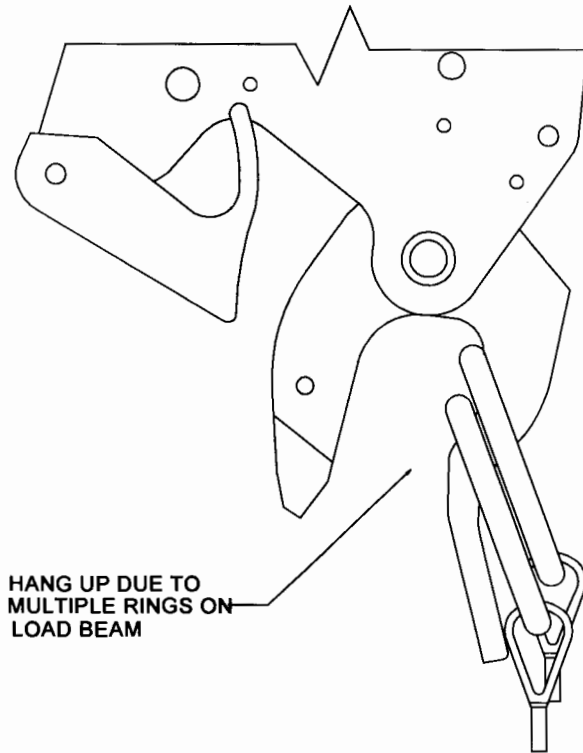


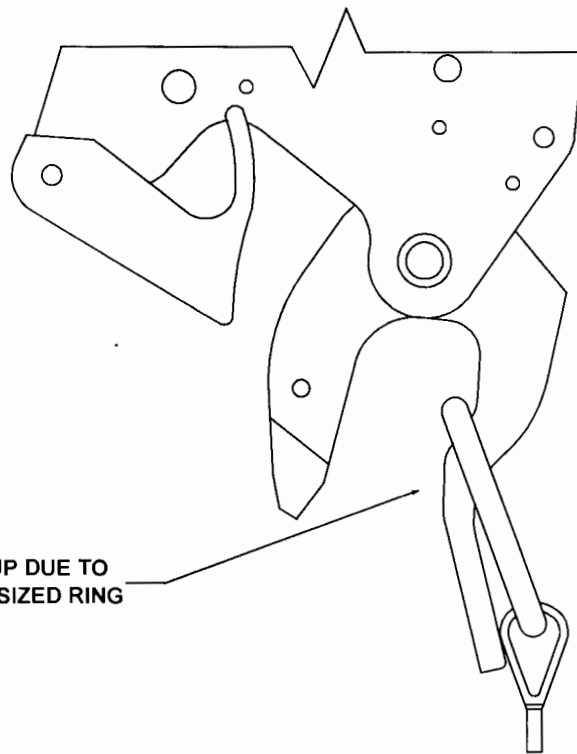
FIGURE 2B

FIGURE 3A



HANG UP DUE TO  
MULTIPLE RINGS ON  
LOAD BEAM

FIGURE 3B



HANG UP DUE TO  
UNDERSIZED RING

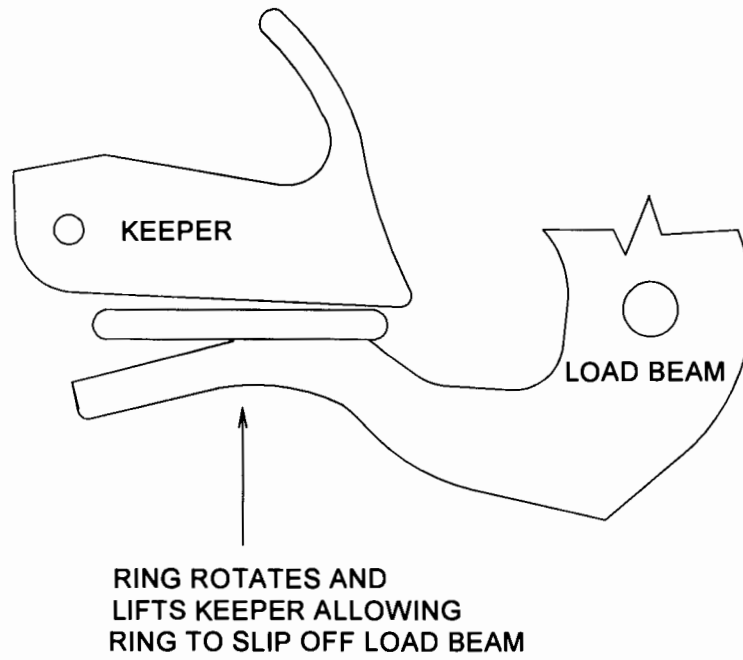
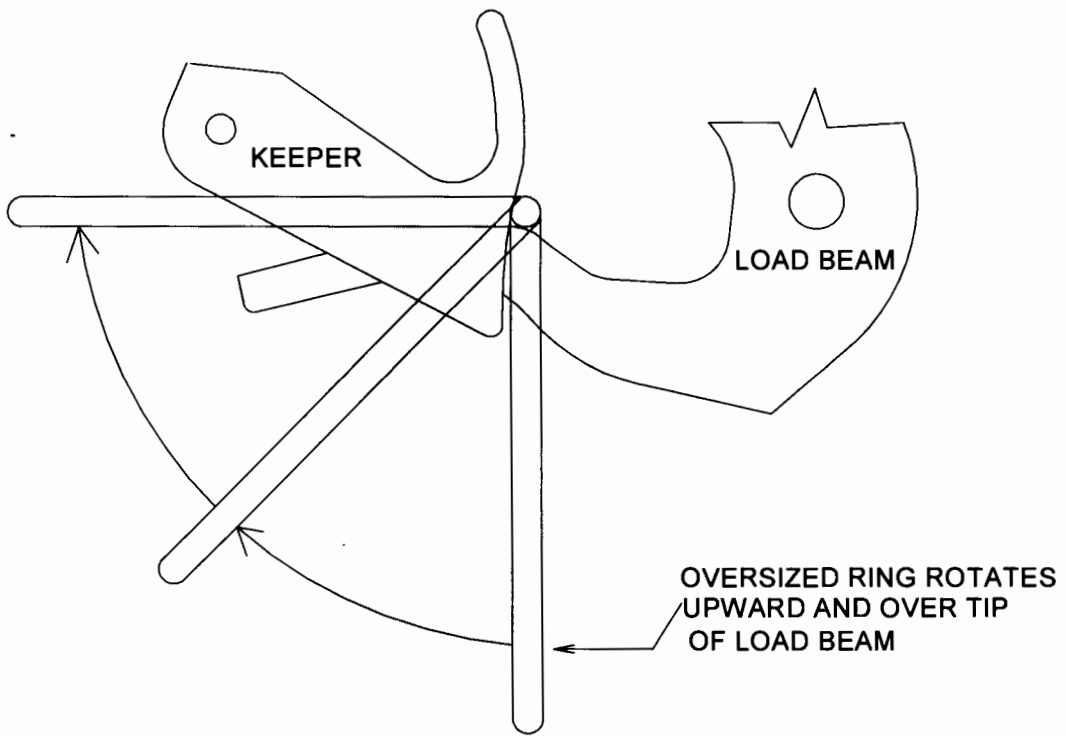


FIGURE 4