ONBOARD SYSTEMS

INTERNATIONAL

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SERVICE BULLETIN

Document No. 159-028-00 Rev. 1

Date: January 8, 2010

Subject: Cargo hook enhanced safety.

Helicopters Affected: All Robinson R22 and 12 volt R44 helicopters with any of the following Onboard Systems cargo hook part numbers installed.

528-010-00
528-010-04
528-023-00
528-023-01
528-023-03 S/N 372 or previous (except S/N 206 and 317)

Cargo hooks installed on 28 volt aircraft are not affected.

Compliance: Recommended within 6 months of the date of this bulletin.

***Description*:**
It has been determined that P/N 528-010-00, 528-010-04, 528-023-00, 528-023-01 and earlier versions of 528-023-03 cargo hooks, when installed on 12 volt aircraft, may suffer from decreased release performance when subjected to operating voltages below 12 volts. Low voltage performance is also made worse over time when combined with the effects of wear and corrosion.

Newer kit configurations (kits sold since late 2005) for the 12 volt R22 and R44 include cargo hook P/N 528-010-06 and P/N 528-023-03. These cargo hooks use a specific solenoid to optimize performance on 12 volt aircraft under worst-case operating conditions. This service bulletin provides instructions to convert P/N 528-010-00 and 528-010-04 cargo hooks to P/N 528-010-06 and P/N 528-023-00 and 528-023-01 to P/N 528-023-03 cargo hooks, when installed on 12 volt aircraft.

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NOTICE

P/N 528-010-00 was converted to P/N 528-010-04 via Service Bulletin 159-017-00 and P/N 528-023-00 was converted to P/N 528-023-01 via Service Bulletin 159-011-00. These Service Bulletins must be complied with before incorporating this Service Bulletin.

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NOTICE

Compliance with this service bulletin does not change the part number of the 528-023-03 cargo hook. If the cargo hook's compliance with this service bulletin is unknown, it can be checked by inspecting the identification plate that is installed on the cargo hook. Compliance with this service bulletin requires that identification plate P/N 215-181-00 be installed and stamped with the cargo hook voltage: 12 (see Section 1 step 11). Contact Onboard Systems if additional information is needed.

Action:

1. Replace the cargo hook's solenoid P/N 455-003-00 with solenoid P/N 455-007-00.
2. Replace the cargo hook's diode P/N 340-027-00 with bi-directional diode P/N 340-035-00 (if this has not already been accomplished during a factory overhaul). This upgrade eliminates the possibility of shorting out the diode if the cargo hook is hooked up incorrectly.

NOTICE

Onboard Systems will offer an exchange program for the affected solenoid assembly, which will have the new solenoid, diode and identification plate installed. Utilization of the exchange unit will eliminate the requirement to comply with steps 3 through 14 in Section 1 of the Accomplishment Instructions. Please contact us for more information.

3. For P/N 528-023-03, S/N 372 or previous (except S/N 206 and 317), in addition to replacing the solenoid, replace the single spring (P/N 514-057-00) with dual spring (P/N 514-056-00).
4. Re-identify the cargo hook as P/N 528-010-06 or 528-023-03 as applicable.

Approval: The engineering design aspects of this bulletin are FAA approved.

Manpower: Approximately 1.0 man-hour will be required.

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Required Material: The following material is required for accomplishment of this bulletin and may be obtained from Onboard Systems:

P/N	Description	Qty
455-007-00**	Solenoid	(1)
340-035-00**	Diode	(1)
215-181-00**	Identification Plate	(1)
J-STD-006	Solder	AR
514-056-00*	Dual Spring	(1)

* For P/N 528-023-03 S/N 372 and previous (except 206 and 317) only.
** These parts are included in the solenoid assembly. They can be purchased separately or the complete solenoid assembly may be obtained through the exchange program (see Notice on previous page).

Special Tools: Soldering iron

Weight and Balance: Not affected

Publications Affected:

Cargo Hook Service Manuals: 122-001-00, 122-013-00

The latest manual revisions are available through Onboard Systems' website at *www.onboardsystems.com*.

Point of Contact: For additional assistance, contact Keys Miller at Onboard Systems. Phone: 360-546-3072 or 1-800-275-0883. Email: *keys@onboardsystems.com*.

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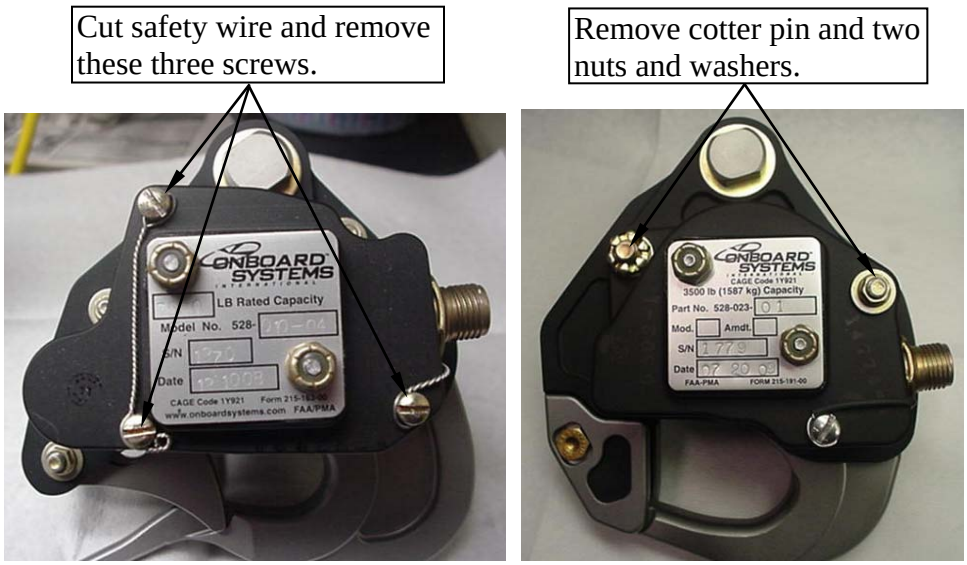
Accomplishment Instructions:

Section 1 – Solenoid Replacement.

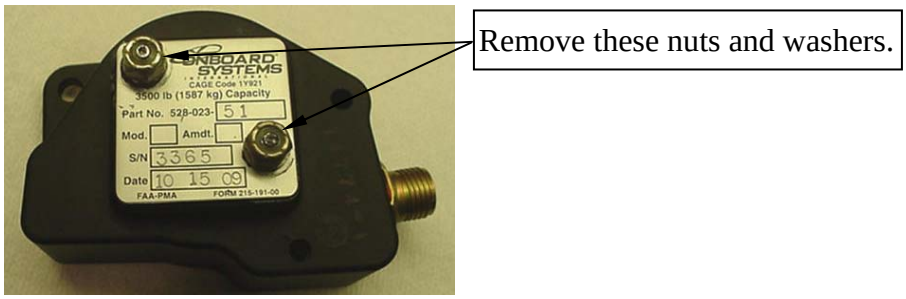
1. Remove the cargo hook from aircraft. Refer to appropriate ICA or Owner's Manual instructions.
2. Remove Solenoid Assembly from cargo hook per instructions below (528-010 series cargo hook shown at left, 528-023 series cargo hook shown at right).



NOTICE

If replacing the entire solenoid assembly (see page 2), skip steps 3 through 14 of this section.

3. Cut safety wire and remove nut from connector.
4. Remove the two nuts (P/N 510-206-00) and two washers (P/N 510-209-00) which secure the solenoid to the housing and remove the solenoid and connector assembly from the housing. Remove the identification plate from the solenoid housing.



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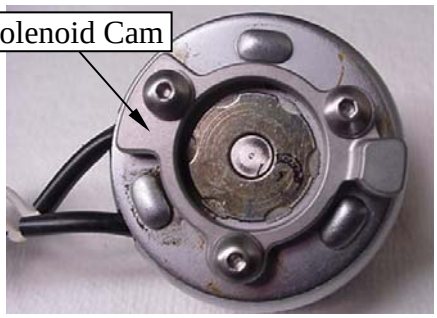
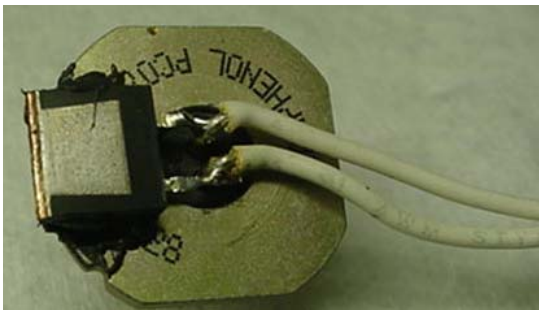
5. Remove the Solenoid Cam from the solenoid by removing safety wire (528-023 series only) and the hardware which secure it in onto the solenoid.

528-010 series	528-023 series
	

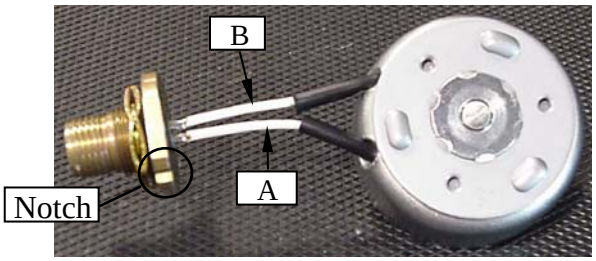
6. De-solder the solenoid wires from the connector contacts. The diode is also soldered to these contacts and will come loose. Note: Earlier cargo hooks included diode P/N 340-027-00 (shown below) which was secured to the connector base with silicone. If this diode is installed, remove it and discard, and replace it with bi-directional diode P/N 340-035-00 at re-assembly.



Re-assemble with new solenoid:

7. Cut wires on the new solenoid to 2" long. Strip the wires back approximately .20" and tin the ends.

8. Solder the solenoid wires to the connector contacts in the orientation shown below.



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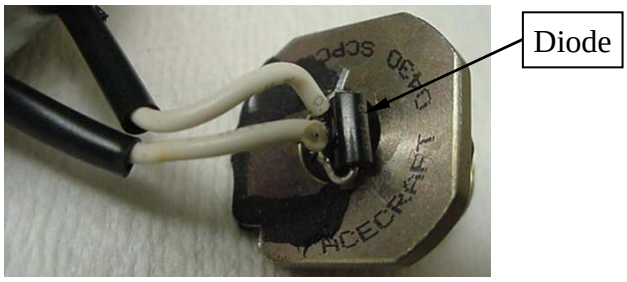
9. Solder the bi-directional diode (P/N 340-035-00) across the connector contacts as shown below.



10. Assemble the Solenoid Cam onto the solenoid as follows. The Solenoid Cam must be oriented as shown.

    On the 528-010 series, apply Loctite 242 threadlocker to the screw threads, place the Solenoid Cam onto the solenoid as shown, assemble washers onto and partially thread all three screws into the solenoid. With the Solenoid Cam still loose rotate it in the counterclockwise direction as far as it will go and then fully tighten the screws to secure it in this position.

On the 528-023 series of cargo hooks secure the solenoid cam to the solenoid with the three screws and safety-wire as shown. Bend safety wire down at the mid-point of each span. Top of midpoint of wire to the top of the solenoid must be .125” or less.

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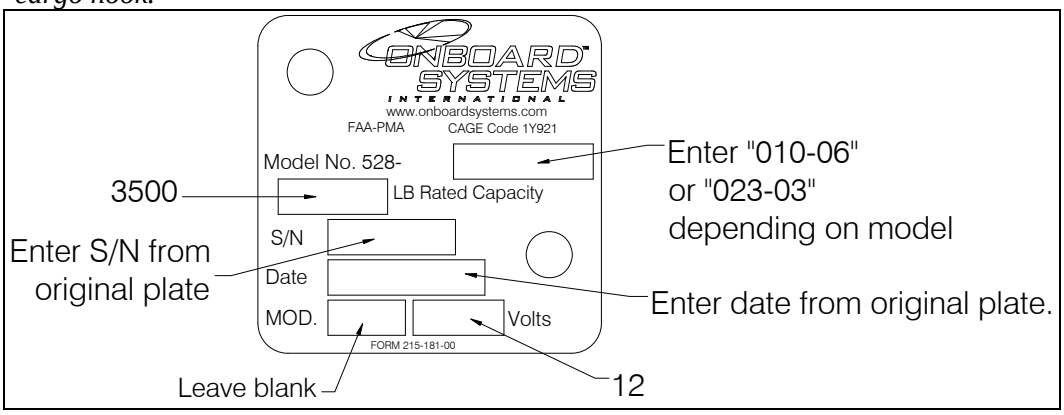
11. Using steel stamps or vibro-engraver fill out identification plate as shown below. Enter the part number per the following chart.

Original P/N	P/N after Service Bulletin compliance
528-010-00 528-010-04	528-010-06
528-023-00 528-023-01 528-023-03 S/N 372 and previous*	528-023-03

** Compliance with this service bulletin does not change the P/N of the 528-023-03 cargo hook.*



12. Apply a small amount of black silicone, Loctite 598 or equivalent, around the base of the two solenoid mounting studs and install solenoid, connector and interconnecting wiring into the solenoid housing (see below for orientation). Place the identification plate over the two solenoid mounting studs.

528-010 series

528-023 series

13. Secure the solenoid with the two washers and nuts removed earlier.

14. Secure the connector with the nut removed earlier.

If in possession of cargo hook P/N 528-023-03 S/N 372 or previous (except S/N 206 or 319), skip to section 2, otherwise complete step 15 and then proceed to installation check-out.

15. Re-install the solenoid assembly onto the cargo hook with the hardware removed on step 2. On the 528-010 series cargo hooks safety wire the two screws on the left side of the solenoid assembly together and safety wire the screw on the right side with the connector nut.

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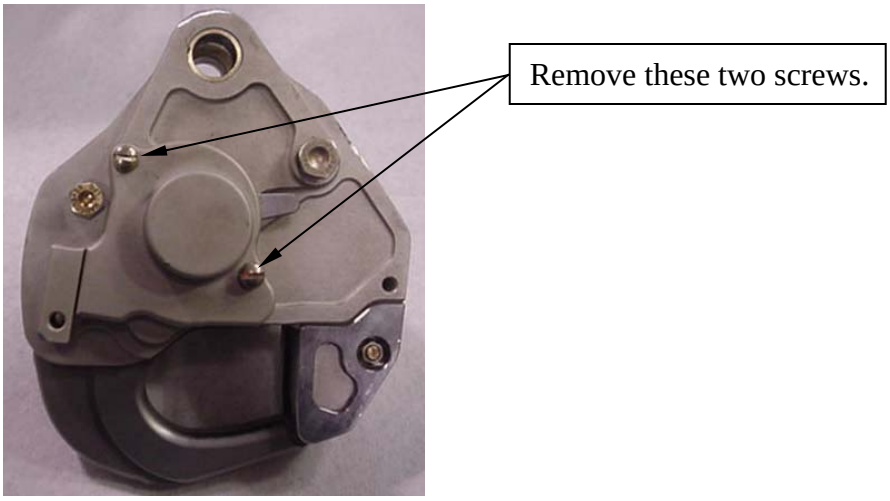
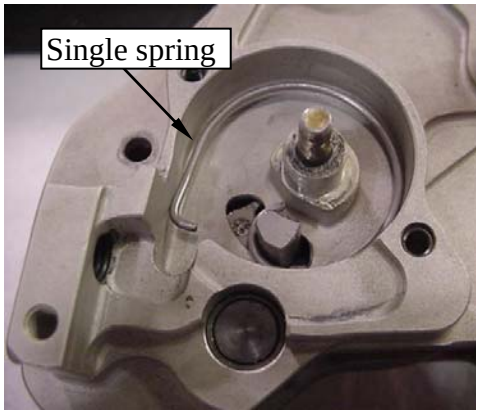
Section 2 – Spring Replacement

In addition to replacing the solenoid, for P/N 528-023-03 S/N 372 or previous replace the single return spring (P/N 514-057-00) with a dual return spring (P/N 514-056-00) per the following instructions.

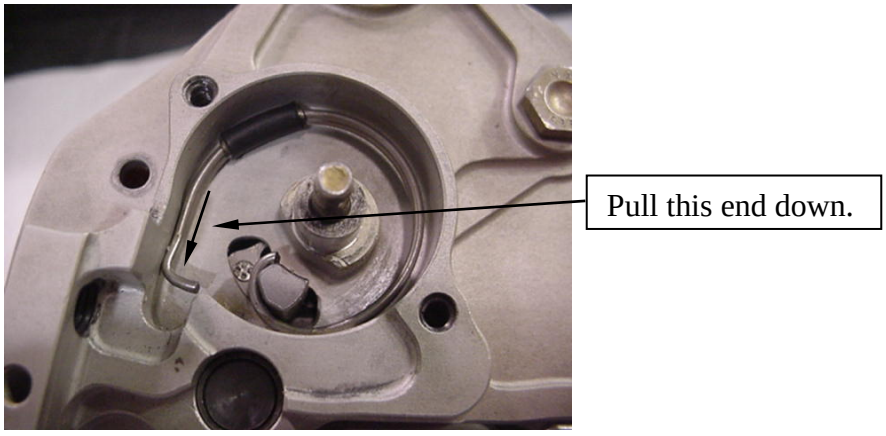
1. Cut safety wire and remove the manual release cover by removing two screws.



2. Remove cotter pin, nut, and washer from bolt.
3. Remove manual release lever, spring retainer, and single spring.



4. Insert the dual spring within the side plate pocket and pre-load it by pulling the free end down within the spring cavity.



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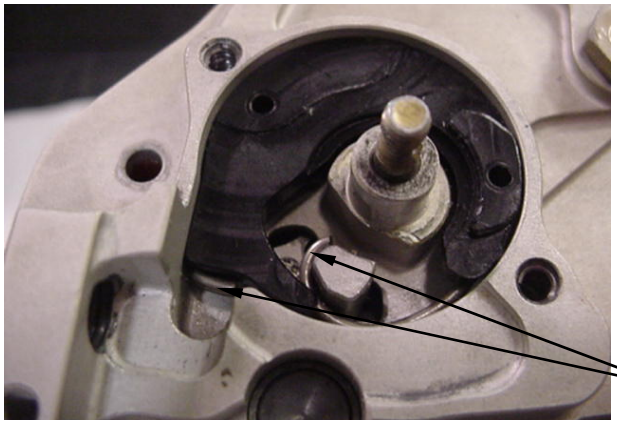
5. Re-install spring retainer. Ensure ends of spring are positioned as shown.



6. Re-install manual release lever and secure with washer and nut. Tighten nut finger tight and then rotate to next castellation to insert cotter pin.

7. Re-install manual release cover with the two screws.
8. Re-install the solenoid assembly onto the cargo hook with the hardware removed on step 2 of Section 1.

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Section 3 – Installation Check-out

1. Re-install the cargo hook onto the aircraft and connect the electrical release harness and the manual release cable to it.
2. For the P/N 528-010-06 cargo hook:
   - Apply a 10 to 20 pound load to the cargo hook load beam and activate the cargo hook electrical release system with the release switch in the cockpit. The cargo hook must release.

   For the P/N 528-023-03 cargo hook:
   - With no load applied to the cargo hook load beam activate the cargo hook electrical release system with the release switch in the cockpit. The cargo hook load beam must open. Re-set the load beam.
   - Activate the manual release system by pulling the T-handle in the cockpit. The cargo hook load beam must open.
   - Safety wire the manual release cover screws.
3. Make appropriate logbook entry.