



2900 Selma Highway  
Montgomery, AL 36108 USA  
Tel: 334-386-5400 Fax: 334-386-5450

# SERVICE LETTER

## SERVICE LETTER No. 091

### **149NL/EC Kickback Protection**

#### **1. Planning Information**

##### A. Effectivity

- (1) Aircraft starter assemblies P/N 149NL/EC shipped by Hartzell Engine Technologies LLC on or after 01 Feb. 2020 are affected by this Service Letter (SL).
  - (a) All serial numbers within date of effectivity are affected by this SL.
  - (b) Starter and engine model/series affected by this SL are shown in Table 1.

**NOTE:** Table 1 is for reference only and is not an all-inclusive list of engines affected by this SL. It is the responsibility of the owner/operator to verify whether an affected starter may be installed.

**WARNING:** DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE LETTER. INFORMATION CONTAINED HEREIN MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. REFER TO THE SKYTEC WEBSITE, WWW.SKYTEC.AERO, FOR THE MOST RECENT REVISION LEVEL OF THIS SERVICE LETTER.

##### B. Concurrent Requirements

- (1) None

##### C. Reason

- (1) Aircraft starter assemblies listed in section 1.A could contain a lay-shaft that does not provide engine kickback protection.
  - (a) This condition may result in damage to the starter and to the starter ring gear of the engine in the event of kickback.

##### D. Description

- (1) This Service Letter is issued to advise the field of a known condition, supply inspection criteria to identify affected starters, and to provide solutions to starters found not to provide engine kickback protection.
- (2) Replacement of an affected starter is not required; however, options for corrective action are found under section 3.B of this document.

##### E. Approval

- (1) This Service Letter has been approved by Hartzell Engine Technologies LLC.

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#### F. Manpower

- (1) Up to four (4) hours labor for starter removal and installation.

#### G. References

- (1) Lycoming Engines' Engine Maintenance/Overhaul Manuals and Service Publications.
- (2) Applicable Aircraft Service Instructions or Maintenance Manual.
- (3) Applicable Aircraft AFM or POH.

#### H. Weight and Balance

- (1) No Change

## 2. Materials Required

- A. One lay-shaft P/N ST25020. See 3.B.(2).

- OR -

- B. One new or repaired starter of the part number removed, or a certified new replacement part number that is not affected by this Service Letter. See 3.B.(3).

## 3. Accomplishment Instructions

**WARNING 1:** THIS PROCEDURE MUST BE PERFORMED BY COMPETENT AND QUALIFIED PERSONNEL WHO ARE FAMILIAR WITH THE AIRFRAME AND ENGINE SYSTEM MAINTENANCE. FAILURE TO DO SO MAY RESULT IN PHYSICAL INJURY, EQUIPMENT DAMAGE AND/OR ECONOMIC LOSS.

**WARNING 2:** DO NOT USE OBSOLETE OR OUTDATED INFORMATION. PERFORM ALL INSPECTIONS OR WORK IN ACCORDANCE WITH THE MOST RECENT REVISION OF THIS SERVICE LETTER. INFORMATION CONTAINED HEREIN MAY BE SIGNIFICANTLY CHANGED FROM EARLIER REVISIONS. REFER TO THE SKYTEC WEBSITE FOR THE MOST RECENT REVISION LEVEL OF THIS SERVICE LETTER, [WWW.SKYTEC.AERO](http://WWW.SKYTEC.AERO).

**CAUTION:** REFER TO THE APPLICABLE MANUFACTURER'S MAINTENANCE MANUALS OR SERVICE INSTRUCTIONS TO GAIN ACCESS TO THE AIRFRAME OR STARTER. IN ADDITION, ANY PREFLIGHT OR IN-FLIGHT OPERATIONAL CHECKS REQUIRE USE OF THE APPROPRIATE AFM OR POH.

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#### A. Inspection

- (1) If previous compliance cannot be verified through aircraft or engine maintenance records, use the same references to determine if an affected starter has been installed. Refer to section 1.A, Effectivity.
- (2) If effectivity of the starter cannot be established using aircraft or engine maintenance records, utilize the applicable aircraft engine maintenance manual to gain access to the starter and inspect the starter against criteria found in section 1.A of this SB.
  - (a) If the starter is affected per section 1.A, continue to 3.B. - Corrective Action.
  - (b) If the starter is not affected per section 1.A, continue to 3.C. - Return to Service.

#### B. Corrective Action

- (1) **Option 1:** Starter may remain in-service. Replacement of the starter is not required; the standard warranty for the starter remains in effect up to 2700 engine hours. Continue to 3.C., Return to Service.
- (2) **Option 2:** Remove the starter in accordance with the applicable engine manufacturer's maintenance manual.
  - (a) Remove the two machine screws (Figure 1, ITM# 1, 5/16" hex) from the starter assembly. Retain machine screws for assembly.
  - (b) Separate the solenoid assembly from the motor adapter, see Figure 1.
  - (c) Carefully remove the lay shaft with roller bearing from the motor adapter assembly.
  - (d) Inspect the lay shaft against Figures 2 & 3.
    - 1) If Figure 2 configuration is observed, the lay shaft does not provide kickback protection. Replace the lay shaft. See 2.A., Material Required:
      - a) Apply Chevron SRI Grease 2 lubricant to each gear of a new lay shaft.
      - b) Insert the new lay shaft into the solenoid assembly.
      - c) Apply Loctite 222MS to the threads of the two machine screws (1).
      - d) Assemble the motor adapter to the solenoid assembly and install two machine screws (1) finger tight.
      - e) Torque the machine screws (1) 55-60 in-lbs.
      - f) Install the starter onto the engine in accordance with the applicable engine manufacturer's maintenance manual. Continue to 3.C. Return to Service.

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- 2) If Figure 3 configuration is observed, the lay shaft does provide kickback protection. Reassemble the starter:
  - a) Apply Chevron SRI Grease 2 lubricant to each gear of the lay shaft.
  - b) Insert the lay shaft into the solenoid assembly.
  - c) Apply Loctite 222MS to the threads of the two machine screws (1).
  - d) Assemble the motor adapter to the solenoid assembly and install two machine screws (1) finger tight.
  - e) Torque the machine screws (1) 55-60 in-lbs.
  - f) Install the starter onto the engine in accordance with the applicable engine manufacturer's maintenance manual. Continue to 3.C. Return to Service.
- (3) **Option 3:** Reference applicable engine manufacturer's maintenance manual and replace the starter with one not affected by this Service Letter. Refer to 2.B, Materials Required.

#### C. Return to Service

- (1) Close all access doors and covers opened to gain access to the starter in accordance with applicable airframe and/or engine maintenance manual.

#### D. Maintenance Record

- (1) Make an appropriate logbook entry noting compliance with this SL.

#### **4. Contact Information**

- A. Contact HET Product Support for all communications regarding the technical content of this Service Letter.

- (1) Phone +1.334.386.5400 (Option 2)
- (2) Fax +1.334.386.5450
- (3) E-mail at techsupport@hartzell.aero
- (4) Address

Hartzell Engine Technologies LLC - ATTN: Product Support  
2900 Selma Highway  
Montgomery, AL 36108  
USA

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### 149NL/EC Kickback Protection

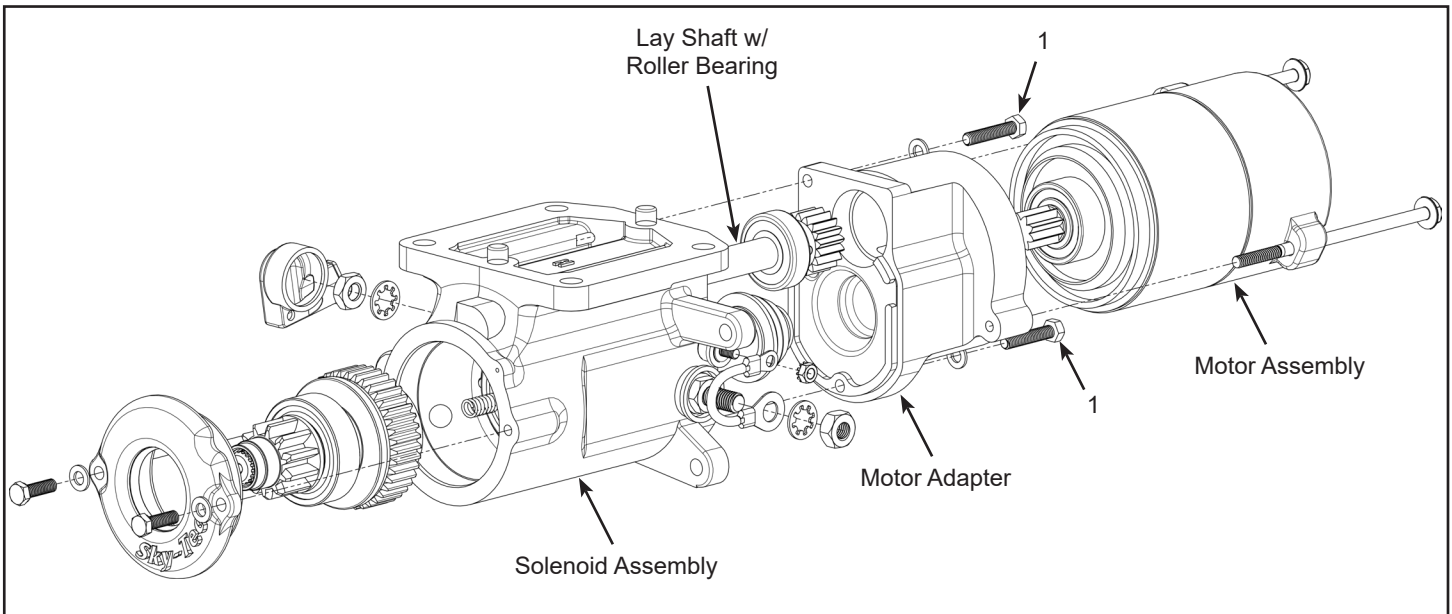


Figure 1 - Typical Starter P/N 149NL/EC Assembly

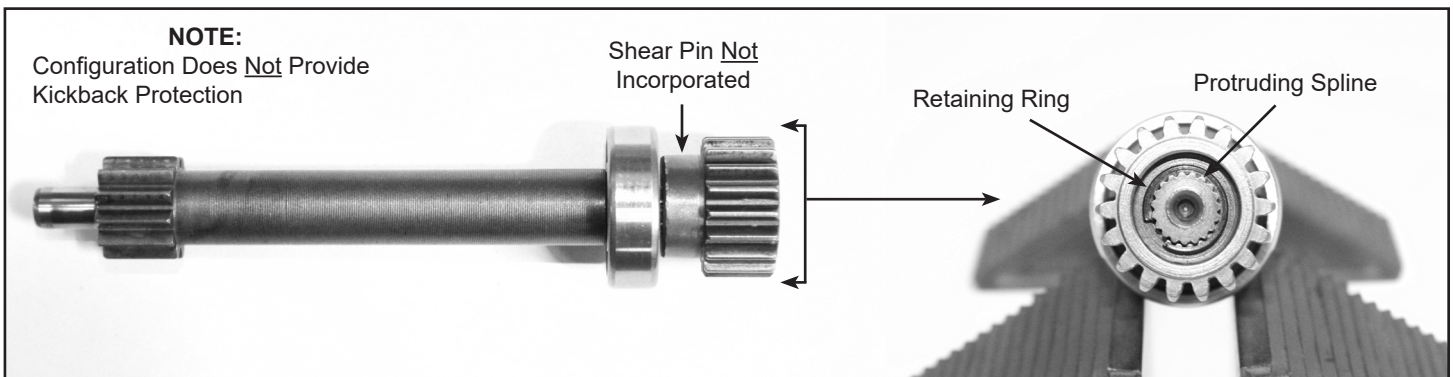


Figure 2 - Lay Shaft w/o Kickback Protection

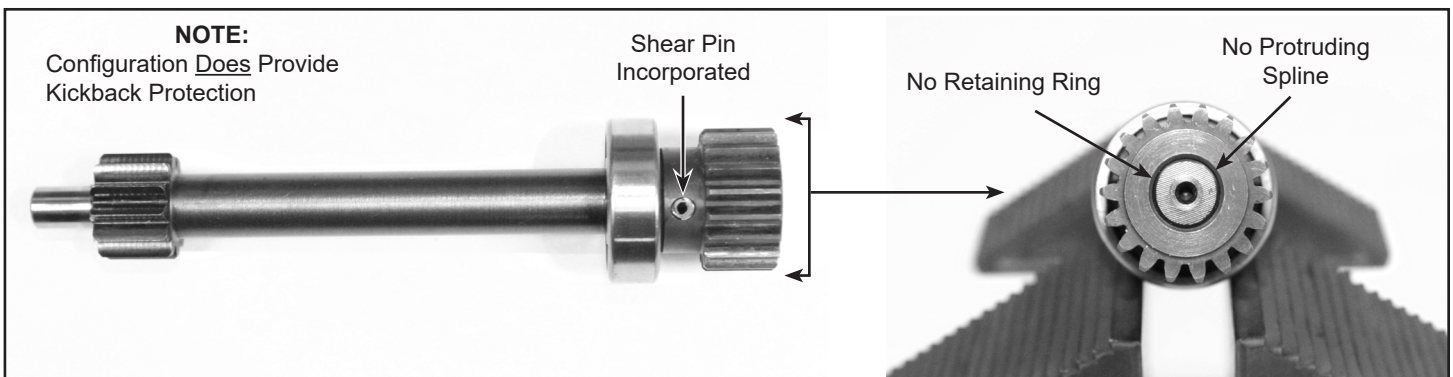


Figure 3 - Lay Shaft with Kickback Protection

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| Starter P/N                                                                                                                                                                                                                                                                                                             | Engine Make | Engine Model/Series                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HET</b><br>149NL/EC<br><br><b>Lycoming</b><br>76212,<br>76214,<br>LW-11939,<br>LW-14208,<br>LW-14210,<br>LW-41213,<br>LW-15557,<br>LW-15572,<br>LW-15574,<br>LW-14447,<br>LW-18990,<br>31B23592,<br>31B22207,<br>31B21064,<br>31B22101,<br>31B22104,<br>31B22105,<br>31B22110,<br>31B22111,<br>31B22476,<br>31B22470 | Lycoming    | O-235, -A, -A1, -AP, -B, -BP, -C, -C1, -C1A, -C1B, -C1C, -C2A, -C2B, -C2C, -E1, -E1B, -E2A, -E2B, -F1, -F1B, -F2A, -F2B, -G1, -G1B, -G2A, -G2B, -H2C, -J2A, -J2B, -K2A, -K2B, -K2C, -L2A, -L2C, -M1, -M2C, -M3C, -N2A, -N2C, -P1, -P2A, -P2C, -P3C                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                         |             | O-320-A1A, -A1B, -A2A, -A2B, -A2C, -A2D, -A3A, -A3B, -A3C, -B1A, -B1B, -B2A, -B2B, -B2C, -B2D, -B2E, -B3A, -B3B, -B3C, -C1A, -C1B, -C2A, -C2B, -C2C, -C3A, -C3B, -C3C, -D1A, -D1B, -D1C, -D1D, -D1F, -D2A, -D2B, -D2C, -D2F, -D2G, -D2H, -D2J, -D3G, -E1A, -E1B, -E1C, -E1F, -E1J, -E2A, -E2B, -E2C, -E2D, -E2F, -E2G, -E2H, -E3D, -E3H, -H1AD, -H1BD, -H2AD, -H2BD, -H3AD, -H3BD                     |
|                                                                                                                                                                                                                                                                                                                         |             | IO-320-A1A, -A2A, -B1A, -B1B, -B1C, -B1D, -B1E, -B2A, -C1A, -C1B, -D1A, -D1B, -D1C, -E1A, -E1B, -E2A, -E2B, -F1A                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                         |             | AIO-320-A1A, -A1B, -A2A, -A2B, -B1B, -C1B                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                         |             | AEIO-320-D1B, -D2B, -E1A, -E1B, -E2A, -E2B                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                         |             | O-340-A1A, -A2A, -B1A                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                         |             | O-360-A1A, -A1AD, -A1C, -A1D, -A1F, -A1F6, -A1F6D, -A1G, -A1G6, -A1G6D, -A1H, -A1H6, -A1LD, -A1P, -A2A, -A2D, -A2E, -A2F, -A2G, -A2H, -A3A, -A3AD, -A3D, -A4A, -A4AD, -A4D, -A4G, -A4J, -A4K, -A4M, -A4N, -A4P, -A5AD, -B1A, -B1B, -B2A, -B2B, -B2C, -C1A, -C1C, -C1E, -C1F, -C1G, -C2A, -C2B, -C2C, -C2D, -C2E, -C4P, -C4F, -D1A, -D2A, -D2B, -E1AD, -E1A6D, -E2AD, -E1BD, -E2BD, -F1A6, -G1A6, -J2A |
|                                                                                                                                                                                                                                                                                                                         |             | HO-360-A1A, -B1A, -B1B, -C1A                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                         |             | IO-360-A1A, -A1B, -A1B6, -A1B6D, -A1C, -A1D, -A1D6, -A1D6D, -A2A, -A2B, -A2C, -A3B6, -A3B6D, -A3D6D, -B1A, -B1B, -B1C, -B1D, -B1E, -B1F, -B1F6, -B1G6, -B2E, -B2F, -B2F6, -B4A, -C1A, -C1B, -C1C, -C1C6, -C1D6, -C1E6, -C1E6D, -C1F, -C1G6, -D1A, -E1A, -F1A, -J1AD, -J1A6D, -K2A, -L2A, -M1A, -M1B                                                                                                   |
|                                                                                                                                                                                                                                                                                                                         |             | TO-360-A1A6D, -C1A6D, -E1A6D, -F1A6D                                                                                                                                                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                         |             | AIO-360-A1A, -A1B, -A2A, -A2B, -B1B                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                         |             | HIO-360-A1A, -A1B, -B1A, -B1B, -C1A, -C1B, -D1A, -E1AD, -E1BD, -F1AD, -G1A                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                         |             | TIO-360-A1A, -A1B, -A3B6, -C1A6D                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                         |             | AEIO-360-A1A, -A1B, -A1B6, -A1E6, -A1C, -A1D, -A1E, -A2A, -A2B, -A2C, -B1B, -B1D, -B1F, -B1F6, -B1G6, -B2F, -B2F6, -B1H, -B4A, -H1A, -H1B                                                                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                         |             | IO-390-A1A6, -A3A6                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                         |             | O-540-A1A, -A1A5, -A1B5, -A1C5, -A1D, -A1D5, -A2B, -A3D5, -A4A5, -A4B5, -A4C5, -A4D5, -B1A5, -B1B5, -B1D5, -B2A5, -B2B5, -B2C5, -B4A5, -B4B5, -D1A5, -E4A5, -E4B5, -E4C5, -F1A5, -F1B5, -G1A5, -G2A5, -H1A5, -H2A5, -H1A5D, -H2A5D, -H1B5D, -H2B5D, -J1A5D, -J2A5D, -J1B5D, -J2B5D, -J3A5D, -J1C5D, -J2C5D, -J1D5D, -J2D5D, -J3C5D, -L3C5D                                                            |

Table 1 - Starter / Engine Effectivity (Cont'd)

# SERVICE LETTER

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### 149NL/EC Kickback Protection

| Starter P/N                                                                                                                                                                                                                                                                                                             | Engine Make | Engine Model/Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>HET</b><br>149NL/EC<br><br><b>Lycoming</b><br>76212,<br>76214,<br>LW-11939,<br>LW-14208,<br>LW-14210,<br>LW-41213,<br>LW-15557,<br>LW-15572,<br>LW-15574,<br>LW-14447,<br>LW-18990,<br>31B23592,<br>31B22207,<br>31B21064,<br>31B22101,<br>31B22104,<br>31B22105,<br>31B22110,<br>31B22111,<br>31B22476,<br>31B22470 | Lycoming    | IO-540-A1A5, -B1A5, -B1B5, -B1C5, -C1B5, -C1C5, -C2C, -C4B5, -C4B5D, -C4C5, -C4D5, -C4D5D, -D4A5, -D4B5, -D4C5, -E1A5, -E1B5, -E1C5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -K1A5, -K1A5D, -K1B5, -K1B5D, -K1C5, -K1D5, -K1E5, -K1E5D, -K1F5, -K1F5D, -K1G5, -K1G5D, K1H5, -K1J5, -K1J5D, -K1K5, -K2A5, -L1A5, -L1A5D, -L1B5D, -L1C5, -M1A5, -M1A5D, -M1B5D, -M1C5, -M2A5D, -N1A5, -P1A5, -R1A5, -S1A5, -T4A5D, -T4B5, -T4B5D, -T4C5D, -U1A5D, -U1B5D, -V4A5D, -V4A5, -W1A5, -W1A5D, -W3A5D, -AA1A5, -AA1B5, -AB1A5, -AC1A5, -AC2A5, -AE1A5 |
|                                                                                                                                                                                                                                                                                                                         |             | HIO-540-A1A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                         |             | AEIO-540-D4A5, -D4B5, -D4C5, -D4D5, -L1B5D, -L1B5, -L1D5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                         |             | TIO-540-A1A, -A1B, -A2A, -A1C, -A2C, -C1A, -E1A, -F2BD, -G1A, -H1A, -J2B, -J2BD, -K1AD, -N2BD, -R2AD, -S1AD, -T2AD, -U2A, -V2AD, -W2A, -AA1AD, -AB1AD, -AB1BD, -AE2A, -AF1A, -AF1B, -AG1A, -AH1A, -AJ1A, -AK1A                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                         |             | Intentionally left Blank                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

(Cont'd) Table 1 - Starter / Engine Effectivity

# Service Letter Appendix

## Service Letter No. 091

### **149NL/EC Kickback Protection**

#### **1. Eligibility:**

- A. Aircraft starter assemblies P/N 149NL/EC shipped by Hartzell Engine Technologies LLC on or after 01 Feb. 2020 are affected by Service Letter (SL) 091.

#### **2. Commercial Assistance Program:**

The following will be provided with the submission of a completed Service Letter 091 Claim Form, copies of invoices showing breakdown of material and labor charges, and log book entries. **Any commercial assistance or other consideration shall expire twelve (12) calendar months from the original published date of Service Letter No. 091.**

- A. Required material listed in section 2 of SL 091.

#### **3. Commercial Assistance ADMINISTRATION:**

- A. Complete the Service Letter SL 091 Claim Form attached to this appendix.
  - (1) Mail, e-mail, or fax the SL 091 Claim Form to the attention of Product Support as indicated on the Service Letter Claim Form.
- B. Upon receipt of the Service Letter Claim Form, Hartzell Engine Technologies LLC HET will:
  - (1) Ship the required material in accordance with section 2 (HET parts) to the service provider indicated.
  - (2) The service provider must return proof of service within thirty (30) days or the service provider shall be invoiced for the HET supplied materials.
- C. For parts listed in section 2:
  - (1) Aircraft/engine service facility or owner must submit an invoice up to the amount specified in section 2, copies of logbook entries, and a completed SL 091 Claim Form for reimbursement (*May be a copy of the original form provided*).

#### **4. WARRANTY STATEMENT:**

- A. The sole warranty for the actions of SL 091 are contained in the HET Limited Warranty Policy issued with the purchase of each new/overhauled alternators (see terms and conditions therein).
- B. Commercial assistance may apply as stated in this Appendix.
- C. Issuance of SL 091 in no way constitutes an implied or expressed warranty of any kind.

# Service Letter Appendix

**Service Letter No. 091**

## **149NL/EC Kickback Protection**

- D. This publication does not imply or state any responsibility for the workmanship of any person or entity performing work or maintenance on the engine or aircraft electrical system.

### **5. CONTACT INFORMATION:**

- A. Contact HET Product Support for all communications regarding the technical content of this Service Letter.

- (1) Phone +1.334.386.5400 (Option 2)
- (2) Fax +1.334.386.5410
- (3) E-mail at techsupport@Hartzell.aero
- (4) Address

Hartzell Engine Technologies LLC  
2900 Selma Highway,  
Montgomery, AL 36108  
USA

# Service Letter Appendix

**Service Letter No. 091**

## **149NL/EC Kickback Protection**

**SL 091 CLAIM FORM**

### **Owner information**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Tel: \_\_\_\_\_ Fax: \_\_\_\_\_

Company Name: \_\_\_\_\_ E-mail: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Country: \_\_\_\_\_

### **Aircraft/Engine Service Facility information**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Tel: \_\_\_\_\_ Fax: \_\_\_\_\_

Company Name: \_\_\_\_\_ E-mail: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Country: \_\_\_\_\_

Aircraft Mfg: \_\_\_\_\_ Model: \_\_\_\_\_ Time in Service: \_\_\_\_\_ S/N: \_\_\_\_\_

Engine: \_\_\_\_\_ Model: \_\_\_\_\_ Time in Service: \_\_\_\_\_ S/N: \_\_\_\_\_

### **Component Information**

Nomenclature: 149NL/EC Starter Assembly Part Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_ (Starter) Date Removed: \_\_\_\_\_

Part Time in Service: \_\_\_\_\_ (Starter) Original Date Installed: \_\_\_\_\_

For RMA Number

Send this SL 091 Claim Form to:

Hartzell Engine Technologies Product Support

Fax: +1.334.386.5410

E-mail: techsupport@hartzell.aero

### **RMA Number:**

(write in HET assigned RMA number)

**Hartzell Use Only - do not write below this line.**

Warranty No: \_\_\_\_\_ Authorized by: \_\_\_\_\_