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SERVICE BULLETIN

N° **189-378**

**RECOMMENDED**

DATE: December 21, 2023

REV. : /

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**TITLE**

**ATA 24 - STARTER GENERATOR DRIVE SHAFT ASSEMBLY REPLACEMENT**

**REVISION LOG**

First Issue

# 1. PLANNING INFORMATION

## A. EFFECTIVITY

All AW189 starter generator P/N 8G2420V00551 with S/N reported in Table 1 below (Honeywell P/N 65000027-2 Series 1) Mod Record 10 kept in stock.

Serial Numbers
65000027-00227
65000027-00228
65000027-00230
65000027-00231
65000027-00232
65000027-00233
65000027-00237
65000027-00238
65000027-00239
65000027-00240
65000027-00241
65000027-00243
65000027-00245
65000027-00247
65000027-00248
65000027-00250
65000027-00251
65000027-00252
65000027-00253
65000027-00257
65000027-00258

Table 1

## B. COMPLIANCE

Before installation on helicopter.

LH recommends the implementation of this SB in accordance with the indicated compliance time, with related tolerances as applicable. It is Operator’s responsibility to properly plan and execute the SB application i.a.w. LH recommendations. The Operator remains liable for any deviation.

## C. CONCURRENT REQUIREMENTS

N.A.

## D. REASON

Honeywell, the supplier of the starter generator, released a Service Bulletin in order to replace a potential defective drive shaft kit installed on a batch of MOD Record 10 generators.

The replacement of this component will prevent a possible engine failure caused by improperly manufactured drive shaft.

For starter generators that have been installed and are in use, no action is required.

The Honeywell SB is endorsed by LHD with the present SB189-378.

LH issued this SB for the following reason:

Helicopter Reliability/Maintainability	✓
Product Improvement	
Obsolescence	
Customization	
Product/Capability Enhancement	

## E. DESCRIPTION

This Service Bulletin is issued in order to provide the necessary instruction on how to perform the replacement of the drive shaft kit on the starter generator in stock, for the purpose of potential field failures prevention.

## F. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

EASA states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives.

If an aircraft listed in the effectivity embodies a modification or repair not LHD certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

## G. MANPOWER

To comply with this Service Bulletin one (1) MMH is deemed necessary.

MMH are based on hands-on time and can change with helicopter configuration,

personnel and facilities available. MMH are not comprehensive of the overall hours necessary to get access to work areas and to remove all the equipment that interferes with the application of the prescribed instructions.

## **H. WEIGHT AND BALANCE**

N.A.

## **I. REFERENCES**

### **I.1 PUBLICATIONS**

N.A.

### **I.2 ACRONYMS & ABBREVIATIONS**

DM	Data Module
DOA	Design Organization Approval
EASA	European Union Aviation Safety Agency
LH	Left Hand
LHD	Leonardo Helicopters Division
MMH	Maintenance Man Hours
P/N	Part Number
SB	Service Bulletin

### **I.3 S/N SERIAL NUMBER ANNEX**

Annex A Honeywell Service Bulletin 65000027-24-0002

## **J. PUBLICATIONS AFFECTED**

N.A.

## **K. SOFTWARE ACCOMPLISHMENT SUMMARY**

N.A.

## **2. MATERIAL INFORMATION**

### **A. REQUIRED MATERIALS**

#### **A.1 PARTS**

##### **NOTE**

Please note that a new Starter generator P/N 8G2420V00551 (Honeywell P/N 65000027-2) will not be supplied. This SB is applicable only to starter generators kept in stock.

Refer to Chapter 2 "Material Information" section of Honeywell Service Bulletin 65000027-24-0002 in Annex A.

#### **A.2 CONSUMABLES**

Refer to Chapter 2 "Tooling" section of Honeywell Service Bulletin 65000027-24-0002 in Annex A.

#### **A.3 LOGISTIC MATRIX**

N.A.

### **B. SPECIAL TOOLS**

Refer to Chapter 2 "Tooling" section of Honeywell Service Bulletin 65000027-24-0002 in Annex A.

### **C. INDUSTRY SUPPORT INFORMATION**

Owners/Operators who comply with the instructions of this Service Bulletin no later than the applicable date in the "Compliance" section will be eligible to receive REQUIRED MATERIALS on free of charge basis (please refer to Honeywell Service Bulletin 65000027-24-0002 in Annex A), except for Consumable Materials and Special Tools. Customers who fail to comply with the instructions in this Service Bulletin before the compliance date are not eligible for the aforementioned special policy.

Please Issue relevant MMIR form to your Warranty Administration Dpt., including pictures of the component plate showing the S/N and formal PO showing required parts, after the inspection required on "Accomplishment instructions" section; claims without the aforementioned attachments will be rejected.

### **3. ACCOMPLISHMENT INSTRUCTIONS**

#### **GENERAL NOTES**

Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.

1. In accordance with section 3 of Honeywell Service Bulletin 65000027-24-0002 in Annex A, replace the drive shaft assembly of the Honeywell starter generator P/N 8G2420V00551.
2. Record for compliance with this Service Bulletin on the starter generator log book.
3. Gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

As an alternative, send the attached compliance form to the following mail box:

[engineering.support.lhd@leonardo.com](mailto:engineering.support.lhd@leonardo.com)

and (for North, Central and South America) also to:

[AWPC.Engineering.Support@leonardocompany.us](mailto:AWPC.Engineering.Support@leonardocompany.us)

# ANNEX A

**HONEYWELL SERVICE BULLETIN**

**65000027-24-0002**

**STARTER GENERATOR UPGRADE**

## Honeywell

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 CAGE: 64547  
 Telephone: 800-601-3099 (Toll Free U.S.A./Canada)  
 Telephone: 602-365-3099 (International Direct)

Website: <https://aerospace.honeywell.com>

# SERVICE BULLETIN

**ELECTRICAL POWER - STARTER GENERATOR - FIELD MODIFICATION OF THE HONEYWELL STARTER GENERATOR, PN 65000027-2 SERIES 1 MOD RECORD 10 TO REPLACE SUSPECT DRIVE SHAFT KIT PN 65058091-1 WITH NEW REPLACEMENT KIT PN 65058091-1**

### Legal Notice

**NOTICE:** This is a CATEGORY 2, RECOMMENDED service bulletin.

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ECCN: 9E991

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28 Apr 2022  
 Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 1 of 22

Publication Number D202201002201

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## SERVICE BULLETIN

65000027

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28 Apr 2022  
 Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 2

Publication Number D202201002201

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## SERVICE BULLETIN

65000027

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28 Apr 2022  
Revision 0, 28 Apr 2022

# 65000027-24-0002

Page 3

Publication Number D202201002201

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65000027

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28 Apr 2022  
Revision 0, 28 Apr 2022

# 65000027-24-0002

Page 4

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

## Transmittal Information

ATA Number 65000027-24-0002 (Publication Number D202201002201)

### Summary

This is the INITIAL release.

Refer to [Paragraph 4.A.](#) for a list of the acronyms and abbreviations used in this service bulletin.

### Revision History

This service bulletin has had no revision(s) as shown in [Table 1.](#)

**Table 1. Revision History**

Revision Number	Revision Date
0	28 Apr 2022

28 Apr 2022  
Revision 0, 28 Apr 2022

# 65000027-24-0002

Page 5

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

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28 Apr 2022  
Revision 0, 28 Apr 2022

**65000027-24-0002**

Page 6

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

1. **Planning Information**

**A. Effectivity**

- (1) This is a CATEGORY 2, RECOMMENDED service bulletin.

NOTE: Category 2 service bulletins address substantial improvements to reliability, usually reducing the probability of experiencing an in-flight shutdown. This category will also be used for bulletins addressing non-conforming hardware that does not create a suspected safety hazard. A compliance schedule stated in the bulletin provides a reasonable reduction in risk while minimizing engine downtime. This schedule is variable and specific to the individual issue if the owner / operator chooses to comply.

- (2) This service bulletin is applicable to the starter generator, PN 65000027-2, Series 1 MOD Record 10 with serial numbers per Table 2.

**Table 2. Applicable Serial Numbers**

Serial Numbers
65000027-00227
65000027-00228
65000027-00230
65000027-00231
65000027-00232
65000027-00233
65000027-00237
65000027-00238
65000027-00239
65000027-00240
65000027-00241
65000027-00243
65000027-00245
65000027-00247
65000027-00248
65000027-00250
65000027-00251
65000027-00252
65000027-00253
65000027-00257
65000027-00258

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 7

Publication Number D202201002201

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## SERVICE BULLETIN

65000027

**B. Concurrent Requirements**

(1) Not applicable.

**C. Reason**

(1) This modification is to the in-service starter generator, PN 65000027-2, Series 1 MOD Record 10 units that were modified using suspect drive shaft kits PN 65058091-1, to prevent field failures.

**D. Description**

(1) This part replacement prevents potential field failures due to improperly assembled drive shaft assemblies.

**E. Compliance**

- (1) For starter generators that have been installed and are in use, no action is required.
- (2) For starter generators that are uninstalled, a new kit PN 65058091-1 must be provided loose to Leonardo Helicopters for service bulletin implementation at the LHD production facility.

**F. Approval**

(1) Not applicable.

**G. Manpower**

- (1) If this modification is done at a customer location (in the aircraft):
- 1 hour(s) for the labor to do the modification of the service bulletin.

**H. Weight and Balance**

(1) None.

**I. Electrical Load Data**

(1) Not applicable.

**J. Software Accomplishment Summary**

(1) Not applicable.

28 Apr 2022  
 Revision 0, 28 Apr 2022

**65000027-24-0002**

Page 8

Publication Number D202201002201

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## SERVICE BULLETIN

65000027

**K. References**

- (1) To find, see, and download Honeywell Technical Publications, go to <https://aerospace.honeywell.com>.
- (2) The documents that follow are recommended but not necessary to do this modification. Unless specified differently, you can use subsequent revisions.
  - CMM, ATA Number 24-21-20 (Publication Number D201107000068), Revision 5 or Latest, Alternating Current Generator.
  - Leonardo AMM.

**L. Other Publications Affected**

- (1) Not applicable.

**M. Interchangeability of Parts**

- (1) The parts provided for this replacement are identical to those being removed, except they have been assembled properly.

**N. Interchangeability or Intermixability of Parts**

- (1) Not applicable.

28 Apr 2022  
Revision 0, 28 Apr 2022

**65000027-24-0002**

Page 9

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

## 2. Material Information

### A. Material - Price and Availability

- (1) For starter generators, PN 65000027-2, Series 1 MOD Record 10, prior to delivery to Leonardo Helicopters, the kit, PN 65058091-1, shall be provided loose to Leonardo Helicopters for service bulletin implementation at the LHD production facility.
- (2) For starter generator re-lubrication, all material is commercially available.

### B. Industry Support Information

- (1) The maximum labor hours that will be reimbursed by Honeywell to do this modification are given below. Reimbursement will not be more than Honeywell's applicable reimbursement labor rate or as specified in the agreement or contract.
  - If this modification is done at a shop location:
    - No labor hours for the labor to do a test if this modification is done at the same time as other inspection, test, or repair work.

### C. Material Necessary for Each Component

- (1) The items specified in Table 3 are necessary to do this service bulletin. Equivalent alternatives are permitted for the materials specified in Table 3.

**Table 3. Operator-Supplied Material**

Number	Description	Source
ASTM D5363 AN0221	Anaerobic adhesive	Commercially available
MIL-S-22473 Grade N or T	Surface primer for anaerobic adhesive	Commercially available
Royco 22MS <sup>1</sup>	Grease (0.045 ounces (1.25 grams))	Commercially available
65000027-2	Starter generator	Contact Leonardo Helicopter
65058091-1	Field service kit	Contact Leonardo Helicopter
	Methyl Ethyl Ketone	Commercially available
	Lint free swabs	Commercially available
	Caliper (with height rod) <sup>1</sup>	Commercially available
	Thin rod (approximately 0.1450 inches (3.683 millimeters in diameter x approximately 4 inches (101.6 millimeters) long) <sup>1</sup>	Commercially available

**NOTE:**

1. The item(s) is/are available from commercial sources and should not be ordered as part of this service bulletin.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 10

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

**D. Material Necessary for Each Spare**

(1) Same as Paragraph 2.C.

**E. Reidentified Parts**

(1) Not applicable.

**F. Tooling - Price and Availability**

(1) The equipment that is necessary to do this modification is specified in the documents given in Table 4 of this service bulletin.

**Table 4. Tooling - Price and Availability**

PN	Keyword/Nomenclature	Price	Availability
65058094-1	Spline wrench		Contact Leonardo Helicopter
	1-1/4 inch open end crows foot torque wrench attachment		Commercially available
	Inch pound torque wrench		Commercially available

28 Apr 2022  
Revision 0, 28 Apr 2022

**65000027-24-0002**

Page 11

Publication Number D202201002201

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## SERVICE BULLETIN

65000027

### 3. Accomplishment Instructions

#### A. General

**WARNING:** BEFORE YOU USE A MATERIAL, REFER TO THE MANUFACTURER'S MATERIAL SAFETY DATA SHEETS. SOME MATERIALS CAN BE DANGEROUS.

**CAUTION:** DO NOT USE A MATERIAL THAT IS NOT EQUIVALENT TO THE MATERIAL SPECIFIED BY HONEYWELL. A MATERIAL THAT IS NOT EQUIVALENT CAN CAUSE DAMAGE TO THE EQUIPMENT AND CAN MAKE THE WARRANTY NOT APPLICABLE.

**CAUTION:** THIS EQUIPMENT CONTAINS MOISTURE-SENSITIVE PARTS. SPECIAL HANDLING IS NECESSARY.

- (1) Obey the precautions.
- (2) Refer to the CMM 24-21-20 (Publication Number D201107000068), for procedures and precautions. Use all CAUTIONS and WARNINGS. Refer to the IPL in the CMM for the location of the parts, unless specified differently.
- (3) Keep all hardware for use in assembly unless specified differently.
- (4) Obey standard established shop practices during modification of the service bulletin unless specified differently.

#### B. Instructions

- (1) Starter generators, PN 65000027-2, series 1 MOD Record 10: Must execute Paragraph 3.C.(1) through Paragraph 3.C.(10).

#### C. Procedure

- (1) Visually Inspect the Field Service Kit Assembly
  - (a) Visually inspect the field service kit assembly, PN 65058091-1, to ensure the gasket:
    - 1 Position: Between the hex nut and the drive shaft flange
    - 2 Condition: Gasket is not damaged (damage examples: holes, tears, missing pieces, etc).
  - (b) If any of the above visual inspections are failed, the hardware shall be rejected and replaced with a conforming assembly. Refer to [Figure 1](#) for the field service kit assembly visual.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

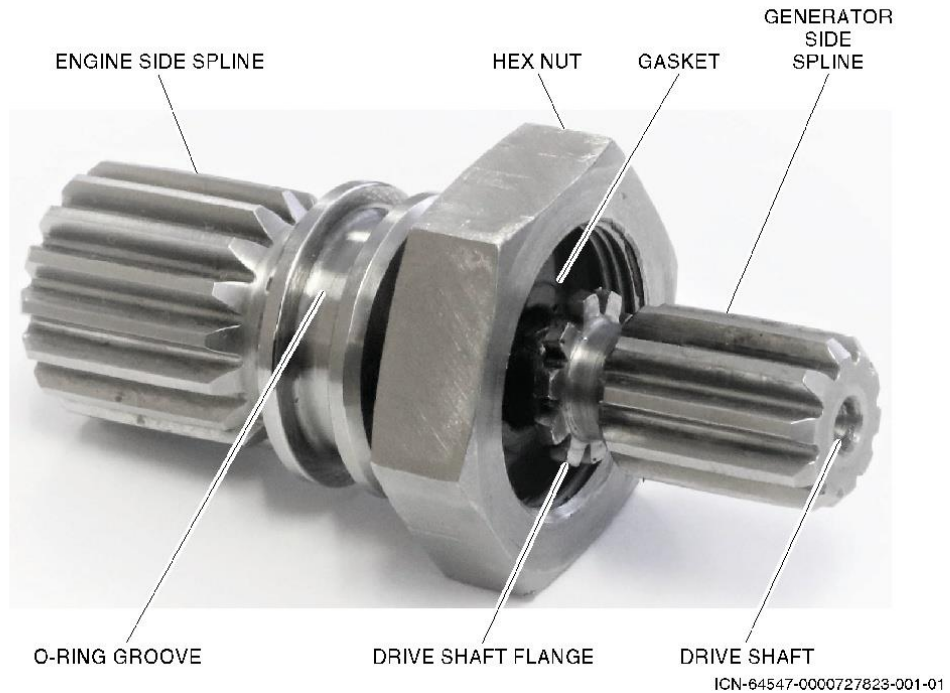
Page 12

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027



**Figure 1. Field Service Kit Assembly, PN 65058091-1**

- (2) Remove Current Drive Shaft
  - (a) Remove the current drive shaft from the starter generator, PN 65000027-2. Refer to Figure 2.
  - (b) Retain all shims for re-use with new kit assembly PN 65058091-1.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

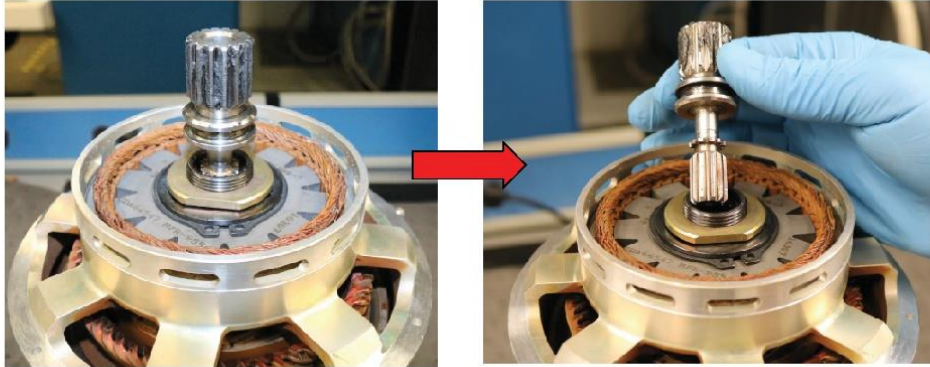
Page 13

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027



ICN-64547-0000722053-001-01

**Figure 2. Drive Shaft Removal**

- (c) Using the appropriate size wrench for the drive shaft hex nut and the special gear spline wrench to hold the drive shaft and rotor assembly stationary, loosen the drive shaft hex nut by turning in the clockwise direction (facing SG Drive End) (HEX NUT is reverse threaded).
  - (d) Rotate the drive shaft hex nut until it comes free of the rotor shaft threads.
  - (e) Pull the drive shaft assembly out of the rotor shaft (grease will likely be present on the internal spline teeth).
  - (f) Remove and retain the shims from the rotor shaft threaded area over the flat permanent magnet nut.
- (3) Install Required Quantity of Shims
- (a) Re-install the required quantity of shims retained in Paragraph 3.C.(2) around the rotor shaft, on top of the PM nut. Refer to Figure 3.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

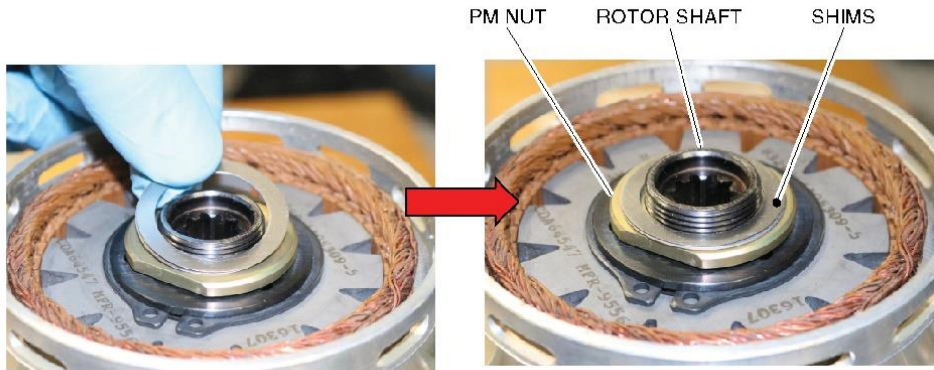
Page 14

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027



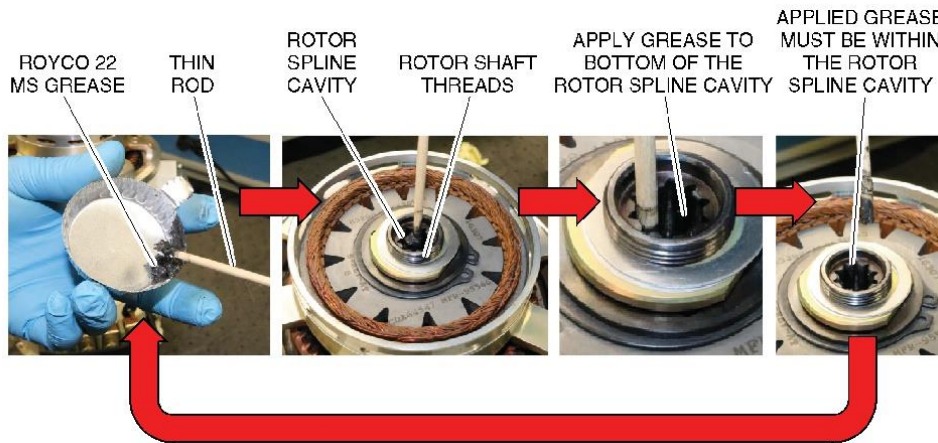
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Figure 3. Shim Position

(4) Applying 1.25 Grams of Royco 22 MS Grease

- (a) Carefully using the end of a thin rod, apply Royco 22 MS grease to the bottom of the spline cavity until a total amount of  $1.25 \pm 0.05$  grams ( $0.045 \pm 0.018$  ounces) has been added. All  $1.25 \pm 0.05$  grams ( $0.045 \pm 0.018$  ounces) of Royco 22 MS must be applied to the inside of the rotor spline cavity. Refer to Figure 4.

**CAUTION:** PREVENT FROM CONTAMINATING THE ROTOR THREADS WITH ANY GREASE.



ICN-64547-0000722057-001-01

Figure 4. Royco 22 MS Grease Application

28 Apr 2022  
Revision 0, 28 Apr 2022

**65000027-24-0002**

Page 15

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

## (5) Clean Threads

- (a) Using lint free swabs and isopropyl alcohol or MEK or suitable solvent clean all rotor shaft threads and hex nut threads. Remove any oil, dirt, grit, grease, or other contamination. Refer to Figure 5.

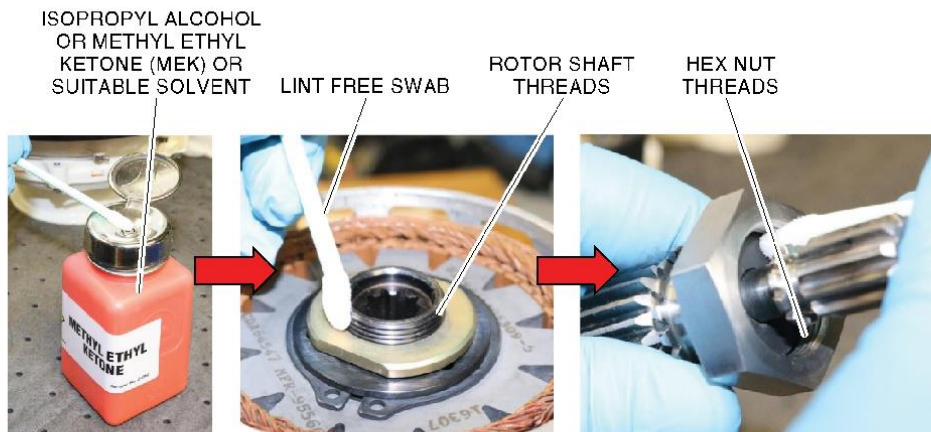


Figure 5. Swab Application

## (6) Apply Surface Primer

- (a) Apply surface primer identified per ASTM D5363 to all the rotor shaft threads and hex nut threads. Refer to Figure 6.
- (b) Surface primer shall be allowed to dry for 3 to 5 minutes before continuing to Paragraph 3.C.(7), the application of the anaerobic adhesive.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

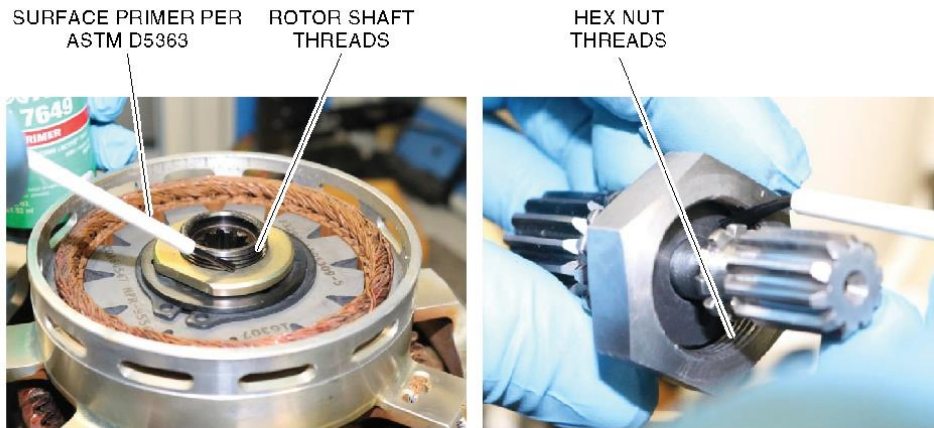
Page 16

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027



ICN-64547-0000722059-001-01

**Figure 6. Surface Primer Application**

- (7) Apply Anaerobic Adhesive to Threads
- (a) Apply a small drop of anaerobic adhesive, identified by AN0221 per ASTM D5363 (thread locker), on the second thread on the end of the rotor shaft. Refer to Figure 7.
  - (b) Apply a second drop opposite the first also on the second thread.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 17

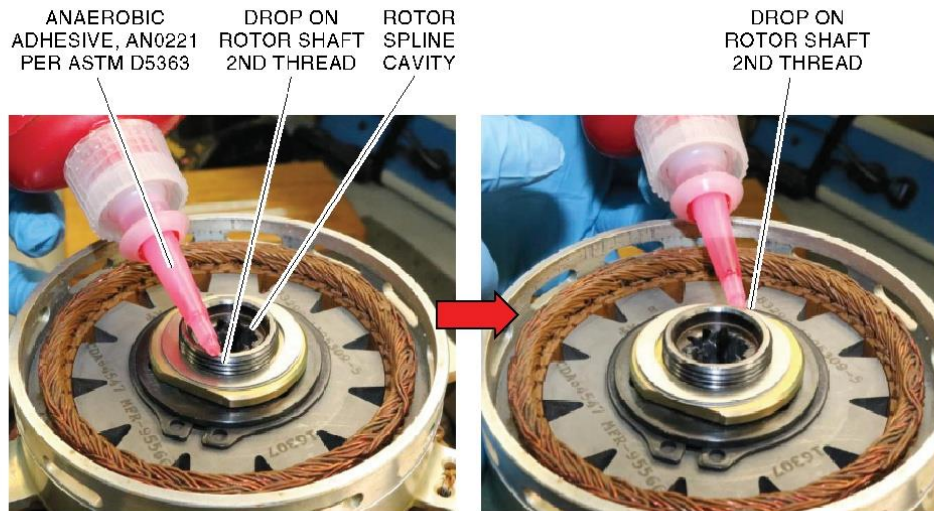
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65000027



ICN-64547-0000722060-001-01

**Figure 7. Anaerobic Adhesive Application**

- (8) Install Drive Shaft Assembly
- (a) While holding the hex nut against the o-ring groove, of the bigger spline section of the drive shaft, slowly insert the drive shaft smaller spline section to the bottom of the rotor spline cavity. Refer to Figure 8.
 

**NOTE:** An insertion resistance will be felt due to the  $1.25 \pm 0.05$  grams ( $0.045 \pm 0.018$  ounces) of Royco 22 MS grease present in the rotor spline cavity.
  - (b) Continue to hold the hex nut against the o-ring groove, of the bigger spline section, and visually inspect all the rotor threads and hex nut threads for any grease contamination.
  - (c) If grease contamination is visually detected on the threads then remove the grease retention hardware, restart process from Paragraph 3.C.(4).

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 18

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

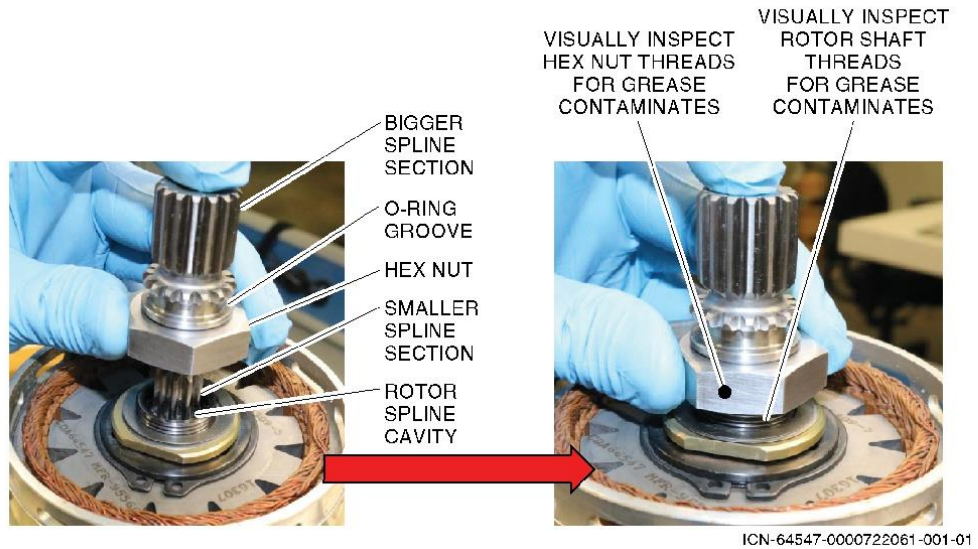


Figure 8. Drive Shaft Assembly

- (9) Torquing the Hex Nut
- (a) Use the gear spline wrench, PN 65058094-1, on the bigger section of the drive shaft to keep the rotor from rotating. Then torque the hex nut in the counter clockwise direction (reverse threading) to  $100 \pm 5$  in-lbs ( $11.3 \pm 0.56$  Nm). Refer to Figure 9.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 19

Publication Number D202201002201

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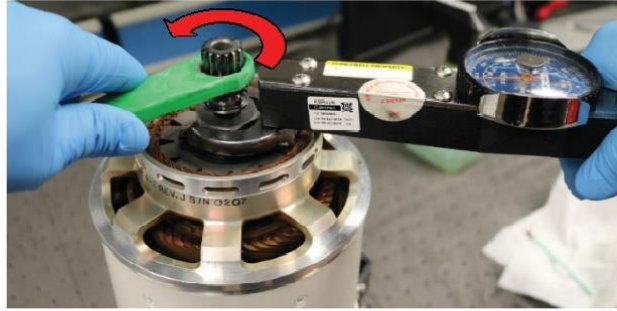
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## SERVICE BULLETIN

65000027



GEAR SPLINE WRENCH  
 COLOR MAY DIFFER  
 FROM PICTURE



ICN-64547-0000722062-001-01

**Figure 9. Hex Nut Rotation**

- (10) Visually Inspect the Assembly
- (a) Visually inspect the drive shaft assembly to ensure that the gasket is not extruding through the hex nut center hole. Refer to [Figure 10](#).
  - (b) If the gasket is observed to be extruding from the hex nut center hole, then restart the process from Paragraph 3.C.(1).

28 Apr 2022  
 Revision 0, 28 Apr 2022

## 65000027-24-0002

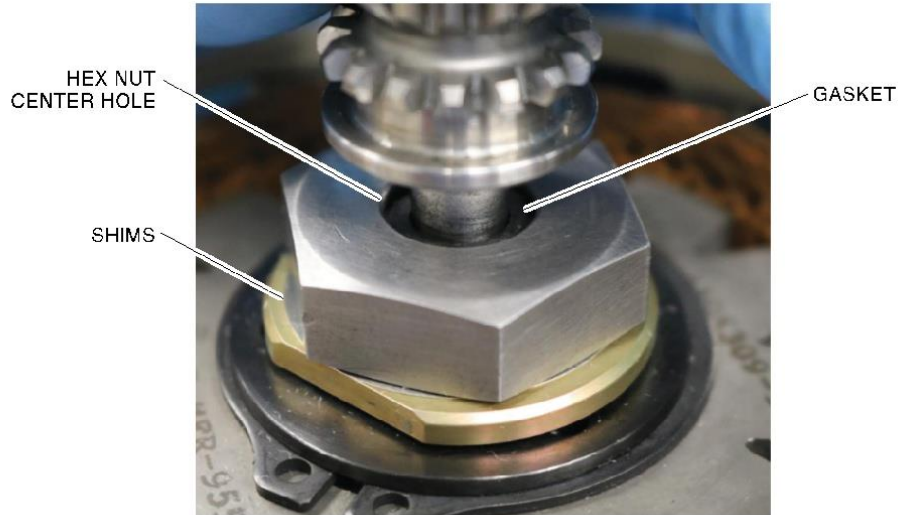
Page 20

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027



ICN-64547-0000722063-001-01

Figure 10. Assembly Inspection

- D. **Test**
  - (1) Not applicable.
  
- E. **Close-up**
  - (1) Not applicable.

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 21

Publication Number D202201002201

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# Honeywell SERVICE BULLETIN

65000027

## 4. Appendix

### A. Appendix A, Acronyms and Abbreviations

(1) Refer to [Table 5](#) for a list of the acronyms and abbreviations used in this service bulletin.

**Table 5. Acronyms and Abbreviations**

Term	Full Term
AMM	Aircraft Maintenance Manual
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
CAGE	Commercial and Government Entity
CMM	Component Maintenance Manual
CFR	Code of Federal Regulations
ECCN	Export Control Classification Number
FAA	Federal Aviation Administration
HCS	Hazard Communication Standard
IPL	Illustrated Parts List
MEK	Methyl Ethyl Ketone
MOD	Modification
Nm	Newton Meter
OSHA	Occupational Safety and Health Administration
PMA	Parts Manufacturer Approval
PM	Permanent Magnet
PN	Part Number
Qty	Quantity

28 Apr 2022  
Revision 0, 28 Apr 2022

## 65000027-24-0002

Page 22

Publication Number D202201002201

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