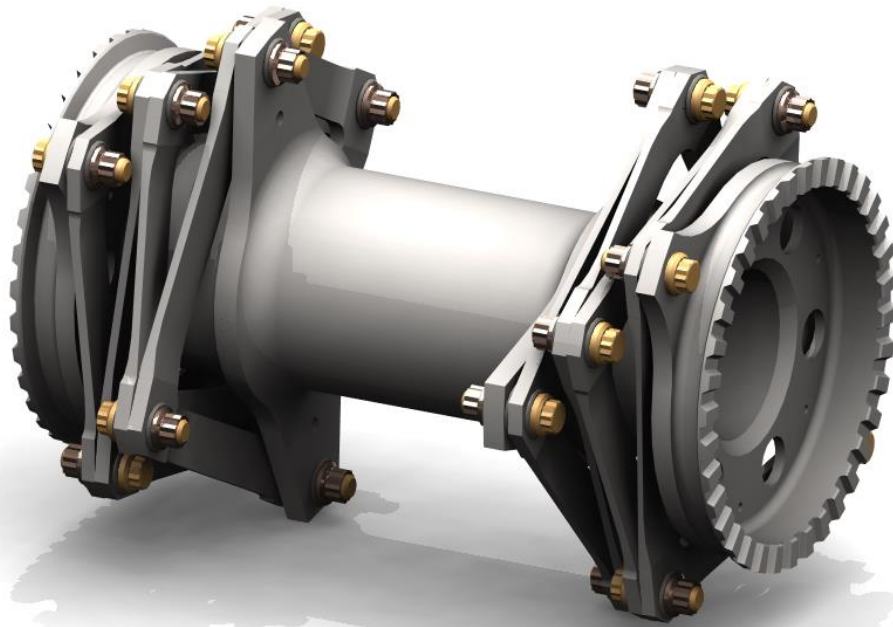


# Maintenance and Repair of the KAflex<sup>®</sup> Driveshaft for the Bell UH-1H Helicopter.



**KAMATICS CORPORATION**  
**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS 3303**

This Instruction for Continued Airworthiness consists of the following sections:

1. KAflex Driveshaft Inspection
2. KAflex Driveshaft Maintenance
3. KAflex Driveshaft Repair

**LOG OF REVISIONS TO KAMATICS CORPORATION**  
**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS 3303**

Revision	Reason	Prepared By
NC		AJZ
A	Removed all references to overhaul operations in accord with FAA Policy Statement PS-AIR-21.50-01	ML
B	Added PMA approval and the Component Historical Card to back of this document	MFN

**SECTION 1**  
**INSPECTION OF KAflex DRIVESHAFT**

1. **Scheduled Inspections**

**DAILY INSPECTION**  
**BEFORE FIRST FLIGHT OF THE DAY**

1. Check general condition of KAflex Driveshaft.
  - a. Check for loose and missing hardware (bolts, nuts, washers). If loose or missing hardware is found, replace with a serviceable unit.
  - b. Inspect flex frame and mount bolt torque stripes for evidence of slippage.

**WARNING**

**DO NOT disturb or tighten flex frame nuts or bolts. Evidence of turning fasteners by wrench or other means is cause for rejection.**

**100 HOUR INSPECTION**

1. Check general condition of KAflex Driveshaft.
  - a. Check for loose and missing hardware (bolts, nuts, washers). If loose or missing hardware is found, replace with a serviceable unit.
  - b. Inspect flex frame and mount bolt torque stripes (yellow) for evidence of slippage. If the torque stripes have faded, touch up using Loctite E-20HP Hysol Epoxy Adhesive, Fast Setting or equivalent available from Henkel North America at <http://www.henkelna.com>.

**WARNING**

**DO NOT disturb or tighten flex frame nuts or bolts. Evidence of turning fasteners by wrench or other means is cause for rejection.**

**100 HOUR INSPECTION (continued)**

- c. Inspect KAflex Driveshaft for damage and corrosion. Refer to Figure 1 for damage and repair limits.

- d. Inspect KAflex Driveshaft flex frame joints for fretting dust which would show up as red metallic residue or debris. If grease, oil or dirt is covering suspected area, or any doubt exists as to whether actual fretting has occurred, clean suspected areas thoroughly and recheck in conjunction with next daily inspection.  
If fretting is apparent, replace with a serviceable unit.
- e. Inspect KAflex Driveshaft for any signs of contact, rubbing, or abrasion. Refer to Figure 1 for damage and repair limits.

### OUT OF AIRCRAFT INSPECTION

#### Note

**This inspection is to be done at 1200 hour intervals (or 12 months of component operation, whichever occurs first). This inspection reads like the 100 hour inspection, but will be more comprehensive with the driveshaft out of the aircraft.**

- 1. Check general condition of KAflex Driveshaft.
  - a. Check for broken, loose, or missing hardware (bolts, butts, washers). If loose or missing hardware is found, replace with a serviceable unit.
  - b. Inspect flex frame and mount bolt torque stripes (yellow) for evidence of slippage. If the torque stripes have faded, touch up using Loctite E-20HP Hysol Epoxy Adhesive, Fast Setting or equivalent available from Henkel North America at <http://www.henkelna.com>.

#### WARNING

**DO NOT disturb or tighten flex frame nuts or bolts. Evidence of turning fasteners by wrench or other means is cause for rejection.**

### OUT OF AIRCRAFT INSPECTION (continued)

- c. Inspect KAflex Driveshaft for damage and corrosion. Refer to Figure 1 for damage and repair limits.
- d. Inspect KAflex Driveshaft flex frame joints for fretting dust. This would show up as red metallic residue or debris. If grease, oil or dirt is covering a suspected area, or any doubt exists as to whether actual fretting has

occurred, clean suspected areas thoroughly and recheck.

If fretting is apparent, replace with a serviceable unit.

- e. Inspect KAflex Driveshaft for any signs of contact, rubbing, or abrasion. Refer to Figure 1 for damage and repair limits.
- f. Enter the 1200 hour inspection record in the historical data card enclosed with this service manual.

### 5,000 HOUR REMOVAL

- 1. After 5,000 hours of operation, the driveshaft should be removed from the aircraft and replaced with a serviceable unit.

## 2. Conditional Inspections

### Note

**The following inspections detail special inspection instructions applicable to KAflex Driveshaft. Refer to appropriate Bell and Textron-Lycoming maintenance manuals for airframe and engine special inspection instructions.**

#### 1. Overtorque

- a. 110-120% overtorque, perform a daily inspection on KAflex Driveshaft.
- b. 120+% overtorque, replace with a serviceable unit.

#### 2. Overspeed

- a. <114% overspeed, no KAflex Driveshaft inspection necessary.
- b. >114% overspeed, replace with a serviceable unit.

#### 3. Sudden Stoppage

- a. Perform a 100 hour inspection on the KAflex Driveshaft. Inspect freewheeling clutch assembly for evidence of overtorque. If clutch sprags are chipped or broken, if there is evidence of static brinelling of clutch races or other evidence of torsional overload, replace with a serviceable unit.

#### 4. Hard Landing

- a. If any of the following components do not pass their respective inspection criteria, the KAflex Driveshaft must be replaced with a serviceable unit:
  - i. Main Rotor Hub
  - ii. Main Rotor Mast
  - iii. Main Transmission, Main Transmission Mounts, Drag Pin, Drag Plate
  - iv. Freewheeling Clutch Assembly
  - v. Engine or Engine Mounts
- b. Even if none of the items in Item 'a' above show the effects of the hard landing, perform a 100 hour inspection on the KAflex Driveshaft.

#### 5. After Lightning Strike

- a. Lightning damage can show as burn marks, heat discoloration, arc marks, or as small weld marks (where the metal has melted and became solid again).
- b. If any evidence of lightning damage is found on the driveshaft or adjacent components as described in Item 'a' above, remove driveshaft and replace with a serviceable unit.

#### 6. Compressor Stall/Surge

- a. Remove and examine the condition of the driveshaft.
- b. If any damage suspected to be related to the compressor stall or surge is found, remove the driveshaft and replace with a serviceable unit.
- c. If no defects were detected, return the driveshaft to service.

#### 7. Pylon Whirl

- a. Pylon Whirl is an elliptical motion of the pylon which occurs after blade flapping and mast bumping. Pylon Whirl inspection will be performed if any of the following conditional events has occurred:
  - i. An abnormal landing
  - ii. Excessive slope landing
  - iii. Helicopter was operated in severe turbulence
  - iv. Low rotor RPM during flight

- v. Application of extreme and rapid cyclic control input
- vi. Main Driveshaft Coupling has contacted the Isolation Mount
- b. Examine Isolation Mount for damage caused by contact from Main Driveshaft.
- c. If the Isolation Mount shows signs of damage, remove driveshaft and replace with a serviceable unit.



**SECTION 2**  
**MAINTENANCE OF KAflex DRIVESHAFT**

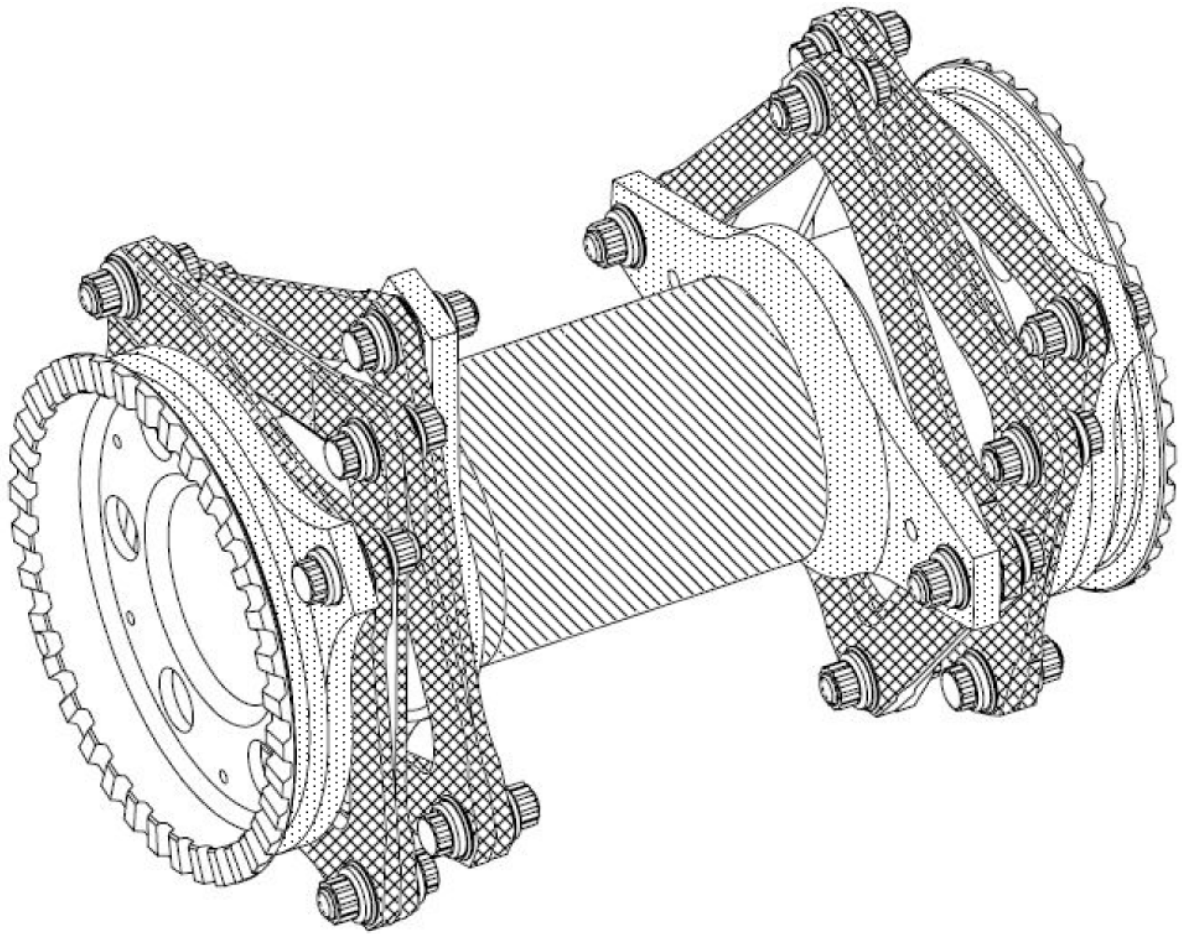
1. There is no periodic maintenance requirement for the KAflex Driveshaft.
2. The following maintenance practices will be incorporated as follows:

The KAflex Driveshaft is not field-overhauled. DO NOT disturb or tighten flex frame nuts or bolts during inspections. Evidence of turning fasteners by wrench or other means is cause for rejection.

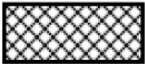

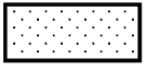

- a. Any time the KAflex Driveshaft is transferred from one aircraft to another, a 100 hour inspection should be performed at this time. Subsequent 100 hour inspections should be performed at aircraft 100 hour intervals.
- b. The KAflex Driveshaft is to be removed at 5,000 hours and replaced with a serviceable unit.

**SECTION 3**  
**REPAIR OF KAflex DRIVESHAFT**

1. Refer to Figure 1 for repair criteria. All blends shall be smooth at maximum depth and smoothly blended with surrounding surfaces.
2. The KAflex Driveshaft is not field overhauled. DO NOT disturb or tighten flex frame nuts or bolts during inspections or repairs. Evidence of turning fasteners by wrench or other means is cause for rejection.
3. The KAflex Driveshaft is to be removed at 5,000 hours replaced with a serviceable unit.




### DAMAGE LOCATION SYMBOLS

Type of Damage	Maximum Damage and Repair Depth			
				
MECHANICAL	0.001" before and after repair	0.005" before and after repair	0.005" before and after repair	0.015" before and after repair
CORROSION	Surface, no pits	0.005" before and after repair	0.005" before and after repair	0.010" before and after repair
MAXIMUM AREA PER FULL DEPTH REPAIR	0.05 in <sup>2</sup>	0.10 in <sup>2</sup>	0.25 in <sup>2</sup>	0.25 in <sup>2</sup>
NUMBER OF REPAIRS	One per leg			
EDGE DENTS, NICKS	0.001 in	0.010 in	0.010 in	0.025 in

**FIGURE 1: Damage Limits – KAFlex Driveshaft**

NOTES:

1. No cracks are permitted
2. Repairs must be no less than 1.000 inch apart.
3. Repairs not to be within 0.500 inches of bolt hole.
4. Faying surfaces must be free of any raised metal areas.
5. All repairs to be smooth at maximum depth and smoothly blended with surrounding surface.
6. Exposed bare metal may be touched up with Sermetel Product 1122 or 196 available from Praxair Surface Technologies. Zinc Chromate, primer color T, even though it does not blend cosmetically with Sermetel coating, can be used if Sermetel touch-up products are unavailable.
7. Sides and corners of flex frames are to be treated as  areas.
8. If damage exceeds limit specified in this section, replace with a serviceable unit.

**SECTION 4**  
**PARTS MANUFACTURER APPROVAL**

Following is a copy of:

1. FAA Parts Manufacturer Approval Number PQ0856NE



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

**Aircraft Certification Service  
System Oversight Division**

**Bradley MIDO Section**  
1699 King Street, Suite 206  
Enfield, CT 06082  
Phone: (860) 386-1850  
Fax: (860) 386-1827

August 16, 2017

Kamatics Corporation  
1330 Blue Hills Avenue  
Bloomfield, CT 06002

**FEDERAL AVIATION ADMINISTRATION – PARTS MANUFACTURER APPROVAL**

In accordance with the provisions of Title 14, Code of Federal Regulations (14 CFR), Part 21, Certification Procedures for Products and Articles, Subpart K, the FAA has found that the design data, based on Test and Computations submitted by Kamatics Corporation, with your letter dated June 26, 2017, meet the airworthiness requirements of the regulations applicable to the products on which the parts are to be installed. Additionally, the FAA has determined that Kamatics Corporation, has established the quality system required by §21.307 at 1330 Blue Hills Avenue, Bloomfield, CT. Accordingly, Parts Manufacturer Approval (PMA) is hereby granted for production of the replacement articles listed in the enclosed Supplement No. 112.

You are reminded that the provisions of 14 CFR, Parts 21 and 45, noted in our PMA letter of approval dated April 22, 2013, also apply to the enclosed PMA Listing-Supplement No. 112. The enclosed supplement should be retained with the original PMA letter as evidence of approval to produce the parts concerned.

Sincerely,

Eileen Murphy  
Manager, Bradley MIDO Section

Enclosure:  
PMA Listing-Supplement No. 112



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

FEDERAL AVIATION ADMINISTRATION (FAA) – PARTS MANUFACTURER APPROVAL (PMA)

Kamatiks Corporation  
1330 Blue Hills Avenue  
Bloomfield, Connecticut 06002

PMA NO. PQ0856NE  
SUPPLEMENT NO.: 112  
DATE: August 16, 2017

Article Name	Article Number	Approved Replacement For Article Number	Approval Basis and Approved Design Data	Make Eligibility	Model Eligibility
KAflex® Driveshaft Main Drive UH-1	SKCP3303-1	SKCP2281-103	Test and Computations per 14 CFR, §21.303 <u>DWG No:</u> SKCP3303-1 <u>Rev:</u> E <u>Date:</u> 06/29/17 or later FAA-approved revisions	JJASPP Engineering Services LLC  Tamarack Helicopters, Inc.  OAS Parts LLC  Southwest Florida Aviation International  Global Helicopter Technology, Inc.  Hagglund Helicopters, LLC  Arrow Falcon Exporters, Inc.  Richards Heavylift Helo, Inc.  Northwest Rotorcraft, LLC	UH-1H

-----END OF DATA-----

GENERAL NOTES:

Provide minor design changes in a manner as determined by the ACO. Process major design changes to drawings and specifications in the same manner as that for an original FAA-PMA.

The FAA accepted the ICA approach for the above articles with their designs. These ICA may refer to those of the respective articles from the holders of type certificates. Otherwise, provide supplemental ICA for differences in the replacement articles. Make referral statements or supplemental ICA readily available per 14 CFR 21.50.

*Neil Doherty*  
NEIL DOH  
for Kevin Dickert, Manager  
Boston ACO Branch

*Eileen Murphy*  
Eileen Murphy  
Eileen Murphy, Manager  
Bradley MIDO Section, AIR-8A1

COMPONENT NAME:

PART NUMBER: SKCP3303-1

SERIAL NUMBER

PAGE OF

## HISTORICAL SERVICE RECORD

[illegible]

## TECHNICAL DIRECTIVES AND HISTORY OF OPERATIONS

[illegible]

		ORIGINALLY PLACED IN SERVICE	INSTALLATION DATA		SCHEDULED REMOVAL	REMOVAL DATA		
COMPONENT NAME	SERIAL NUMBERS		ACCULATED TIME ON ASSEMBLY OR PART		DATE	DATE	ACCUMULATED TIME ON ASSEMBY OR PART	
PART NUMBER			DATE COMPONENT HOURS	SINCE NEW (HRS)	SINCE REBUILD (HRS)	COMPONENT HOURS	AIRCRAFT HOURS	SINCE NEW (HRS)
NAME:								
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