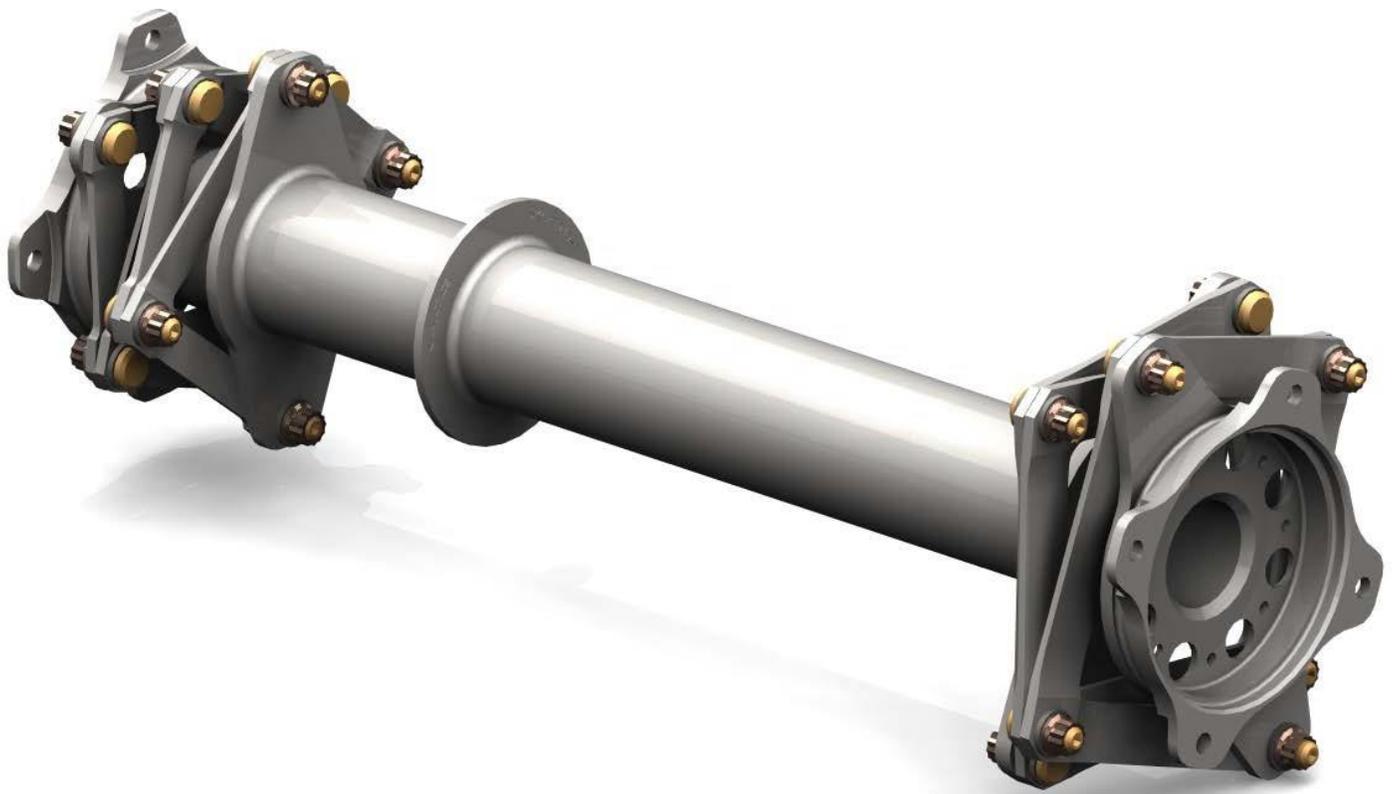




# Service Instruction Number SIN3052 Revision D



Installation, Maintenance, and Repair of the KAflex®  
Driveshaft for the Bell 206 LI/LIII LongRanger





## **KAMATICS CORPORATION SERVICE INSTRUCTION NUMBER 3052**

Installation, maintenance and repair of the KAflex® Driveshaft for the Bell Models 206 L1 and 206 L3 Helicopters.

This Service Instruction Consists of the following sections:

1. KAflex Driveshaft Retrofit
2. KAflex Driveshaft Rotor Brake Disk Installation
3. KAflex Driveshaft Inspection
4. KAflex Driveshaft Maintenance and Repair
5. KAflex Rotor Brake Disk and Cup Inspection
6. KAflex Rotor Brake Disk and Cup Maintenance and Repair
7. Supplemental Type Certificate (FAA / EASA)
8. Installation Drawings

The KAflex Driveshaft Installation Kit in accordance with drawings SKCP3052 SKCP3053, contains the following parts (please check parts before continuing):

### Section 1

1. KAflex Driveshaft P/N SKCP3040-5
2. Firewall Cover Kit P/N SKCP6054-1 consisting of 2 pcs with hardware
3. Filter Housing Assembly SKCP3057-1 Kit with MS29561-236, MS29561-236 and MS29561-024 preformed packings.

### Section 2

4. Rotor Brake Disk SKCP2962-13 and Rotor Brake Cup SKCP2967-13 with hardware
5. Spacer Kit including SKCP2970-13 spacers, SKCP2971-11 peel shims and hardware
6. SKCP3056 Firewall Disk Cover Kit with hydraulic lines, clamps and hardware



### Both Sections

7. Certificate of Compliance
8. Kamatics Corporation Service Instruction Number 3052
9. Historical Service Record (in back pocket of Service Instruction)
10. FAA Form 337 (in back pocket of Service Instruction)

In addition to standard hand tools, the following tools will be required to complete installation per this Service Instruction:

### Section 1

1. 0-100 in-lbs torque wrench
2. MS20995C32 .032 dia. safety wire
3. SKSP1404 Installation Tool

### Section 2

4. Abrasive cutoff wheel and air or electric motor
5. Vacuum cleaner
6. Deburring tool for sheet metal
7. 8" straight edge ½" wide
8. AMS 3374 (MIL-S-38249) Firewall Sealant (Proseal 700 or equivalent per this MIL Specification)
9. Scribe for sheet metal
10. Thin scrap sheet metal of any material, approximately 12" x 20" x .030-.070 thick
11. Fire extinguisher
12. Safety Glasses
13. Hearing Protection
14. Drill motor with 1/8" drill bit
15. Adhesive Tape

**LOG OF REVISIONS TO KAMATICS CORPORATION**  
**SERVICE INSTRUCTION NUMBER 3052**

Revision	Reason	Prepared By
<b>Basic</b>	Preparation of basic manual	J. Miller
A	Installation procedure clarification	J. Miller
B	<p><b>Section 1</b> Pg. 7: Installation Tool was SKCP1375 SKCP3052 drawing rev was "F"</p> <p>Pg. 9: Added "Caution" note for installation Compression of 0.360" max. Installation tool was SKCP1375</p> <p><b>Section 2</b> Pg. 16: Installation Tool was SKCP1375</p> <p><b>Section 3</b> Pg. 19: Added reference to Henkel North America web site for purchasing of "Yellow" torque stripe material. Removed reference to Kamatics website for touch-up kit.</p> <p>Pg. 20: Created Table for Damage Location and Repair</p> <p>Pg. 21: Sermatech International changed to Praxair. Added reference to Henkel North America web site for purchasing of "Yellow" torque stripe material. Removed reference to Kamatics website for touch-up kit.</p> <p>Pg. 24: Added Inspection Criteria for Compressor Stall/ Surge paragraph to Conditional Inspection Section 3-2, Paragraph "F"</p> <p><b>Section 8</b> Pg. 31-32: Rotor Brake Modification Drawing SKCP3053 rev "E" replaced with rev "F". Added coating note #10.</p> <p>Pg. 33: Installation Drawing SKCP3052 rev "F" replaced with rev "G". Added coating note #5.</p>	J. Parekh
C	Revised to account for possible change in OEM hardware due to EASA SIB No: 2012-06R2.	A. Zink
D	Revised to restore the 100 hr. inspection requirements of Rev. A	A. Zink



## SECTION 1

### KAflex DRIVESHAFT RETROFIT

#### 1. Preparation and General Notes

- a. Disconnect battery.
- b. Remove transmission fairing and open engine cowling to gain access to main driveshaft
- c. Remove attachments holding the firewall-mounted fuel filter, and swing the assembly aft out of the way.
- d. Remove particle separator (if installed) to gain access to front portion of 206-064-904 forward firewall.

#### 2. Removal of BHT Driveshaft

- a. Remove firewall cover components and attachments adjacent to driveshaft per 206 L1/L3 Maintenance Manual. If aircraft is equipped with a rotor brake, remove the rotor brake disk and calipers, and the hydraulic lines up to the AN804-H4 bulkhead fitting per the BHT Maintenance Manual. Temporarily cap the open ends of the AN804-H4 Bulkhead fitting.
- b. Remove 206-040-015-015 driveshaft per the BHT Maintenance Manual.

#### 3. Oil Filter Housing Retrofit

- a. Remove oil filter and housing from main transmission per the BHT Maintenance Manual and inspect filter. Obtain replacement filter element if necessary.
- b. Discard MS29561-236 and -024 preformed packings (o-rings).
- c. Install SKCP3057-1 oil filter housing assembly with new MS29561-236 and -024 preformed packings (o-rings) per BHT Maintenance Manual.

#### NOTE

**If helicopter is equipped with a rotor brake, proceed to section 2 of this service instruction at this time.**

#### 4. Relocation of Lines Away from Driveshaft

- a. Note how the AE705974-1 oil line (the oil return line between the freewheeling unit and the main transmission sump) is clamped to the right arm of the 206-033-506 transmission restraint shown on Drawing SKCP3052, View C.
- b. Loosen clamps holding flexible line number AW705974-1. Move the line to more closely follow the arm of the transmission restraint so that it can be secured underneath the arm and away from the rotating flex frames.
- c. Reposition the Adel clamps on the 206-033-506 transmission restraint per Drawing SKCP3052, View C. This moves the clamps from the right hand arm to the left hand arm.
- d. Retighten clamps securing AE705974-1 that were loosened in step “b” above.
- e. Clamp or reposition any hoses or lines not mentioned above which come within ½” of driveshaft rotating components.

#### 5. KAflex Driveshaft Installation

- a. Inspect firewall gasket bonded to firewall. Repair as necessary per BHT Maintenance Manual. Install the SKCP3054-5 lower firewall cover as shown on the installation Drawing SKCP3052 and Figure 1.
- b. Install the SKSP1404 installation tool on the transmission end of the driveshaft per Figure 2. Compress the KAflex Flex Frames just enough to install the driveshaft by tightening the nuts evenly with a deep socket.
- c. Insert driveshaft end with small diameter flex frames into opening in the firewall cover so that the end with the larger flex frames rests against the upper right part of the main transmission.
- d. Move the driveshaft into position and engage pilot. With the driveshaft correctly positioned between the engine and transmission flanges, remove the installation tool.
- e. Install mounting hardware per assembly Drawing SKCP3052.



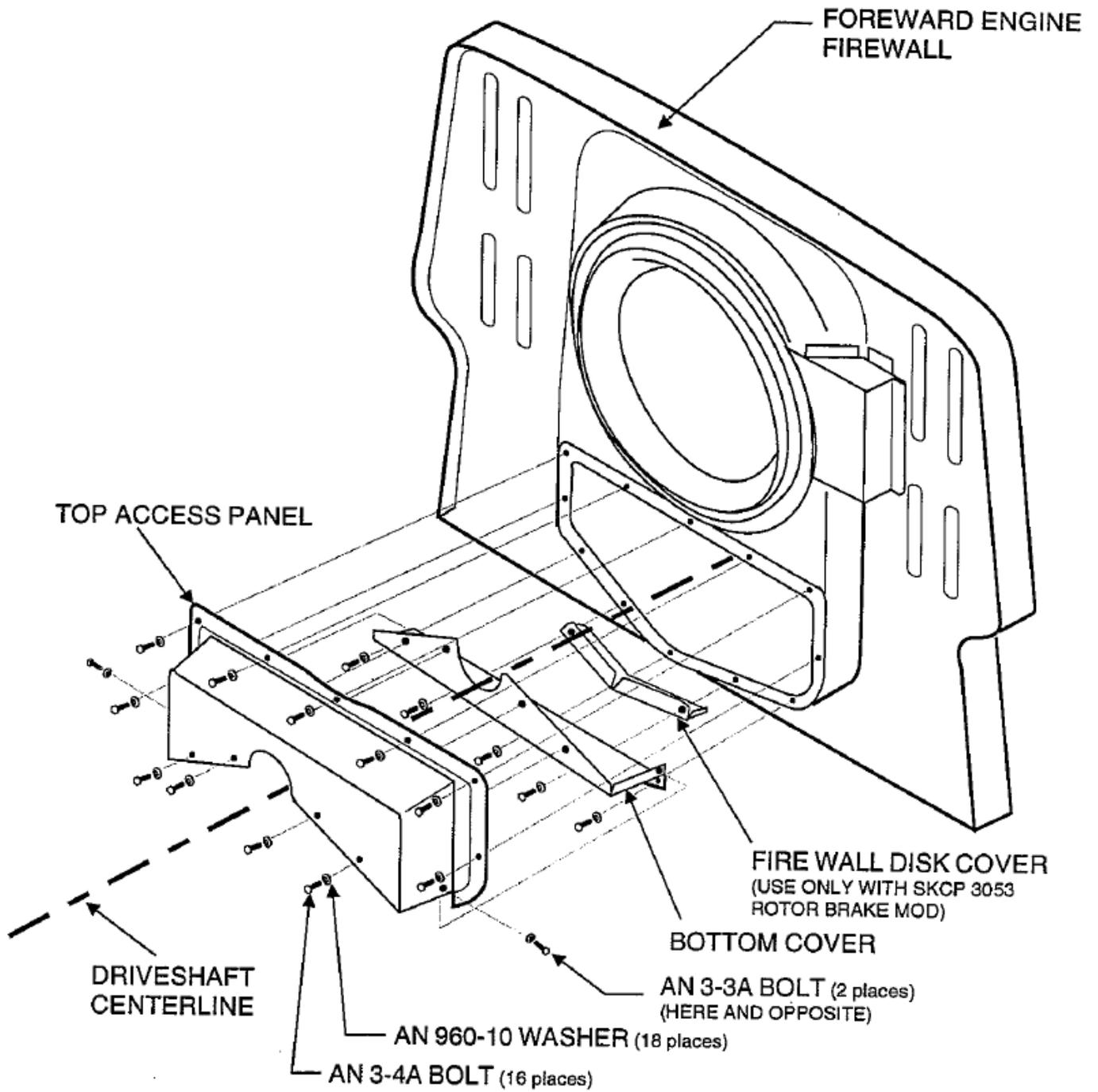
5. KAflex Driveshaft Installation (Continued)

**CAUTION**

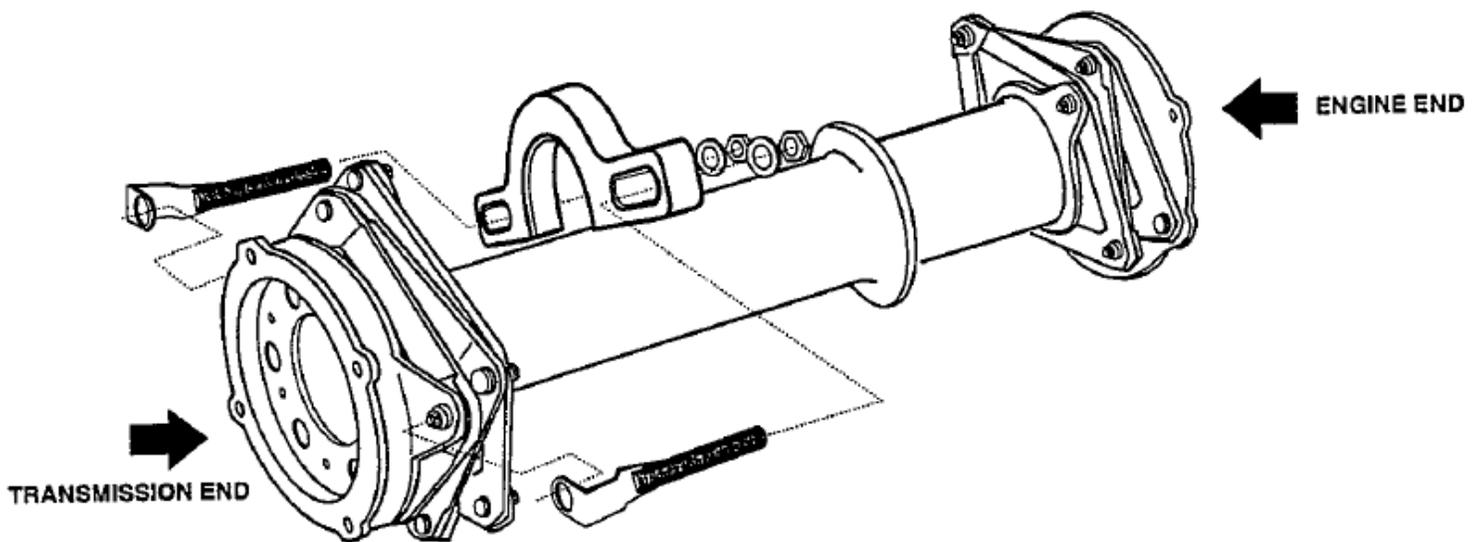
**Carefully check all electrical lines, fuel lines, hydraulic lines, bleed air lines and other nearby components for damage, interference, looseness or leakage. Route and secure all lines in accordance with AC43.13-1A, Chapters 10 and 11.**

- f. Install the SKCP3054-5 upper firewall cover as shown on the Installation Drawing SKCP3052 and Figure 1. The upper cover assembly is most easily installed by positioning it as shown in Figure 3 if the aircraft is equipped with a rotor brake. If no rotor brake is installed, a special technique is not necessary for installation.

At the completion of Step 5.f described above, report the alteration of the aircraft by executing FAA Form 337 included with this Service Instruction. Since the flight manual supplement included in the back of this Service Instruction only applies to the rotor brake installation modification, discard it at this time.



**FIGURE 1: Kamatics Firewall Cover**



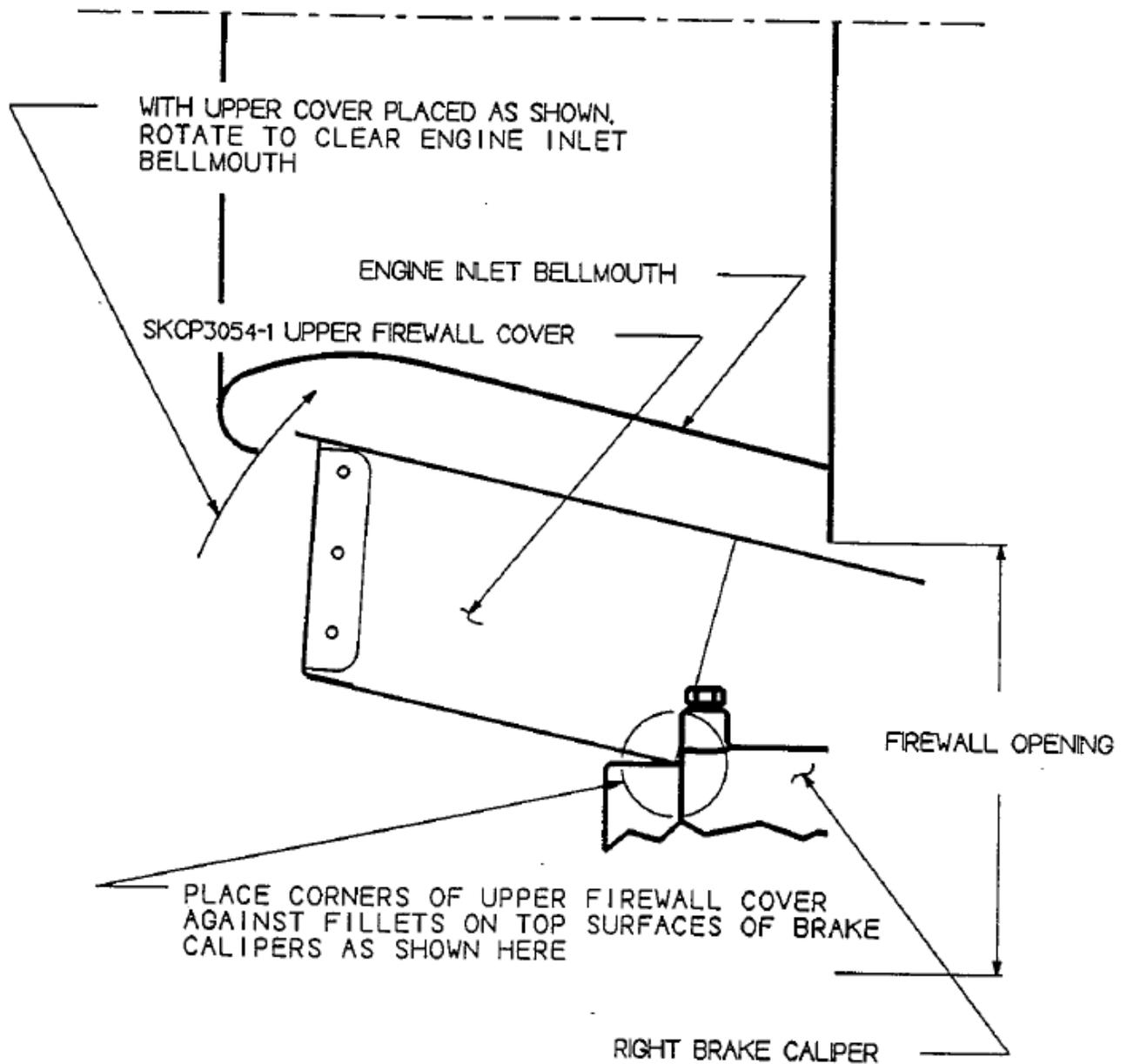
Use ½" deep socket or wrench to compress Flex Frames just enough to install driveshaft. Compress driveshaft only enough to allow installation.

**CAUTION**

Do not compress ends of driveshaft beyond 0.360". End Fitting and Interconnecting Tube will contact at this point.

**FIGURE 2: Driveshaft with SKSP1404 Installation Tool**

VIEW FROM AIRCRAFT CENTERLINE LOOKING RIGHT:



**FIGURE 3: Location of Upper Firewall for ease of installation with Rotor Brake**

## SECTION 2

### KAflex DRIVESHAFT ROTOR BRAKE INSTALLATION

1. Proceed with KAflex Driveshaft retrofit up to paragraph 3.c of Section 1 of this Service Instruction
2. Clean out firewall using the following procedure:
  - a. Clean rotor brake installation area thoroughly to remove oil and residue under and near forward firewall and aircraft roof.
  - b. Temporarily install SKCP2967-13 cup on engine output flange using 2 bolts, nuts and washers per drawing number SKCP3052 **EXCEPT: Do not install rotor brake disk (see Figure 4)**. Install bolts, nuts and washers in two places per Figure 4. Do not torque bolts per the drawing; bolts need only be tight enough to hold mount lugs and washers in contact.
  - c. Rotate cup so that two diametrically-opposed 3/16" diameter holes are in a vertical plane.
  - d. Using a straight edge, transfer the front plane of the cup down to the firewall. The center of the driveshaft can be located on the firewall by lining up the straight edge with the centers of the vertically-oriented holes on the flange of the cup.
  - e. Proceed to mark lines for rotor brake disk firewall cutout per Figure 4. Marking lines per Figure 4 should result in lines located per SKCP3053. Measure and mark 2.5-2.65" on either side of the center established in Item "d" above.
  - f. Recheck scribed lines relative to the dimensions of the cutout shown on SKCP3053.
  - g. Remove cup and washers temporarily installed above.
  - h. Cover engine inlet, generator air intake and other equipment that may be affected by debris from abrasive cutting operation.

### CAUTION

**Inspect area for oil residue and have a fire extinguisher on hand during the following abrasive cutting operation. Use hearing and eye protection during this process.**

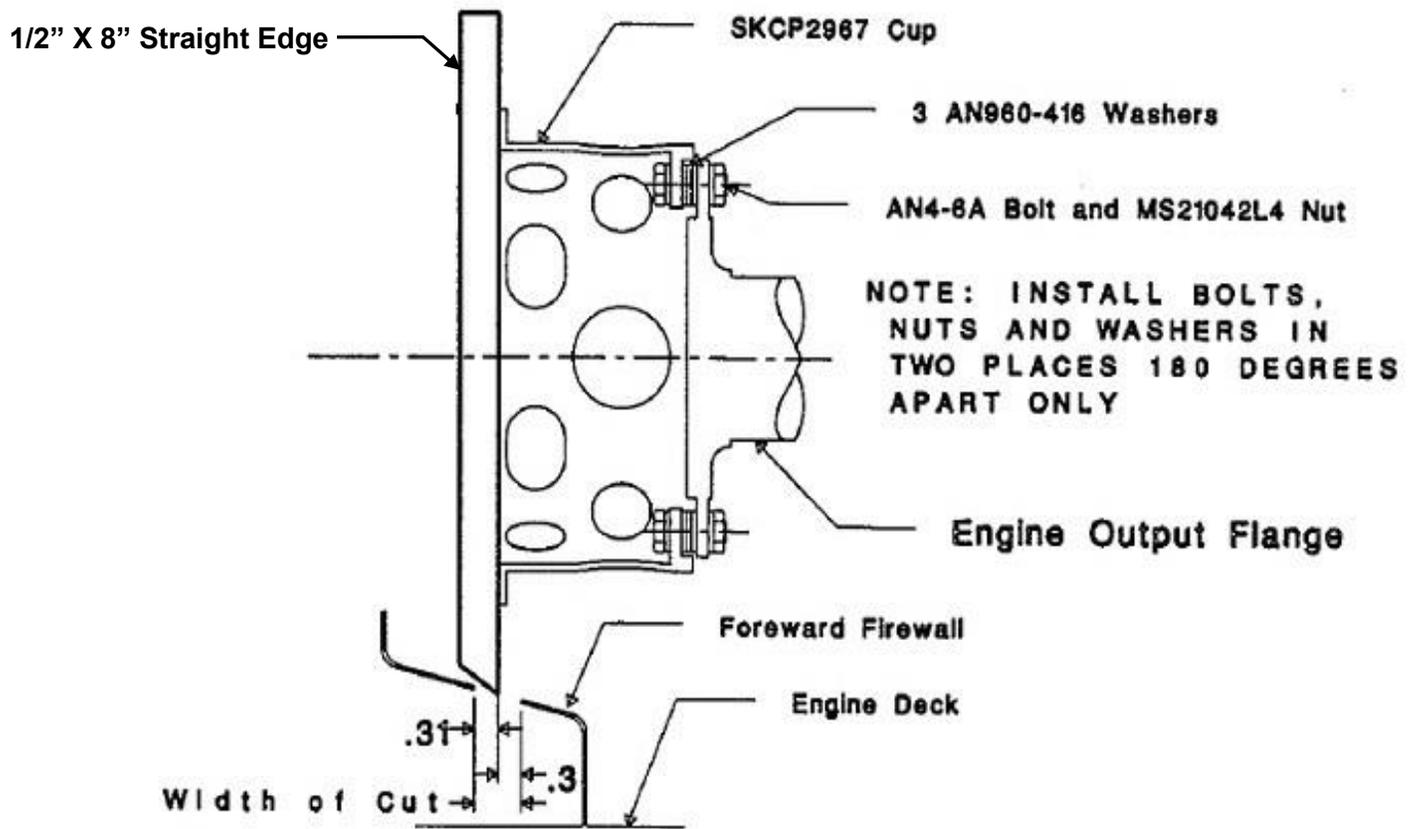
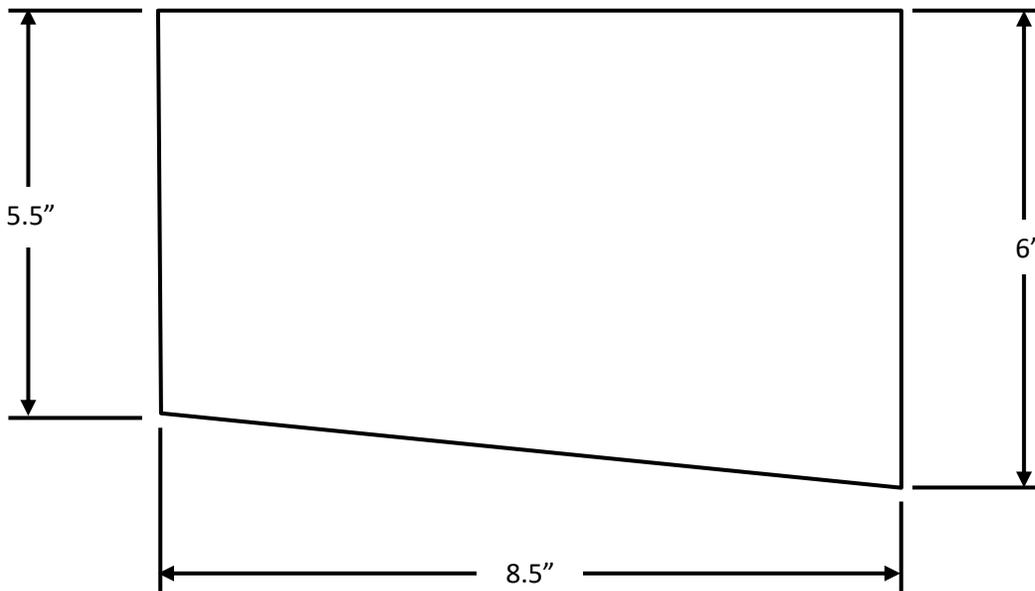
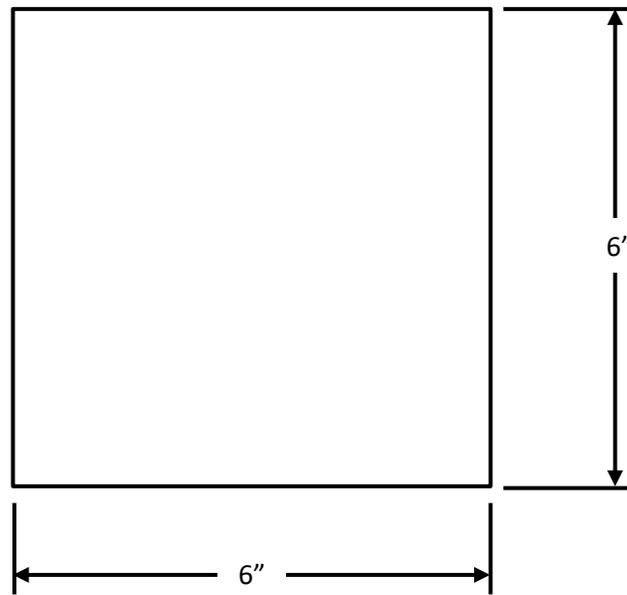


FIGURE 4: Method of transferring line to firewall for firewall cutout

2. Clean out firewall using the following procedure (Continued)

- i. Insert the small sheet metal cutting guard shown in figure 5 under the firewall in the area adjacent to the cutout to prevent damage to the surrounding components when cutting wheel “break through”.
- j. Tape the large sheet metal cutting guards shown in figure 5 to the aft side of the firewall in the area of the cutout to prevent cutting debris from going behind the firewall.
- k. Observe rotation direction of cutting wheel and tape vacuum cleaner hose along the firewall front side to catch debris generated with the cutting wheel breaks through.
- l. Center punch the sheet metal and drill 1/8” diameter hole at each of the four corners of the marked cutout area. Center punch marks and drilled holes should be positioned to produce a filleted corner after all cutting is completed. Center punch and drill a fifth and sixth hole tangent to and in the center of both short edges.
- m. Cut out firewall along the two longer marked lines using abrasive cutoff wheel. After cutting both long edges the entire length, use pointed diagonal cutters to clip webs between the holes drilled in the previous step. Using the abrasive wheel and standard deburring tools, smooth and deburr the edges of the cut-out. Measure hole to verify correct size per SKCP3052.
- n. Thoroughly clean area of abrasive cutting debris and chips from the drilling operation. Remove temporary sheet metal covers and vacuum cleaner hose used in the previous steps. Remove rags used to cover generator cooling holes.
- o. Install lower firewall cover SKCP3054-3 and firewall disk cover SKCP3056 per drawing SKCP3053 and Figure 1. Seal all remaining openings in the installed firewall with sealant per MIL-S-38249 (Proseal 700 or equivalent).

This completes the firewall modification.



**FIGURE 5: Sheet metal guards for use during firewall cutting operation**

### 3. Driveshaft and rotor brake disk installation

- a. Remove clear rust-inhibiting coating from SKCP2962-13 Rotor Brake Disk with suitable degreasing solvent.

#### **CAUTION**

**Be certain to observe Manufacturer's Recommended Safety Procedures when using degreasing solvent.**

Suggestion: Review the assembly procedure given in the following sections on the bench prior to assembling the parts on the aircraft. Observing the relationship of the parts during the assembly process on the bench beforehand will simplify the process on the aircraft.

#### **CAUTION**

**Rotation of the driveshaft during these procedures may cause Main and Tail Rotor blades to rotate. Verify that adequate clearance exists around the blades prior to rotating the driveshaft.**

- b. Bolt the SKCP2962-13 rotor brake disk to the SKCP2967-13 rotor brake cup as shown on SKCP3053. Apply torque stripes to all fasteners.
- c. Install the SKSP1404 installation tool on the driveshaft per Figure 2. Compress the KAflex the KAflex flex frames approximately  $\frac{1}{4}$ " by tightening the ruts with a deep socket.
- d. Maneuver the rotor brake cup and disk assembly into approximate position behind the firewall. The bottom of the rotor brake disk should sit in the firewall cutout made previously.
- e. Insert the driveshaft end with the small diameter flex frames into both the firewall cover opening and the SKCP2967-13 cup so that the end with the larger flex frames rests against the upper right part of the main transmission.
- f. Move driveshaft into position. With the driveshaft correctly positioned between the engine and transmission flanges, remove the installation tool.
- g. Install the mounting hardware per assembly drawing SKCP3053.

#### 4. Installation of Brake Calipers

- a. Inspect caliper assemblies to verify that Bell Part Number 206-040-426-1 laminated washers are removed from the aft surface of the caliper assembly feet. If these washers are stuck in place, remove them with the use of a plastic scraper and remove any residue from this surface to produce a flat surface on both calipers.
- b. Using a plastic scraper, remove all debris from the 206-040-267-1 Cap Assembly and mating surfaces of the 400397-2 Brake assemblies to produce clean, flat surfaces on each part.
- c. Position the SKCP3054-3 Top Access Panel Assembly, the lower half of the firewall cover and the SKCP3056 firewall disk cover under the driveshaft. Bolt both parts to the firewall as shown in Figure 1 and SKCP3053. Seal any gaps between aircraft firewall and the SKCP3056 firewall disk cover with sealant per AMS-3374 firewall sealant.
- d. Take the 400397-2 brake assemblies to a work bench. Loosen the nuts on the MS21908J4 elbow fittings (part of the 400397-2 Brake Assembly) and screw the fittings into the brake assemblies until they bottom out. Check the condition of the packing around these fittings and replace if necessary. Position the fittings with their ends pointing down and approximately 20 degrees toward the center of the aircraft when in final position. Do not tighten the nuts with the fittings in this position, at this time.
- e. Install the SKCP2970 Spacers on the right and left 400397-2 brake assemblies per SKCP3053.
- f. Remove the 206-076-074-1 and 206-076-073-1 tube assemblies if not done previously. Replace the tube assemblies with the short flexible line on the left side of the aircraft and the longer flexible line on the right side of the right side of the aircraft.
- g. Run the shorter flexible line (from the SKCP3056-1 firewall disk cover kit) to the fore and aft thread of the AN804-J4 tee and tighten the nut at that fitting. Likewise, run the longer flexible line to the lateral thread AN804-J4 tee and tighten nut.
- h. Place the brake assemblies in the aircraft behind the firewall. Secure each line to the appropriate brake assembly.

#### 4. Installation of Brake Calipers (Continued)

- i. Install the SKCP2971-11 shims on each side as shown on SKCP3053. Verify the differential shim thicknesses on each side and the puck to disk clearances are in accordance with SKCP3053. Verify all bolts are properly installed, torqued and locked.
- j. Position the longer flexible hydraulic line midway between the rotor brake cup and the engine deck of the aircraft behind the firewall. To maintain this position, secure the hydraulic line to the freewheeling unit drain line shown on SKCP3053 Sheet 1 using two MS21919WCJ11 clamps with bolt, nut and washers per the drawing.
- k. Reposition the MS21908J4 elbows as necessary. Tighten the nuts on these fittings and on the hydraulic lines.

#### **CAUTION**

**Carefully check all electrical lines, fuel lines, hydraulic lines, bleed air lines and other nearby components for damage, interference, looseness or leakage. Route and secure all lines in accordance with AC43.13-1A Chapters 10 and 11.**

#### 5. Modification of Master Cylinder

- a. Remove Master Cylinder Assembly 206-076-047-3 or 206-076-047-101 from the aircraft.

#### **CAUTION**

**Inspect Master Cylinder assembly for condition. Repair or rework Master Cylinder as necessary to ensure proper operation.**

- b. Adjust the output pressure to  $119 \pm 8$  psi peak in accordance with BHT Service Instruction 206-105 Section III, Paragraph 4: "Overhaul-Rotor Brake Master Cylinder".
- c. Reinstall the master cylinder upon completion of the pressure adjustment.
- d. Fill and bleed the rotor brake hydraulic system using MIL-PRF-87257 or MIL-PRF-83282 hydraulic fluid. Maintain fluid in cylinder during bleeding process.

5. Modification of Master Cylinder (Continued)

- e. Install the SKCP3054 Top Access Panel Assembly per Figure 1 and SKCP3053. The upper cover assembly is most easily installed by positioning it as shown in Figure 3. Verify that the AN3-3A bolts on the sides of the Top Access Panel do not contact the brake hoses.

**CAUTION**

**Carefully check all electrical lines, fuel lines, hydraulic lines, bleed air lines and other nearby components for damage, interference, looseness or leakage. Route and secure all lines in accordance with AC43.13-1A Chapters 10 and 11.**

The weight and balance change, as a result of this installation is 16 oz-in aft. At the completion of the above process, report the alteration of the aircraft by executing FAA Form 337 included with this Service Instruction and review the appropriate Flight Manual Supplement (included) and place it in the Aircraft Flight Manual.

### SECTION 3

#### INSPECTION OF KAflex DRIVESHAFT

##### 1. Inspection

###### NOTE

The following checklists are to be used in place of those used for the spline coupling driveshaft.

##### 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).
  - b. Inspect flex frame and mount bolt torque stripes (red) for evidence of slippage. If the torque stripes have faded, touch up using F-925 “Skydrol” resistant seal or equivalent available from Organic Products Co. at (972) 438 - 7321. If the torque stripes are yellow, contact Henkel North America to obtain a touch up kit. <http://www.henkelna.com> (Loctite E-20HP Hysol Epoxy Adhesive, Fast Setting).

###### 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 Hr. Inspection

1. Check general condition of KAflex Driveshaft.
  - a. Check for loose and missing hardware (bolts, nuts, washers).
  - b. Inspect flex frame and mount bolt torque stripes (red) for evidence of slippage. If the torque stripes have faded, touch up using F-925 “Skydrol” resistant seal or equivalent available from Organic Products Co. at (972) 438 - 7321. If the torque stripes are yellow, contact Henkel North America to obtain a touch up kit. <http://www.henkelna.com> (Loctite E-20HP Hysol Epoxy Adhesive, Fast Setting).

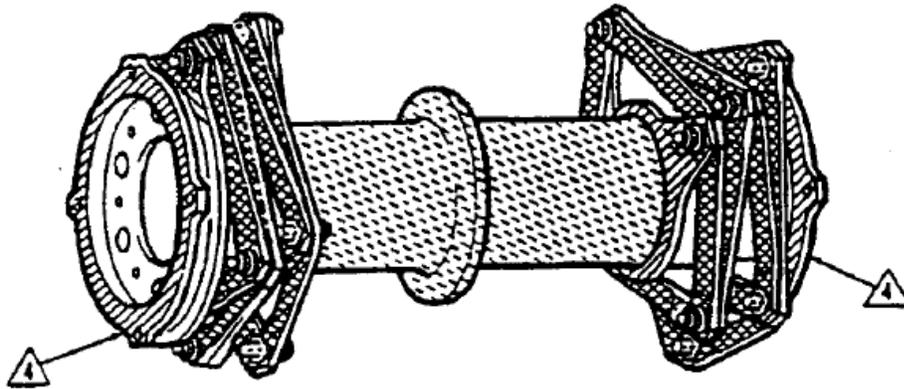
**WARNING**

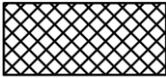
**DO NOT disturb or tighten flex frame nuts or bolts. Evidence of turning fasteners by wrench or other means is cause for rejection.**

- c. Inspect KAflex Driveshaft for damage and corrosion. Refer to Figure 6 for damage and repair limits.
- d. Inspect KAflex Driveshaft flex frame joints for fretting dust which will appear as red metallic residue. 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, return KAflex Driveshaft to Kamatics Corporation as described under 4500 hour inspection.

- e. Inspect KAflex Driveshaft for signs of contact, rubbing, and/or chafing.



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 SQ. IN.	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

**NOTES:**

1. No cracks are permitted.
2. Repairs must be no less than 1.000 in. apart.
3. Repairs not to be within 0.500 in. of bolt hole.
4. Faying surfaces must be free of any raised metal areas.
5. All repairs must completely clean up damage and are 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, 1550 Polco St. Indianapolis In. 46222. 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.

**FIGURE 6: Damage Limits – Kflex Driveshaft**

## OUT OF AIRCRAFT INSPECTION

### NOTE

**This inspection is to be performed at 1500 hour intervals (coinciding with removal and inspection of freewheeling clutch). This inspection is structured similar to the 100 hour inspection, however will be more comprehensive with the driveshaft out of the aircraft.**

1. Check general condition of the KAflex Driveshaft
  - a. Check for loose and missing hardware (bolts, nuts, washers).
  - b. Inspect flex frame and mount bolt torque stripes (red) for evidence of slippage. If the torque stripes have faded, touch up using F-925 “Skydrol” resistant seal or equivalent available from Organic Products Co. at (972) 438 – 7321. If the torque stripes are yellow, contact Henkel North America to obtain a touch up kit. <http://www.henkelna.com> (Loctite E-20HP Hysol Epoxy Adhesive, Fast Setting).

### WARNING

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

- c. Inspect KAflex Driveshaft for damage and corrosion. Refer to Figure 6 for damage and repair limits.
- d. Inspect KAflex Driveshaft flex frame joints for fretting dust. This dust will appear as red metallic residue. 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 KAflex Driveshaft.

- e. Inspect KAflex Driveshaft for signs of contact, rubbing, and/or chafing.



### **4500 HOUR INSPECTION**

1. Remove KAflex Driveshaft for factory inspection. Return to Kamatics Corporation, 1330 Blue Hills Ave., Bloomfield CT 06002. Include description of reason for return and copy of historical log with driveshaft.

### **WARNING**

**Package driveshaft carefully to ensure safe arrival at Kamatics Corporation.**

2. Assuming the driveshaft is returned to the user for further service, inspections between 4500 and 9000 hours or multiples thereof will be the same as between new and 4500 hours.
2. KAflex Driveshaft Conditional Inspection

### **NOTE**

**The following inspections detail special inspection instruction applicable to the KAflex Driveshaft.**

1. Overtorque
  - a. 110-120% overtorque, perform a daily inspection on KAflex Driveshaft.
  - b. 120+% overtorque, perform a 100 hour inspection on KAflex Driveshaft.
2. Overspeed
  - a. 114-% overspeed, no KAflex Driveshaft inspection necessary.
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, return driveshaft to Kamatics Corporation with information described in Section on 4500 hour inspection.

#### 4. Hard Landing

- a. If any of the following components do not pass their respective inspection criteria as detailed in chapter 5, “Inspections” of the Bell 206 LI / LIII Maintenance Manual, the KAflex Driveshaft must be returned to Kamatics as described in the Section of this manual on inspection after 4500 hours:
  - i. Main Rotor Hub
  - ii. Main Rotor Mast
  - iii. Main Transmission, Main Transmission Mounts Nodal Beam System, 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.
- c. Carefully inspect components near driveshaft for evidence of contact with 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 evidence of lightning damage is found on the driveshaft as described in Item ‘a’ above, attach a tag to the driveshaft and write, “THIS DRIVESHAFT WAS REMOVED FROM SERVICE BECAUSE OF A LIGHTNING STRIKE”. Return the driveshaft to Kamatics for evaluation.

#### 6. Compressor Stall/Surge

- a. Remove and examine the engine-to-transmission driveshaft for condition.
- b. If any damage suspected to be related to the compressor stall or surge is found, make an entry on the Historical Service Record, and attach a tag on the driveshaft and write, “THIS COMPONENT WAS REMOVED FROM SERVICE BECAUSE OF A COMPRESSOR STALL/SURGE”. Return the driveshaft to Kamatics Corporation for evaluation.
- c. If no defects were detected, return the engine-to-transmission driveshaft to service.

## **SECTION 4**

### **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:
  - a. The KAflex Driveshaft is not field overhauled. The KAflex Driveshaft can only be disassembled for inspection at Kamatics Corporation.
  - b. Any time the KAflex Driveshaft is transferred from one aircraft to another the KAflex Driveshaft does not require a complete disassembly and inspection. The KAflex Driveshaft does require a 100 hour inspection at this time, and then at each aircraft 100 hour inspection.
  - c. The KAflex Driveshaft is to be removed at 4,500 hours and sent to Kamatics Corporation for complete factory inspection and overhaul as required. The KAflex Driveshaft is not field overhauled.

Refer to the Section on 4,500 hour inspection for return instructions.

## **SECTION 5**

### **REPAIR OF KAflex DRIVESHAFT**

1. Refer to Figure 6 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. The KAflex Driveshaft can only be disassembled for inspection at Kamatics Corporation.
3. The KAflex Driveshaft is to be removed at 4,500 hours and sent to Kamatics Corporation for complete factory overhaul and inspection as required. The KAflex Driveshaft is not field overhauled.



## **KAflex ROTOR BRAKE DISK AND CUP INSPECTION**

The following inspections are in addition to inspections of the Rotor Brake System in accordance with Bell Service Instruction Number 206-105.

### 1. Inspection of KAflex Driveshaft

Inspection of the driveshaft should proceed in accordance with Kamatics Corporation Service Instruction Number 3052, Section 3. The driveshaft in the rotor brake area is inspected through the holes in the SKCP2967-3 Cup. Torque stripes on the bolts in the driveshaft have been placed tangentially in order to be visible through the aforementioned holes. In addition to the inspections listed in Service Instruction Number 3052, the tips of the various bolted joints of the coupling should be inspected for evidence of excessive angular travel that may result in contact with the cup and subsequent polishing of the areas in contact. The observation of this condition indicates that excessive deflections have been imposed on the system, and the driveshaft should be removed and returned to Kamatics Corporation for a 4,500-hour inspection with a full description of the history of the part and the reason for removal.

### 2. Inspection of KAflex SKCP2967-13 Rotor Brake Cup

The Rotor Brake Cup should be visually inspected at the same intervals as the driveshaft. The inspection should include looking for loose or missing hardware, evidence of contact with the driveshaft on the bore of the cup, evidence of contact with nearby lines, fittings, et cetera, and presence of cracks, dents or other distress. The part is made from 17-4 Stainless Steel and has no coating.

### 3. Inspection of KAflex SKCP2962-13 Rotor Brake Disk

The Rotor Brake Disk should be visually inspected at the same intervals as the driveshaft. The Rotor Brake Disk should also be inspected for loose or missing hardware, evidence of improper contact with the caliper pucks, evidence of overheating or distortion, or evidence of excessive wear of the disk or caliper pucks. Inspect the rotor disk for excessive runout and play. The gap between the rotor brake disk and the caliper pucks should be consistent on all four pucks within .020" (Refer to SKCP3053). Additionally, twice a year, the rotor brake disk should be inspected for thickness and parallelism of the faces. Replace the disk if its thickness is measured below 0.260" or if the faces are not parallel within 0.002".



## **KAflex ROTOR BRAKE DISK AND CUP INSPECTION** (Continued)

### 4. Inspection of KAflex SKCP2970-13 Spacer

The Spacer should be visually inspected at the same intervals as the driveshaft. Inspect for loose or missing hardware. Verify the integrity of the spacer installation by using hand pressure to try to move the caliper assembly. If excessive movement is observed, check the mounting hardware for looseness.

## **SECTION 6**

### **KAflex ROTOR BRAKE DISK AND CUP MAINTENANCE AND REPAIR**

#### 1. Maintenance and Repair of KAflex Driveshaft

Maintenance and repair of the driveshaft should proceed in accordance with Kamatics Corporation Service Instruction Number 3053.

#### 2. Maintenance and Repair of KAflex SKCP2967-13 Rotor Brake Cup

Only repair to superficial damage is permitted. Cracks or dents in excess of .010" are cause for removal and replacement. Surface damage up to .010" deep is to be blended smoothly with surrounding surface to a finish of 32 micro inches. The blending must completely clean up the damage. Rework of this nature which covers any more than 50% of any contiguous two square inch area is cause for removal and replacement of the part.

#### 3. Maintenance and Repair of KAflex SKCP2962-13 Rotor Brake Disk

Repair of the rotor brake disk is limited to blending the surface damage on the rim or mounting bolt circle. Damage which can be removed by blending to a maximum depth of .020" is acceptable. Damage requiring more than this is cause for removal and replacement.

#### 4. Maintenance and Repair of KAflex SKCP2970-13 Spacer

Smoothly blend any damage to a maximum depth of .030". This rework must completely clean up the damage.



**SECTION 7**  
**TYPE CERTIFICATE**

Following is a copy of:

1. FAA Supplemental Type Certificate Number SH8683SW.
2. EASA Supplemental Type Certificate Number 10053360.

United States of America  
Department of Transportation — Federal Aviation Administration  
**Supplemental Type Certificate**

*Number* SH8683SW

*This certificate, issued to* Kamatics Corporation  
1330 Bluhill Ave.  
Bloomfield, CT 06002

*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 6 of the Civil Air Regulations.*

*Original Product — Type Certificate Number:* H2SW  
*Make:* Bell  
*Model:* 206L-1, L-3

*Description of Type Design Change:*

Installation of a Kaflex driveshaft in accordance with Kamatics Drawing SKCP3052, Revision C, dated 09-17-93, or later FAA approved revision.

*Limitations and Conditions:*

Rotorcraft Flight Manual Supplement dated 09-08-93 or later FAA approved revision is required when SKCP3052-3 Kaflex driveshaft with rotorbrake modification is installed. Compatibility must be determined by the installer.

*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:* March 14, 1991 *Date issued:* 10/7/93

*Date of issuance:* September 8, 1993 *Date amended:*



*By direction of the Administrator*

*Larry M. Kelly, Manager*  
Rotorcraft 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.*

## SUPPLEMENTAL TYPE CERTIFICATE

**10053360 REV. 1**

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

### KAMATICS CORPORATION

1330 BLUE HILLS AVENUE  
BLOOMFIELD 06002  
USA

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

**Original Type Certificate Number:** EASA.IM.R.512

**Type Certificate Holder:** BELL HELICOPTER TEXTRON CANADA

**Type:** BELL 206

**Model:** BELL 206L-1, BELL 206L-3

**Original STC Number:** FAA STC SH8683SW

**Description of Design Change:**

Installation of KAMATICS Kaflex Main Rotor drive shaft KIT SKCP3052-1

Installation of KAMATICS Kaflex Main Rotor drive shaft KIT SKCP3052-3 (with rotor brake)

**EASA Certification Basis:**

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval. The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval

See Continuation Sheet(s)

**For the European Aviation Safety Agency**

**Date of Issue: 30 June 2015**



**Massimo MAZZOLETTI**  
Head of Rotorcraft Department

10037269

SUPPLEMENTAL TYPE CERTIFICATE - 10053360 - REV. 1 - KAMATICS CORPORATION - 305396



**Associated Technical Documentation:**

Rotorcraft Flight Manual Supplement dated 13.07.1994

or later revisions of the above listed documents approved by EASA in accordance with EASA ED Decision 2004/04/CF (or subsequent revisions of this decision)"and/ or the Technical Implementation Procedures of EU/ USA Bilateral Agreement.

S/N 3052 Revision D (Service Instruction Manual)

Drawings SKCP 3052 Revision H and SKCP 3053 Revision H

**Limitations/Conditions:**

Rotorcraft Flight Manual Supplement dated 13.07.1994 (or later FAA approved version) is required when SKCP3052-3 Kaflex driveshaft with rotor brake modification is installed.

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -



**SECTION 8**  
**INSTALLATION DRAWING**

Following are copies of each of two pages of the Installation Drawing for STC SH8683SW.

SKCP3052	SH 1
SKCP3053	SH 1, 2

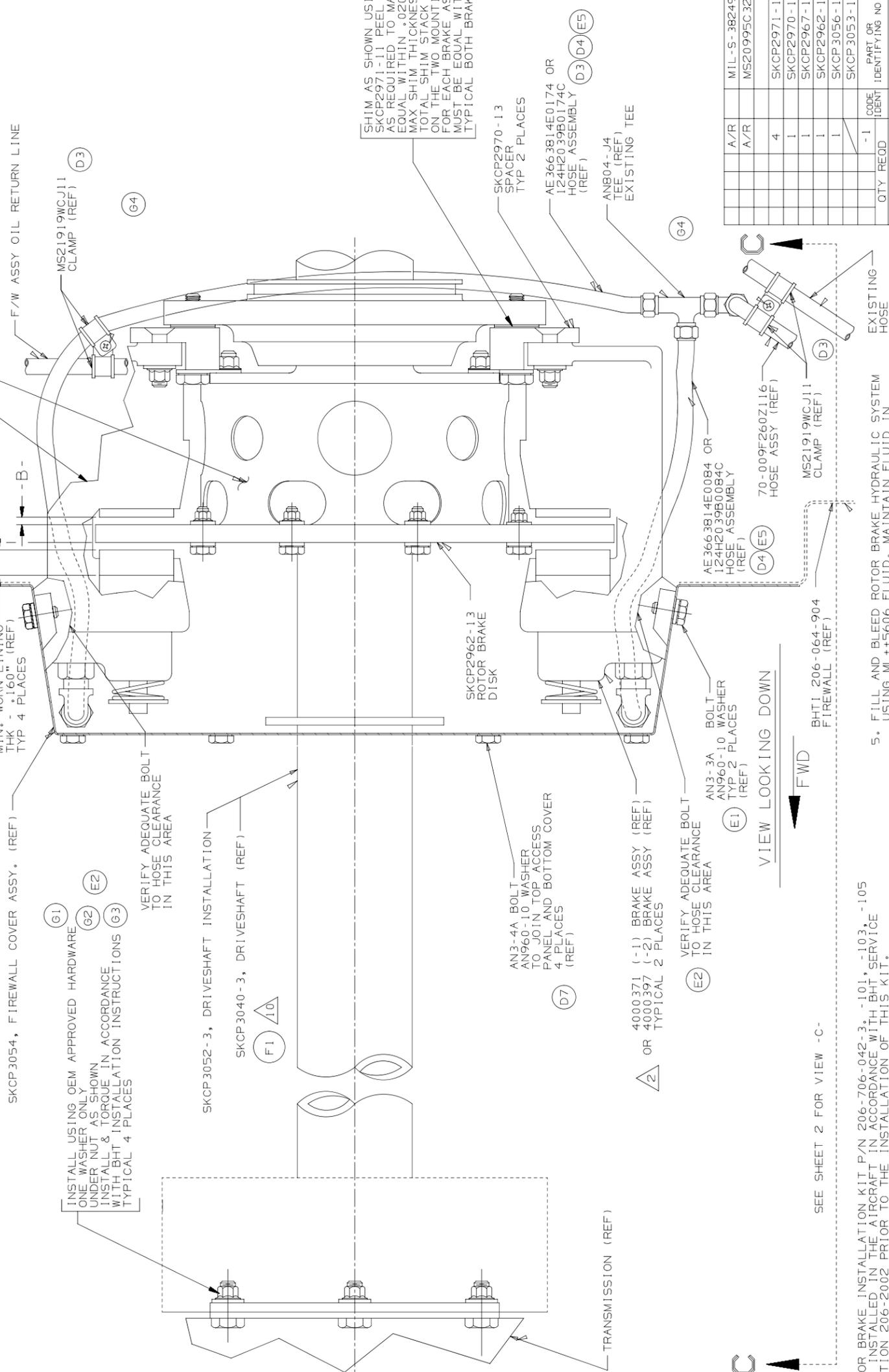


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SPECIAL PROPRIETARY NOTICE

INFORMATION CONTAINED HEREIN IS CONSIDERED PROPRIETARY TO KAMATICS CORPORATION AND IS TRANSMITTED TO BELL HELICOPTER TEXTRON UNDER THE PROPRIETARY INFORMATION EXCHANGE AGREEMENT BETWEEN KAMATICS AND BELL HELICOPTER TEXTRON DATED 25 JANUARY 1996.



SHIM AS SHOWN USING SKCP2971-11 PEEL SHIM WASHERS AS REQUIRED TO MAKE GAPS -A- AND -B- EQUAL WITHIN .020" MAX SHIM THICKNESS = .130" TOTAL SHIM STACK THICKNESS ON THE TWO MOUNTING BOLTS FOR EACH BRAKE ASSEMBLY MUST BE EQUAL WITHIN .004" TYPICAL BOTH BRAKE ASSEMBLIES

REV	ZONE	DESCRIPTION	REV BY	CHK BY	DESIGN	DATE
D		FOR REVISION HISTORY SEE REV. F 1. REMOVED BAG AND NOTE 7 2. DELETED ITEMS CONTAINED IN KITS OR PACKAGED WITH MAJOR DETAILS 3. MADE REFERENCE 4. ADDED ALTERNATE HOSES 5. ADDED NOTE 9 6. WAS IN ALBS (SHEET 2) 7. ADDED BOLT CALLOUT	J. MILLER		S. GARDNER	11/23/93
E		1. ADDED BOLT CALLOUT 2. ADDED NOTE AND CHANGED FIGURE TO SHOW REQUIRED HOSE CLEARANCE IN 2 PLACES 3. CHANGED DESCRIPTION 4. WAS "A/B" 5. CORRECTED HOSE DESCRIPTION	J. MILLER		S. GARDNER	11/23/93
F		1. ADDED COATING NOTE 10 2. ADDED BELL PROPRIETARY NOTE 3. CORRECTED SPELLING, NOTE 9	WM 5/22/13		S. GARDNER	11/23/93
G		1. ADDED "OEM APPROVED" 2. REMOVED SPECIFIED HARDWARE 3. REPLACED SPECIFIED TORQUE W/ REFERENCE TO OEM INSTRUCTIONS 4. REMOVED REFERENCE TO HARDWARE ON MS21919WCJ11 CLAMP	RSM 5/17/13		S. GARDNER	11/23/93
H		1. ADDED "USE RECOMMENDED OEM APPROVED NUT" 2. MODIFIED TORQUE REQUIREMENT	AJZ 3/24/15		ML 1/22/15	ML 3-30-15

A/R	QTY REQD	CODE IDENTIFYING NO	PART OR IDENTIFYING NO	DESCRIPTION
A/R		MIL-S-38249		FIREWALL SEALANT (PROSEAL 700 OR EQUIV.)
A/R		MS20995C32		SAFETY WIRE
	4	SKCP2971-11		PEEL SHIM
	1	SKCP2970-1		SPACER MOUNTING HARDWARE
	1	SKCP2967-1		ROTOR BRAKE CUP MOUNTING HARDWARE
	1	SKCP2962-1		ROTOR BRAKE DISK MOUNTING HARDWARE
	1	SKCP3056-1		FIREWALL DISK COVER KIT
	1	SKCP3053-1		KAFLEX ROTOR BRAKE MODIFICATION

LIST OF MATERIAL		APPROVED		DATE	
QTY	DESCRIPTION	BY	DATE	BY	DATE
		J.D. FINLEY			
		S. GARDNER	4-7-93		
		S. GARDNER	4-7-93		
		S. GARDNER	4-7-93		
		S. GARDNER	4-7-93		

- UNLESS OTHERWISE SPECIFIED BREAK SHARP EDGES .015/.030 TWO PLACE DECIMALS ±.03 THREE PLACE DECIMALS ±.010 SURFACE FINISH PER MTL-STD-10
- DRILLED HOLES  
 .940 TO .1689 DIA. ± .002  
 .940 TO .1689 DIA. ± .002  
 .940 TO .1689 DIA. ± .004  
 .940 TO .1689 DIA. ± .005
5. FILL AND BLEED ROTOR BRAKE HYDRAULIC SYSTEM USING MIL-5566 FLUID. MAINTAIN FLUID IN MASTER CYLINDER DURING BLEEDING PROCESS.
6. INSTALL SKCP3052-3 DRIVESHAFT INSTALLATION EXCEPT USE THE HARDWARE AS SHOWN IN THIS DRAWING.
9. HARDWARE SHOWN ON THIS DRAWING BY (REF) IS MAJOR COMPONENT SHOWN ON BILL OF MATERIAL.
10. COMPONENTS OF THE DRIVESHAFT TO BE COATED WITH CORROSION PROTECTION COATING ALL OVER PER KAMATICS OF 4/78002.





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## FLIGHT MANUAL SUPPLEMENT FOR BELL 206L1/L3 SKCP3052-3 KAFLEX DRIVESHAFT INSTALLATION WITH ROTOR BRAKE MODIFICATION

## ROTORCRAFT FLIGHT MANUAL SUPPLEMENT FOR BELL 206L1/L3 KAFLEX ROTOR BRAKE MODIFICATION

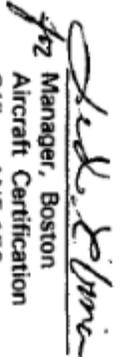
This supplement shall be attached to the flight manual for the Bell 206L1/L3 with SKCP3052-3 Kaflex Driveshaft Installation with Rotor Brake Modification installed in accordance with S.T.C. No. SH8683SW.

### LOG OF REVISIONS

This information contained herein supplements the information of the basic flight manual. For limitations, procedures and performance data not contained in this supplement, consult the basic flight manual.

REVISION NO.	PAGES REVISED	REMARKS	DATE	FAA APPROVED
1	1,2	Pages		
	3,4	Reformatted		

Approved:   
Joe Manager, Boston Aircraft Certification  
Office  
ANE-150

  
Joe Manager, Boston  
Aircraft Certification  
Office, ANE-150

SEP 08 1993

FAA APPROVED: ~~JUL 13 1994~~

SEP 08 1993

FAA APPROVED: ~~JUL 13 1994~~



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## FLIGHT MANUAL SUPPLEMENT FOR BELL 206L1/L3 SKCP3052-3 KAFLEX DRIVESHAFT INSTALLATION WITH ROTOR BRAKE MODIFICATION

## FLIGHT MANUAL SUPPLEMENT FOR BELL 206L1/L3 SKCP3052-3 KAFLEX DRIVESHAFT INSTALLATION WITH ROTOR BRAKE MODIFICATION

### DESCRIPTION:

The Kaflex Rotor Brake Modification modifies an existing Bell Rotor Brake Installation to allow for the use of Kaflex Driveshaft with the Rotor Brake.

### SECTION 2 - Operating Procedures (continued)

#### Engine Shutdown Procedure:

CAUTION: AVOID RAPID ENGAGEMENT OF ROTOR BRAKE IF HELICOPTER IS ON ICE OR OTHER SLIPPERY OR LOOSE SURFACE TO PREVENT ROTATION OF HELICOPTER.

### SECTION 1 - Operating Limitations

Rotorbrake Limitations: Engine starts with rotor brake engaged are prohibited.

#### Normal Procedures:

Weight/CG Limitations: Actual weight change shall be determined after kit is installed and ballast readjusted, if necessary, to return empty weight CG to within allowable limits.

Rotor Brake As desired, apply rotor brake between 38% and 30% rotor RPM. Return to stowed position after main rotor stops.

#### Placard:

ENGAGE ROTOR BRAKE BETWEEN  
38% & 30% ROTOR RPM  
(Located on the R/H side of  
Rotor Brake Master Cylinder Housing)

### SECTION 3 - Emergency Procedures

No change.

### SECTION 4 - Malfunction Procedures

No change.

### SECTION 2 - Operating Procedures

#### Normal Procedures:

Interior and Prestart Check  
Rotor Brake Handle - Up and Latched

### SECTION 5 - Performance Data

No change.

FAA APPROVED: **SEP 08 1993**  
REVISED: **JUL 13 1994**

FAA APPROVED: **SEP 08 1993**  
REVISED: **JUL 13 1994**





