



# SCHWEIZER SERVICE NOTICE

NOTICE NO. N-179.1\*

DATE 17 AUGUST 1982

PAGE 1 OF 10

\*Supersedes Service Information Notice  
No. N-114.3 dated 19 Sept 1977, Notice  
No. N-143 dated 31 May 1977, and  
Notice No. N-179 dated 17 July 1981

MANDATORY

MANDATORY

MANDATORY

SUBJECT: INSPECTION AND RETIREMENT — PN 269A5179 and 269A5179-3 DRIVE SHAFT AND COUPLING ASSEMBLY, MAIN ROTOR GEAR DRIVE ASSEMBLY PN 269A5175 BASIC, -3 OR -5

MODELS AFFECTED: All Model 269 Series Helicopters equipped with subject Main Rotor Gear Drive Assembly incorporating PN 269A5179 or 269A5179-3 Drive Shaft and Coupling Assembly

#### TIME OF COMPLIANCE:

1. For helicopters equipped with 269A5179 drive shaft and coupling assembly NOT modified per Hughes Notice No. N-114.3 or prior revisions:
  - a. At 2000 hours total time in service (269C) or at 2500 hours total time in service (269A/A-1/B/TH-55A), remove and replace shaft and coupling assembly with 269A5194 Ring Gear Carrier Assembly, per Hughes Notice No. N-142.1 or subsequent revision. If total time of 269A5179 assembly exceeds above, remove, retire and replace shaft and coupling assembly within next 100 hours of operation.

#### NOTE

Limited Life of PN 269A5194 Ring Gear Carrier Assembly is 6000 hours total time in service.

- b. At 300 hours total time in service and/or at each 300 hours of operation, perform inspection of shaft and coupling fastener area per Part IIB of this Notice, until retirement of 269A5179 assembly per 1a above.
- c. At 600 hours total time in service, or within next 100 hours of operation if total time exceeds 600 hours, remove lower bearing and inspect bearing bore per Part IIA of this Notice\*\*.

\*\*Part IIA inspection NOT required if removal and inspection of lower bearing bore has been accomplished previously.

(1) Denotes portion of text added or revised.

2. For helicopters equipped with 269A5179 drive shaft and coupling assembly already MODIFIED per Hughes Notice No. N-114.3 or prior revisions:
  - a. At 2000 hours total time in service (269C) or at 2500 hours total time in service (269A/A-1/B/TH-55A), remove and replace shaft and coupling assembly with 269A5194 Ring Gear Carrier Assembly, per Hughes Notice No. N-142.1 or subsequent revision. If total time of 269A5179 assembly exceeds above, remove, retire and replace shaft and coupling assembly within next 100 hours of operation.

NOTE

Limited Life of PN 269A5194 Ring Gear Carrier Assembly is 6000 hours total time in service.

- b. Within next 1000 hours time in service and at each 500 hours time in service thereafter (if 269A5179 assembly was modified per Notice No. N-114.3), and within next 300 hours time in service and at each 300 hours time in service thereafter (if 269A5179 assembly was modified per Notice No. N-114.2 or prior revision); inspect fastener area of shaft and coupling assembly per Part IIB of this Notice until retirement from service.
- c. At 600 hours total time in service, or within next 100 hours of operation if total time exceeds 600 hours, remove lower bearing and inspect bearing bore per Part IIA of this Notice\*\*.

\*\*Part IIA inspection NOT required if removal and inspection of lower bearing bore has been accomplished previously.

3. For helicopters equipped with 269A5179-3 drive shaft and coupling assembly:
  - a. At 2000 hours total time in service (269C) or at 2500 hours total time in service (269A/A-1/B/TH-55A), remove and replace shaft and coupling assembly with 269A5194 ring gear carrier assembly per Hughes Notice No. N-142.1 or subsequent revision. If total time of 269A5179-3 assembly exceeds above, remove, retire and replace shaft and coupling assembly within next 100 hours of operation.

NOTE

Limited Life of PN 269A5194 Ring Gear Carrier Assembly is 6000 hours total time in service.

- b. At 600 hours total time in service, or within next 100 hours of operation if total time exceeds 600 hours, inspect shaft and coupling assembly lower bearing bore and fasteners per Part IIA and IIB of this Notice\*\*.

\*\*Part IIA inspection NOT required if removal and inspection of lower bearing bore has been accomplished previously.

PREFACE: This Service Information Notice lists a procedure for periodic inspections, and for replacement as required, for the 269A5179 and 269A5179-3 drive shaft and coupling assemblies. Part I provides for main transmission removal and disassembly. Part IIA covers detailed inspection of the drive shaft and coupling assembly lower bearing bore. This Part IIA inspection is not required if lower bearing has been removed and bore inspected previously. Part IIB covers inspection of the shaft and coupling fastener area. Part III provides for assembly and installation of main transmission, including increased torque for the drive shaft and coupling cap screws.

\*It is to be noted that this Notice supersedes Service Information Notice No. N-114.3 and prior revisions, and Notice No. N-143; and also supersedes requirements of FAA Airworthiness Directive AD 77-21-10 referenced below. Modification in accordance with Notice No. N-114.3 or prior revisions is no longer allowed.

Instructions for initial installation of the 269A5194 ring gear carrier assembly, and modification of the main transmission upper housing to accommodate the larger carrier, are provided in Hughes Notice No. N-142.1 and subsequent revisions. Also, the referenced Hughes Notice No. N-159.1 provides instructions for replacement of an anti-fretting liner if required.

#### References

269 Series - Basic HMI, Reissued 15 March 1982  
269 Series - HMI Appendix B, Reissued 1 April 1980  
269 Series - HMI Appendix C, Part I, Reissued 15 December 1981  
Hughes Service Information Notice No. N-114.3, dated 19 September 1977  
Hughes Service Information Notice No. N-142.1, dated 31 May 1977  
Hughes Service Information Notice No. N-143, dated 31 May 1977  
Hughes Service Information Notice No. N-159.1, dated 18 December 1979  
FAA Airworthiness Directive AD 77-21-10  
FAA Airworthiness Directive AD 81-17-04

PARTS LIST

<u>Nomenclature</u>	<u>Part No.</u>	<u>Qty</u>	<u>Mfg</u>
Ring gear carrier assembly, main rotor drive	269A5194	1	HHI
Fluorescent penetrant inspection equipment	Uresco P-303A		Uresco Inc. Downey, CA
	Turco WP167		Turco Products Wilmington, CA
	Equivalent Kit conforming to MIL-L-25135		
Primer, zinc chromate	TT-P-1757		Commercial
	or MIL-P-8585		Commercial
Cloth, emery	100 grit or finer		Commercial

PART I - REMOVAL AND DISASSEMBLY OF MAIN TRANSMISSION

CAUTION

When performing steps b thru d below, comply with precautions and instructions in HMI and HMI Appendix C, including marking and retaining original parts for reassembly.

NOTE

Part I of HMI Appendix C contains complete disassembly, overhaul and reassembly procedures for main transmission.

- a. Remove main transmission (Section 10, Basic HMI).
- b. Remove exterior hardware oil pump assembly and oil pump drive assembly from main transmission (Part I, HMI Appendix C).
- c. Separate main transmission upper and lower housings and remove pinion shaft and bearing assembly.

## PART II - DETAILED INSPECTIONS

The following inspections are to be performed after completion of Part I, and in accordance with criteria specified in Time of Compliance of this Notice. Disassembly for access to inspect as accomplished as instructed per Part I.

### Part IIA - Inspection of Lower Bearing Cup

#### NOTE

To prevent corrosion damage to bearing cup, do not handle cup with bare hands. Finger marks are difficult to remove and perspiration starts corrosion.

a. Remove ring gear, and lower bearing cup from shaft and coupling assembly, according to instructions for disassembly of main rotor drive shaft and coupling assembly (HMI Appendix C). Removal of upper bearing cone is not required.

#### NOTE

The 269A5179-3 shaft and coupling assembly has an anti-fretting liner bonded to lower bearing seat. Do not remove liner for inspection of lower bearing seat. If required, replace anti-fretting liner per Hughes Notice No. N-159.1 or subsequent revision.

b. Using a 10X magnifying glass, conduct a close visual inspection of lower bearing bore on gear drive shaft and where lower bearing seats against drive shaft. For 269A5179-3 assembly, pay particular attention to area adjacent to bonded liner. Also inspect ring gear mating area. Inspect for fine cracks, wear, nicks, burrs, fretting or other damage.

NOTE

Any fretting or cracking of lower bearing seat or gear mating area is cause for replacement of shaft and coupling assembly with 269A5194 ring gear carrier assembly per Hughes Notice No. N-142.1 or subsequent revision.

Do not mistake machine marks for fretting. For permissible correction of minor defects, refer to Part I, Section 3 of HMI Appendix C.

If cracks are not found, perform a fluorescent penetrant inspection of same areas per MIL-I-6866.

c. If a sharp edge exists at shoulder inside diameter (ID) of lower bearing cup seat on drive shaft, remove sharp edge with a stone or 100 grit (or finer) emery cloth. Remove approximately 0.005 to 0.010 inch of material. (See Figure 1.)

NOTE

If shoulder at ID of lower bearing cup seat on drive shaft was chamfered per step c above, add a small dot of yellow paint to lower left corner of main transmission nameplate.

d. Measure ID of bearing bore on drive shaft for lower bearing cup, and outside diameter (OD) of lower bearing cup at four equally spaced locations around mating areas. Add and average the inside and outside diameters separately; subtract the average ID from the average OD to determine interference fit. Acceptable interference fit is 0.007 inch minimum to 0.009 inch maximum. Acceptable dimensions for the diameters are as follows:

Shaft and lower bearing cup ID	5.367-5.368 inches
Lower bearing cup OD	5.375-5.376 inches

NOTE

If a dimension is out of limits specified in step d above, replace drive shaft and coupling assembly with 269A5194 ring gear carrier assembly, per Hughes Notice No. N-142.1 or subsequent revision.

- e. Record compliance with Part IIA of this Notice in Compliance Record of helicopter Log Book.

Part IIB - Inspection of Locking Collar Area

NOTE

Removal of locking collars is not required for inspection of areas adjacent to locking collars. Do not disturb locking collars when performing inspection.

- a. Using a 10X magnifying glass, conduct a close visual inspection of visible areas of shaft assembly for fine cracks adjacent to locking collars.

NOTE

If cracking is not found during inspection in step a above, perform a fluorescent penetrant inspection of same areas per MIL-I-6866. Do not mistake machine marks for fretting.

For permissible correction of minor defects, refer to Part I, Section 3 of HMI Appendix C.

If fretting, cracking, or other non-correctable defect is noted, replace defective drive shaft and coupling assembly with 269A5194 ring gear carrier assembly per Hughes Notice No. N-142.1 or subsequent revision.

- b. Record compliance with Part IIB of this Service Notice in Compliance Record of helicopter Log Book.

PART III - REASSEMBLY AND INSTALLATION OF  
MAIN TRANSMISSION

NOTE

When installing lower bearing cup, cool cup to -20°F with cry ice and heat shaft or carrier assembly to 275°F; apply wet zinc chromate primer to faying surfaces of bearing cup at installation. To prevent corrosion damage to lower bearing cup, do not handle cup with bare hands.

When assembling drive shaft and coupling assembly, dry torque the 14 cap screws to 360-395 inch-pounds.

- a. Reassemble lower bearing cup and ring gear with mated shaft and coupling assembly or carrier assembly, according to instructions per Part I, Section of HMI Appendix C, except use increased torque (360-395 inch-pounds) for cap screws as noted above.

CAUTION

At reassembly, a 269A5104 ring gear is to be used only with a 269A5103 pinion (input) shaft assembly, and a 269A5104-5 ring gear only with a 269A5103-9 input pinion shaft assembly, in sets.

- b. Determine output assembly bearing preload breakaway torque.

NOTE

If no components of pinion shaft and bearing retainer assembly or attaching shims are replaced, perform following step c. If any part of the assembly is replaced, perform procedure for determination of input shaft and retainer assembly mounting distance (HMI Appendix C).



- c. Perform no-load wipe test, backlash check and adjustment.

NOTE

Backlash check should be performed at 3 or 4 radial positions of the ring gear. This assures that radial alignment of the reassembled shaft and coupling or carrier assembly is correct.

- d. Perform final installation of pinion shaft and bearing retainer assembly; drive shaft coupling assembly and upper and lower housing assemblies.

- e. Install oil pump drive retainer assembly, oil pump assembly and exterior hardware on transmission.

- f. Perform final check of transmission; install main transmission on helicopter, per Section 10, Basic HMI.

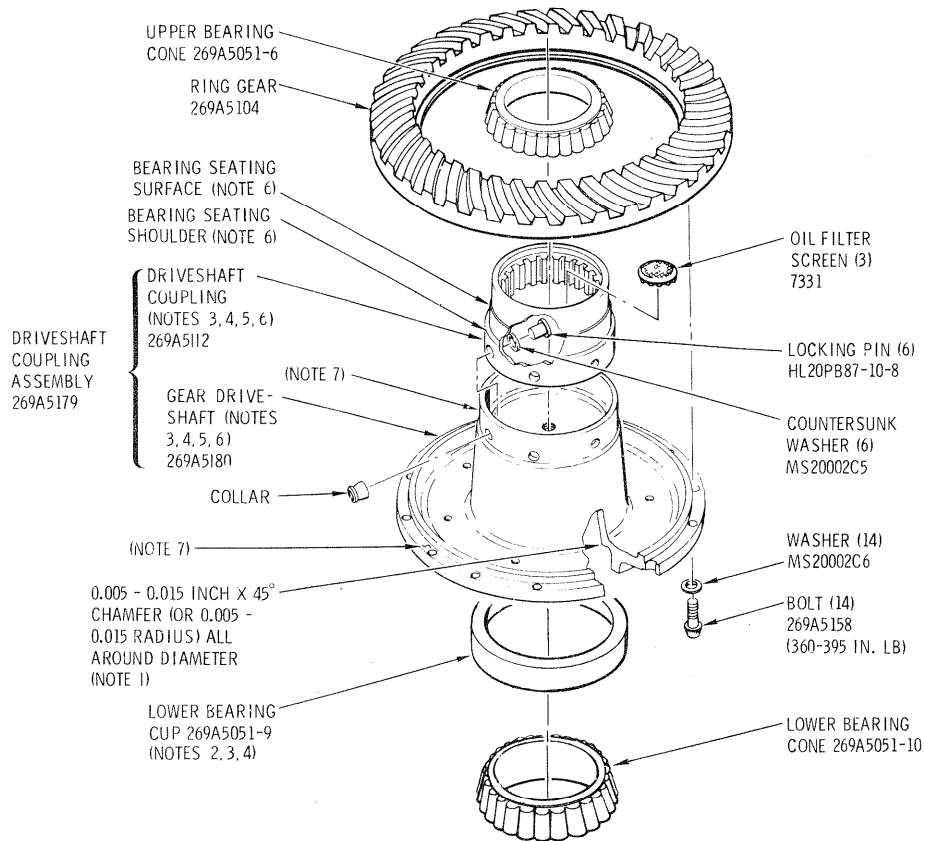
- g. Service main transmission with lubricant. (Section 2, Basic HMI.)

- h. Record compliance with Part I and Part III of this Notice in Compliance of helicopter Log Book.

WEIGHT AND BALANCE DATA

Weight and balance not affected

FAA APPROVED



NOTES:

1. INSPECT FOR SHARP EDGE. IF SHARP EDGE IS PRESENT, REMOVE MATERIAL FOR REQUIRED CHAMFER (OR RADIUS). (REFER TO TEXT.)
2. CUP TO SHAFT INTERFERENCE FIT OF 0.007 IN. MINIMUM TO 0.009 IN. MAXIMUM REQUIRED. (FOR DIAMETER REQUIREMENTS REFER TO TEXT.)
3. INSTALL WITH ZINC CHROMATE PRIMER.
4. REMOVE OR INSTALL USING TEMPERATURE DIFFERENCE METHOD. (REFER TO TEXT.)
5. PRIOR TO DISASSEMBLY, PAINT MARK ON EACH COMPONENT FOR REASSEMBLY AT SAME POSITION.
6. AFTER REASSEMBLY OF SHAFT AND COUPLING, CHECK COUPLING-TO-SHAFT ALIGNMENT. (REFER TO TEXT.)
7. AFTER INSPECTION OF COUPLING IN SHAFT, APPLY ZINC CHROMATE PRIMER TO CIRCUMFERENCE AT COUPLING AND SHAFT.

88-113C

Figure 1. Drive shaft coupling assembly -- exploded view

## REFERENCE SHEET

### SERVICE INFORMATION NOTICES AND LETTERS

Action Reference: When performing maintenance, inspection or replacement of PN 269A5179 or 269A5179-3 drive shaft and coupling assembly, refer to Notice No. N-179.1 for inspection and retirement criteria. Notice No. N-179.1 supersedes Notice No. N-114.3 and prior revisions, and Notice No. N-143.

HMI Reference: Insert this sheet in Basic HMI, Section 10, page 10-5.

This reference sheet shall be kept as a part of the HMI until the data is incorporated at the next scheduled revision of the Basic HMI. (Refer to Service Information Summary, Basic HMI, page i.)

## REFERENCE SHEET

### SERVICE INFORMATION NOTICES AND LETTERS

Action Reference: When performing maintenance, inspection or replacement of PN 269A5179 or 269A5179-3 drive shaft and coupling assembly, refer to Notice No. N-179.1 for inspection and retirement criteria. Notice No. N-179.1 supersedes Notice No. N-114.3 and prior revisions, and Notice No. N-143.

HMI Reference: Insert this sheet in HMI Appendix B, Section 2, Table B-5, page 2-17.

This reference sheet shall be kept as a part of the HMI until the data is incorporated at the next scheduled revision of HMI Appendix B (Refer to Service Information Summary, HMI Appendix B, page i.)

## REFERENCE SHEET

### SERVICE INFORMATION NOTICES AND LETTERS

Action Reference: When performing maintenance, inspection or replacement of PN 269A5179 or 269A5179-3 drive shaft and coupling and coupling assembly, refer to Notice No. N-179.1 for inspection and retirement criteria. Notice No. N-179.1 supersedes Notice No. N-114.3 and prior revisions and Notice No. N-143.

HMI Reference: Insert this sheet in HMI Appendix C, Part I, Section 1, page 1-1.

This reference sheet shall be kept as a part of the HMI until the data is incorporated in the next scheduled revision of HMI Appendix C. (Refer to Service Information Summary, HMI Appendix C, page i.)