



HN-198.1\*  
DN-131.1\*  
EN-020.1\*  
FN-008.1\*

# SERVICE BULLETIN

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**MANDATORY MANDATORY MANDATORY**

\* Supersedes Service Information Notices HN-198, DN-131, EN-20, FN-8 Dated 14 November 1984.

## CORROSION REMOVAL AND MAGNETIC RUBBER INSPECTION OF MAIN ROTOR DRIVE SHAFT I.D.

### 1. PLANNING INFORMATION

#### A. MODELS AFFECTED:

All MD Helicopters, Inc. (MDHI) 369 Series helicopters, including the 369A (OH-6A) Series helicopters.

#### B. PREFACE:

The information in this Notice provides procedures for removal of corrosion on the inner surfaces of 369A5500 and 369D25510 series main rotor drive shafts and restoring the protective coating on the I.D. This Notice also provides procedures for performing a magnetic rubber inspection of the main rotor drive shaft I.D.

**NOTE:** DYNAMOLD magnetic rubber contains ferromagnetic particles (colored black for contrast) which accumulate at any surface cracks by magnetic attraction, thereby permitting the cracks to be discerned.

The information given is to be considered as part of the HMI and will be incorporated at the next scheduled revision to the below referenced manuals.

#### C. TIME OF COMPLIANCE:

This Service Information Notice shall be complied with whenever corrosion is found or cracks are suspected on inside diameter surfaces of main rotor drive shaft or if corrosion pits were previously found and an inspection for cracks was not accomplished at that time.

#### D. FAA APPROVAL:

The resultant alteration to affected models as described by procedures in this Notice has been shown to comply with Federal Aviation Regulations and is FAA Approved.

#### E. WEIGHT AND BALANCE:

Weight and balance not affected

#### F. REFERENCE:

369D/E HMI VoI. I (CSP-D-2), Revised 15 June 1985  
369F/FF HMI VoI. I (CSP-F-2), Revised 15 April 1986  
369H Basic HMI (CSP-H-2), Revised 15 June 1985

#### G. PARTS LIST:

PARTS LIST			
Nomenclature	Part No.	Qty.	Source
Cork Plug	23420-515-24	1	MDHI

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## H. MATERIALS:

MATERIAL	
Nomenclature	Source
Sealing compound (MIL-S-7502)	Commercial
Epoxy primer Base (1-1G-69) Catalyst (1-1 H-75)	Advance Coating and Chemicals 4343 Temple Blvd Temple City, CA 91780
Epoxy enamel White #37875 MIL-C-22750	Advance Coating and
Surface cleaner (TT-C-490) P/N WO-1	Turco Products, Inc. Wilmington, CA.
1,1,1 Trichloroethane, technical inhibited 0-T-620	Commercial
Cement, polysulfide P/N's 247, 890 or PR1221B-2	Product Research Burbank, CA.
Wash, primer MIL-C-8514	Commercial
Adhesive tape	Commercial
Dynamold magnetic rubber, kit P/N MR-502K (1 quart) Note: shelf-life is 10 months after date received	See list below

### Domestic and International suppliers of Dynamold magnetic rubber:

Dynamold, Inc. 2905 Shamrock Ave. Fort Worth, TX 76107 817 -335 -0862 telex: 379-1940 DYNAM	Quality Concepts 7825 Hillmont Houston, TX 77040
Norwest Company 5729 Lakeview Dr. NE Seattle, WA 206-827-9562	Sofratest 39 Bis rue, du D Maurer 78630 Orgeval, France (3) 975-99.09

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	Citicorp Air Singapore
Hannah International Hongik Bldg. Kwanhoon Dong Chongro-Ku, Seoul, Korea 733-8234-5	Matcon Singel 386 1016 AJ Amsterdam, Holland 020-238278
Citicorp Air Tel Aviv, Israel 248801	Staveley NDT Technologies Inspection Instruments Division 712 Banbury Ave. Slough Berks SL14LH, England Slough 0753-76216
Citicorp Air Moreno 970 of 13 1091 Buenos Aires, Argentina 32-2809, 34-4097	NDT Italiana SAS viale Monza, 190 20128 Milano, Italy 2576089
Citicorp Air Aerospace Dept. Okura & Co. Okura Annex 3F 4-1 Ginza 3-Chrome chui-ku, Tokyo, Japan 03-535-3550	Aviation and Industrial Distributors 39 Church Street Onehunga, Auckland, New Zealand  Citicorp Air Melborne, Australia
Candet 18 Canso Road Rexdale, Ontario, Canada M9W 4L8 416-243-3456	Labratory Supply 2057 Princes Hwy. Clayton, Victoria, Australia 03-543-1155

## I. TOOLS AND EQUIPMENT:

TOOLS AND EQUIPMENT	
Nomenclature	Source
Brush, wire or rotary	Commercial
Inspection unit, magnetic particle*	Commercial
Cord, 1/8 inch x 36 inch (qty.3)	Commercial
Mixing cup, graduated	Commercial

\*Capable of holding the 369D25510 and 369A5500 main rotor drive shaft securely in a level (horizontal) position during the inspection and curing period. The magnetic particle inspection unit must have a coil capacity of 2500 ampere turns (longitudinal field).

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## 2. PROCEDURE

- a. Remove main rotor drive shaft (Section 9, applicable HMI).



Care shall be taken not to damage inner bore of drive shaft when removing cork plug.

- b. Using suitable scribe or penknife, carefully remove cork plug from end of drive shaft. Lightly abrade inner surfaces of shaft using crocus cloth to remove any cork remnants.
- c. Degrease entire drive shaft inner diameter (ID), using 1,1,1 trichloroethane.
- d. Inspect interior of drive shaft for corrosion with suitable light or borescope.

**NOTE:** Corrosion will appear as flaking or raised surface areas of drive shaft ID.

- e. Using a fine wire rotary brush or wire brush, remove corrosion and contaminants from the drive shaft ID.



**Turco WO-1 will irritate the skin; always use rubber gloves when handling this material. Wash skin exposed to Turco WO-1 thoroughly with water.**

- f. Using swab and extension rod, swab ID of drive shaft with Turco WO-1, diluted one part to four parts water.
- g. Thoroughly rinse drive shaft ID with distilled water and dry with clean compressed air.
- h. Using suitable light or borescope, inspect shaft ID for additional corrosion and pitting.
- i. If required, locally hone drive shaft ID to remove corrosion using wire or rotary brush. Blend honed area with existing surrounding area.
- j. Verify drive shaft ID does not exceed 1.655 inches. If corrosion removal causes or would cause shaft ID to exceed 1.655 inches, replace shaft. If any cracks are noted, replace drive shaft.
- k. Perform Dynamold magnetic rubber inspection per the following steps:

**NOTE:** If corrosion is localized to one area of the shaft ID (120 degrees or less of ID circumference), only one replicant has to be made.

1. Set up magnetic particle inspection unit to hold driveshaft secure during the inspection and curing period. Set up coil shot (longitudinal field) at 2500 ampere turns DC.
2. Place cord through the ID bore and leave ends hanging out and plug ID of drive shaft by taping gear end closed with cord hanging out.
3. Per Dynamold manufacturer's instructions, thoroughly mix MR-502K with stirring stick mixing all sediment (magnetic particles) into the rubber liquid. Make sure all lumps are mixed into a smooth consistent streak free condition.
4. Pour 10.5 fluid ounces (300ML) into mixing container and add catalyst per manufacturer's instructions. Stir this mixture for approximately 30 seconds.
5. Quickly pour the entire 10.5 ounces (300ML) into the ID bore. Plug the hub end using tape, leaving the cord hanging outside. This amount of magnetic rubber will cover 120 degrees of circumference over the entire length of the drive shaft ID.
6. Immediately place the drive shaft in the magnetic particle inspection unit with the shaft positioned horizontally and secure.

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7. Begin magnetizing the drive shaft using the coil (longitudinal field) moving along the entire length of the drive shaft in approximately four (4) inch increments, between each pulse (1/2 second shot). This should take 35 to 40 seconds.

8. Remove drive shaft from magnetic particle inspection unit and place in a safe area after mixture has set up. Ensure drive shaft is not rotated and in same position as it was magnetized and continue curing process for approximately 30 minutes or longer if curing is not completed.



Dynamold rubber material, when cured, will feel soft and pliable to the touch and will tear easily if not handled carefully during removal.

9. When mold has cured, remove tape from both ends of drive shaft. The exposed ends will be indicators of the cure rate. Using the cord to lift each end, continue removing the mold.

l. If additional replicas are required, repeat steps K-1 through K-9.

## NOTE:

- Questionable replicant indications shall be carefully packaged and sent to MDHI for evaluation. If considerable corrosion is noted, the drive shaft can be sent to MDHI Warranty and Repair Department for inspection and interpretation.
- If any cracks are noted, scrap and replace shaft (see Figure 1.)
- See Figure 2 for location of acceptable machining indications.

m. Clean shaft ID.

n. Apply one coat of wash primer to drive shaft ID according to manufacturer's instructions.



Do not allow epoxy primer or epoxy enamel to contact drive shaft splines or mounting surfaces.

o. Fill shaft with epoxy primer mixed according to manufacturer's instructions to slosh-coat the shaft ID. Drain primer from shaft. Ensure that shaft ID is completely coated. Allow primer to dry one hour at room temperature.

p. Apply two coats of white epoxy enamel to drive shaft by filling and draining shaft. Allow enamel to dry 48 hours at room temperature or let dry 30 minutes at room temperature, then cure for three hours in oven at 250-275 degrees F.

q. Install cork plug to rotor end of drive shaft by applying a thin coat of adhesive to ID of shaft end in which cork is to be installed and all cork plug surfaces. Press cork into shaft until top of cork is flush with top of drive shaft. Allow adhesive to cure according to manufacturer's instructions. Apply a second coat of adhesive to all exposed surfaces of cork; allow to dry.

r. Reinstall drive shaft in helicopter per applicable HMI, Section 9.

s. Record compliance to this Service Information Notice in the compliance record section of the helicopter Log Book.

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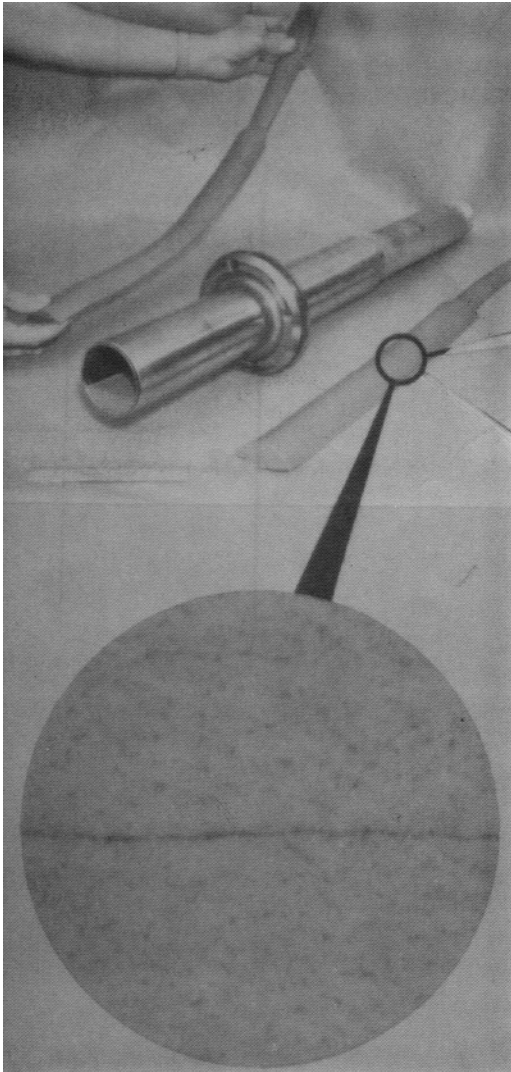
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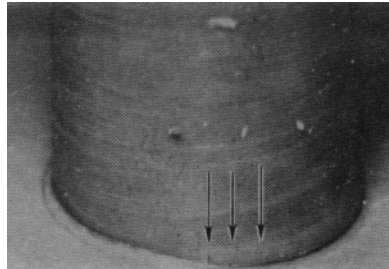
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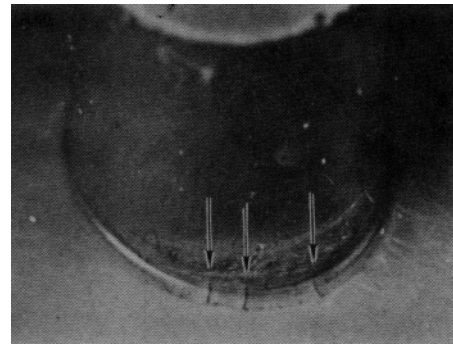
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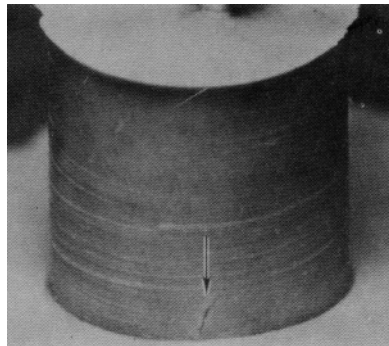
INDICATIONS OF CRACKING  
WHEN VIEWED WITH A  
10X MAGNIFYING GLASS  
(UNACCEPTABLE DRIVE SHAFT)



A. EDGE CRACKS IN THE .002"  
TO .015" SIZE RANGE



B. .020" TO .030" EDGE CRACKS



C. INTERNAL CRACK IN HOLE IS .050"  
IN LENGTH

SMALL CRACKS EASILY SEEN UNDER 10X MAGNIFICATION

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**Figure 1. Inspection of Main Rotor Drive Shaft Inside Diameter.**

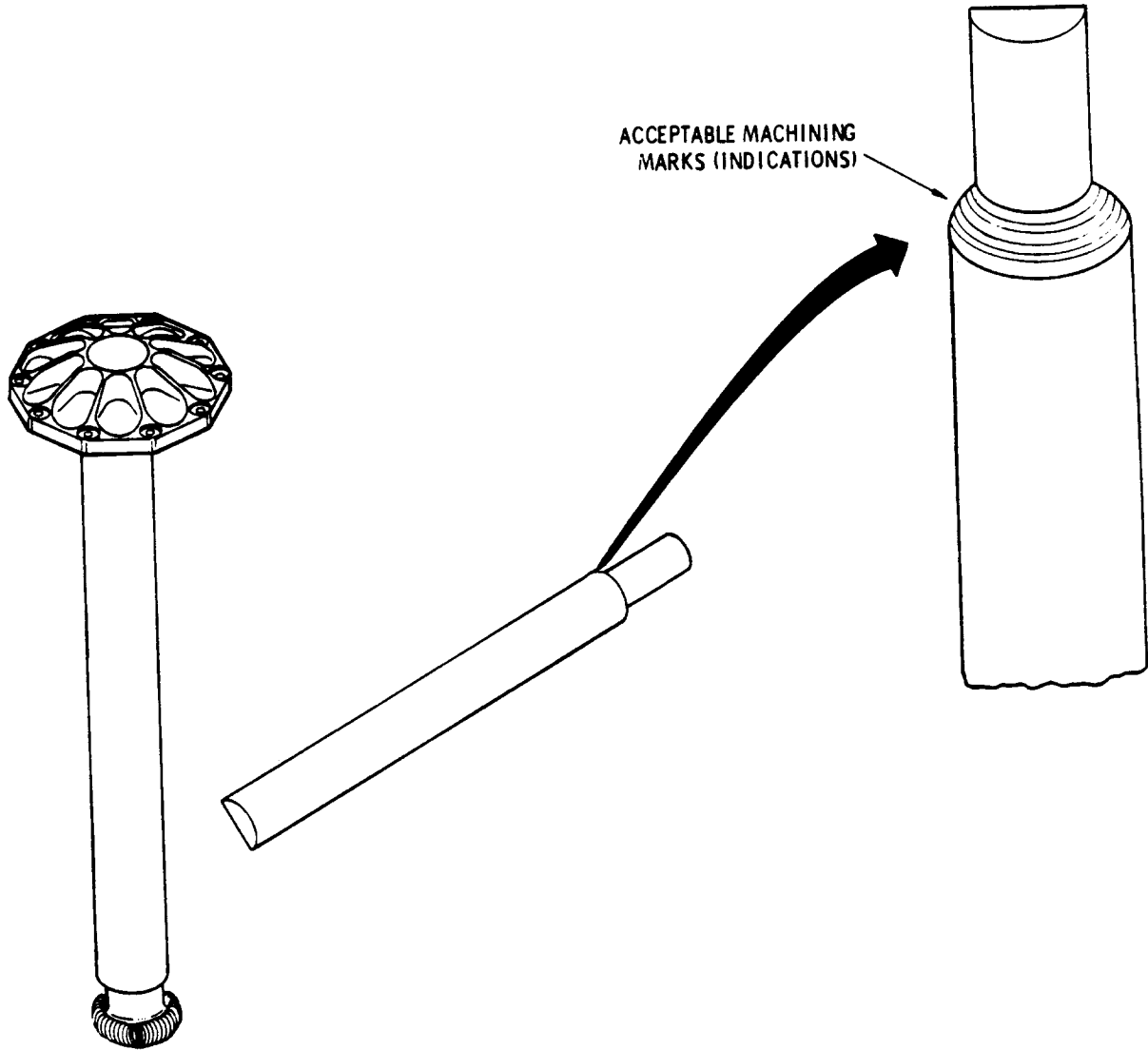
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**Figure 2. Location of Acceptable Machining Indications**

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