SCHWEIZER SERVICE INFORMATION NOTICE

NOTICE NO. N-134.3*
DATE: 03 July 1989

*Supersedes Service Information Notice No. N-134.2 dated 15 July 1983

MANDATORY MANDATORY MANDATORY

SUBJECT:

REVISED ENGINE OPERATING PROCEDURES AND MAINTENANCE PRACTICES

MODELS AFFECTED:

- All Model 269C Helicopters

TIME OF COMPLIANCE:

- Shall be accomplished as specified herein upon receipt of this Notice.

PREFACE:

The purpose of this Service Information Notice is to advise owners and operators of Model 269C helicopters of revised operating procedures and maintenance practices to be used for the Lycoming HIO-360-DIA engine.

Part I of this notice lists revised engine operating procedures in accordance with the Approved Rotorcraft Flight Manual referenced below.

Part II of this notice specifies a list of recommended maintenance practices and techniques for proper use of the DIA engine.

Part III of this notice lists recommended modifications to the engine and accessory equipment to help improve engine performance and achieve optimum service life prescribed for the engine.

(▌) Denotes portion of text added or revised.

REFERENCES:

- Schweizer 300C Model 269C Helicopter FAA Approved Rotorcraft Flight Manual, Dated 21 September 1988 or subsequent
- Schweizer 300C Model 269C Helicopter FAA Approved Rotorcraft Flight Manual Supplement for Dual Engine RPM Operation, CSP-C-1F, Reissued 21 September 1988 or subsequent
- Schweizer Service Information Notice No. N-110, Dated 24 September 1973
- Flight Manual Supplement Engine Throttle Governor Installation PN 269A4995 CSP-C-1I, Dated 21 September 1988
- Flight Manual Supplement Engine Overspeed Installation CSP-C-1K, Dated 21 September 1988
- Schweizer Notice No. N-180 Engine Throttle Governor Kit Installation, PN 269A4995-301, Dated 18 January 1982
- Schweizer Notice No. N-202 Improved Methods for Checking Idle Mixture and Idle Speed. Operational Check of Fuel System, Dated 23 February 1987
- Schweizer Notice No. N-224 Inspection and Possible Replacement of 33-199-915 Fuel Filter Element (Wire Mesh Screen Without Stiffeners), Dated 21 September 1988
- Lycoming Service Instructions No.1409A, Dated 23 November 1884
- Schweizer 269 Series Illustrated Parts Catalog, Reissued 15 September 1981; Revision No. 1, 1 June 1982
- Lycoming Service Bulletin No. 369G, Dated 7 September 1982
- Lycoming Service Bulletin No. 388A, Dated 14 April 1978
- Lycoming Service Instruction No. 1014K, Dated 23 November 1984
- Lycoming Service Instruction No. 1116C, Dated 25 April 1975
- Lycoming Service Instruction No. 1275B, Dated 6 October 1978
- Lycoming Service Instruction No. 1287, Dated 14 September 1973
- Lycoming Service Instruction No. 1319B, Dated 4 December 1981
- Lycoming Service Bulletin No. 480, Dated 18 January 1988

NOTE

From numerous engines returned to Lycoming for teardown and from field reports, it is evident that some operators of the engines do not observe the limitations for power and rpm speeds that are imposed on the HIO-360-DIA engine. Intentionally or inadvertently some of these engines are being operated at speeds above 3200 rpm and at power settings exceeding the prescribed manifold pressure limits. FAA approval of 3000 rpm for takeoff and landing should eliminate any need for operations above 3200 rpm.

Experience with the HIO-360-DIA engine shows that when the engine is operated within the recommended limits and is properly maintained, it will readily attain its designed TBO. However, when these limits are exceeded, overstressing of vital parts will occur resulting in a shortened TBO and/or engine malfunctions. It has been determined that engine overspeed is a major cause of engine malfunction; see Lycoming Service Bulletin No. 369G for specific recommendations on overspeed.

Hughes and Lycoming have also determined that there are additional factors that can affect engine life. Therefore, Hughes and Lycoming undertook a joint study to investigate engine malfunctions and to analyze engine life. In this study Lycoming centered their attention on mechanical aspects of the engine and Hughes on operating techniques.

During the study, a survey of operators was conducted, including those who had experienced numerous engine problems, those who experienced a moderate number of problems and those who had a minimal number. As an example of the latter, one operator with a fleet of 12 300C's had successfully operated 18 engines trouble-free to normal TBO time.

This Notice outlines the Schweizer and Lycoming recommendations resulting from the above. The recommendations fall into three categories:

A. Operating Procedures

B. Maintenance Factors

C. Modifications

PART I - OPERATING PROCEDURES

A. Operating Procedures. For optimum engine performance and life, adhere to the operating procedures prescribed in the Approved Rotorcraft Flight Manual Reissue, dated 21 September 1988 or later.

1. Engine RPM Control
   a. Engine starting - Many instances of overspeed were registered during engine starts. Performance of engine starting procedures in accordance with the Rotorcraft Flight Manual will preclude overspeeds and improve starting as well.
   b. Hovering, takeoff and landing - As with any reciprocating engine, the extended use of maximum rpm will reduce engine life. Use procedures as specified in the Rotorcraft Flight Manual.

NOTE

In step 1c. below, an electronic limiter is also available.

   c. Engine overspeed limiters - Some operators have installed a hydraulic overspeed limiter and set the limiter as high as 3350 rpm. If an rpm runup is made to functionally check the unit, an overspeed is the result. The limiter is to be adjusted so that rpm limits of the Rotorcraft Flight Manual are complied with.

2. Power Management
   a. When cruising, the manifold pressure should be reduced to the minimum necessary to maintain the desired speed and altitude (within the limitations of the Approved Rotorcraft Flight Manual).

3. Engine Cool Down

   a. As with any other reciprocating engine, immediate shutdown without first cooling the engine produces high localized temperatures, especially near the exhaust valves. These higher temperatures are a contributing factor to carbon buildup in the valve stem guides, which has been indicated as a major cause of exhaust valve sticking. Following the cool down procedures specified in the Rotorcraft Flight Manual will aid in preventing the above problems.

PART II - MAINTENANCE FACTORS

A. Maintenance Factors. Performance of sound maintenance practices is as vital as proper use of the equipment. The following highlights are specified and recommended for the HIO-360-DIA engine.

1. Lubrication

   a. Frequent oil and filter changes are highly desirable. Lycoming and Schweizer recommend a 50 hour interval oil change and filter replacement for all engines using a full-flow filtration system. A 25 hour interval oil change and screen cleaning is recommended for all engines using a pressure screen system. In either event, there is a four month maximum interval between changes. More frequent changes are desirable when poor environmental conditions (i.e., dust and high OAT) are present.

   b. Use of ashless dispersant oil for engines that have been broken-in is recommended by Lycoming at all times. (Refer to Lycoming Service Instruction No. 1014E.) It is further recommended that a straight mineral oil be used for a break-in period (maximum 50 hours) in all overhauled or remanufactured engines.

2. Fuel System

   a. Fuel injection nozzles are to be cleaned as required. Clogged or dirty fuel injection nozzles result in poor fuel distribution. This condition is indicated by rough engine operation, uneven idle or cold cylinders. Should any of these indications occur, clean nozzles per Lycoming Service Instruction No. 1275B.

CAUTION

FOR HELICOPTER OPERATED IN DUSTY ENVIRONMENT, OR USED FOR CHEMICAL SPRAYING, CLEANING OF THE FUEL INJECTION NOZZLE IS RECOMMENDED AT 100 HOUR INTERVALS, OR MORE FREQUENTLY IF REQUIRED. (REFER TO LYCOMING SERVICE INSTRUCTION NO. 1275B.)

3. Exhaust Deposits

   a. Accumulation of deposits on the cylinder head fins adjacent to the exhaust port inhibits cooling and promotes excessive heating. Cleaning of the fins is recommended at 100 hours and as required by carbon accumulation. Use of the new exhaust port seals (PN 269A8225-003) is recommended to promote proper cooling.

4. Valve Guide Clearance

   a. Lycoming has devised a new valve guide check fixture to pinpoint excessively worn valve guides. The use of this tool is recommended. (Refer to Lycoming Service Bulletin No. 388A.)

5. Throttle Backlash

   a. The throttle system should be maintained per the HMI for minimum backlash. Excessive backlash is detrimental to throttle coordination and rpm control.

PART III - MODIFICATIONS

A. Modifications. Several modifications to the helicopter and to the engine and accessory equipment are recommended; these are listed below.

NOTE

Step 1a. below is a mandatory change and is to be accomplished upon receipt of the reissued "Approved Rotorcraft Flight Manual" dated 21 September 1988 or later.

1. Helicopter

a. Blank out the limitation "3200 RPM Minimum Below 400 Feet above Terrain" located on the instrument panel at the bottom of the Manifold Pressure placard.

NOTE

Step 1b. below is a mandatory change on helicopters equipped with the Dual Engine RPM Operations Kit per Drawing 269A4957, upon receipt of Rotorcraft Flight Manual Supplement reissued 21 September 1988 or later.

b. Remove and replace the Limit Manifold Pressure placard PN 269A4646-203 with the PN 269A4646-207 placard. The placard may be obtained free of charge by ordering from Schweizer Aircraft Corp.

c. The installation of a dual oil cooler on early Model 269 helicopters (see Service Information Notice No. N-110) is a must in certain climates and is a definite asset under most conditions. The dual oil cooler will maintain a lower oil temperature with less resultant carbon buildup on the exhaust valves and guides.

d. Schweizer now provides exhaust port seals PN 269A8225-3, which greatly reduce exhaust deposit buildup on the cylinder head fins and aid in proper engine cooling. The seals are recommended for all Model 269C helicopters and are shown in the IPC.

2. Engine

a. The installation of a full-flow oil filter is recommended. (Refer to Lycoming Service Instruction No. 1319B.)

b. Modification of, or replacement of, the valve guides to increase clearance is recommended. (Refer to Lycoming Service Instruction No. 1116C.)

c. The installation of the Bendix starter spring shim, Lycoming PN RW17613-A-1, will increase the spring tension and aid in smooth, quick engine starts without premature disengagement. (Refer to Lycoming Service Instruction No. 1287.)

WEIGHT AND BALANCE DATA

Weight and balance not affected.