



SCHWEIZER SERVICE NOTICE

NOTICE NO: N-202

DATE: 23 FEB 1987

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MANDATORY

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SUBJECT: IMPROVED METHODS FOR CHECKING IDLE MIXTURE AND IDLE SPEED. OPERATIONAL CHECK OF FUEL SYSTEM.

MODELS AFFECTED: All 269 Series Helicopters

TIME OF COMPLIANCE:

- PART I - Shall be accomplished at each adjustment of idle mixture.
- PART II - Shall be accomplished at each adjustment of idle speed.
- PART III - Shall be accomplished after any adjustment to idle mixture or idle speed.
- PART IV - Shall be accomplished at the end of the last flight of each day, prior to engine shut down.

REFERENCE: 269 Series - Basic HMI, Reissued 15 March 1982.
269 Series - HMI Configuration Supplement, Reissued 15 September 1982

PREFACE: This Service Information Notice establishes an improved method for checking idle mixture and idle speed. An operational check of the fuel system is also included. PART I (idle mixture check) and PART II (idle speed check) should be alternately repeated until idle mixture and idle speed are within the required limits. PART III is to be accomplished after idle mixture and idle speed are set. Part IV is a daily pilot's check of idle mixture and idle speed. This allows the pilot to track idle mixture and idle speed progression and to notify the appropriate maintenance personnel (to perform Parts I through III of this notice) whenever the progression indicates a malfunction.

It is strongly recommended that the checks of idle mixture and idle speed be repeated several times, until a definite recurrent condition is established. Only after establishing a definite condition (such as idle mixture being too rich) should an adjustment be made. Repetitive checks will produce more accurate results and reduce the likelihood of an unnecessary adjustment.

PART I - IDLE MIXTURE CHECK

NOTE

Idle mixture and idle speed are coincidental adjustments, one affecting the other. After adjusting one, the other should be rechecked, and adjusted as required. (Always perform idle mixture check before idle speed check.)

- a. Start and warm-up engine.
- b. Check idle mixture as follows:
 - (1) Engage rotor system and operate helicopter in a low hover.

NOTE

Refer to applicable Pilot's Flight Manual for the operational rpm of helicopter model which is being checked.

- (2) Maintain engine speed at operational rpm until cylinder and oil temperatures stabilize.
- (3) Land helicopter and continue to operate at operational rpm with the rotor system engaged, friction on the cyclic and collective controls, and governor disengaged.
- (4) Ensure MIXTURE is set to FULL RICH.

CAUTION

AIRCRAFT MAY ROTATE IF LANDING GEAR IS SET ON A SMOOTH HARD SURFACE AND OPERATOR DOES NOT CORRECT FOR LOSS OF TORQUE WITH PEDALS.

- (5) Rapidly rotate throttle to CLOSED position. (Set at normal idle stop, do not override.)

NOTE

Engine speed will immediately decline to idle level. Rotor speed, however, will decline gradually. The next step must be performed before rotor tachometer needle superimposes with engine tachometer needle.

- (6) Observe engine tachometer needle and smoothly move mixture control to idle cutoff position.
- (7) Return mixture control to FULL RICH before the rpm decreases to a point where the engine will stop.

PART I. (Con't)

NOTE

Engine rpm rise is required to be between 25 and 75 rpm. Preferred rise is between 25 and 50 rpm.

- (8) Adjustment of idle mixture (Basic HMI or Con. Supp. C, Section 4) is required if rpm rise is not within the required limits. Idle mixture adjustments can only be made by authorized personnel.

NOTE

The inability to achieve proper idle mixture and a need to frequently readjust idle mixture, are indications that the fuel injector servo needs to be bench checked and/or overhauled.

- (9) Repeat idle mixture check (steps b(1) through b(8)) until no adjustment in idle mixture is required.
- (c) Any adjustment to idle mixture must be entered in the Helicopter Log Book.

PART II - IDLE SPEED CHECK

NOTE

Idle speed and idle mixture are coincidental adjustments, one affecting the other. After adjusting one, the other should be rechecked, and adjusted as required.

NOTE

Refer to applicable Pilot's Flight Manual for the operational rpm of the helicopter model which is being checked.

- a. Operate helicopter at operational rpm with rotor system engaged, friction on collective and cyclic controls, and governor disengaged.

CAUTION

AIRCRAFT MAY ROTATE IF LANDING GEAR IS SET ON A SMOOTH HARD SURFACE AND OPERATOR DOES NOT CORRECT FOR LOSS OF TORQUE WITH PEDALS.

- b. Rapidly rotate throttle closed and into full override position.

PART II. (Con't)

- c. Read and record engine idle rpm prior to engine and rotor tachometer needles superimposing.
- d. Stabilize engine temperatures (engine head temperature near 300°F, but not above) and recheck idle speed (a through c) with the throttle at the normal idle stop.
- e. Disengage rotor system (release clutch) after engine head temperature has stabilized at 300°F (or below) and recheck idle speed (a through c) with throttle at normal idle stop.

NOTE

The first check (throttle into full override, rotors engaged) should produce an idle speed between 1400 and 1450 rpm. The second check (throttle at normal idle stop, rotors engaged) and third check (throttle at normal idle stop, rotors disengaged) should produce idle speeds no greater than 1600 rpm.

- f. Adjust idle speed (Basic HMI or Con. Supp. C, Section 4) if idle rpm is not within required limits. Idle speed adjustments can only be made by authorized personnel.

NOTE

The inability to achieve proper idle speed and a need to frequently readjust idle speed, are indications that the fuel injector servo needs to be bench checked and/or overhauled.

- g. Repeat idle speed check (steps a through e) until no adjustment in idle speed is required.
- h. Any adjustment to idle speed must be entered in the Helicopter Log Book.

PART III - FUEL BOOST CHECK

- a. Operate helicopter at idle rpm with fuel boost pump ON.
- b. Turn fuel boost pump OFF while observing engine tachometer.
- c. If a change in engine rpm is observed, ground helicopter and troubleshoot fuel system.

NOTE

Any noticeable change in engine rpm is unacceptable and must be entered in the Helicopter Log Book.

PART IV - PILOT'S CHECK OF IDLE MIXTURE AND IDLE SPEED.

a. Accomplish the engine idle speed check as follows:

NOTE

Refer to applicable Pilot's Flight Manual for the operational rpm of the helicopter model which is being checked.

- (1) Land from a hover with engine cylinder head temperature and oil temperature as near to in-flight conditions as possible, friction on the collective and cyclic controls, governor disengaged, and engine speed at operational rpm.
- (2) Ensure MIXTURE is set to FULL RICH.

CAUTION

AIRCRAFT MAY ROTATE IF LANDING GEAR IS SET ON A SMOOTH, HARD SURFACE AND OPERATOR DOES NOT CORRECT FOR LOSS OF TORQUE WITH PEDALS.

- (3) Rapidly rotate throttle to CLOSED position. (Set at normal idle stop, do not override.)

NOTE

Engine speed will immediately decline to idle level. Rotor speed, however, will decline gradually. The next step must be performed before rotor tachometer needle superimposes with engine tachometer needle.

- (4) Observe engine tachometer needle and smoothly move mixture control to idle cutoff position.
- (5) Return mixture control to FULL RICH before the rpm decreases to a point where the engine will stop.

NOTE

Engine rpm rise is required to be between 25 and 100 rpm for this check.

- (6) If rpm rise is not within the required limits, notify the appropriate maintenance personnel to perform Parts I through III of this Service Information Notice.

- b. Accomplish an idle speed check as follows:

NOTE

Refer to applicable Pilot's Flight Manual for the operational rpm of the helicopter model which is being checked.

- (1) Operate helicopter at operational rpm with rotor system engaged, friction on the collective and cyclic controls, and governor disengaged.

CAUTION

AIRCRAFT MAY ROTATE IF LANDING GEAR IS SET ON A SMOOTH, HARD SURFACE AND OPERATOR DOES NOT CORRECT FOR LOSS OF TORQUE WITH PEDALS.

- (2) Rapidly rotate throttle closed and into full override position.
- (3) Read and record engine idle rpm prior to engine and rotor tachometer needles superimposing.
- (4) With engine head temperature near 300°F, but not above, repeat steps (1) through (3), without going into full override (set throttle at normal idle stop).

NOTE

The first check (throttle into full override) should produce an idle speed no less than 1400 rpm. The second check (throttle at normal idle stop) should produce an idle speed no greater than 1600 rpm.

- (5) If engine idle speed is not within the required limits, notify the appropriate maintenance personnel to perform Parts I through III of this Service Information Notice.
- c. Perform a fuel boost pump check as specified in Part III of this Service Information Notice.

WEIGHT AND BALANCE DATA

Weight and balance not affected.

The procedures and information provided by this Service Information Notice has been shown to comply with applicable Federal Aviation Regulations and is FAA approved.

REFERENCE SHEET

SERVICE INFORMATION NOTICES AND LETTERS

ACTION REFERENCE: Refer to Service Information Notice No. N-202 when making idle speed and idle mixture adjustments.

HMI REFERENCE: Insert this sheet in 269 Series Basic HMI, Section 4, page 4-6A.

This reference sheet shall be kept as part of the manual until the data is incorporated at the next revision of the 269 Series Basic HMI. (See Service Information Summary, Page i of Basic HMI.)

REFERENCE SHEET

SERVICE INFORMATION NOTICES AND LETTERS

ACTION REFERENCE: Refer to Service Information Notice No. N-202 when checking or adjusting idle mixture and idle speed.

HMI REFERENCE: Insert this sheet in HMI Configuration Supplement C, Section 4, page 4-1.

This reference sheet shall be kept as part of the manual until the data is incorporated at the next revision of the 269 Series HMI Configuration Supplement C.