

SERVICE BULLETIN

FAA APPROVED
SR-3B-1

RECIPROCATING ENGINES

No. 1787

TITLE: R-1340 CYLINDER HEAD - FLUORESCENT PENETRANT INSPECTION AND VISUAL INSPECTION OF

ENGINES AND MODELS AFFECTED: R-1340, Wasp Engines, All Models.

REFERENCES: (1) R-985 and R-1340 Overhaul Manual, PN 123440.
(2) Service Bulletin No. 1703, Cylinder Heads - Rework of
(3) Service Bulletin No. 1720, Cylinder Head Repair and Rework
(4) Service Bulletin No. 1744G, Engine Parts - Time Limitations

PUBLICATIONS AFFECTED: None

REASON FOR BULLETIN: Service experience indicates that some R-1340 Wasp cylinder heads, which due to rebarreling or cylinder barrel chromium plating, have operated for longer than normal usage or time (Reference (4)), can develop an over-the-head cooling fin root crack on the outer surface of fin roots Nos. 7 - 8, or 8 - 9, locations (counting from the R/H intake fins, as viewed from the rear). This type crack can propagate in fatigue fore and aft along the fin root and inward until a major portion of the head fails in tension and is liberated. It is the purpose of this bulletin to:

1. Provide instructions for fluorescent penetrant inspection of certain cylinder head fin roots at each overhaul.
2. Provide instructions for repair of cylinder heads with this type of crack in early stage of progression.
3. Provide instructions for inspection of cylinder heads at periodic maintenance.

RECOMMENDATION:

Part A - Overhaul - Recommended.
Maintenance - If desired.

- Part B - Maintenance -
1. Visual inspection of cowled and baffled installations at 500 hour intervals.
 2. Visual inspection of unbaffled or "cropduster" installations at 200 hour intervals.

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DETAILED INSTRUCTIONS:

PART A

- A. Degrease cylinder head and clean off all dirt and grease between Fins No. 7 - No. 9 over top of cylinder head, between front and rear spark plug holes.
- B. Fluorescent penetrant inspect cylinder head Fins Nos. 7 - 8, and 8 - 9, along the outer surface of the fin roots over the cylinder head dome between the front and rear spark plug holes and including the partially formed cooling fin by the rear spark plug hole. See Figure 1. Carefully mark fins with pencil marks to enclose areas where defects are indicated. See Reference (1). The following inspection standards will apply;
 - (1) On cylinders undergoing reconditioning, any confirmed indication over one inch in length renders the affected cylinder unserviceable and rework may be applied to salvage part. See Paragraph D.
 - (2) For in-service engines, cylinders with one crack less than one inch in length may remain in service, subject to periodic inspection, as detailed in RECOMMENDATION section.
- C. At overhaul, metal stamp acceptable cylinder assembly using 5/32 inch capital letters, over the intake port with Fluorescent Penetrant (FP) and last two numbers of year inspected. Typical stamp will read FP83.
- D. Rework Procedure;
 - (1) Using milling machine or a portable power tool and a 1/8 - 1/4 inch diameter end mill, machine over the top of cylinder head to remove the section of #8 or #9 fin containing a root crack or the section of #8 or #9 fin closest to root crack, between inspection marks. Machine fin down to root removing fin pedestal smoothly. Round edges of fin at cut out.
 - (2) Using a milling machine or portable power tool and a 1/8 inch diameter end mill with a full radius end, rout out crack in root to 0.150 inch maximum depth. Scan defect area to assure complete crack removal. Remove all cylinder heads, with deeper cracks, from service. Blend ends and sides of crack cavity smoothly.

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PART B - MAINTENANCE

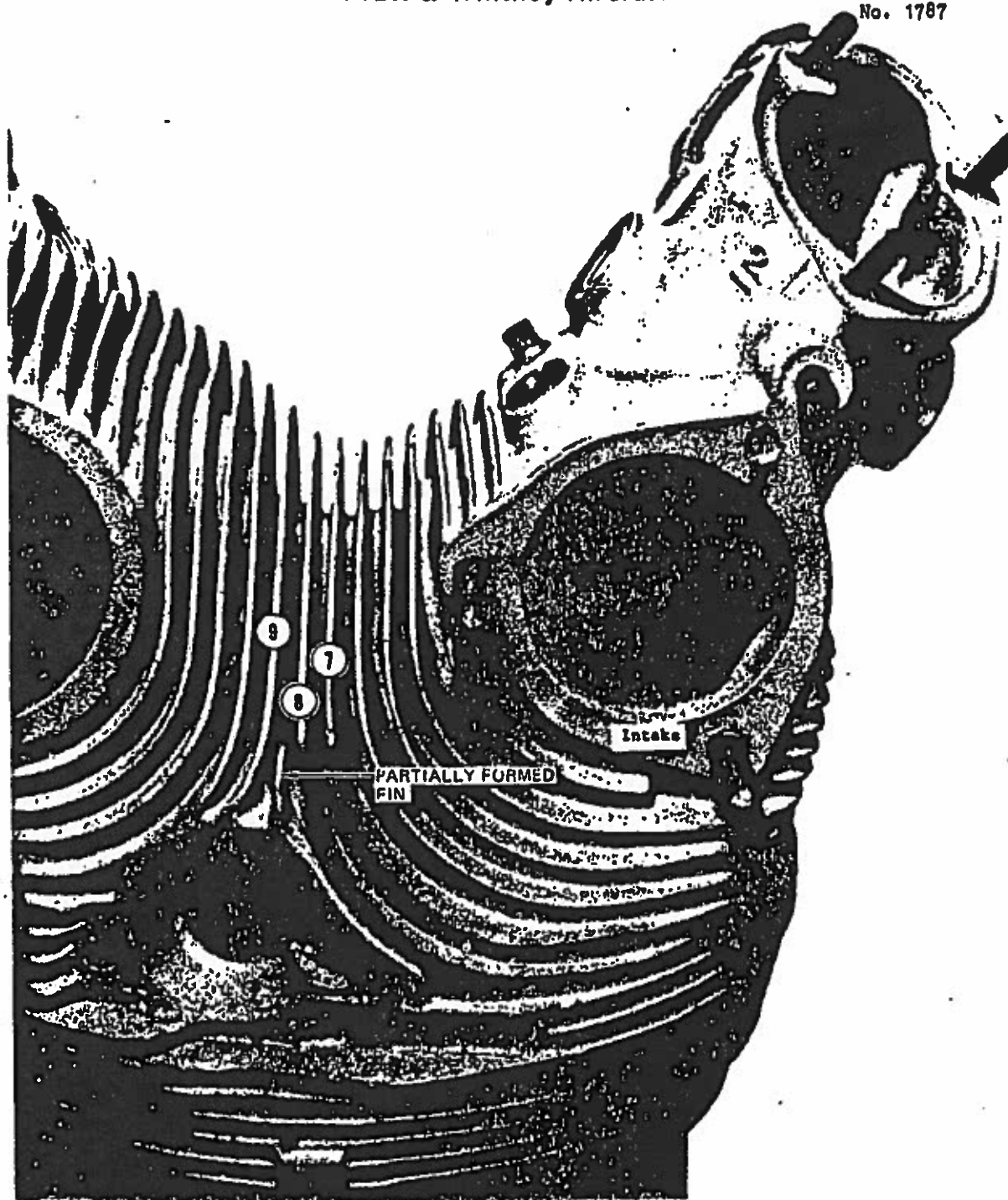
A. For installed engines, visually inspect top of cylinder heads between Fins No. 7 and No. 9 (see Figure 1) as follows:

- (1) As required, remove cowlings, disconnect and swing baffles clear of the central cooling fins over the top of the cylinder heads, and where applicable, remove attached priming line from between the exhaust and inlet rocker covers on each cylinder. If necessary, disconnect spark plug leads.
- (2) Clean area between Fins No. 7 - No. 9 over top of cylinder head, between front and rear spark plug openings, of all dirt and grease. Varnish need not be removed unless sufficiently lumpy to restrict visual inspection of cylinder surface.
- (3) Using sufficient light, visually inspect between the central cooling fins (Fins No. 7 - No. 9) over the top of the cylinder head between front and rear spark plug openings. If crack over one inch in length is visible, or if black combustion leakage is found, replace cylinder assembly. Return rejected cylinder assembly to overhaul for inspection and salvage of usable parts.

SPECIAL TOOLS REQUIRED:

None

Reference No.
PM/RK C-81-6-4



CYLINDER HEAD SHOWING FINS NO. 7 - NO. 9
FIGURE 1