The Stinson 108 Voyager
Franklin 6A4-165-B3 Engine - Light Case versus Heavy Case
http://www.westin553.net
By Larry Westin - May 29, 2013
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All production Stinson 108 airplanes were delivered from the factory with a 6 cylinder Aircooled Motors Franklin engine. Stinson models 108 and 108-1 used the Franklin 6A4-150-B3 engine. Stinson models 108-2 and 108-3 used the Franklin 6A4-165-B3 engine.

The Franklin 6A4-165-B3 engine at serial number 33045 and below came from the manufacture, Aircooled Motors, with a "light case." Franklin 6A4-165-B3 engines serial number 33046 and above came from the Aircooled Motors factory with a "heavy case."

Cracks sometimes developed in the 6A4-165-B3 engine crankcase with the "light" case. Franklin issued Service News Number 10 to address this issue. The CAA (now FAA) issued Airworthiness Directive 51-15-02 (see page 2 below for AD wording) covering this issue. Engines with the Light case require repetitive inspections for cracks.

As with most air cooled aircraft engines, the crankcase (or just "case") is split. There is a left side (pilots side), and a right side (co-pilot side) which together make up the case.

The light crankcase can be replaced with the heavy case at major overhaul. Many Stinsons originally delivered with the "light case" Franklin engine are advertised for sale as having the "heavy case" Franklin engine. External visual inspection of the crankcase casting marks below the number 1 and 6 cylinders will show if the engine has a "light" or "heavy" crankcase.

Cylinder number 1 is on the left side of the engine, the cylinder closest to the accessory case.

Cylinder number 6 is on the right side of the engine, the cylinder closest to the propeller.

Crankcase Type	Casting Mark on crankcase below Cylinder 1 Left side of engine	Casting Mark on crankcase below Cylinder 6 Right side of engine
Light Case ➜	18305	18306
Heavy Case ➜	18905	18906

NOTE - both halves of the crankcase must be either "light" or "heavy," it should not be a combination of both types.

Here is CAA (now FAA) Airworthiness Directive 51-15-02

51-15-02 Franklin: Applies to All Franklin 6A4-165-B3 Engines Serially Numbered 33046 and Below Incorporating Original Crankcase (Left Half No. 18305; Right Half No. 18306). These Two Parts Form Crankcase Assembly, P/N 18553. The Number of Each Crankcase Half is Located on Each Casting Below the Number 1 and 6 Cylinder Location.

To Be accomplished by July 15, 1951.

Effective on and after this date, all applicable crankcases with 500 hours of operation since new or 250 hours since last overhaul should be inspected as follows: Remove crankcase cover and visually inspect the webbing near the main journal area for cracks.

(1) Crankcases found to be free of cracks should be inspected at 250-hour intervals thereafter. In the event that the conditions described in (2) and (3) are detected, the provisions of (2) and (3) will apply.

(2) Crankcases found with (a) surface indications, hairline cracks, or small wall cracks and (b) cracks starting at main bearing stud hole on the opposite side from main bearing support, may be operated further at the option of the owner. Such crankcases should be inspected at 50-hour intervals thereafter to determine progress of cracks.

(3) Crankcases found fractured or with cracks that have progressed to the extent that they enter the main bearing supports (usually from back near (a) main bearing stud hole and (b) drilled oil hole) indicate that a complete break soon will occur. Such crankcases should be replaced with the reinforced crankcase assembly, P/N 18925 at which time no further inspection is required.

Crankcase assembly P/N 18925 may be identified by casting No. 18905 appearing below No. 1 cylinder location and casting No. 18906 appearing below No. 6 cylinder location.

Franklin Service News No. 10 also covers this subject.