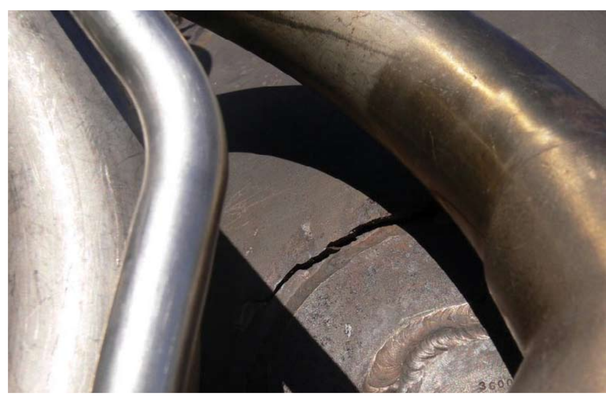
X-RAY BRAVO ALPHA

The Engine Changes

A feature of the 707 is the way the engines are mounted on the wing in pods that makes servicing and access so much easier than those buried in the wing root such as were the de Havilland Comet's. Whether this was one of the deciders that led Qantas to buy American instead of British is a moot point but whatever the reason, the engineers were to have good reason to be glad of that decision.

During the course of the restoration, two engines revealed defects that required their removal. One had developed a crack in the diffuser case, the part of the engine that contains the airflow compressed during its passage through to just before the combustion chambers. Extensive enquiry revealed that repair could not be done on-wing, since following the welding process used to repair the crack, heat treatment to stress relieve the welded area had to be performed in a temperature-stable room in which the engine could slowly cool. Outside, it would not be possible to control the temperature, so off it had to come.



The other problem the team encountered was the failure to start of number 2 engine. After all avenues of trouble-shooting had been exhausted, the diagnosis of an internal fuel manifold defect was made. This too was not an area that could be accessed with the engine on-wing, so it was removed to be taken to ATC Lasham's engine shop.

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This is where Turbine Motor Works entered our lives. In both instances, this company, headed by **Tom Vaughan,** came to our aid and performed the welding, non-destructive testing and heat treatment, as well as transporting the one and a half-tonne engine to his facility and back - all gratis.

In the case of number 2 with the failure to start problem, he dispatched two of his engine experts to Southend where they worked to dismantle the combustion case and change the defective manifold during a 12 hour stint that finished at midnight.

With all this engine removal and installation practice, the team had the second engine from transport cradle to being bolted in place in only 37 minutes.