

LAA/AWA/20/24
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Volkswagen Engines Removal of Mechanical Fuel Pumps Using Plastic Rocker Arms from Service

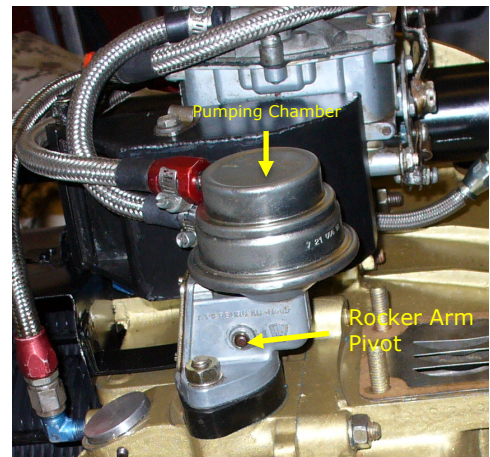
A recent engine failure affecting a Druine D.31 Turbulent aircraft led to an off-airfield forced landing, during which the aircraft was substantially damaged; fortunately, the pilot wasn't seriously hurt in the incident. After a detailed examination of the engine, the LAA Inspector discovered that the rocker arm, designed to transfer motive force from the engine's mechanical fuel pump operating pushrod to the fuel pump's diaphragm, had broken at its pivot, preventing the pump from operating.

As a matter of routine, the operator of the aircraft involved in the incident regularly changed the mechanical fuel pumps on their VW powered aircraft; the subject aircraft's mechanical fuel pump had been changed approximately 30 flying hours before failure.

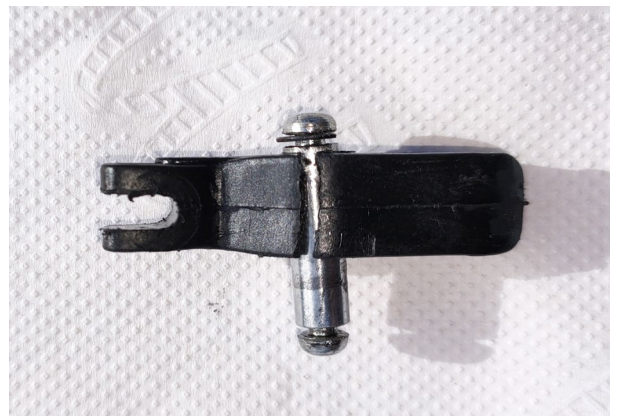
Dimensional checks were carried out to ensure that the fuel pump had been correctly fitted, especially with regard to the possibility that there had been, during fitment, an excessive pre-load on the arm. The pump was found to have been, in every respect, fitted correctly.

Enquiries suggest that 'after-market' pumps using plastic rocker arms have a high failure rate and, for little extra cost, pumps based upon the original VW design, using steel rocker arms, are readily available. For this reason, mechanical fuel pumps using plastic rocker arms must not be used on VW derived aero-engines operating under an LAA administered Permit to Fly.

A copy of the Airworthiness Information Leaflet (LAA/MOD/ENG/VW/001 Issue 1) may be downloaded [HERE](#):



This picture (above) shows a fairly typical after-market automotive mechanical fuel pump. Note that the chamber containing the diaphragm and non-return valves is a sealed unit but, in this example, because a side panel may be removable to inspect the rocker arm itself, it may not be necessary to lift the pump itself. OEM pumps can be stripped into individual components.



The picture above shows the rocker arm from the failed fuel pump described in the text. Following the recent accident, plastic rocker arms are not considered suitable for use in an aero application.