



Civil Aviation Authority

# PROPOSED MANDATORY PERMIT DIRECTIVE



Number: 16-01 R1

Issue date: 18 February 2016

In accordance with 22(1) of Air Navigation Order 2009 as amended the following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

<b>Type Approval Holder's Name:</b> Rolls-Royce, de Havilland, Motorlet, Ivchenko	<b>Type/Model Designation(s):</b> Rolls-Royce Avon series, Rolls-Royce Viper series, Rolls-Royce Orpheus series, Rolls-Royce Derwent series, Rolls-Royce Nene series, de Havilland Goblin series, de Havilland Ghost series, Motorlet M701 series, Ivchenko AI-25 series
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<b>Title:</b>	Engine Fuel System – Ageing Effects
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<b>Manufacturer:</b>	Rolls-Royce, de Havilland, Motorlet, Ivchenko
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<b>Applicability:</b>	Turbine engines fitted to ex-military jet aircraft: Rolls-Royce Avon series, Rolls-Royce Viper series, Rolls-Royce Orpheus series, Rolls-Royce Derwent series, Rolls-Royce Nene series, de Havilland Goblin series, de Havilland Ghost series, Motorlet M701 series, Ivchenko AI-25 series
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<b>Reason:</b>	<p>During an accident investigation involving a gas turbine powered aircraft, CAA has been notified of significant deterioration in a rubber coated diaphragm used in the fuel pump of an engine fuel system. While not being considered a factor in the accident, the deterioration observed has been attributed by the manufacturer to ageing, chemical attack and air exposure.</p> <p>Such components were not lifed by the manufacturer, since the extended calendar times in service now experienced in civil operation were not envisaged for the original operation.</p> <p>Failure of the fuel units would lead to loss of thrust. This MPD is raised to instruct a review of records of ageing fuel systems used on ex-military gas turbine jet engines to check that fuel system protection has been carried out in accordance with the manufacturer's instructions. It also instructs a check on records of storage conditions of any units fitted since last overhaul.</p> <p>Once fitted to an engine, the life of rubber or rubber coated seals and diaphragms can be affected by various factors including fuel type, operating environment, compression load and time. Stale fuel in contact with diaphragms and seals over long periods with the aircraft parked or stored causes attack of rubber parts due to reaction with the material. Draining of fuel away from diaphragm and seal faces during</p>
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<b>Reason Cont:</b>	<p>periods of inactivity also leads to air exposure, loss of plasticity and subsequent cracking.</p> <p>During periods of inactivity, it is therefore important that regular running and/or inhibiting of fuel systems is carried out in accordance with the manufacturer's instructions. Note that many manufacturers specify the need for action to protect the fuel system after as little as 1 month of inactivity.</p> <p>For any unit used in the fuel system which has been subject to a storage period prior to fitment, a review of records is also required to ensure storage instructions for the built up unit have been followed, and any maximum storage period specified in manufacturer's instructions has not been exceeded.</p> <p>CAA views this as an interim step while the investigation continues, with the potential for further action.</p> <p>This PAD has been revised to expand the applicability to include Rolls-Royce Orpheus series engines.</p>
<b>Effective Date:</b>	<b>(TBD upon issue of final MPD)</b>
<b>Compliance/Action:</b>	<p>For any turbine engine with calendar time greater than 20 years since last overhaul :-</p> <p>Within 1 month or 10 flying hours from the effective date of this MPD, whichever limit is reached first:</p> <p>Examine the engine records subsequent to the release from military service and record evidence found of :-</p> <ol style="list-style-type: none"> <li>1) Regular running of the engine, shown to be at intervals and to methods in accordance with manufacturer's instructions and</li> <li>2) Inhibition of the engine fuel system in accordance with manufacturer's instructions after any period of inactivity specified in the relevant operating manuals.</li> </ol> <p>Following examination of the records, replace any engine which cannot be shown to have been run at specified intervals and inhibited in accordance with the manufacturer's instructions with a serviceable engine which meets these criteria.</p> <p>If any unit used in the engine fuel system has been replaced since last full engine overhaul, examine the records for both storage and subsequent operation of the unit fitted.</p> <p>Following examination of the records, replace any such unit fitted since last full engine overhaul which cannot be shown to have been stored in accordance with manufacturer's instructions with a serviceable unit which meets these criteria.</p> <p>From the effective date of this MPD, do not install engine fuel system units which have not been stored in accordance with manufacturer's instructions and any time limits specified.</p>

**ENSURE COMPLIANCE WITH THIS MPD IS RECORDED IN THE AIRCRAFT LOGBOOK**

<b>Reference Publications:</b>	Nil
<b>Remarks:</b>	<ol style="list-style-type: none"><li>1) This Proposed MPD will be closed for consultation on 29 February 2016.</li><li>2) Enquiries regarding this Mandatory Permit Directive should be referred to: GA Unit, Civil Aviation Authority, Safety Regulation Group, Aviation House, Gatwick Airport South, West Sussex RH6 0YR.  Tel: +44 (0)1293 573074 E-mail: ga@caa.co.uk</li></ol>