

Air Force Head-Quarters

NENE INSTRUCTION NO. 8

Technical Order

Application: NENE 2-VH

FUEL PUMPS - TYPES FITTED TO NENE 2-VH

Introduction

1. The integral fuel system of the Nene 2-VH engine contains two Lucas high pressure positive displacement, variable stroke, multi-plunger pumps. These pumps form part of a Lucas series supplied for the Nene and other turbo-jet and turbo-prop engines.

2. These Lucas pumps carry individual type numbers. One pump fitted to the Nene 2-VH quoted to illustrate this, is a Lucas GC. 21/4H. This type number is explained as follows:-

G	-	Governor controlled.
C	-	Indicates size of pump or potential capacity.
21	-	Relates to the specification and drawing standard.
4	-	Indicates the installation standard.
H	-	Relates to the rating.

The general description and principles of operation of these pumps are laid down in Air Publication 4282A, Volume 1, "Fuel System Components for Gas Turbine Engines".

3. Nene 2-VH engines 1 to 8 inclusive were originally issued from the manufacturer with a GC.13/4H series pump fitted in the upper position and a GC.14/5H series fitted to the lower position. Nene 2-VH engines 9 to 60 inclusive were issued from the manufacturer with Type GC. 21/4H fitted to the upper position and GC.14/5H fitted to the lower.

4. The basic difference between the GC.13/4H and the GC.21/4H is in the isolating valve solenoid unit. The operating capacity of the solenoid unit on the GC.21/4H is double that of the GC.13/4H. Fitment of the larger solenoid unit to the GC.13/4H pump alters its specification and drawing standard and thus creates the alteration of the type to GC.21/4H. Nene Modification No. 6 calls for the change-over of the GC.13/4H to GC.21/4H on the first 8 engines. Nene 2-VH present standard pump fitment then becomes GC.21/4H pump, upper and GC.14/4H pump, lower. All three pumps referred to in this paragraph are cleared only for an overhaul life of 200 hours. Reason for this short life is primarily excessive wear on the internal cam plate at the point of contact of the rotor pistons.

5. Later types of Lucas pumps have now become available with the overhaul life extended to 300 hours. The extra life has been obtained by fitment to rotor piston heads of special slipper pad bearing surfaces with an associated modification of the cam plate bearing surface. Both upper and lower pumps are affected by this change, new upper type being GC.205/8F, and lower GC.204/25F. One of the main advantages of

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these later type pumps is not only the longer life but its ability to run on straight gasoline. It is not possible to run the GC.14 and 21 series pumps on neat gasoline due to the excessive wear and danger of early pump failure. Consequently if gasoline is used with these early type pumps it must have 3% of lubricating oil mixed with it.

Aircraft Engineering Instruction-General, Part 5, Section 1, Instruction No. 1 lays down fuels to be used in the Nene and is to be adhered to irrespective of which types of pump are fitted.

6. C.A.C. Nene 2-VH 61 inclusive onwards will be issued by C.A.C. with GC.204 and GC.205 series pumps fitted. In order that stocks of the GC.14 and 21 series pumps are fully used it is desirable that when any pump replacements are made on engines 1 to 60 that they be of similar type and the same procedure followed with engines 61 onwards with the later type pumps. Both the early and later series pumps may be mixed on engines, however, if spares availability is such that there is no alternative, Nene Modifications are to be checked at such times to ensure that installation standards have not altered.

References: File R.A.A.F. 150/4/8223.
C.A.C. Nene Mod. No. 46.
Rolls-Royce Nene Mod. 164.

Date of Issue: 7th December, 1951.

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