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No. Rolls-Royce petrol engines/3
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B Range & V8 Petrol Engines

Other changes affected

Circulation Rolls-Royce Motor Cars
MP/HC Quality (1)
EW Production (1)
DKW Engineering (1)
TFC Metallurgy/Laboratory (1)

File Copy (1)
Technical Library (1)
Reynolds Boughton Devon Ltd. (1)
MOD (A)

The use of 95 RON (BS7070) lead free and 97 RON (BS4040) low lead fuel in 'B' range and V8 military and commercial petrol engines.

Background

Tetraethyl Lead (TEL) has traditionally been used in fuel as an anti-knock compound which artificially raises the RON number.

Historically, the highest RON fuel available in the UK was as tabulated below:-

Year	Research Octane Number
1939	81
1939 - 1946	74
1953	92
1955 - 1957	95
1958 - 1959	97
1960	98
1961 - 1970	99
1971 - 1973	100
1974	99
1975 to date	97

TEL in fuel has thus allowed the use of higher compression ratios and greater ignition advance hence more power.

A secondary feature of TEL is its seeming ability to act as a dry lubricant within the combustion chamber at the valve/seal interface.

Specialist Engines 'B' range and V8 engines

'B' range

These engines were developed in the early 1950's and are low compression ratio. Minimum fuel RON requirements are as below:-

Engine	Compression Ratio	Min. Fuel Requirement
B40, B60, B80		80 RON minimum rating (or 2 Star)
B61, B81	6.4:1	
B61, B81	7.25:1	86 RON minimum rating (or 2 Star)

From the table it can be seen that 'B' range engines require no retuning to run on 95 RON unleaded or 97 RON low lead fuel.

In addition valve and valve seat materials are such that the use of low lead or unleaded will have no detrimental effect.

V8 engines

All Specialist Engines V8 commercial engines are 8:1 compression ratio. Provided all tuning parameters meet the original manufacturers specification, no retuning is necessary to run on 95 RON unleaded or 97 RON low lead. Again valve and valve seat materials are fully compatible with these fuels.

General

Under unusual operating conditions e.g. abnormal temperature or altitude, the engine may be suspected of detonation (pinking) even when all tuning parameters are adjusted as per manufacturers recommendations.

In this unlikely event, road testing should be undertaken and the ignition timing retarded by 1° increments until the detonation is alleviated.