Engine overview

Overview

Pistons

The pistons are 'Forged' for strength and have various design characteristics depending on the model.

The McLaren 12C & McLaren 650S differ from the McLaren P1™ in design due to a difference in engine compression requirements. The McLaren P1™ has a lower compression ratio and the piston crown design plays a large part in this factor.

Pictured below are the two normal piston designs seen in the M838T engines. The pistons also differ in appearance from the point of view of colour. The McLaren P1™ incorporates a DLC (Diamond Like Coating) coating on the piston skirt. The DLC coating aid's with the run in period for the engine.

The piston design

Piston design plays a large part in the efficiency of the engine. The piston crown can be shaped in a way as to create an effect on how the combustion gases rotate in the cylinder.

- 1 Compression piston ring
- 2 Secondary compression ring
- 3 Oil scraper ring
- 4 Squish point
- 5 PTFE or DLC coating

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Pistons

The M838T engine employs two main methods of mixture distribution in the cylinder in order to achieve optimum volume metric efficiency, the first method of creating good fuel and air distribution is 'Tumble', tumble has a pouring effect as the air fuel mixture entre the cylinder, the gasses bypass the inlet valves and pour into the cylinder, a vertical rotation takes place as pictured below in Fig 1.. Tumble is created mainly by the angles machined into the cylinder head, valves and valve ports.

The second method is known as 'Swirl', as the piston approaches TDC (top dead centre) the mixture is compressed, there is a raised section known as the Squish point on the piston, this raised section forces a displacement of mixture at a greater pressure and causes the gases to accelerate towards the centre of the crown and then to rotate towards the outer peripheral of the piston, as shown below in Fig 2.

Fig 1

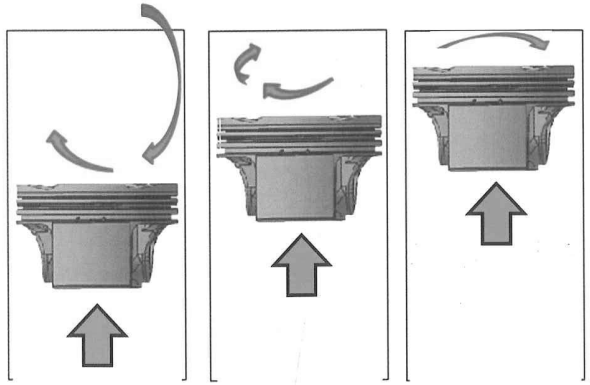
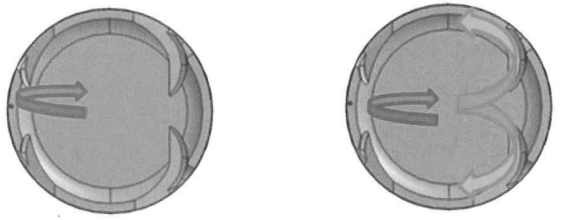


Fig. 2



Vertical rotation of tumble

Vertical rotation of tumble with horizontal rotation of swirl