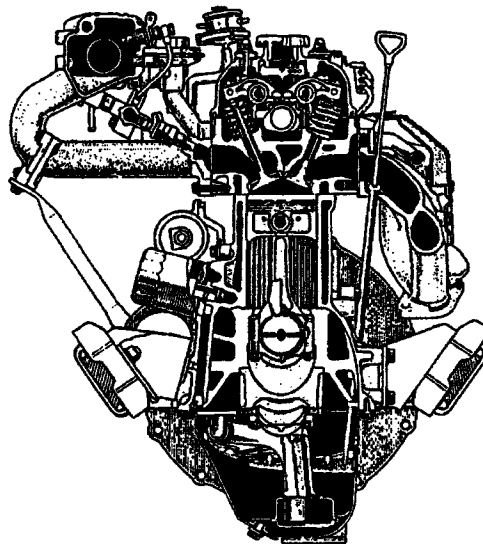
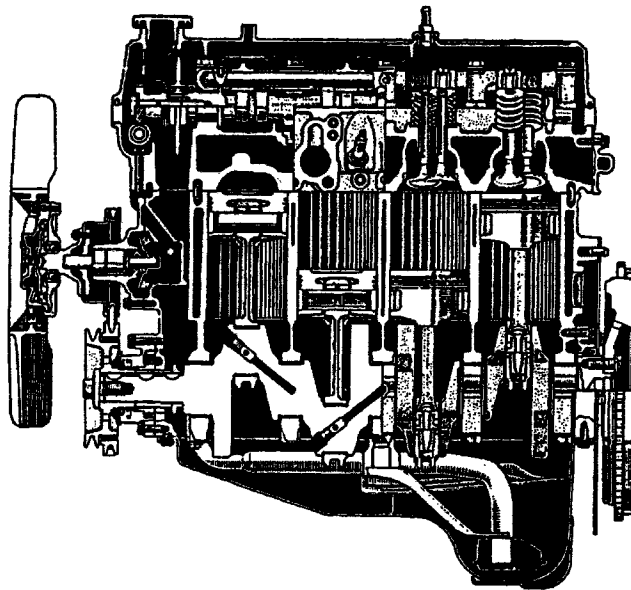


# ENGINE MECHANICAL

## DESCRIPTION

The 22R-E engine is an in-line 4 cylinder 2.4 liter OHC 8 valve engine.

## OPERATION



The 22R-E engine is in-line 4-cylinder engine with the cylinders numbered 1-2-3-4 from the front. The crankshaft is supported by 5 aluminium alloy bearings.

The crankshaft is integrated with 4 weights which are cast with it for balance. Oil holes are made in the center of the crankshaft to supply oil to the connecting rods, bearing, pistons and other components.

The firing order is 1-3-4-2. The cylinder head is made of aluminium alloy, with a cross flow type intake and exhaust layout and with pentroof type combustion chambers. The spark plugs are located to the left of the combustion chambers.

Exhaust and intake valves are equipped with springs made of special valve spring carbon steel which are capable of following the cam profile at all engine speeds.

The camshaft is driven by a timing chain. The cam journal is supported at 3 places, located at the center and the front and rear of each cylinder head. Lubrication of the cam journal gear is accomplished by oil supplied through the oil passage in the cylinder head.

Adjustment of the valve clearance is done by means of an adjusting screw on the rocker arm for .easy adjustment.

The timing chain cover is made of aluminium alloy, with a water pump and oil pump on the outside.

Pistons are made of highly temperature-resistant aluminium alloy, and a depression is built into the piston head to prevent interference with valves.

Piston pins are the full-floating type, with the pins fastened to neither the connecting rods nor the piston boss, but with a snap ring fitted to both ends of each pin to prevent it from slipping out.

The No. 1 compression ring is made of stainless steel and the No. 2 compression ring is made of cast iron. The oil ring is made of stainless steel. The outer diameter of each piston ring is slightly larger than the diameter of the piston and the flexibility of the rings allows them to hug the cylinder walls when they are mounted on the piston. No. 1 and No. 2 compression rings work to prevent leakage of gas from the cylinder and the oil ring works to scrape oil off the cylinder walls to prevent it from entering the combustion chambers.

The cast iron cylinder block has 4 cylinders which are approximately 2 times the length of the piston stroke. The top of each cylinder is closed off by the cylinder head and in the lower end of the cylinders the crankshaft is installed, supported by 5 journals. In addition, the cylinder block contains a water jacket, through which coolant is pumped to cool the cylinders.

The oil pan is bolted onto the bottom of the cylinder block. The oil pan is an oil reservoir made of pressed sheet steel. A dividing plate is included inside the oil pan to keep sufficient oil in the bottom of the pan even when the vehicle is tilted. The dividing plate prevents the intake of air and allows oil circulation to be maintained even if the oil forms waves when the vehicle brakes suddenly.