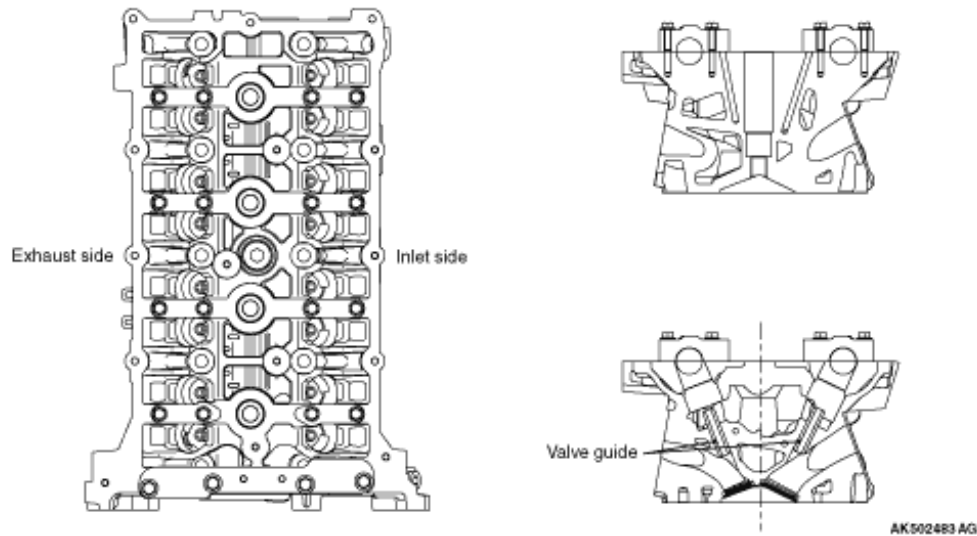


BASE ENGINE

CYLINDER HEAD



A cylinder head made of an aluminum alloy, which is lightweight and offers a high level of cooling efficiency, has been adopted. A pentroof combustion chamber with a center spark plug has been adopted. It has a small valve compound angle to realize a compact chamber. Cross-flow type inlet and exhaust ports have been adopted. Two inlet ports and two exhaust ports are provided independently on the right and left sides. Five camshaft bearings are provided at the inlet and exhaust sides, respectively. The No. 4 bearing sustains the thrust load of the camshaft. Only the No. 1 bearing uses a bearing cap that integrates both the inlet and exhaust sides.

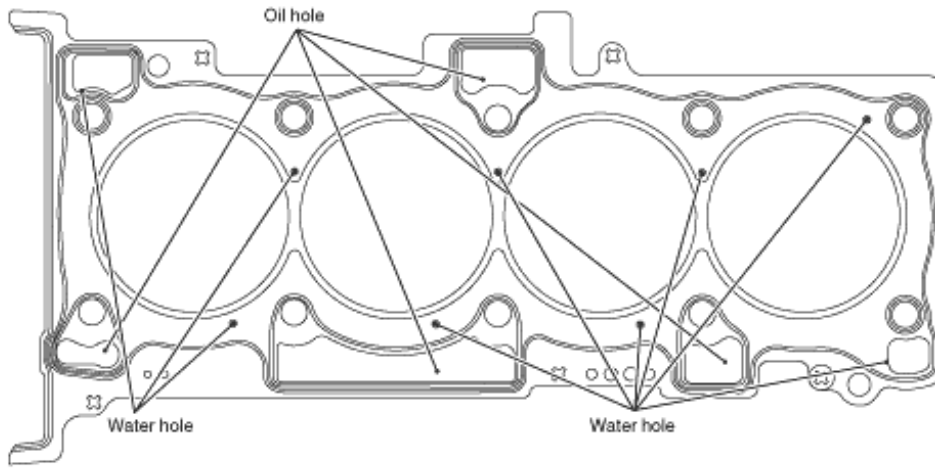
VALVE SEATS

Sintered alloy valve seats have been adopted.

VALVE GUIDES

Valve guides that are common to both the inlet and exhaust have been adopted.

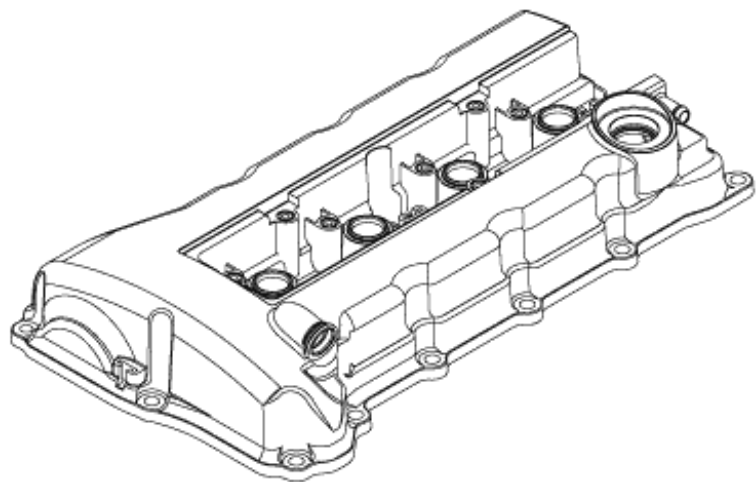
CYLINDER HEAD GASKET



AK502484 AC

A dual-layer, metal type cylinder head gasket that excels in heat resistance and sealing performance has been adopted.

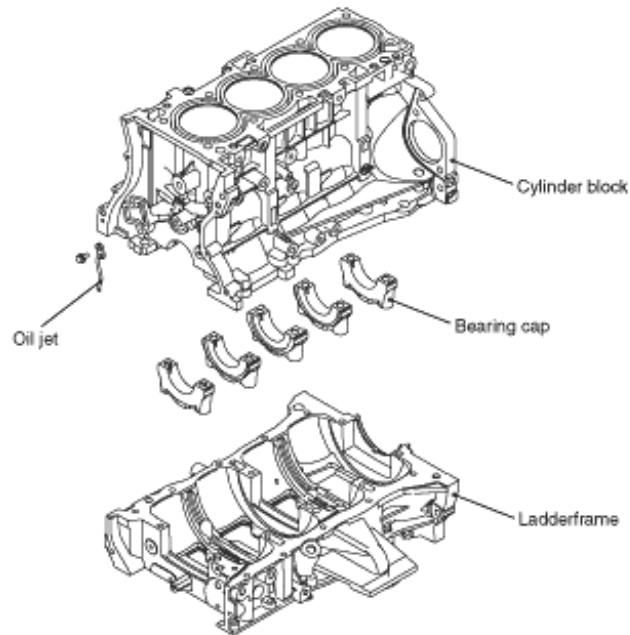
CYLINDER HEAD COVER



AK502485

A Plastic cylinder head cover has been adopted.

CYLINDER BLOCK



AK502486 AD

A cylinder block made of an aluminum alloy has been adopted for weight reduction.

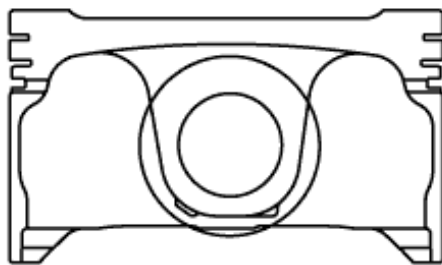
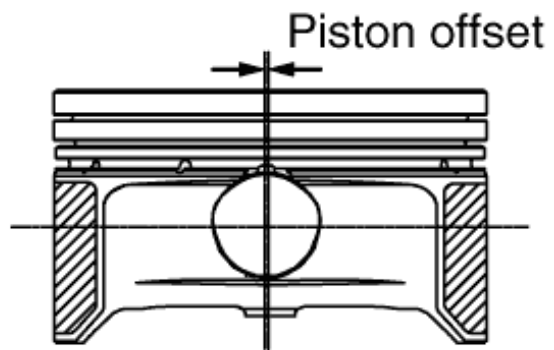
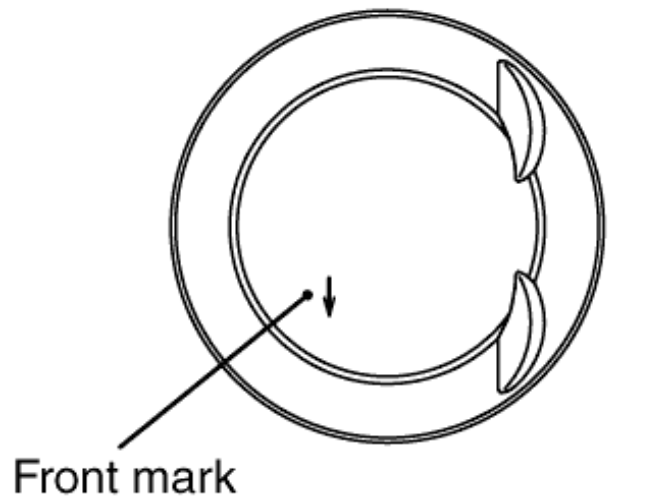
5 bearings are provided for the crankshaft journals and the No. 3 bearing sustains the thrust load of the crankshaft.

The water jacket is the full Siamese type.

An oil jet is provided in front of the cylinder block to supply engine oil to the timing chain.

Item	Specifications
Overall height mm	240.1
Overall length mm	375.1
Distance between top and crankshaft center mm	230.1
Bore mm	88
Bore pitch mm	96
Stroke mm	97

PISTONS



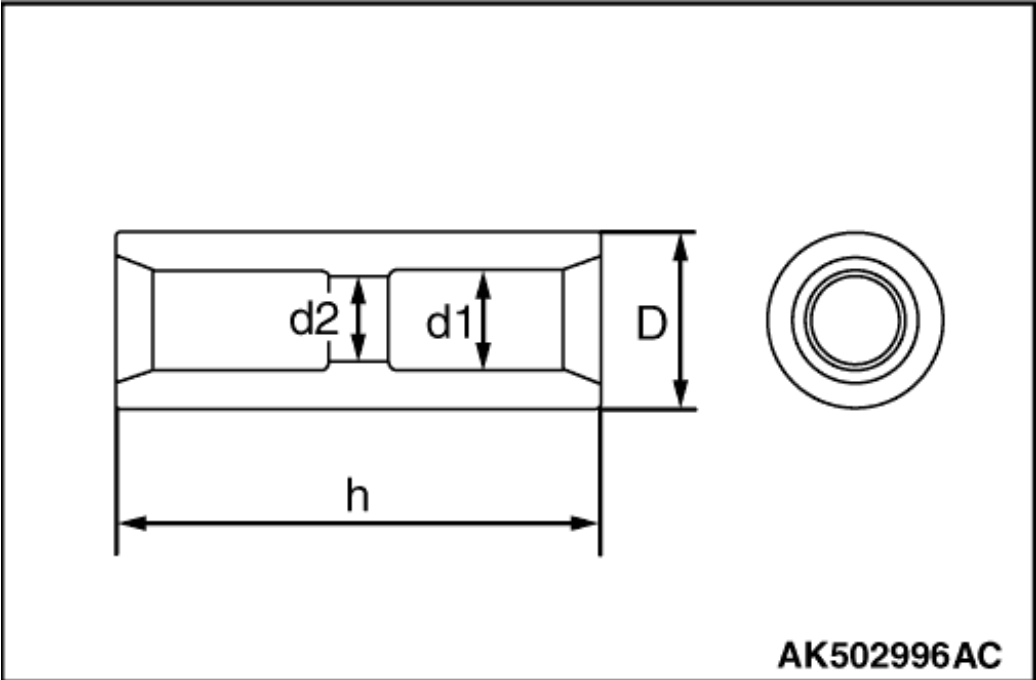
AK502488AC

The pistons are made of a special aluminum alloy. Their weight has been reduced by lowering their overall height and increasing the depression at each

end of the piston pin.
The piston pin hole center is offset 0.8 mm towards the thrust side of the piston center.
The skirt portion along the perimeter of the piston is finished with streaks that excel in oil retention and seizure resistance.

Item	Specifications
Basic diameter mm	88
Pin hole diameter mm	21
Overall height mm	51.5

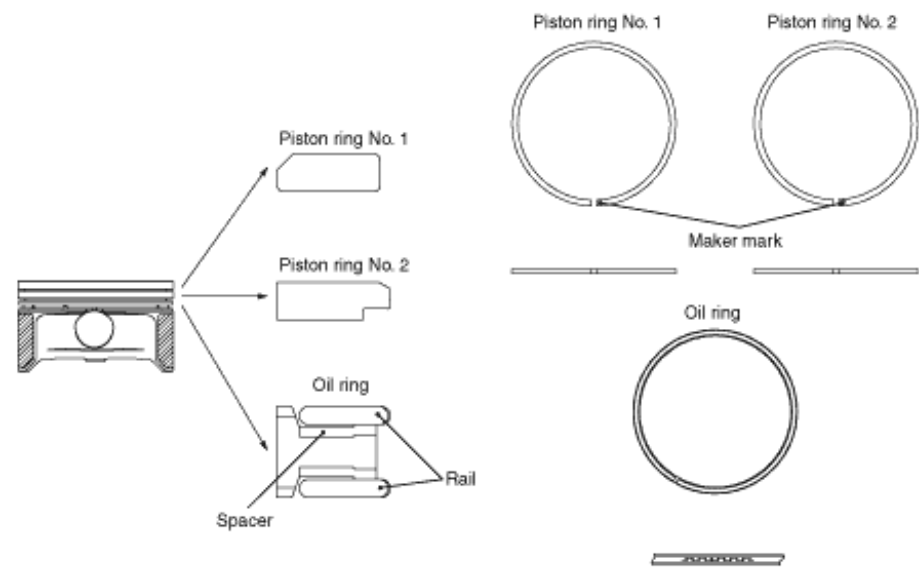
PISTON PINS



The piston pins are the semi-floating type. Each pin is press-fit and secured in the small end of the connecting rod, while it floats in the piston.

Item	Specifications
Outer diameter (D) mm	21
Inner diameter (d1) mm	12
Inner diameter (d2) mm	10.5
Overall length (h) mm	58

PISTON RINGS

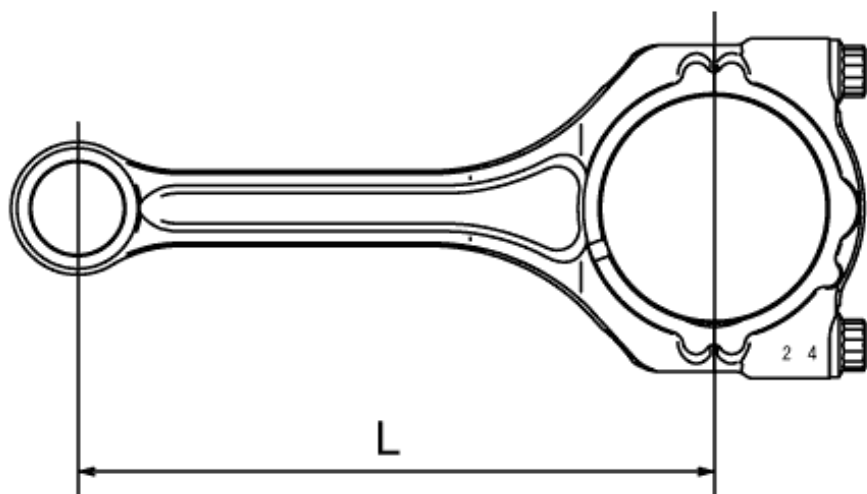
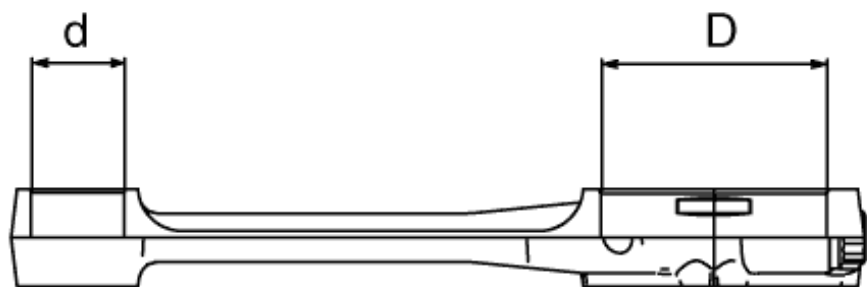


AK592499AC

The piston rings consist of No. 1 and No. 2 rings and an oil ring.

Item	Piston ring No. 1	Piston ring No. 2	Oil ring
Shape	Inside bevel, Barrel	Taper undercut	3-piece, Barrel
Surface treatment (cylinder contact surface)	Chrome plating	Parkerizing	Hard plated Parkerizing
Supplier mark	1T	2T	None

CONNECTING RODS



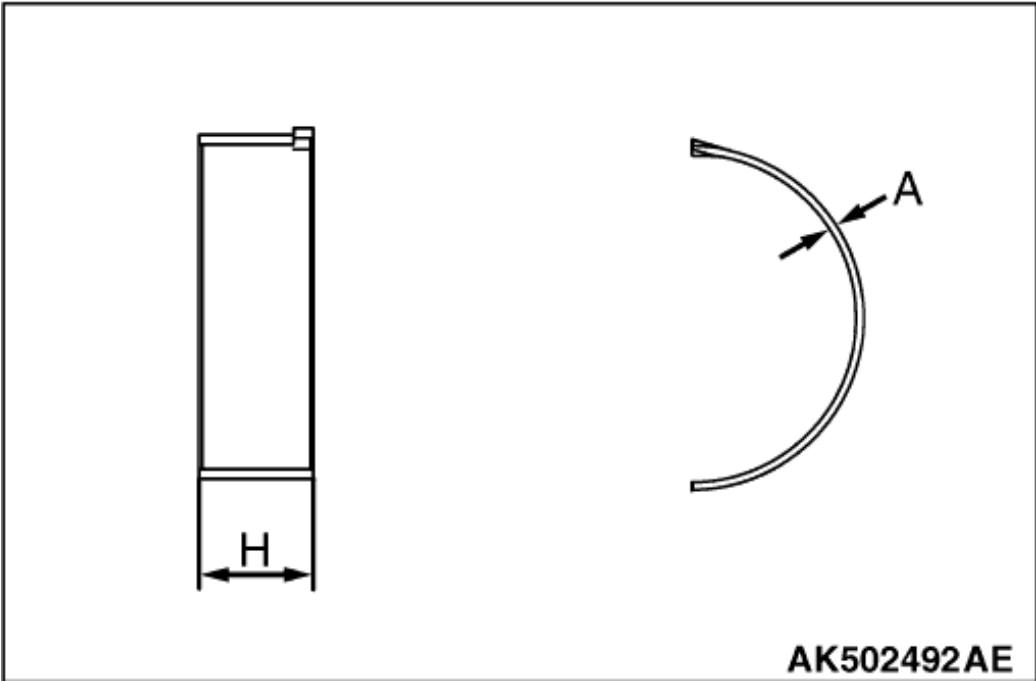
AK502491AC

The connecting rods are made of highly rigid, forged carbon steel. The cross section of the rod portion is shaped like the letter H.

A fracture-split process has been adopted for splitting the big end of the connecting rod.
The oil holes that feed oil from the main journals of the crankshaft to the crankshaft pins lubricate the bearings at the big ends of the connecting rods.

Item	Specifications
Small end hole diameter (d) mm	21
Big end hole diameter (D) mm	49.8
Center-to-center distance (L) mm	143.75

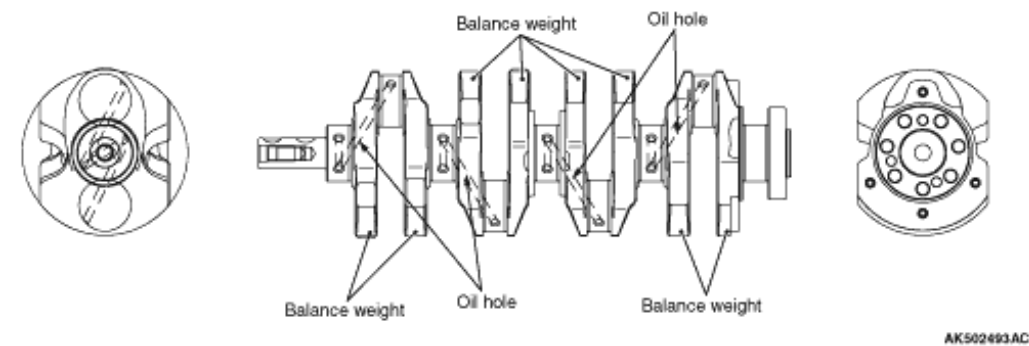
CONNECTING ROD BEARINGS



The upper and lower connecting rod bearings are the same. A connecting rod bearing is provided with a backing plate. Its bearing portion is made of an aluminum alloy and its backing plate is made of ordinary sheet steel.
The width of the connecting rod bearing has been made as narrow as possible in proportion to the bearing cap in order to reduce friction loss.

Item	Specifications
Width (H) mm	17
Thickness (A) mm	1.5

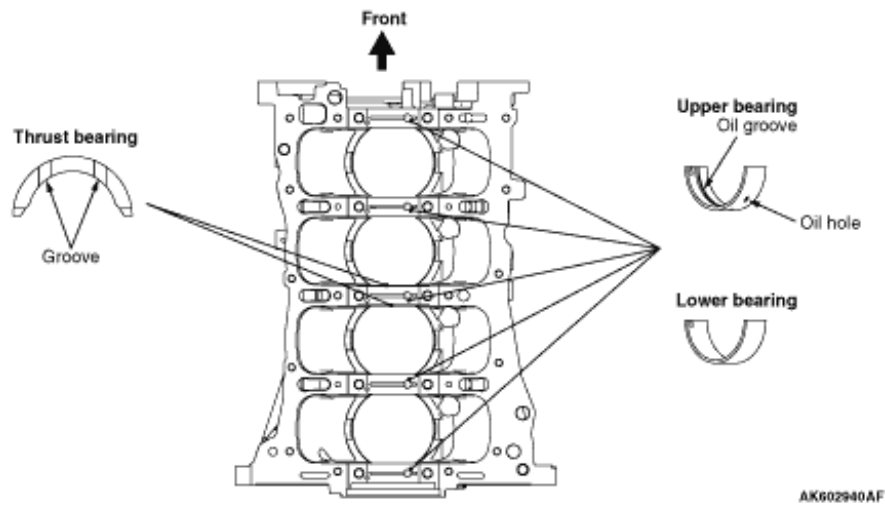
CRANKSHAFT



A forged crankshaft has been adopted.
It has 5 main bearings and 8 balance weights.
The crankshaft pins are located at equal 180° intervals.
The oil holes feed engine oil from the journals to the pins.
A crankshaft sprocket and an oil pump drive shaft are press-fit to the front of the crankshaft.

Item	Specifications
Pin outer diameter mm	48
Journal outer diameter mm	52

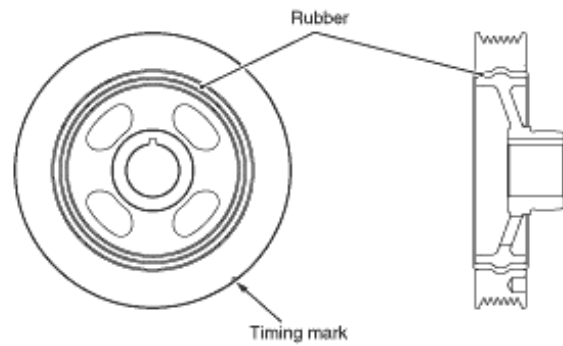
CRANKSHAFT BEARINGS, THRUST BEARINGS



The upper crankshaft oil bearings have oil grooves and the lower crankshaft oil bearings do not have oil grooves. Each crankshaft bearing is provided with a backing plate. Its bearing portion is made of an aluminum alloy and its backing plate is made of ordinary sheet steel. A thrust bearing, which sustains the load in the thrust direction, is provided at each end of the No. 3 bearing.

Item		Specifications
Crankshaft bearing	Width mm	18
	Thickness mm	2.0
Crankshaft thrust bearing	Thickness mm	1.5

CRANKSHAFT PULLEY



AK502495 AC

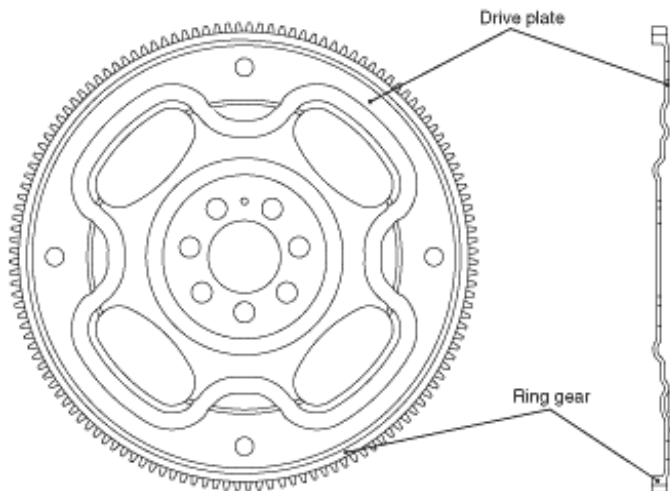
The pulley is made of cast iron.

The pulley portion has grooves for the V-ribbed belt (with 6 crests).

The flange portion of the pulley has a timing mark notch for checking the ignition timing.

A torsion damper has been adopted to reduce the torsional vibration of the crankshaft, as well as to dramatically reduce noise and vibration in the high-speed range.

DRIVE PLATE

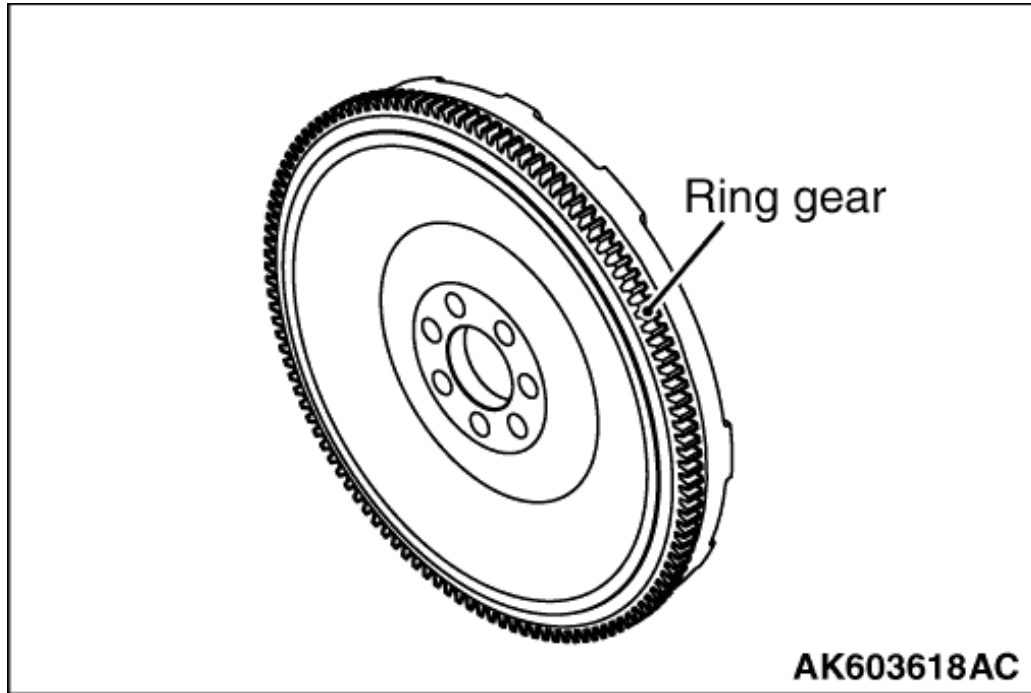


AK502496 AC

The drive plate is made of sheet metal.

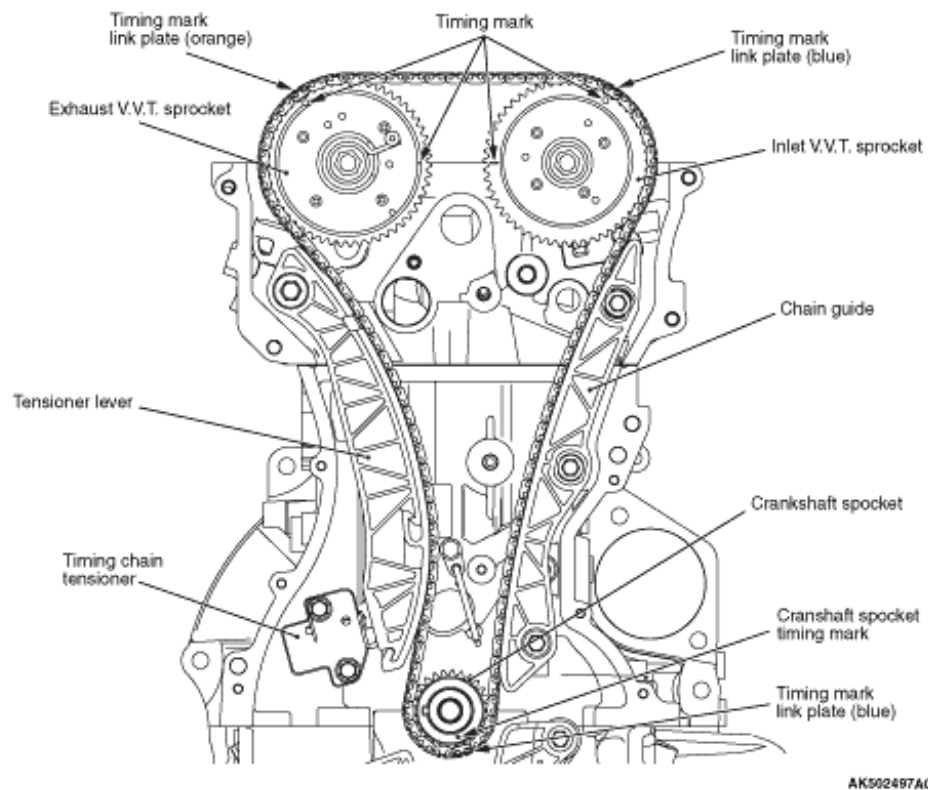
The drive plate is mounted with 7 bolts.

FLYWHEEL



A cast iron ring gear is a shrink fit in the iron casting of the flywheel.
The flywheel is mounted with 7 bolts.

TIMING CHAIN TRAIN



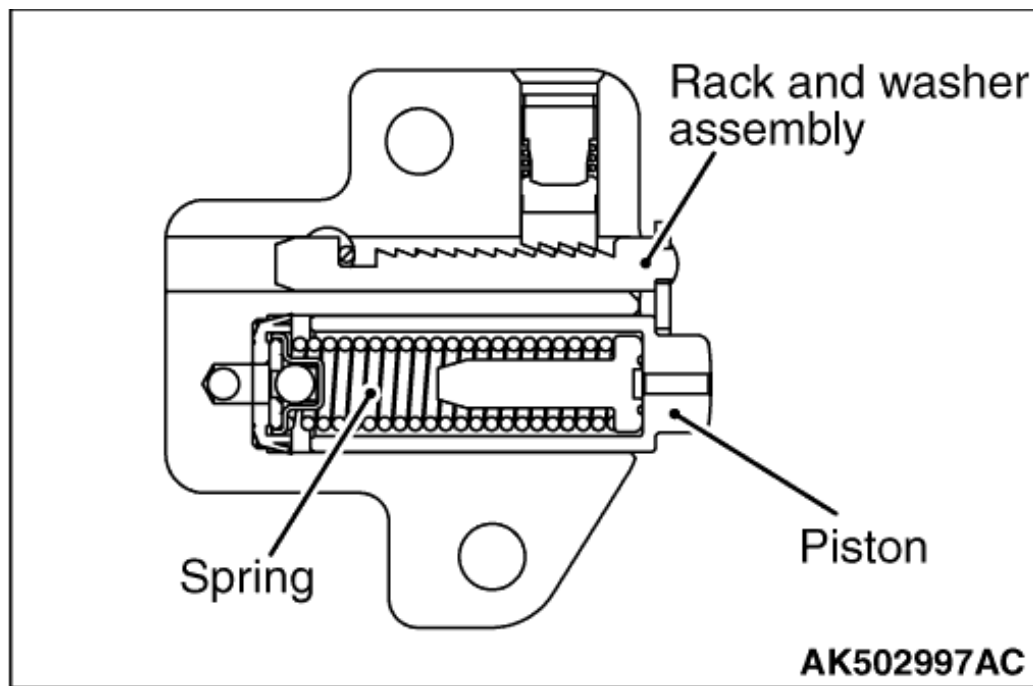
The two camshafts are driven by the timing chain via the camshaft sprockets.

The timing chain is a silent, endless type, consisting of 180 links. It is installed around the V.V.T. sprockets and the crankshaft sprocket.

Three mark link plates (orange and blue) are installed on the timing chain to locate the sprockets.

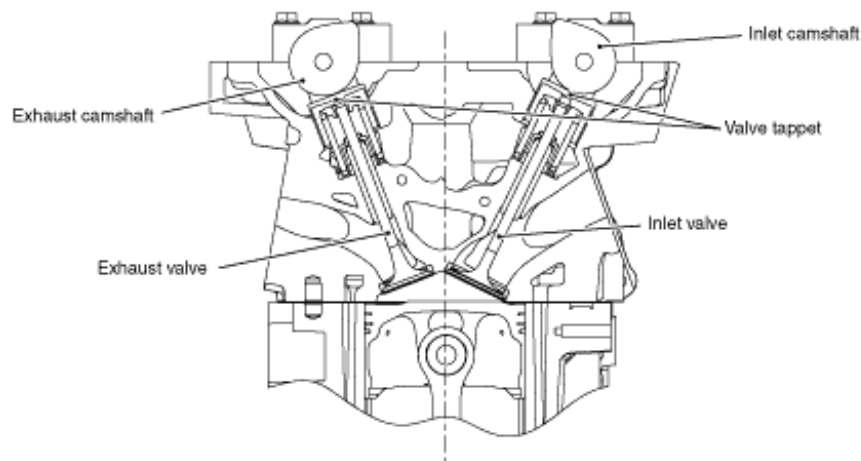
Item	Number of teeth
V.V.T. sprocket	54
Crankshaft sprocket	27

TIMING CHAIN TENSIONER



The tensioner maintains the tension of the timing chain. It contains a piston with a built-in spring. With the tensioner installed, its piston directly pushes on the tension lever in order to automatically adjust the tension of the timing chain.

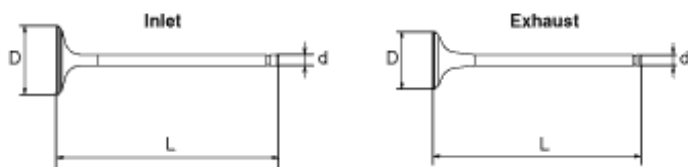
VALVE TRAIN



AK502499 AH

The valve train is the 4-valve, double overhead camshaft (DOHC) type in which the camshafts are located above the valves. Two inlet and exhaust valves for each cylinder are arranged in a V shape. A valve tappet is interposed between the camshaft and each valve, which allows the valve to open and close.

VALVES

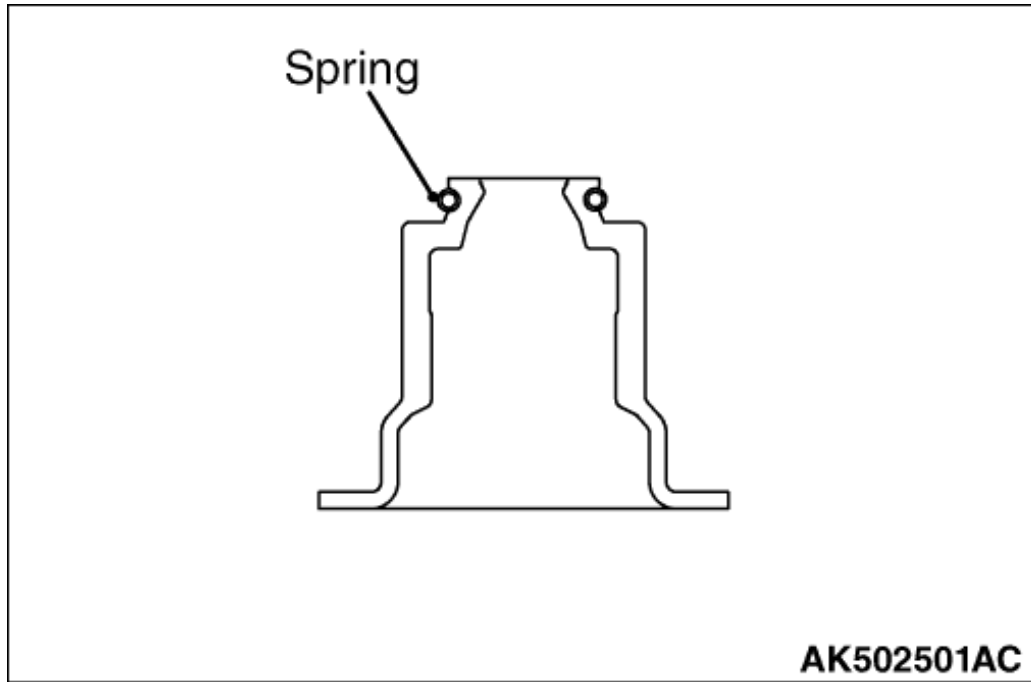


AK502500 AG

The valves are made of heat-resistant steel and are nitrided on their entire surface.

Item	Inlet valve	Exhaust valve
Head diameter (D) mm	35.0	29.0
Stem diameter (d) mm	5.5	5.5
Overall length (L) mm	113.180	105.887

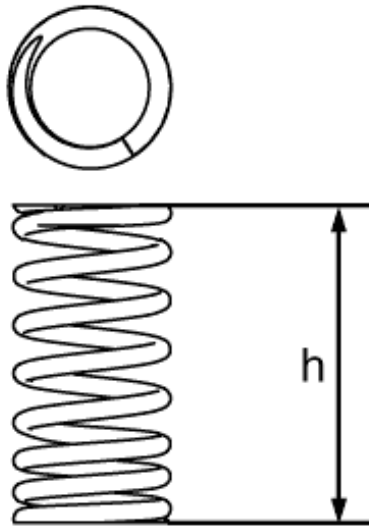
VALVE STEM SEALS



The valve stem seals are integrated with the valve spring seats.

The valve stem seal portion excels in sealing performance and is equipped with a spring to prevent oil from descending.

VALVE SPRINGS

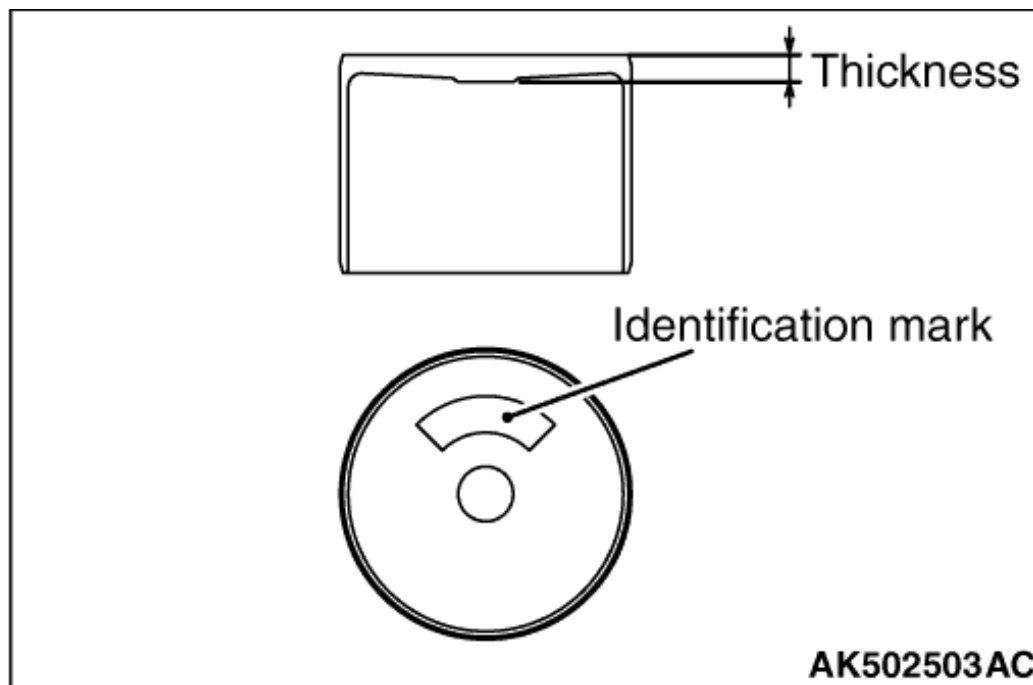


AK502502 AC

The spring steel having the oval section, good heat resistance and excellent settling resistance is used.

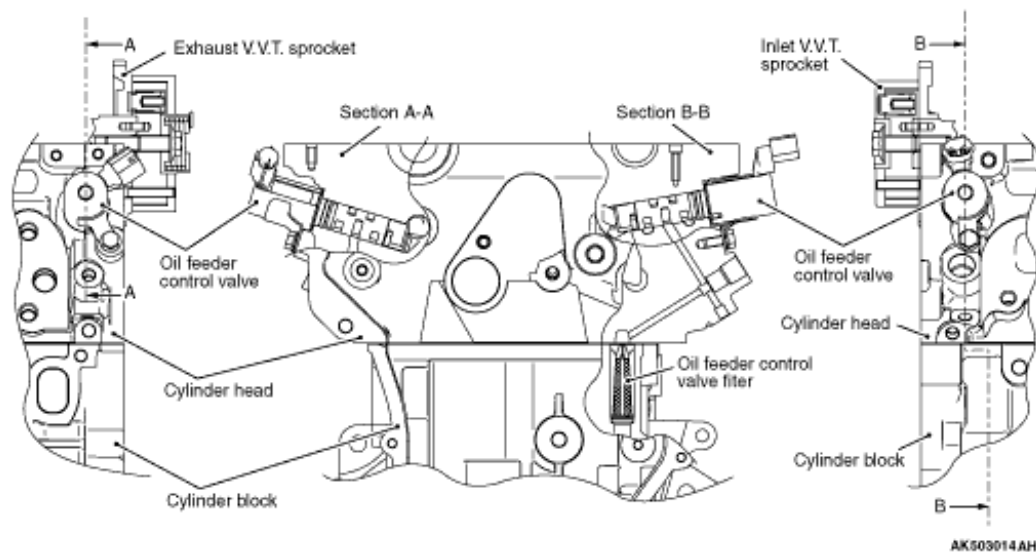
Item	Specifications
Free height (h) mm	47.20
Total number of windings	8.23

VALVE TAPPETS



To adjust the valve lift, 47 sizes of valve tappets are available in 0.015 mm increments, from 3.000 to 3.690 mm.

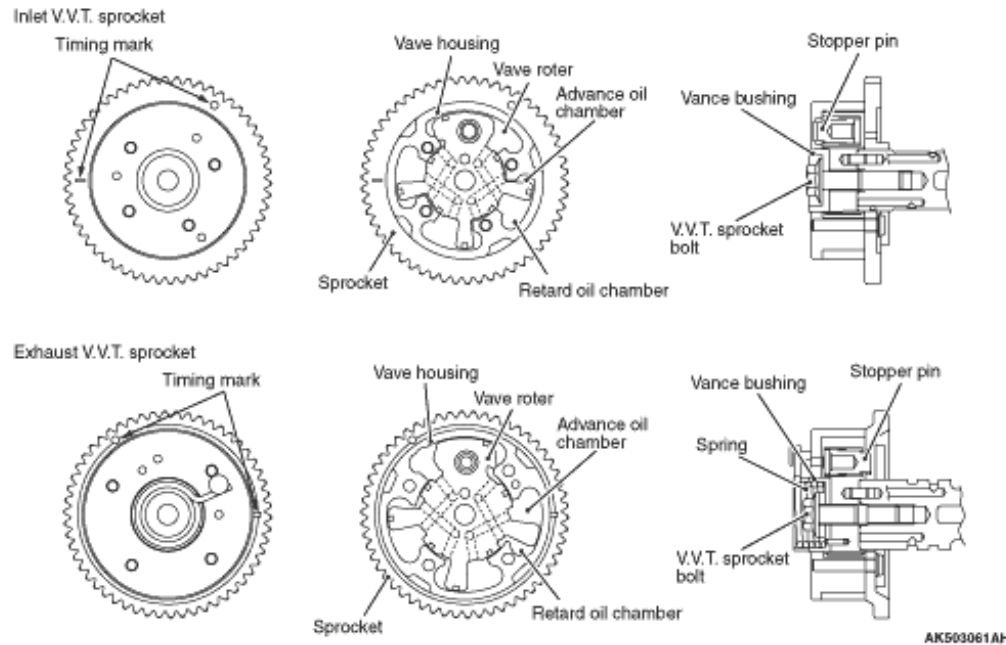
MIVEC (MITSUBISHI INNOVATIVE VALVE TIMING ELECTRONIC CONTROL SYSTEM)



The MVEEC consists of the parts shown in the illustration.

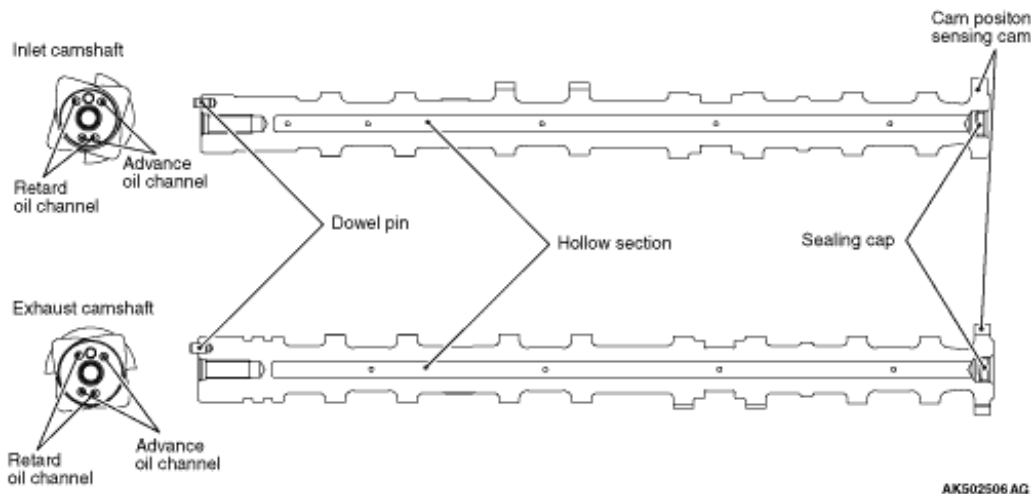
This system continuously varies and optimally controls the opening and closing timing of the individual inlet and exhaust valves, in order to improve torque and power output in all speed ranges.

V.V.T. SPROCKET (VARIABLE VALVE TIMING SPROCKET)



The hydraulic pressure that has been controlled by the oil feeder control valve acts to move the vane rotor in the V.V.T. sprocket, which is provided to optimally control the valve timing.

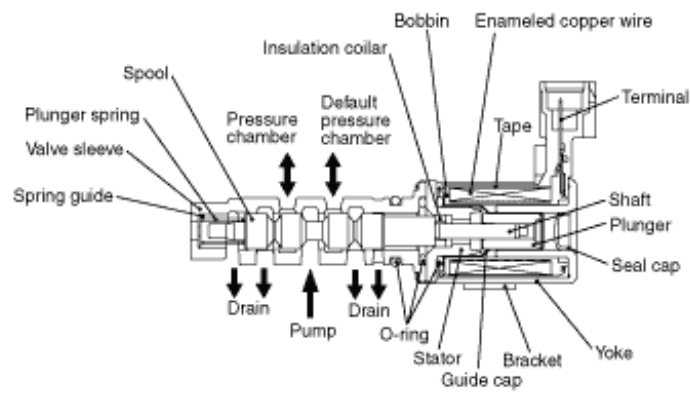
CAMSHAFT



The camshaft is made hollow for weight reduction.
 Each camshaft is provided with an oil passage to guide the hydraulic pressure from the oil feeder control valve to the V.V.T. sprocket.
 A cam position sensing cam for detecting the cam position (used by the cam position sensor) is integrated at the back of each camshaft.

Item			Specifications
Overall length mm	Inlet		435.00
	Exhaust		438.27
Journal outer diameter mm	Inlet	No.1	30
		No.2 - 5	24
	Exhaust	No.1	36
		No.2 - 5	24
Camshaft lift mm	Inlet		9.3
	Exhaust		8.2

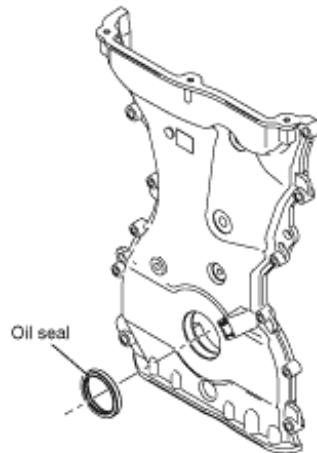
OIL FEEDER CONTROL VALVE



AK302997AB

The oil feeder control valve consists of a solenoid valve, which switches the hydraulic pressure that acts on the vane rotor in the V.V.T. sprocket assembly. This valve is actuated by a signal from the engine ECU.

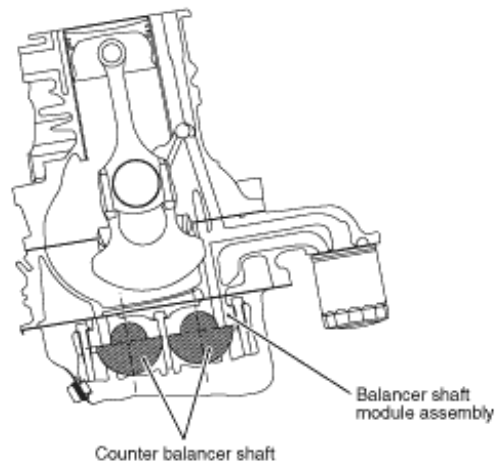
TIMING CHAIN CASE



AK502507 AC

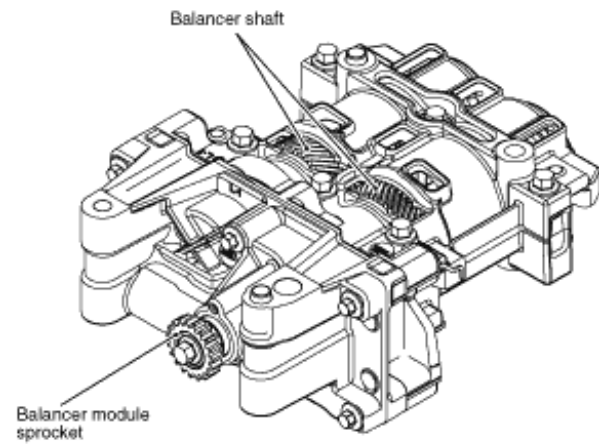
The timing chain case is made of an aluminum alloy. A front crankshaft oil seal is press-fit into the case.

BALANCER SHAFT MODULE ASSEMBLY



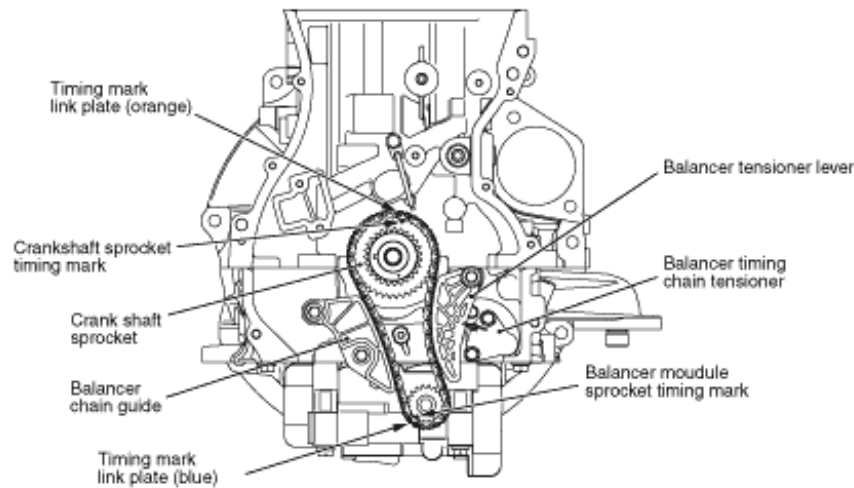
AK801521AB

The counter balancer shaft is located inside the oil pan to achieve a compact engine.



AK502509AC

The balancer shaft module assembly integrates an oil pump and a balancer unit to realize a compact and lightweight package. The balancer shaft module assembly cannot be disassembled.



AK502508AF

The balancer chain is a silent, endless type, consisting of 72 links. It is installed around the balancer module sprocket and the crankshaft sprocket. Two mark link plates (orange and blue) are installed on the balancer chain to locate the sprockets. When the balancer chain drives the balancer module sprocket, the balancer gear causes the right and left balancer shafts to rotate.

Item	Number of teeth
Crankshaft sprocket	38
Balancer module sprocket	19