

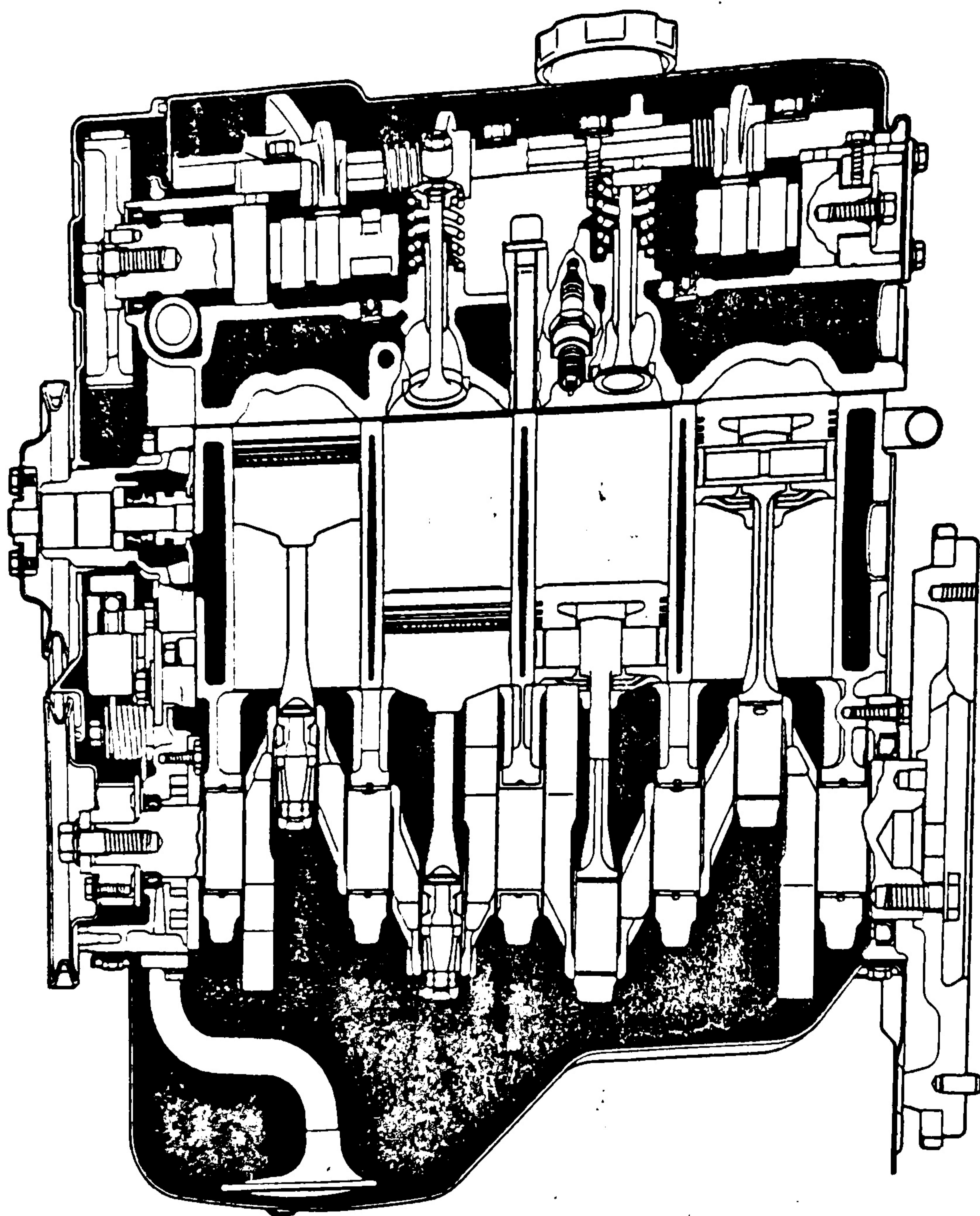


# ENGINE

<b>GENERAL</b> .....	1-2
Service Standard .....	2
Tightening Torque .....	3
Specifications .....	5
Longitudinal Section of Engine .....	8
Cross Section of Engine .....	9
Troubleshooting .....	10
Special Tools .....	12
On-vehicle Service .....	13
<b>TIMING BELT TRAIN</b> .....	17
<b>ROCKER ARM/SHAFT</b> .....	23
<b>CAMSHAFT</b> .....	26
<b>CYLINDER HEAD</b> .....	30
<b>VALVES AND VALVE SPRINGS</b> .....	34
<b>FRONT CASE AND OIL PUMP</b> .....	40
<b>PISTON AND CONNECTING ROD</b> .....	45
<b>CRANKSHAFT</b> .....	52
<b>CYLINDER BLOCK</b> .....	57
<b>OIL PRESSURE SWITCH</b> .....	60
<b>ENGINE MOUNTING</b> .....	61
<b>ENGINE AND TRANSMISSION ASSEMBLY</b> .....	64

**GENERAL**

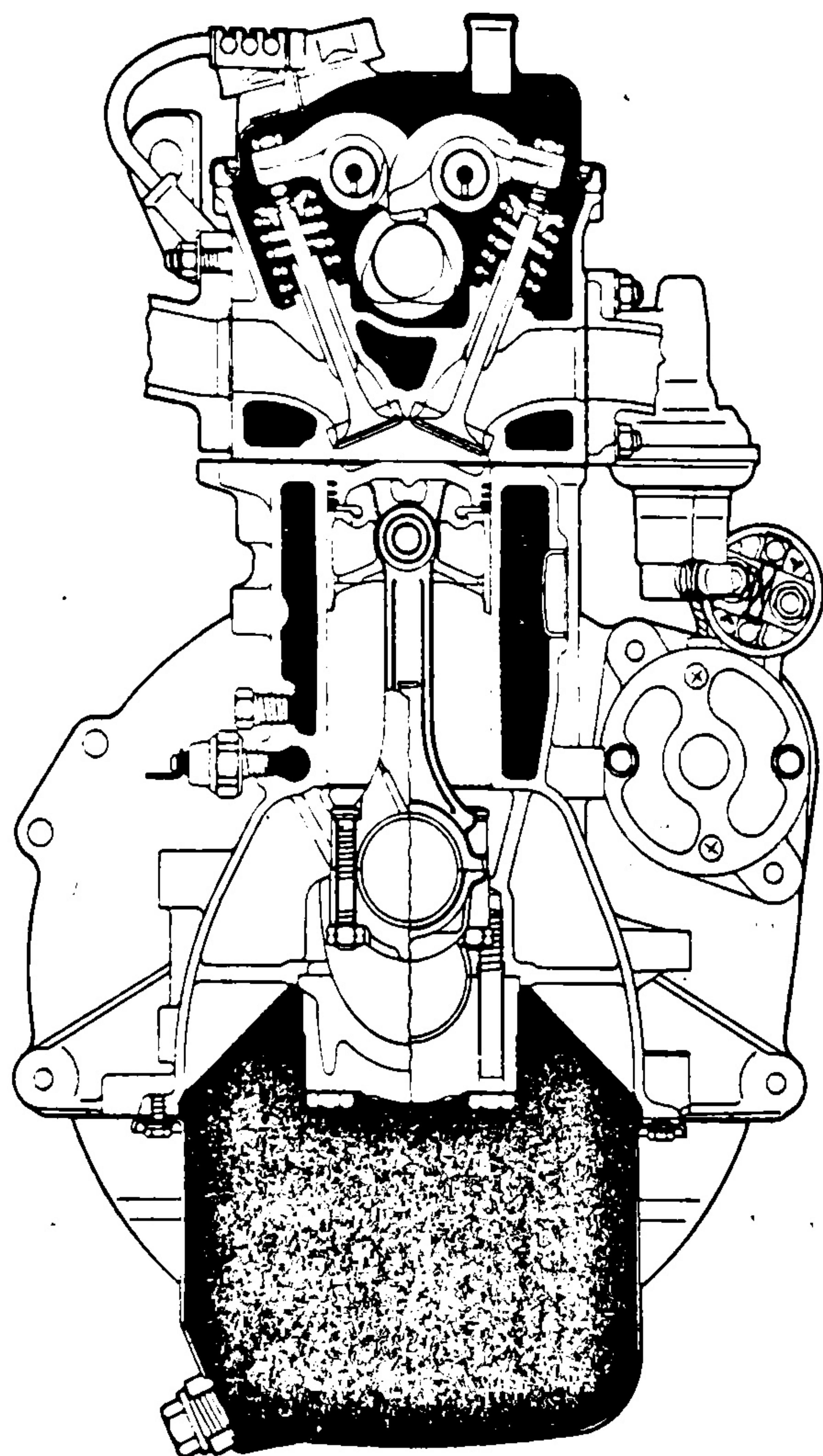
**LONGITUDINAL SECTION OF ENGINE**





## GENERAL

### CROSS SECTION OF ENGINE



MARIZAM B. ACCCI 2011M

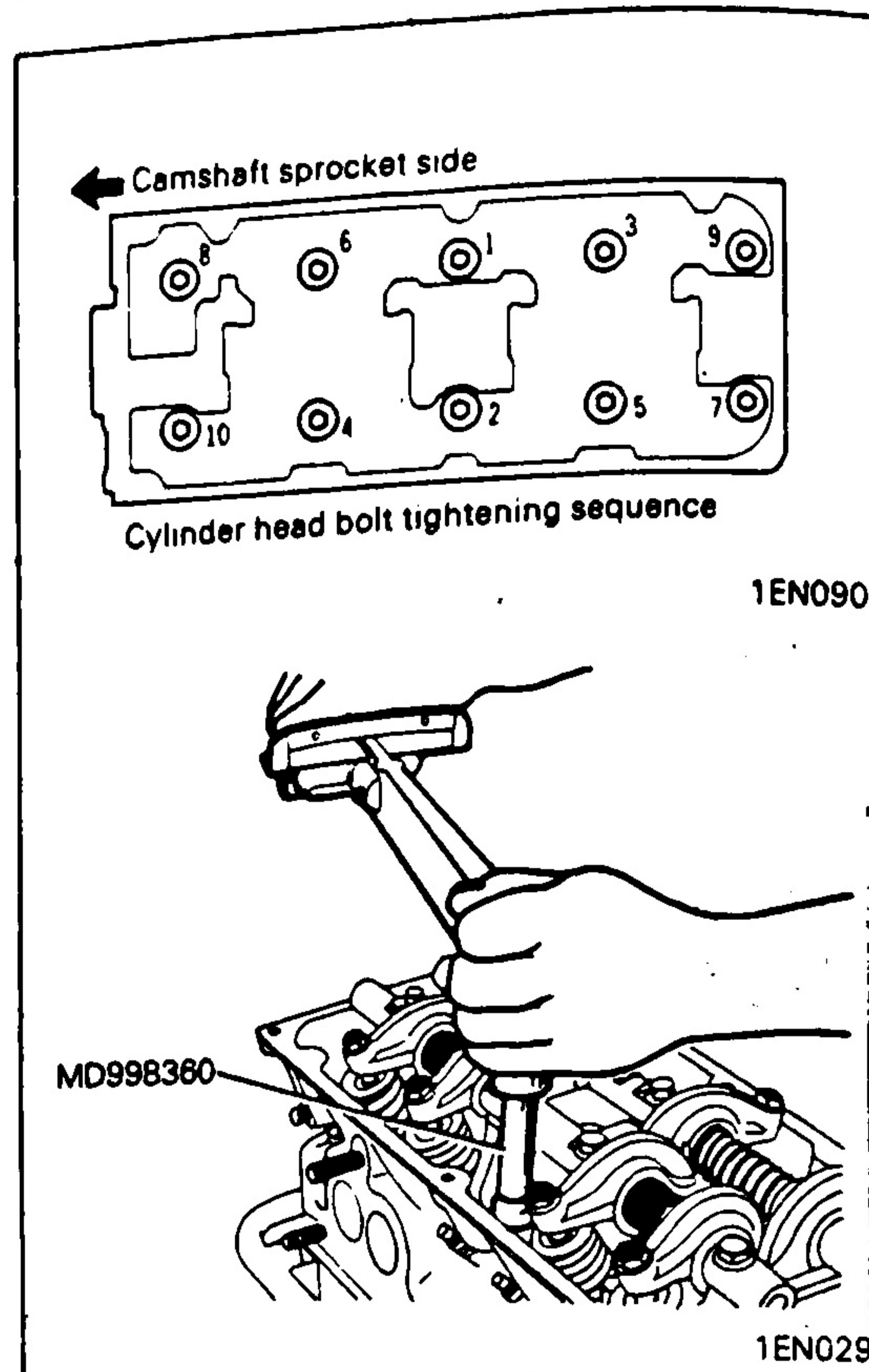
1GE003

## GENERAL

### Additional Tightening of Cylinder Head Bolts

When cylinder head bolts are retorqued, first slightly loosen and then tighten to specified torque.

After cylinder head bolts have been tightened to specified torque, run engine until normal operating temperature is reached, allow it to cool down, and then retorque bolts to specification for best results.



### Engine Oil

#### SELECTION OF ENGINE OIL

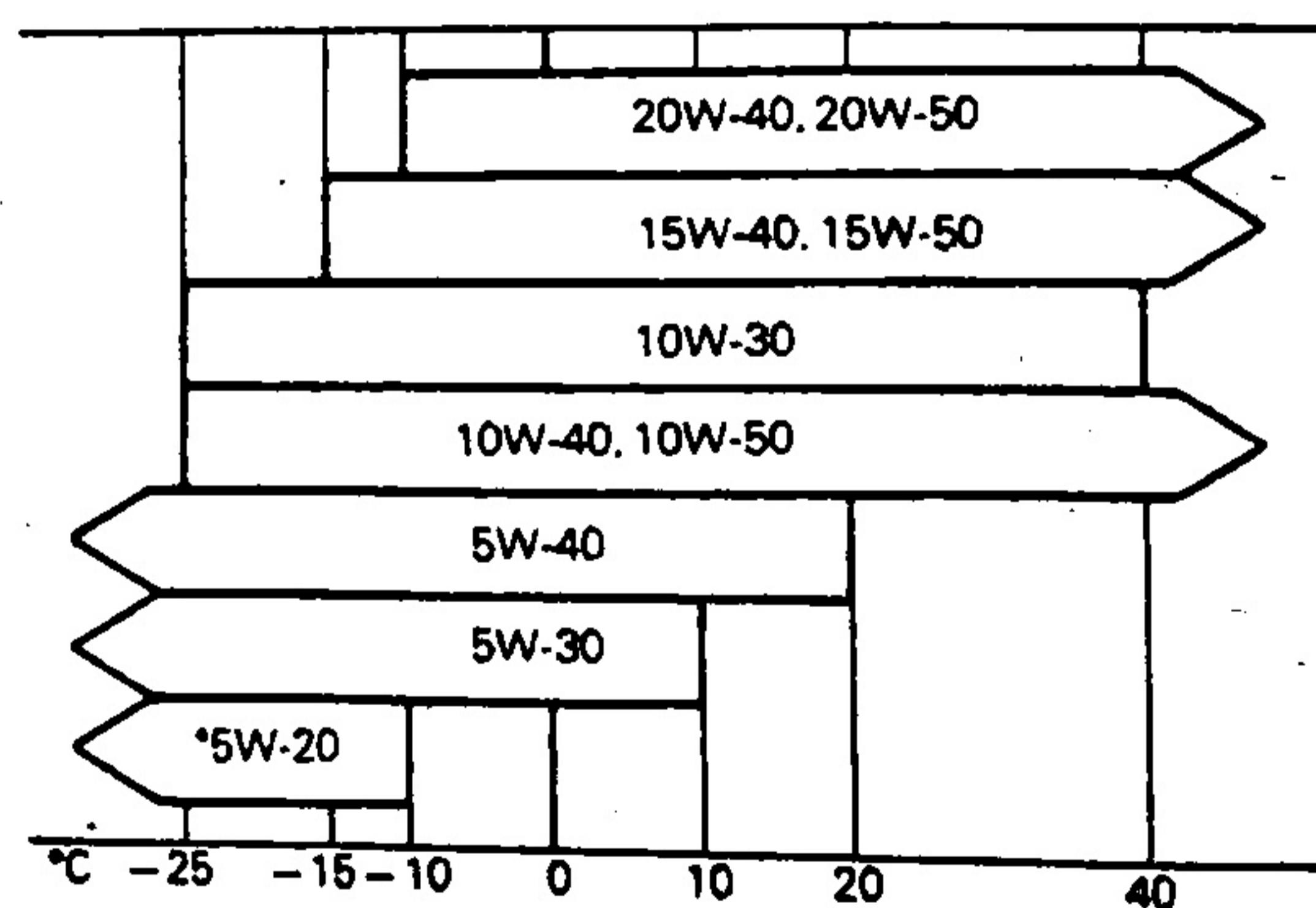
For best performance and for maximum protection of all engines for all types of operation, select only those lubricants which:

1. Conform to the requirements of API classification.
2. Have proper SAE grade number for expected ambient temperature range.

Lubricants which do not have both an SAE grade number and an API service classification on the container should not be used.

Low viscosity oils make engine starting easier in cold weather. As shown in following chart, oils of SAE 5W-20, 5W-30 or 5W-40 grade number may be used when minimum temperatures consistently fall below -10°C. However, even in cold weather, these grades should not be used if vehicle is driven in competition or other forms of maximum performance operation.

#### Recommended SAE viscosity grades



#### NOTE

\*SAE 5W-20 is not recommended for sustained high speed vehicle operation.

Recommended PETRONAS LUBRAM GPX or equivalent  
API classification SC or higher.

## GENERAL



### CHECKING ENGINE OIL LEVEL AND REPLENISHING ENGINE OIL

Position vehicle on a flat level.  
Stop engine.

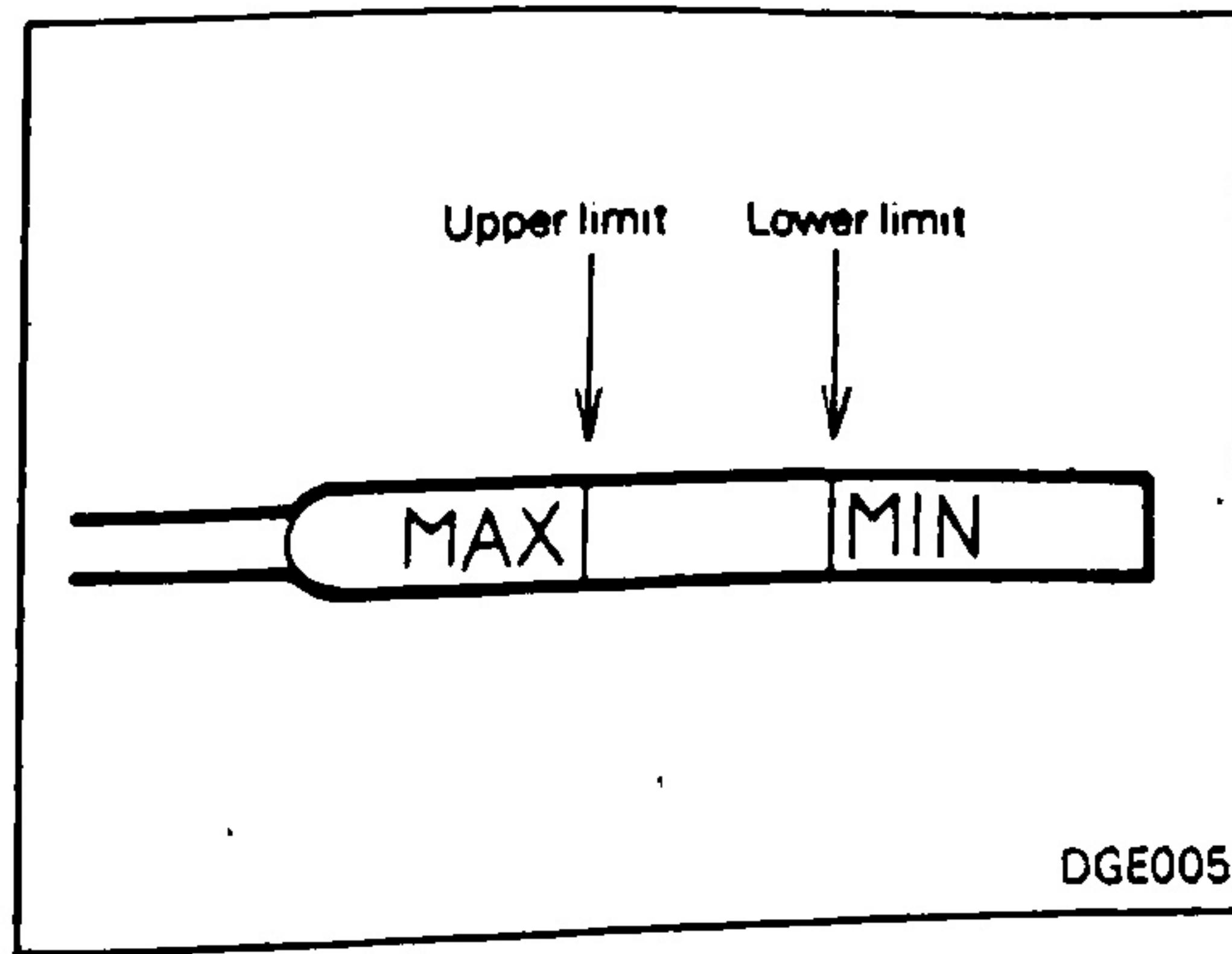
#### NOTE

In the case of a vehicle that has been out of service for a prolonged period, run engine for several minutes and then stop for some time before attempting to check oil level.

Check engine oil level with an oil level gauge. If oil level is found to have fallen to lower limit as indicated by MIN mark, replenish 1 liter of engine oil.

#### Caution

For replenishment, use the same type of engine oil as one currently used.



DGE005

### CHANGE ENGINE OIL

Warm up engine.

Stop engine.

Remove oil filler cap (on rocker cover) and drain plug (on oil pan) and drain old engine oil.

Tighten drain plug to specified torque.

Fill crankcase with fresh engine oil through oil filler port.

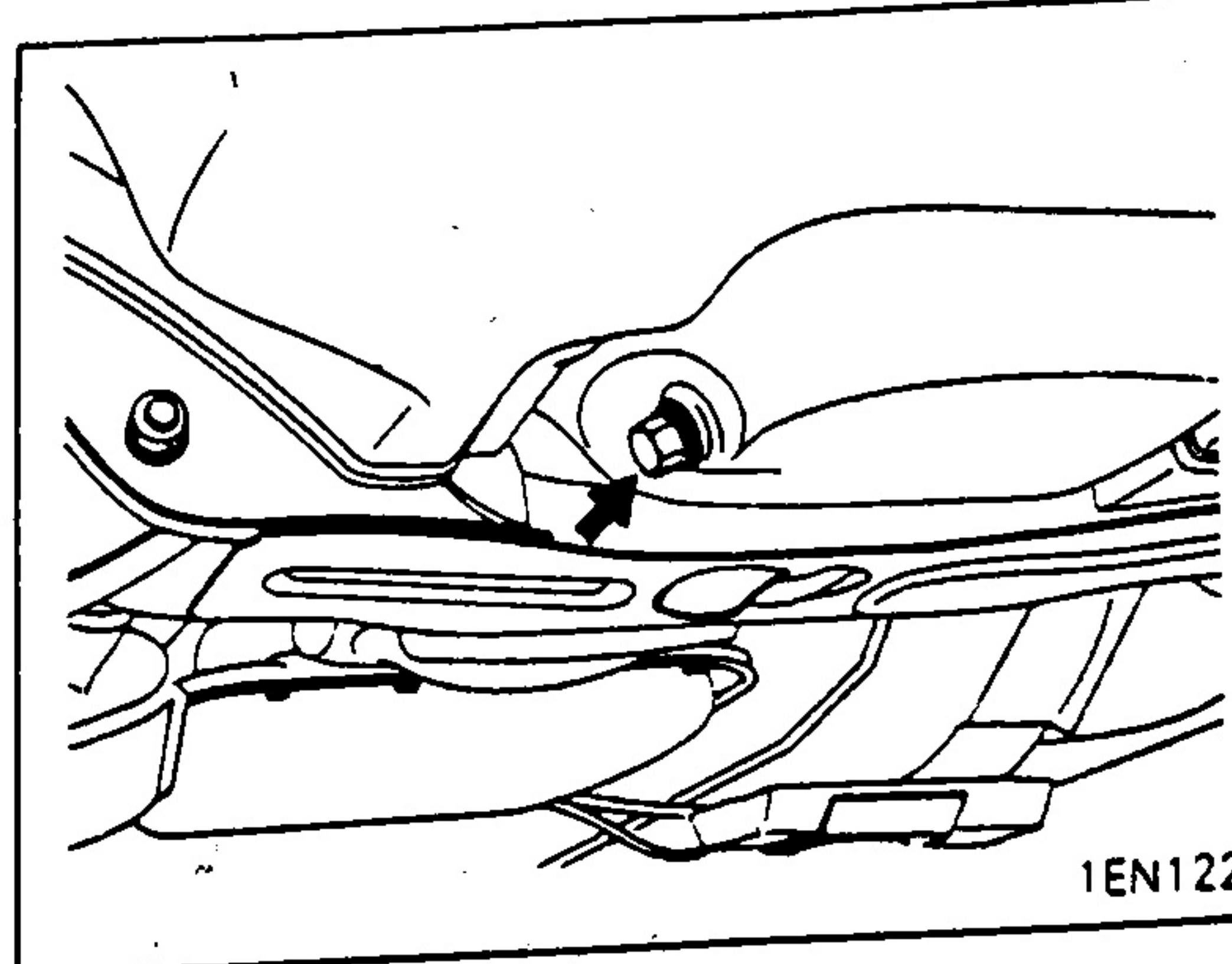
#### NOTE

If oil filter has not been replaced, quantity of engine oil added will be above specification less 0.5 liter.

Install filler cap.

Start and run engine.

Stop engine and then check oil level. Apply oil if necessary.



MARZAM 3. A/C