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**BMW 3-Series (92-98) & Z3 (96-98) Haynes Online Manual**

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# 1 General information

## How to use this Chapter

This Part of [Chapter 2](#) describes the repair procedures that can reasonably be carried out on the engine while it remains in the vehicle. If the engine has been removed from the vehicle and is being disassembled as described in Part C, any preliminary dismantling procedures can be ignored.

Note that, while it may be possible physically to overhaul items such as the piston/ [connecting rod](#) assemblies while the engine is in the car, such tasks are not usually carried out as separate operations. Usually, several additional procedures are required (not to mention the cleaning of components and oil passages); for this reason, all such tasks are classed as major overhaul procedures, and are described in Part C of this Chapter.

Part C describes the removal of the engine/transmission from the vehicle, and the full overhaul procedures that can then be carried out.

## Engine description

The four-cylinder engine is a double overhead [camshaft](#) design, mounted in-line, with the transmission bolted to the rear. A double [timing chain](#) drives the double overhead camshafts. On M42 engines, self-adjusting hydraulic lifters (or followers) are fitted between the camshafts and the valves. M44 engines are equipped with hydraulic pedestals and roller rockers instead of hydraulic lifters. Each camshaft is supported by bearings incorporated in bearing castings fitted to the [cylinder head](#).

The [crankshaft](#) is supported in five main bearings of the usual shell-type. Endplay is controlled by [thrust bearing](#) shells on No. 4 main bearing.

The pistons are selected to be of matching weight, and incorporate fully floating wrist pins retained by circlips.

The rotor-type oil pump is located at the front of the engine, and is driven directly by the [crankshaft](#).

## Repair operations possible with the engine in the vehicle

The following operations can be carried out without having to remove the engine from the vehicle:

- A. Removal and installation of the cylinder head.
- B. Removal and installation of the timing chain and sprockets.
- C. Removal and installation of the camshafts.
- D. Removal and installation of the oil pan.
- E. Removal and installation of the connecting rod bearings, connecting rods, and pistons\*.
- F. Removal and installation of the oil pump.
- G. Replacement of the engine/transmission mounts.
- H. Removal and installation of the flywheel/driveplate.

\* Although it is possible to remove these components with the engine in place, for reasons of access and cleanliness it is recommended that the engine be removed.

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