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TECHNICAL REPORT

Application of different cylinder
head bolts in BMW engines
M52



PURPOSE

Expose **differences between cylinder head bolts in BMW engine M52** in which could be assembled 3 different bolt sets depending on manufacturing year and materials of those engines.

DESCRIPTION

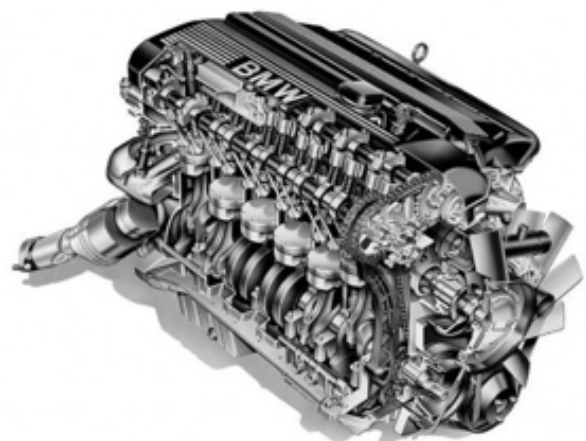
The **M52 engine** series was released first in 1995. For these engines are two sets of different cylinder head bolts to August 1998, and a **third set different from the previous two** for engines built after that date.

At the beginning of the production of M52, the **engine block was manufactured in an aluminum alloy** which is widely used in engines, especially those of large capacity because it is lighter than cast iron and is able to obtain engines with **much lower final weight**.

This fact has a direct influence on the behavior of the vehicle and other factors such as **improved fuel economy**, mainly due to the **reduction of overall vehicle weight**. Apart from dynamic improvements, **aluminum** has other thermal characteristics that may be interesting to use as raw material for the manufacture of a vehicle engine, such as having **good conductivity metal** and therefore good heat dissipation capacity.

This type of **aluminum blocks need to be covered** in the cylinders with some **other ferrous alloy which resists high temperatures and friction of the piston** without deforming. For this particular engine, the manufacturer used a silicon and **nickel alloy** commonly named **“Nikasil”**, performing a coating as a cylinder liner inside that block.

BMW had **serious problems** with the M52 in countries like USA, whose **petrol possess a high level of sulfur which attack the Nikasil coating**, producing engine failure. This fact forced the manufacturer to build a variant where the aluminum block was replaced by cast iron in all engines where the problem was detected.



Many of these **aluminum blocks were replaced by cast iron**, not only in the manufacturing of the engines but also in repairs to vehicles under warranty.

From **August 1998** the manufacturer re-launched again this aluminum-block engine **improving the problematic areas** which forced the brand to replace it in the past.

Thus, from that date, the new M52 aluminum block is applicable in all models everywhere.

For this reason, **AJUSA** provides **for vehicles produced from 09/1995 to 08/1998, the cylinder head bolts set** with part number 81024300 (110mm long) for aluminum block engines and set with part number 81008500 (95mm in length) for those with **cast iron block**.

In the same way, AJUSA offers cylinder head bolts set for vehicles manufactured after 08/1998, with part number 81027600 (110mm in length) for new aluminum blocks.

Although the manufacturer has unified the two cylinder head bolts sets for aluminum blocks, **AJUSA remains three available part numbers** to ensure the best coverage for their customers.

