

WHAT GOES WRONG?

The M10 relies on the kind of maintenance that modern engines don't need. It has manual-adjust tappets that need doing every year or 12,000 miles, and the cam spray bar needs to be cleaned out – remove the banjo bolts, twist it through 180° and run a small drill through the oil holes to open them up a bit. Fit new banjo bolts from BMW as well – the originals always had a habit of coming loose and the new ones have a slightly different thread pitch so they stay in place.

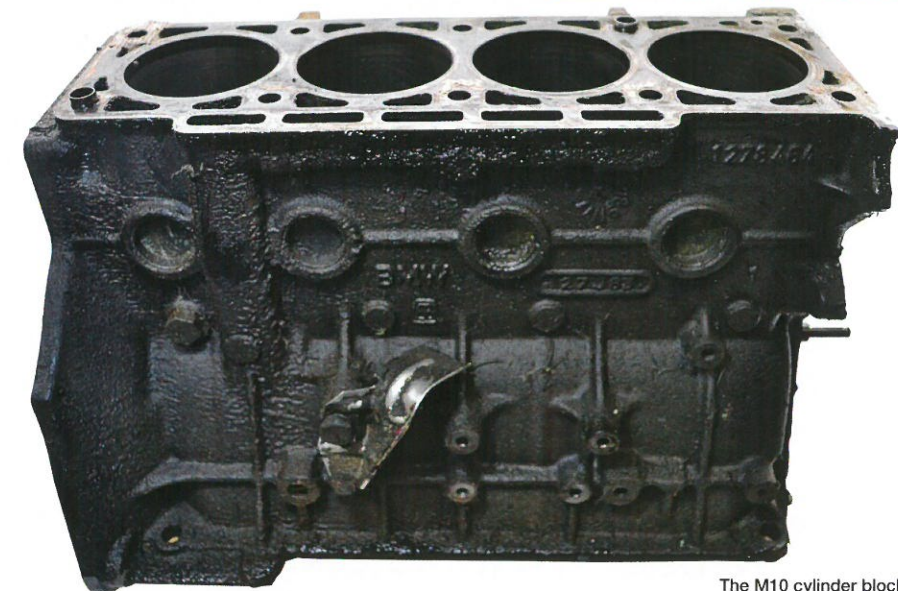
Never ever thread-lock the old ones into place as the stuff will just congeal in the oil hole. The post-1980 Simplex timing chain was very strong, but it has a habit of wearing out the camshaft sprocket. But you can buy these new and they're simple to fit.

Head gasket trouble is rare, but cracked heads and popped exhaust manifold studs aren't. The inlet side of the LE Jet injection engines is a swine to work on, and be very careful about swapping cylinder heads – you need the right head for the right pistons and, on the E30, the 318i and 316 heads are different.

Overall, though, the M10 is a very good engine, but it demands regular maintenance. However, it was never quite as bulletproof as some claim, and many were very tired by 100,000 miles, and showing signs of valve guide and cam wear. Low oil pressure can be a problem – you may find it takes ages for the oil pressure light to go out. This can be an O-ring on the pipe from the pump to the block that's blown out on a cold start, but it's not too bad to lower the sump slightly and remove the timing chain cover to replace it.



M10 2002Ti engine.



The M10 cylinder block.

a pair of 40PHH Solexes (from the 1800 Ti) and ran with a compression ratio of 9.3:1. The result was 120hp at 5,600 rpm and 167Nm of torque at 3,500rpm.

This was enough output to give the 2000CS useful performance, with a top speed of 110mph and a 10.4-second 0-60 time – faster than a Rover 2000TC. The 2000 engine in both single- and twin-carburettor form, went on to be fitted to the New Class saloon in 1966, and the 2002 in 1968, but there was more in the meantime.

For 1966, the 1800 engine was revised. To reduce production costs, the 1800 made use of the 89mm bore block from the 2000 engine, plus the 71mm-stroke crank from the 1600. This resulted in a new capacity of 1,766cc, although the quoted power output remained the same. However, the new engine was smoother at high revs, thanks to its shorter stroke.

BMW also launched the two-door 1600 in 1966, and added a 1600Ti version; a very sparky version with the same modifications as the 1800Ti, resulting in a lively car befitting its 105hp at 6,000rpm and 131Nm at 4,500rpm figures. A 10.8-second 0-60 time and 110mph top speed made the 1600Ti a fast car that

was very popular in the USA – like a well-made and reliable Lotus Cortina!

In 1969, a 2000Ti was launched with Kugelfischer mechanical fuel injection, which gave the 2000 great performance as you'd expect, with 130hp and 176Nm of torque and a sensibly-high 9.5:1 compression ratio.

HEAD IMPROVEMENT

The 121 cylinder head was introduced with the 2000 engine, and filtered its way on to the other M10 units thereafter. The M10 then continued in this form until autumn 1972, by which time the New Class was about to be replaced by the E12 520 and 520i. This first 5 Series used the M10 2-litre engine, but with changes.

The 520 used a pair of Stromberg 175CDET carburettors plus a new design of combustion chamber and piston crown, and this unit developed 113hp at 5,800 rpm. It produced a torque figure of 165Nm at 3,700rpm with a 9.1 compression, and this unit was used only in the 520 – the E12-type engine, with its new head (with 'E12' cast on the side), was used in the 2002 from late 1972, but only the 520 used this bizarre, twin-carb set-up. The 520i relied on a revised

version of the 2002Ti unit, with the new E12 head, but the power outputs were virtually identical.

BMW launched a 518 model in 1974, in the wake of the fuel crisis. It was an 89hp rocket-ship (not) version of the 520 fitted with a detuned, 1,766cc engine. Running a single-choke Solex 32/32 DIDTA carb and a low, 8.3:1 compression ratio, that 89hp was achieved at 5,800rpm together with a fair, 140Nm of torque at 3,700rpm. But BMW soon revised this simply because the 518 was so slow. Consequently, a twin-choke Solex carb was fitted from late 1975, but there are no power figures for this.

At the opposite end of the scale from the 518 was the 2002 Turbo. Based on a Ti motor, the Turbo's engine used a KKK turbo, a different version of the 121 head (with machined chambers), dished pistons and various other details that mean not much directly interchanges. Power was rated at 167hp at 5,800rpm while torque was 240Nm at 4,000 rpm on a low 6.9:1 compression ratio.

FIRST TURBO

The 2002 Turbo made use of early turbo technology, and had the first, small-

capacity turbo engine that made it into production. In retrospect, the truth is that it wasn't very good, suffering as it did with chronic lag and reliability issues that should have put people off turbos for life. However, when properly set-up, it was pretty fast and exciting car to drive. But it was Saab who really took the bull by the horns, developing the turbo-charged four-cylinder into something reliable, easy to drive and economical.

In 1975, the 2002 range was replaced by the new E21 3 Series, which brought with it another raft of revisions. The engine's head was again revised (coded 'E21' on the side), but the biggest change was in the fuelling system. Gone was Kugelfischer mechanical injection and in came Bosch K Jetronic, which was fitted to the new 320i as well as the existing 520i models.

The 316 used a revised version of the outgoing 1602 engine, with 89hp and 123Nm, while the 320 got a new two-litre, producing 110hp and 152Nm on a low 8.1:1 compression ratio. The two-litre

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M10 ceased production in 1977, as the new M60 (later M20) two-litre straight-six engine was fitted to the 320 and 520, leaving the 1,600 and 1,800 units in the 316, 318 and 518 cars.

September 1980 saw the end of the 1,600cc engine in the 316, when it was replaced by the 1,800cc. There was also a change to the timing chain setup on all M10s. The original Duplex chain was replaced by a lighter but equally robust Simplex chain and, at this time, the

distributor was altered to run in the opposite direction (anti-clockwise).

There was a base 315, fitted with a Pierburg carburettor, that produced 75hp and 110Nm of torque, but this wasn't imported into the UK. The new 1,800cc 316 gave 90hp and 140Nm on a 9.5:1 compression with a Solex Pierburg 2B4 twin-choke carb and, once the 315 had been discontinued, this 1,800cc unit was one of only two M10 engines left in production. It powered the 518 in E12 and E28 bodies, and was made alongside the fuel-injected version.

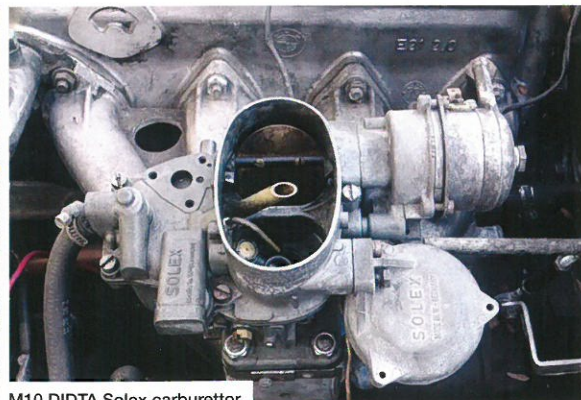
The first one used Bosch K Jetronic until late 1982 and the end of E21 production, and this had 105hp and 145Nm of torque – this engine would be used in the early E30 318i. For late 1983, the E30 318i and 518i (not sold in the UK until 1985), had a new version of the M10, with yet another revised cylinder head for emissions and Bosch LE Jetronic fuel injection. Power figures were as before (well, 103hp) on a high 10:1 compression ratio.

By now, the M10's successor – the M40 – was at the design stage, and the M10 was over 20 years old. The first M40 engine was built in mid-1987, for the launch of the facelifted, plastic-bumper E30 and the final E28 518i, built in December. The M10 continued for another few months until July 1988, when the final M10-engined car was built, an E30 316 that was replaced by a 1,600cc M40 316i.

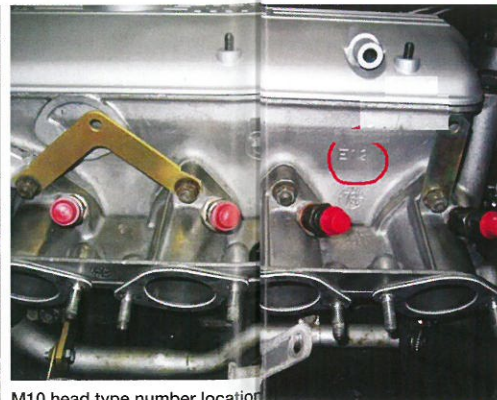
The M10 had been in production for 25 years, yet had barely changed, such was the quality of the original design. However, by 1980s standards, it was heavy, not very good on fuel and engines such as the GM Family 2 were probably better all-rounders by then. What's more, the M40 was certainly a better unit and a worthy replacement. ●



M10 520 Stromberg carburetors.



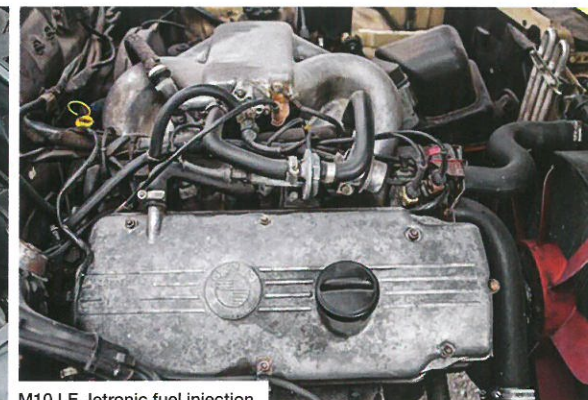
M10 DIDTA Solex carburettor.



M10 head type number location



M10 BMW 2,000cc



M10 LE Jetronic fuel injection.