

Technical

The M52, as previously mentioned, builds on a very similar block to the M50. Six in-line cylinders, with 91mm bore spacing, placed in a 30-degree inclined aluminium alloy block; 2.0-litre engines feature an 80mm bore, while the 2.5-litre and 2.8-litre versions share the same block – both having an 84mm bore. The strokes measure 66mm, 75mm and 84mm respectively.

VANOS variable valve timing was fitted to the inlet camshaft of all M52s, with TU versions featuring it on the exhaust camshaft too. Siemens fuel injection was fitted to all models, and they all featured coil-on-plug ignition too.

The 2.0-litre (or 1991cc, to be precise) M52 features peak outputs of 150bhp at 5900rpm and 140lb ft of torque at 4200rpm, with a compression ratio of 11.0:1. The TU shares the same peak figures but with the torque arriving lower at a lower 3500rpm.

The 2.5-litre (2494cc) version boasts figures of 168bhp at 5500rpm and 181lb ft at 3950rpm. Again, the TU version shifted peak torque down the rev range to 3500rpm. The compression ratio is 10.5:1. With its over-square bore/stroke ratio, the 2.5 is sometimes considered a little revvier than its big brother, the 2.8 (2793cc). The daddy of the M52 range (excluding S variants – see 82), the B28 pushes out 190bhp at 5500rpm and 210lb ft at 3950rpm, with a compression ratio of 10.2:1. Much like with the 2.5, the torque peak remained the same but shifted down to 3500rpm for the TU.

The M52B25 in our own project 323i has received a few of the steps mentioned to boost power and response



Tuning

The 2.0-litre is an engine that, in all honesty, isn't worth doing much with – any tuning is going to cost more than swapping it out for one of its bigger brothers, which can produce much stronger figures.

The tuning process for the 2.5 and 2.8 run along similar lines. Both came from the factory with a highly restrictive inlet manifold – hence the fact the 2.8 only makes the same power as the old 2.5 M50, and the 2.5 M52 is 20bhp down on that. The solution?

Well, with a pretty simple conversion kit (which is needed to connect up the oil breather system, throttle body and fuel rail properly) the M50's intake manifold will fit. You can expect around 190bhp from the 2.5 M52 while the 2.8 has been known to produce very healthy figures of up to 220bhp. This upgrade also stops power dropping off at high revs as can be experienced with the standard manifold. A big bore throttle body is an excellent way to top the setup off. The 2.5 also comes with a restrictive single-cat setup as standard – bolting on an exhaust from a 2.8 sees another few horsepower gained, while E36 M3 exhaust manifolds are another bolt-on that can gain around 5bhp. Beyond that, US-spec M3 camshafts will give a healthy gain.

The TU engines had a different breather system and intake, meaning an M50 manifold conversion doesn't apply to these. However, swapping the intake manifold from the 3.0-litre M54 can give some good gains. M3 exhaust manifolds are not applicable. US-spec iron blocks are extremely strong and so forced induction is without doubt the route to take, beyond the steps above.

