

Diesel manifold flaps

Worried by the stories about diesel swirl flaps? Here's what you need to know

WORDS & PICTURES
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Time was when a large chunk of our technical queries were concerned with the question of the Nikasil engines, but these days we're seeing a steady flow of enquiries from readers worried about their diesel engines.

Regular readers will be aware of the controversy surrounding the design of the inlet manifolds on BMW's common rail diesel engines and the potentially disastrous effects of failure.

The problem lies in the design of the inlet manifold, which includes butterfly flaps (commonly known as swirl flaps). The idea is that by opening and closing they lengthen or shorten the effective length of the manifold which in turn should alter the torque output of the engine. The engine normally runs with the flaps open, giving a shorter tract.

Unfortunately, it isn't known for them to break up and the consequences can write off the engine. Although the flaps themselves are made from plastic and will generally either lodge inside the manifold or simply pass through the engine without harming it, the metal fixings can be ingested into the cylinders.

The result can include a ruined piston, valves and cylinder head... while on their way out, the bits will also take out your turbo and then just for good measure the catalyst too.

BMW addressed the problem by introducing stronger swirl flaps and larger diameter spindles – made from plastic – in 2006. This however is no help to the owners of older models, especially as they are now coming out of warranty.



The best solution is simply to eliminate the problem by removing the flaps completely.

As a rough guide, engines affected will be those produced from 2001 to July 2005, although specialists report having seen engines from 2004 with the updated flaps fitted at the factory. Although BMW UK will generally treat each case on its merits and "listen with a sympathetic ear" to any claims on a car out of warranty, the

best solution is simply to eliminate the problem by removing the flaps completely.

It's not as serious as it sounds, since the effect of removing the flaps is apparently a very slight increase in emissions at idle and the car will drive no differently: off idle, the engine runs with the flaps fully open in any case.

You will of course need to block the holes created by removing the flaps and spindles, and although you will see posts on the internet from people using epoxy glue and self-tappers, who can trust them not to break free and get ingested into the engine one day?

To do the job properly, we visited Peter Mould at Chelmsford BMW specialist PMW Ltd who has researched the subject carefully and can supply and fit supply and fit neat billet aluminium blanking plugs in the holes left in the manifold. If you want to do the job yourself, PMW can supply the plugs to you via mail order at £14 each plus VAT and as you'll see from the following steps it's easy DIY.

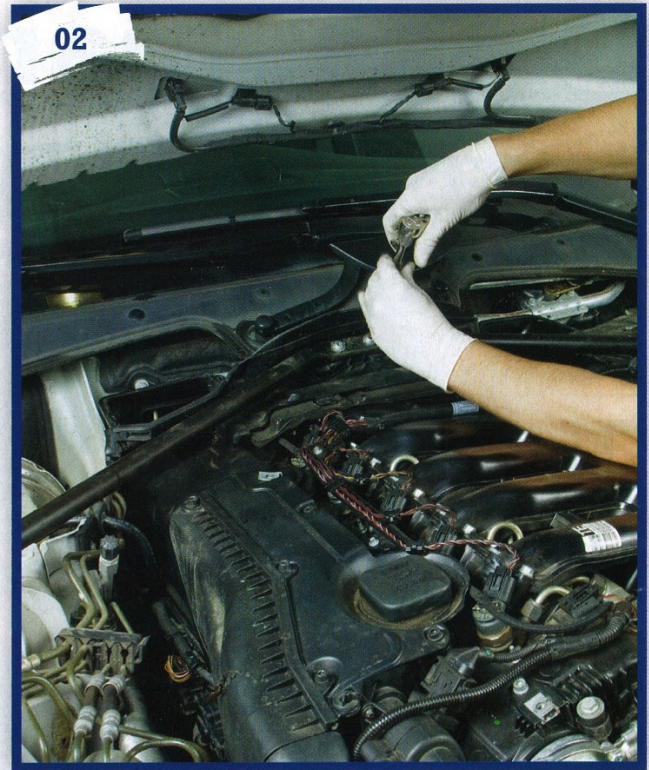
ENGINES AFFECTED

M47TU (four cylinder) and M57TU (six cylinder). The 'TU' stands for 'technical update' and signifies that they are the successor of the earlier engines and so have the swirl flaps.

Engine code	Introduced	Applications
M47TUD20	2001	E46 320d, 320Cd, X3 2.0d
M57TUD25	2004	E60/E61 525d
M57TUD30	2002	E46 330d/330Cd, X3 3.0d, X5 3.0d E60/E61 530d/535d, E65 730d



Remove the screws holding the elaborate plastic engine cover and lift it away to access the manifold.



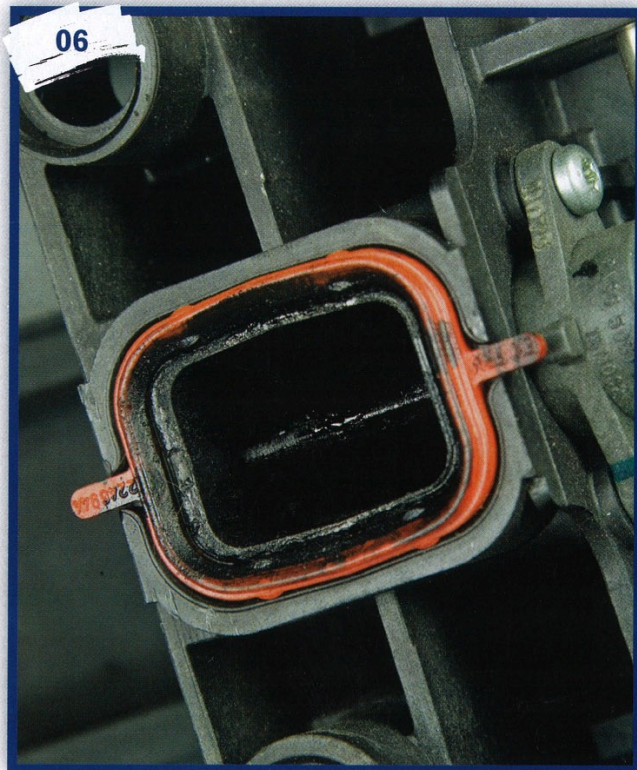
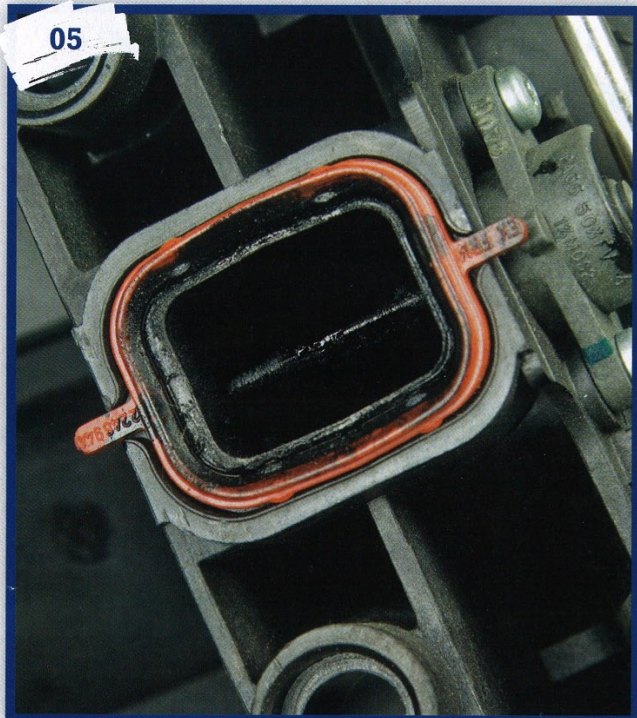
The strut brace needs to be removed to gain access to the top of the engine. It is attached the top of the struts and fixed to the bulkhead.



Remove the bolts which hold the manifold to the cylinder head.



After loosening the EGR tube, the manifold can be removed. Don't let anything fall into the inlet ports!



This is the swirl flap in the open position. This is the unit that we will remove altogether, but it is interesting to compare this metal version with BMW's updated version in the next picture. Incidentally, the oily soot is common for a diesel engine.

This is a manifold from a later engine. Note that BMW has changed the design to a one-piece plastic butterfly without the metal fixings.



The swirl flaps are actuated by a rod that links them to a small servo. This can be removed and discarded.

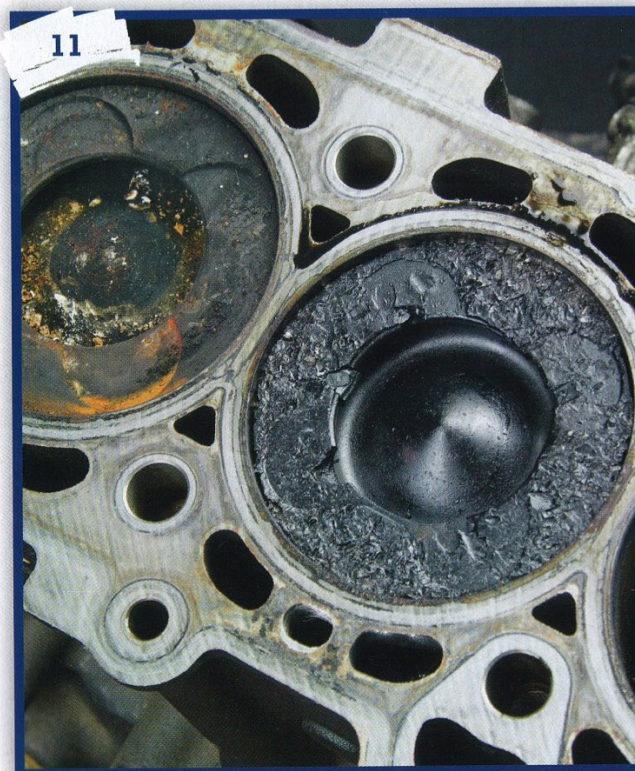
The swirl flaps are held into the manifold by two screws. After these are undone, the flaps can be withdrawn. Although they will be discarded, you might want to examine them to see if they were about to fail...



Note the two tiny screws which hold the flap to the spindle. They can work loose from vibration and just one of these sucked into the combustion chamber would write off the engine.



This is an example of a broken flap from a 320d engine. The consequences of this failure are shown in next two pictures.



Here's what can happen when a foreign object hits a piston 60 times every second...



... and as you can see the damage to the cylinder head matches the piston quite well.



PMW produces single-piece aluminium billet blanking plugs complete with 'O' ring. As these are a solid piece and are fitted from the outside of the manifold, there is no danger of these being drawn into the engine.

Job done. The original swirl flap is on the left and the inlet port on the right shows the very neat replacement. You can either discard the bits or squirrel them away somewhere but the car won't feel any different to drive and you won't have to worry about the bill for a replacement engine, turbo and catalyst.

Contact

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Established back in 2000 by boss Peter Mould, PMW boasts all the facilities you'd expect from a modern independent specialist including the Autologic diagnostic kit, air conditioning service facilities, wheel alignment kit and MoT testing.

Peter himself boasts over nine years' experience at BMW with a stint at Mercedes too, while the business has grown from a one-man band to accommodate two industrial units with nine staff working on BMW, Mercedes and Porsche.

As you can see from their research into the swirl flaps issue, they really know their way around BMW engines, so if you don't fancy taking the manifold off yourself, then give them a call.

