

BMW Maintenance and Valve Adjustment



This article was originally planned as a straight valve adjustment sequence on a BMW six cylinder engine. Odds are, however, that you'll be doing this adjustment as part of a maintenance procedure anyway. So we rolled up our sleeves and did a maintenance service on the car, noting any points of interest and highlighting them.

Our afternoon with this 1987 BMW 535i was time well spent. Our local dealer charges about \$200 to do this, which includes turning off the maintenance reminder light. I don't know about you, but \$200 is \$200 where I come from.

You see, we occasionally get a card or letter from someone suggesting that they see no use in familiarizing themselves with a car that's only a year old. Those cars, we're told, are still going to the dealerships. Besides, what does a year-old car need anyway?

We discovered two very important things:

1) The car did need some attention, and without that attention the owner could have been in for some unpleasant surprises.

2) The car wasn't hard to work on. Aside from the special reset tool for the maintenance reminder light,

we did the entire maintenance with common hand tools. You don't have to be born on the banks of the Rhine to work on this car.

The valve adjustment is a very important part of this maintenance. The adjusters are easy to reach, and the procedure is straightforward. A BMW mechanic suggested, however, that getting them really right took some practice—that it was a matter of feel.

To be sure things were done properly, I adjusted all the valves. The underhood sticker called for 0.30 mm cold, intake and exhaust. Then I started back through the valves again, double checking myself by running the feeler gauge through the gaps. Sure enough, there were a couple that really could have been closer.

It was only after the second try that I was satisfied that the job was done correctly. It was just a matter of getting a feel for things.

I also felt that the easiest way to turn the engine over was to put the trans in fifth gear and simply roll the car (key off, please and make sure you have room). It's a tight fit between the crank bolt and radiator. Even if you do have a wrench that'll squeeze in there, it

would be awkward to turn it.

Firing order on the BMW six-cylinder is 1-5-3-6-2-4, so complementary cylinders are 1 and 6, 5 and 2, 3 and 4. Just remember that when the valves on any given cylinder lap (that is, when one valve on a cylinder is closing, the other valve on that cylinder just starts to open), the complementary cylinder is at TDC.

If the valves on cylinder number 1 are lapping, then the complementary cylinder, or number 6, is at TDC, and its valves are ready to be adjusted.

The same thing goes for cylinders number 2 and 5, and cylinders number 3 and 4. This can save you the hassle of chasing the distributor rotor around, trying to keep track of the cylinder you're supposed to be adjusting.

Checking and correcting the valve clearances on

this car made a big improvement in the smoothness and general performance of the engine. The owner suggested that the car ran a lot better, period.

Since the BMW's computer calculates mileage as well as the type of driving to turn on the maintenance reminder lights, the maintenance schedules suggested in the owner's service booklet are not based on mileage alone. They are fairly comprehensive, however, and provide guidelines for setting up a thorough maintenance schedule. Please refer to them.

Some suggested intervals like fuel filter replacement may be shortened to compensate for repeated fuel contamination or generally poor quality fuel in your area.

We offer this as an introduction to the car and encourage you to offer this service to potential customers who own these cars.

—By Ralph Birnbaum



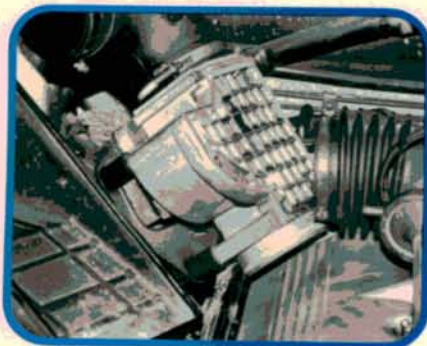
1

The BMW doesn't just count miles to turn on those maintenance reminder lights. Its computer also keeps track of tach and temperature signals to know how the car was driven. It adds that info to miles driven and turns on a row of lights as the maintenance approaches. The yellow light means it's time.



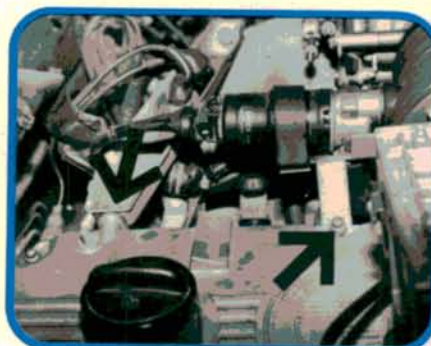
2

These photos will give you some idea about the relative location of components under the hood. Coolant recovery jug, power steering reservoir, fuse box, and oil filter are all on the left side of the engine and easy to reach.



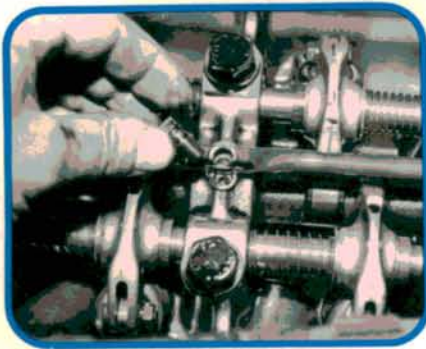
3

Adjust the valves cold. The valve cover is trapped below the air flow meter and plumbing so you'll have to get the meter out of the way first. Be careful not to damage the wiring to the air flow meter. It's probably a good idea to unplug the air flow meter and lay it aside for safekeeping.

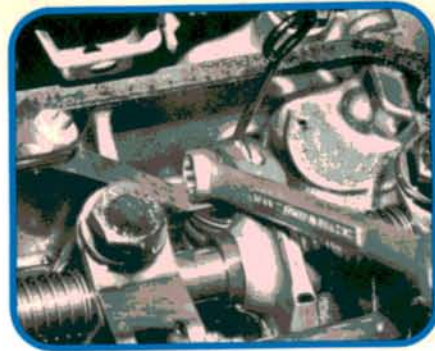


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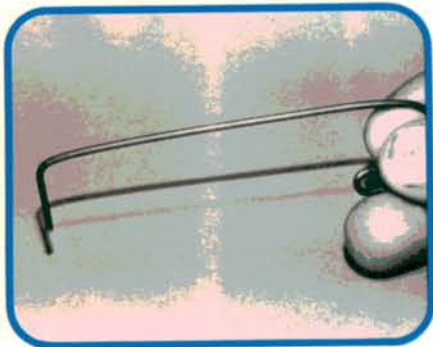
Things are a little more crowded on the right side of the engine, but hardly impossible. In addition to removing the air flow meter, you have to unbolt the support brackets between the valve cover and intake plenum, as well as the support bracket nut for the idle air stabilizer.



Good grief. Look what we found lying down next to the valves. This banjo bolt connects an oiling passage to the oiling tree for camshaft lubrication. I don't know about you, but loose parts inside an engine make me nervous. The customer was also relieved to have it reinstalled.



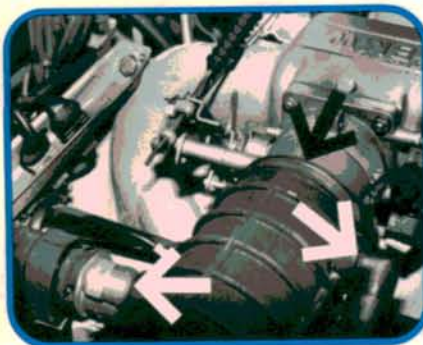
Each rocker arm has a small adjustment eccentric that's held tight by a pinch bolt. Loosen the pinch bolt. Turn the eccentric by using a small bent steel rod inserted in the drilling on the eccentric. Be sure to tighten, but not overtighten, the pinch bolt after correcting the clearance.



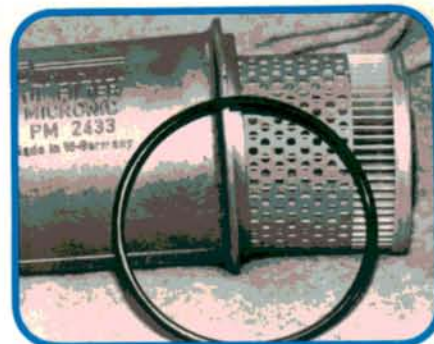
It was easy to make a small tool to rotate the eccentrics for the valve adjustment. Place a small bend in a piece of hardened steel that fits into the hole on the eccentrics. This is admittedly low tech, but it got the job done and the price was right.



This bundle of ground connections is located on a stud in the cylinder head just below the idle stabilizer. A year of road salt and vibration had left the connection corroded and half-tight. This was a good time to clean and retighten things—before the problems started.



After replacing the valve cover, take time to make sure the reassembled air intake connections are clean and tight, including the fit of the crankcase breather hose and idle stabilizer. Also, inspect the throttle, throttle linkages, and all cables for free movement.



The BMW uses a replaceable oil filter cartridge. To change it, loosen the long bolt that runs through the filter flange into the housing. Remove and clean the housing, and blow it dry. Replace the element, the rubber sealing ring, and the sealing ring at the bolt head. Don't overtighten the bolt.

BMW 535i SERVICE HIGHLIGHTS

SERVICE INFORMATION 535i/S

Firing order 1-5-3-6-2-4

Spark Plug Type—WR 9 LS (OE)

Spark Plug Gap—0.027 in + 0.004 (0.7 mm + 0.1)

CAPACITIES

Crankcase—5.3 U.S. quarts (add 0.8 U.S. quart for filter change) API SE approved-SF grades recommended. (Refer to owners' manual viscosity chart for your climate conditions.)

Manual Transmission—1.7 U.S. quarts (good quality non-hypoid gearbox oil—SAE 80 spec MIL-L-2105 or API-GL 4.)

Automatic Transmission (Oil change only) 3.2 U.S. quarts Dexron®

Rear axle—2.0 U.S. quarts hypoid SAE 90 (GL-5)

BELT SIZES

V-Belts

BMW 535i/S/528e/M5

Alternator and Water Pump

BMW 535i/S/M5 12.5 X 1055

BMW 528e 9.5 X 965

Power Steering Pump

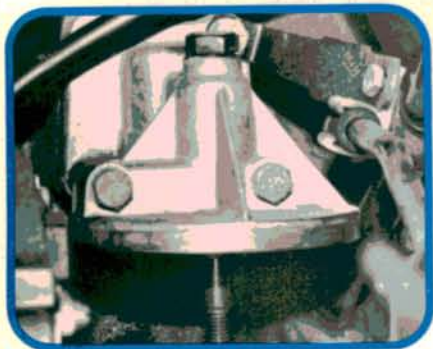
BMW 535i/S/M5 9.5 X 888

BMW 528e 9.5 X 825

Air Conditioning Compressor

BMW 528e/535i/S 12.5 X 810

BMW M5 12.5 X 800

**11**

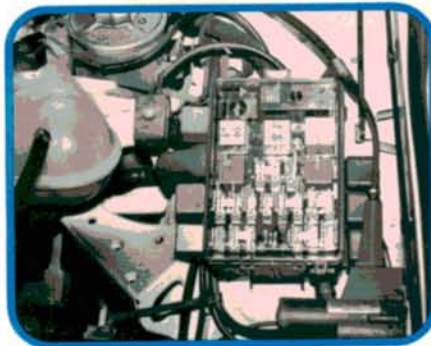
Here's a better view of the oil flange and the through bolt that holds the cartridge housing in place. Unless you're neater than I am, you'll have some oil to wash away from the side of the block after removing the housing. Make sure to run the engine and check for leaks before you send it.

**12**

These before-and-after-cleaning photos show the corrosion buildup between steel lug bolts and alloy mags. If the customer had had a flat, he'd have never removed these by hand. Always wire brush, anti-seize, and hand torque wheel bolts (110 Nm/81 ft/lb). Note your efforts to the customer.

**13**

Take a moment to check the main ground bundle for corrosion or looseness. This is the same connection we noted in our first electrical service article last year. A clean, tight connection here is essential or you'll end up with any number of electrical nightmares.

**14**

Pop the cover on the main fuse panel. Check for signs of corrosion or looseness where the fuses mount in their spring clip holders. We can't stress strongly enough, how much grief you're saving your customer—and neither should you when you talk to him.

**15**

If you kick this rubber mount across the floor as I did and wonder what it is, it's the support for the air filter housing. It sits on a stud, but may stick to the air cleaner housing just long enough to fall on the floor when you're not looking. Maybe a spot of glue on the stud will help.

**16**

Unfortunately, resetting the maintenance reminder lights is not as simple as pushing a button. You'll need a reset tool like this one from Assenmacher Tool. It resets lights on BMW 6 cylinder cars from 1983 on, and 1984 and newer 4 cylinder models. An adapter for the tool is available for the '88 models.