

Old School BMW Maintenance Schedule v02.11

Please do not post on the Internet. Two reasons:

- 1) This document is copyrighted.
- 2) It gets updated periodically.

Substantive updates from v12.10:

- 1) Due to conflicting information from BMW and in the parts system, E53 X5 transfer case type, 2003 model year-on, must be identified visually before ordering or changing the operating fluid.



BMW CCA Pocono Mountain Chapter President Rich Warren blasts through rural Northeastern Pennsylvania's fall foliage in his 1999 M3 convertible with Dinan Stage 2 suspension.

Introduction

This document discusses maintenance for long-term ownership. Long-term means more than 100,000 miles or without a warranty.

If you are going to trade, sell, or return your car during the BMW New Vehicle Limited Warranty or even much before 100,000 miles there is no reason to perform extra maintenance other than helping out subsequent owners of the car. If you get rid of the car during the warranty or even much before 100,000 miles, good maintenance is not likely to affect your ownership experience with one exception, the manual gearbox – it will shift better if you change its oil at the reasonable intervals discussed here.

And before deciding how long you plan to keep the new BMW, bear in mind that unless you're doing it yourself, BMW maintenance is expensive and BMW repairs are

extremely expensive. BMWs in general, regardless of year or maintenance, are extremely expensive cars to own, *properly* maintain, and repair. Also, there is a reason why new BMWs depreciate faster today than ever before – they have reliability problems, and only the dealer and very few independent shops can fix them. Personally I believe the days of the 300,000-mile daily driver BMW are drawing to a close – they’re just going to be too expensive to repair. But I could be wrong, and my readers want an Old School Maintenance Schedule regardless so here it is!

I’m aware many of you really want just the maintenance schedule for your particular BMW, and not necessarily a treatise that covers all BMWs. I apologize for the girth of information here, but I simply don’t have time to create a document for every BMW ever made. Use of an Excel spreadsheet to convey this information would increase your follow-up questions exponentially, because you would want to know why. I don’t blame you, but knowing why is going to require some reading on your part. The spreadsheet does not lend itself to the volume of information that has to be conveyed here. Many of you have tried to convince me otherwise and ended up agreeing with me.

In an era that sometimes sees 50 incoming tech questions per day I have an overall strategy of providing a level of information calculated to foreclose follow-up questions. Most of the revisions to this document are part of that strategy, rather than substantive changes in maintenance procedures or lubricant recommendations.

History of BMW-recommended Maintenance

The BMW Maintenance Program (formerly known as Scheduled Maintenance) means that BMW will perform scheduled maintenance free of charge during the BMW New Vehicle Limited Warranty period.

In 1992 BMW made 3/36 scheduled maintenance coverage available for purchase. In 1993 BMW began covering scheduled maintenance for V12 models (750iL and 850i). Three-year/36,000 mile scheduled maintenance became standard across the BMW line-make in 1996. Three/36 “scheduled” was upgraded to 3/36 “full maintenance” on all BMWs in 2000. The four-year/50,000 mile BMW Maintenance Program (the term “full” was dropped) was introduced across the BMW line-make in 2004.

Prior to the advent of Scheduled Maintenance, approximate BMW maintenance recommendations on the E30 3 Series were: automatic transmission fluid (ATF) and filter changes every 15,000 miles, manual gearbox and differential oil changes every 30,000 miles, annual brake fluid changes, and coolant changes every two years. Spark plugs, air filter, and fuel filters were typically replaced every 30,000 miles on most BMWs (this is a tune-up) except M cars up to 1995, which got new spark plugs and a valve adjustment every 15,000. Later advances in computer engine management and spark plug technology legitimately allow 60,000-mile spark plug life if not more.

Prior to Scheduled Maintenance, you couldn't change engine oil often enough according to the dealer. And when the car was in the shop it would often be due for this service or that inspection, all at the owner's expense.

The operative word here is "scheduled." Once BMW began paying for scheduled maintenance, lo and behold the schedule was continually revised to eliminate maintenance items. Today, according to BMW, the cars hardly need any maintenance at all. The 1,200-mile break-in service was done away with except for M cars. Engine oil suddenly lasts 15,000 miles (dealers are supposed to use BMW synthetic oil). Manual gearbox and differential oil? Now BMW says they never need to be changed on the non-M cars; it's "lifetime fill." Brake fluid and coolant service intervals were doubled with no change in the original BMW brake fluid and anti-freeze dealers are supposed to use. As of 2005, coolant is now "lifetime fill" as well – with no change in the actual coolant.

So, is today's BMW Maintenance Program all about marketing and cost reduction – BMW's costs? Draw your own conclusions. There is no doubt that many buyers view BMWs as high maintenance cars and that can be an impediment to sales – but it is also entirely correct. Nothing can address that more effectively than Free Scheduled Maintenance. The operative word in the name is "scheduled." In my opinion, extended service intervals and "lifetime fill" came very close on the heels of Free Scheduled Maintenance.

Environmental issues also played a part in the demise of BMW maintenance. Governments around the world are pressuring car manufacturers to reduce liquid waste resulting from maintenance as well as the escape of gasoline vapor and crankcase vapors.

I believe the point of diminishing returns on environmental regulation has long past, and today the government is mainly looking for ways to enable corporate polluters to keep on polluting while placing the onus of remedial environmental regulation upon people who don't have lobbyists, i.e., motorists like you and me. And there is an increasing sense of a cottage industry specializing in environmental alchemy – turning carbon into gold.

Regardless of what side you're on, it's important to bear in mind that the lubricants in your car will be drained someday. Doing so during regular maintenance has no additional affect on the environment as long as they are recycled or used properly, such as to heat a building in a waste oil burner.



BMW CCA member Ed Ullom's 1982 320is. Turbocharged and tastefully modified for the street, Ullom has driven it in countless races, autocrosses, and other driving events. It's got over 170,000 miles on the original drivetrain, and it runs perfectly. The secret? Routine maintenance, the Old School Way!

This is an alternative to the BMW Maintenance Program. It is not, “Mike Miller’s maintenance schedule.” It is actually BMW’s maintenance schedule, more or less, which was used prior to Free Scheduled Maintenance. It also represents my opinion, based upon my experience and that of my readers, tech advisors, and professional BMW technicians both dealer and independent. I have prepared it because of the large number of readers asking for this information. The fact that my opinions may differ from those of others does not mean anyone – including me -- is necessarily right or wrong. You will get a different answer from every person you ask about routine vehicle maintenance, and the only way to verify an ideal oil change interval is through consistent use of oil analysis.

Once again, it has to be recognized that the benefits of good drivetrain lubricant maintenance do not accrue until the car matures. So, if you're maintaining the car religiously only to get rid of it during the warranty or much before 100,000 miles then you're a good guy for helping out subsequent owners. That's nice, but to realize the fruits of your diligence, you need to keep the car for the long haul.

Break-in Service for New Cars: 1,200 miles

Before they started paying for maintenance, BMW performed a break-in service at 1,200 miles on new cars, which included changing the engine oil and filter, manual gearbox oil, and differential oil. With the advent of Free Scheduled Maintenance, BMW stopped performing break-in services except on M cars.

As of the E90-family M3, BMW has started to dumb-down the break-in service for M cars, as well. Readers report some dealers refuse to change gearbox and/or differential oil at 1,200 miles even though both are specified in the owner’s manual.

I have seen that the engine and driveline oils in new modern BMWs are literally full of metal at 1,200 miles – as has always been the case with any new car. For this reason, I recommend a 1,200-mile break-in service. Note: In case of automatic transmission, no ATF and filter change is necessary at 1,200 miles.

As for break-in technique, my best advice is to break-in the engine over an extended road trip comprised of as much mountainous terrain as possible, for as long as possible up to 1,200 miles, and keep the rpms within the limits BMW recommends on the windshield sticker included all new BMWs.

I also recommend a 1,200-mile break-in service for rebuilt engines and other rebuilt drivetrain components.



The author's freshly-rebuilt M10-powered 1977 320i.

Oil and Filter Intervals: Variable every 3,000 to 10,000 miles

BMW recommends their Castrol 5W-30 synthetic motor oil in all BMWs except contemporary M cars, for which they recommend their Castrol TWS Motorsport 10W-60 synthetic motor oil. BMW recommends Castrol SLX Professional OE 5W-30 for the Efficient Dynamics diesel engines (but not the E28 524td). The factory oil change interval is controlled electronically, but is presently about every 15,000 miles. If you are running BMW's oil, I recommend oil and filter change intervals of 7,500 miles at the most, depending upon the results of oil analysis.

If you have an M car with the S54, S62, or S85 engine, be advised that Red Line Oil has a 10W-60 product available now for these M engines.

Note that the commercially available Castrol products sold at Wal-Mart bear no resemblance (other than brand name) to the Castrol products sold at the BMW dealer and through BMW parts houses.

In Europe, BMW endorses Elf (confusingly called Total in the U.S. market) 5W-30 and 5W-40, and LubroMoly 5W-30, 0W-40, and 5W-40 for the non-M cars. These are PAO synthetics like Red Line, and I'd have no problem running them 7,500 to 10,000 miles. Of course, they are not available at Wal-Mart; like Red Line, you have to order them for UPS delivery.

Because you guys generally want to know, In my cars I use Red Line synthetic oil (www.redlineoil.com) in 5W-30, 10W-40, 15W-50, 10W-60, or 20W-50, depending on

factory recommendation, ambient temperatures, and severity of service (track use, sustained high rpm use), with a drain interval – 7,500 to 10,000 miles depending on engine and severity of service. Under racing or track conditions I'd use a short interval; same for carbureted engines which tend to get some fuel into the oil. I would run the same intervals with very high end “designer synthetics” such as Agip, Amsoil, Lubrication Engineers Monolec Ultra, Elf (Total), Lubro Moly, or Motul.

All other commercially available synthetic oils, 5,000-7,500-mile drain intervals.

BMW's High Performance Synthetic 5W-30 and their Motorsport 10W-60 can go up to 7,500 miles.

Old fashioned petroleum oil, same viscosities, 3,000-to-5,000 mile drain intervals (I prefer Kendall, which easily goes 5,000 miles without a problem in most engines).

Please note that the above represent guesstimates based on experience. The only way to validate any oil drain interval with any oil in any engine is by oil analysis. I use www.blackstone-labs.com.

Because many of you ask: My 2005 Dinan S2-325Ci received a break-in service at 1,200 miles using Red Line 10W-40 (along with Red Line MTL in the manual gearbox and Red Line 75W-90 in the differential), followed by oil and filter changes using the same product at 10,000, 20,000, 30,000, 40,000, 50,000, and 60,000 miles. At the 40,000-mile oil change, I had Blackstone Labs perform an oil analysis. The results were excellent, showing no wear, viscosity good and well within the 40W range, TBN of 1.4 indicating some active additive left. The 10,000-mile interval is perfect for Red Line 10W-40 in this engine, in this car, with me as the driver. Oil analysis is really the only way to validate *your* oil choice and *your* drain interval.

The following information is courtesy of Motorwatch.com:

“Red Line is Group V (polyol ester) based (POE or esters). Amsoil and some Mobil-1 are Group IV (poly-alpha olefin) based (PAO or synthesized hydrocarbons SHC). Castrol Syntec and all the others calling themselves synthetic are Group III (hydrocracked slack wax). The petroleum motor oils are all mineral oil based and make up Group II. We really should group Red Line by itself, and put the others in separate categories (according to the groups) because their performance is so different.”

Old school turbocharger warm-up and cool-down procedures

Many of my readers who own BMWs powered by the wonderfully powerful but notoriously problematic N54 twin-turbo engine ask how they can help the turbochargers last longer. They are concerned, and rightly so, with the cost of post-warranty ownership of the modern BMW and want to know how to approach it.

Well, you can approach it by not owning the car that long. But if you want to keep it, the best way to prolong turbocharger bearing life is to do two things:

First, use a very high quality full synthetic oil in a viscosity that can withstand tremendous heat, and change it at an interval appropriate to the product, verified by oil analysis. If I had an N54 that I wanted to keep for the long haul it would get Red Line 10W-40.

Second, practice traditional turbocharger warm up and cool down procedures. This means allowing the engine oil to reach operating temperature before spooling up the turbos (keep the rpms low), and allowing the turbos to cool down before shutting off the engine by driving gently at low rpm for several miles before reaching the destination.

Now, anticipating your follow up question, "Why doesn't BMW recommend this?" Here is why:

Back in the olden days, every car manufacturer with a turbocharged engine (BMW, Ford, GM, Mercedes Benz, Porsche, SAAB, Renault, etc.) detailed this warm up and cool down procedure. But those cars were bought and driven exclusively by driving enthusiasts who knew their way around cars. Car buyers have changed and today's oil is better, but engine oil lubricated turbocharger bearings have not changed. The nature of turbocharged cars has changed as well. Back then, only sports cars, executive limousines like BMW's E23 745i, and diesel-powered sedans had turbochargers. People who owned those cars could be counted upon to have a certain degree of automotive knowledge.

Nowadays, the family sedan has two turbos to go along with the automatic transmission and the baby seat. If BMW told today's turbo car buyers they had to follow warm up and cool down procedures first off few would understand it, secondly few would do it, and third-wise a lot of them just wouldn't buy the car.

All that being said, every turbocharged engine shares one thing in common, which is that if it is in service long enough it will eventually need a new turbocharger -- two in the case of the N54.

Spark Plugs: Variable every 10,000 to 60,000 miles



Replacing spark plugs in an M54 engine.

There is no reason to deviate from the factory-recommended Bosch or NGK spark plug specification, changed at 30,000-to-60,000-mile intervals, depending upon the car and severity of service. Basically, any BMW engine produced after 1993 (with multiple-coil ignition systems) including the S54, S62, S65, and S85 can easily run 60,000 miles on a set of spark plugs – but not necessarily 100,000 as BMW often says.

The exception is the modern gasoline-powered turbocharged engines, for which BMW recommends spark plug replacement every 45,000 miles. This is covered, the first time, under the BMW Maintenance program. However, the onboard computer *will not*, at this writing, indicate the need for spark plug replacement. You have to go back to the dealer and ask for it. Note that some dealership technicians do not know about this requirement. Some technicians believe that some of the many problems with this engine are being misdiagnosed, and that it actually needs new spark plugs. Original BMW spark plugs are highly recommended.

BMW has part numbers and applications for “100,000-mile spark plugs.” These are good too, and may be capable of 100,000 miles of service in the appropriate applications (not the N54 engine) assuming no other problems, which might cause them to foul during that time. However, in engines with spark plugs recessed into the middle of the cylinder head, oil can leak into the spark plug recesses past the valve cover gaskets. This is a hidden leak if the plugs are left in service for an extended period of time, because no one looks in there until they’re changing the plugs or chasing a problem. An oil leak in the spark

plug recesses, left to fester, can cause ignition coil failure and even ECU failure. So, even if you want to leave the plugs in service, you should at least check the spark plug recesses for signs of oil leakage at least every 60,000 miles. And at the point you're in there, you might as well replace the plugs. And then there is the matter of getting them out after 100,000 miles when no anti-seize compound was used at factory installation – there have been cases of stripped threads in the cylinder head. These are the issues with 100,000-mile plugs.

Moreover, while you may not have any problems running spark plugs for 100,000 miles in some BMWs, this does not mean the plugs will not be worn, or that that wear is not affecting engine performance. In other words, for optimum engine performance, most BMWs want spark plugs about every 60,000 miles.

Note that older M cars with the S14 and S38 engines want plugs about every 15,000 miles.

Stay away from platinum plugs in BMWs for which they are not the factory-recommended spark plugs. These don't last as long as the regular Bosch copper or silver plugs and NGK plus, and have been known to fail in other ways. The regular old Bosch Platinum single electrode plug is, however, a very good choice for cars *OTHER THAN* BMWs.

Old, pre-motronic engines need spark plugs replaced every 10,000-12,000 miles. If they have ignition points, replace them at the same time.

Original BMW Bosch Spark Plugs vs. Aftermarket Bosch Spark Plugs

Like just about everything else on the modern BMWs, Bosch spark plug choice is complicated and confusing. The short answer is if you order the spark plugs from BMW (sometimes there is a choice between Bosch or NGK), then you are good to go and there is no confusion. But they are expensive.

Savvy enthusiasts have found that Bosch has a part number for commercially-available spark plugs that cross-references to the BMW original equipment Bosch spark plugs, often at a fraction of the price. The problem is, the commercially-available (aftermarket) Bosch spark plugs are not always the same as the original BMW Bosch plugs even though they cross-reference and they do work.

Dealership technicians report problems with the commercially-available Bosch Platinum +4 spark plugs in BMW engines. I have never seen this personally, but physical inspection does reveal differences in insulator design between the original BMW Bosch spark plugs for the modern cars and the commercially-available Bosch Platinum +4.

We're talking about the newer multiple-coil BMWs above. Now, when we're talking about older BMWs with a single ignition coil, where the original BMW specified spark plugs are Bosch copper or silver plugs, everything is completely different. On those cars,

there is absolutely no difference between the original BMW spark plugs and commercially-available Bosch copper or silver plugs.

I realize this requires a certain intimate knowledge of Bosch spark plugs, and I don't know what to tell you about that except to ask if you don't know, or just buy them from the dealer.

Distributor or Ignition Cap and Rotor: Variable 30,000 to 90,000 miles

Pre-motronic point-fired ignitions should get a new cap and rotor every 30,000 miles. Motronic cars, every 90,000. Once BMW went to the multiple-coil ignition systems these parts were eliminated.

Oxygen Sensors: Variable 60,000 to 150,000 miles

The BMW-recommended oxygen sensor replacement interval varies by model and model year from every 60,000 miles on the older one-wire sensors to 150,000 miles on the new cars. The interval for your car is set forth in the service booklet, in the glovebox.

I have no problem with the BMW-recommended oxygen sensor replacement intervals assuming the sensor(s) doesn't fail before the interval -- the newer the car the more likely premature failure becomes.

Instead you can leave oxygen sensors in service until they fail and set the check engine/service engine soon light. The beauty of replacing them preventively at the recommended intervals is that you can most likely avoid check engine/service engine soon lights at least for oxygen sensor failure.

From 1996-on, BMWs have primary and secondary oxygen sensors – one before and one after the catalytic converter. The primary oxygen sensor(s) (pre-cat) send information to the DME that controls engine operation. The secondary oxygen sensor(s) (post-cat) merely monitor catalytic converter function and have no effect on engine operation.

Oil Filter: Change with the engine oil, not between, not after, but with...

Original BMW filters are recommended for price and quality, or MANN, Mahle, Bosch, or Knecht filters.

Special note to military members stationed in Naples, Italy: In addition to their other charms, the local dealer there will tell you they replace the oil filter every other oil change. Near as I can tell, this is due to Naples' garbage disposal debacle – as a result of poor land use planning and no growth management, they have no where left to put trash and little infrastructure to collect it. Poor planning and administration on the part of the government of Naples does not constitute mandatory engine problems on your part. Make the the dealer change the filter at every oil change. If necessary, take the old filter with you back to the base and dispose of it there.

Air Filter: Variable every 15,000 to 30,000 miles

Stock paper element, check every 15,000 miles, tap out dirt, replace if necessary, standard interval 30,000 miles, use Original BMW filters or aftermarket filters such as Knecht, MANN, Mahle, or Bosch

K&N oiled cotton gauze filters, clean every 15,000 to 30,000 miles depending on condition, use only K&N approved cleaner and oil, and follow K&N cleaning procedures. But really, I would very much prefer to simply replace an oiled cotton gauze filter rather than clean it.

Interior Air Filter: Variable every 15,000 to 30,000 miles

On cars so equipped, the interior air filter service life really depends on where you drive and how often you operate the climate control system, especially if you do not use the recirculate mode. If the system is on all the time, figure on replacing the interior air filter every 15,000 miles. Otherwise, every 30,000 miles will probably be sufficient. For some models BMW has two types of interior air filters: A regular, cheaper one, and a more costly activated carbon one. Obviously, the more expensive one works better and I'd recommend it for urban dwellers and people who suffer from pollen allergies.

Fuel Filter: Variable every 30,000 to 60,000 miles

Replace every 30,000 miles on models produced up to 1992 (small fuel filter, including the 1992 E30 convertible) and every 60,000 miles on models produced from 1992-on, (large fuel filter), also replace the fuel filter any time the fuel pump is replaced. Use original BMW filters or Bosch, Knecht, MANN, or Mahle. Note that newer Bimmers have an integral fuel pressure regulator on the fuel filter, raising the price to \$60-\$80. And you'll need to order new hose clamps, too. Note the installed position of the old fuel filter on the modern cars – it is possible to install the new one with the hoses oriented incorrectly and then the car won't run.

According to factory technicians, BMW is now teaching new technicians in school that the new cars have "lifetime fuel filters." The instructors say this means that when the car arrives at the shop on a roll back because the fuel filter is clogged and the engine won't start, the fuel filter's lifetime is over, and that is the time to replace the fuel filter. Ridiculous? I certainly think so. Why wait for a breakdown to perform this simple maintenance?

In reality, the service life of a fuel filter depends entirely on the cleanliness of the fuel it filters. It's possible for a fuel filter to last indefinitely if it always filters clean gasoline. It's also possible for a fuel filter to last a block and a half if you fill up with sufficiently dirty gasoline. Usually gasoline cleanliness is in between those two extremes. There's no way to really tell how much dirt is trapped in a fuel filter without cutting it open or back-

blowing the fuel into a receptacle. This is why the fuel filter is best replaced as a routine maintenance item.

Note that the fuel filters on the modern from the mid-2000s on are now in the fuel tank, a one-piece assembly with the pressure regulator and hoses, and the cost is nearly \$200 at this writing. This is where we've come from the \$1 inline filter for the old 2002! Is it worth the savings to wait for a breakdown in order to replace the fuel filter? That's up to you.

Battery Maintenance: Use a Battery Tender for period of inactivity longer than a few days.

With the news that the E60/E90 generation of BMWs has to go back to the dealer at battery replacement time in order to "register" the battery with the electronic control units in the car, I thought it was important to add the Battery Tender FAQ to the Old School Maintenance Schedule.

Contemporary BMWs since the 1990s draw battery power all the time, even with the engine shut down. Multiple electronic control units are always drawing on the battery. This means when the car is stored for periods of "about" one or two weeks or more with no battery tender attached to the charging system, the battery will discharge and fail to start the car. Sometimes it can be jump started or charged, but usually the battery will be rock dead.

We need to use a Deltran Battery Tender Plus (www.batterytender.com) for storing these cars longer than a week. The Battery Tender Plus is not a trickle charger, which will overcharge the battery. It is a voltage-sensing battery maintainer, which sense when voltage drops below 12-volts and then activates at a 1.25-amp charge until battery voltage reaches 13.5-volts. Then it reverts to monitoring mode. Stay away from trickle chargers – they are not for use when the car is stored unattended.



It is not necessary to access the remote-mounted battery to use the Battery Tender Plus. The Battery Tender Plus connects to the positive (+) power tap under the hood, which is located under a black plastic cover marked (+). The ground connector of the Battery Tender Plus connects to any underhood ground including the grounding lug which is located near the positive power tap. The unit also comes with a hardware cable, which can be connected to the power tap and grounding lug and routed to the grill area or under the bumper for ease of use.

See photo below. E46 3 Series shown.



Deltran also has a waterproof version Battery Tender for cars parked outdoors.

If you don't want to open the hood, BMW also has a version of the Battery Tender Plus, available for order at dealership parts departments, that does not involve opening the hood (BMW part number 82 11 0 026 663). It is called the BMW Advanced Battery Advanced Battery Charging System, and it plugs into the cigarette lighter.

BMW also has a part number for a solar-powered battery tender that sits on the dashboard and plugs into the cigarette lighter, but this unit costs a great deal more than the others (BMW part number 82 30 0 143 365).

Note that starting in 2006 BMW began using gel cell-type batteries as original equipment and replacement parts. According to Deltran, BMW found that the Deltran Battery Tender Plus overcharges BMW's new style gel cell batteries, reducing battery life.

Deltran's testing did not reveal overcharging, but currently Deltran does not recommend the Battery Tender Plus or any of their chargers for use with BMW's new style gel cell batteries, installed in 2006-on new BMW cars and sold over the parts counter starting in

2006. Instead, Deltran recommends using only the BMW Advanced Battery Charging System. Note there are those who suspect the Deltran Battery Tender Plus and the BMW Advanced Battery Charging System are one and the same. I do not know if this is true, but it would not surprise me if it is.

Neither BMW nor Deltran wants to talk about the Deltran Battery Tender and the newfangled gel cell batteries in technical terms to explain their positions. To my thinking, in a sea of noise you can sometimes pinpoint the location of quiet thing by the absence of noise. Speaking hypothetically, if I had to bet, I would bet that the same factory in China builds both the Deltran Battery Tender and the "BMW Advanced Battery Charging System" and these devices are identical except for the faceplate and packaging. I'm not anal enough to buy the BMW unit and disassemble it on the work bench side-by-side with a Battery Tender -- I really don't care. But I can say that if I had a gel cell battery I wouldn't hesitate to use a Battery Tender on it.

Finally, beginning at various times in recent years BMW began building cars with cigarette lighter plugs that are not hot with the key off. This means the cigarette lighter plug version of the BMW Advanced Battery Charging System will not work on the newer cars. How newer? I don't know the cutoff. You have to check and see if your cigarette lighter plug works with the car shut down. If it does, you can use the cigarette lighter plug version of the BMW Advanced Battery Charging System. If it doesn't, then you need to use the alligator clip version and connect it to the positive power tap and grounding lug under the hood.

Valve Adjustment: Variable every 15,000 to 30,000 miles

Perform every 15,000 to 30,000 miles on the M10, M20, and M30 engines depending on how hard they are used; every 30,000 miles on the S54 engine; other modern BMW engines do not require valve adjustments because they use hydraulic lifters.

Timing Belt, Tensioner Pulley, and Front Cam Seal

Replace every five years or 50,000 miles on vehicles so equipped, 40,000 miles or four years on the E30 325iX (1988-1991), Water pump replacement also recommended as preventative attendant service, but not required,

Note that only two BMW engines in the U.S. market use timing belts: The M20 six-cylinder installed in various (but not all) BMWs from 1986-1992, and the M21 six-cylinder diesel engine in the E28 524td. All the rest have timing chains, which do not require preventive replacement.

Engine Drive Belts

Replace O.E. or O.E.M. BMW poly-ribbed serpentine belts every 60,000 miles. Replace O.E.M. Continental or Pirelli or original BMW V-belts every 30,000 miles. Replace "auto store" quality V-belts every 15,000 miles.

In the case of the S38 engine in the E24 M6, E28 M5, and E34 M5, for some reason these engines eat belts. I'd recommend replacing them every 15,000 miles, which is also the spark plug replacement interval for this engine.

Engine Coolant Service: Every two years

The factory coolant change interval used to be every two years. Starting in the late 1990s, BMW lengthened the coolant change interval to every three years, then every four years. As of 2004, BMW says coolant is "lifetime fill." There was no discernable change in original BMW anti-freeze during this transition, other than who pays for the service during the warranty period.

I recommend changing engine coolant at two-year intervals, using only factory BMW anti-freeze mixed 50-50 with distilled water (reason – BMW anti-freeze is phosphate free, phosphates cause aluminum oxidation, which blocks cylinder head coolant passages and causes head gasket failure, others may claim to be "aluminum safe" or "phosphate free" – make your choice, but I've used BMW anti-freeze exclusively in many cars and have *never* had an aluminum oxidation or head gasket problem)

Coolant and Fuel Hoses: Every 150,000 miles

Replace coolant and fuel hoses every 150,000 miles. I highly recommend use of O.E. or O.E.M. hoses only, along with the original hose clamps or Wurth/Zebra replacements. The original BMW hose clamps are far superior to anything you'll find in a U.S. auto store.

Cooling System Preventive Maintenance M50, M52, M54, S50, S52 (US-spec) Six Cylinder Engines



OE/OEM water pump (l), compared with EMP Stewart High Performance Water Pump. The pump on the left has a metallic Impeller – that doesn't make any difference in longevity. Both the plastic and metallic impeller OE/OEM pumps fail prematurely, just in different ways.

First, it doesn't matter if you have the plastic or metallic impeller; both fail premature only in different ways. The original design of the OE pump had a plastic impeller, which would disintegrate and cause overheating and sometimes engine damage. The later OE design had a metallic impeller, and the bearing would seize, causing overheating and sometimes engine damage or destruction. Now we're back to plastic impellers.

I recommend the following preventive replacement schedule for the cooling system on this car:

Every 60,000 miles: water pump, thermostat, plastic thermostat housing if so equipped (or replace it once with the aftermarket aluminum thermostat housing)

Every 90,000 miles: radiator, expansion tank, fan and fan clutch if so equipped (for cars you're going to keep forever, consider using the all-aluminum radiator and expansion tank from www.zionsvilleautosport.com and you won't have to do it again at 180,000)

Every 150,000 miles: all coolant and fuel hoses

Every two years: drain and fill coolant, including draining the engine block by opening the drain plug on the right side under the exhaust manifolds, replace using fresh original BMW anti-freeze mixed 50-50 with distilled water

As for the EMP Stewart Heavy Duty Water Pump, they have proven themselves worth it for people who are going to keep their car for the long haul and also track junkies. They are marketed as a "high performance" water pump and much is made of their supposedly improved efficiency. However, the performance of the original water pumps was never a problem. Their durability is the problem.

It actually pains me to recommend replacing the entire cooling system preventively before 100,000 miles, as above. Yet experience has shown this maintenance is cheap compared to the alternative. It is unbelievable how many engines are destroyed in these cars by premature cooling system failures.

The N-series engines do not seem to suffer the sort of regular and systematic cooling system failures that led me to recommend replacing the entire system on the above engines as a preventive measure. If your BMW is a 2006 or newer and *not* an E46, then you've got an N-series engine.

Note: The M42 and M44 BMW four-cylinder engines do not have the consistent premature failure rate of cooling system parts that would lead me to recommend preventive cooling system replacement. This doesn't mean they last forever. I would say if you've got 150,000 miles on the water pump, thermostat, radiator and expansion tank then you might want to think about preventive replacement if you're going to keep the car.

Power Steering Fluid: Every 30,000 miles

This is a very neglected operating fluid and changing it at a reasonable interval can easily make the power steering pump, rack or box last a great deal longer.

I just open a line down by the pump, and, with the engine off, work the steering wheel back and forth to evacuate the old power steering fluid from the system.

Almost all older BMWs use automatic transmission fluid in the power steering system, except for a select few that require special Pentosin hydraulic oil. Nothing will balls up the works faster than using one when you should be using the other. Check the sticker on the reservoir, check the owner's manual, and if you are still confused, take the car to a pro or e-mail me. The rule of thumb is, if the car has a self-leveling rear suspension, then it uses Pentosin. Problem is, people tend to remove the self-leveling rear suspension because it's too expensive to repair or they want high performance shocks and springs. This can trap future owners into putting ATF into the power steering system when they should have used Pentosin.

All 2006-on BMWs except the 2006 E46 require Pentosin CHF 11.S special hydraulic oil in the power steering system. These cars all have a sticker on the top of the power steering fluid reservoir cap setting forth whether they require Pentosin CHF 11.S.

Do not screw this up, or you will be in a world of hurt. Pentosin CHF 11.S is not compatible with ATF or any other lubricant or hydraulic oil!

If your car uses ATF in the power steering system, Red Line D4 ATF is fine if you want to use a premium product. I don't recommend Red Line Synthetic Power Steering Fluid for use in BMWs.

Manual Gearbox Oil: Every 30,000 miles

Only synthetic oil should be used in BMW manual gearboxes, drain interval 30,000 miles

BMW-specified factory synthetic gearbox oil is MTF-LT-2 available at the dealer, and the spec often changes. It is a good product; I just wouldn't leave it in service forever.

Red Line products are also highly recommended (www.redlineoil.com).

All the BMW gearbox rebuilders I know use Red Line MTL exclusively, regardless of model year or gearbox. The general consensus is MTL is the better lubricant.

However, Red Line D4ATF will require less shifter babying during cold operation. I use Red Line MTL in manual gearboxes except where I can't trust the driver to shift properly when the gearbox is cold, in which case I use Red Line D4 ATF.

Red Line MT-90 as slightly higher viscosity than their MTL product, which can be useful in reducing gearbox rattle, which can occur in neutral with the clutch pedal out in vehicles that do not have dual mass flywheels. The rattle does not affect gearbox function. The Getrag 280 gearbox in the E28 and E34 M5 and E24 M6 favors Red Line MT-90.

BMW sequential manual gearboxes (SMG) use the same lubricant as the “real” manual – MTF-LT-2 or Red Line MTL. At this writing BMW is now up to MTF-LT-3 – I don’t know what the difference is from MTF-LT-2.

M Double Clutch Gearbox: every 30,000 miles if you can get the oil

BMW is trying “lifetime fill” with the optional M Double Clutch Gearbox on the E90-family M3, and this gearbox requires a special lubricant: BMW DCTF-1 Pentosin. It is only available at the dealer. As per always, I recommend changing it at 1,200 miles and every 30,000.

Automatic Transmission Fluid (ATF) and Filter: Variable every 15,000 to 60,000 miles



Used automatic transmissions (lower shelf) waiting for new homes at Euro Depot in New Hampshire. They won’t be waiting long, thanks to “lifetime fill” automatic transmission fluid!

Here is the short answer: Automatic transmissions are the bane of my existence, and the darn thing will be the bane of yours, too, at replacement time.

For older automatics using Red Line or other synthetic ATF, drain interval 30,000 miles. Old fashioned petroleum ATF, drain interval 15,000 miles

The short answer for the modern BMWs with “lifetime fill” ATF: Change it and the filter at least every 60,000 miles using ONLY the factory BMW proprietary ATF.

Here is the long answer:

At various production dates in the mid-1990s, which vary according to model, BMW switched to their so-called “lifetime fill” ATF in automatic transmissions, as well as manual gearbox lubricant and differential oil. The reason for this, as far as anyone can tell, is marketing and not engineering – the idea being to foster the notion of the low-maintenance BMW.

There was no explanation of what “lifetime” meant, i.e., lifetime of the car, the component, or for that matter the driver. If it was the component, then obviously anything could be “lifetime fill”. The factory’s initial position is that these lubricants never need to be changed. Then, some time later, it came out that “lifetime” means 100,000 miles. Many dealerships are now recommending manual gearbox and differential oil changes be done at customer expense every 60,000 miles. Every independent BMW technician I know recommends a 30,000-60,000-mile interval, and many recommend Red Line synthetic oils, but not for automatics with “lifetime fill” – you need the factory proprietary ATF for “lifetime fill” automatics.

Older automatic transmission models, which do not have “lifetime fill” should have ATF and filter services every 15,000 miles if using petroleum ATF; every 30,000 miles with synthetic.

However, the modern automatic transmissions are different. No one knows exactly what BMW’s proprietary ATF is, so no one knows if there are viable alternatives. We do know that BMW dealerships charge about \$500 for an ATF and filter service, due to the price of the ATF. And that’s assuming you can get them to do the job, which is not often the case.

Bavarian Autosport (www.bavauto.com), Pelican Parts (www.pelicanparts.com), and perhaps others are now importing the proprietary “lifetime fill” ATF at reasonable prices, which they sell along with filter kits, for independent BMW shops and do-it-yourselfers.

It is risky to drain a previously un-maintained automatic transmission with high mileage, even though if it were my car I would probably chance it. Still, I have seen it happen too many times, where a well-meaning owner or technician performs an ATF and filter service on a neglected but well-shifting automatic, and then all of the sudden it starts slipping. I can’t explain it, but my feeling is the fresh ATF flushes a bit of sludge from a place where it was doing no harm to a place where it does do harm. Overfilling, underfilling, and cleanliness are also issues in ATF and filter servicing, but these should not be problematic for a professional BMW technician, dealer or independent.

BMW has backed off its lifetime fill mantra for automatic transmissions, currently recommending an ATF and filter change every 100,000 miles for the current BMW models.

My inclination is to tell people to change “lifetime” ATF and filter every 60,000 miles. However I have seen BMW automatic transmissions that were maintained break anyway. In that event, say it happens at 90,000 miles, you would like to have the money you spent on the ATF and filter change to put toward your new automatic transmission. And if I told you to spend it on maintenance you’re probably not going to be very happy with me. On the other hand, I have seen maintained automatics last 200,000 miles. I have also seen un-maintained automatics last 200,000 miles, although both are very rare. There's just no predicting with these transmissions. When you choose to buy an automatic transmission, you also buy into the vagaries of the darn things, which is one reason technicians hate them. Whether to maintain a modern BMW automatic is up to you.

At automatic transmission replacement time, we are confronted with the reality that the local transmission shop cannot rebuild BMW automatic transmissions, even those built by GM (BMW’s GM transmissions bear no resemblance to GM transmission in domestic cars). There are some domestic specialists who concentrate in BMW automatic transmission rebuilding, and you’ll see their ads in *Roundel* and *Bimmer*. However, I have no current experience with domestic rebuilders. My experience in the past is...well, the owner wound up buying a BMW factory rebuilt automatic transmission every time, and this is the course I recommend to readers – “back to the dealer.”

Some of you, having seen the light, may be interested in converting to a manual gearbox. This is always possible, but for most of us it won’t be less expensive than a replacement automatic transmission. This is because of all the other parts and additional labor required. And the newer the car the harder and more expensive the job will be. It is certainly a doable swap, but there’s no cost savings even if you do the work yourself. The exception would be if you have access to a manual gearbox donor car for little or no expense.

All-Wheel-Drive Transfer Cases: Every 30,000 miles

E30 325iX: ATF Dexron® III formulation (Red Line D4 ATF is a great choice)

E46/16 325xi/xiT, 330xi: MTF-LT-1 83 22 9 408 942 (MTF-LT-2 = 5 Liters) or Red Line MTL

E53 X5 All models with NV125 transfer case: ATF Dexron III (Red Line D4 ATF)

E53 X5 All models with X-Drive transfer case: TF0870 83 22 0 397 244 (1 Liter)

Note: Due to conflicting information from BMW and in the parts system, E53 X5 transfer case type, 2003 model year-on, must be identified visually before ordering or changing the operating fluid. The question is whether you have the NV-125 (non-xDrive) transfer

case or the newfangled ATC-500 (xDrive) transfer case. BMW told me the cutoff production date was up to 02/2005 for the NV-125. Realoem says 10/2003. As is often the case where a production split exists, the only way to know for sure is to visually inspect the transfer case before ordering the operating fluid and certainly before changing it. In turn, this requires the ability to distinguish between the two transfer case types. Diagrams are on realoem.com. If you are unsure, take the vehicle to a professional BMW technician.

E60 All models: TF0870 83 22 0 397 244 (1 Liter)

E61 All models: TF0870 83 22 0 397 244 (1 Liter)

E70 All models: TF0870 83 22 0 397 244 (1 Liter)

E83 X3 All models with X-Drive transfer case: TF0870 83 22 0 397 244 (1 Liter)

E90, E91 and E92 All models: TF0870 83 22 0 397 244 (1 Liter)

Note: There is no aftermarket substitute for TF0870. Before opening the container, shake the container to evenly mix the additives with the oil.

The X-Drive transfer case must be reset electronically at the dealership after the oil is changed. You can change the transfer case oil yourself or have it done wherever you want, but the vehicle does have to go back to the dealer to have the transfer case reset. This “resetting” procedure is only possible on the BMW service computer.

Specifically the “reset” uses the actuator inside the transfer case to gauge the thickness of the remaining clutch material. The transfer case then relearns the end stops of the clutch pack to compensate for wear. The electric motor inside the X-Drive transfer case then knows how much it has to apply the clutch pack in order to transfer power when necessary.

Ordinarily under BMW’s condition-based service the X-Drive transfer case oil wear sensor will set a code (but no light) indicating the “need” for a transfer case oil change. This has been known to happen as early as 50,000 or as late as over 60,000. I don’t trust the sensor – it’s just a quart of oil. But you do have to pay for the reset, because as of now it is “dealer only.”

Differential Oil: Every 30,000 miles

Once again, BMW’s specified synthetic differential oil is all good...just not forever. Note BMW has different products for open and limited slip differentials.

For open non-limited slip differentials, BMW recommends its Castrol SAF XO product.

I use and also recommend Red Line 75W-90 synthetic gear oil, drain interval 30,000 miles in all BMW differentials except as noted below.

Here is where it gets very confusing. I will try to make this as clear as possible:

The E46 M3, E90/91 M3, E60 M5, and E61/62 M6 must use Castrol SAF-XJ, BMW part number 82 22 2 282 583, or Red Line 75W-140 (not 75W-140NS).

The 75W-140 viscosity is required by the Variable M Differential Lock in the above-referenced cars.

The 75W-140 is not required for other BMW limited slip differentials, but you may use it if you want.

Once BMW came out with the Variable M Differential Lock, they discontinued the old factory 75W-90 limited slip oil. There is tremendous confusion out there today, with many people thinking that all BMW limited slip differentials require 75W-140 oil. This is wrong; only the Variable M Differential Lock requires 75W-140.

See, BMW has a long history of mandating that Special Lubricant X must be used or else (insert parade of horrors here). But a few years later, Special Lubricant X is no longer available, having been replaced by Special Lubricant Y for use in the new cars. Then, Special Lubricant Y is magically approved for use in the older cars that supposedly would have self-immolated if they got anything but Special Lubricant X. Whenever they do this, which is pretty often, it throws the Internet folks into a dither!

Red Line 75W-90 vs. 75W-90NS

The difference between Red Line 75W-90 Synthetic Gear Oil and Red Line 75W-90NS Synthetic Gear Oil is that the former has friction additives for limited slip differentials whereas the latter does not. However, both are the same price, and there is no problem using the 75W-90 Synthetic Gear Oil with friction additives in an open, non-limited-slip, differential – the open diff doesn't mind the friction additives at all.

For my purposes out in my home shop, this means I only have to stock one differential gear oil rather than two (three if you count the 75W-140).

For my purposes in answering BMW tech questions, this means I recommend 75W-90, because if I discuss the differences between 75W-90 and 75W-90NS once, I'll have to do it every day, and there remains the fact that limited slip differential owners will then have a 50-50 chance of getting it wrong.

So, if your BMW has an open, non-limited-slip, differential, there is no problem using the 75W-90NS if you want. If you don't know what a limited slip differential is, then you probably haven't read this far, but use 75W-90.

Note that BMW did away with the differential drain plug as of the current non-M cars, which I find incredible, but it is what it is. We can still drain the differential through the fill hole, but this requires a suction device such as an oil extractor and a quarter-inch plastic tubing reach the bottom of the differential. Most oil extractors come with three-eighths-inch plastic tubing, which is too big. You need a reducer and quarter-inch tubing. And change the oil as hot as possible – you'll get more metal out of it the sooner you drain it after driving the car.

Diffs getting smaller, weaker

Another note on BMW differentials: Since the E30 era, BMW differentials, with the exception of the M variable lock differential, have become progressively smaller. The pinion gear and its roller bearing are huge in the E30, smaller in the E36, and smaller still in the E46. The differential oil capacity has also become less and less with each generation of 3 Series cars since the E30.

Now, with the E90 3 Series, we have a very small pinion gear, no drain plug, and an oil capacity under 0.5 U.S. quarts. Moreover, and most incredibly, BMW did away with the strong tapered roller bearing in favor of old fashioned ball bearings. Worse, they are mounted in plastic bearing cages.

E90 family cars are simply too new for differential longevity predictions, but it's not looking good. BMW differential rebuilder Brett Anderson thinks maintaining the diff with oil changes is still the way to bet, but he is suspicious of plastic bearing cage failure, which of course is not lubrication-related. The bright side? E90 family rebuilt differentials from BMW (open only) are \$1,350; E30 limited slip differentials cost about \$2,500.

Brake Fluid: Once a year



BMW Master Technician John Franchetti hooks up a pressure bleeder during a brake fluid change on a supercharged E46 330Ci convertible.

I recommend once a year brake fluid changes for optimal maintenance, and also prior to each driving school or track event. BMW progressively extended the interval to two years and now three years with no change in the brake fluid, just in who pays for the service – the company or us – during the warranty period. BMW used to recommend a one-year interval back when we paid for it.

Recommend ATE SL, Pentosin Super, or original BMW brake fluid for normal street use, ATE Type 200 or Pentosin Racing Brake Fluid for track work or very high performance use. Note that ATE Super Blue is the exact same product as ATE Type 200, except with blue dye. Personally, I can't stand the blue dye because it turns everything blue – the reservoir, my Vacula brake bleeder, my hands, etc. Blue brake fluid helps race teams identify the source of leaks in race cars, and that is its only benefit as far as I'm concerned.

Original BMW, ATE SL.6, or Pentosin LV is recommended for BMWs that call for low-viscosity brake fluid, such as the xDrive models.

Maintenance Records

It is important to keep records of vehicle maintenance, not only for your own reference but also for that of your mechanic and future owners of the vehicle. Keep the records in the car, where you or a mechanic will look if there is a problem. The factory service booklet, contained in the glovebox vehicle document portfolio, is the logical place to record maintenance. If you're the type of person who has to see everything on a computer screen, you can always keep a separate file on your hard drive – but that alone will not help your technician when he's trying figure out what has already been done and when. For that information he's going to look in the glovebox.

Always make sure your BMW technician has access to your maintenance records. This can help him diagnose problems as well as advise him on what maintenance is due.

Storing the BMW (or any vehicle)

Question number one when considering storing a BMW is, are you able to store the car indoors? If you have to store the car outdoors for an extended period of time that is necessarily going to involve a fair amount of deterioration. And the longer it sits, the more it will deteriorate. We can help you preserve it to the best extent possible, but if you want to keep the car nice you need to find dry, rodent-free indoor storage.

This precludes barns. Only animals thrive in barns; vehicles deteriorate rapidly in barns.

Either way, I recommend starting with a good detailing inside and out. Use a good wax, rubber care, and leather and vinyl treatments.

I prefer to cover stored cars if they are indoors, in a dry location. Outside, it's a toss up. A good cover can protect the car, but you have to tie it down thoroughly to keep the cover on the car for a year. If it starts flapping around in the wind, it can damage the paint. And the expensive cover will be history by the time you get back.

If the car is stored outdoors uncovered, you should cover as many interior surfaces as possible to protect them from UV rays. You can use old blankets and get a sunshade for the front windshield from BMW.

Whether stored inside or out, close the HVAC system vents by shutting down the system, stuff stainless steel wool into the tailpipes and air intake, and put some mothballs under the hood. This is about all you can do to protect the car from rodents.

Use the recommended amount of Sta-Bil (read the bottle) fuel treatment at the gas station before filling up the tank and driving to the storage location.

Use of a Battery Tender Plus (www.batterytender.com) or the equivalent BMW Advanced Battery Charging System is required, or your battery will be history long before you return from a trip or military deployment. A modern BMW will discharge its battery in a couple of weeks, rock dead. This is due to the number of electronic control units that are powered up all the time even when the car is in sleep mode.

If you store the car outdoors, Battery Tender makes a waterproof version if you have shore power handy. If not, BMW makes a solar-powered battery charger that sits on the dashboard or between a sunscreen (advisable for outdoor storage) and the windshield. Very handy for military base use but quite expensive -- you can just replace the battery for less, but then the car will be without power during storage, and that can spell future electronic problems.

If you have no outdoor power source, you really need to get the BMW solar powered battery charger UNLESS the car is going to be stored for a matter of several years, in which case you really have no choice but to simply remove the battery.

I prefer to keep power to the control units, though. Modern BMWs don't like being without their little electron friends for very long. Store a modern BMW without power for a year, and chances are good you'll have electronic problems when the car awakens.

Finally, military personnel need to bear in mind that if you store the car outdoors, in a parking lot paved with blacktop, sitting on four jack stands, bear in mind that blacktop is going to get hot and soft once summer arrives. Get some 3/4-inch pressure-treated plywood and cut it into squares large enough to place between the blacktop pavement and the jack stands. Otherwise, the jack stands are liable to sink into the hot black top this summer and create a nasty welcome-home surprise.

Upon return, change the engine oil and the brake fluid, and if the coolant is more than two years old, change that, too. Do not forget to adjust tire pressure and remove the stainless steel wool and moth balls.

Also, if the engine has hydraulic lifters they are going to bleed down during storage, so when you finally restart the engine it is going to have a ticking noise and a misfire, possibly setting a check engine light. Don't worry, both will go away.

Actual questions from Tech Talk assembled as a short FAQ in a no-doubt futile attempt to stave off follow-up questions:

1) Question: “My BMW is a garage queen. It will be ten years before I hit 30,000 miles! How does this affect maintenance?”

Answer: It doesn't affect maintenance; it affects storage and that's another article. E-mail me and I'll send it to you.

Only coolant, brake fluid, and to some extent engine oil are time-related maintenance items. Your gear oil can be in service for 20 years and it makes no difference because there is no combustion taking place inside a manual gearbox or differential. Same for the automatic transmission fluid. These operating fluids wear on mileage, not time.

Even with respect to coolant, I really think heat cycles have a major effect on the chemical integrity of coolant, so that garage queens may not necessarily benefit from two-year coolant changes. The problem is, unless it is discolored or has stuff floating around in it, there is really no way to know for sure what condition the coolant is in without chemical analysis, which costs more than the original BMW anti-freeze you would need to just change it.

2) Question: “I want to maintain my BMW for the long haul, past the warranty, and past 100,000 miles, but the dealer says NO! I'm not very good at asserting myself. What to do?”

Answer: First and foremost, BMW will only pay for “scheduled maintenance” during the warranty period. Any maintenance you want performed over and above BMW's scant specifications is a customer-pay job – YOU pay, not BMW. That's the old fashioned way!

Secondly, we have to recognize that just as dealership quality varies, there are dealers out there who refuse to maintain cars any other way but the factory way, which, today, means virtually no maintenance. And there are other dealers who will maintain cars to customer specifications without backtalk.

This is YOUR car and it will be your repair bills and your money once the warranty is expired. You can maintain the car whatever way you want, and anyone who tells you differently shouldn't work for you anymore. My best advice is if you get backtalk at one

dealer, call another one. And don't hesitate to use independent BMW service professionals.

To find an independent BMW shop, visit www.bimrs.org and www.bimmershops.com.

3) Question (this one usually comes from guys wearing tweed sport coats with leather elbow patches who smoke, or at least own, a corn cob pipe):

“I used to maintain my old 2002 right here at home. In fact, I still drive the '02 when my new 335i needs another high pressure fuel pump! (Wouldn't start down the VFW last night. Don't know why I put up with it. Damn fast, though! I'm thinking about twin turbos for my riding lawn mower. Would that impair durability?) The dealer makes me park the old '02 out back because, you know, it's two different colors (three if you count rust as a color) and it doesn't have any doors. Anyways, can I do all this expensive maintenance stuff myself on the new car?”

Answer: It depends on your skill level and tool/equipment collection, but probably yes. Routine maintenance will probably be the final bastion of the BMW do-it-yourselfer. Engine, manual gearbox, transfer case, and differential oil changes remain they same as they ever were. On the latest BMWs (the ones without differential drain plugs) is some finesse required – we have to draw the oil out through the fill hole using a hand pump of some sort. Brake fluid changes and coolant changes remain pretty much the same as well, although coolant changes can be quite challenging in practice if not in theory. However, I recommend professional BMW service for automatic transmissions.

4) Question: “My BMW is a race car! Even if it still has license plates, I do 10 [or whatever] high performance driving events per year, and we all know that really means my BMW is a race car! Do you recommend different maintenance for race cars?”

Answer: We may call these events driving schools or autocrosses, but to the car the service demands are the same as racing. As any racing team mechanic will tell you, you cannot perform too much preventive maintenance on a race car. There are plenty of guys out there who just change every operating fluid after every track event, and I cannot say they are overdoing it especially with modern BMWs, which are heavy and high-powered.

Obviously that can be pretty expensive if you're paying a professional BMW technician to maintain the race car. If you're doing the work yourself it's not so bad cost-wise.

5) Question (and one of my personal favorites): “I live so far north that I can stand on my back porch and shoot squirrels in Canada. Heck, I may even live in Canada! I'm not really sure which country I live in, but there does seem to be a lot of inordinately friendly people walking around. In spite of all that, or maybe because of it, I am one of those crazy people who drive a BMW M car in arctic temperatures! It has four studded snow tires that I'm thinking about just replacing with tank tracks, and it sits outside on permafrost covered with ice most of the time

like Admiral Byrd's old shack in Antarctica while my wife's brand new Subaru gets the heated garage because, you know, it has to be in perfect condition for her to trade-in next year. I know I really should have an X3, but I need my 400 hp E39 M5 [or whatever] when I have to go to the general store five miles away in the town of Frozen Rabbit! Should I still run 10W-60 engine oil?"

Answer: First off, this question related to M cars only, where 10W-60 oil is specified. Secondly, put the Subaru outside. It's stupid to leave the aging but incredibly expensive to repair BMW Motorsport special outside to rot while the new car gets the garage.

The answer to the oil question really depends more on how you drive the car. The issue with relatively high viscosity oil in extremely cold temperatures is that it doesn't warm up as quickly as relatively low viscosity oil, nor does the high viscosity oil flow as well as low viscosity oil at extremely cold temperatures. You can address this most effectively by putting the car in your heated garage, or even a non-heated garage.

So, where you have primarily short trips where the engine is really not warming up to operating temperature anyway, you're exacerbating the situation with high viscosity oil in extremely cold temperatures.

The question is, what is the cut-off temperature above which you should use one oil and below which you should use another oil, and that is a difficult question to answer. I think there will be an element of arbitrariness in anyone's answer to this question. Here is mine: 10W-60 in ambient temperatures predominantly over 10 degrees F., and 5W-30 below that.

6) Question: "I have never lived anywhere north of Attapulcus, Georgia, where the average weather is 900 degrees with 900 percent humidity. But now that I've graduated from college I've decided to leave my entire extended family behind to chase money, which, I think, will make me happier. I've taken a job in Boston. Are there any special maintenance requirements for my non-M BMW due to the cold winters? They've got some traffic problems there, I think."

Answer: No. Get four snow tires for the car, and get some wool for you: www.johnsonwoolenmills.com recommended. Don't pack your Gumby collection; you'll be back.



Author's 2005 Dinan S2-325Ci in winter mode.

7) Question: I bought a new diesel-powered BMW. Does this affect your maintenance advice?

Answer: I've never maintained a diesel engine any differently than a gasoline engine except for the obvious lack of ignition parts on the diesel. That includes the last time BMW brought diesels to the U.S., which was the 1986 model year (524td) as well as the occasional VW and Mercedes diesel back when I worked at a shop. I don't see any reason why I'd maintain a diesel differently today, except to remind you that additional maintenance over BMW's scant maintenance schedule really only pays off after the long haul, past the warranty and past 100,000 miles. Ask yourself how long you're going to keep the vehicle.

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