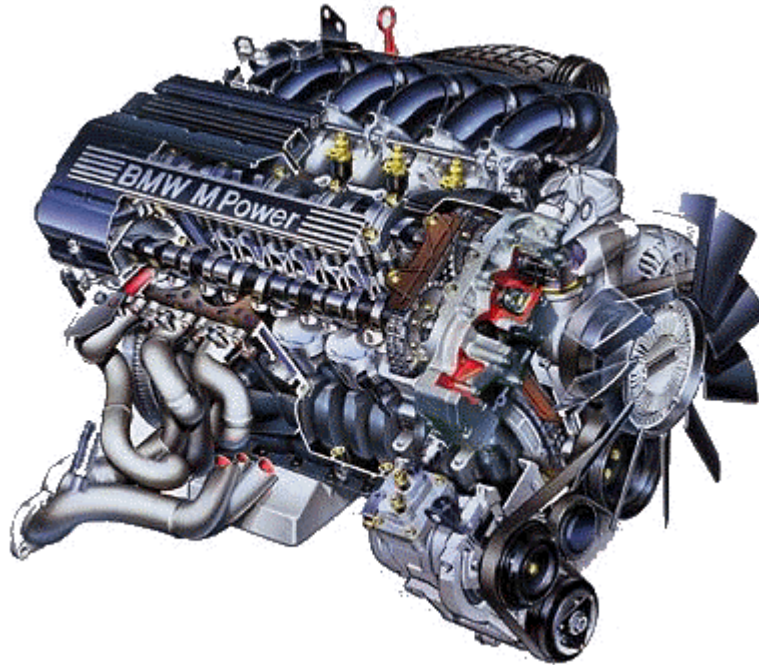




US E36 M3 FAQ

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European Spec. Motor (S50 B32)

Author / Maintainer: Jonathan Zimmitti euospeed@euospeed.org

Visit <http://www.euospeed.org/> for updates. Many thanks to all who have contributed.

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1. BRAKES

Q. How can I eliminate or reduce brake dust?

A. Aside from changing your driving style, you may need to change your brake pad type. The stock Jurid pads have excellent bite, even when cold or wet, but produce excessive dust as a result. Metallic pads (e.g., Porterfield R4S pads) will reduce the amount of dust at the expense of noise and rotor disc wear, however, replacing rotors when replacing pads would be a logical step for the enhanced life metallic pad. Semi-metallic pads (e.g., Rotex and Mintex Redbox pads) provide an excellent compromise of reduced brake dust and increased stopping power. Finally, Kevlar based, non-metallic pads (e.g., EBC Red Stuff pads) are much easier on the rotors and produce very low amounts of dust.

Q. How can I prevent my brakes from squealing?

A. A simple, temporary fix is to use them firmly one time. For example, come to a hard stop from 40 MPH and the squealing should stop for a few days. They usually only squeal from excessive light braking and using the brakes solidly once tends to solve the problem. A more permanent solution is to remove your brake pads, clean them and their surroundings thoroughly with brake cleaner, and apply BMW anti-squeal compound to the backs of the pads.



(image courtesy of Ron Stygar)

BMW Plastilube (anti-squeal compound)

P/N **81.22.9.407.103**

Q. What are Euro floating rotors?

A. If you need new front rotors or are looking for a rotor less prone to warpage, then you should consider the European floating rotor discs. BMW used these rotors on the European specification M3. The rotor is not only lighter than the US spec. rotor, but it significantly reduces rotor warpage due to the floating hub design leading to improved heat dissipation.



BMW M3 Floating Rotor Discs (European spec., front only)

P/N **34.11.2.227.737** (left side)

P/N **34.11.2.227.738** (right side)

Q. What can I use to paint my calipers?

A. Most high temperature engine enamels will work, however most will not survive long with the combination of heat cycling and brake dust. Folia Tec sells a kit specifically designed for painting calipers and their paint seems to be more durable than the spray paint variety. Another option is to powder coat the calipers. This is a bit more expensive, but if done right, it will outlast all other options. Eastwood Company <http://www.eastwoodco.com/> sells a home powder coating system (HotCoat) and it appears to be rather simple to use with an air compressor.

2. DRIVETRAIN

Q. What is ASC and how do I know when it is off?

A. Automatic Stability Control plus Traction (ASC[+T]; not available on 1995 M3s) reduces engine power and independently applies the brakes to reduce wheel spin. ASC is turned off when the letters 'ASC' are lit up on your instrument cluster. You should always disable ASC when mounting your spare tire.

Q. What is a clutch stop?

A. A clutch stop is a device which is calibrated to limit the throw of the clutch pedal to the precise point where the clutch engages. This, in turn, decreases the amount of time spent pushing the clutch pedal and takes the guesswork out of determining the clutch engagement point. Homemade clutch stops are easily fabricated using a few common pieces of hardware. Ron Stygar has detailed instructions on how to create a clutch stop or you can purchase his own unique design http://www.unofficialbmw.com/all/drivetrain/all_clutch_stop_adjustment.html.

Q. Why does my clutch pedal squeak and why is it sloppy and loose?

A. The creaking noise when depressing the clutch pedal is caused by a spring. Generally, a quick shot of lubricant will suppress the noise for a bit until it dries out again. The lateral movement (loose feeling) is caused by worn bushings. Ron Stygar http://www.unofficialbmw.com/e36/drivetrain/e36_remove_clutch_pedal_slop.html and UUC Motorwerks <http://www.uucmotorwerks.com/> have each developed a unique product to significantly reduce or eliminate the clutch pedal play and noise.

Q. Who are the manufacturers of the M3 transmissions?

A. There are two manufacturers and both are German. Getrag produces the European six speed manual gearbox and Zahnradfabrik Friedrichshafen (commonly abbreviated ZF) produces the US five speed manual and automatic transmissions.

3. ENGINE

Q. How do I calculate horsepower at the crankshaft when given horsepower figures at the wheels?

A. When running a car on a dyno (dynamometer), one measures horsepower and torque at the wheels. To precisely calculate your actual horsepower at the crankshaft (also known as brake horsepower (bHP)) is close to impossible due to the unknown drivetrain losses (bearings, gears, couplings, shafts all account for loss of HP). No two vehicles are alike, i.e., some have stronger engines with high drivetrain losses and some have weaker engines with low drivetrain losses and so on. Through testing and experience, a safe approximation is to assume between 15-18% drivetrain losses. To calculate, simply use the following equation (assuming 17% drivetrain loss): $bHP = (wheel\ HP) / 0.83$.

Q. Why should I be concerned if my water pump has a plastic impeller?

A. Model year 1995, most, if not all, 1996, and even some very early 1997 M3s were equipped with the plastic impeller water pump. The unofficial build date cut off for the plastic impeller is 10/96 (check driver side door jamb to verify build date). If you have a 1996 or early build 1997 M3 and are unsure if the improved metal impeller water pump has been installed, consult your dealership as the water pump needs to be removed to determine the impeller type (there is no other way of verifying). Plastic impeller water pumps have commonly failed without warning at around 60K miles and up. The result is sometimes a badly overheated engine that can cost thousands of dollars to repair if your warranty has expired. Note that in 2001, BMW has reintroduced an improved durability plastic impeller water pump for all vehicles.



BMW Water Pump (metal impeller; remanufactured)
P/N **11.51.7.504.040**

Water Pumps: Plastic Impeller (left) and Metal Impeller (right)
(image courtesy of Ben Liaw)

Q. How long should I wait for the engine to warm up?

A. Because an oil temperature gauge is not provided with the vehicle, it is impossible to determine the precise engine temperature. However, it is possible to approximate a safe operating temperature. As a general rule, engine oil is most efficient at 180° F and up. Using an ambient temperature of 32° F, start by letting the vehicle idle for no more than one minute. Begin driving, using as little throttle as possible (no more than half throttle), while keeping the engine speed below 3000 RPM. The coolant temperature should slowly creep up and level off at the midpoint. At this point your engine oil should be above 100° F, however it will still be relatively cold so stay below 4000 RPM with no more than ¾ throttle usage. Depending on your driving conditions, an additional five to ten minutes may be required to reach the magic 180° F mark. After that, full throttle and limited high RPM visits are acceptable, but it would be a good idea to wait a few additional minutes to ensure you are at maximum engine operating efficiency.

Q. What is the firing order of the M3 engine?

A. The cylinders fire in the following order: 1 & 5, 3 & 6, 2 & 4.

Q. What OEM spark plugs are used in the M3 engine?

A. Depending on the engine type, the two OEM brands are Bosch and NGK. For the proper spark plug part number, refer to the spark plug application chart at the Unofficial BMW site <http://www.unofficialbmw.com/images/sparkplugchart.jpg>.

Q. What is the oxygen sensor fault code?

A. One of the more common causes of the check engine light is a failing or failed oxygen sensor (also referred to as a lambda probe). The 1995 M3s had only one oxygen sensor (located before the catalytic converter) due to OBD I and the 1996-1999 M3s had four oxygen sensors (two before and two located after the catalytic converter) due to a more stringent OBD II standard. In short, the oxygen sensor measures the air/fuel mixture and transmits the signal to the DME which attempts to achieve the stoichiometric air:fuel ratio of 14.7:1 (or a Lambda of one). Running the vehicle with a failed oxygen sensor is not overly harmful, but efficiency is reduced because the vehicle will be running excessively rich; a default setting of the DME to reduce any probability of damage when no signal is present.

Q. What is the tapping noise near the top of my engine?

A. The tapping noise is often attributed to the hydraulic lifters in a low oil condition. Oil starvation also occurs during prolonged hard turns and is pronounced with an initial low oil state. Detailed oil starvation occurrences and solutions have been outlined below thanks to Edgar Bernard who spoke with Gregg Forde, chief mechanic of PTG (edited).

The US M3 engine will have oil starvation problems on left handed, high G corners at limited duration (roughly 10 seconds). It is a combination of oil starvation and oil foaming. A temporary remedy is to put 1 to 1-1/2 quarts of extra oil in the crankcase during track events. The E36 M3 engine does not experience the same problems as the E30 M3 engine when the oil is over filled. (The E30 M3 engine will blow or leak oil out of the rear engine seal if too much oil is used.) A low cost fix to the problem is to install the M3 Lightweight oil pan/pump kit. The kit has two pickup points in the oil pan and is indeed tricked. PTG has the kit for around \$1600 with the gasket (should be under \$100). The US M3 engine produces approximately four bars of oil pressure in the block and one bar in the head.

Q. What is the grinding noise when I start my M3 in cold weather?

A. The noise is most likely a delayed actuation of the starter gear causing it to remain in mesh and consequently grind with the ring gear for a longer period than normal. This problem is exacerbated in cold weather and is often solved by replacing the starter provided the dealer can confirm the noise. If replacement of the starter is not possible, simply release the key sooner on startup, perhaps after one or two engine revolutions.

Q. What is the ticking noise after I turn off my M3?

A. The ticking noise is due to the rapid cooling of the various metals in your exhaust system and is completely normal.

Q. How can I check my engine's fault codes without a special tool? (1995 M3 only)

A. The procedure only works on 1995 (OBD I only; OBD II vehicles require a special scan tool) M3s and will not work on later models. Instructions on how to retrieve and interpret the fault codes can be found at Bonneville Motor Werks <http://www.bonnevillemotorwerks.com/fault.html>.

4. EXTERIOR

Q. How can I reduce my blind spots?

A. To properly adjust your mirror, you need to place your head against the window (for driver side) or place your head in the center of the vehicle (for passenger side) and you should just be able to see the side of your vehicle. For even better visibility, you can remove your old mirror glass (both sides) and replace them with the BMW M3 European spec. mirror glass. Both mirrors are convex and the wider angle significantly removes blind spots (the only change to the passenger side is the omission of the "objects may appear..." writing).

BMW M3 Side Mirror Glass (European spec.)

P/N **51.16.2.267.191** (driver side)

P/N **51.16.2.267.224** (passenger side)

Q. What type of bulbs do the headlights and fog lights use?

A. The headlights use 55W 9006 bulbs for low beams and 55W 9005 bulbs for high beams. The fog lights use 55W H1 bulbs.

Q. Why do some coupes have different BMW rear wings?

A. BMW produced two rear wing designs with an integrated third brake light. If the option was ordered, M3 coupes were delivered with a high arch rear wing, whereas M3 sedans came with a flatter, squared-off wing design. However, for reasons unknown, if the wing was added later on by the dealer, the wing designed for the sedan was installed on both models. When looking at a coupe now, you should be able to determine whether the wing was installed at the factory or not.

BMW M3 Coupe Rear Wing

P/N **51.71.2.260.317**

BMW M3 Sedan Rear Wing

P/N **51.71.2.260.319**

Q. Why does the lower splash guard keep falling off?

A. The fasteners (bolts and some plastic pins) for the lower splash guard tend to fail or fall out after a relatively short period of time. If your splash guard scrapes the ground, you will most likely need to replace it. Some have removed the splash guard altogether, but make sure all items that were previously attached to the panel are securely fastened by other means. Another alternative is to install an aluminum underpanel made by JT Designs <http://www.jt-designs.com>.

Q. Why is it so difficult to open my doors (inside or outside)?

A. The latches and strikers tend to bind at times making the handles a bit difficult to operate. To alleviate the binding, use grease (as opposed to a silicone lubricant; anti-seize grease tends to last the longest) to lightly coat both the latch mechanism and the striker.

5. SUSPENSION

Q. What are the maximum tire and wheel sizes I can fit on a stock M3 without rubbing?

A. Assuming stock offset of 41 mm, you should not exceed the following sizes: 245/40-17 x 8.5 or 245/35-18 x 8.5 rear (larger sizes in the rear will require rolling the fenders to avoid rubbing) and 235/40-17 x 7.5 or 225/40-18 x 8.0 front (larger sizes in the front will require more negative camber and possibly a spacer to avoid rubbing). Also, 235/40-18 x 8.5 with a 38 mm offset will fit in the front without any additional modifications.

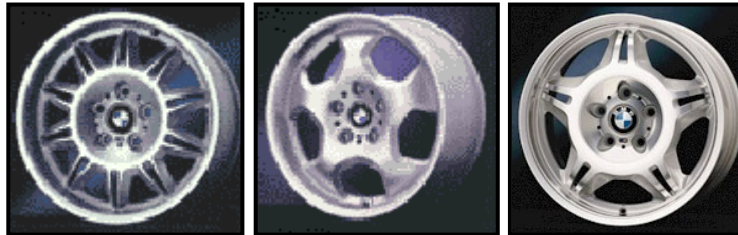
Q. What is the difference between a staggered and non-staggered tire setup?

A. Model year 1995 M3s came from the factory with a non-staggered setup (all four wheels and tires are the same size), whereas 1996-1999 M3s were fitted with a staggered setup (see wheel and tire sizes below). Some believe this was BMW's way of reducing oversteer to help American drivers, but since the change had been implemented worldwide it may not be the case. As you may have guessed, the original non-staggered setup is more balanced and allows the car to rotate or oversteer with less effort. All M3s can run either setup without any problems.

Q. What are the OEM tire and wheel sizes and weights?

A. See table below:

YEAR	OEM TIRE – WHEEL SIZE	OFFSET	WHEEL WEIGHT		
			M Round Spoke	M Contour	M Forged
1995	235/40-17 x 7.5 (all)	41 mm	21.30 lb	22.30 lb	19.50 lb
1996-1999	225/45-17 x 7.5 (front) 245/40-17 x 8.5 (rear)	41 mm	M Round Spoke II	M Contour	M Forged
			21.90 lb	22.30 lb	19.70 lb
			22.90 lb	23.40 lb	20.90 lb



From left to right: M Round Spoke II [also referred to as double spoke] (style 22), M Contour (style 23), and M Forged wheels (style 24)

Q. What are the differences between genuine M Forged wheels and replicas?

A. BMW made two versions of the M Forged wheels, an early (for the 1995 M3 Lightweight) silver painted version with 'MOTORSPORT' text and later (1996+) a polished version with no lettering. The more common 1996+ forged wheels included small pockets for the '///M' logo, something no replica includes. Also, be mindful that the replicas are not forged, making them significantly weaker and heavier than the genuine wheel.

Q. Will 16 inch diameter wheels fit on my M3?

A. Generally, most (if not all) 16 inch wheels will not fit due to brake caliper clearance issues. Ronal and ATP do make 16 x 7.5 inch wheels that should fit (verify with your wheel distributor) and may be a worthy option if you intend to drive in the snow. A recommended minus one sizing for tires is 205/55-16.

Q. What are the recommended stock tire pressures?

A. The information located on the driver side door jamb indicates 33 psi front and 36 psi rear for 1995 M3s and 30 psi front and 35 psi rear for 1996-1999 M3s. However, a few psi higher in both front and rear will help better protect your rims from potholes with the minor downside of increased ride harshness. An increase or decrease in front or rear tire pressures may result in altered vehicle dynamics per Tire Rack's informative table <http://www.tirerack.com/tires/tiretech/racepres.htm>. Also note that your vehicle may respond more like the BFG R1 tire example if it has low profile tires with stiff sidewalls.

Q. What is the recommended torque for the lug bolts?

A. The 17 mm lug bolts require 100 Nm (± 10 Nm) or 73.8 lb ft (± 7.4 lb ft) of torque.

Q. What is the clunking noise coming from the back of my car when going over bumps?

A. The clunk or rattling noise (emanating from either the right or left side, aft of the rear seats) when going over bumps or rough roads is likely caused by a failed shock mount. Replacement of the mount is the only fix, however JT Designs <http://www.jt-designs.com> offers a stronger urethane mount that should last considerably longer. For additional information, be sure to visit Ron Stygar's page at http://www.unofficialbmw.com/e36/suspension/e36_replace_rear_shock_bushings.html.

6. ELECTRONICS

Q. Where can I find the radio code if I don't have it?

A. First check your stereo manual to see if the code has been written in it. If not, contact your local BMW dealer. With your radio serial number (for Harman Kardon units see the volume question below, otherwise, you may need to pull out the radio) and VIN they should be able to look up your radio code.

Q. Why does my Harman Kardon stereo increase and decrease volume automatically and can I adjust it?

A. The Harman Kardon head units are set to dynamically adjust the volume at certain speeds to compensate for engine, road, and wind noise. The amount of automatic volume adjustment can be controlled by modifying the head unit's default settings. To do this, start with a unit that is off, then turn it on and hold the 'm' button (approximately 10 seconds) until the display shows the head unit's serial number. Use the '<' and '>' keys to navigate through the options and look for "GAL 1-6." Now select the radio buttons '1' through '6' for the desired setting ('1' produces a negligible volume shift and '6' produces a dramatic volume shift). Note that this also works for the BMW business radio in most M3s.

Q. What is the whirring noise I hear from the center of the dashboard after I turn off my car?

A. The noise is normal and it is the operation of the interior temperature sensor fan.

Q. What are the pin and wire assignments for the connectors on the OEM stereo amplifier?

A. Below are the pin numbers, wire colors, and their functions for the two connectors on the ten speaker stereo amplifier (Harman Kardon system included). They are valid for all E36 vehicles made from 9/95 to the present.

Connector X605

Pin #1	power from fuse #9 (red/white)
Pin #2	antenna amplifier input (white)
Pin #3	ground
Pin #5	(+) to right rear low range speaker (blue/violet)
Pin #6	(-) to right rear low range speaker (blue/gray)
Pin #7	(+) to left front low range speaker (blue/white)
Pin #8	(-) to left front low range speaker (blue/brown)
Pin #9	(+) to right front low range speaker (blue/red)
Pin #10	(-) to right front low range speaker (blue/brown)
Pin #11	(+) to left rear low range speaker (yellow/gray)
Pin #12	(-) to left rear low range speaker (yellow/black)

Connector X606

Pin #1	right rear (-) output from radio (brown/orange)
Pin #2	right rear (+) output from radio (blue/black)
Pin #3	left rear (+) output from radio (yellow/black)
Pin #4	left rear (-) output from radio (brown/orange)
Pin #8	(+) to right front mid range speaker (blue/white)
Pin #9	(-) to right front mid range speaker (blue/brown)
Pin #10	(+) to left rear high range speaker (yellow/violet)
Pin #11	(-) to left rear high range speaker (yellow/gray)
Pin #12	(+) to right rear high range speaker (blue/black)
Pin #13	(-) to right rear high range speaker (blue/gray)
Pin #14	right front (-) output from radio (brown/orange)
Pin #15	right front (+) output from radio (blue/red)
Pin #16	left front (+) output from radio (yellow/red)
Pin #17	left front (-) output from radio (brown/orange)
Pin #21	(+) to left front high range speaker (yellow/green)
Pin #22	(-) to left front high range speaker (yellow/brown)
Pin #23	(+) to right front high range speaker (blue/gray)
Pin #24	(-) to right front high range speaker (blue/brown)
Pin #25	(+) to Left front mid range speaker (yellow/white)
Pin #26	(-) to left front mid range speaker (yellow/brown)

Q. What is the instrument cluster test mode and how is it performed?

A. The test mode allows BMW technicians to analyze specific vehicle data. Such data includes a digital readout of engine speed, road speed, and other diagnostic information. For detailed instructions visit the BMW M Power website at <http://www.bmw-m.net/techproc/test.htm>.

Q. What hidden functions are available for the on-board computer (OBC)?

A. The OBC has quite a few hidden parameters that are both informative and configurable. However, do not change any of the parameters unless you are absolutely sure of what you are doing (write them down). Detailed information can be found at the Unofficial BMW website at http://www.unofficialbmw.com/all/electrical/all_obc_secret_codes.html.

7. MAINTENANCE

Q. When is it time for Inspection I and II services?

A. Your service interval lights will indicate the proper service time, however, if your vehicle is not driven regularly, you should service it sooner. It will help to consult your local dealership and thoroughly read your manual, but in general, Inspection I should be performed sometime before 2 years / 20K miles and Inspection II before 4 years / 40K miles.

Q. How much does Inspection II cost and what does it include?

A. Anywhere from \$300 to \$800 depending on the dealer and what they actually do. Your local dealer should have a list of every procedure performed and it is up to you to verify whether it abides by BMW's recommended procedures outlined in your owners manual. An online list of those procedures can also be found at BimmerZone <http://www.bimmerzone.com/inspection.htm>.

Q. How much oil does the space between the dipstick high and low marks represent?

A. 1.06 quarts

Q. What was the factory fill motor oil?

A. The factory fill was either BMW Mineral Based Oil (15W-40) (most M3s) or BMW Longlife Synthetic Oil (5W-40) (some 1999 M3s).

Q. What motor oil type and viscosity is recommended?

A. BMW released a service interval bulletin (SIB #110400) to modify recommended oil for the 'M' series engines. Also note that the synthetic oil listed below is manufactured by Castrol and is likely a custom blend exclusively for BMW. Mobil 1 and Valvoline synthetic oils are also approved by BMW. The recommended oils have been changed to:

BMW High Performance Mineral Based Oil (SAE 15W-40)
P/N **07.51.0.017.868**

BMW High Performance Synthetic Oil (SAE 5W-30)
P/N **07.51.0.017.866**

According to BMW, for reliable engine performance in all temperature ranges mineral based engine oil viscosity must be matched to the temperature range at which the vehicle will be operated. Check the temperature viscosity chart in the Owners Manual or Operating Fluids Manual for further information.

Q. How do I change the engine oil?

A. BMW's use of a filter canister allows for a simpler oil change without the mess. A detailed explanation of a standard DIY M3 oil change can be found at <http://www.bmw-m.net/TechProc/oilchange.htm> or at http://www.dol.net/~stimpee/e36_ofc1.htm.

Q. How do I change the manual transmission and differential fluids?

A. Changing the transmission and differential fluids is rather straightforward and detailed information can be found at Ron Stygar's web page for manual transmission fluid http://www.unofficialbmw.com/e36/drivetrain/e36_change_manual_transmission_fluid.html and differential fluid changing http://www.unofficialbmw.com/e36/drivetrain/e36_final_drive_fluid_change.html.

Q. What fluid is recommended for manual transmissions?

A. There is little wrong with BMW's recent use of lifetime factory fill transmission oil (BMW MTF LT-1). However, some M3 transmissions may exhibit notchiness and minor grinding when engaging gears especially in colder weather. A simple yet effective solution is to change your existing fluid to Redline D4 ATF Lubricant.

Q. How can I reset my service interval lights?

A. A special reset tool is needed, however rather than buying one, instructions on how to make your own are available at Ron Stygar's web page http://www.unofficialbmw.com/e36/electrical/e36_reset_service_lights.html.

Q. What is bad about using a car wash (automatic and touchless)?

A. Automatic car washes should be avoided for a couple of reasons: the M3's DME is particularly susceptible to flooding (there have been numerous problems with this) and the more obvious is potential damage to the vehicle's finish. The large rotary brushes and sponge-like devices may look clean, but after washing countless other vehicles, dirt, sand, and chemicals are trapped and ready to be redeposited on your finish. Your vehicle's finish will suffer micro scratching and any useful layer of wax will most likely be removed. Another problem is the water filtration system used by car washes. Most of the water is recycled to keep operational costs down and the process retains dirt and chemicals in the closed loop system. This is the primary reason why touchless car washes, while somewhat better than the automatic washes, should be avoided as well.

Q. What are the proper methods of: vehicle detailing, repairing paint chips and leather seats, and even cleaning the engine?

A. While I could spend a significant amount of time discussing this topic, Car Care Specialties Online has compiled an excellent selection of articles on the topic http://www.carcareonline.com/howto_articles.html.

Q. How do I clean and protect my leather seats?

A. Most leather products available leave a wet look and make the leather extremely slippery. A quality leather treatment is somewhat difficult to find, but Lexol and Leatherique are two companies offering cleaners and conditioners created to properly detail leather, leaving it soft, supple, and not slippery.

Q. What can I do to clean my side moldings?

A. Because the black plastic moldings have a rough texture, removing wax build up can become very frustrating. Outlined below are several effective procedures, but before you attempt any of them, I recommend masking off the areas above and below the trim or remove it entirely so you don't damage your paint.

- For light residue, a simple mild abrasive such as a pink eraser works well at getting into the texture to remove the wax.
- Another option is to use a chemical cleaner. Note that products containing silicone, such as Armor All or Black Magic, do not work and merely cover up the wax until the next car wash. Many people have had success with off-the-shelf automotive products such as Zymöl Leather Cleaner, Meguiar's #39 Heavy Duty Vinyl Cleaner, and Black Again (no longer available).
- For extremely stubborn wax, Xylene (the professional detailer's choice) may be your last hope. Using an excessive amount will actually remove small amounts of plastic, however it will surely remove any wax residue. Be extremely careful not to get any on your paint.
- If you have clean trim (or after you have removed the wax) and it is faded, you may want to try a chemical dye called Forever Black. The dye will last for about a year and a half depending on the amount of sunlight and will restore your trim's original deep black appearance.
- Finally, be sure to treat the plastic with a protectant (non silicone preferred) upon completion of the above steps.

Q. What brand of ramps will fit under the M3?

A. One of the better lightweight, plastic ramp sets made by Rhino can be purchased for about \$30 at most major retail stores, e.g., Wal*Mart. Look for the model with the wording "Low Profile." M3s with modified suspensions may scrape the front air dam on the ramps depending on the amount of drop.

Q. Where can I purchase original BMW parts at the best prices?

A. For savings close to 40% off retail prices and BMW CCA member discounts, visit the following dealers:

Pacific BMW <http://www.pacificbmw.com/parts/partindex.htm>

Circle BMW <http://www.circlebmw.com/parts/parts.html>

Nick Alexander Imports (800) 800-6425 (ask for Joe Chavez or Danny Campos)

8. VARIATIONS

Q. How many US E36 M3s have been built?

- A. According to the *3 Series Enthusiast's Companion*, in:
- 1994, 2953 (sold as MY 1995)
 - 1995, 5806 (5763 coupes [1311 automatic], 43 lightweights)
 - 1996, 3175 (3096 coupes [299 automatic], 79 lightweights)
 - 1997, 7940 (4535 sedans, 3405 coupes)
 - 1998, 8762 (3225 sedans, 2876 convertibles, 2661 coupes)
 - 1999, 6557 (3222 coupes, 3335 convertibles)

Q. What colors and body styles were available?

- A. In 1995 and 1996 a coupe (two door) was the only model available. The sedan (four door) came out in 1997 and was followed by the convertible in 1998. Colors available for 1995 were Alpine White, Arctic Silver, Avus Blue, Boston Green, Bright Red, Cosmos Black, Dakar Yellow, and Daytona Violet and colors for 1996-1999 were Alpine White, Arctic Silver (up to March 1998), Boston Green (up to March 1998), Bright Red, Byzanz (1997 sedan only), Cosmos Black, Dakar Yellow II, Estoril Blue, Fern Green (after March 1998), Techno Violet, and Titanium Silver (after March 1998).

Q. What is a Euro M3?

- A. The European specification M3 was introduced in 1993 and included several parts (S50 B30 & S50 B32 engine, lighting, rotor discs, powered rear windows (coupe), sequential transmission option, and more) which were deleted from or modified for the US M3 (introduced in 1995). The Euro M3, with an engine more adept to high speed (top end horsepower) than off-the-line acceleration (low end torque), is quite different from the cheaper US M3. For more information, visit Die Inoffizielle BMW M3 home page <http://bcw3design.com/m3/homepage.htm>.

Q. What is a lightweight M3?

- A. Detailed information on the M3 Lightweight can be found at <http://www.m3ltw.com/>. See below for a brief description from BMW NA (edited):

The 1995 M3 Lightweight (BMW NA model code 9520) was produced between 8/95 through 10/95. A small quantity (approx. 100 units) of M3 were produced, aimed at the performance purist and/or active competitor. This street-legal model (as delivered to the dealership) eliminated several comfort and convenience items for weight reduction purposes which were normally found on standard M3 models. The M3 lightweight came with several performance upgrades based on the European M3 GT homologation series for worldwide GT racing.

Q. What is a luxury model M3?

- A. From 1995 through 1997, BMW offered a luxury package to compliment the M3 line. The model included 8-way electrically adjustable seats, extended leather on the door panels, chrome interior door handles, wood trim throughout the cabin, cruise control, on-board computer, M-Technic side sills, M-Technic front spoiler, and M-Contour wheels. The additions (mainly the seats) increased the weight of the M3 by about 125 lbs.

Q. Why do the 1995 and 1996-1999 M3s have different engines?

- A. The 1995 M3 (engine code S50US B30) was equipped with a Bosch DME (M3.3.1) with OBD I, whereas the 1996-1999 M3s (engine code S50US B32) were equipped with a Siemens DME (MS41.2) with OBD II. Also see below for a dated, yet informative, response from Jim Conforti (edited):

There will be 1995 M3s until December. There will be no 1996 M3s since the S50US B30 engine would have to be emasculated to meet the 1996 emissions regulations. At that time it was presumed that there would be a 3.2L version of the new 328i 2.8L alloy L6 for the 1997 M3. The 1997 M3 was supposed to hit the shores in the summer of 1996. However, a slight glitch has hit. The 2.8L was to be made of Nikasil alloy, the same used in the M60 V8 blocks. This material was found incompatible with a lot of US fuels due to sulfur content, so for the M60 they are going to sleeve the blocks in the 3.x and 4.x liter V8s. There is not enough meat in the 2.8 block to sleeve, so they are changing the alloy to Alusil (same as the M70 V12) which is immune to sulfur but more expensive. This requires reengineering the 2.8L and presumably 3.2L M3 blocks.

9. OTHER INFORMATION

Q. How much does the stock M3 coupe or sedan weigh?

- A. Average curb weight without driver is close to 3175 lb. Individual vehicle weights will vary based on options, e.g., the luxury package.

Q. How should I winterize or prepare my car for long term storage?

A. For a vehicle which will not be driven or even started for a long period of time, several key steps should be taken. First off, change the motor oil, top off the gasoline, and add a product called Stabil (prevents the chemical break down of gasoline) to the fuel tank. Specially designed mats and over inflation of the tires to about 50 psi will prevent tire flatspotting or you can roll your vehicle a foot or so every couple of days. Another option some have employed is to use jack stands to raise the entire vehicle, although this does not allow suspension components to rest in their intended position. Disconnect the battery (make sure you have your radio code first). A more efficient alternative to disconnecting the battery is to use the BMW Advanced Battery Charging System (shown below) or the original Battery Tender <http://www.batterytender.com/>. For lengthy storage periods (greater than one month of non use), remove the spark plugs and coat the cylinder walls to prevent flash rust. A recommended option is to use specially made desiccant (absorbs moisture) canisters which take the place of the spark plugs. Do not use the emergency brake, instead use wheel chocks. Finally, cover the vehicle to prevent dust build up in areas difficult to reach.



(image courtesy of Circle BMW)

BMW Advanced Battery Charging System
P/N **82.11.0.026.663**

Q. How do I remove the air bag stickers from the visor?

A. A product called Goof-Off works well at removing the sticker and any residue. After the sticker has been removed, be sure to treat the vinyl with a non-silicone vinyl protectant.

Q. Where is the best place to mount a radar / laser detector?

A. You want to mount the detector as high as possible on the windshield for a maximum line-of-sight. However, do not place the unit in the tint band as this will impede laser detection performance. A suggested location is to the left of the rear view mirror just below the tint band. An alternate location is to centered on the windshield just below the rear view mirror.

Q. How can I contact someone at BMW other than the dealer?

A. Visit the US website <http://www.bmwusa.com/> or call BMW Customer Relations at (800) 831-1117 (Mon. - Fri., 9 AM - 7 PM EST).

Q. Where can I find the official BMW M Power book?

A. This fantastic book can be found at BMW's website http://www.bmw.com/bmwe/products/m_buch/index.shtml.

Q. Where can I find websites with useful M3 information?

A. Forums for M3 enthusiasts: <http://www.bimmer.org/m3/messages/>, <http://www.bimmerforums.com/>, <http://www.dtmpower.net/forum/index.php>
 BMW Big Links (Ben Liaw): <http://www.bmwlinks.com/>
 BMW Car Club of America: <http://www.bmwcca.org/>
 BMW M Power: <http://www.bmw-m.net/>
 BMW of North America: <http://www.bmwusa.com/>
 Ron Stygar's Page: http://www.unofficialbmw.com/frame_ron.html
 Unofficial BMW Technical Assistance: <http://203.102.130.85/staff/rnott/bmw/technical.html>

Q. Where can I find BMW icons for my computer?

A. A beautiful set of BMW mouse pointer icons (for Windows) can be found at <http://www.kwyjibo.com/bmw/>.

Q. What are the commonly suggested brands for...?

A.

ITEM	BRAND
air intakes	Active Autowerke, Dinan, ECIS, Jim Conforti
air filters	ITG, K&N
clutch stops	Ron Stygar, UUC Motorwerks
exhaust systems	Active Autowerke, B&B, Dinan, Strömung, SuperSprint
leather treatments	Lexol
performance chips	Dinan, Jim Conforti
radar detectors	Bell, Escort, Valentine 1
speakers	a/d/s/, JL Audio, Stealthbox
suspensions	Bilstein, H&R, Koni
tires	Bridgestone, Dunlop, Kumho, Michelin, Pirelli, Yokohama
waxes	Blitz, Meguiar's, Zaino Brothers, Zymöl

Q. How does one interpret the VIN?

A. Information regarding the logic behind the VIN sequence can be found at http://www.unofficialbmw.com/images/all_vin_chart.gif.

Q. Who is Ron Stygar?

A. While I don't personally know Ron Stygar, I've heard and read enough about him to fill a book. Ron spends countless hours helping the BMW community with repairs, modifications, advice and just about everything else BMW related. Visit his web page where you'll find some of the most useful BMW related information on the internet http://www.unofficialbmw.com/frame_ron.html.

10. PURCHASING

Q. What should I look for when purchasing a used M3?

A. There are a few notable items. If purchasing a 1995 or 1996 M3, make sure the water pump has been changed to the metal impeller type (discussed in the Engine section). On all M3s, verify the following: the radiator neck is not cracked, compression of all cylinders is within spec., there are no parts with DOT-R labels (discussed above), and no fault (may be minor) or over-rev codes have been saved. Finally, if you are serious about your purchase, you should have the vehicle inspected by a certified BMW technician.

Q. What are DOT-R labels?

A. DOT-R (Department Of Transportation - Replacement) labels are used in place of the standard BMW label (includes your VIN number) indicating a particular part has been replaced, e.g., the hood or fender, and is often attributed to a motor vehicle accident. For more information visit the Unofficial BMW website http://www.unofficialbmw.com/images/all_vin_chart2.gif which includes a further explanation of DOT-R labels.

Q. What is a Certified Pre-Owned (CPO) M3?

A. In short, a CPO M3 is a dealer inspected and certified M3 with an additional 2 year / 100K mile factory warranty. For a detailed description, visit the BMW NA site at <http://www.bmwusa.com/>.

11. MODIFICATIONS

Q. Will modifications or aftermarket parts void my warranty?

A. Yes and no. Technically, it is up to the dealer to determine whether a certain modification or aftermarket part has directly affected the item in question. However, no two dealers are alike; some look the other way, while others will flat out refuse to provide warranty service for a failed water pump when it was clear that the owner has modified his center console to accommodate a six pack. For further clarification, a statement from a BMW bulletin (#010397) follows:

In general terms, the BMW warranty on a component is void due to a modification, where the modification, alteration or installation of an aftermarket part was directly responsible for the failure.

Q. Why do I sometimes have problems shifting under hard acceleration and what is a mis-shift?

A. One of the primary causes of problematic shifting may be the stock manual transmission mounts. Under high loads, the mounts tend to excessively flex and sometimes to the point where gear engagement can be difficult. This symptom is often exacerbated by accelerating around a corner, further compressing the mounts. On occasion an unlucky few have mis-shifted (selected the incorrect gear, e.g., 2nd instead of 4th) causing severe engine damage. A mis-shift may be due to weakened mounts that have deflected too much, although many other factors may be contributing as well. In any case, a stiffer transmission mount will reduce potential complications down the road with few, if any, drawbacks. UUC Motorwerks <http://www.uucmotorwerks.com/> has designed a replacement mount and an enthusiast's informative page details the mount installation http://home.earthlink.net/~r_tech/cars/transmission_mount_bushing.html.

Q. What horsepower gain will I experience with certain modifications?

A. The figures listed below are approximate and most are referenced from Dinan <http://www.dinanbmw.com>. Also note that one can't simply add each item's effective HP, i.e., the overall system increase in HP is not equal to the sum of the individual modification gains.

MODIFICATION	GAIN (HP, approx.)
air intake	10
camshafts	10
chip	10
exhaust	7
headers	10
high flow air meter	7
supercharger	100
throttle body	5
underdrive pulley	7

Q. What is the easiest and cheapest way to gain a few extra horsepower?

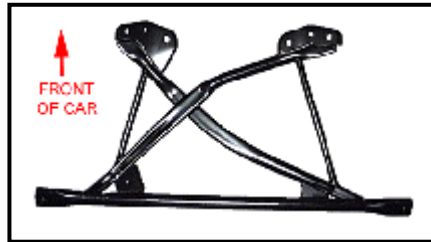
A. With a quick and easy modification to your factory airbox, your M3 should gain approximately 4 HP and 4 lb ft of torque as proven by Active Autowerke Tuning's dyno results <http://www.activeautowerke.com/dyno/96M3%20Stock%20NoBaffles%20vs%2096M3%20Stock.asp>. Simply remove the lower baffle on the inlet side, inside your airbox. Access to the baffle is best achieved by temporarily removing the entire airbox assembly from the vehicle. Looking on the underside of the airbox, a wedge shaped tab will be protruding through a slot on the airbox. This is what holds the baffle in and you may need a screwdriver to coax it out. After removal of the baffle, simply reinstall your airbox and keep the baffle handy in case you ever want to return the airbox back to stock form.

Q. Do I need a heat shield for my air intake?

A. Yes, heat and horsepower do not mix. A general rule of thumb is that for every 7° F increase in temperature (above 60° F) your engine will experience roughly a 1% loss of horsepower (an additional rule of thumb is that for every additional 1,000 feet in altitude, your engine's horsepower will drop by about 3%). For example, at 95° F ambient air temperature, your 240 bHP M3 is now producing about 228 bHP. Additionally, compounding the ambient air temperature with your engine and radiator heat can severely reduce your performance.

Q. What is an x-brace?

A. The x-brace or cross reinforcement is a BMW OEM part designed for the M3 Lightweight (discussed in the Other section) and M3 convertibles. It effectively stiffens the chassis for improved steering response at a fraction of the cost of your average strut brace and with better results. The install is relatively straightforward, but make sure you do not mount the stock brace in addition to the x-brace or you will alter the safety characteristics of the engine in the event of a frontal impact. Also, you may want to install a buffer stop which reduces engine twist and thus helps attain proper drive line attitude. Detailed installation instructions of the x-brace can be found at Ron Stygar's web page http://www.unofficialbmw.com/e36/suspension/e36_rons_xbrace_install.html.



(image courtesy of UUC Motorwerks)

BMW Cross Reinforcement

P/N **51.71.8.410.212**

BMW Buffer Stop (not shown)

P/N **11.81.1.095.700**

Q. What does it mean to get sharked?

A. When a vehicle is sharked it simply means that Jim Conforti's <http://www.bonnevillemotorwerks.com/> performance chip has been installed.

Q. Can I install both a lightened flywheel and an underdrive pulley?

A. No, the combination of a lightened flywheel and underdrive (also lighter) pulley will not be able to effectively dampen crankshaft vibrations. The increased vibration (and reduced ability to prevent a resonant frequency) will likely result in crankshaft fatigue and failure.

Q. Will the BMW aluminum pedal set (for E46 BMWs) fit on my E36 M3?

A. Yes, but it is a good idea not to use the accelerator pedal that comes with the kit as the geometry and shape is slightly different. Also, be careful when drilling the holes (especially in the plastic clutch pedal) as they end up very close to the edge of the pedals.



BMW E46 Aluminum Pedal Set

P/N **35.00.0.006.949** (manual transmission)

P/N **35.00.0.007.018** (automatic transmission)

