fast times
the newsletter of **Bavarian Autosport**
Summer 2008

Fast Times celebrates its 5th anniversary with "Otto's Greatest Hits, Volume One."

In the Summer of 2003, the first issue of *Fast Times* was produced and Bavarian Otto was born. (Pretty neat trick for a guy with more than 200 years of experience.) Over the past five years, Otto has written dozens of articles that show you how to save money by doing some maintenance and repair tasks yourself. In this, the 5th anniversary issue of *Fast Times*, we're revisiting four of the most popular articles from the past… sort of an "Otto's Greatest Hits." But rather than fill the pages with a bunch of oldies-but-goodies, we'll just start the articles here and tell you the issue in which they first appeared. If you'd like to read more, go to www.BavAuto.com/newsletter – all the previous issues of *Fast Times* are there in PDF format for easy downloading and reading. A more substantial list of D.I.Y. (do it yourself) topics and the issues in which they appear can be found on page two of this newsletter. Happy reading!

Changing Cabin Air Microfilters. 🔧 or 🔧🔧

Top: cabin air microfilter from a 99 323i after approximately 30,000 miles. Bottom: new cabin air microfilter.

Most BMW owners are very good about changing their engine's air filter, but they rarely change the cabin air microfilter. (If your response is, "I didn't even know my BMW had a cabin air microfilter," you're not alone.) The size and shape of these filters vary widely from model to model, as does the step-by-step procedure for changing them. On the 5 series 97 thru 03, for example, you simply raise the hood, locate the two filter boxes (they're next to the firewall), open them, take out the old, dirty filters and slide the new ones in.

More at www.BavAuto.com/newsletter in the Summer 2003 issue.

Repairing odometers on earlier BMWs. 🔧 or 🔧🔧

One of the recurring questions to Bavarian Otto concerns inoperative odometers on the 1980s vintage BMWs… These models have an electrically driven, analog speedometer which receives its signal from a speed sensor mounted in the differential. The odometer is driven by a separate, small motor and a set of reduction gears. With age, these small plastic gears can break or strip, which renders the odometer inoperative, even though the speedometer still functions fine…

Until recently, the only option was to replace the complete speedometer head unit, at a cost of more than $300.00. Bavarian Autosport now offers separate odometer drive gears so you can easily fix your inoperative odometer at much less expense.

More at www.BavAuto.com/newsletter in the Winter 2005 issue.

continued on page 2...

Cool Carbon S/T pads now available for more models.

Since we introduced Cool Carbon S/T (street/track) brake pads last March, hundreds of you have discovered why we're calling these the best all-around, performance brake pads for BMWs and MINIs. Even more of you have been asking, "When will you have Cool Carbons for my car?"

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BAVARIAN autosport
PRODUCTS FOR BMW ENTHUSIASTS

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Otto's Greatest Hits *continued from page 1*

Tune-up your direct-fire ignition system. 🔧

All 6-cylinder and V8 BMWs 1992 and later (except 535i and 735i) use a Direct Ignition system (also known as "coil-on-plug")… On cars with Direct Ignition systems, BMW recommends 100,000 miles before changing the spark plugs. We believe this is part of an industry-wide effort by car manufacturers to make their "cost of ownership" figures look better to potential buyers and consumer reporting agencies…

All this may mislead one into assuming that no standard "tune-up" maintenance is required on these engines. This is simply not the case. Now that these Direct Ignition systems have been out in the real world for several years, we are seeing specific areas where ignition tune-up maintenance is needed.

More at www.BavAuto.com/newsletter in the Spring 2005 issue.

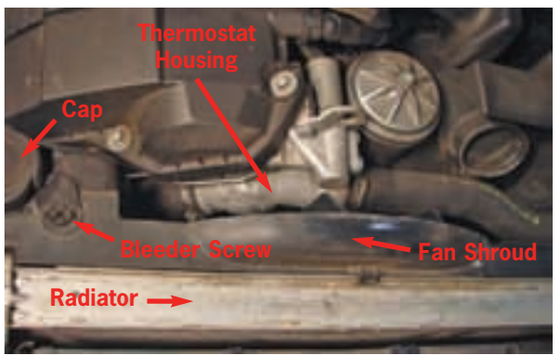
Too hot to handle. 🔧🔧 or 🔧🔧🔧

'Tis the season for cooling system woes. We see it every year, as soon as spring breaks into summer, the calls and e-mails center around overheating BMWs. Be it a well worn '79 320i, a pristine '87 M6 or a rather new '99 740il, they all start showing signs of needed cooling system maintenance or repair.

The cooling systems on our BMWs are fairly simple, once you understand what's involved, but they do include a few different parts and systems within the vehicle. Each of these parts must be doing its job correctly or we end up with a cooked BMW and quite possibly a ruined day or worse yet… a ruined vacation.

In order to properly inspect and diagnose a BMW cooling system, we first need to understand it. Here are the major parts of the cooling system that can typically fail and cause problems…

More at www.BavAuto.com/newsletter in the Summer 2005 issue.



More D.I.Y.s from Otto…

And these aren't all of them – you'll find even more on our web site at www.BavAuto.com/newsletter.

5 series 97–03 cup holders, replace (Summer 2004)
aFe intake, install (Spring 2007)
Brake rotors and pads, replace (Spring 2008)
Control arms & bushings, replace (Fall 2006)
Differential fluid, change (Winter 2004)
Engine oil, change (Fall 2004)
External air temp sensor, replace (Winter 2008)
Fault codes (engine), how to read (Spring 2005)
Heater problems, diagnose (Winter 2006)
Hood & trunk emblems, replace (Summer 2004)
Muffler, install (Spring 2008)
Oxygen sensors, replace (Fall 2004)
Paint chip, repair (Spring 2008, Special Edition 2008)
Plastic headlight covers, restore (Spring 2005)
Service interval PC boards, replace (Fall 2005)
Shocks, replace (Spring 2004; Summer 2006)
Shock nuts, tightening (Spring 2007)
Starting problems, diagnosing (Fall 2007)
Transmission fluid – manual, change (Winter 2004)
Transmission fluid – automatic, change (Spring 2006)
Vapor recovery system, maintenance (Winter 2005)
Water pump – 6 cylinder, replacement (Spring 2007)

Product Focus: Retro-fit your BMW or MINI with our truly retro Coco Mats

Heavy-duty vinyl trim around the edges won't fray the way the edging on the original coco mats did. And a rugged vinyl pad on the driver's mat prevents wear-and-tear in the heel area.

Coco mats are made from coir, a rugged, natural fiber harvested from the husks of coconuts. Coir is thick, strong and is highly resistant to abrasion. Plus it is relatively waterproof and is one of the few natural fibers resistant to damage by salt water. To make these mats, the coir fibers are twisted together to create what amounts to a thin rope, which is then woven into the attractive patterns you see here.

Years ago, coco mats were popular in cars that had no factory floor mats (e.g. early BMWs and Porsches). They were good looking and durable, but they had a couple of problems. First, those original coco mats had no backing, so dirt would work its way through the open weave onto the floor. This was fine when cars had rubber flooring, but in cars with carpeting, cleaning becomes a big issue. To alleviate this problem, our coco mats have a backing that catches dirt and water before it reaches your carpet, protecting the carpeting and saving you a lot of work. To clean the mats, just take 'em out and shake 'em out.

The second problem with the original coco mats was that they were slippery underfoot. The backing that's on our coco mats has hundreds of short nibs on the bottom to help prevent them from sliding around.

Our coco mats usually cost $119.95 for a set of 4 (set of 2 for roadsters), but now through August 31, they're on sale for $109.95. (P.S. BMW's coco mats are $170.)

Note: because these coco mats are custom-cut to fit your year and model precisely, please allow 2-3 weeks for delivery.

Make sure you order the right color (right) – call for free color samples!

Slate Herringbone | **Black/Gray Weave** | **Nat/Tan/Brown Weave** | **Black Herringbone** | **Natural Herringbone** | **Black/Red Weave** | **Calico Weave**

Cool Carbon *continued from page 1*

Well, if you own one of the following models, you're wait is officially over:

- 128i 08 on
- 320i thru 83
- 330ci 01 thru 06
- Most 3 series 06 on
- Most 5 series 04 on
- Most 6 series 04 on
- Most 7 series 02 on

That means that we now have Cool Carbon S/T pads for most 3 series, 5 series, 6 series, 7 series, X3, X5, Z3, Z4 and MINI.

If you'd like to know why we're so excited about these new Cool Carbon S/T brake pads, check out the article in the Spring 2008 edition of *Fast Times* at www.BavAuto.com/newsletter. And if reading about all the great benefits of Cool Carbon pads isn't enough to convince you to try them, how about if we put them on sale? A full-car set of front and rear pads normally costs $229.95. During the month of August, we'll take $40 off that price – you pay just $189.95. (And since the total is over $150, the shipping is free!)

🔧 Very simple installation. 🔧🔧 Relatively simple; your BMW may need to be raised.

from our tech team

ask "bavarian otto"

Over 200 years of BMW experience is just a phone call or e-mail away.

If you add up all the years the enthusiasts at Bavarian Autosport have been working on BMWs – and helping people like you work on theirs – it totals well over 200 years. That's a lot of BMW knowledge. And it's yours for the asking. Have a BMW question? Ask that savvy old BMW enthusiast, "Bavarian Otto" – just call 800.535.2002 or e-mail Otto@BavAuto.com.

Let there be (computer) light.

Dear Bavarian Otto,

The OBC [on-board computer] light on my '91 525i just went out. I think you did a write-up on replacing the OBC light bar some time ago. If I remember, it was a pretty simple fix. My problem is I can't find the article or the replacement light bar on your web site. Can you help me out?

Andrew

Otto replies:

Andrew, thank you for your question regarding your 525i. The article you're referring to was in the Spring 2004 issue of Fast Times. (You can read it at www.BavAuto.com/newsletter.) The reason you can't find the light bar for your car is that it doesn't use one. Instead, your OBC uses two individual bulbs to illuminate it. I wrote an article about replacing those in the Spring 2005 issue, which you can find at the same web address. Briefly, after removing the radio, the OBC just snaps into place. Pull the release lever in the right rear corner of the radio cavity and pull the OBC out. Once the OBC has been removed, you can simply replace the defective bulb(s). The part number is 2721S ($5.95 each). Feel free to contact me if you have any questions about the procedure.

Let there be (brake) light.

Dear Bavarian Otto,

The brake lights on my '92 325is will not work. We have tried new fuses and a completely new set of bulbs. The front lights work. We are at a loss. Help!

Connie

Otto replies:

I believe we can help get your brake lights functioning again, Connie. If just the brake lights are inoperative (i.e. your turn signals and running lights work), you probably just need a new brake light switch. The brake light switch is located up above the brake pedal. You will need to check the switch you have to determine which replacement switch to order. To do this, remove the lower trim panel under the dash on the driver's side. There is a metal knee bolster behind the trim panel that will need to be removed as well. With these pieces removed you can look above the brake pedal for the switch. There are two different types of switches for your 325is: one is a two-pin switch, which will have two wires leading to it. A new 2-pin switch costs $9.95. There is also a four pin switch (four wires leading to it) which costs $24.95. This should take care of the problem.

If you also have no taillights, turn signals, or brake lights, you likely have a different problem. On these older 3 series cars, we do see failures of both the bulb sockets and the taillights themselves. Basically, you need to check the contacts on both. If there are no burn marks and the connections are clean, you should be fine. (I would recommend using some DeoxIT Power Booster contact cleaner on all bulb-to-socket contact points. You can order a small tube for $4.95 or an easy-to-use mini spray bottle for $9.95.) If there appears to be damage to the sockets or connections, you should replace them. We do stock the bulb sockets, which range from $6.95 to $7.95 each. The complete taillight assemblies are $119.95 each. Feel free to contact me if you have questions about replacement procedures.

Hey Otto, your last name wouldn't be Frankenstein by any chance?

Dear Bavarian Otto,

You're my last hope. While waiting for my wife at the store, I was playing with the OBC on my '85 535i. When my wife returned, I started the car, drove a block or two and all of sudden the engine just cut out. There was no warning, no sputtering, just instant death. I couldn't restart it, so I had it towed to my mechanic. He can't start it either. Can you help me bring it back to life?

Norman P.

Otto replies:

Older OBC units like the one on your 535i have an anti-theft option, which I suspect you accidentally activated when using the OBC. It entails creating a code that must be entered into the OBC after unlocking the car. If the code is not entered, the engine management system will shut down after driving a short distance and you will be unable to restart the car. Details are in the owner's manual. (If you don't have one, we do – #01 47 9 699 397, $21.95). Fortunately, there is an emergency start procedure:

> *Disconnect battery for 5 minutes or more, then reconnect battery and turn the ignition key to position 1. An alarm should sound and a time display will appear on the OBC, counting down from 15 minutes. After the 15 minutes have expired, the engine can be started.*

This should bring your 535i back to life, Igor... I mean, Norman.

P.S. If you happen to know the anti-theft code, you can cut the 15-minute waiting period short by pressing the CODE button, inputting the code, pressing the S/R button and starting the engine.

Bavarian Profile

Danny Gimenez

Danny first started working at Bavarian Autosport in 2004. In 2006 he took a brief detour as a civil servant for the state of Florida, but missed the NH weather so much (yeah, right), he rejoined us in 2007. We're glad he did! Danny brings a wealth of automotive knowledge to his job. His love for things motorized began with his first motorcycle ride at age 4. (He owned his first motorbike at age 6!) Before coming to Bavarian he worked in several speed shops, a body shop, a few race prep garages and a VW parts company. BMWs he has owned include a '95 M3 Lightweight, a '91 535i and an '01 330xi, and he has worked on a slew of other chassis. He has also owned an '81 DeLorean, '74 914 widebody, '88 Scirocco, '84 Alfa GTV6, '88 RX7 turbo, '96 Mitsubishi evo IV RS, and a host of others – about 25-30 cars in all. When asked what his favorite BMW is, Danny replies, "The M1, even with its poor interior... though the 335xi sounds like it could be lots of fun." When he's not at work, Danny enjoys photography, visiting art museums in Boston and NYC, long trips on back roads (e.g. Vancouver to LA, Boston to Miami) and mountain biking. Danny can be reached at extension 1243 or at DannyG@BavAuto.com.

What are you doing Sunday, October 5th?

Come to Show & Shine, a friendly gathering of 1,500 or so BMW and MINI enthusiasts in Portsmouth, NH. It's 100% free! For details go to www.BavAuto.com/show&shine...

A $5 donation could win you a car-load of goodies worth more than ~~$1,000!~~ $2,000!

Once again this year, Bavarian Autosport and its vendor partners will be raising money for Susan G. Komen for the Cure with a raffle. You could win one of 13 prizes valued from $100 to more than $2,000. Prizes include:

- NOAH car cover by Covercraft
- Full front-end bra by Colgan
- Power Flow kit by aFe
- $100 gas card from Hella
- Set of winter tires by Hakkapeliita
- Four shock absorbers by Sachs
- BassLink subwoofer kit by Infinity
- More! *(Note: Prizes may be different than shown. Z3 not included.)*

The drawings will be held at our Show & Shine event on October 5, 2008. The Grand Prize, worth at least $2,000, will be drawn at 2pm. *You need not be present to win any of the prizes!* Individual tickets are $5 each, or 5 tickets for $20. Raffle tickets can be purchased by phone or online at www.BavAuto.com. Winners who are not present for the drawing will be contacted on October 6, 2008. *100% of the proceeds go to the Komen foundation!* Please help in finding a cure. Thank you.

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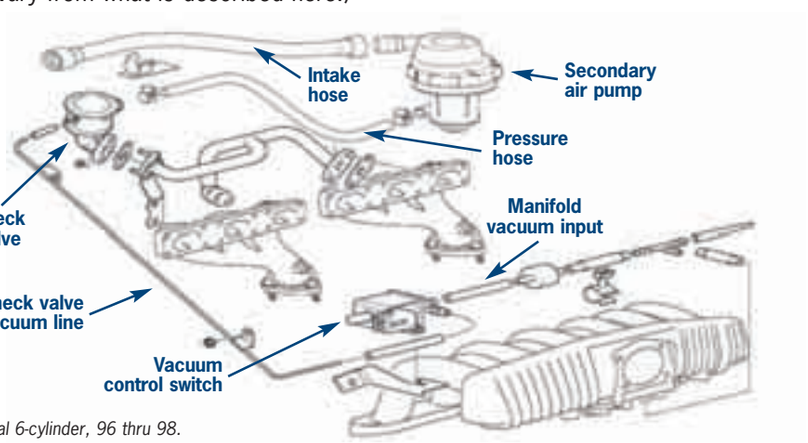
Diagnosing secondary air injection systems. 🔧🔧 or 🔧🔧🔧

Some of the most common "check engine" fault codes for BMWs from 1996 through the mid-2000s involve the secondary air injection system. This system consists of an air pump, exhaust manifold input check valve and a vacuum control switch, along with the associated input and vacuum hoses and electrical input circuit to the vacuum control switch. *(See illustration below.)* During cold starts, the system pumps fresh air into the exhaust as it exits the engine (at either the exhaust ports in the cylinder head or the exhaust manifold ports). This feeds oxygen to the exhaust gasses, allowing for a more complete burn of hydrocarbons (harmful emissions). The system turns off after about a minute or less.

Fault codes attributable to this system (such as "Secondary Air Flow Too Low") are usually caused by a faulty air pump and/or exhaust manifold check valve. However, we have found that other parts of this system (including leaking vacuum lines and a faulty vacuum control switch) can be the initial cause of problems, leading to failure of the pump, check valve, relays and fuses. Follow along as we diagnose a secondary air system on a 2001 330i. Note that most 6-cylinder models 1996 through mid-2000s will be similar. (The same diagnostic procedures can be used on V8s and the M3 01 thru 05, but the locations of the parts will vary from what is described here.)



Typical 6-cylinder, 96 thru 98.

NOTE: Many of these diagnostic tests must be done with the engine fully cold. This may require some of the follow-up tests to be performed after the engine has cooled down (a few hours). Also, some of the following tests will generate fault codes. When all testing is complete and faulty parts have been replaced, remember to clear all fault codes.

1 *Is the pump running? With the engine fully cold (such as overnight or after a few hours of sitting), remove the pressure hose from the pump. (You can also remove the opposite end of the hose, from the manifold check valve, if access is easier.) Have a helper start the engine. Is the pump running and pumping air out of the outlet nipple (or the end of the hose that was removed from the valve)? If no, go to step 2; if yes, go to step 4.* Note: Turn engine off as quickly as possible, in order to perform the next stage of testing while engine is still cold.

2 *Unplug the pump's electrical harness connector. (This may require the pump to be unbolted from its mounting bracket.) Using jumper wires, apply 12 volts directly to the pump (the terminal that has the brown wire in the harness plug, is ground; the other terminal is positive). Does the pump run? If yes, go to step 3. If no, pump is faulty and must be replaced. However, you are not finished with the diagnostics; proceed to step 3.*

3 *Test for 12 volts at the pump harness connector. With the engine fully cold, use a multimeter or 12-volt test light to check for power between the two terminals in the pump harness plug when the engine is started. (Have a helper start the engine so you can test immediately.) If yes, and the pump did run in step 2, repeat steps 1 through 3 to verify your findings; you may have made a mistake. If no, check the fuses and relay. See applicable Bentley repair manual for details and locations. In this case, they are fuses #2 (30-amp) and #3 (20-amp) in the electronics box fuse pack carrier (under hood, driver's side), fuse #36 (50-amp) in the main fuse panel (above glove box) and the relay in main relay panel (behind glove box). If you find a faulty fuse or relay, correct the fault and repeat step 3 to verify that you have power at the pump's harness connector. Repeat step 1 if the pump did run in step 2 (pump should now run). If pump did not run in step 2, we need to replace the pump and go on to diagnosing the check valve circuit. It would also be wise to diagnose the check valve circuit even if the pump now runs properly.*

At this point, we have determined whether the pump is faulty AND that we have power through the circuit to the pump. We now must determine if the check valve and the vacuum switch circuit are functioning properly.

4 *With engine fully cold, remove the pressure hose from the check valve. As in step 1, start the engine and note if exhaust gas is coming from the valve (where the hose was removed), indicating that the valve is open. In this test, continue to run the engine. Does the valve close within a minute or so? If valve was initially open, then closed, your diagnostics are complete; the valve and control circuit are functioning properly. If valve did not open at all, go to step 5. If valve stayed open, remove the vacuum control hose from the check valve and start the engine (temperature does not matter). If the valve is still open, it is faulty. If valve is now closed, the vacuum control switch is likely faulty.*

5 *Test for check valve function. Use a vacuum pump (such as a MityVac hand pump, available at auto parts stores, Wal-Mart, Sears, etc.) to apply vacuum to the check-valve vacuum nipple. Start the engine – is the valve open (exhaust coming through the valve's air input nipple)? Release the vacuum – does the valve close? If yes, the valve is OK; go to step 6. If the valve did not open at all, or if the valve does not close, the valve is faulty.*

6 *Test check valve vacuum control circuit. With engine fully cold, install a vacuum gauge to the vacuum control hose that connects to the check valve (remove hose from valve). Start engine and check for vacuum on the gauge. You should have at least 10" to 15" of vacuum. If no vacuum (or very low) and your testing in step 5 showed the check valve to be OK, the diagnostics will be more difficult and may require removal of various engine and/or engine compartment parts. Shut engine off right away, to try to keep it in "cold-start" mode. Before continuing, make sure that the fuses and relay mentioned in step 3 are fully functional, then repeat step 6. If still no vacuum, go on to step 7.*

7 *Locate the vacuum control switch. On this '01 330i, it is located under the rear of the intake manifold and is rather difficult to access. (Access is easier on many other models.) You must remove the microfilter housing, valve cover trim cover and fuel rail trim cover. Follow the vacuum line from the check valve, along the side of the cylinder head, across the rear of the cylinder head, down under the rear of the intake manifold and, ultimately, to the control switch. As you are tracing the line, be aware of any hardened rubber hose sections and/or cracks or loose connections (creating vacuum leaks). Replace any suspect vacuum hose sections and redo the test in step 6. It's a good idea to replace all of these vacuum hoses, at this time, regardless of the test results. If still no vacuum, we will need to actually*

access the control switch in order to test the input manifold vacuum hose and the electrical function of the switch itself. As noted, on this particular model, this can be a bit of a task. Better access to the switch can be had by removing the air filter box, mass air flow sensor and throttle body (and all of the associated hoses, etc). This will allow you to access the control switch from under the manifold. Go to step 8.

NOTE: If you can access the electrical harness plug on the control switch, prior to (or instead of) disassembling the intake system, test the harness plug for 12 volts of input. Wire colors vary depending on the model (see wiring diagrams in the applicable Bentley repair manual), however, of the two wires in the harness plug, one will be brown with one or more color stripes, while the other will have no brown. The wire that does not have any brown is the input wire. Test for 12 volts from this wire to ground, with the ignition key on. If no power is found, go back and re-check fuse #2. Once power is established, continue to step 8.

8 *Remove the input vacuum line from the control switch. Use a vacuum gauge to test for manifold vacuum, through the input hose, with engine running. If no vacuum, or the reading is low, replace the input vacuum hose and retest. (Again, it's a good idea to replace this hose no matter what the test indicates.) Go to step 9.*

9 *At this point, if you can access the vacuum control switch for testing (and you have verified that there are 12 volts of input), apply vacuum to the input nipple on the vacuum control switch (using the vacuum pump noted in step 5). The valve should be closed and the vacuum pump should hold vacuum. Apply 12 volts across the two terminals of the vacuum control switch, using jumper wires. The switch should open and release the vacuum from the vacuum pump. If the valve does not function as noted in this test, it is faulty.*

Product Focus:

Using aFe panel filters makes dollars and sense

• **Better air flow.** aFe panel filters have the deepest pleats in the industry for more surface area. That means more air can enter the engine, giving you a slight boost in power. Plus, as dirt builds up, air flow isn't diminished as rapidly as on other filters.

• **Better filtration.** Multiple layers of progressively smaller, oiled gauze generate a static charge that attracts particles as small as two microns.

• **Better construction.** Some manufacturers use plastisol or foam where their panel filters meet the inside of the air box. Over time, heat and chemicals can harden plastisol and turn foam to dust. aFe filters use a urethane bump seal that compresses against the box to fill uneven surfaces, plus it remains pliable for years. As a result, air always flows through the filter, not around it.

• **Better value.** Because aFe lifetime filters can be recharged (cleaned and oiled) multiple times, they never need replacing. Plus, they come with a Lifetime Warranty. And now through August 31, when you buy any aFe panel filter, we'll give you a recharge kit for free – a $13.95 value.

aFe makes panel filters for most BMWs and MINIs. For more details on aFe filters, see the Winter 2006 *Fast Times* at www.BavAuto.com/newsletter.

How easy is this?!

do-it-yourself

Replacing fog lights, 3 series 99 thru 05. 🔧

Shown below are the four most common factory fog lights used on this 3 series. If you don't see your fog lights here, give us a call and we'll help you figure it out.

1 *Pry off the trim ring (fig. 1).*


Fig. 1

2 *Remove the inboard screw (fig. 2).*


Fig. 2

3 *Step A: Pull the inboard side of the light out of bracket. Step B: pull the light off of the outboard locator pins (fig. 3).*

Fig. 3

1 *Unsnap/remove lower trim panel (fig. 1).*


Fig. 1

2 *Remove screws and unsnap trim (fig. 2).*

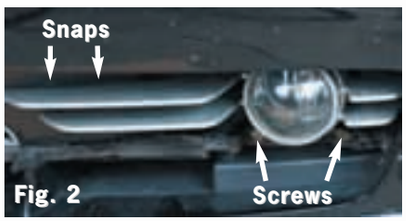


Fig. 2

3 *Pull the light and grill assembly down and out (fig. 3).*


Fig. 3

1 *Access to this style fog light (fig. 1) is from behind the bumper.*


Fig. 1

2 *Remove the splash panel in front of the wheel (fig. 2), then remove the fog light mounting screws and pull out the light (fig. 3).*

Fig. 2

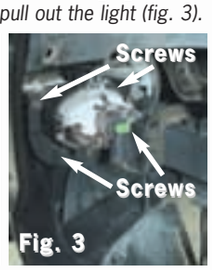


Fig. 3

1 *Using a non-marring pry-tool, pry out the inboard end of the light (fig. 1).*


Fig. 1

2 *Pull light out and remove (fig. 2).*


Fig. 2

🔧🔧🔧 Specific tools needed; repair experience recommended. 🔧🔧🔧🔧 Experienced technicians only.