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DIY ZF 6HP19Z Transmission Drain & Refill

968turboS

Posted 24 October 2009 - 11:34 PM

DIY (#) ZF 6HP19Z Transmission Drain & Refill

Procedure: This method should also apply to most E60 models. I would expect fluid levels to be different due to differences in the torque (#) converters for the higher HP/torque models.

History: ZF developed a 6 speed code named 6HP19, with 6HP19Z designation for the BMW unit. These units came with BMW "lifetime fill" ATF, which is listed in the BMW Operating Fluids Manual, Groupe 24, as Shell M-1375.4, only available at the dealer. I priced this fluid at the dealer at \$16 for ♦ liter. I instead opted to do some research and found two alternatives for this fluid, Pentosin ATF1 and ZF-Lifeguardfluid6 AT fluid. ZF and Pentosin fluid can be found at dealers. People have found other alternatives with labels stating that their ATF is compatible with Shell but I decided to play it safe. Unfortunately, ZF decided to make the pan and filter as an integrated unit made out of plastic. So, you must change the pan and filter as 1 piece.

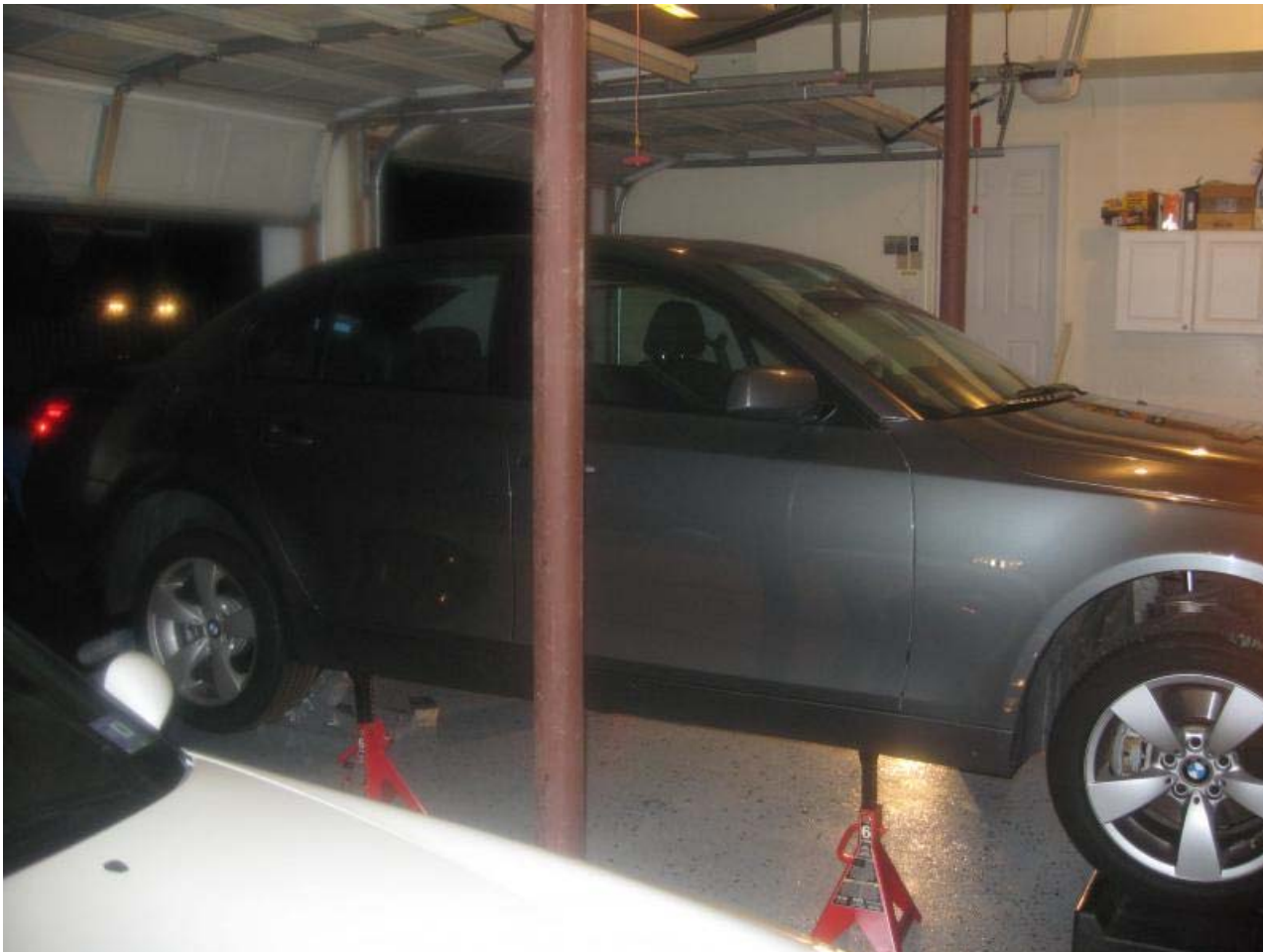
Note: You will not be able to completely drain all the fluid out, instead some fluid will remain in the torque converter. Factory fluid capacity is 9 liters. One drain gets 5.5 liters out, so you get you close to 60% new fluid on one drain and refill. Subsequent drain and fill will get you close to 90%.

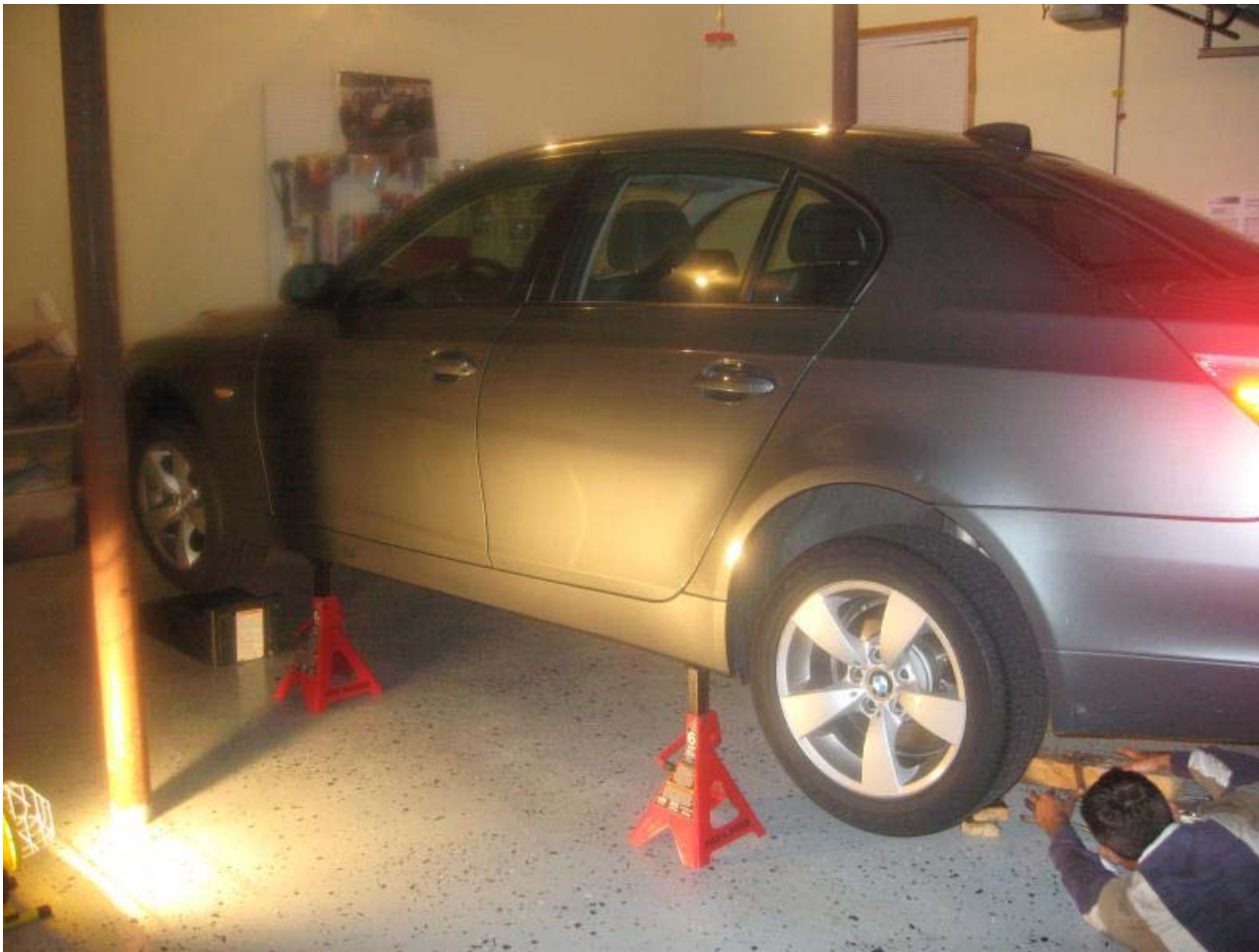
Parts (#) Required: ZF transmission filter kit, Transmission fluid of your choice.

Tools Required: Sockets: 8mm, 10mm, 16mm, Torx T-40, 8mm L-shaped hex, Torx E10, 10mm hex head, 13mm ratcheting wrench, 3/8 Ratchet, Phillips screw driver, floor jack, 4 jack stands, ramps, oil catch can, fluid pump(available at any auto (#) store).

WARNING: ZF has strict temperature requirements for fill. As per ZF, when adding new fluid while the engine is running, the temperature of fluid should be at 40 deg C. Oil temperature MUST NOT exceed 50 deg C. If the temperature gets past 50 deg C, you must allow transmission fluid to cool down before you start the fill procedure again.

1. Put the car (#) up on stands on all four corners. I found the best way to do this was by 1st driving the car on ramps, then lifting the rear of the car by the differential. Always place a piece of wood between the jack and differential to protect it from damage. Once the car is up in the back, place jacks on the jack mounting points on the sides of rocker panels.





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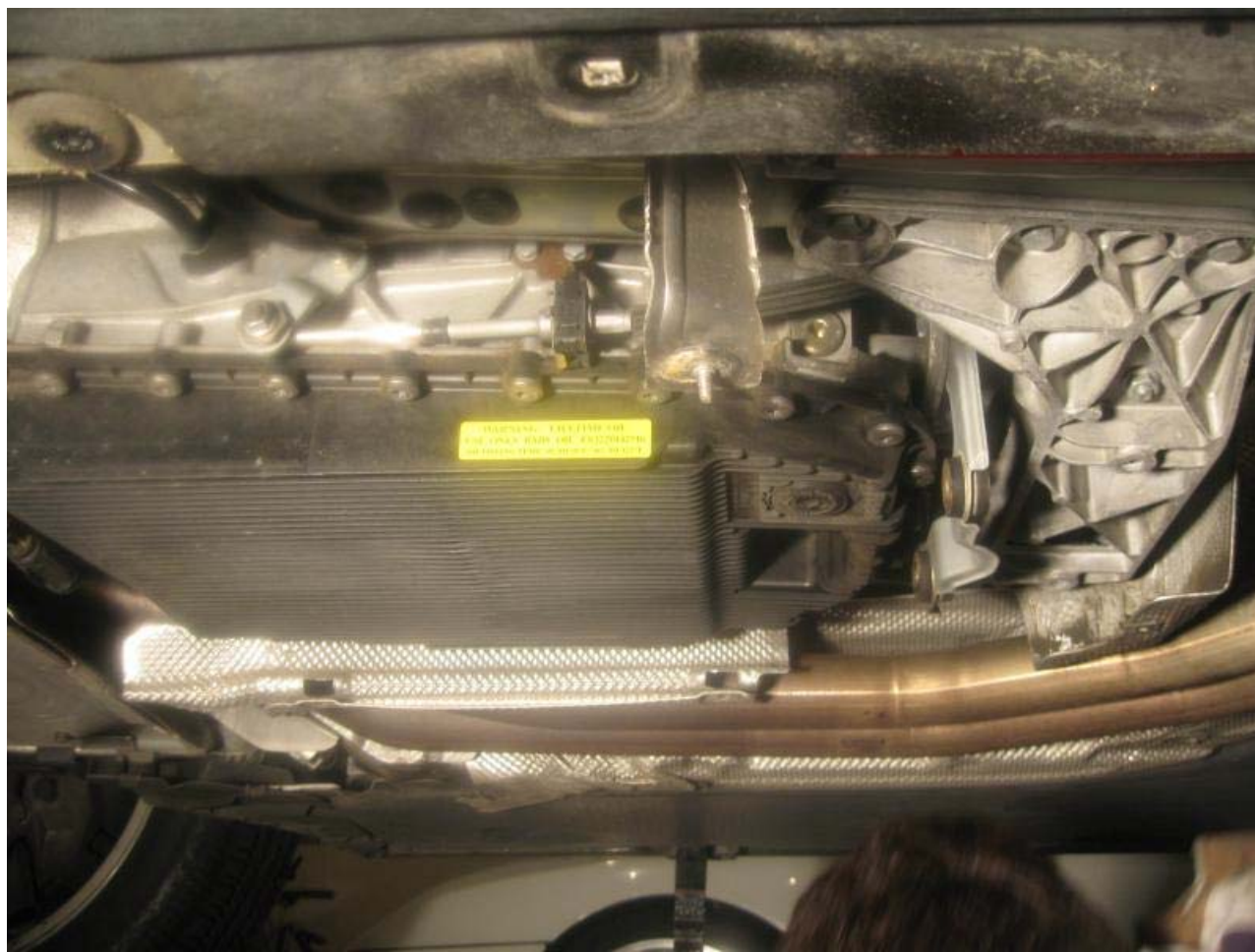
2. Remove front under body cover using Phillips screw driver. Pan is held together by 8 phillips screws.



3. Remove rear under body cover using 8mm, 10mm sockets and Phillips screwdriver. This is a big piece, so proceed with care.



4. Lift the front of the car using cross member and install jacks on the front jack mounting points on sides of rocker panels. Make sure the car is level. Front jack mounting points are 1.5 inches lower than rears, so compensate your jack stands accordingly. Make sure car is steady on stands.
5. Loosen fill plug using 8mm L shaped tool. It's a tight fit with the shifter linkage in the way. It's an extremely important step because you want to make sure you will be able to fill new fluid before you go draining old fluid.



6. Remove rear transmission mount/vibration damper by undoing 16mm bolts.



7. Remove exhaust hanger by holding E10 Torx bolt undoing the 13mm nuts. There are 3 E10 bolts plus a 4th E10 bolt between the two hangers. Once you have removed the hanger, you will have complete access to all the T-40 Torx bolts holding the transmission oil pan.











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8. Place oil catch can under the transmission pan. Open the drain plug using a 10mm hex socket, transmission oil will gush out so make sure you are ready to catch it all. I always like to measure the amount of oil that comes out, so that I know how much I need to put in. It is important to avoid spills so you can get accurate measurements on how much oil was drained.





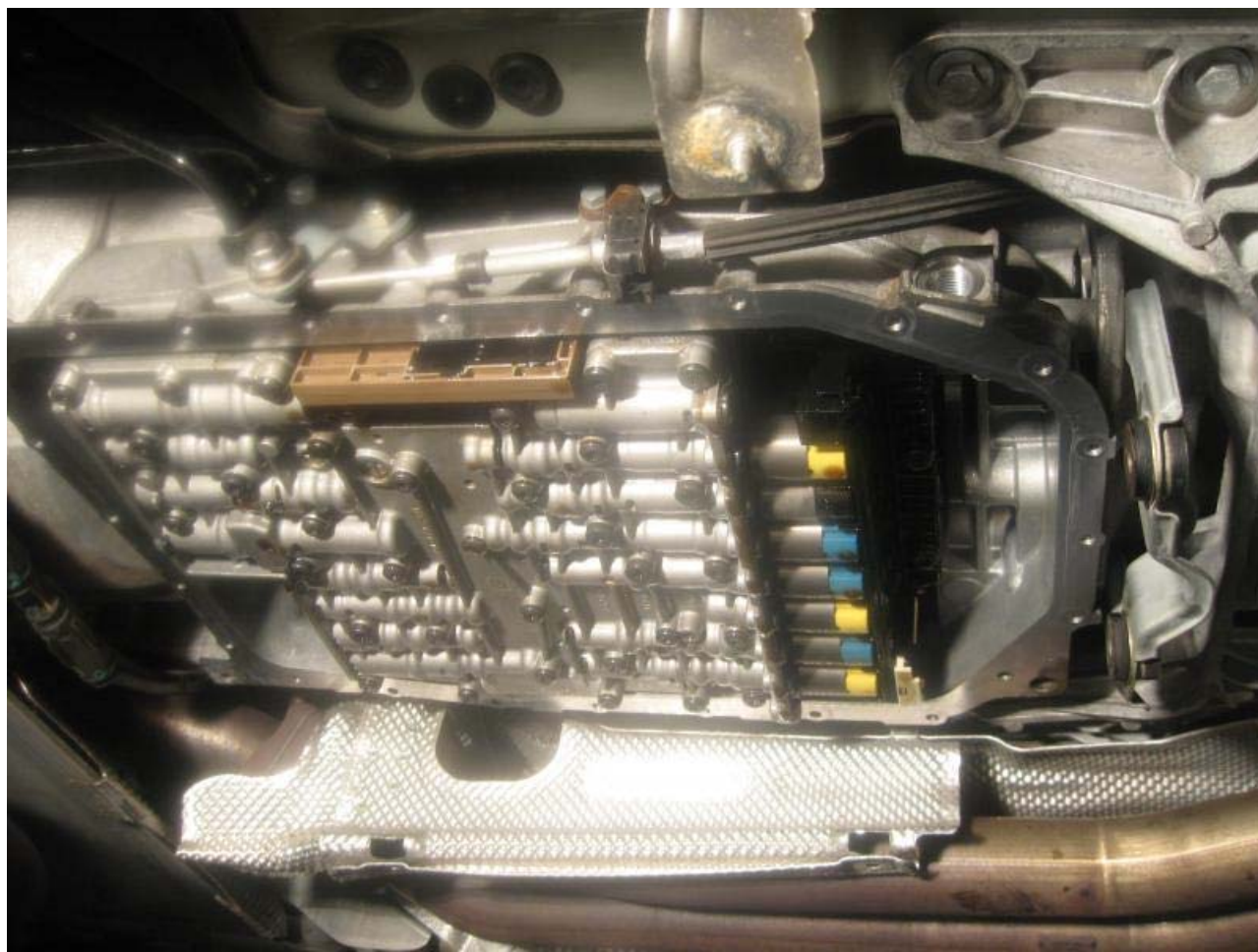


9. Once the oil stops draining, remove all T-40 Torx Bolts. Be careful to angle the pan towards the catch can because some fluid is still left in the pan. Remove pan and drain the remaining fluid in the catch can.





10. Drain all the fluid out of the catch can into empty container to measure. I was able to get 5.5 liters out.







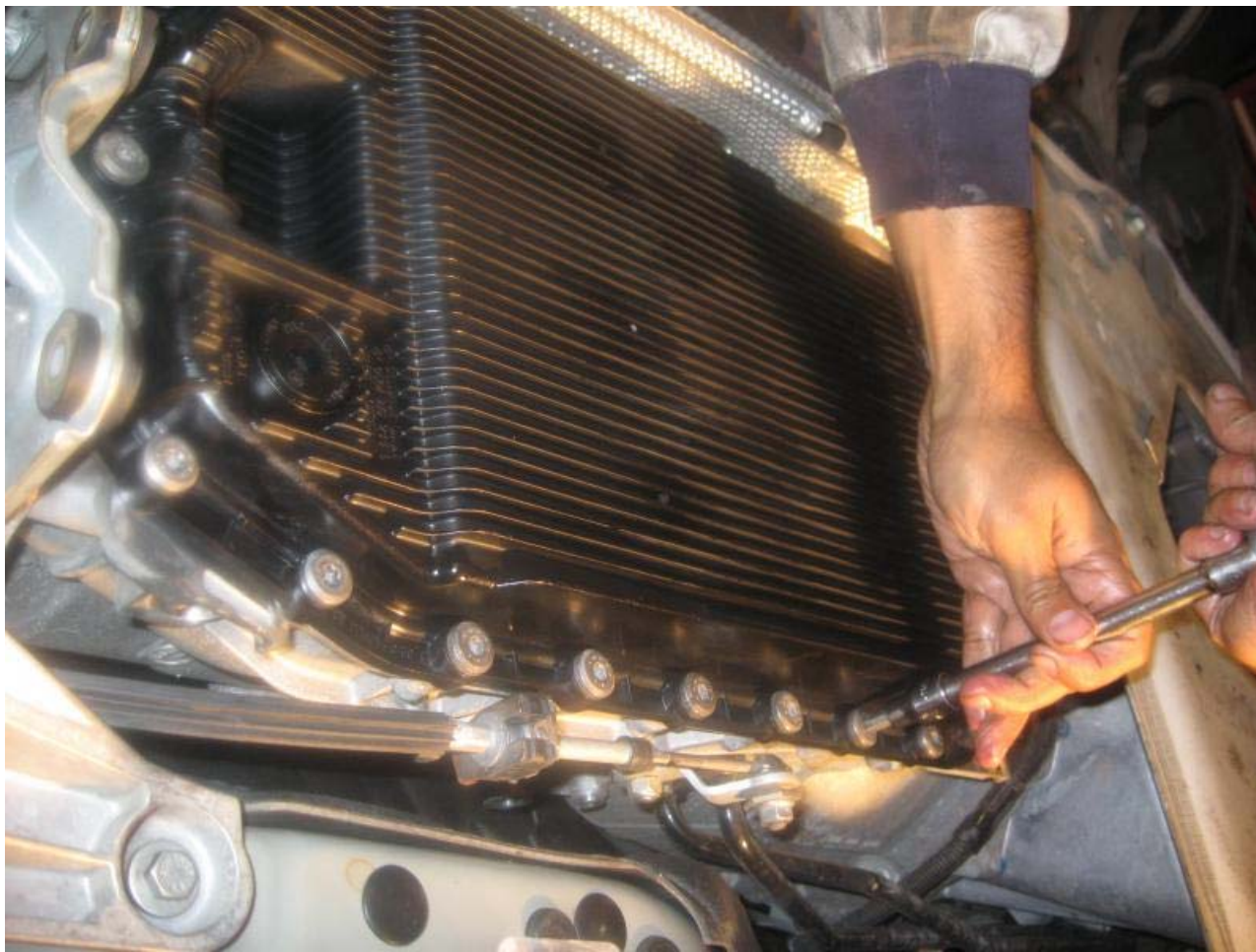


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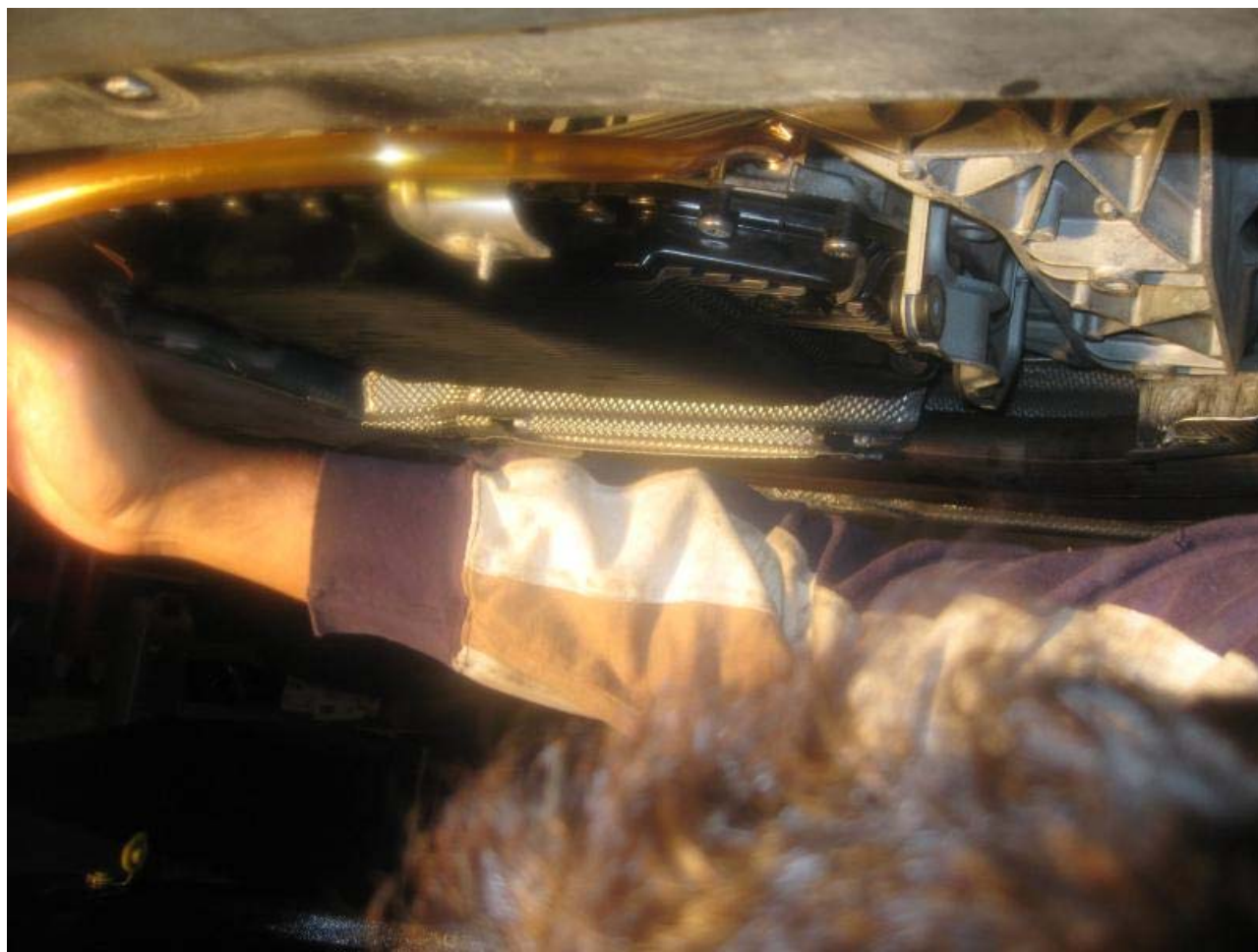
11. Clean pan mating surface and install the new pan. Use a start patterns to torque bolts evenly. Torque specs: 6 lb/ft.

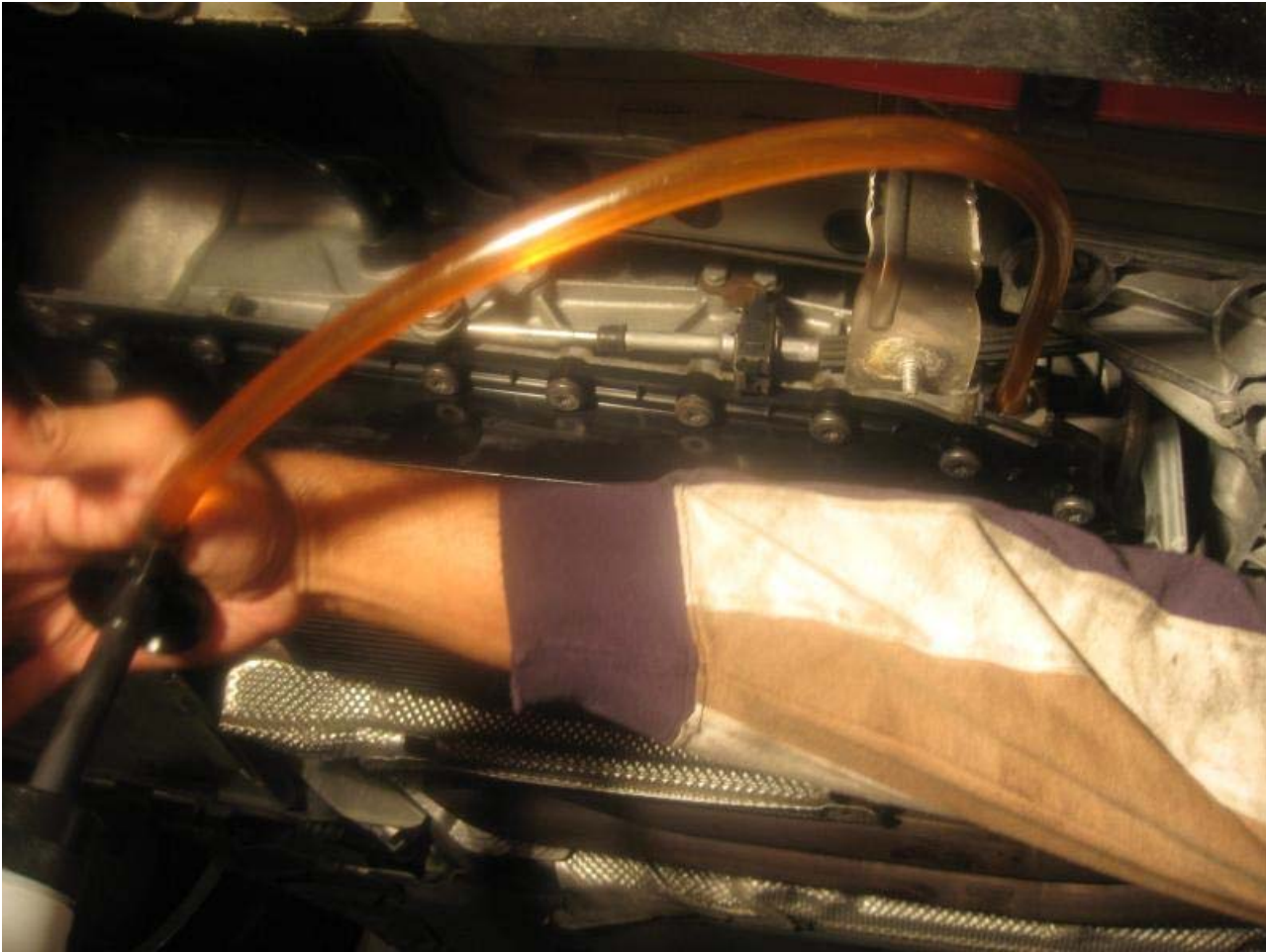




12. Undo filler orifice plug with engine stopped, top up transmission fluid until it emerges from filling orifice (approx 3.5 liters). Install filler cap but do not tighten it yet. Start engine, put on AC to load engine. Select gears with engine running at idle, Select positions R and D and shift through as far as 3rd gear (Steptronic program), keep each gear selected for 3 seconds and then engage the parking lock. Undo filling orifice plug and pump in fluid until it starts to overflow from the orifice. Install plug and torque to 25lb/ft. You should get the full 5.5 liters in using this process. I waited 5 total minutes from when I started the car to let the oil reach proper filling temperatures.

ZF has strict temperature requirements for fill. As per ZF, when adding new fluid while the engine is running, the temperature of fluid should be at 40 deg C. Oil temperature MUST NOT exceed 50 deg C. If the temperature gets past 50 deg C, you must allow transmission fluid to cool down before you start the fill procedure again.





13. Install hanger back on, install transmission mount/vibration damper, rear belly pan, front belly pan. Lower the car back on the ground.
14. Go for a test drive. Car should not hesitate after abrupt slowdowns or after going through fast turns. If the car tests fine, you are done!
15. Congrats. You just added a bit of life to your 6 speed transmission.

Difference between old and new fluid



Disclaimer: I hold no responsibility for any damage occurred from following this procedure or any injuries from it. Proceed at your own risk.
Regards.
Raj Datta

pinguhk

Posted 25 October 2009 - 03:27 AM

very nice post.
Thanks for the write up

Rizbel

Posted 25 October 2009 - 04:42 AM

Thanks. Pictures are great 😊. This is my next maintenance project.

StasGS4

Posted 25 October 2009 - 09:45 AM

Thanks for the DIY!

What kind of a oil/fluid pump did you use to fill the transmission?

968turboS

Posted 25 October 2009 - 10:11 AM

👤 (<http://forums.5series.net/index.php?app=forums&module=forums§ion=findpost&pid=1039982>) StasGS4, on Oct 25 2009, 10:45 AM, said:

Thanks for the DIY!

What kind of a oil/fluid pump did you use to fill the transmission?

I used Pentosin ATF1. As far as pump, they sell these pumps at Pepboys that screw on top of a gallon container. I used an empty windshield washer fluid container. Filled it up with ATF, screwed on the pump and pumped away.

Regards.
Raj

donnu

Raj, Fantastic DIY, Thank you, I will have to do this once I get my new house with Garage..

968turboS

Posted 25 October 2009 - 03:12 PM

You are very welcome guys. My pleasure.
Raj

goodman

Posted 25 October 2009 - 05:37 PM

Now I know why it costs \$800.

lcc014

Posted 26 October 2009 - 09:27 AM

Did mine at 50k miles but did not replace the oil pan. Will do the oil pan replacement @ 100k miles. Thanks for the tip to expose all the oil pan screws.

968turboS

Posted 26 October 2009 - 10:26 AM

↪ (<http://forums.5series.net/index.php?app=forums&module=forums§ion=findpost&pid=1040585>) lcc014, on Oct 26 2009, 10:27 AM, said:

Did mine at 50k miles but did not replace the oil pan. Will do the oil pan replacement @ 100k miles. Thanks for the tip to expose all the oil pan screws.

My pleasure. What was your fluid like at 50K?
Raj

lcc014

Posted 26 October 2009 - 10:31 AM

↪ (<http://forums.5series.net/index.php?app=forums&module=forums§ion=findpost&pid=1040629>) 968turboS, on Oct 26 2009, 11:26 AM, said:

My pleasure. What was your fluid like at 50K?
Raj

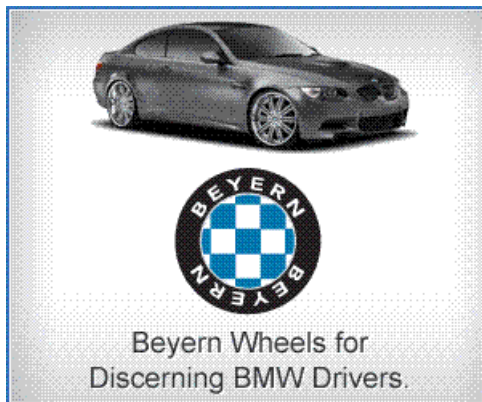
Mine was kind of the same as yours !

<http://forums.5series.net/index.php?showto...1&hl=lcc014> (<http://forums.5series.net/index.php?showtopic=72741&hl=lcc014>)

lightfytr

Posted 26 October 2009 - 03:48 PM

Great write-up! I love this site!!!

5Series

(<http://ad.doubleclick.net/click;h=v8/3c75/0/0/%2a/z;250324806;0-0;0;76378516;4307-300/250;47043079/47059292/1;~sscs=%3fhttp://www.beyernwheels.com>)



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