

Mini Cooper 6-Speed Automatic Transmission Fluid Replacement How-To

Written and compiled by fishbone

Last revised 4/28/12

Background Information

Based on user feedback, I have decided to compile my own write-up notes along with user contributions that I hope overall will be a comprehensive guide to help you change the automatic transmission fluid.

The original discussion which started this guide can be found on the North American Motoring forums here:

<http://www.northamericanmotoring.com/forums/drivetrain-cooper-s/178242-mcsa-tranny-fluid-change.html>

Or by going to the 1st Generation MINIs section, under Modifications, Drivetrain (Cooper S) and looking for the thread called MCSA Tranny Fluid Change.

Special thanks to everyone from the community who has contributed to the effort of sharing their knowledge in the hope that we can keep on motoring!

I realize this is a LOT of text. Don't be discouraged! If you are competent enough to change your own oil, with some extra care and patience this fluid change is a job that you should be able to tackle without any problems.

Read on!

****There is absolutely no warranty, implied or otherwise, that comes with this guide. The final responsibility always rests with you, the vehicle owner****

You will be doing this drain and fill procedure a total of at least 3 times if you want to replace most (about 70%) of the fluid. If you want to put more fresh fluid, do additional drain/fills. There is a total of 6 quarts and you will only be able to drain out about 2.5 quarts at a time. Best thing to do is drive the car for a bit between drain/fills to get a good mix going.

Should you change your transmission fluid?

Let's start with MINI's "lifetime fluid". **There is NO such thing as lifetime fluid!** Sooner or later any fluid breaks down. Mini does not define what lifetime means and no dealer will be crazy enough to put it in writing. Therefore, lifetime means the usable life of the transmission, which means until the warranty is up. So unless you want to treat your transmission as a disposable expensive part, at one point or another you should be replacing the fluid.

The factory is a JWS-3309 type which is nothing fancy; it is a non-synthetic fluid. Any aftermarket multi-vehicle universal synthetic transmission fluid will work just fine as long as it meets the JWS-3309 spec. The fluid appears to be the same as the Toyota T-IV, so if you see that spec as well you should also be OK. For more evidence on this, read the bottom section of this guide. Since the fluid change is so involved and anything BUT straight-forward, it pays in the long run to spend the money on top of the line synthetics that can last a while, such as Amsoil. Most will last 50K miles under severe driving or 100K normal driving. It makes no sense to replace non-synthetic with non-synthetic which will need replacing within 40K miles.

The transmission cannot be flushed like a traditional automatic because it has no front external cooler; it uses a heat exchanger. This is one of the main reasons most shops will refuse to service it. There is no dipstick to measure the ATF or fill through it either. There is NO transmission filter to be replaced, there is just an internal strainer which is not accessible unless you drop the pan, which you should have no reason to do so.

If you want to get an idea what the ATF looked like at 70K miles versus new, here is a picture for reference. Speaks for itself



Here is a picture of the pan to get a better idea. The picture is oriented as if you were looking at the car from the front.



Here is a picture of the drain bolt with the crush washer. After doing the last drain/fill, replace the crush washer for peace of mind and assurance you will not develop an ATF leak. Your dealer should stock it, if not the size in millimeters is 17X12X2.



Here is a picture of the Allen key and stand pipe. **It is plastic. Be gentle. Do not cross-thread or overtorque. Handle with care, etc!** Just get it approximately hand-tight when putting it back on, it's not like it's going anywhere.



Will this fix my transmission?

Keep in mind this is intended to be primarily a maintenance/preventive procedure. If your transmission has suffered damage due to neglect (yes, not changing the fluid is neglect, despite what Mini claims), then no amount of fluid changes will fix it. If your transmission is shifting strangely (slamming gears, slipping), there is a very good possibility all it needs is some fresh fluid to get back to normal operating condition. The transmission needs a few drive cycles to re-adapt the shifting pattern and behavior to the new fluid. Give it time. One user reported it took several drain/fills and driving over a period of several thousand miles to get a transmission that had many miles on the original fluid to perform in a normal manner again. It generally should not take this long.

In my own experience, after the initial few drain and fills, the transmission seemed to shift excessively smooth, to the point that it felt like it was slipping/riding the gears. After a few drive cycles it adapted and settled into a shifting pattern that was even better than brand new.

If you want to skip this re-learning process altogether, your dealer may be able to reset the Transmission Control Module. Any claims that you can do this by yourself by disconnecting the battery are completely wrong. The ONLY way to reset the TCU is by using the Mini dealership OBD tool.

2002-2006 Mini 6-Speed Automatic Transmission Fluid Change Procedure

For all 2007 Minis and newer, skip to page 9

Tools needed:

- Socket extensions
- Allen 5 key
- T-55 torx
- Philips head
- Flathead screwdriver
- Funnel
- Shallow drain pan (preferably with measures on the sides for fluid)
- Rags

Here is a picture of the funnel that works perfect. Found at Walmart, it was ideal because it was very tight against the fill plug and has the right height. If there is ANY room around the fill bolt, you will get ATF to seep out instead of go in the tranny and you will make a mess. The funnel is called Spill Saver by FloTool.



Step 1: Raise your car on stands or a ramp as if you were to drain the oil. The best thing to do is jack up the passenger side as far higher than the right as you can. The goal is to get as much of the ATF to be sitting near the drain bolt, which is at the back upper right corner of the pan.

Step 2: Unclamp the intake duct to give yourself room to get to the fill bolt.



Step 3: Put the torx and extensions together and make your way to the fill plug and take it out. A magnet helps a lot holding it from dropping into the engine bay.



Here is a picture of the drain bolt taken out. Hopefully this will help you locate it in the engine bay



Step 4: Get under the car and remove the plastic undertray. You should now be in clear view of the drain plug, circled red in the picture. Get the pan under it, stick the Allen 5 key on it and unscrew it and let the ATF drain



Step 5: Once done draining, stick the long end of the Allen key into the hole gently until it catches the stand pipe, unscrew it and take it out. You guessed it. The standpipe screws into the pan, then the drain bolt screws in to shut off the stand pipe. Make sense? Careful, a bunch more ATF will gush out. **Important!** Measure exactly how much ATF you got out. In my case, I got a total of 2.5 quarts out. What comes out must go in, in order to maintain proper ATF level from factory. If you suspect you have had a leak or want to make 100% sure you have the proper ATF level (which you should check), then keep reading, this will be addressed lastly. Put the stand pipe back in and screw the drain plug.

Step 6: Time to fill her up! **Don't put the drain plug back in.** This will make pouring fluid a lot faster since air has a place to escape through. Take the funnel and insert it tight in the fill bolt. Make sure that you are not a total brute about it. If you happen to chew up the lip of the funnel, guess where those plastic bits are going to end up! Also, make sure you don't insert it in too much, reason being the actual fill hole is only half open in order to accommodate a special dealer fill tool in order to, you guessed it, make it tough for anyone else to do this. Just enough so you don't spill over.

Pour transmission fluid slowly into the funnel as to not spill over. It drains into the transmission very slow, which is perfectly normal.

Put the same quantity in that you have taken out and you **should** be at the same transmission level. However, **I strongly encourage** that once you are done with all your drain/fills, you **check the fluid level** as per the procedure outlined below.

And that's about it! The total capacity is 6 quarts. I did 2 drain and fills and on the second drain the ATF was still fairly dark. The second drain is what made the biggest difference in shifting for me. I can barely feel the gear engagements now. It is smooth sailing.

2007 And newer Mini 6-Speed Automatic Transmission Fluid Change Procedure By clutchless

Tools and Steps:

Step 1: Raise your car on stands or a ramp as if you were to drain the oil. The best thing to do is jack up the passenger side as far higher than the right as you can. The goal is to get as much of the ATF to be sitting near the drain bolt, which is at the back upper right corner of the pan.

Step 2: These are photos of the tools needed to access the fill bolt: a T55 socket and 3/8 hex cap that allows you to place a box wrench usually 14 or 15 mm on it to open the fill plug. It also helps to have a magnet or finger style grab tool for when you drop the socket trying to place it on the plug and it rolls out of finger reach on the trans. None of these will fit: a ratchet, a T55 curved Allen style wrench, T55 that takes a 1/2 hex cap. There is not enough room.

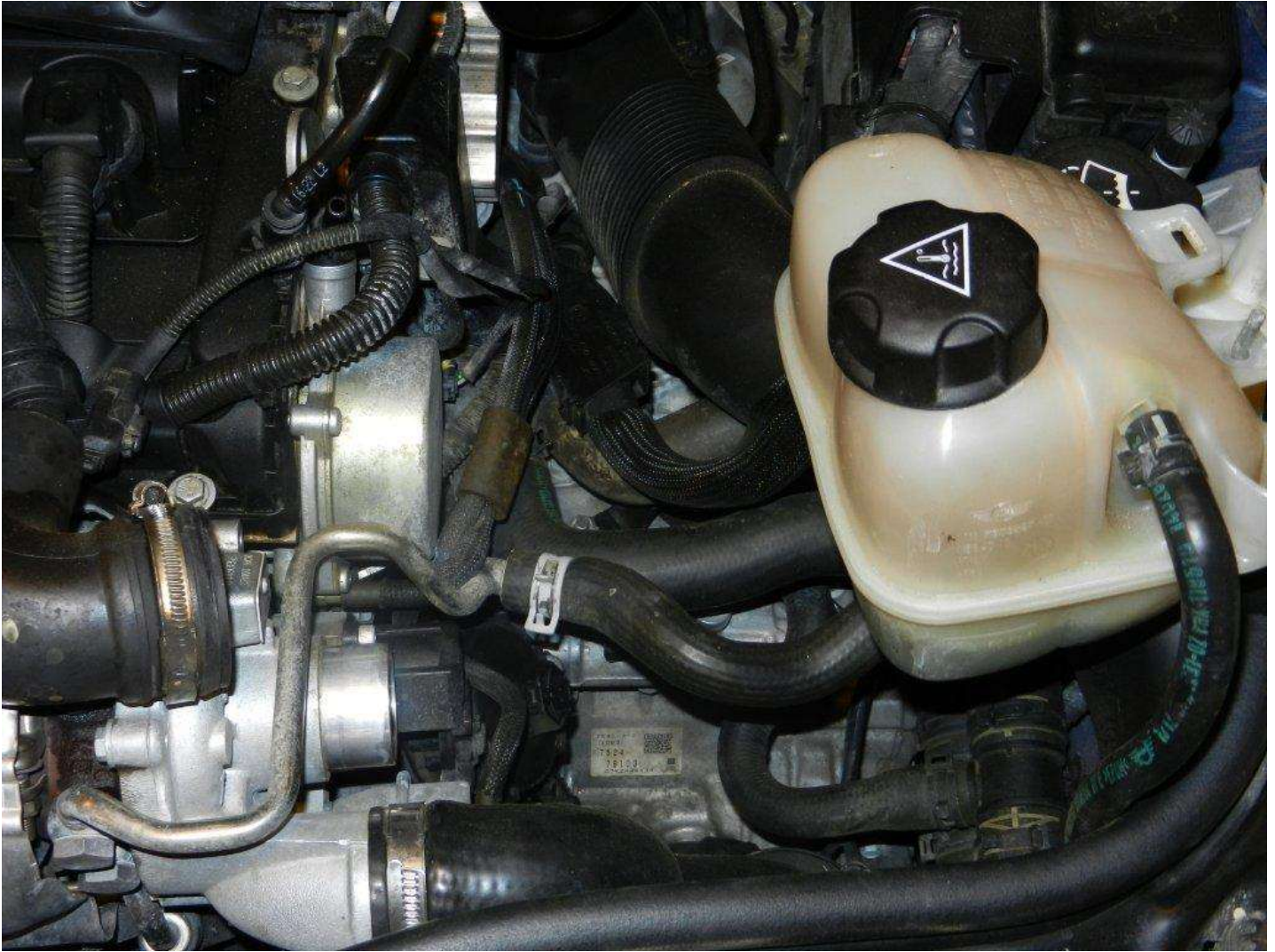




To fill the transmission, you will need a long flexible funnel which is able to bend around the hoses as it is not a straight shot to reach the fill plug. They sell similar type funnels with clear tubing and a funnel on top at Wal-Mart.



Step 3: To access the fill plug you need to remove the air intake hose, remove the 2 hose clamps and twist it over out of the way. I found it helped to remove the coolant overflow reservoir to allow more room to turn the box wrench when removing the fill plug. It is held with an 8mm bolt and I just moved it out of the way with a bungee cord wrapped around the headlight hole in the hood.



This is the fill plug, buried under several hoses and wire harnesses.





The fill plug with the hex cap and box wrench on top. There is more room on the opposite side from where the wrench is in the photo.



Step 4: Get under the car to remove the drain plug, circled red in the picture. Get the pan under it, stick the Allen 5 key on it and unscrew it and let the ATF drain



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How to measure the proper ATF level

This procedure is a LOT easier if you have OBD access to the temp sensor inside the tranny and can take a reading. If not, the directions below SHOULD work just fine. I know this is a wall of text but really, there is no other way to say it without covering it. It's not that hard when you figure out how the pan and the stand pipe works.

1. The car needs to be absolutely cold
2. The car needs to be perfectly level on the ground. The entire fluid level check procedure depends on this. Do NOT overlook this.
3. NEVER have the fill bolt off with the car running! If you start the car with the fill bolt off, it will start puking ATF. I have learned this by staining my garage floor with 3 quarts of ATF which spilled out in a matter of seconds.
4. Take the drain bolt off ONLY. Do NOT take the stand pipe out.
If tranny fluid drains, let it drain until it stops and proceed to next step
5. Grab a kitchen thermometer or any other means to measure temperature
Digital is best because it offers instant reads
6. Start the car. With your foot on brake, go R, N, D pausing at least 2 seconds in each and then from D back to N, R and P.
7. Go back under the car and watch for when ATF starts to run out. Be ready with the thermometer
8. As soon as you see ATF coming out, take a temperature reading of the ATF (NOT the pan) by letting the ATF run over the thermometer. ATF needs to be between 35°C and 45°C, which is 95-113°F.
9. If you see ATF coming out that's at that range, you're good to go. Put the drain bolt back on asap.

Here is the idea. Mini says that at that temperature range the ATF should be at the height of the stand pipe that is inside the drain hole. If it is over, it is overfilled and it will spew out and you'll know it. If it is underfilled, the ATF will never reach the height of the stand pipe and you will never see it drain out. ATF level changes based on temperature

Now that you know this:

- if you see ATF come out right away, it is overfilled
- if you see NO ATF come out after the car has idled for a while, you can touch the transmission pan with the thermometer and see what temp it's at to get an idea if you've waited enough or not. Based on the temperature outside, basically after about 5 to 10 minutes of idling, that ATF by all means should be at the temp quoted above. If it doesn't come out, you are low on fluid. Shut the car off and you have 2 choices.
 - a) You can warm up the bottles of ATF fluid at 45°C/113°F under hot water in the sink and start filling the transmission until you see it start coming out the drain boltOR
 - b) Wait until the car is cold and then top off with cold ATF like above. Keep in mind this will likely get you to overfill it but it should not be by a severe amount AND you can always follow the previous steps to get it to drain.

The transmission is better off being slightly overfilled than underfilled. Keyword is slightly. The question is ... what do you do if you DO see ATF start coming out. Do you let it keep draining until it stops? I submit that I would not do that, and I did not do that because of fear of too much coming out. If it comes out gushing, you are WAY overfilled. If it comes out in a thin drain, you're good, don't

worry about it. As long as the temp is above 35°C/95°F but NOT over 45°C/113°F. you're OK to just put the bolt on and stop.

Helpful information and tips

This is a collection of posts by users that I believe are helpful, including supporting evidence indicating the type of OEM transmission fluid that Mini uses and what it can be replaced with. They are copied/pasted posts from the discussion on the forum. I recommend you read them.

MiniKar:

For those that want replacement parts go to: [Error! Hyperlink reference not valid.](#)

For our Aisin Warner auto-transmission GA6F21WA here are some OEM parts numbers:

Pan drain bolt: Screw plug # 24117570791
Pan drain washer: Gasket ring # 24117570792
Overflow pipe: # 24117551083
Oil pan: # 24117551079
Oil pan gasket # 24117566356
Oil strainer # 24347551087

For those that want to start all over:

OEM rebuilt transmission model # GA6F21WA, part # 24007548536 **\$6,450.35**

Change that Transmission Fluid ! ! !

I don't know of a JWS 3309 that is synthetic. After searching long and hard on the internet, people have offered various points of arguments that led to this:

Mobil 1 3309 = Mini JWS 3309 = Volvo JWS 3309 = Toyota TIV ATF = any trannies built by AW
Furthermore, the 3309 stuff seems to be nothing special, just something very close to Dexron III with a more robust make-up and specced limited slip behavior.

They are all dino, none are synthetic

The supplier of ATF in the US, I have gathered, is one and the same for the Aisin-Warner trannies and each manufacturer buys and labels the ATF to their own needs. At the Toyota dealer the stuff is around \$6, the Mini dealer wants \$30 a quart. Go figure.

BlimeyCabrio:

1st drain: 100% old fluid

2nd drain: ~58% old fluid

3rd drain: ~34% old fluid

Now the car has less (more like 20% old fluid)

The reason 1-2 and 3 are slammy is because of the gear ratios and the type of load the engine sees. If you accelerate grandma-mode, you won't feel the shifts. There cannot be a significant difference between Sport mode and normal because that would involve significantly higher line pressure, which isn't really possible to do without some serious mods.

Mobil 1 ATF is superior to both OEM and 3309. It is synthetic and multi-vehicle, meaning it will meet the specs of Mini.

To keep it short, 3309 is more than likely oem, which is more than likely Toyota Type 4 ATF, Volvo OEM etc. Same fluid but the price varies wildly depending on which dealership you want to rape you. I've done exhaustive research on this topic because I did not want to gamble with my transmission either.

Mobil 1 synthetic has worked great for numerous Minis including my own. As long as the bottle still says it meets 3309 spec you are golden. It used to say this on the quarts when I bought it, I no longer see it listed.

Either way, the oem stuff is junk.

They define lifetime as the life of your warranty.

Mobil 1 ATF at least is guaranteed to last at least 50K miles under the severe driving conditions which I would think a Mini applies for sure. With the OEM stuff, your guess is as good as mine, I would not use it more than 30K miles. Ever.

Folks on www.bobistheoilguy.com have had success using the following synthetic ATFs in Aisin-Warner automatic transmissions that call for Toyota T-IV fluid: Redline D4 , Amsoil and Royal Purple. All state they are compatible with Toyota T-IV and JWS 3309.

Here's some nice proof, courtesy of Mazda, that the fluids are the same. Per Mazda bulletin:

The 2005 Mazda6 with V6 engine and the 6-speed Automatic Transaxle (ATX) requires a special type of Automatic Transmission Fluid (ATF).

The Aisin Warner produced 6-speed requires ATF type JWS3309 produced by Mobil and Exxon.

This new fluid is NOT compatible with any current fluids offered by Mazda such as Dexron II/III, Mercon or Mercon 5. Any mixing of JWS3309 fluid with Dexron II/III, Mercon or Mercon 5 will cause internal ATX damage and/or shifting concerns, even if just topping off the ATF during PDI.

At this time, JWS3309 ATF is not available through Mazda, but can be purchased from the following sources using their fluid part numbers listed below:

MFG. Part Number

Ford XT-8QAW

Volvo Volvo 1161540

Toyota T-IV

Mobil JWS 3309

GM GM 9986195

wkp1219:

soi went to change my ATF today and noticed that I have a larger drain plug in addition to the smaller one on the pan. it is located right under where the axle shaft exits the tranny. I pulled that plug first and got out approx 3 quarts of fluid then pulled the smaller one on the pan and plastic riser tube and got out another quart for a grand total of 4 quarts! that part was easy. the filling took forever as you all know that fill hole is tiny so as that was filling I made myself useful and put new bushings in the lower engine mount.

I never heard anyone mention this other larger drain plug, my MCSa was built 10/06 so not sure if something changed during that build period???

jimmycorn:

Found the crush washer at NAPA for \$1.39. It's a 12x17x1 whereas the original OEM is 12x17x2mm. In my pic above, the OEM is the top silver one, and the one I used is the 2nd copper one. I just stacked 2 of them and it seems to be holding fine...

clutchless:

I found this letter from Valvoline on a BMW forum where they state it is compatible with Toyota TIV (which is our fluid), however since TIV is about \$4 or \$5 at a Toyota dealer, I wonder if Maxlife is any cheaper than the real thing? I used Mobil 1 Synthetic on mine.

THOMAS R. SMITH Technical Director, Valvoline Brand July 1, 2005 To Whom It May Concern:
Valvoline has received several inquiries regarding the topic of MaxLife ATF and its use in various vehicles beyond those requiring DEXRON®-III or MERCON® approved products. In response to these questions Valvoline has issued the following statements: Valvoline supports the use of MaxLife ATF in a broad range of transmissions beyond those requiring DEXRON III and MERCON fluids including those where the following fluids are recommended: • GM DEXRON II • Ford MERCON V • Allison C-4 • Chrysler ATF+3 or ATF+4 fluids • Toyota (and Lexus) Type T, T-III or T-IV fluids • Mitsubishi Diamond SP-II or SP-III fluids • KIA SP-II and SP-III Fluids • Hyundai • Honda/Acura ATF-Z1 fluid (except in CVTs) • BMW LT71141 or LA2634 fluids • Nissan Matic-D, Matic-J, and Matic-K fluids • MB Sheet 236.x • Volvo 1161521 and 1161540 • JWS 3309 • GM 9986195 • Audi G-052-025-A2 • VW TL52162 Valvoline has conducted in-house testing to support MaxLife ATF performance in these transmissions. However, it is important to note that these vehicle manufacturers have neither evaluated nor approved MaxLife ATF. Valvoline stands behind all of its products, including MaxLife ATF. Use of MaxLife ATF in transmissions where recommended by Valvoline WILL NOT void the vehicle's warranty. In the unlikely event that any transmission was to be damaged as a result of the use of MaxLife ATF, please contact Valvoline at 1-800-Team-VAL. While MaxLife ATF is designed to meet the special needs of higher mileage transmissions, new transmissions can also benefit from its enhanced oxidation protection, shear stability, seal compatibility, and anti-shudder protection and many consumers have chosen to take advantage of this level of performance. MaxLife ATF is recommended for the new 5 and 6 speed transmissions, except the Ford 5R110, Ford 6RXX, and the Mercedes Benz W7A700 (7G-Tronic) which all require a low viscosity ATF fluid. Valvoline does not recommend MaxLife ATF for use in continuously variable transmissions (CVT's) or in automatic transmissions where Ford Type F is recommended. Sincerely, Thom Smith Technical Director, Valvoline Brand Valvoline, a division of Ashland Inc.

The system total has about 6 quarts, give or take. I'm too lazy to do the math but I am thinking you're around 80%? I added a little bit of info in my previous post.

Here is my math on 3 drains.

So on first change, 3.5q original, 2.5q new (41.66% new)

On second change, 2.5q fluid is drained, out of which 41.66 is old and 41.66 is new, remember the fluid has mixed. So out of the 2.5 fresh quarts we initially put in, 1.041585 are actually fresh.

Third change, you add 2.5q of fresh fluid, so you have a total of 3.9585 of new fluid total in the system.

The final concentration is $3.9585 \times 100 / 6 = 65.97\%$ new, 34.03% old.

In my case, I started the car up with no fill plug attached, the car puked a quarts of fluid before I shut it off so really I put in 6 quarts fresh fluid :D I still don't have 100% fresh fluid but I should be darn close.