**Oil Tank**

See the Two Easy Alternatives below if you are ONLY Changing the Oil. The following procedure must be carried out however, if you doing the Oil AND checking the Valves.

1. Place bike on Centerstand. Start the bike, allow it to reach operating temperature (the fan should cycle on) [Ed: Or, you might actually RIDE it] Turn bike off.
2. Remove seat. (The seat is removed by first removing the little, locked [cover](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/RearCoverGS.jpg) at the rear of the bike, which exposes a latch. Pull on the latch, and then lift the seat off)
3. There are seven stainless steel Torx-head screws that need removal or loosening so that the **left panel** of the faux "gas tank" can be removed, exposing the oil tank. (The oil tank is hidden underneath the "gas tank," and is the item to which the black [oil filler cap](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilCapGS.jpg) on top of the "gas tank" screws on to) (For the uninitiated, Torx is the trademarked name for a star-shaped screw head)
4. Six of the seven Torx screws are removed, and one is loosened. Remove the following: the [left-most screw](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/LHSPanelRearScrew.jpg) that is exposed when the seat is removed, the [screw at the front](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/FrontScrewLHSPanel.jpg) of the "gas tank" slightly forward of the black filler cap, and the four screws that go through [the silver-colored plate](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/RHSBlinkerMountingPlateGS.jpg) (This Picture shows the RHS one, but is similar on the Left) to which the left front turn signal is attached. When these last four are removed, the turn signal will hang. That's OK. You can also [unplug the turn signal wire](http://faq.f650.com/GSFAQs/Photos/TankOffPhotos/CanUnplugtheIndicator3.jpg) (Just squeeze the black tabs at the sides and pull gently) if you want and [remove it completely](http://faq.f650.com/GSFAQs/Photos/TankOffPhotos/CanUnplugtheIndicator2.jpg) from the bike (very good idea).
5. The [seventh screw](http://faq.f650.com/GSFAQs/Photos/TankOffPhotos/7thScrewLoosenOnly.jpg), which merely needs to be loosened, is underneath the panel, about an inch behind the rear-most portion of the front beak-like fender.
6. Remove the oil filler cap. The panel can now be lifted up and off the oil filler neck. The lower part of each "tank" half fits in a [rubber grommet.](http://faq.f650.com/GSFAQs/Photos/TankOffPhotos/PullLeftFrontLowerGently2.jpg) Be gentle or you will break the [male fitting on the panel](http://faq.f650.com/GSFAQs/Photos/TankOffPhotos/PullLeftFrontLowerGently.jpg) ! Use Vaseline on the grommet before installing the panels and assembly/disassembly will be easier next time. There is a relatively tight force-fit between the panel and neck, just use gentle pressure and it will come off.
7. The [black oil tank](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilReservoirGS.jpg), which has fins built in, is now **visible**. The tank needs to be removed from the bike so it can be tilted, to enable a complete draining or you can just put the bike on the sidestand which will give it enough lean to get pretty much all of it out. If you do not want/need to remove the tank, skip step 8 and part of 11. (Thanks to Paul).
8. First, loosen the [bottom-most bolt](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilTankDrainPlug.jpg) on the tank. (It is a hex-head.) **This is a drain bolt.** You want to loosen it and then re-tighten it finger tight so that it can be removed without too much difficulty once the tank is off the bike.
9. The tank is attached to the bike at three places: one is a [bolt](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/RHSOilResTankBolt.jpg), the other two places are [C-clips](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/LHSCClipOilTank.jpg). Dislodge the clips using a screwdriver. Note that under each of the [C-clips](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilTankLHLowerClip.jpg) is a [black washer](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/ClipsWasherRemoved.jpg), which you should also remove, so as not to lose them. Then remove the uppermost bolt, which holds the tank against the air-box. Take care not to drop the [black plastic spacer](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilTankRHUpperBoltSpacer.jpg). The oil tank should now be free from the frame. **Take CARE removing the top bolt and when you put it back, do NOT overtighten or it will** [**Pull Out of or Rotate in the Airbox**](http://faq.f650.com/GSFAQs/Air_Filter_LocationGS.htm#Rubber%20Grommet/Insert%20Pulled%20Out%20of%20or%20Rotates%20in%20the%20Airbox)**!**
10. Remove the previously-loosened [drain bolt](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilTankDrainPlug.jpg), and allow the oil to drain into a receptacle. (A long funnel may be useful in directing the oil flow.) Tilt the tank to assure that it is dry. **Alternatively if you're only changing the oil and don't need to take the cover off for anything else:**  **Easy Alternative #1**  OK this may not be earth breaking news or anything like that but I did not want to remove the "tank cover' and pull out the oil tank. I admit I'm lazy and the thought of removing that stuff makes me mad, they (BMW) can not put in a remote drain, (winter project). Went to the local auto store to get oil and picked up a hand pump for 10 bucks. Put the hose in the oil tank and the other hose end in the bucket and started pumping, two minutes later the tank was empty. OK some will say I did not get all the oil, how much oil is still left in pockets that don't drain. I can live with the thought that a few table spoons eluded capture. Thought it was of interest. **Thanks to Tom#1089   Easy Alternative #2** Remove the oil tank from its mounting to empty it. Just remove the drain plug with the Dakar on the sidestand and catch the oil in a milk jug. ECho
11. After the oil has drained, reattach the tank to the frame. Tighten the upper bolt to 9 nm. (Or if doing this by feel, "not too tight, not too loose). **NOTE!** The Rubber plug in the Airbox that the Upper RHS Oil Tank Bolt goes into can turn in the Rubber Grommet in the Airbox and the Brass insert is pretty thin, so **don't over torque it when you do your Oil Change.** See [**Oil-tank bolt-grommet Pulls Out of or Rotates in the Airbox**](http://faq.f650.com/GSFAQs/Air_Filter_LocationGS.htm#Rubber%20Grommet/Insert%20Pulled%20Out%20of%20or%20Rotates%20in%20the%20Airbox)The other place where they use a similar arrangement is the Airbox Drain, which leaks oil past the Rubber Seal, down along the outside of the Drain Tube. Great. I couldn't tighten it any either. What's wrong with a cast Plastic Nipple like the Classic?. I've never over-filled the Oil, nor dropped the bike, so [oil coming up into the Airbox](http://faq.f650.com/GSFAQs/Air_Filter_LocationGS.htm#Oil%20in%20GS/Dakar%20Airbox) is a bit of nuisance, especially with that dreadful Drain Arrangement.   **Looking for where this goes?** **Q.** A black metal spacer, about 1/2 inch thick by 3/4 inch diameter with a 1/4 inch hole in it fell out of someplace. I know the black plastic housing the air filter goes in was off and I think I was removing the coil from the plastic cylinder head cover when it fell out. Could not determine where it came from. Any one know? **A.** There's a (black plastic) spacer between the oil tank and frame!
12. Then replace the two clips. The drain bolt must be replaced, using a new crush washer that comes with the kit. Tighten the bolt to 21 nm, which is fairly tight; the washer will actually be "crushed," hence its name.
13. Slide the previously removed body panel over the oil tank filler neck, engage the panel into the middle panel that is still on the bike, and replace the six Torx-head screws. Tighten up the screw that was merely loosened, making sure the panel is engaged on top of it. Then replace the oil tank cap so stuff doesn't land inside the tank while you work on the other two areas.

**Crankcase**

1. Remove the bash plate. That is the silver (apparently aluminium) plate at the very bottom of the frame, containing three triangular holes. The plate is attached to the frame with three Torx bolts. Remove all three, and then remove the bash plate. [Front Bolt.](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/BashPlateFront.jpg) [Lower bolts.](http://faq.f650.com/GSFAQs/Photos/FrameFairingPhotos/BashPlateUnder.jpg)
2. The [**drain plug**](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/GSOilDrainPlug.jpg) is at the very bottom of the crankcase, in the middle. (There is a similar looking plug off to the side. Leave that alone. The drain plug should have a black label saying "Made in Italy" and " [magnetico](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/GSDrainPlug.jpg)" or something like that)
3. Place your oil receptacle directly under the drain plug. Then remove the plug using a 24 mm or 15/16" socket. The oil will drain out. It should be hot or warm. Gloves are recommended.

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| 1. **Direction To Unscrew Oil Drain Bolt**
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| 1. Many people have trouble trying to figure out which way to unscrew the oil drain bolt. Always keep in mind: the F650 bikes do not contain any reverse threaded bolts. In other words - clockwise will tighten a bolt, and anti-clockwise will loosen a bolt. The following things may help you work out the correct direction:
	* Lay down on your back looking back up at the oil drain plug
	* Use a ratchet on another bolt first. Once you know what direction on the ratchet is correct to loosen the bolt, change to the 24mm socket.
	* I use a ratchet and I set the direction by holding the socket in my left hand and trying it. That way it can turn only one way whether it is upside down or right side up. (thanks to *norbrat*)
	* When you removed the bash plate bolts, keep track of the direction you used for the two bolts under the bike. Unscrewing the oil drain bolt is the same as unscrewing the bash plate bolts.
	* If you are unsure - ask a competent "friend/mechanic".
2. You are better off waiting five days for a "friend/mechanic" to show you the correct way to do it, than damaging your oil drain plug / engine cases. Also see the note regarding Sump Plug Removal on a GS/Dakar, below.
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1. While the oil is dripping, [clean off the drain plug](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/GSDrainPlug2.jpg), and especially the little metal filings that have adhered to the "magnetico" portion of the plug.
2. After the [oil stops dripping](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/SumpDrainLocn2.jpg), (note the Mesh Filter in the Picture) replace the drain plug, making sure to use a new copper ring. The torque spec is 40 nm, which is "nice and strong." Don't over-tighten it, or you'll have a job getting it off again. See the [Classic Sump Plug FAQ](http://faq.f650.com/FAQs/Sump_Plug_FAQ.htm) for ideas on what to do if you do not want to over tighten it, but don't want it to leak or worse, come off.
3. Reattach the bash plate, using the three bolts. The torque is 9nm.

**Oil Filter**

1. To access one of the bolts on the [oil filter housing](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilFilterCoverGS.jpg), you need to remove the [plastic sprocket cover](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/GSDakarOilChange.jpg). This is the item that says "650" on the right side of the bike. There are three Torx bolts attaching the sprocket cover to the bike. Two are on the bottom, and one is recessed, going right through the cover. Remove all three bolts and the sprocket cover will come off.
2. The oil filter cover sits right above the sprocket cover. It is circular and is about 4 inches in diameter.
3. Before removing the oil filter cover, dislodge the black wire underneath it, first [studying how it is routed](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/EarthwireunderOilFilter.jpg). **This is the neutral indicator wire.** It should be dislodged because oil is going to spill out of the filter housing when you remove the cover, and you should try to avoid dousing that wire with oil if possible. (A little bit doesn't hurt, so long as you mop it up). If you cover it sufficiently with a cloth, dislodging it is not absolutely necessary. Arrange a Cloth under the bottom of the filter cover, out over the edge of the bike.
4. Remove the three Torx bolts that are equidistant around the perimeter of the oil filter cover. As you are loosening the third one, oil should start leaking out. BMW sells a tool that engages on the frame and supposedly directs the flow of oil neatly into your receptacle. (Tool no. BMW 11 7 511). The part is a small trough that hangs off 3 little pins under the oil filter cover. It directs the oil away from the frame so you can put a catch it in a receptacle. When I asked my dealer how much it cost he told me "about $68" Sixty-eight bucks!? Never mind...See Oil Drip Tray Alternatives below. Anyway, remove the third bolt and pull off the cover. **NOTE! The '05 and maybe later GS has ONE extra bolt. It is one of the connectors for Jump-Starting the bike.**
5. After sopping up the errant oil, remove the filter by pulling it straight back. (You may have to use a tool to encourage it to leave its home) After the filter is removed, clean the filter housing using a clean, lint free cloth.
6. Inside the filter cover is a black rubber o-ring. Pry it off with a screwdriver. Coat the new o-ring with fresh oil, and place the O-ring over the cover.
7. Coat the rubber ring inside of the new filter with fresh oil. Press the new filter into the filter housing. The hole in the filter, of course, must face the bike. There is a protrusion onto which the filter will seat.
8. Reattach the filter cover using the three bolts. The torque spec is a "not-too-tight" 10 Nm. **NOTE! The '04 and maybe later GS has ONE extra bolt. It is one of the connectors for Jump-Starting the bike. Do NOT Torque this bolt to 10Nm! If you do, it will break, like this one!**
9. Re-route the neutral wire as you found it, if you dislodged it.
10. Re-attach the "650"- emblazoned sprocket cover. The spec is a hand-tight 2 nm.

**Refilling (with new Oil)**

1. Remove the oil filler cap on the "gas tank" and pour two liters of oil inside. Start the bike and let it idle for thirty seconds. (This forces oil to circulate and lowers the level in the oil tank.)
2. Add another 0.3 liters of oil.
3. Replace the seat. Replace the "glove compartment" cover.
4. In order to get proper readings from the [sight glass](http://faq.f650.com/GSFAQs/Photos/EnginePhotos/OilSightGlassGS.jpg), you need a good ride of a few miles to get things circulating and settled. You may find that you need to add another 0**.**1 liter if you like the oil to be at the maximum of the sight glass, rather than in the middle.
5. Clean up.

**SECTION 2: MISC QUESTIONS AND PROBLEMS**

**SUMP PLUG REMOVAL ON A GS/DAKAR**

Lots of people have had a lot of problems removing the Sump Plug on the Dakar. Dealers seem to do them up VERY tight. As the head is not that DEEP, and many sockets have a Bevel at the Leading edge, the real hex part of the Socket starts only 1-2mm into the Socket. In order to stop rounding the corners of the NUT, consider the following.

* Use a SIX sided, not a 12 point Socket.
* Use a Breaker Bar for Leverage.
* You can always have the socket machined down at a machine shop to remove that bevel completely, making it into a shorter socket (that's one way to make the special "low overhead socket" for the steering head nut). *Marty #436-Chicago-97 F650F*
* If you are willing to butcher a socket, you can just grind it down. It probably does weaken the socket somewhat, don't expect a warranty. *Todd #389.*
* Track down the nearest Snap-on truck and get a six-point flank drive socket. These have a relief in the corners of the hex so that they rest on the FLATS of the bolt head, not on the corners. They will absolutely remove any hex head fastener, no matter how rounded the corners are. Will probably cost $20, but cheaper than ruining the plug. You may be able to order from [www.snapon.com](http://www.snapon.com/), but would have to pay S&H. *Chuck#1124*

**Experiences:**

* Some owners (including me) have noted that the sump plug is often over-torqued beyond belief from the factory, and easy to round. Use good tools, including a six-sided socket or box-end wrench. This seems to be a chronic problem on the GS's. My first oil change attempt resulted in a trip to the dealer when I couldn't get the darn thing off. Ended up putting a new sump plug in, just to be careful. Last oil change, I was in my dad's workshop, and he had a box-end, 6-sided 24mm wrench with a breaker bar attached. I have no idea where he got that, cuz I had a hard enough time coming up with a 6-sided 24mm socket. Came right off, and it never felt like it was about to let go. Now if I can just get that wrench "liberated" from his toolbox.. *Robin #79*
* In my first attempt at an oil & filter change on my 2002 F650GS I bunged up the oil drain plug. The soft metal is now pretty much rounded off. Can't get a good angle on it with a Vice Grip. Any other suggestions on how to remove the drain plug? I realize I must get a replacement drain plug. Problem started when I put a 12 point socket on it (Bad Idea) instead of a six sided socket. I'll buy that too for the next time. *dAnal #1159.*
* I have changed the oil twice now in my 01 F650GS and both times the drain plug was very tight even though I torqued the bolt to spec. I use a pipe the goes over the end of the socket wrench for extra leverage for removal of the drain plug. I also wedge my foot between the socket wrench and floor to ensure that the socket does not dislodge of the drain plug. *Rodger#1046*
* Just bought a 2001 F650GS sight unseen from Perth over 3000km away. ......As a matter of policy, I changed the oil as soon as I got the bike. The sump plug was on very tightly - in fact I rounded the corners of the plug off - yes I was using the correct socket. What saved the day was one of those Metric sockets that work on the flats rather than the points of a plug or bolt. Will use one all the time from now on. A friend who has worked extensively with aluminium says aluminium into aluminium is a no-no, and was quite scathing of BMW for doing this. Dealer is sending a new plug - his mechanic admitted that they have from time to time had to hammer the next size down socket onto the plug to remove it. *Rick*
* I've had it with the aluminum foil sump plug on my GS. I've now managed to complete 4 partial oil changes on my bike as I've never been able to get the damn thing off. Does anyone make one that isn't made of Nerf metal, or one that accommodates a different tool? I find that the negligible depth of the nut head makes it very difficult to grip with conventional socket/wrenches. Frustrated. *Andre Whistler, BC #1119*
* Are you using a SIX sided socket? If not, get one. Are you using a breaker bar? If not you can get a good one at an auto parts store for about 10 bucks (about 70 Canadian, right!!!). Get a long bar. Mine is 18 inches and works like a charm. My method (while laying on my back on the left side of the bike) is to put my right hand on the actual (6 sided, not 12)socket and hold it on the bolt. With my left hand I push on the end of the breaker bar toward the front of the bike and it comes instantly loose. I then re-torque to 40 nm, which is factory spec. I have heard of people getting confused with the upside down bolt and accidentally over-torquing when they think they are loosening. Is your bolt stripped or over-torqued? I got my slightly used GS with a bolt that had been over-torqued and then stripped. Once I got it out, all has been fine. *Denver Jim.*
* Just like Denver Jim says, use a breaker bar and the right socket. When it comes loose it will feel as if you broke it off. Just one big "tink" and it's loose. BTW-The technical term for the "Nerf metal" is "Softium." This special material has been used on both motorcycles and bicycles for almost a century. *Rod, CO '02GS*
* Can you use a file to modify the bolt head to give you more purchase (fit deeper into the socket)? Also if its buggered you might be able to file the head down to the next size down or to a closer SAE size. I have literally hammered sockets onto bolt heads. I wouldn't do that here because of the case, though light tapping should be OK. I guess you could also sacrifice a socket and use JB Weld or some Proto-Poxy to just glue the socket to the bolt head. Anything for more friction. Have you tried to loosen it while its cold? Maybe expansion is an issue. I'm just guessing here. *Chris in Santa Cruz, CA #782*
* Even if it is a 6 sided socket (the only thing to use on a bolt like this), I have noticed that different sockets can have different dimensions on the opening lip. Some are very rounded, making them easy to slide on a bolt, but not suitable for a shallow bolt head such as this one. Try to examine and borrow some other brand of 6 pt sockets and see what I mean. Find one with a tighter precision lip, less rounded on the inside edge. I'm looking at a dozen different socket sets of 3-4 quality brands, with 3-4 generations of replacements. There's an amazing difference in the same Craftsman socket over 30 years, let alone between the same size Craftsman vs. an SK or Snap-On. *Todd #389*
* After my friendly Costa Rican mechanic had over tightened the engine oil drain plug on my 2000 Dakar, Gerry and I had extreme difficulty in removing it, taking a corner or two of the head and eventually requiring an air wrench. I contacted (the dealer) to enquire about getting a new one, and after a lengthy pause from the first person I talked to, was told she couldn't see it on the fiche, and was I sure about what I was asking for. I asked if she could talk to one of her mechanics, explaining that this part is the one on the underside of the motor which you take out to drain the last of the oil. A guy came back to the phone and categorically informed me that no such part exists, and that the only drain plug is the one for the oil tank / reservoir on the top of the bike. I tried explaining again, but he was just not getting it, and in fact he was getting quite pissed with me. I said " I can't really believe I'm hearing this, but thanks anyway". I phoned the competition at another BMW dealer, and I had the part number 1 141 76 529 39 within seconds. *Jaz #1126.*