Audi UrS4 Clutch Replacement, by Chad Toblin & amended by Jerry Scott, 5-09, Rev 3

Part 1:

I've gotten a few requests for a write up on this so here is part 1. More episodes to follow.

This procedure is for doing an S4 clutch change with the car on the ground elevated on jack stands. This write up is not intended as a substitute for the Bentley service manual.

Parts: Clutch kit (Clutch disk, pressure plate, throw out bearing, pilot needle bearing and alignment tool with splines) . Other parts: CV joint gaskets (dealer only $4ea.) and 6 bolts with nuts to replace the ones from the downpipe to the cats. Optional parts: Rear crankshaft seal, trans input shaft seal, driveshaft flange seals. All of these are a piece of cake with the trans out so now's the time!

1) Loosening the bolts: First off remove the exhaust, middle cross member and heat shield. (*Also you should remove the exhaust mounts from the bottom of the trans. This will prevent damage to the mounts later by the trans. jack. - JS)* I left the down pipe in place. Probably be easier with it out. There are 9 (*I found there to be 11 bolts, including the two long starter bolts. - JS)* different kinds of bolts on the bell housing. <u>You need to mark them and where they go</u>. *(Mark a number on the bolt head and mark the same number on the bell housing. Since there are a lot of extra holes in the bell housing, this will prevent confusion when reassembling -JS.)* The Bentley has a diagram but it's easier if they're marked. I bought a 4 dollar organizer at Lowes to put all the parts in as I took them off and marked them. If you're doing this on the ground you need to jack up the tail of the trans to get to the 2 bottom bolts that are blocked by the sub-frame. The starter is held in by the bell housing bolts as well. Just prop it somewhere out of the way. (I hope you disconnected the battery!)
2) Driveshafts: Remove the cover under the passenger side drive flange. Drive shaft positions should be marked with a paint marker or chisel. The half shafts need to be loosened with 12 point star bits NOT torx. These are available at most Auto parts chains. These are not that hard to break loose. Tie these up and out of the way.
   The rear driveshaft cover is held in place with spring clips. Just pry them off with a screwdriver and pull it off. The rear driveshaft is held in place by 6 mm allen head bolts that are red Loctited on. These must be heated with a torch to break them loose. (*I heated each bolt head with a very low flame propane torch for 25 seconds. – JS)* Make sure that the allen bit fits in there tight! Once you get the driveshafts all loose put some plastic bags over the ends to keep the CV joints clean and to keep the grease from getting all over the place. Don't take all of the bolts out of the bell housing yet.

2) Removing everything else: Get a jack under the front of the motor or make something like the special brace shown in the Bentley. Jack up the front of the motor.
   Shift linkage: Mark the position of the linkage with paint or tape or whatever. This will save some adjustment later. The Bentley says to put the trans in third gear then loosen the linkage bolts and pull the shifter back in the direction of fourth gear. If you want to save a couple of hours of struggling with this just unbolt the linkage from the trans. at the bell crank Remove the mounting flange from the passenger side of the trans. This will make it easier to get to the linkage and the slave. The bell crank linkage is attached to the trans with a chrome hooded nut right next to the slave. It can only go back on in one position so it's not a big deal. (*It's easier to get on if the trans. gear is in the neutral position. – JS)* While you're in position go ahead and take out the slave. (*The slave is much easier to take out after the trans. is removed from the car. – JS)* Only one bolt, and it comes out real easy. Goes in like….well we'll get to that later. On the re-assembly. The pro-con ten cable guide comes off with one bolt and pulls right out. No problem. (*This allows the cable to lift and disengage from the pro-con casting on the trans. – JS)* There are 2 electrical connectors that need to be removed, one on each side near the drive flanges.

3) Pulling the beast out: Jack up the front of the engine and get your transmission jack in place. Don't try this without a transmission jack! Make sure the trans is secure on the jack. Take out the remaining bell housing bolts and pull the trans back. You may have to wiggle it some. Pull it straight back until it is clear of the down pipe then lower it down and tilt it back. It's a very tight squeeze with the down pipe on. It will get stuck on the steering rack, (*above the bell housing - JS),* if you tilt it back before it is clear. Tilting the engine back as much as possible helps. The half shafts also need to be moved around a bit to get the trans out. (*I found it helpful to tie the half shafts up and out of the way with zip ties. – JS)* You can push the trans one way and get one out and then do the other side. Lower the trans and pull it back as far as possible. Take a well deserved break.

Chad Tobin
Hey guys, Here's part 2. Hopefully it comes through better from my S-cars e-mail.

Part 2:
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5) Removing the old clutch: To loosen the pressure plate you need to loosen one bolt a small amount and then loosen the opposite one a small amount. Alternate loosening each bolt only a little so the pressure plate comes of evenly. If you loosen the bolts all the way as you go you will end up with some bolts that are very tight because of the pressure from the pressure plate. It took me a while to realize this. These allen bolts are no fun to turn with vise grips after they're rounded out! (*Use a socket allen driver for these bolts. –JS)*

6) The pilot bearing: First you will have to remove the flywheel. The Bentley says to mark its position but then one line later it says the bolt holes are offset so it can only go on in one position. The holes on mine would only line up in one spot. I used a screw driver that looks like an allen wrench and has a philips on one end and a flat on the other to hold the flywheel. I put a pin in one of the trans bolt holes and then put the flat on this screwdriver thing in the teeth of the flywheel and turned it until it was wedged between the pin and the flywheel. *(Use a 6 point socket on these flywheel bolts to keep from rounding off the points. – JS)* Watch out when you're loosening the last bolt the flywheel will drop and it's heavy. Set the flywheel face down on something clean and fairly soft. Use a socket to knock the pilot bearing out from the back. Put some oil on the outside of the new bearing and tap it in from the front with a socket or something else that fits over the bearing. The bearing should be flush with the flywheel according to the Bentley. While you have the flywheel off you need to clean it up. I used 80 grit and then 100 grit going slightly diagonal. My clutch works great but I am no expert on re-surfacing flywheels. This worked for me YMMV.

7) The seals: The crank seal looks a little intimidating. It has a big flange around it with a bunch of small bolts. Well it wasn't hard to do on my car at all. I used a bicycle tire wrench to pull it out. It has a small lip for getting under a bike tire. I've read somewhere that somebody ground one side off of a nail head and used this to pull it out. The seal I got came with a sleeve that allows the new seal to slide over the crank. Put some oil on the seal and slide it in. I used the old seal to seat mine. I put it about an eighth of an inch from the outer surface which is approximately where the old one was. The trans mainshaft seal was also pretty straight forward. Just remove the TO bearing guide sleeve and you can get to it easily. Needle nosed pliers worked for me. The Bentley says to pack the sealing lips with grease and oil it. You can also use the old seal to tap this one in. Mine was leaking so I was glad I had the new one.
The drive flange seal is the easiest. Just put a couple of screws in the flange and hold with a big screwdriver. You may want to clean around the seal before you pull the flange all the way out. If you tip the trans away from the seal you are changing you won't lose any oil. Pack grease between the sealing

lips, coat with oil and push it in. This one will stop when it gets where it's supposed to go. The main thing with these seals is to keep them straight.

8) Putting the new stuff on: I re-used my guide sleeve. It's metal so I just sanded it with some 600 grit and coated it with grease. Put some grease on the input shaft of the trans and slide the new clutch disk over it. (don't touch the friction surface) Wipe off the excess grease so it doesn't fling all over. Put the alignment tool on the clutch and put them on the flywheel. Make sure the longer center splined section of the disk is facing out, *(or to state it differently, the longer spline hub should be inside the clutch pressure plate, and facing rearward on the car The shorter spline hub goes toward the flywheel. Make sure to clean the pressure plate friction surface with brake cleaner or rubbing alcohol to remove the rust preventative oil. Also do this to the flywheel surface. Do not touch the disc friction surface, as body oil could cause the clutch to slip. - JS.*) Put the pressure plate over the disk and get some bolts in it. If you removed it gradually they should all be in tact. Tighten it down a little at a time alternating from side to side as you go. Pull up a little bit on the alignment tool and make sure it is straight with the pressure plate on. Once the pressure plate is snug, torque according to Bentley spec. (*Since the plastic spline centering tool has some slop, I measured from the tool to the ends of the belleville spring, to make sure that the disc was centered in the clutch – JS)* The Throw out bearing just snaps into the arm. Make sure you grease the guide sleeve. Just about ready to re-assemble. Stay tuned. (*Note that the LUK clutch has a running change in 1993. My early 93 used LUK part number: 02-025. The later clutch has a deeper pressure plate housing. Make sure that you have the right one by matching to your old clutch. The dual mass flywheel I believe is the same for all 92 -95 UrS4 cars. My LUK part number was: DMF-038.- JS)*

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Just remembered to finish this. If anyone has any questions shoot me an e-mail.

Part 3:
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9) Getting the trans back on: By now you should have the trans firmly situated on the transmission jack. (*Put the trans. in any gear so that you can rotate the main shaft by turning the tail shaft. This will help with getting the splines to engage. You will have to put a couple of bolts in the rear flange to get it to turn. – JS).* If you have the downpipe in place like I did, roll the trans all the way up to it and gradually raise the trans. If
you took the downpipe off you will probably have a much easier time of it. You want to have the engine tilted back as far as you can. As soon as you get the trans over the downpipe and moving towards the engine you will want to start working the halfshafts back in place. You can push the trans one
way and get one on and then do the other side. Once you get the halfshafts close to where they need to be you can start lining up the trans with the engine. While you're moving over the downpipe watch out for the steering rack and the coolant hose bracket that attaches to the trans. Get it fairly close and start adjusting the jack so the holes are lined up. It helps to put one of the longer bolts through and use it as a guide. Once you have the trans lined up give it a push and maybe a little wiggle. Mine went all the way on very easily when I got the right pressure plate. Don't draw it down with the bolts! If you have it lined up and all the parts are correct there should be no need to draw it down. My friend who was helping me told
me this but I still cracked my bell housing trying to draw it down over the wrong pressure plate and eventually ruined the trans trying to make it fit. Again, it should slide all the way on. Put a couple of bolts in to hold it in place.

10) The linkage: This is pretty easy if you disconnected it at the trans. If you're doing it ala Bentley you are in for a struggle. Put the two linkage pieces together and install the securing bolts. Then re-attach the bell crank to the trans. (*To make the final adjustments, put the trans. in neutral and have the shifter pointing straight up. Adjust the linkage to accommodate this straight up position of the shifter lever. This will get you very close to the final adjustment. Push in the clutch and check the feel of all of the gears. I found the best final adjustment to be slightly to the right of straight up. - JS)*

11) The slave: Well after doing this you will probably wonder which one of you is the slave. This was one of the biggest pains of the whole job. If you haven't removed the drivers side mounting arm from the trans you may want to do so now. First, grease the hell out of the rubber boot on the slave where it goes through the trans. Another thing I did was grind about 1/8 inch of threads off of the end of the slave bolt so it is easier to get started. You may be able to shove it in far enough to catch on the little ridge that holds the slave in place. Then get the bolt in and push the slave a little farther into the trans and get the bolt started. Doesn't sound too hard does it? It sucks. At least the last 10 tries do. (*The slave cylinder was no problem to install with the trans. out of the car. – JS)*

12) Finishing up: Put all of the bolts back in that you can reach from under the hood. Lower the jack in the front of the engine. Jack up the tail of the transmission so you can get the bottom bolts on. Torque all the bolts and plug the 2 connectors back in. Put your new gaskets on the CV joint flanges and bolt them back on. Torque to spec.*Replace the Procon bracket to the side of the trans. and make sure that it is engaged to the cable at the top. – JS)* Put the halfshaft cover back on. Bolt the rear driveshaft back on and re-install the cover. (*If you find that there is not enough room to swing the CV joint into place at the rear of the trans., use a pry bar and gently pry the drive shaft rearward aft of the center bearing. – JS)* Hang the exhaust and you should be done. I've probably forgot something but it beats "Installation is the reverse of removal" doesn't it? (*Bleed the slave cylinder by applying a pressure bleeder to the reservoir cap, and open the valve at the slave. Bleed all of the brake calipers to remove any air that may have gotten into the system. – JS)*
Make sure you have the proper service manual and tools. This job is not all that complicated but you have to do it right or you will be in for a lot more work.
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(*If your transmission main shaft seal was leaking and caused the clutch failure, check the trans. fluid level to make sure that it is full. – JS)*

Italicized notes and photos added by Jerry Scott

Here are some pictures of my clutch replacement in August 08.- JS
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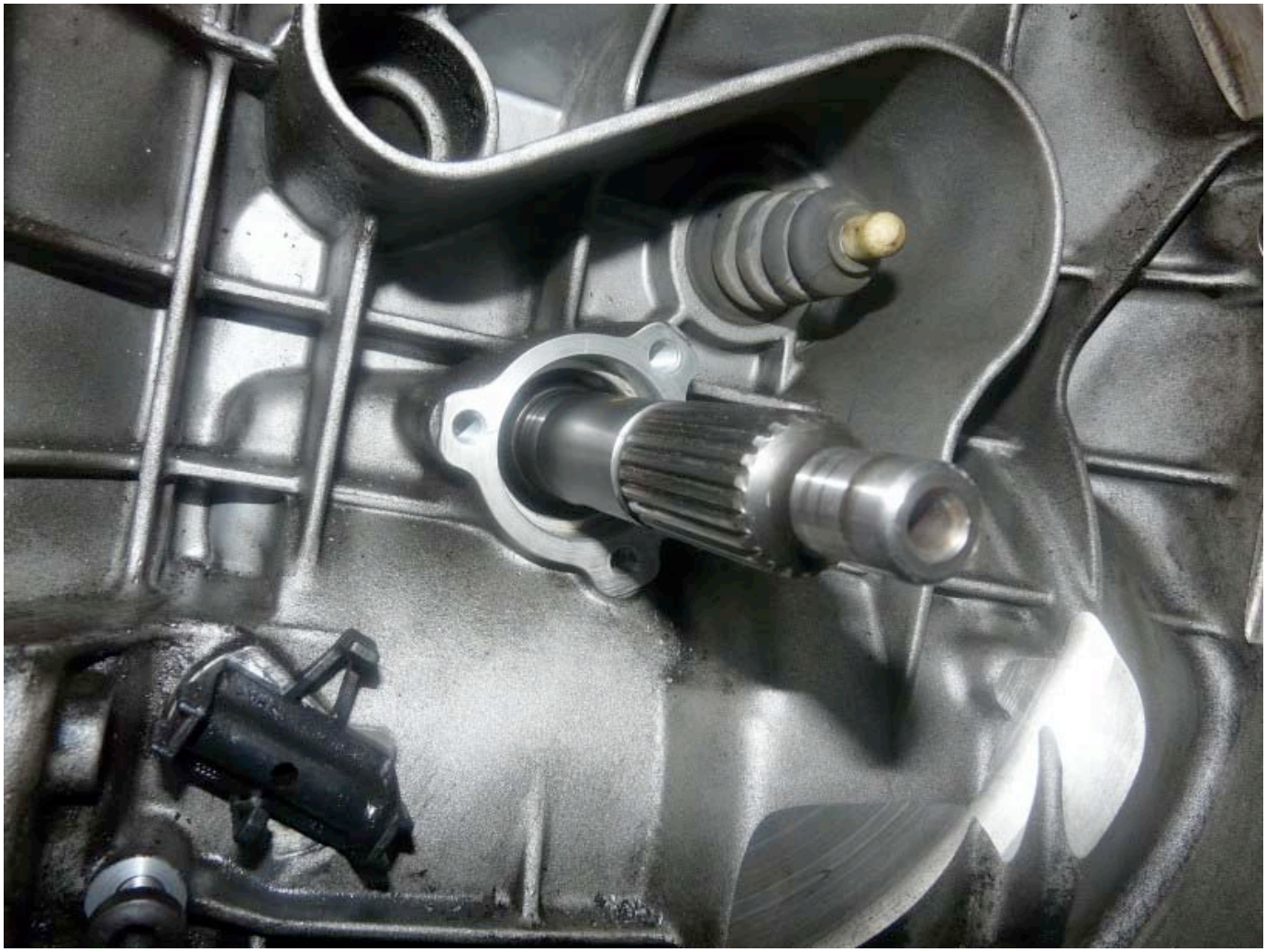
jack stands that I used from Northern Tool
This raised the car 26 in.. You could probably get by with 24 in., but would not want to raise less than this amount.

where the exhaust was separated to remove the exhaust system
Bolts will need to be hack sawed to remove.



trans. main shaft with the seal removed

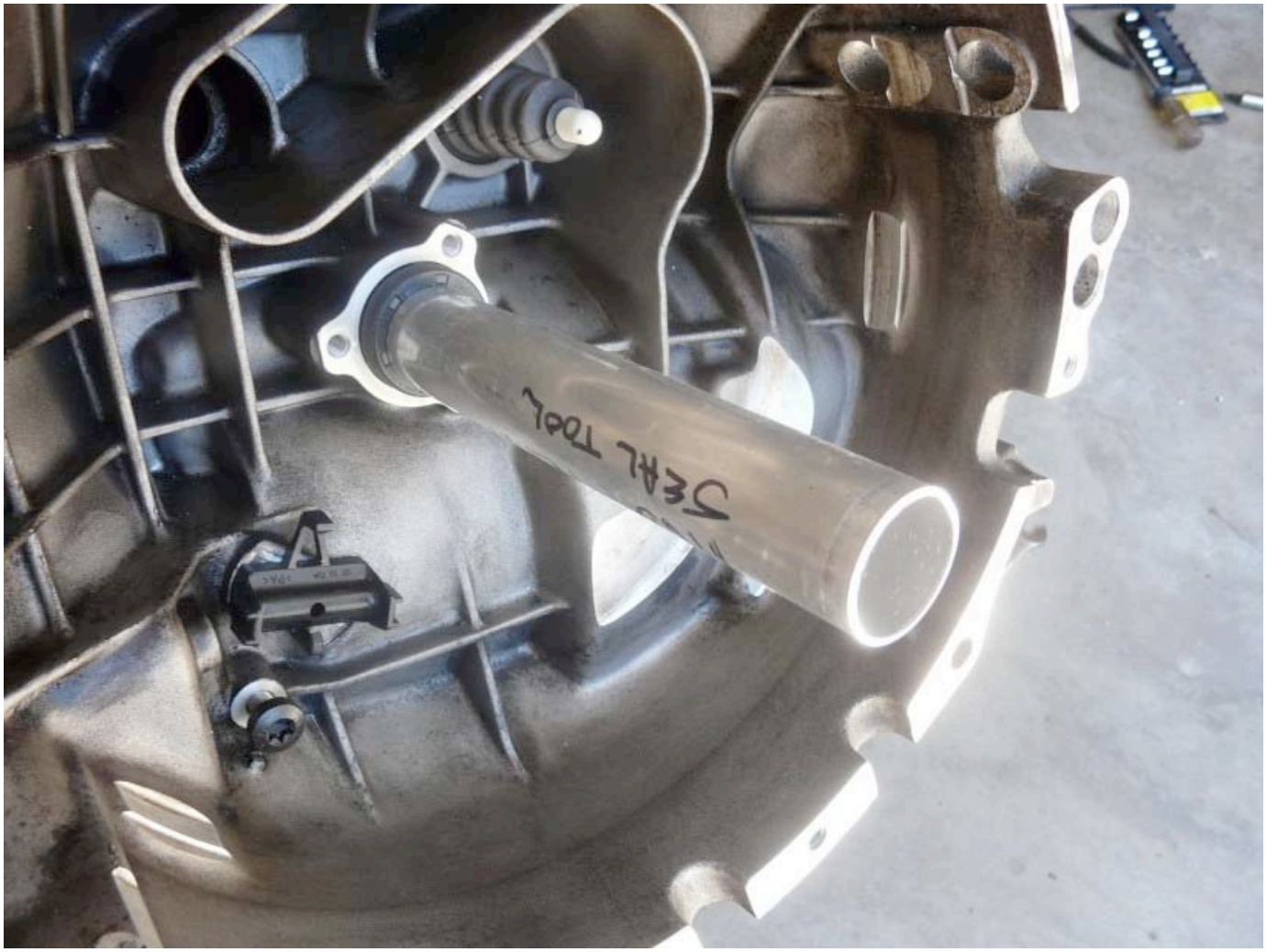
bell crank that needs to be removed from the shaft to get the shifter linkages to separate

old oil soaked clutch removed.

tool used to remove the engine crank seal

plastic protector for crank seal, while driving the seal in place
This protects the lip of the seal from any burrs that you might have made on the chamfer of the crank. Use the old seal to drive in the new one.

engine crank seal replaced



home made tool to drive in the trany main shaft seal

trans. ready to be reinstalled into car, with new throw out bearing

new LUK clutch and disc before installation.

old dual mass flywheel (viewed from the crankshaft side), which was replaced with a new one
Find the widest bolt separation and match to the crank. It will only go on one way. The new flywheel came with a new pilot bearing.

face of old dual mass flywheel

method of raising the front of the engine to get a good angle for trans. removal and installation
This worked just fine for me.

trans. jack that I used
I don't see how you can do without this item. I borrowed this one, but it is available at Harbor Freight for $130. see: http://www.harborfreight.com/cpi/ctaf/displayitem.taf?Itemnumber=3185

will need this picture to get the exhaust hung correctly after removing the hangers from the trans. Once the parts are removed, the location of each part can be confusing.

holding exhaust system while removing three flange bolts on each side, and removing rubber hangers
This was fairly close to the balance point.