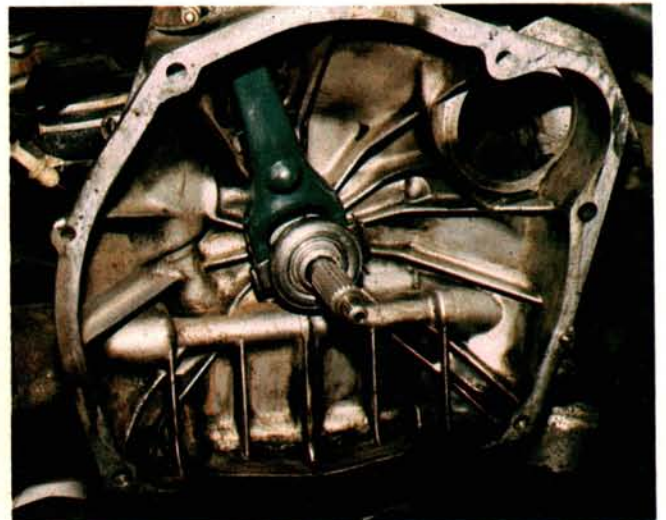
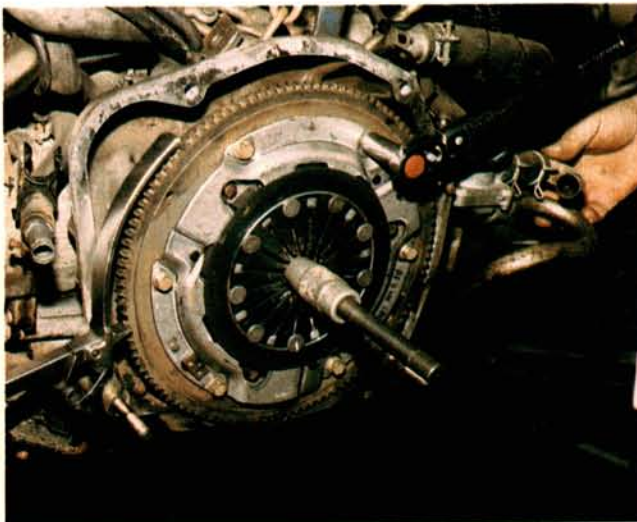


Subaru Clutch Replacement



If you've ever put a clutch in a VW Beetle, you have some idea what it's like to put a clutch in a Subaru. Oh sure, the engine is at the wrong end compared to the old Bug, and it's water cooled. But there are quite a few design similarities that make the two cars distant cousins, even if they aren't blood brothers.

This month's victim of the *Import Service* tear-down and pose for pictures routine is a 1983 Subaru GL station wagon with air conditioning. Depending on personal preference or additional repair work needed, you can remove either the transaxle or the engine to get at the clutch. Since the air conditioning didn't pose any real problems in terms of engine removal, and since we planned a valve adjustment and crankshaft seal replacement anyhow, we chose to remove the engine.



Here are some tips that may save you some time and aggravation when you do this job:

- **The clutch release bearing holders are not the same for 1600 and 1800 applications.** If you buy a clutch package in kit form, make sure the holder in the kit matches the one you remove.
- **Check the release bearing holders for wear at the release fork contact points.** Our local dealer replaces almost all of these holders because of this wear. This Subaru was no exception, as you'll see.
- **Subarus are equipped with a hill holder device that operates through a PHV (Pressure Holding Valve) to apply one diagonal circuit of the hydraulic brake system.** The PHV keeps you from rolling backward on a grade when the clutch pedal is depressed. When the street light at the top of the hill finally turns green, and you release the clutch pedal, the hill holder is also released. The hill holder cable runs between the PHV

and the clutch release arm. It connects to the release arm right above the clutch cable.

The adjustment of the clutch and hill holder cables is very important. A Subaru service bulletin suggests that you release all tension on the hill holder cable before making an adjustment of clutch cable free play. That way, any tension on the hill holder cable won't give you an incorrect clutch cable adjustment.

• **Subaru gives a specification for total travel on the clutch release arm as well as a free play specification.** There is no factory adjustment to help you out if the clutch release arm isn't moving far enough. But a release arm that doesn't have enough total travel is probably telling you something. There's a problem with wear somewhere between the pedal and the clutch release fork. Check for worn or broken parts in

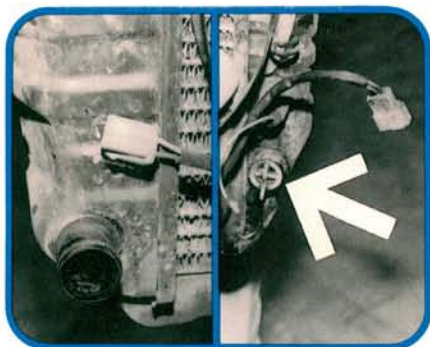


the clutch pedal assembly (especially at the cross shaft pivot points) or in the clutch cable itself.

- **If you prefer removing the transaxle to yanking the engine, you'll have to go through the normal exercise of disconnecting the axle shafts, shifter, trans crossmember, and so on.** On four wheel drive vehicles, unbolting the driveshaft center support will allow you to bow the two piece driveshaft far enough to disconnect it from the transaxle.
- **If the input shaft seal is leaking, you'll have to disassemble the trans to replace it.** We'll try to do that in a separate article later this year.

Our thanks to the good people at LuK Automotive Systems for their assistance in the preparation of this article, and of course for the new LuK clutch we used.

—By Ralph Birnbaum



1

Disconnect the battery negative terminal. Remove the radiator cap and open the plastic petcock (arrow) to drain the radiator. Unplug the electrical connectors for the cooling fan and temperature sensor (right photo). There's another connector for the A/C condenser fan on the left side of the radiator (left photo).



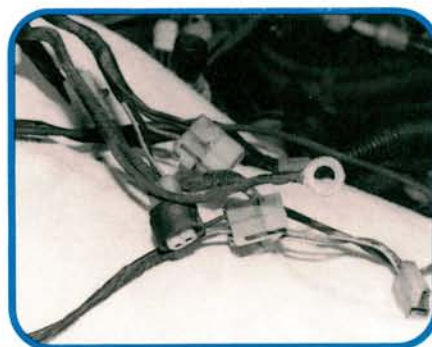
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Remove top and bottom radiator hoses. Remove the top bolts holding the radiator to the core support and tilt the radiator back an inch or so. The bottom of the radiator has two locator pegs that sit in rubber grommets. Gently wiggle the radiator from side to side and lift it from the core support.



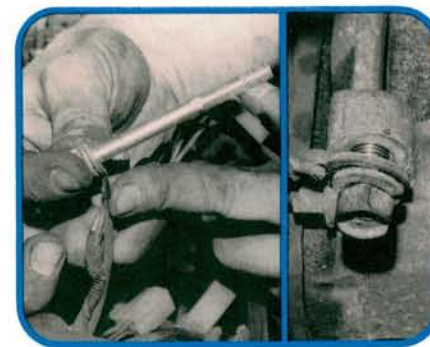
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You don't need to discharge the air conditioner. Three easy to reach bolts (two pivot bolts and a belt tension adjustment bolt in the compressor support bracket), and the compressor and hoses can be laid to one side. Leave the alternator in place but disconnect the wiring and pull it aside.



4

Remove the air cleaner and spare tire. There's a main wiring harness on the right side of the engine. Don't worry about keeping track of which connector fits where since the connector ends are different and will only plug together one way.



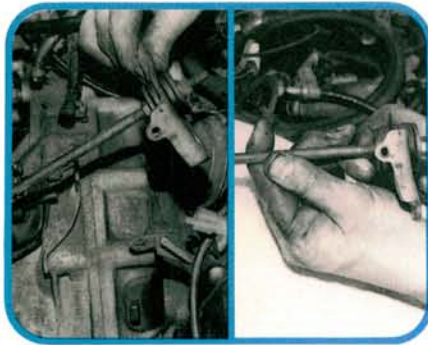
5

There are two main grounds bolted to the engine. One is in the engine harness and bolts to the engine at the right front intake manifold bolt. The other comes from the main battery ground and bolts to the front of the right cylinder head near the air cleaner preheat tube. Check for corrosion at both.



6

You'll also need to disconnect the distributor wires at the ignition coil. The leads are color coded to match the carside wiring. If you leave the carside harness attached to the coil, there'll be no problem remembering where the wires go at reassembly.



7

Disconnect the throttle cable (and cruise control cable if so equipped). Remove the bolts holding the support rod bracket to the engine and lift the rod up and away. If you remove the nut and washer from the 8 mm stud below the tire perch at the other end of the rod, you can remove the rod completely.



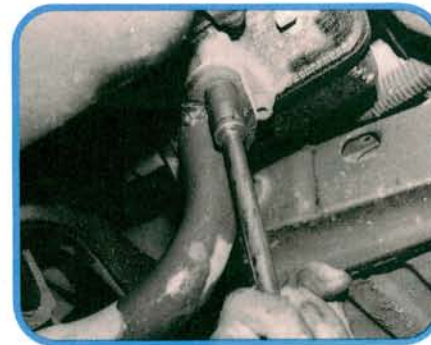
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Fuel inlet and return, fuel vapor, brake booster, and heater hose connections are all located on the left side of the engine compartment. The hoses are different sizes, so you won't need to mark anything for reinstallation. Just match hose sizes to the correct size steel tubing.



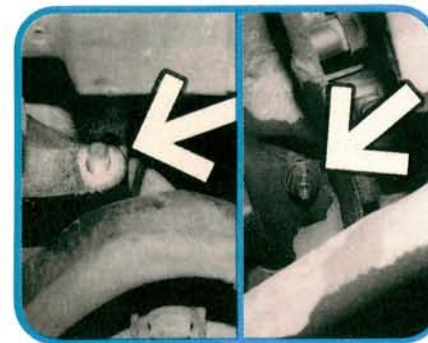
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Before we go beneath the car, we'll disconnect the oxygen sensor. The sensor wire from the exhaust is routed up the right hand side of the bell housing and is held in place by two clamps. Disconnect the sensor at this plug near the firewall and free it from the clamps.



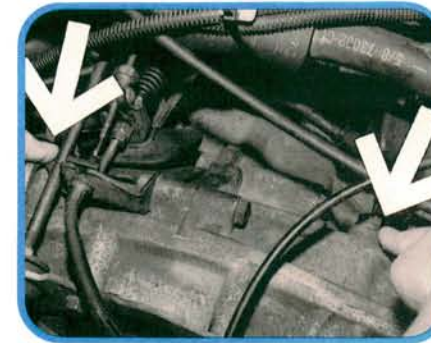
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The crossover pipe is held to the underside of the cylinder heads by four stud/nut combinations, two per side. There are also two spring loaded nuts and bolts holding the crossover outlet to the exhaust. Four manifold studs, two exhaust bolts, and an O₂ sensor wire, and the exhaust is out of the way.



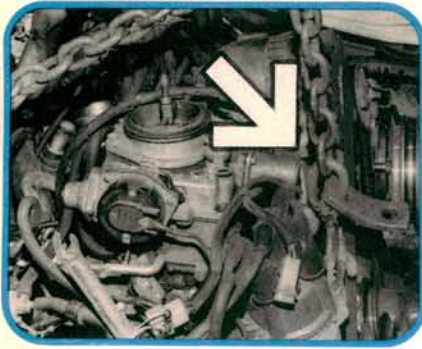
11

Just like the old VW, there are two lower studs in the engine that come through holes in the transaxle. Remove the nuts and washers. The lower motor mount studs come through the mount support brackets at an angle, but the cradle holes are slotted, so the studs come out and go back in quite easily (right photo).



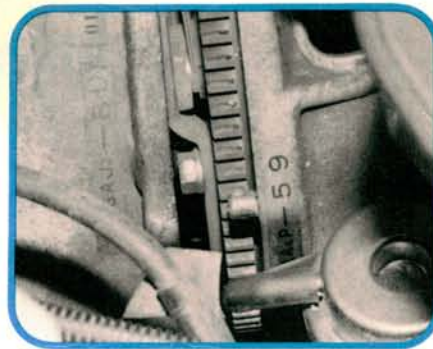
12

Let's go back on top. Lower the car and support the trans with a jack. Remove the two top engine bolts. The one on the left is longer since it also goes through the flange on the starter. You don't need to remove the nut from the lower stud on the starter. Just leave the starter where it's at.



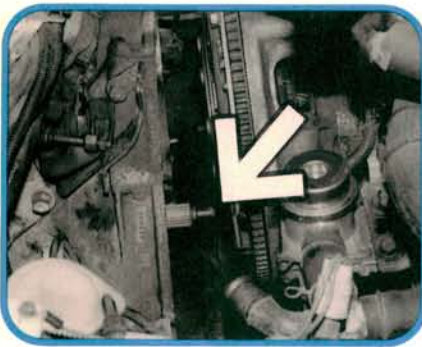
13

Be careful when you attach your chain to the engine. Make sure the chain is in a locking style hanger so that it can't slip and crush the front of the carburetor as you lift the engine. Lift the engine until the motor mount studs are just out of their holes. Raise the floor jack just enough to support the transaxle.



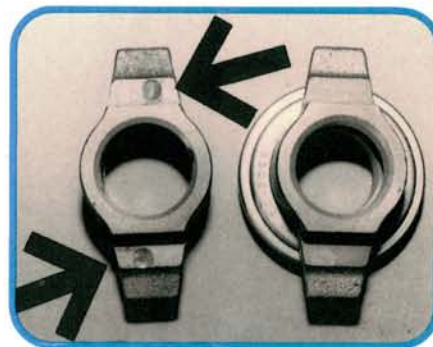
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With everything unbolted, this engine and transaxle decided that they'd been together a long time, and wanted to stay that way. Corrosion between the steel locating dowels and their mating bores in the aluminum housing held things tight. It took some additional spraying, tapping, and coaxing to free them.



15

Even with the air conditioner condenser still in place, we had plenty of room to move the engine forward far enough to clear the input shaft. For safety's sake, you may want to place a board between the front of the engine and the condenser, especially if this is your first try at one of these.



16

Lift and remove the engine. Remove and inspect the clutch release bearing holder where it rides against the release fork. Don't install a new bearing on a worn holder. The old holder had some pretty deep indentations (arrows). The right side holder is a new one and we've already installed a new bearing on it.



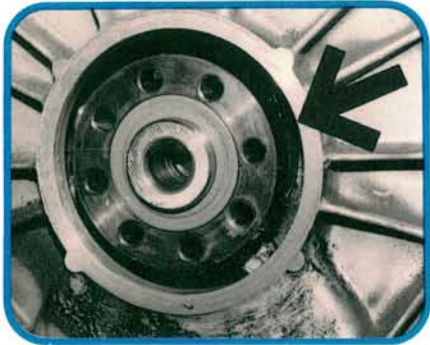
17

Clean the bell housing and main shaft splines, then take the new clutch disc and try it on for size. It's far better to find a problem with scored, gouged, or worn splines now, than it is to fight them later. Lightly lube the splines and slide the disc in and out to make sure the disc fits and doesn't bind.



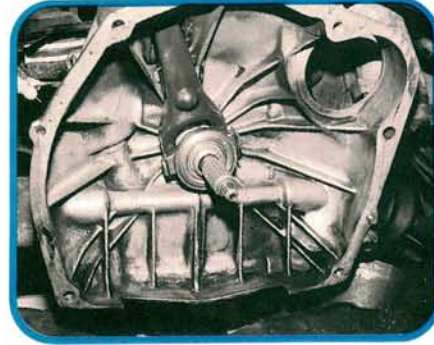
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Subaru uses a pilot bearing, not a bushing. Make sure the new pilot bearing slides snugly but easily over the nose of the input shaft. Then remove the old bearing with a suitable puller and replace it with the new one. No additional lubrication is needed here.



19

If you're replacing the crankshaft seal, you won't need the puller since you can drive the old pilot bearing out from the back with the flywheel removed. The flywheel will bolt on only one way, so you don't have to mark it. A slide hammer with a small metal screw screwed into the old seal works well as a seal puller.



20

Remove the clutch fork from the pivot stud in the bell housing. Check the snout of the transmission where the release bearing rides for wear or gouging. Lightly (lightly please) lube the snout and pivot stud with high temp grease. Reinstall the clutch arm release bearing and check that it moves freely.



21

REASSEMBLY TIP ONE: Make sure the clutch disc is really on center as you tighten the clutch cover bolts. The fit between the input shaft and pilot bearing is a close one. Then select fifth gear and pull the handbrake to hold the input shaft. That way you can rock the crankshaft with a wrench until the clutch splines.



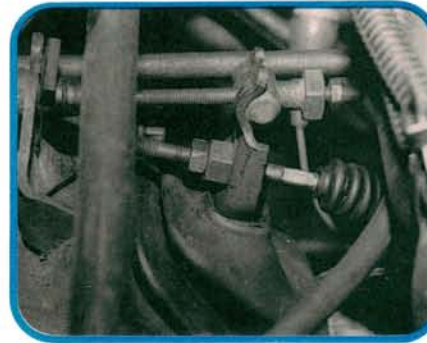
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REASSEMBLY TIP TWO: We said earlier that it was pretty hard to get the engine harness connected wrong since the connectors are all different. But the connectors for the engine temp sensor and the vacuum control solenoid are similar. The one without the lock tab goes to the temperature sensor.



23

REASSEMBLY TIP THREE: Adjust the clutch free play to the specifications for the Subaru you're working on before you reinstall the hill holder cable. Our test car called for 2-3 mm of free play measured between the adjustment nut and clutch release fork. Also check for 17-18 mm total fork travel.



24

REASSEMBLY TIP FOUR: Adjust the hill holder. With clutch free play adjusted, adjust the hill holder cable until it just touches the release fork. Then take the car out on a grade and fine tune the adjustment until the brakes hold with the clutch cable depressed, but release as you let out the clutch pedal.