IMPORT SERVICE

# Saab 900 Clutch Replacement

Most of the cars built today feature front wheel drive. Different manufacturers chose different front drivetrain layouts, but Saab's method for getting the power from the engine to the front tires is a unique one. Saab 99 and 900 models have a flywheel and clutch assembly located at the front of the longitudinally mounted engine. The transaxle is mounted directly below the engine. The 180-degree change in drivetrain direction is accomplished by a clutch shaft splined to an upper transfer gear. The upper gear is then connected by a chain to a lower transfer gear splined to the transaxle input shaft.

This unusual design has given the Saab an air of mystery in some circles, and has probably convinced many technicians that Saab repair is better left to someone else. This leaves an ideal situation for anyone who is willing to take the time to learn about these cars. Since Saab specialists are pretty rare in most places, good ones can expect to be well paid for their knowledge.

Replacing the clutch on a 900 series Saab isn't as difficult or mysterious as you might think, however; it's just different. An experienced Saab technician took us through the procedure recently. Our photos detail clutch replacement on a 1983 Saab 900. The drivetrain on the 99 series all the way back to 1975 is constructed very similarly to the later 900. Most of what is described here will apply to the 99 as well. Clutch replacement on the 99 differs in the following areas.

- A more crowded engine compartment makes radiator removal a necessity rather than an option. The cooling fans are mounted on the front of the radiator which makes removal a tricky proposition. The addition of air conditioning further complicates matters.
- The 1978 model 99 Turbo (a rare bird) uses a different style pressure plate than any other model. This requires the use of a thicker retaining ring tool to keep the pressure plate fingers compressed for removal.
- The hood hinge bolts are adjustable. Be sure to scribe the hinge location before removal. This will assure accurate realignment when the hood is reinstalled.

**—By Karl Seyfert**

**1**

Since all of the work we're going to be doing is right in the front of the engine compartment, the time it takes to remove the hood is time well spent. Remove the washer hose, then remove one bolt from each hinge. Get help removing the hood. It won't realign too well if you drop it. Disconnect the battery for safety's sake.

**2**

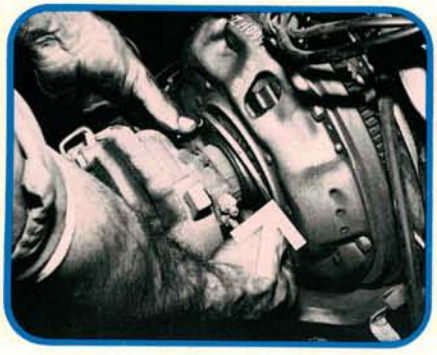
Disconnect the intake air preheat tube from the exhaust manifold and remove the air hose between the air flow sensor and the throttle housing. Unplug the temperature sensor from the air intake hose and unclip the air inlet scoop from the radiator core support.

**3**

Leave the preheat tube and air inlet scoop connected to each other. Remove these two along with the hose between the air flow sensor and the throttle housing. Removing these parts may not seem absolutely necessary at first glance, but the added room you gain by removing them makes the job that much easier.

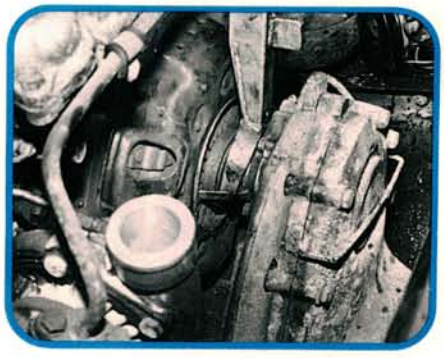
**4**

The engine wiring harness passes over the top of the plastic clutch cover. Cut the wire ties that hold the harness to the cover, then move the harness aside. Remove the three bolts that hold the plastic cover in place. The lower left bolt also holds a lower radiator hose bracket. Carefully remove the clutch cover.



**5**

You need to keep the clutch diaphragm compressed to remove the clutch. This ring fits between the clutch cover and the diaphragm fingers. Start the tool under the lip of the cover at the outer edge of the diaphragm fingers. Then have an assistant depress the clutch so you can fully insert the tool under the clutch cover.

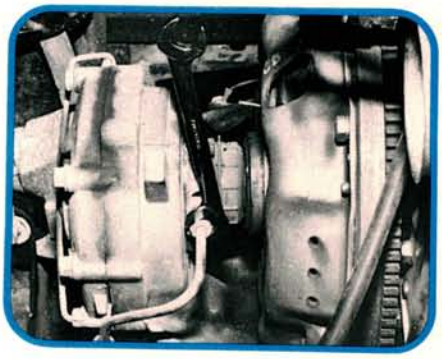


**6**

This Saab tool pushes the release bearing against the clutch fingers. Place the pry bar behind the bearing to finish compressing the diaphragm fingers. The clutch assembly can't be removed if the clutch fingers aren't compressed completely. Use care when prying if you don't have the factory pry bar.

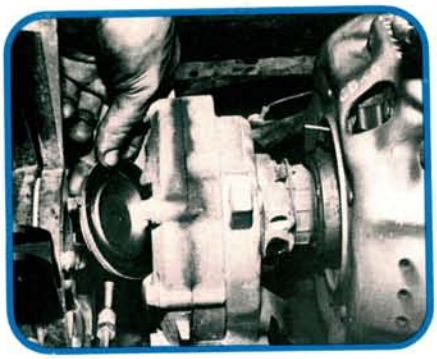
**7**

Here's a better look at the Saab tool. The horseshoe opening on the end fits behind the release bearing. Leverage is applied at the back of the tool where it rests against the slave cylinder. If you're making one, the lever should be at least three-feet long for added leverage.



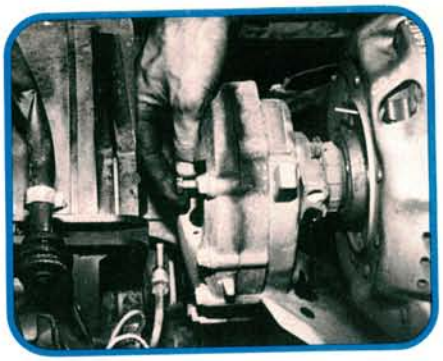
**8**

Remove the bleeder screw from the slave cylinder first to allow room for a wrench. Loosen the hose fitting with a line wrench, then use an angle wrench on the flare nut to allow enough swing to remove it. These threads have been known to seize and put up a fight. Cap the hydraulic line to prevent fluid loss.



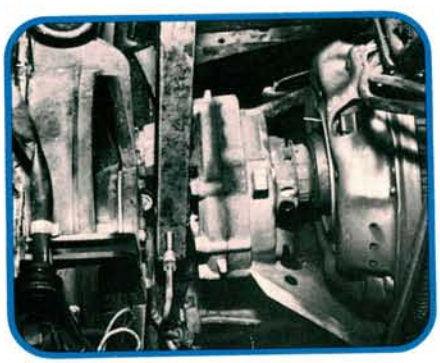
**9**

Remove the clamp holding this front cover on the transfer gear housing, then the cover and its seal. Note the location of the breather hole in the cover. A clogged breather will build pressure in the transaxle and cause leaks. Remove the plastic impeller (oil slinger) on the end of the clutch shaft.



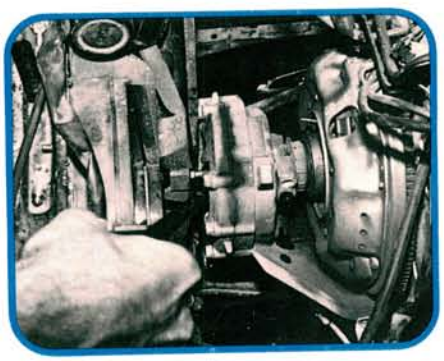
**10**

The clutch shaft is held in the transfer gear by an external snap ring. The ring sits in a groove in the clutch shaft. It's similar to the rings used to keep an outer CV joint on a drive axle. The first step in removing the shaft is to remove one pressure plate bolt and screw it into the end of the clutch shaft.



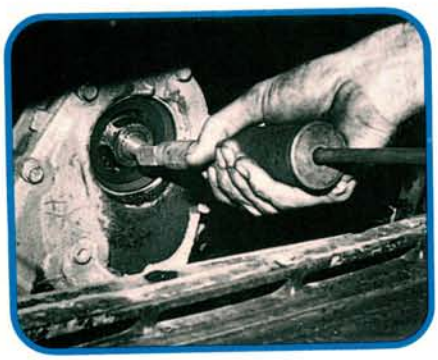
**11**

The other end of the Saab pry bar has a slotted opening. Slip the slotted end over the bolt on the end of the clutch shaft. Lean the back of the pry bar against the transfer gear housing and give the pry bar a sharp jerk. There's not much clearance here, so don't spear the cooling fan or radiator.



**12**

Here's an alternative method if you don't have the Saab tool. Two pry bars hooked on the edge of the bolt head should pop the shaft loose. This shaft decided to be difficult and no amount of persuasion would budge it. The shaft would move further inward, but refused to come out past the ring. Camera shy, I guess.

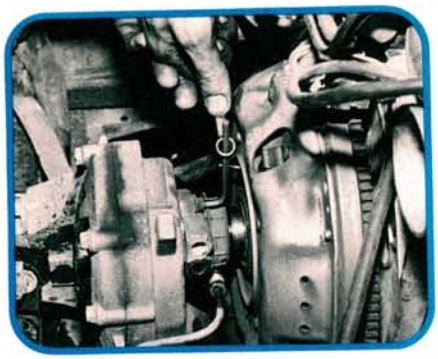


**13**

There was only one thing left to do. We removed the radiator and grille and lowered the air conditioning condensor to get a clear shot at the clutch shaft. We attached a slide hammer to the threaded end of the clutch shaft and crossed our fingers. (This is a very rare problem so don't let it scare you off).

**14**

Here's the culprit. One swing of the slide hammer and the shaft was out and in our hands. Earlier shafts have a gentler slope on the chamfered groove, allowing the shaft to slip past the retaining ring more easily. If you grind a small relief in the snap ring groove on the shaft, it will come out easier next time.



# 15

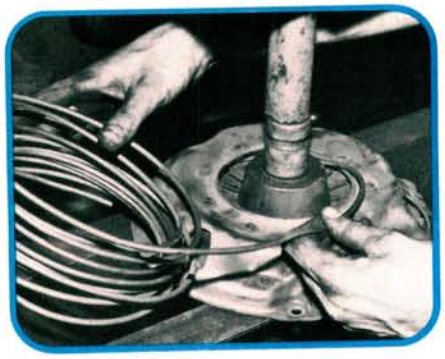
The clutch slave is held in place by Allen-type screws, but there isn't enough room for a ratchet and Allen bit. Use an Allen key and box wrench for leverage since the bolts are installed with thread-locking compound. Saab 99s have hex-head bolts on the slave cylinder but Allen-heads on the plastic cover bolts.

# 16

Remove the five remaining bolts from the pressure plate. Grab the clutch cover and disc, release bearing and slave cylinder, and remove them all at once. It's a tight squeeze but they will come out if the pressure plate fingers have been fully depressed. Watch your knuckles.

# 17

The retaining ring tool must be removed from the old pressure plate. Here's a safe and easy way to get the job done. An old flywheel is bolted to the bench and a threaded rod sticks up from below the bench. Compress the pressure plate with an old release bearing and remove the retaining ring tool.

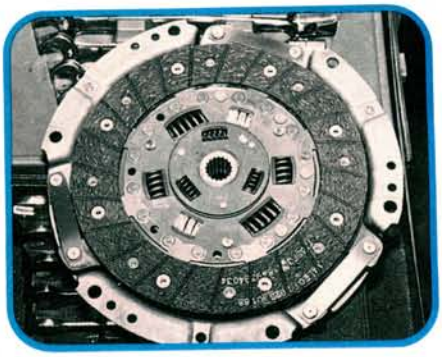


# 18

If you don't have the retaining ring tool or the flywheel rig, you'll have to improvise. A press will work and copper tubing may be substituted for the retaining ring. Leave enough tubing hanging out so that it can be easily removed. Whatever you decide to use, be sure it's safe if you don't want to wear it.

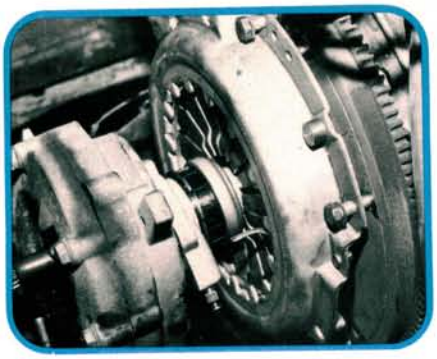
# 19

Disassemble the slave cylinder completely and examine it for damage or wear. It's not worth a comeback if it fails later. O-ring seals are used rather than the more common cup seals. This one was rather badly scored after about 50,000 miles. The replacement cylinder has a larger diameter piston.



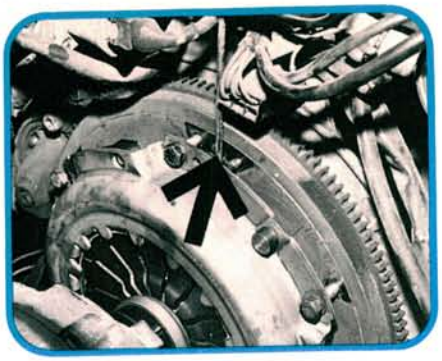
# 20

The clutch disc from the 900 Turbo can be substituted on 900 non-turbos. Its larger diameter provides more surface area for a better grip and should wear a little longer too. The standard pressure plate can be used with this disc. Check the condition of the flywheel and pilot bearing before beginning reassembly.



# 21

Transfer the retaining ring tool to the new pressure plate. The revised finger design on the new pressure plate makes it easier to remove and install the retaining ring tool. Lower the plate, disc, bearing, and slave cylinder into position. Loosely attach the pressure plate to the flywheel with two top bolts.

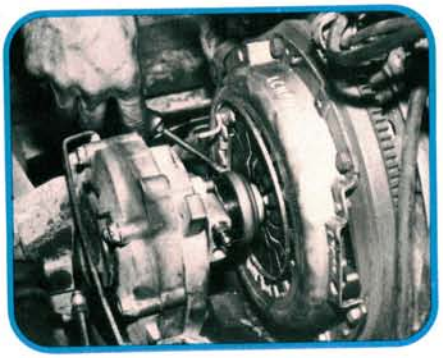


# 22

Use the retaining clamp from the transfer gear housing front cover or a similar hook to lift up on the clutch disc. Hold the disc in position as you guide the clutch shaft through the disc's splines. Tap the end of the shaft with a soft-faced hammer until the retaining ring locks it in place.

# 23

Don't forget to reinstall this insignificant looking plastic impeller on the end of the clutch shaft. It's the one we removed in step nine. The impeller slings gear oil over the transfer gears, bearings, and chain. Forget the impeller, and these parts will be screaming for mercy before too long.

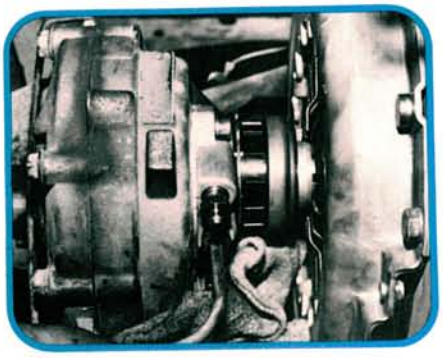


# 24

Replace the housing cover removed in step nine and its retaining clip. The cover breather hole points to the top. Reinstall the four remaining pressure plate bolts, then torque them alternately and evenly. Reinstall the three bolts in the slave cylinder. Remove the retaining ring tool from the pressure plate fingers.

# 25

While we were in there, we removed your appendix! I've included this photo of a 99 Turbo not to confuse you, but to remind you to be on the alert for other problems while you're doing the clutch. It never hurts to check the turbo bearing for radial and axial play when it's right there in front of you.



# 26

Remove the bleeder screw from the slave cylinder, then reinstall the hydraulic line. Put a rag below the slave cylinder to catch fluid. Gravity bleeding will remove nearly all of the air. Have an assistant pump the pedal to remove the rest. Reinstall all remaining parts in reverse order of disassembly.