Motorcycle Clutch Replacement

Has your motorcycle's clutch started slipping or grabbing? Don't panic and don't resign yourself to leaving you bike at the dealer for a week. You can change your clutch plates yourself with a few tools and the necessary parts. From the April 1998 issue of *Motorcycle Cruiser* magazine. **By Evans Brafield**

Most motorcycle riders don't think about their bike's clutch at all. Sure they use it every time they ride. They may even do the right thing by adjusting and lubricating the motorcycle's clutch cable occasionally. But really think about the clutch? Never -- that is until it starts to get cranky and becomes grabby, or just gets lazy and starts to slip. Repleacing the plates, the usual villans in this scenario, and perhaps the clutch springs is easy and takes perhaps an hour on most bikes once you have the necessry parts and tools. We offer this run-though on our Virago 750 to inspire those who are unsure of the process. The process is typical of most Japanese motorcycles, a bit different than a Harley, and much different than with a dry clutch, such as you might find in a BMW or Moto Guzzi.

1. Gather What You'll Need

Photography by Dean Groover

Although you can often get away with only replacing the clutch's fiber plates, we usually replace all the plates and springs to assure that everything is within specs. Barnett Tool and Engineering (9920 Freeman Ave., Santa Fe Springs, CA 90670; 562/941-1284) supplied us with new Kevlar friction plates ($80), steel plates ($35), and springs ($18) for our Virago 750. A clutch cover gasket set us back another $12.

After gathering all the parts, any mechanic -- even a novice -- can replace a clutch in about an hour. The tools required to replace the clutch in our trusty Virago 750 were: 10mm, 14mm, and 17mm sockets; a 5mm allen socket; 4- and 6-inch extensions (although the 6-incher will do); a ratchet; a torque wrench; a 14mm wrench; a big flathead screwdriver (a technical term); and gasket sealer. Of course you also need a shop manual, some clean rags, refreshments and a clean place to work. Music is nice, too.

2. Open Up the Patient

Start by leaning the bike away from the clutch side, so the oil will stay put when you get the clutch cover off. (If you're replacing the clutch after it has failed, you should change the oil and filter -- since they're most likely contaminated with clutch-plate particles. This may seem like a good time to change the oil if you need to do do anyway, but you might want to wait a couple hundred miles and do it when the clutch plates have broken in and shed their initial friction material.)

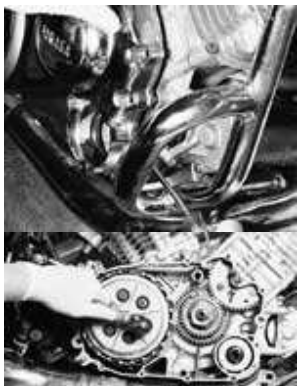
To get to the 750 Virago's clutch cover, we needed to remove the brake light spring, the brake pedal (note the alignment marks on the pedal and spindle to simplify replacement), and the right peg mount bracket.

Next, using a 5mm allen, loosen all of the clutch cover bolts in a crisscross pattern. Pick a point on the cover (mark it with a grease pencil if you're forgetful), remove the bolts one at a time in either a clockwise or counter-clockwise direction, and place them in order on a clean shop rag.

Since the length of the bolts in the Virago clutch cover varies by almost one-half inch, trying to figure out which bolt belongs in which hole is time-consuming and terribly dull. ("Nope, doesn't fit there. Not here either. Dang. Only 12 more to go...") If you are afraid they might get accidentally scattered, set them on a strip on duct tape to hold them in order.

Another system for keeping track of where fasteners go is discussed in this short article: "Where Does that Screw Go?"

3. Peel Back the Skin



To remove the case cover on the Virago, remove the oil filter cover, then locate the notch between the clutch cover and the engine case (slightly in front of the oil filter cover). Gently pry the cover free of the case with a screwdriver. (Although some people may say you can save the gasket if you remove the cover carefully, we recommend buying a new one to assure an oil-tight reassembly.)

4. Get to the Plates

Next, remove the clutch pressure plate bolts with a 10mm socket.

Take note of any alignment marks on the clutch pressure plate and basket that may need to be matched on reassembly, or make your own with a marker.

5. Relieve the Pressure

Remove the pressure plate (the top plate on the clutch assembly) and set it aside. The throw-out bearing in the center of the basket may fall out as the pressure plate is removed. (You should set a couple of rags beneath the clutch to catch it so it doesn't get damaged bouncing on the shop floor.) If it does, check for alignment marks and place it back in position.

Next, using the tips of your fingers, or a pair of curved picks, remove the clutch plates one at a time and stack them in exactly the same order. Note the plate order for installation. Incorrectly stacked plates can cause premature clutch failure.

6. Neatness Counts.

The importance of how carefully parts must be set aside can't be overstated. Getting all the components disassembled and organized in order is extremely important so that you know how everything goes back together. It also allows you to see where trouble has developed.

Here, the full set of clutch plates, both the friction plates and the metal plates, are zip-tied together to maintain their order, prior to inspection.

7. Order Counts Too

If fasteners are arranged neatly and logically, reassembly of the clutch pack and covers will be much easier for novices and experts alike. If you have followed the suggestions for arranging the fasteners you removed back in Step 2, this should go smoothly.

8. Check It Out

While the clutch is apart, inspect the clutch basket's inner and outer hubs for wear.

If any notches or grooves are visible in the fingers or splines of the clutch basket, the basket probably needs to be replaced. Consult your shop manual or local mechanic for information on how to remove the basket's hubs. Remember, installing a new clutch into a worn basket may result in abrupt clutch engagement or clutch chatter.

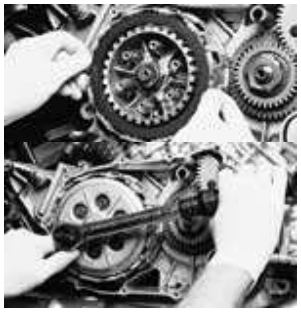
If you don't plan on replacing the steel plates along with the fiber ones, check the steel plates for any signs of wear -- such as discoloration or scoring. Measure the steel plates' thickness to make sure the plates are within suggested tolerances. Make sure the plates are not warped by placing them on plate glass. If any of the plates do not lay flush to the surface, or can be rocked in any direction, replace the plates as a set.

Because we hate doing the same job twice, we chose to replace the steel plates even though the stockers showed no signs of wear.

9. Come Together

Before assembling the new clutch pack, soak the fiber plates in fresh oil for five to 10 minutes.

When sliding the plates into the clutch basket, be sure to arrange fiber and steel plates in exactly the same order as the old clutch pack. If you are unsure, the innermost and outermost plates are usually fiber -- but check your shop manual before proceeding.



The steel plates are usually made of stamped metal, with one rounded edge and one sharp edge. Some mechanics say to make sure the steel plates are installed with the sharp edge facing the pressure plate, or excessive outer hub wear may result. Barnett says it doesn't matter if the sharp edges face in or out, but *all of the steel plates must be installed facing the same way*.

10. Torque Talk

Place the pressure plate over the clutch pack. Install the springs into the pressure plate and screw the bolts in until snug. Be sure to install the springs and bolts and tighten them gradually in a crisscross pattern for even pressure on the plate. Using a torque wrench, tighten the bolts -- again in a crisscross pattern -- to the shop manual's specified torque (5.8 foot pounds in the case of our Virago). While some people may proclaim with pride that they never use a torque wrench, we've found that properly torqued assemblies (clutch and otherwise) fail much less frequently.

Again, although the original-equipment springs showed no signs of wear and exceeded the 40.2mm minimum-length specification, we chose to replace them with Barnett springs. While the Barnett springs are stiffer and require a slightly firmer pull at the lever, the company says that the additional tension provided by the springs helps make engagement of the Kevlar plates more progressive.

11. OK, Strip!

Clean off any remnants of the old gasket with a knife or gasket scraper. Be careful not to score the sealing surface. Chemical strippers, like naval jelly, can help in particularly tough cases, but be careful to keep these chemicals away from all painted parts. Make sure all gasket pieces are removed from both surfaces.

Clean the mounting surfaces with a solvent, such as contact cleaner, to make sure no oily residue remains to interfere with gasket adhesion.

12. All Together Now

Apply a thin coat of gasket sealant to both gasket mounting surfaces. If you are unsure of where to apply the sealant, look at the shape of the gasket itself.

We've found that pliable, non-hardening sealant works best on covers like the clutch cover. After allowing the sealant to skin over for a couple of minutes, place the new gasket (remember the $12 you save by reusing the old gasket will seem inconsequential if the cover leaks oil) in position on the engine case. The sealant should hold the gasket in position. Make sure the dowel pins in the case (if any) are in place before mounting the cover.

Reinstall the clutch cover bolts in the same order that they were removed, but do not tighten more than finger-tight. Once all the bolts are installed, torque them to the factory specs in a crisscross pattern. Finally, install the footpeg bracket, the brake pedal (don't forget the alignment marks), and the brake light spring. Let the bike sit for an hour or so, to allow the gasket sealant to set, before starting the engine.

Your new clutch will most likely engage in a slightly different lever position, and you may have to adjust the slsck in the cable to adapt to this. But you'll also notice it engages much more positively than the cranky old clutch you removed.

Since the new clutch will shed more friction material initially, change the oil after a few hundred miles.