

BANDIT MACHINE WORKS

Big Twin SuperClutch Installation Instructions

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ATTENTION: You've just purchased the best clutch money can buy. Please take the time to read these instructions completely and carefully before you start. We at BANDIT recommend that a qualified mechanic does the installation of this product.

Disassembly Of Your New Clutch

1. Remove the (6) spring retaining nuts. **Caution! The springs are under pressure.** Lift the pressure plate, spring cups, springs, and spring collars off as an assembly and set aside. Turn clutch over and carefully let the clutch plates slide out of shell assembly and set them aside, making sure not to allow the clutch plates to get bent. Remove the snap ring holding the bearing hub in the bearing. (The smaller of the two snap rings.) Push or press the bearing hub out of bearing.

2a. For **pre-'90** models with tapered mainshafts. Check the bearing hub for proper fit on the transmission input shaft and for clearance in the primary case (see note 2c below). Clean the input shaft and remove any burrs or high spots on the taper. Lap the bearing hub to the shaft lightly with valve grinding compound. What you want is a light gray pattern on the shaft and in the hub just to insure that the two fit each other well with no high spots. Now clean everything again. Lapping the hub to the shaft is not absolutely necessary for bikes equipped with street tires, but we recommend it for all high-performance applications. Lapping is a must for any bike that uses a drag slick!

2b. For **'90 and later** models with splined mainshafts. (*Do not remove the snap rings retaining the thrust washer in the front of the hub.*) Check the bearing hub, with the small snap ring on, for proper fit on the transmission input shaft and for clearance in the primary case (see note 2c below).

2c. Note: Clearance - Most inner primary covers require a reduction in thickness of the retaining lip around the input shaft support bearing. Do this as follows: Reinstall the small snap ring onto the bearing hub with the tapered side of the ring toward the transmission. Install the bearing hub onto the mainshaft, and install the mainshaft nut. Tighten the mainshaft nut and check the clearance between the snap ring and the boss around the mainshaft bearing. Cut or grind the lip on that boss to produce at least 1/16" clearance all around. This clearance will close up during operation as the transmission case and primary case expand and less than 1/16" will allow the snap ring to contact the boss and shave aluminum off the boss. If this happens, the shavings will be forced into the bearing and ruin the bearing. Make sure you have adequate clearance! Check carefully that there is sufficient clearance between the basket and the outer primary cover. The lower threaded bosses for the inspection cover will usually require trimming. Grind them at an angle to that there is at least 1/16" clearance between the pressure plate and the cover when the clutch lever is pulled in completely. Shorten the screws holding the inspection cover as needed. We recommend shortening all three screws the same amount to avoid damage to the pressure plate in the event that the screws are swapped from hole to hole. Flat inspection covers or covers with a flat backing plate will not clear the spring retaining studs – use a domed inspection cover.

Assembly and Installation

3. The clutch bearing is pre-installed. If the bearing must be removed for some reason, reinstall as follows: Coat the outside diameter of the bearing with light oil and press it into the clutch shell with an arbor press and a proper sized driver. Avoid pressing directly on the basket. We recommend supporting the inside of the clutch shell just below the bearing; this should be a light press fit. Install the large snap ring with the tapered side facing the transmission.

Coat the inside diameter of the clutch bearing with molybdenum disulfide grease or silicone grease and slip the bearing hub into place in the bearing. **DO NOT INSTALL THE BEARING HUB DRY!** Install the small snap ring, again with the tapered side facing the transmission. Make sure that the small snap ring is seated securely in its groove. If necessary, you can tap it *very* lightly around the outside diameter with a small drift to seat it securely.

4. Installing the drive keys into the clutch shell: Install with the 10-32 x 5/16 button heads provided. Apply removable (blue) loctite and torque to 30 in./lbs.

On models with a 1-piece center hub (bearing hub/center hub), refer to step 6b next.

On models with a separate bearing hub and splined hub, proceed to step 5.

5. Install the center hub onto the bearing hub: Clean both mating surfaces and install with six 3/8-16 x 3/4 socket head cap screws provided. Apply Loctite and torque to 35 ft./lbs.

6a. For **pre-'90** models with a tapered mainshaft: Be sure the key is in place and that the mainshaft key does not bottom in the bearing hub keyway and prevent the hub from seating on the taper properly. The '84 -'89 key is taller than the pre-'84 key and the corners may require chamfering to clear the radius in our keyway. Apply light oil to the threads and install the retaining nut. Use the hub wrench (pn 195001) to hold the outer hub. Torque the mainshaft nut to 140 ft./lbs minimum on pre -'90 tapered mainshaft models. We have successfully torqued the mainshaft nut on high output bikes to over 250 ft./lbs. A spacer is provided for use with the '84-'89 transmission shaft. Check chain alignment as with the stock clutch.

6b. For **'90 and later** models with splined mainshaft: Apply a grease with molybdenum disulfide to the splines of the shaft and the splines of the bearing hub. Also apply moly-disulfide grease to the 25mm diameter where the hub presses onto the shaft **Do not** use anti-seize or never-seize. Apply loctite to the threads and torque the nut to 80 ft./lbs. This can usually be achieved with an impact wrench.

7. Installing the clutch plates: Inspect the drive slots in the friction plates, deburr as necessary and remove any lining that overlaps the slots. The plates must move freely on the drive keys for the clutch to release freely. Before installing the clutch pack, pre-wet the friction plates with the fluid you are going to use in the primary. Soaking the plates works, however simply rubbing a liberal amount into both sides of each plate as it is installed works well also. See below for fluid recommendations. Place the .120 thick steel backing plate on the splined hub first. Next, install a .047" thick steel plate onto the hub followed by a friction plate and continue alternating steels and frictions until nine friction plates and ten .047" thick steel plates are installed with the last plate being a steel plate. Hold the plates into the assembly with firm finger pressure and measure the clearance from the last plate to the end of the splined hub. This should be a minimum of 0.180" and a maximum of 0.300". Adjust this clearance by adding steel plates. Inspect periodically and adjust this clearance dimension as the lining wears.

8. Installing the pressure plate: Align the timing mark on the pressure plate with the timing mark on the splined hub and install. Insert the spring cups into the pressure plate. Insert the springs into the cups, followed by the spring collars. Install the retaining nuts and tighten until the spring collars are flush with the pressure plate. Adjust free play with center adjusting screw and lock. To increase spring pressure for high output engines, the spring collars may be set as much as .250" below the pressure plate face without coil-binding. See below for more information on spring pressure adjustment.

9. Adjust the clutch release freeplay as follows: Collapse the cable adjuster completely. Turn the adjusting screw in the pressure plate in until it stops against the pushrod, removing freeplay from the pushrods. Back the adjusting screw out 1 full turn and lock with the adjusting screw lock nut. Adjust the cable adjuster to produce 1/8" to 3/16" freeplay in the cable at the hand lever. The release mechanism must produce .070" travel of the pressure plate after freeplay is set for the clutch to release reliably. This clutch uses a great deal less spring pressure than other clutches for the big twin and what might seem like enough free play could be holding the pressure plate slightly released. If adequate pressure plate travel can not be created on '90 and '91 bikes, update the release mechanism with '87 parts as per H-D service bulletin using PN 25452-87A(inner ramp) and 25453-87 (outer ramp).

10. Reinstall the cover and add primary fluid. We recommend using 14oz. This allows the ring gear to pick the oil up and distribute it onto the chain without filling the clutch pack and causing hydraulic drag between the plates. Golden Spectro Motorcycle Gear Lubricant SAE 80w (Golden Gear 80) is recommended for best results. We have also had good results from automotive Automatic Transmission Fluid (ATF), either Dexron or Mercon, and Torco MTL. **DO NOT use the HD primary fluid or equivalent lubricants - the clutch will drag and slip!**

11. Upon initial fire-up, the clutch will drag until the oil used to pre-wet the friction plates slings off the plates. One trip around the driveway is usually enough. Test ride the bike and watch the clutch freeplay adjustment over the first 10-20 miles, and readjust as necessary. The kevlar material is very long lived and after this initial seat-in requires a lot of riding to 'break in'. Depending on the bike and the rider's riding style, you may need from 1000 to 5000 miles before the clutch 'breaks in' and produces a completely free release under all conditions. The up side to this is that this is an indication of how long the lining will last after break in.

Suggestions and Recommendations

Use a dial indicator to true the pressure plate. Adjust the spring retaining nuts until the pressure plate runs out less than .010" when the clutch is released (handle pulled in). The more true the pressure plate runs, the less total release travel will be required. On pre '84 models, the clutch pushrod and the adjusting screw mating surfaces must be flat and true. Check these surfaces for wear if the pressure plate will not run true.

Use the dial indicator to measure pressure plate travel. At least .060 travel is needed to release the clutch completely, and .070 is recommended. If your clutch does not release freely with .070" travel, you have some warped drive plates. Make sure that there is enough free play in your release cable. We recommend a minimum of 1/8" free play measured at the cable, and prefer 3/16" free play.

The clutch can be removed as a unit without removing the splined center hub but **DO NOT USE THE 1/4" STUDS TO PULL THE ASSEMBLY FROM THE SHAFT!** Remove three of the 3/8-16 x 3/4 cap screws and use those holes to pull the hub with a steering wheel or harmonic balancer puller. When installing the puller bolts into those holes, be careful not to allow the bolts to contact the bearing seal which lies behind the flange. If the seal is damaged, lubricant will leak out onto the friction plates, the bearing will run dry and will fail prematurely. Inspect the mainshaft nut each time it is removed. Replace it when the threads start to show evidence of damage. If the threads are not perfect the nut will not hold proper torque, and will not hold the hub securely to the shaft. We recommend replacing the nut after it has been torqued (6) times.

Springs and spring adjustment

There are 4 springs available for this clutch. In order from lightest to heaviest they are short gold PN154406(light), long gold PN154401(standard), Red PN154402(medium), and Gray PN154403(Heavy Duty). We recommend the Short gold springs for engines below 75 horsepower where the rider needs the very lightest lever pull possible. We recommend the long gold springs for engines up to about 90 HP, The red springs for up to 120 HP and the gray springs for engines over 120 HP. Spring pressure requirements are altered by the riding style of the rider. A motorcycle which is shifted at wide open throttle will require more spring pressure than an identical motorcycle which has the throttle rolled closed during shifts.

The spring pressure can be adjusted by turning the spring retaining nut to place the spring retaining collar below the surface of the pressure plate to shorten the springs' compressed length. When the collar is flush with the pressure plate the spring's compressed length is 1.250. The collar can be run as far down as .250 below the pressure plate which will make the spring's compressed length 1.000. 1.000 is the minimum length recommended for all springs to avoid the possibility of coil bind. When adjusting the springs, make sure that all 6 collars are set at the same distance below the pressure plate ($\pm .010$) so that the pressure plate is not pulled out of true by unequal spring pressure when released. If the pressure plate does not run true, the clutch will not release cleanly. If the pressure plate runs out .020", this shortens the effective release travel by .010". Applying more pressure than necessary will not affect the operation of the clutch, but will make the lever effort higher than necessary. The chart below shows the pressure produced by 6 springs.

Springs	Light PN154406 (short gold)(1.75")	Standard PN154401 (long gold)(1.875")	Medium PN154402 (red)	Heavy Duty PN154403 (gray)
Minimum Pressure(lbs) @ 1.250	144	210	258	276
Maximum Pressure(lbs) @1.000	240	300	372	507

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