

# BANDIT MACHINE WORKS

## Big Twin Sportsman SuperClutch Installation Instructions

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1. Remove your stock clutch, disassemble and remove the stock clutch hub from the stock clutch shell as per factory service manual instructions and clean the shell thoroughly.
2. Disassemble the Sportsman superclutch by removing the spring retaining nuts, the springs and spring collars, removing the pressure plate and removing the friction plates and steels from the clutch center hub. Do not remove the snap rings retaining the thrust washer in the hub.
3. Apply light oil to the press-fit surface of the clutch center hub and press the hub into the bearing of the clutch shell with an arbor press, being certain to support the inner race of the bearing with a sleeve of the proper size so that the bearing is not damaged.
4. Install the snap ring supplied with the new clutch onto the hub to retain hub in the bearing. Do not interchange the Bandit snap ring with the HD snap ring.
5. Lubricate the splines of the transmission with the supplied assembly lube containing moly-disulfide. Clean the threads on the end of the shaft.
6. Install the clutch shell, chain, and engine sprocket as a unit. Slide the clutch center hub onto the lubricated transmission input shaft. Apply loctite to the mainshaft threads, install the mainshaft nut supplied with the clutch, and torque to 80 ft/lbs.
7. 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.
8. Install the clutch plates as follows: First install the thick(.119) steel and slide it to the back of the assembly. Next install a pre-wetted friction plate. Now install a thin(.047) steel. Continue alternating frictions and steels until you have 9 frictions and 8 thin steels installed, with the last plate facing you being a friction plate. Make sure all of the plates fall in freely - If any drag on the sides of the shell, that will cause drag when the clutch is released. Check to make sure that the friction material on the friction plates does not contact the inside diameter of the basket! – trim the material back with a sharp utility knife if this occurs.
9. Measure the stack height of the clutch pack as follows: Hold the clutch pack in position firmly with one hand and using a dial caliper, measure the distance from the last friction plate to the end of the teeth on the clutch center hub. This measurement must fall in the range of .180/.300. Less than .180 may allow the pressure plate to catch on the end of the center hub when released, which will cause the clutch to stick in the released position, and more than .300 will allow the pressure plate to bottom out on the end of the center hub, which will prevent full pressure to be applied to the clutch pack, causing slippage and premature wear of the plates. If the clutch pack is worn enough to increase this dimension to over .300, we recommend replacing the clutch pack. **On models with HD hydraulic release mechanisms, hold the stack height to .180/.240 for proper operation of the hydraulic release.**
10. Install the pressure plate, aligning the spring cup holes with the spring retaining studs. Install a spring cup into each hole.
11. Install a spring into each spring cup, followed by inserting a spring collar into each spring. Start a spring retaining nut on the end of each stud and run the nut down until the collar is flush with the pressure plate. When servicing the clutch, make sure used nuts have enough drag on the threads to prevent them from losing adjustment.
12. Adjust the clutch release freeplay as follows: Collapse the cable adjuster completely. Turn the adjusting screw in the pressure plate in lightly 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. **DO NOT USE 'ez-pull' accessories – they reduce the amount of pressure plate release travel, and prevent drag free release of the clutch.** If after break-in, you find that the clutch engages too close to the end of the lever travel, you can increase the cable free play to change the engagement location.
13. Set up a dial indicator to read runout on the pressure plate, place the indicator on the flat part of the plate just outside the engraved logo. Put the transmission in gear, release the clutch and rotate the rear tire to rotate the pressure plate. The pressure plate runout should be no more than .010" in the released position. If it exceeds .010, you can adjust it in by adjusting the spring retaining nuts slightly. The dial indicator is also the best way to measure your pressure plate travel.

14. Flat inspection covers or covers with a flat backing plate will not clear the spring retaining studs – use a domed inspection cover. On PN.039801 clutches, check the outer cover for clearance. Normally the 2 lower bosses for the inspection cover screws must be ground to provide clearance over the pressure plate. Make sure there is at least 3/16" clearance when the cover is installed to allow for pressure plate travel. Also make sure that the inspection cover screws are short enough to clear the pressure plate at full travel. We recommend that all 3 or 5 screws be the same length to prevent damage to the pressure plate in the event that the screws are not returned to their original locations after the cover is removed for inspection.
15. 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 SAE80w (Golden Gear 80) and Bel Ray Gear Saver SAE 75W or 80W are 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 HD Primary fluid! Using the HD Oils will cause the clutch to slip and drag.
16. 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.

### 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 only 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 100 HP, and the gray springs for engines over 100 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 red springs are a compromise between gold and gray, have a slower spring rate than the gray and can provide a slightly lighter 'feel' for a given pressure than the gray.

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)	<b>144</b>	<b>210</b>	<b>258</b>	<b>276</b>
Maximum Pressure(lbs)	<b>240</b>	<b>300</b>	<b>372</b>	<b>507</b>

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