

# ***BANDIT MACHINE WORKS***

## **Bruiser SuperClutch**

### **PN 036315 complete Bruiser clutch assembly Installation Instructions**

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[www.banditmachineworks.com](http://www.banditmachineworks.com)

1. Remove the stock clutch according to Big Dog service manual. Drain primary oil and remove outer primary cover.
2. Remove clutch adjustment cover on the right side of bike.
3. Turn the adjusting screw out 2 to 3 turns.
4. Remove the four hex head bolts that hold the pressure plate, remove pressure plate.
5. Remove the snap ring that holds the button into the bearing on the stock pressure plate if present and set the button and snap ring aside to reuse in the Bruiser clutch release bearing.
6. Remove the rest of the stock clutch according to Big Dog service instructions. The manual is available online at Baker Drivetrain. Remove the pushrod to make better access to the mainshaft nut. The mainshaft nut is left hand thread, turn clockwise to remove. Set the nut and washer aside to reuse during installation.
7. Remove the original clutch outer shell from the stock clutch to reuse on your Bruiser clutch. Remove the 6 capscrews holding the shell to the bearing carrier, and remove the shell.
8. Disassemble the Bruiser assembly, set the clutch plates aside, keeping them clean. Install the shell onto the Bandit carrier. Reuse the capscrews – clean the threads of any oil, apply blue Loctite and tighten to 19 ft/lbs
9. Check the trans mainshaft for wear or burrs. Clean the mainshaft threads. Slide the clutch shell, hub and carrier assembly onto the mainshaft. Apply blue loctite and torque the mainshaft nut to 80 ft/lbs. We have a hub wrench available to hold the inner hub stationary, otherwise put the trans in 6<sup>th</sup> gear and hold the rear brake to hold the mainshaft. Make sure the outer assembly turns freely on the bearing, and the hub and mainshaft turn freely after tightening the mainshaft nut.
10. Before installing the clutch pack, pre-wet the friction plates with the fluid you are going to use in the primary. Simply rubbing a liberal amount into both sides of each plate as it is installed is adequate. Soaking is not necessary. (*See below for fluid recommendations.*)
11. Install the clutch plates as follows: First install the thick (.120) steel and slide it to the back of the assembly. Next install a pre-wetted friction plate. Now install a thin(.059) steel. Continue alternating frictions and steels until you have 14 frictions and 13 thin steels installed, with the last plate facing you being a friction plate. Make sure all of the plates fall in freely - *If there are any plates that drag on the sides of the shell, that will cause drag when the clutch is released.* Notches or grooves worn in the shell will also cause drag
12. Measure stack height. Recommended height .140-.170. (*This is measured from the outer most edge of clutch hub to the first plate in the clutch pack. See picture to the right.*) We check this dimension when the clutch is assembled before shipping, but we recommend you check this dimension any time the clutch is serviced or plates are changed.

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13. Reinstall the pushrod. Apply light grease to both ends, and a light amount to the length of the pushrod inside the mainshaft.
14. Install the button previously removed from the old release bearing into the release bearing in your new pressure

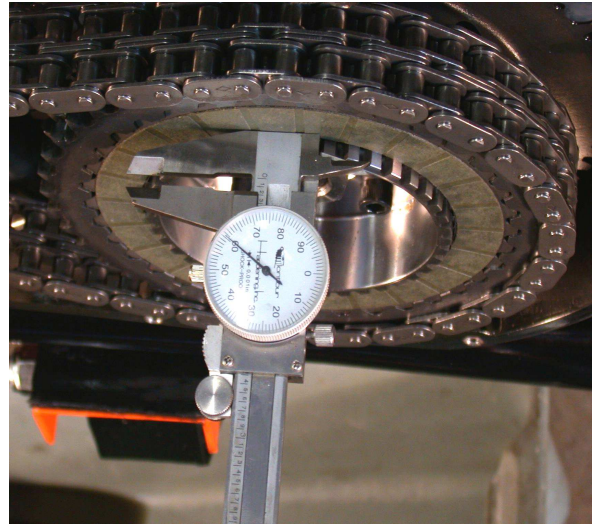
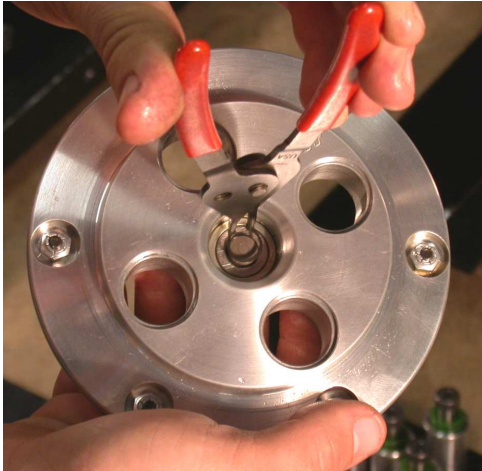


plate. Install the snap ring as shown, if your bike was equipped with one.

15. Installing the pressure plate: Align the timing mark on the rear face of the pressure plate with the timing mark on the face of the splined hub and install. Insert the spring cups into the pressure plate. Insert the springs into the cups, followed by the shoulder bolts. Use blue loctite. Torque to 25 lbs. *(See below for more information on spring pressure adjustment. Install shims under the springs to increase static pressure) Also see below for clutch cable lubrication recommendation.*
16. Adjust the clutch release free play as follows: Collapse the cable adjuster completely. Turn the adjusting screw in lightly until it stops against the pushrod, removing free play from the pushrod. Back the adjusting screw out  $\frac{1}{4}$  to  $\frac{1}{2}$  turns and lock the jam nut. Adjust the cable adjuster to produce  $\frac{1}{8}$ " free play in the cable at the hand lever. The release mechanism must produce  $.070$ " min. travel of the pressure plate after free play is set for the clutch to release reliably. *With less than  $.070$ " the clutch can drag. The more travel the better.* **NOTE: If the bike has previously been fitted with the 8 plate easy-pull clutch and the easy pull release ramps, you MUST reinstall the standard 12 plate release ramps. The easy pull ramps will not lift the pressure plate far enough for correct release.**

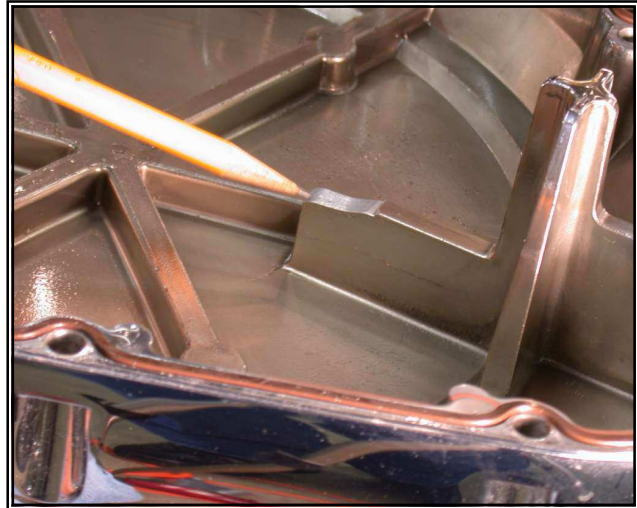
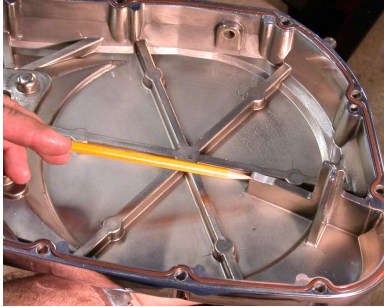


17. Using a dial indicator check the run out of the pressure plate. Put the bike in gear. Put a dial indicator on the pressure plate and engage the transmission in high gear. Pull the clutch lever in, then rotate the back tire to turn the clutch. The pressure plate should be within  $.010$  total run out. *See picture to left.*
18. Check the outer cover for clearance over the pressure plate. *(The closest point is right at the angle on the pressure plate where the six*

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*flexloc nuts are.) Most covers have a fin that will need to be filed or ground down. A good way to check is to put modeling clay on the raised bar in the primary. With the cover on the bike pull the clutch lever in and release. Then take the cover off and see if there is 1/16" clearance or more. See pictures below.*



19. Reinstall the cover and add primary fluid. We recommend using 32oz. same as stock. We recommend Golden Spectro Motorcycle Gear Lubricant SAE 80 or Bel Ray Gear Saver 75W. Do Not use Harley primary fluids.
20. Test ride the bike and watch the clutch free play adjustment over the first 10 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.
21. Clutch cable lubrication recommendations – Lube the cable with oil, not with aerosol sprays. Aerosol sprays don't last long, and don't lube well while they do last. Our practice is as follows – slacken the adjuster and disconnect the cable from the hand lever mount. Take a small ziplock bag and cut one bottom corner off. Fit that corner over the cable and tape it securely to the cable housing. Pour 2 or 3 ounces of oil into the bag and zip it shut. Now hang the cable up high by the end, taping it to a stepladder placed next to the bike works well. The oil in the bag will drain down through the housing. Pull the adjuster bellows back to keep it dry but keep the adjuster together to keep the oil flowing through the connection. When the bag is empty, remove it, wipe off the cable and reinstall the end and adjust as described above. We recommend a heavy oil like SAE 40 or transmission oil to last longest. Proper lubrication of the cable is essential to achieve the lightest lever pull and smooth operation. Of course, the cable will last longer too.

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**Spring Adjustment:** To adjust pressure on the clutch there are a set of shims in the clutch kit. *(There are 4pcs. .025 thick and 20pcs. .050 thick.)* With rider style, weight, and horse power the clutch may need more or less pressure. Take out the four shoulder bolts and springs. Then put in an equal amount of shims in each of the spring cups. With the spring and bolt back in recheck the run out of the pressure plate. An unequal number of springs will cause pressure plate runout which will cause clutch drag. See line 17 for reference.

### **Pressure Chart: 1-1/2" Long- Green Spring**

Shoulder Screw Above pressure plate	Shim Height Under Spring	Compressed Spring Length	Total lbs Spring Pressure
<b>0.150 (Starting Point)</b>	<b>None</b>	1.275	216
	<b>0.025</b>	1.250	236
	<b>0.050</b>	1.225	256
	<b>0.075</b>	1.200	280
	<b>0.100</b>	1.175	300
	<b>0.125</b>	1.150	320
	<b>0.150</b>	1.125	344
	<b>0.175</b>	1.100	364
	<b>0.200</b>	1.075	384
	<b>0.225</b>	1.050	404
	<b>0.250</b>	1.025	424
	<b>0.275</b>	1.000	448

<b>Shims Included in Kit:</b>	
<b>QTY</b>	<b>Thickness</b>
<b>4</b>	<b>0.025</b>
<b>20</b>	<b>0.050</b>

### **Recommendations –**

Stock bikes usually work fine with one shim under each spring. If minimum lever pull is desired, install the springs with no shims but watch out for clutch slippage under full throttle. External engine modifications, such as carb and exhaust usually require 2 shims under each spring. Further engine mods, cam, porting, etc will need more spring pressure. Add shims as needed but don't exceed .275" total shim thickness.

Watch your clutch pack height. .150" from the pack to the end of the hub will put the spring retaining shoulder screw head .150" above the pressure plate when assembled, and will set the spring length to 1.275" with no shims. As the clutch pack wears, these dimensions will increase which will reduce your spring pressure.

If increasing clutch spring pressure does not solve a slipping clutch issue, check the condition of your transmission. The helical gears in a Big Dog transmission put end thrust load on the mainshaft and if the thrust bearings wear the shaft will shift laterally under engine load, causing the pushrod to release the clutch slightly under load.