

INSTALLATION INSTRUCTIONS FOR



BRUTE IV EXTREME™ BELT DRIVE

FOR 1990 TO 2005 EVO & TWIN CAM Dyna® Models

PLEASE NOTE: PICTURES CONTAINED WITHIN THIS INSTRUCTION SHEET ARE ALSO USED FOR OTHER INSTRUCTIONS, SO THEY MAY NOT ACCURATELY DEPICT THE BELT DRIVE THAT YOU HAVE PURCHASED.



Shown w/optional mid-shift control

It's common knowledge that a belt drive primary can provide advantages and service that a chain cannot, especially considering the new technology present in every belt. For dependable, high performance, long-life service nothing beats a modern Primo Belt Drives primary-drivebelt-kit! Primo's® long-time tradition of "Quality & Performance" has made our belt drives the most popular in the world. That same quality & performance is now available in the Brute IV EXTREME™ 3" wide open electric-start primary belt-drive for most Softail® style motorcycles. The Brute IV EXTREME™ is ideal for street-performance, competition, and show-bike applications. It looks as good as it works. Carefully read and follow these instructions for a quick, convenient installation. If you have any questions regarding this installation call (562) 907-2600 and a PRIMO BELT DRIVES technician will be happy to assist you!

Use of the word Harley-Davidson, various motorcycle model names & designations & OEM part numbers are for end-user reference or application information only. No affiliation between Rivera Engineering & The Harley-Davidson Motor Company exists or is implied by the use of said information. Rivera Engineering, Pro-Clutch, Primo, and Primo Belt Drives are registered trademarks of Rivera Engineering Inc & Primo Products Inc. Unauthorized use is prohibited by law.

IMPORTANT SAFETY NOTE....

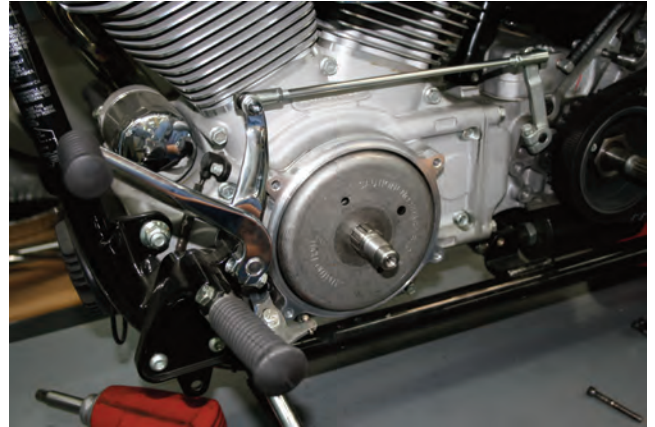
When performing any motorcycle work such as installing a belt drive it should be securely fastened in an upright position with easy access to the primary drive. If you are working with a lift, fasten the motorcycle securely to prevent it from falling. Always disconnect BOTH battery cables when performing the following installation.



The photo to the left shows the basic component pieces as delivered in the BRUTE IV EXTREME belt drive kit. Keep in mind that this photo shows both pulleys with their stainless steel flanges already mounted on them. In addition, the entire Pro-Clutch pack and all of its components have been pre-assembled for purposes of illustration.

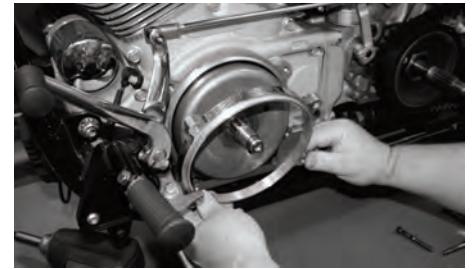
STEP 1

Begin by disconnecting the battery cables. Remove all of the OEM primary drive components including the inner primary cover, as well as the factory inner bearing race on the trans mainshaft. Check for leaky seals. Check & tighten, if necessary, the shift lever. Should you wish to change the gearing, now's the time to install Primo's billet aluminum rear drive pulley. This pulley weighs 3 lbs. less than the stock one. It's available in 29, 30, 32 & 34-tooth sizes.



STEP 2

Take the front motor plate spacer (engine case to motor plate) and place it over the alternator and up against the engine case. Do not secure with bolts at this time. Make certain that all holes are properly indexed so that the spacer is properly aligned.



STEP 3

Apply a coating of Anti-Seize compound on the transmission mainshaft to the area where the motor plate bearing will come to rest. Make certain you do this prior to installing the motor plate section.



STEP 4

Assemble the 4 stand-offs to the motor plate (may be factory-assembled). These pieces will act as the support for the outer guard. Using 3 drops of Red thread locker, begin threading each stud into a stand-off until they bottom (should be left with 3/4" exposed). Now thread each stand-off into one of the four counterbore in the motorplate locating points on the motor plate. Tighten until they bottom-out on the plate. At this time if you plan to use Rivera Primo's Mid Controls also install the mid control shift support with bushing. Install the oil line nipples on the rear of the motor mount to the cover plate if oil filter is being used.

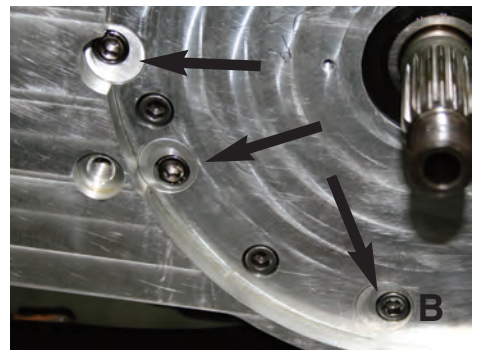


STEP 5

Now it's time to install the motor plate on the bike. Position the plate over the shafts and push forward until contact is made, sandwiching the front motor plate spacer between the motor plate and the engine case. Make certain all mounting holes are properly indexed.

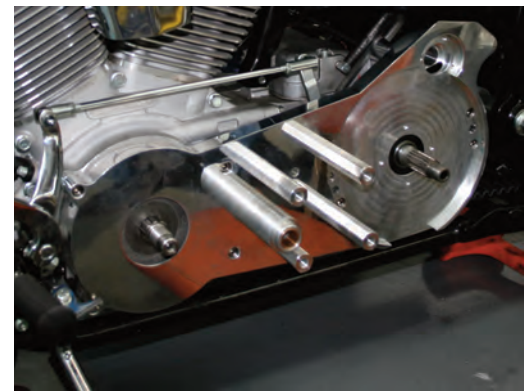


Note: The eccentric cams are used on this belt drive because the bolt pattern on the 1990-2000 Dyna® models is different than the 2001-2005 Dyna® models.



STEP 6

Apply 3 drops of Blue threadlock to all seven mounting bolts. Install the 4 5/16 x 1.5" bolts in the front of the motorplate first threading each bolt in until they seat equally up against the plate. Check that even contact is made front-to-back on the motorplate rear surface. Proceed to tightening all 4 bolts equally. Now install the 3 eccentric cams into the rear of the motorplate noting that the bottom cam is marked with a 'B'. Align the cam holes to the threaded holes in the transmission and then thread in the 3 5/16 x 2.250" bolts. This is what the mounted motor plate will look like to this point. Install oil filter nipple if center-mount oil filter is being used.



STEP 7

Install the starter motor using the two 5/16-18 x 3-3/4" socket head cap screws. Place the starter to the rear of the trans flange and slide the bolts through to the threads in the motor plate.

STEP 8

At this point it's time to address the starter jackshaft components which are included with the belt drive kit (see last page for an exploded view of the starter mechanism).



Begin by installing the starter coupler onto the end of the starter motor. Then the remaining pieces . . . the extender, spring, pinion gear, thrust washer, lockwasher and bolt. Insert this assembly into the coupler. Make certain the lockwasher is correctly oriented to the slot in the extender. Tighten the bolt. Bend the locking tab over to keep the bolt from vibrating loose.



STEP 9

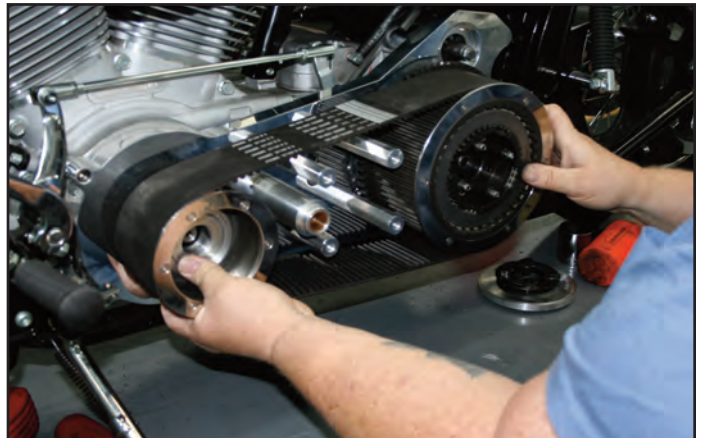
Now begin assembling the rear clutch basket. At this time begin installing the clutch plates in the same order as received. The steel .120" thick plate first. Then a fiber plate, then steel and alternating until all plates are inserted. The last plate in is a steel plate.



STEP 10

After re-checking the alignment between front & rear pulleys and correcting, if necessary, by adding spacing behind the front pulley (Primo sells these pulley shims in thicknesses of .020", .030", .050", .075" and .100") slip the front pulley into the belt and onto the engine shaft.

Visually re-check your work to make sure all clearances appear correct.



STEP 11

Take the supplied engine nut and coat the threads with 3 drops of Blue threadlock. Insert the nut onto the threaded shaft & hand tighten.



STEP 12

With an impact wrench tighten the nut to factory specifications.



STEP 13

Coat the threads of the transmission mainshaft with 3 drops of Blue threadlock. Start the supplied clutch hub nut on the shaft & hand tighten (remember this is a left-handed thread application). Finish this procedure with your impact wrench. Torque the clutch hub nut to factory specs, 70-90 foot pounds of torque. The belt should have no more than 1" total up and down free play and no less than 1/4" at the center of the belt.



STEP 14

Coat the threads of the Pro-Clutch studs with Anti-Seize compound. This will prevent the shouldered nuts from sticking to the clutch hub stud threads during disassembly. Install the clutch adjusting screw into the pressure plate. Insert the pressure plate (with the stamped "OUT" facing out) into the rear pulley, up against the last steel plate previously installed in STEP 8.



STEP 15

Prepare the diaphragm spring, the spring retainer, lock tabs and shouldered nuts for installation. Remember, the beveled side of the spring retainer faces in. In addition, the retainer has a stamped "OUT" marking on it. This side should face out.



STEP 16

Install the diaphragm spring, making sure the notches register correctly with the now-in-place pressure plate. Follow this with the spring retainer (beveled side facing in), now assembled with the locking tabs and the shouldered nuts.



STEP 17

Tighten the shouldered nuts equally until they bottom. Then tighten to 30 inch pounds of torque. That's 30 inch pounds, not foot pounds.



STEP 18

At this time, adjust the Pro-Clutch according to specifications. Re-check until you are satisfied (see last page for adjustment specs).

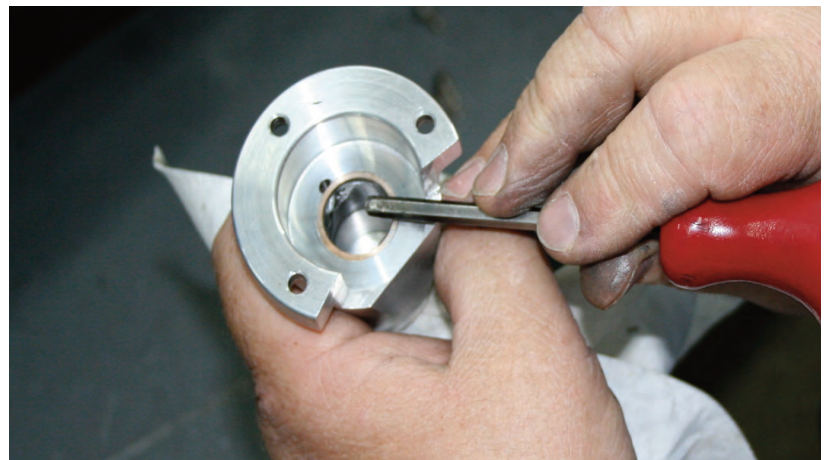
Finally, bend the lock tabs over against a flat on the nuts. This will prevent the nuts from coming loose.



STEP 19

Now turn your attention to the starter nose cap. This piece bolts to the motor plate and covers the starter jackshaft assembly.

Looking at the inside of the cap you'll notice a vent hole on the top side. Check to make sure this hole is unobstructed. It allows air to escape when the starter is engaged.



STEP 20

Place the starter nose cover over the protruding pinion gear and up against the motor plate. Check to make sure the holes line-up and the plate sits squarely up against the mating surface.



STEP 21

There are 3 mounting bolts used to attach the nose cover. Coat each with 2 drops of Blue threadlock and torque until secure.



STEP 22

The outer belt guard together with its stylish derby cover is the final component needing installation. Position the guard up against the stand-offs and check to make certain all mounting holes properly line-up and that the guard sits square-ly up against the stand-offs. At this time install the oil filter if purchased separately.



STEP 23

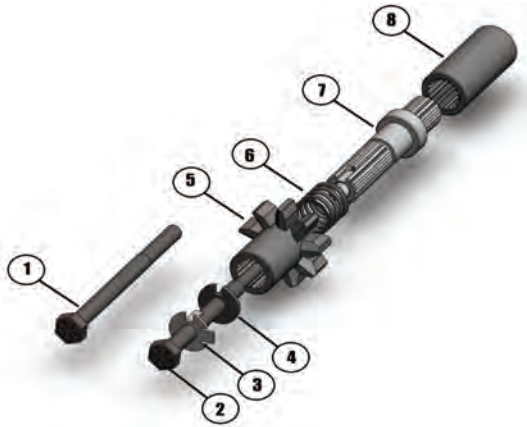
Coat the threads of the mounting bolts with 2 drops of Blue threadlock and start the bolts with your Allen driver.



STEP 24

Continue the mating process by fastening all 4 bolts until they have seated within the countersunk holes in the outer guard. Now you can stand-back and admire your work !





- 1-1/4-20 Bolt
- 2-10-32 Bolt
- 3-lock tab
- 4-thrust washer
- 5-pinion gear
- 6-spring
- 7-extension shaft
- 8-coupler

PRO CLUTCH ADJUSTMENT

BRUTE IV EXTREME CLUTCH PACK HEIGHT= 1.410" - 1.430"

As delivered the Pro-Clutch clutch-pack requires no adjustment, the clutch pack height having been set at the factory. After the Pro-Clutch has accumulated significant mileage, it may require some adjustment due to normal wear. Use the procedures out-lined below if & when adjustment is required. For best all around performance the diaphragm spring should be compressed to within .010" of being flat when the shouldered spring retainer nuts have been properly tightened (bottomed)! This provides best leverage at the handlebar, & normal spring pressure to the clutch pack. Slightly more clutch pressure can be gained with the diaphragm spring with .030" of spring height (outward bow), but this increases slightly the hand effort needed for the clutch. This spring con-figuration can be obtained by placing a small diameter washer on each of the clutch hub studs, as shown in photo B! Three clutch spring strengths are available: A stock equivalent spring (black in color), a medium spring for street performance applications (silver in color), & a competition spring (gold in color) recommended for drag race only applications.

If the diaphragm spring adjustment requires a small amount of more spring compression, this can be accomplished by using one or more of the special .020" washers on each of the shouldered nuts (Photo A)

If the diaphragm spring adjustment requires less spring compression, this can be accomplished by using one or more of the special .030" washers on top of the clutch hub stud nuts reducing spring compression. (Photo B)



PHOTO A

The diaphragm spring will be compressed to within .010"-to-.020" of flat when correctly installed & adjusted

Photo C shows a diaphragm spring that is compressed too far, & needs adjustment. Correct adjustment will require that special adjustment washers be added to the clutch hub studs as shown in photo B.



PHOTO B

This is a diaphragm spring correctly adjusted. Daylight is showing at either edge, because the spring is within .010" of being flat! (Slightly bowed outward) as seen in photo D.



PHOTO C



PHOTO D

12450 WHITTIER BLVD. WHITTIER, CA 90602

TEL: 562-907-2600 FAX: 562-907-2606



Orders: 800-872-1515

www.riveraprimo.com