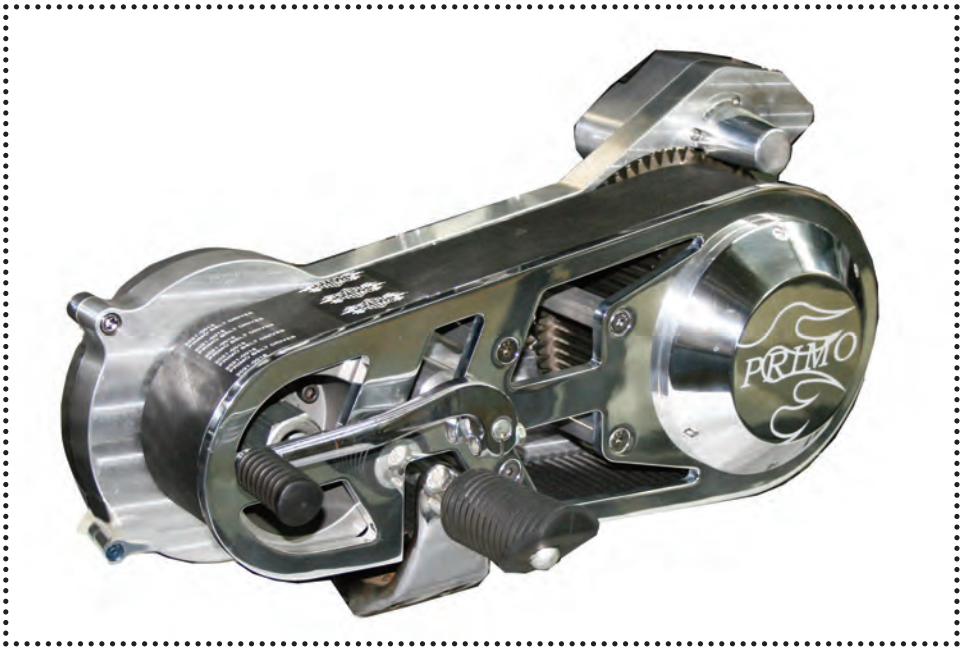
INSTALLATION INSTRUCTIONS FOR

BRUTE IV EXTREME™ OPEN BELT DRIVE

FOR 1990 TO 2005 EVO & TWIN CAM Dyna® Models
with
OE MID CONTROLS

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.



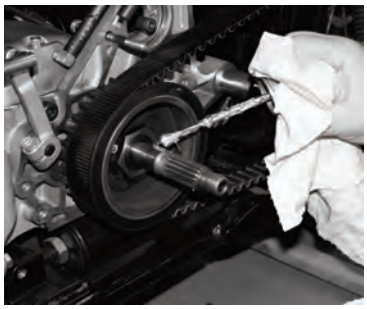
It's common knowledge that a belt drive primary can provide advantages and service that a chain cannot, especially considering the new technology present in every belt. For dependable,high performance, long-life service nothing beats a modern Primo Belt Drives primary-drivebelt-kit! Primo's® long-time 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. Itlooks as good as it works. Carefully read and follow these instructions for a quick, convenientinstallation. If you have any questions regarding this installation call (562) 907-2600 and a PRIMO BELT DRIVES technician will be happy to assist you!

IMPORTANT SAFETY NOTE....
When performing any motorcycle work such as installing a belt drive it should be securely fastened in an upright positionwith 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.

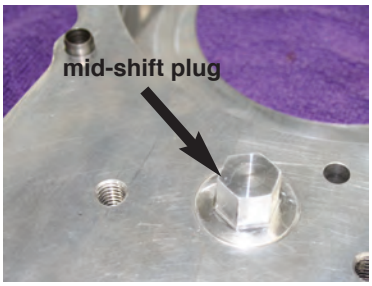
STEP 1
Begin by disconnecting the battery cables. Remove all of the OEM primary drive components including the inner primary cover, as well as the factory inner bearing race on the trans mainshaft. Check for leaky seals. Check & tighten, if necessary, the shift lever. Should you wish to change the gearing, now's the time to install Primo's billet aluminum rear drive pul¬ley. 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.

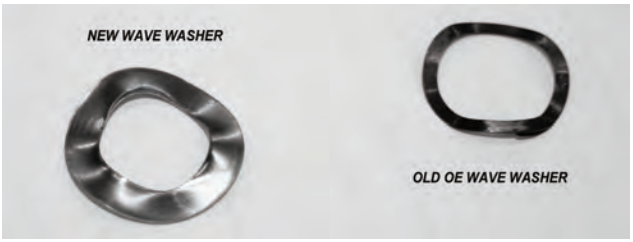


STEP 4
At this time remove the mid-shift plug and install the mid shift support with **three drops of blue thread locker**. Install if the center mount oil filter will be used. (At this time, install the oil line fittings (not supplied) on the rear of the motorplate and the oil filter nipple on the front middle of the motorplate (supplied) only if you will be using a spin-on center mount filter with this install).



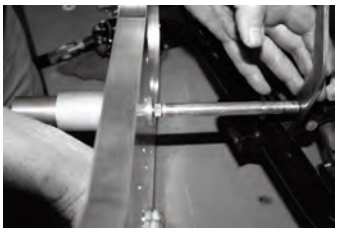
mid-shift support

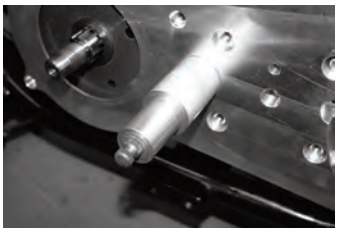
STEP 5
The stock OE shifter shaft used a wave washer to spring load the shaft. We use the same method, however our wave washer is larger.



You should now remove the OE washer and install our wave washer onto the shifter shaft.

STEP 6
Now it's time to install the motor plate on the bike. Position the motorplate plate over the Sprocket shaft and trans M/S making sure that the shifter shaft is centered in the shaft support and push forward until the motorplate is tight against the motorcase spacer and the transmission. Make certain all mounting holes are properly aligned.

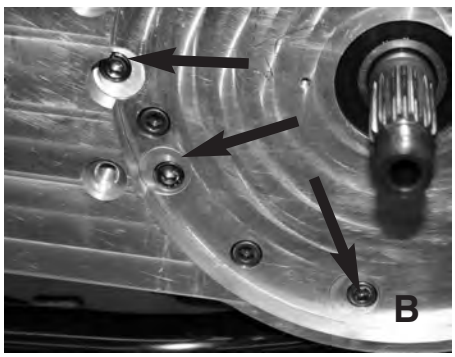


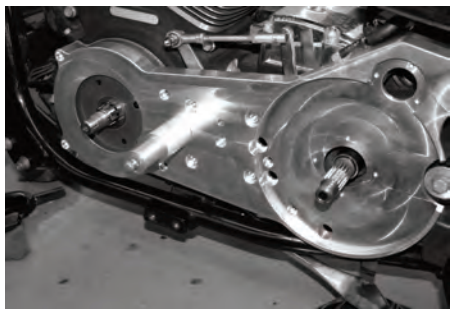


STEP 7 Install the eccentric cams in the motorplate.

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

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.



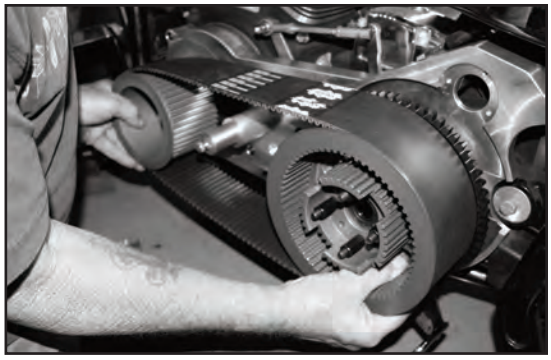


STEP 8
Install the starter motor using the two 5/16-18 x 3-3/4" socket head cap screws.Place the starter to the rear of the trans flange and slide the bolts through to the threads in the motor plate.

STEP 9

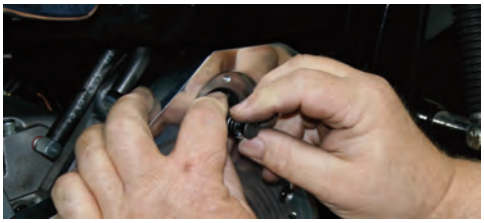
Install the front pulley, rear pulley without the belt. Place the washer on the sprocket shaft, then thread the front pulley nut onto the shaft torqueing it to 150-165 Ft. Lbs. Next torque the transmission mainshaft nut 80-90 Ft. LBs. Now check the alignment between front & rear pulleys and correct, 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. **NEVER space out the rear pulley.**

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



STEP 10

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).



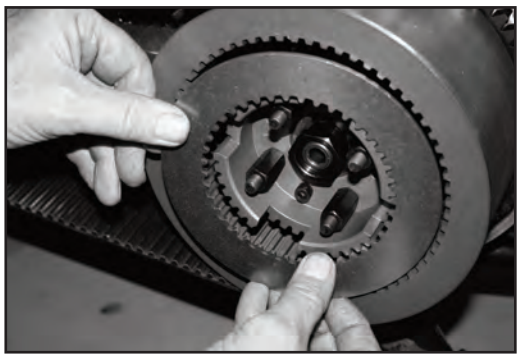
Begin by installing the starter coupler onto the end of the starter motor. Then the remaining pieces . . . the extender, spring, pinion gear, thrust washer, lockwasher and bolt. Insert this assembly into the coupler. Make certain the lockwasher is correctly oriented to the slot in the extender. Tighten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

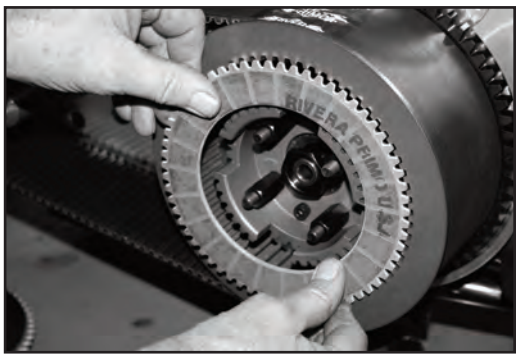
STEP 11

After insuring correct alignment, remove the front and rear pulley. Re-Install the front pulley, rear pulley and belt at the same time. Place the washer on the sprocket shaft, then hand thread the front pulley nut onto the shaft torqueing it to 150-165 Ft. Lbs. Next apply 3 drops of blue thread locker, then hand thread the left hand nut onto the transmission mainshaft and torque to 80-90 Ft. LBS. We recommend using a pnuematic impact driver to torque the front pulley nut.

STEP 12

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.



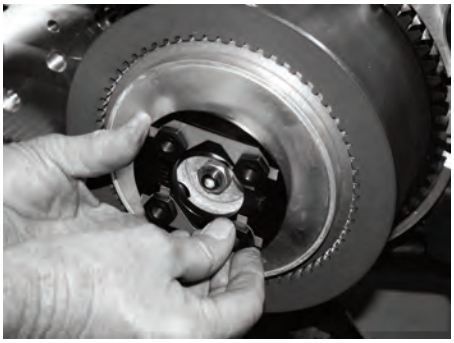


STEP 13

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 press¬ure 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.

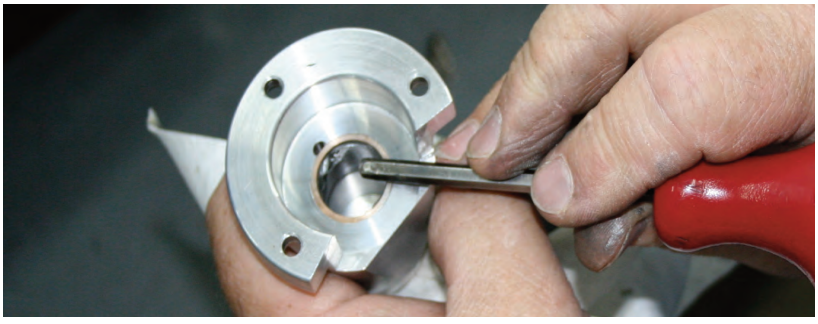
STEP 14

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 the word "OUT" stamped on it. This side should face out. 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 15

Now turn your attention to the starter nose cap. This piece bolts to the motor plate and supports 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 unobstructured. It allows air to escape when the starter is engaged.



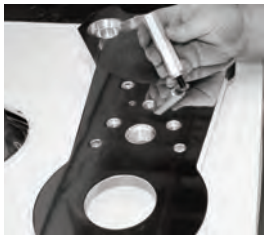
STEP 16

Place the starter nose cover over the protrud¬ing 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 17
There are 3 mounting bolts used to attach the nose cover. Coat each with 2 drops of Blue threadlock and torque until secure.

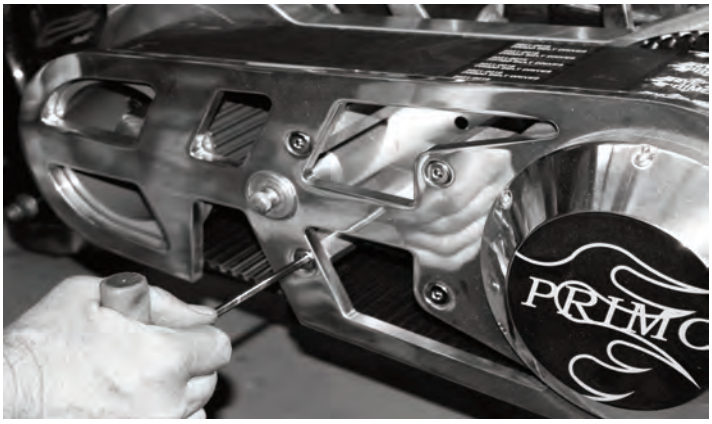
STEP 18
At this time, adjust the Pro-Clutch according to specifications. Re-check until you are satisfied (see last page for adjustment specs).
Finally, bend the lock tabs over against a flat on the nuts. This will prevent the nuts from coming loose.

STEP 19
Assemble the 4 stand-offs to the motor plate. These pieces will act as the support for the outer guard. Begin by thread¬ing in each stud into each stand-off using 3 drops of **Red** loctite.Thread them into the stand-offs until they bottom (should be left with 3/4" exposed). Now apply 3 drops of Red thread locker on the exposed stud and thread each stand-off into a counterbored & threaded hole on the motor plate. Tighten until they bottom-out on the plate.



STEP 20
Installing the outer belt guard together with its stylish derby cover is next. (Prior to installing the outer guard, install the oil filter if purchased separately). Position the guard up against the stand-offs making sure that the shifter shaft support is aligned with the hole and then check to make certain all mounting holes properly line-up and that the guard sits squarely up against the stand-offs.

STEP 21
Coat the threads of the mounting bolts with 2 drops of Blue threadlock and tighten the bolts with your Allen driver. Continue the mating process by fastening all 4 bolts until they have seated within the countersunk holes in the outer guard.

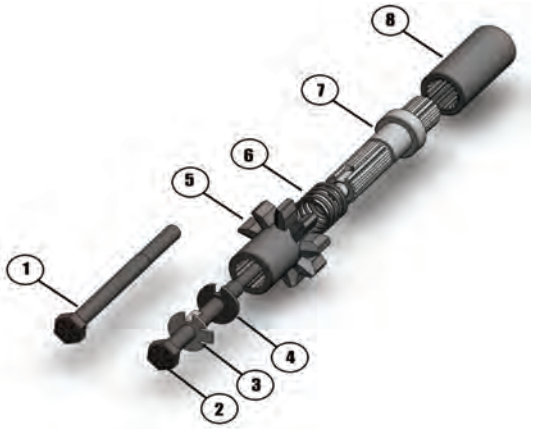


STEP 22
Install the white Delrin plastic washer on the outside of the guard onto the shifter shaft.

STEP 23
Install the shift lever onto the shifter shaft.

STEP 24
Install the foot peg and bracket to the frame.

The Finished Masterpiece!



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"

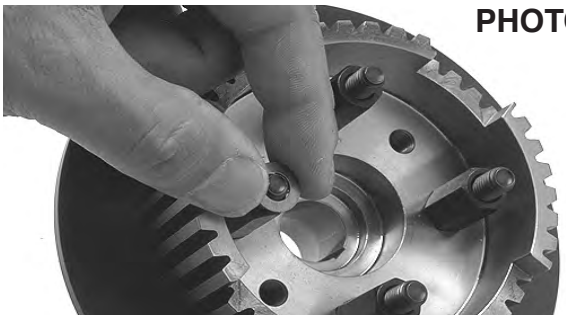
As delivered the Pro-Clutch clutch-pack requires no adjustment, the clutch pack height having been set at the factory. After thePro-Clutch has accumulated significant mileage, it may require some adjustment due to normal wear. Use the procedures out¬lined below if & when adjustment is required. For best all around performance the diaphragm spring should be compressed to with¬in .010" of being flat when the shouldered spring retainer nuts have been properly tightened (bottomed)! This provides best leveraction 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 odf the shouldered nuts (Photo A)

PHOTO A

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

PHOTO B



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 C

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 D

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RIVERA PRIMO

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