INSTALLATION INSTRUCTIONS FOR

Brute IV™ Belt Drives

3" Wide
8mm Belt

Fits 1970-2006
Big Twins
(Except Late 1978-86 w/Rotary Top 4-Speed Trans)

**** To prevent serious injury, all open belt drives must be run with a full coverage Belt Guard !**

BRUTE IV™ SHOWN WITH STANDARD POLISHED ALUMINUM BELT GUARD (PP-419-P-AY), SUPPLIED IN KIT (NON RUBBER-MOUNT MODELS)

BRUTE IV™ KIT SHOWN WITH OPTIONAL FLAMED BELT GUARD # 2014-0010

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-drive belt-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™** 3" wide open electric-start primary belt-drive for most Big-Twin motorcycles. The **Brute IV™** 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 Primo Inc. & 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 Primo Inc. Unauthorized use is prohibited by law.

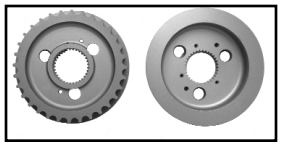
IMPORTANT SAFETY NOTE....

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.

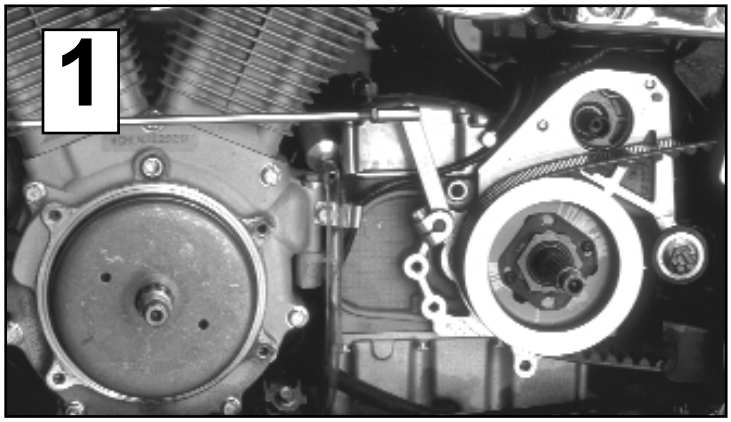
Always remove the battery to prevent accidental start-up.

STEP 1:

Begin by disconnecting battery cables. Removing all the OEM primary-drive components including the inner primary cover, AND THE FACTORY INNER-BEARING RACE ON THE TRANS-MISSION MAIN SHAFT! Check the motor shaft & transmission main shaft for leaky seals. Check & thoroughly clean the motor drive shaft & trans main shaft. Check & tighten the shift-lever as needed at this time!

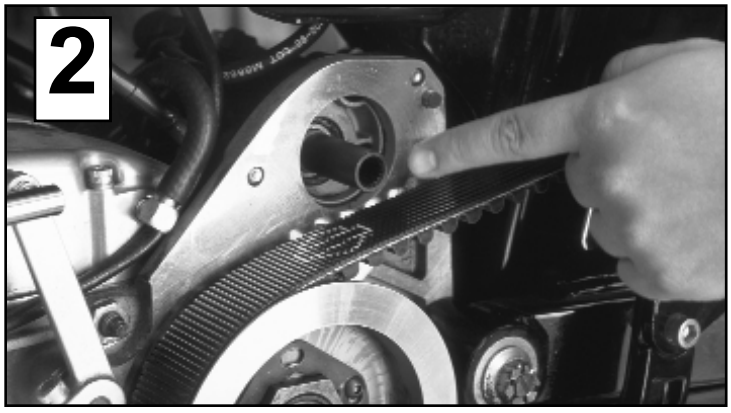


If you wish to change the final drive ratio, now is the time to install a rear belt drive transmission pulley (tighten nut perprocedure outlined in HD factory service manual). Primo's billet aluminum rear drive pulley is available with 29, 30, 32, or 34 teeth & weighs 3 pounds less than the OEM unit.



STEP 2:

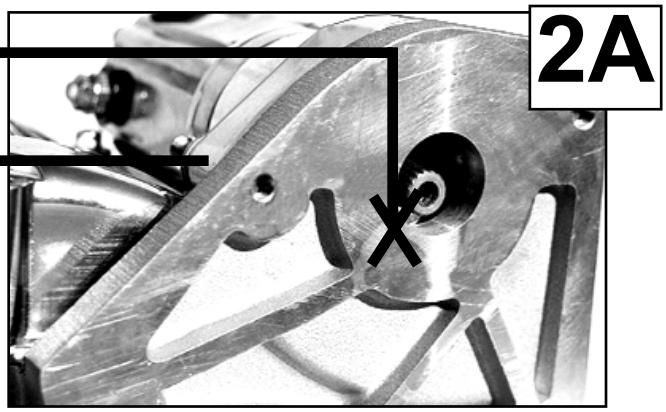
Install the starter coupler onto the end of the starter motor as shown. This component must be installed prior to the installation of the bearing support.



1986-1988 Softail / FXR applications:
Adequate clearance for the coupler must be made. Remove approximately .150" of material in the area indicated by the **X** (use the 7 o'clock position as your guide).

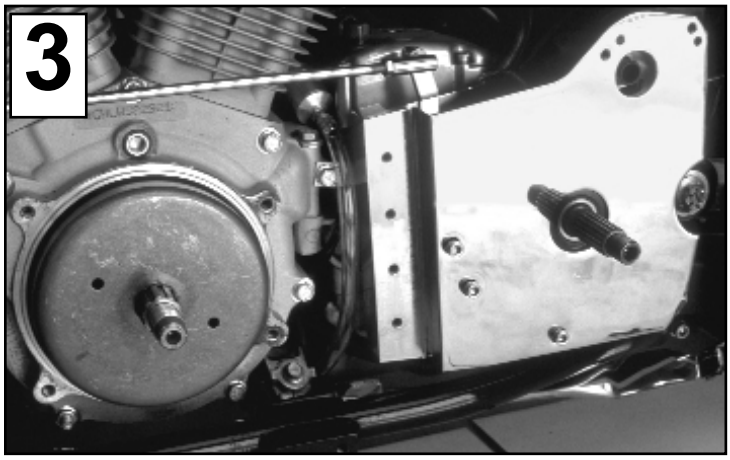
A 1990 or later starter motor is required. The Primo Belt Drives adapter plate (PP-407H) is mounted between the starter motor and the transmission starter boss as pictured.

1970-78 Shovelhead applications (**ratchet top only**).
A 1990 & later starter motor is required for Shovelheads. A Primo Belt Drives adapter plate (PP-306) is mounted between the starter motor & the transmission starter similar to the Softail adapter.

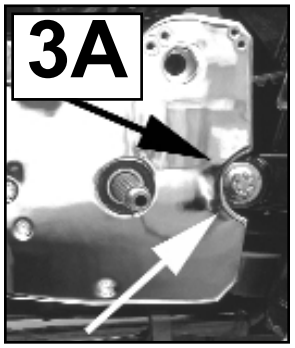


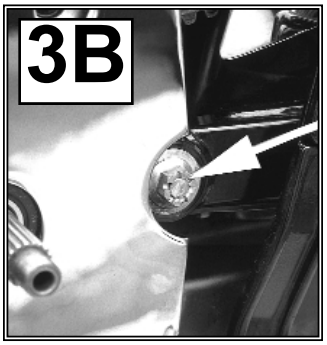
STEP 3:

Install the bearing support (rear motor plate section PP-304, PP-404, PP-504, or PP-604). Carefully align the bolt-holes and install the bearing support over the starter extender. Only hand tighten the bolts at this time. Attach the 1990 or later starter motor to the rear of the bearing support (1986 Softails require an adapter PP-407-I) (1970-78 Shovelhead with ratchet top requires the starter adapter PP-306).



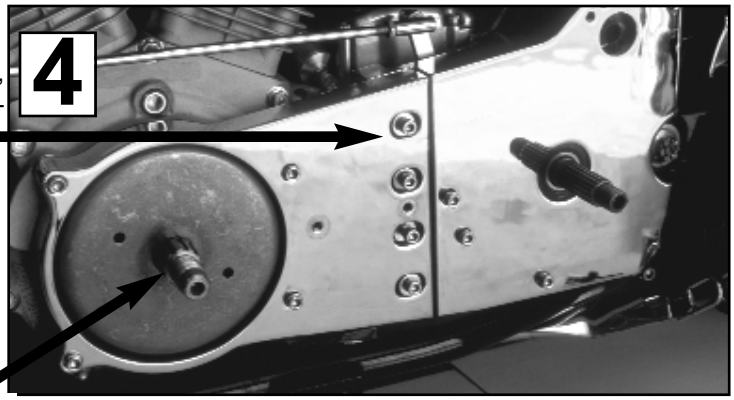
STEPS 3A & 3B:





Primo Belt Drives PP-502 Motor Plate assembly (rear section) for Dyna Glide is notched for swing-arm pivot-boss clearance (photo 3A). Approximately .125" of material must be removed from the end of the nut & swing arm pivot bolt assembly (photo 3B) to allow clearance for the Brute IV starter ring-gear before installing the clutch basket. Remove enough material from the end of the nut & bolt to allow the starter ring gear & clutch basket assembly to be installed & rotated with approximately .100" clearance between the ring gear & the nut-bolt.

STEP 4:

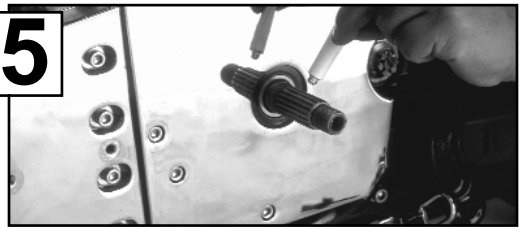


Install the Motor Plate (front section PP-303, PP-403, PP-503, or PP-603), start the four front section bolts, but only hand tighten at this time!

Install the 4 center bolts that attach the front section of the Motor Plate Assembly to the rear section. TIGHTEN THE MOTOR PLATE BOLTS, THE BEARING SUPPORT BOLTS AND THE CENTER BOLTS TO 29 FOOT POUNDS OF TORQUE AT THIS TIME, WHILE ENSURING THAT THE PLATES ARE PROPERLY SEATED AND ALIGNED. If you have a PP-400 (show chromed alternator cover) install it now!

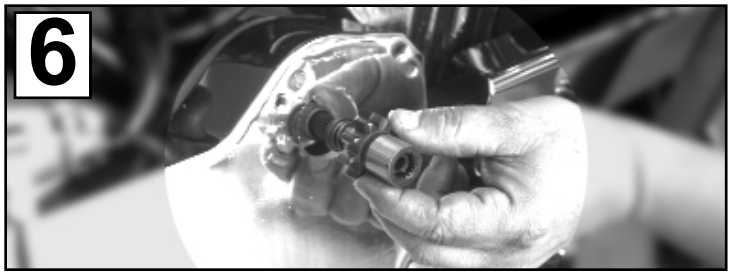
PP-400

STEP 5:



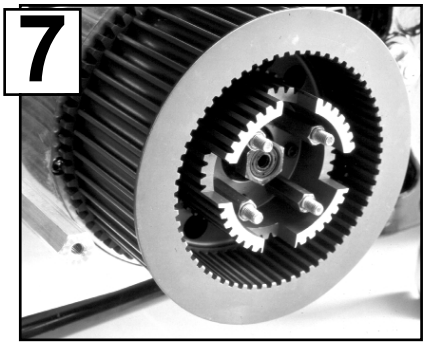
Apply a liberal amount of bearing grease to the transmission main-shaft splines to act as a corrosion inhibitor. The grease also protects the splines by absorbing shock-loads & preventing rust.

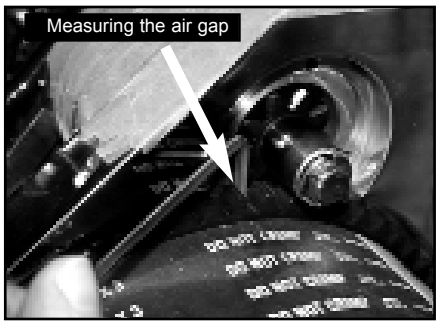
STEP 6:



Install the starter jack shaft mechanism (extender, spring, pinion gear, thrust washer, lock washer, and bolt). Make sure the lock washer is correctly oriented. Use 1-2 drops of blue threadlock & snug the bolt. Bend the locking-tab over to keep the bolt from vibrating loose.

See page 7 for starter mechanism diagram!





STEP 7:

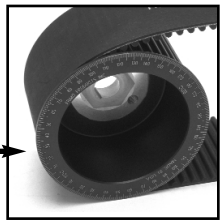
Install the rear pulley (clutch basket) and hand tighten the clutch hub nut making sure it is snug. Note that this nut is left-hand thread. At this time it is important to check the air gap between the back side of the starter ring gear and the pinion gear. Recommended gap should be .075" to .125". Use an 1/8" Allen wrench to measure the gap. Just slip the short end of the wrench between the ring gear & the pinion gear. If it fits, great. If there is too much gap, the jackshaft assembly should be shimmed to reduce the gap to the spec above (order #1185-0500 shim kit).

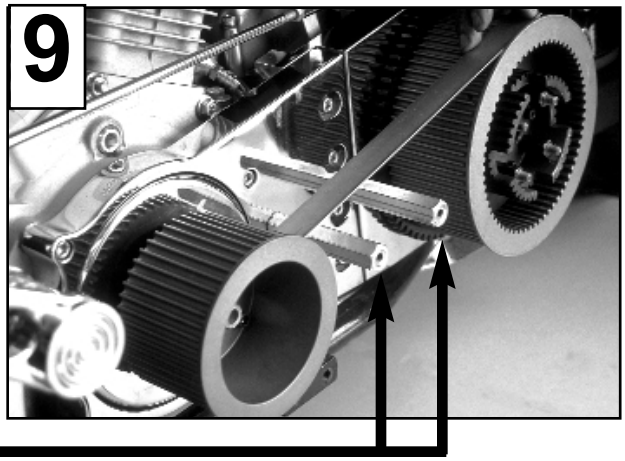
STEP 8:

If you're installing the Brute IV on a Dyna Glide, check for clearance between the rear of the starter ring gear and the swing arm pivot nut/bolt assembly. If needed remove additional material from the swingarm pivot nut/bolt assembly.

STEP 9:

Install the front pulley & nut (hand tighten to snug). Check alignment of the pulleys by placing a straight edge flush with the inside lip of the clutch basket as shown. If needed, spacers can be used behind the front pulley to correct minor mis-alignment. The straight edge should line-up flush with both the inside of the front pulley lip and the inside of the clutch basket lip. Space the front pulley as needed for alignment.
Available is a laser etched, number front pulley (part no. P-48-S-3N as shown here)



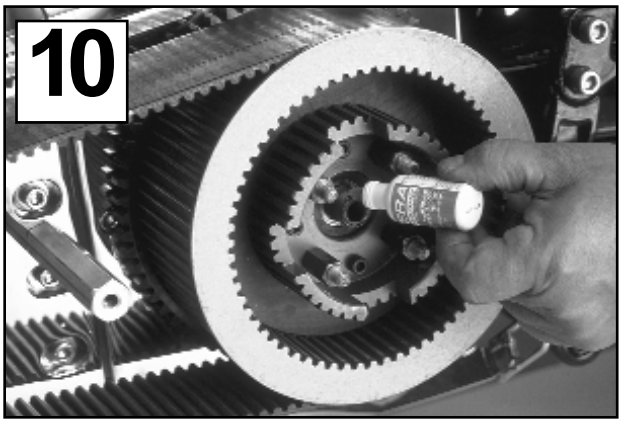


Also tighten the two stand-off studs at this time using one(1) drop of "Blue" threadlock on each stud. IF YOUR KIT INCLUDED 5/16" STUDS TORQUE TO 29 FOOT POUNDS. IF YOUR KIT CAME WITH 3/8" STUDS, TORQUE THEM TO 47 FOOT POUNDS.

STEP 10:

After checking and/or correcting pulley alignment, permanently install the rear pulley & hub assembly on the trans mainshaft using 2-3 drops of "Blue" or "Red" threadlock or equivalent. TORQUE THE MAINSHAFT (CLUTCH HUB) NUT TO FACTORY SPECS (70-80 FOOT POUNDS OF TORQUE).

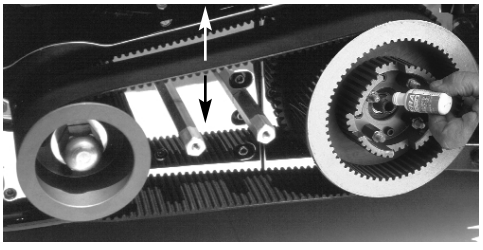
Note: Nut is left-hand thread.

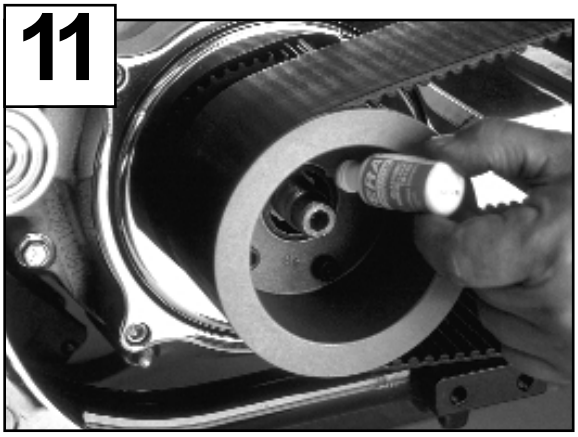


STEP 11:

Remove the front pulley. Wrap the belt around the rear pulley, slide the front pulley into the belt. SLIDE THE FRONT PULLEY ONTO THE MOTOR SHAFT AND TIGHTEN THE NUT TO 150-165 FOOT POUNDS OF TORQUE (use "Blue" or "Red" threadlock). With a cold drive-train there should be enough slack in the belt to allow the front pulley to easily slide into place (approx. 3/4" of slack is ideal).

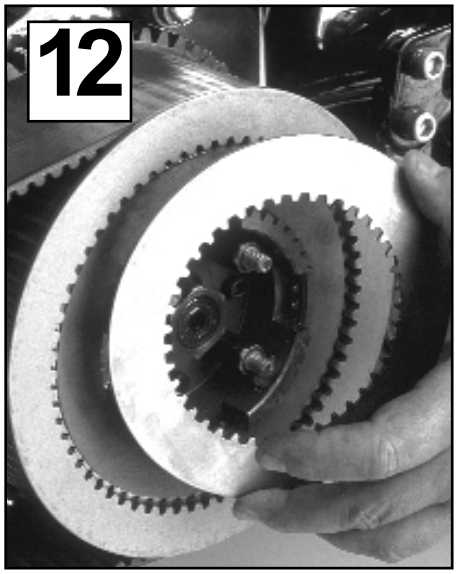
Check belt tension now. Belt should have no more than 1" total up and down play, and no less than 1/4" at the center of the belt. A small measure of adjustment can be had Evo Softail & FXR applications can adjusted by loosening the four bolts of the motor plate and the transmission bolts. Evo Dyna Glide and Twin Cam applications have no adjustment (movement) because the transmission is bolted solid to the motor.

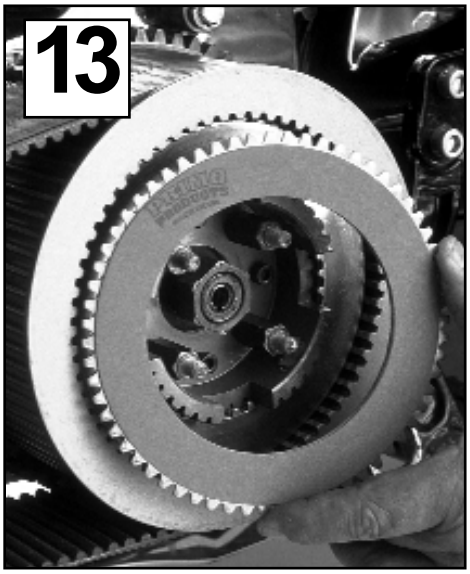




STEPS 12 & 13:

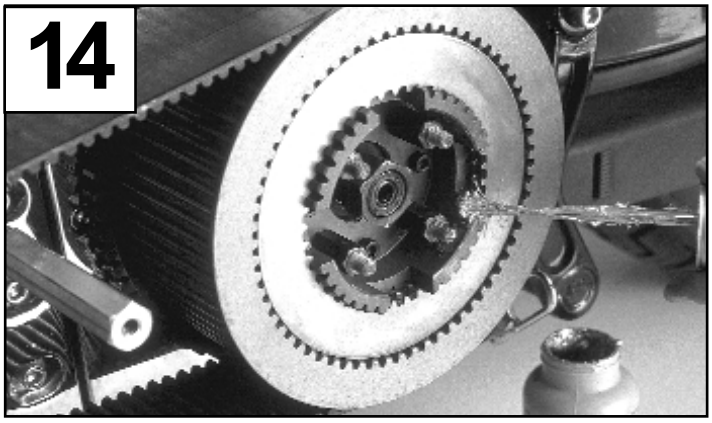
With both pulleys and the belt installed the clutch plates can now be installed. Install the clutch plates in exactly the same order as they were shipped. The steel .120" thick plate first, then a fiber plate, then steel, alternating until all the plates are installed. Last plate in is steel. When in doubt, call Rivera Primo Inc., and consult a technician.





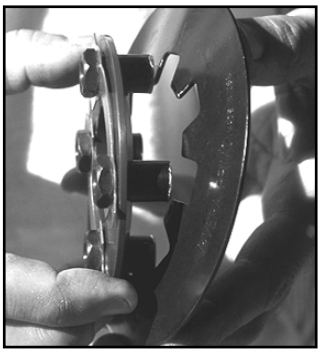
STEP 14:

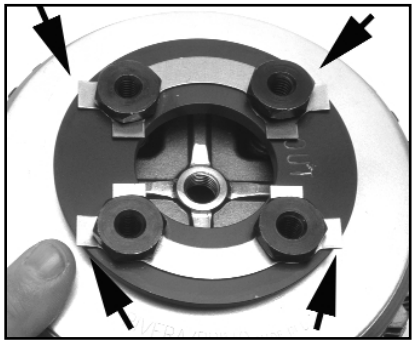
Apply anti-seize compound liberally to the the threads of the Pro-Clutch studs as shown to prevent the shouldered nuts from sticking to the clutch-hub stud threads during disassembly.

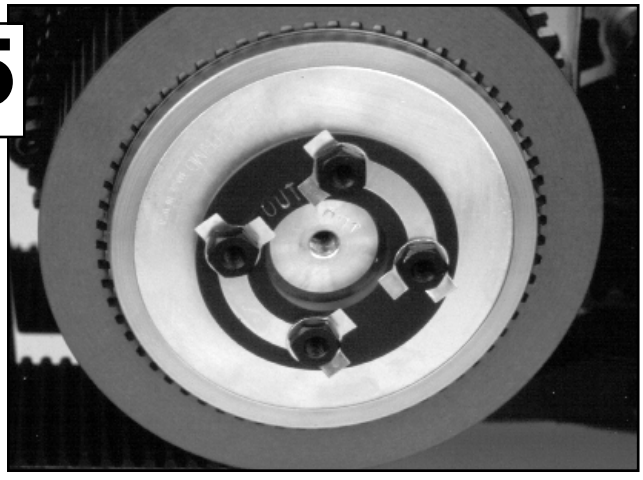


STEP 15:

Install the pressure plate, diaphragm spring, spring retainer (beveled side in) lock-tabs and shouldered nuts as shown.



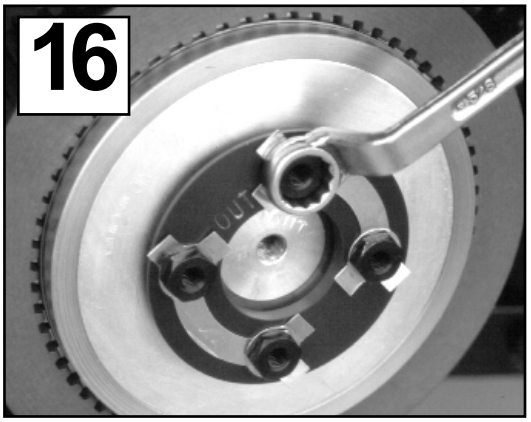


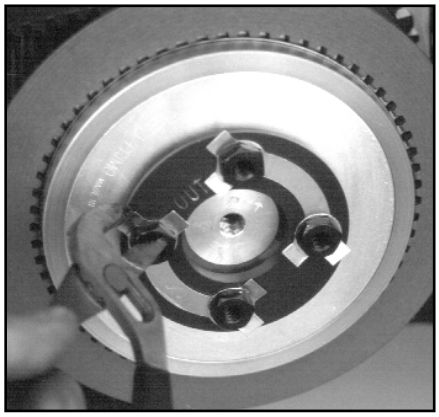


STEP 16:

TIGHTEN THE SHOULDERED NUTS EQUALLY UNTIL THEY BOTTOM, AND THEN TIGHTEN TO 30 INCH POUNDS (NOT FOOT POUNDS) OF TORQUE. Install the clutch adjustment screw & adjust the clutch following factory procedures as found the Harley-Davidson service manual. Bend the lock tabs over to prevent the nuts from coming loose.

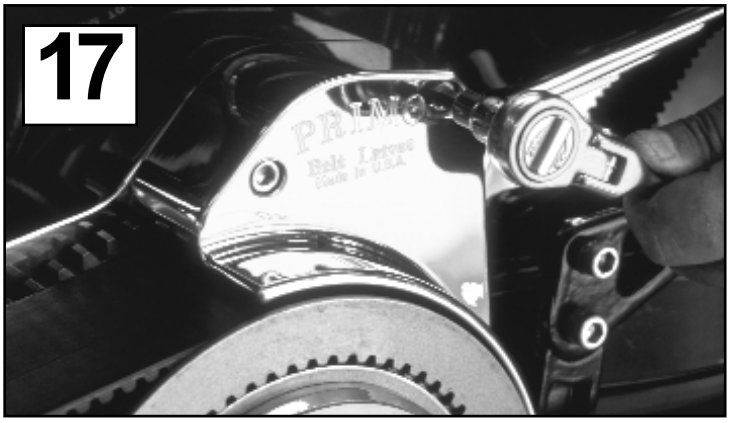
Note: Never use Loctite on these threads





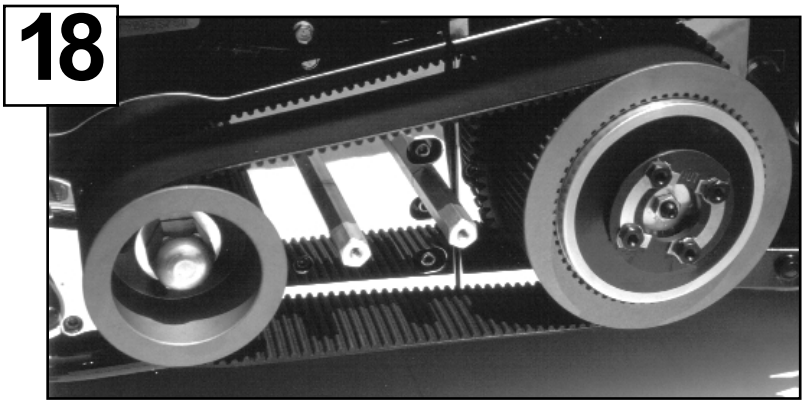
STEP 17:

Install the starter support housing (over the starter extender mechanism) as pictured. Carefully locate the housing to align the bolts. Check to make sure the starter can turn freely as the bolts are tightened. TORQUE TO 29 FOOT POUNDS.



STEP 18 & 18A

This is what your installation should look like. Be sure & install either the belt guard that came with the kit, or one of Rivera Primo Inc.'s optional belt guards.
To check belt tension grasp the top belt and move up and down. It should have approximately 3/4" of total movement with a cold drive train.



A belt guard is included with all Brute IV™ kits. Using one(1) drop of "red" threadlock or equivalent on each fastener, bolt the belt guard to the stand-off studs using the supplied 5/16" buttonheads & TORQUE TO 29 FOOT POUNDS.

Y O U R A T T E N T I O N P L E A S E ! !

DO NOT OPERATE

this or any other Rivera Primo Inc. open-primary belt-drive without the proper safety guard or belt cover in place. A well designed belt guard actually adds to the appearance of the motorcycle while protecting you as well as the belt drive from incidental damage caused by rocks or debris between the belt and the pulleys. Be safe, always use a belt guard!

REPLACEMENT PARTS LIST

FRONT PULLEYS (w/o INSERT)

P-48-3 . . . . 48 TOOTH / 1986-UP / FITS SOFTAIL/DYNA-GLIDE
P-49-3 . . . . 49 TOOTH / 1986-2000 / FITS FLH & FXR MODELS

BELT GUIDES / WASHER

PP-113 . . . . . INSIDE GUIDE FOR OFFSET PULLEYS
PP-115-45-1.25 . . . OUTSIDE GUIDE FOR FRONT 45T PULLEY
PP-117-S-1.25 . . . . FRONT PULLEY WASHER

OFFSET FRONT PULLEY INSERTS /(PULLEY/HARDWARE NOT INCLUDED)

PP-IS-1A . . . . STANDARD INSERT (NO OFFSET)
PP-IS-8A . . . . 1/4" (.250") OFFSET INSERT
PP-IS-2A . . . . 1/2" (.500") OFFSET INSERT
PP-IS-9A . . . . 3/4" (.750") OFFSET INSERT
PP-IS-3A . . . . 1" (1.00) OFFSET INSERT
PP-IS-20A . . . 1-7/16" (1.4375") OFFSET INSERT
PP-IS-5A . . . . 1-1/2" (1.50") OFFSET INSERT
PP-IS-12A . . . 1-3/4" (1.750") OFFSET INSERT
PP-IS-6A . . . . 2" (2.00) OFFSET INSERT
2100-0010 . . INSERT BOLTS - 5/16-18 x 3/4" SHCS / BLK OXIDE

SPECIAL ACORN MOTOR NUTS FOR OFFSET INSERTS

PP-116-S . . . . . NUT FOR STANDARD & 1/4" INSERT
PP-116-S-.5A . . . . NUT FOR 1/2" OFFSET INSERT
PP-116-S-.750A . . NUT FOR 3/4" OFFSET INSERT
PP-116-S-1A . . . . NUT FOR 1" OFFSET INSERT
PP-116-S-1.25A . . . NUT FOR 1-1/4" OFFSET INSERT
PP-116-S-1.5A . . . .NUT FOR 1-7/16" & 1-1/2" OFFSET INSERT
PP-116-S-1.75A . . .NUT FOR 1-3/4" OFFSET INSERT
PP-116-S-2A . . . . . NUT FOR 2" OFFSET INSERT

REAR PULLEYS

2020-0019 . . . . . 8mm / 3" WIDE / 76 TOOTH / SPLINED
2020-0011 . . . . . 8MM / 3" WIDE / 76 TOOTH / TAPERED

STARTER RING GEAR KIT

2171-0009 . . . STARTER RING GEAR KIT / 66 TOOTH w/SCREWS

REPLACEMENT BELTS

2021-0018 (OLD # 37144-3) . . . 8mm / 3" WIDE / 144 TOOTH / FOR 47-76, 48-76 PULLEY COMBINATIONS
2024-0010 (OLD # 37144-3-K) . SAME SPECS AS ABOVE, BUT "KEVLAR"
2021-0015 (OLD # 37135-3) . . . 8mm / 3" WIDE / 135 TOOTH / 49-76 PULLEY COMBINATIONS / FOR 1986 & UP FXR/FLH, FLT MODELS

FRONT MOTOR PLATE ASSEMBLY / POLISHED

PP-403-P . . . . FRONT MOTOR PLATE SECTION / ALL SOFTAILS
PP-503-P . . . . FRONT MOTOR PLATE SECTION / DYNA GLIDES
PP-603-P . . . . FRONT MOTOR PLATE SECTION / FXR MODELS
PP-303-P . . . . FRONT MOTOR PLATE SECTION / SHOVELS '70-'84
PP-408 . . . . . MOTOR PLATE BOLTS
PP-308 . . . . . MOTOR PLATE BOLTS (SHOVELHEAD)
PP-408-A . . . . ALLEN BOLTS (REQUIRES QTY 4)
PP-408-B . . . . THRUST WASHER (REQUIRES QTY 4)
PP-703-1-P . . SHIFTER SHAFT CROSSOVER (FLH/FLT/FLHT/FLHR)

COMPLETE 1-PIECE MOTOR PLATE ASSY / POLISHED

PP-702-P . . . FITS 2000 & LATER TWIN CAM B-MOTOR SOFTAILS
PP-703-P . . . FITS 2001 & LATER FLH/FLT/FLHT/FLHR MODELS

STARTER SHAFT SUPPORT HOUSING KIT / POLISHED

PP-406-P . . . . . SUPPORT HOUSING
PP-405-B . . . . . REPLACEMENT BUSHING
PP-408-2.25 . . MOUNTING BOLTS (REQUIRES QTY 2)
PP-408-2.00 . . MOUNTING BOLTS -FLH/T/R, FLT (REQUIRES

BELT GUARD KIT / POLISHED

PP-419-P -AY. BELT GUARD / RIBBED ALUMINUM (EXCEPT FXR/FLH/T)
PP-613-P-AY. BELT GUARD / FLAT ALUMINUM / FXR/FLH/FLT/FLHT/R
PP-412 . . . . . STAND-OFF / 5/16-18 x 1/2" (REQUIRES QTY 2)
PP-412-A . . . SET SCREWS (REQUIRES QTY 2)
PP-1064B . . . BUTTONHEAD SCREWS (2) (EXCEPT FXR/FLH/FLT/FLHR)
PP-1064B . . BUTTONHEAD SCREWS (2) /FXR/FLH/FLT/FLHR MODELS
PP-412-D . . . LOCKWASHER (REQUIRES QTY 2)

REAR MOTOR PLATE ASSEMBLY / POLISHED

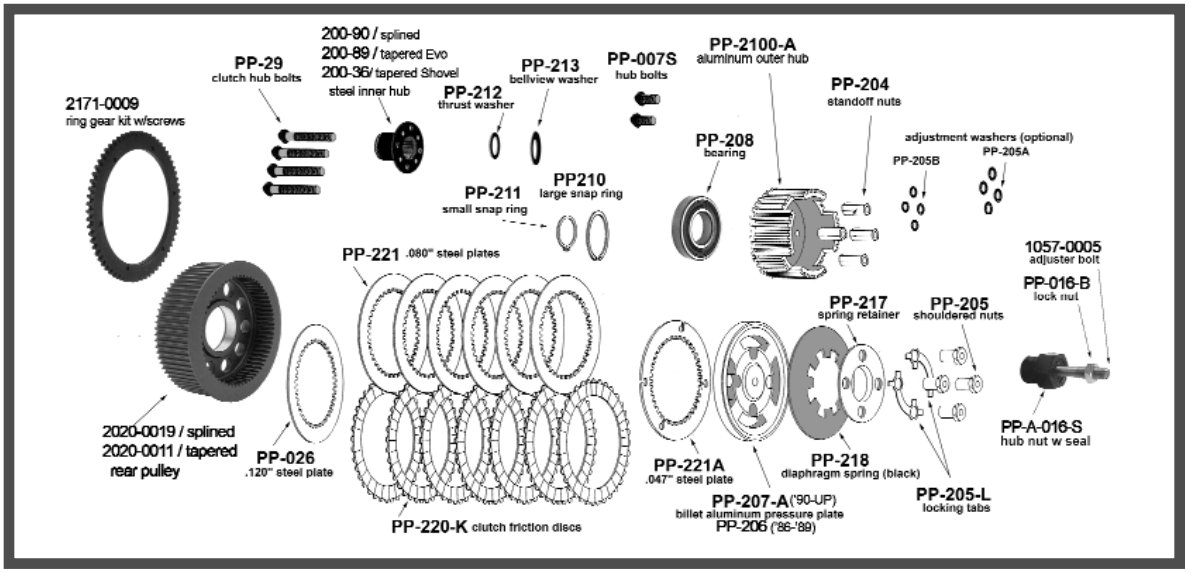
PP-404-P . . . REAR MOTOR PLATE SECTION / ALL SOFTAILS
PP-504-P . . . REAR MOTOR PLATE SECTION / DYNA GLIDES
PP-604-P . . . REAR MOTOR PLATE SECTION / FXR MODELS
PP-304-P . . . REAR MOTOR PLATE SECTION / SHOVELS '70-'84
PP-410 . . . . MOTOR PLATE BEARING (EXCEPT SHOVELHEADS)
PP-409 . . . . BEARING SUPPORT BOLT (REQUIRES QTY 4)
PP-410-A . . . SNAP RING FOR MOTOR PLATE BEARING
PP-409-A . . . BOLT, TRANS TO INNER MOUNT / FXR MODELS
PP-409-B . . . LOCKWASHER / FXR MODELS
PP-310 . . . . MOTOR PLATE BEARING / SHOVELHEADS '70-'84
PP-304-P . . . BEARING SUPPORT / SHOVELHEADS '70-'84
PP-309 . . . . BOLTS-BRNG SUPPORT/SHOVEL (REQUIRES QTY 4)
PP-305 . . . . CABLE ADAPTER / SHOVELHEADS '70-'84
PP-307SQ . . CLUTCH ARM (SQUARE) / BILLET / SHOVEL '70-'84

STARTER EXTENSION (JACKSHAFT) ASSEMBLY

PP-407-66 . . . COMPLETE JACKSHAFT ASSEMBLY
PP-407-C-66 . . PINION GEAR / 9-T / MATES TO 66-T RING GEAR
PP-407-F . . . . EXTENDER / MALE SPLINE BOTH ENDS / '89-UP
PP-407-F-86 . . EXTENDER / MALE SPLINE BOTH ENDS / '86-'88
PP-407-H . . . . ADAPTER PLATE / 1986-1988 SOFTAIL MODELS
PP-407-G . . . . COUPLER / STARTER EXTENSION / FEMALE SPLINE
PP-407-A-86 . STARTER SHAFT BOLT / 1986-1988 STARTERS
PP-407-A-90 . STARTER SHAFT BOLT / 1990-1993 STARTERS
PP-407-A-94 . STARTER SHAFT BOLT / 1994 & LATER STARTERS
PP-407-B . . . . STARTER EXTENSION SPRING
PP-407-D . . . . STARTER EXTENSION THRUST WASHER
PP-407-E . . . . LOCKING TAB

PRIMO BELT DRIVES
DESIGNED TO FIT, ENGINEERED TO LAST!

CLUTCH ASSEMBLY - BRUTE IV™ / 3" WIDE / 8 mm BELT



IMPORTANT INFORMATION

DO NOT OPERATE this or any other Rivera Primo Inc. open primary belt drive without the proper safety guard or belt cover in place. A stamped billet aluminum safety guard has been supplied with this belt drive kit. Install the supplied guard or suitable other guards and/or belt covers available from Rivera Primo Inc. prior to starting the motorcycle.

ADEQUATE GROUND CLEARANCE is extremely important, especially when turning to the left. Once installed, make certain the belt drive assembly does not in any way interfere with this turning geometry. Should there appear to be a problem, correct it immediately so as to provide adequate & safe ground clearance. DO NOT OPERATE the motorcycle until this is done!

LIMITED WARRANTY:
All pulleys are warranted to be free from defects in material and workmanship under normal use for a period of one year from actual date of purchase. Seller's liability shall be limited to repair or replacement of any materials found to be defective, free of charge at it's plant or authorized service depots, of specific manufactures components. It is further warranted that products that were designed for a specific purpose, shall perform for that purpose when installed exactly as defined in the Installation Instructions accompanying the unit. In no event shall Rivera Primo Inc. or seller be liable for consequential or special damages asserted to be attributed to malfunction of our product, for any reason including, but not limited to, damage asserted to be from improper installation of our purchased Primary Belt Drive components.
This warranty shall not apply to any products which have been subjected to abuse, neglect or accident, nor shall it apply to any product which has been repaired or modified by any person not specifically authorized in writing by the manufacturer.

THERE IS NO WARRANTY ON BELTS. Due to the differing conditions and circumstances under which all belts are installed and used, Gates Rubber Company will not warranty any belt for length of service. Regardless of belt type, keeping your system free of debris and other objects is most important. Remember too, improper handling of the belt can shorten service life. Do not crimp the belt. Do not twist the belt. Do not pry the belt onto the application. If you're shipping or storing, try to eliminate forward and back-bending of the belt.

LIMITATION OF LIABILITY:
THERE ARE NO IMPLIED WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF ANY SHIPMENT AND THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS EXCEPT THAT THE MATERIAL SOLD HEREUNDER SHALL BE OF SELLER'S STANDARD QUALITY, and buyer assumes all risk and liability for all loss, damage or injury to person or property resulting from the use of said material in manufacturing processes or in combination with other substances, or otherwise. Except as otherwise provided herein quality shall be in accordance with seller's specifications. Final determination of the suitability of the material for the use contemplated by buyer is the sole responsibility of buyer, and seller shall have no responsibility in connection with such suitability.

RIVERA PRIMO
(562) 907-2600