Z-Ball Clutch Installation

Cobra Motorcycle Mfg.

240 Uran Street
Hillsdale, MI 49242

(517) 437-9100 phone
(517) 437-9101 fax

Supplied Components

Qty.	Description	Cobra #
30	Balls	CCEX0009
1	Spring loaded ball plate	CCEX0019
1	Thrust plate	CCEX0008
2	1.2mm (0.047”) steel drive plate	CCEX0006
2	1.4mm (0.055”) steel drive plate	CCEX0005
1	1.4mm (0.055”) modified drive plate	CCEX0004
1	Rotating stand-off	CCEX0013
1	Stall spring (H4, red)	CCEX0010
1	Thrust bearing & washer	CCEX0007
3	0.2 mm thrust washer (0.008”)	CCEX0014
3	0.3 mm thrust washer (0.010”)	CCEX0015
1	0.5 mm thrust washer (0.020”)	CCEX0016
5	1.0 mm thrust washer (0.040”)	ECDC0063
1	0.8 mm wire – gap measure	CCEX0017
1	1.0 mm wire – gap measure	CCEX0018
1	10 X 35 MM SHCS	HCBC1035
1	8 x 20 SHCS	HCBC0820
1	8 mm nut	HCNS0801
1	8 mm flat washer	HCWF0801
1	Clutch cover plate – adjustable no canulus	ECDC0000

Accessories

M4 stall spring (orange)	Light	CCEX0011
M5 stall spring (yellow)	Medium for 90	CCEX0012

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Tools Required for Installation

- Flat blade screwdriver (medium to small size)
- 4 & 6 mm hex key (Allen wrench)
- 10mm wrench
- 0.8 & 1.0 mm thickness gages (0.030” & 0.040”)

Instructions

1. Vehicle preparation
    a. Shut off the fuel flow to the carburetor at the fuel petcock
    b. Tilt / rotate the quad over on its side so that the clutch cover is up for easy access.
2. Disassemble the old clutch
    a. Using a 10mm wrench remove the four bolts holding the clutch slave cylinder to the clutch cap.
    b. You can now remove the entire clutch lever / master cylinder, line and slave from the vehicle, although it would be easier to do at a later time when the vehicle is back resting with four wheels on the ground.
    c. Using a medium flat blade screwdriver, remove the clutch cap retaining ring and pull off the clutch cap.
    d. Place the throw out bearing and push rod aside as they will be needed later.
    e. Using a 4mm hex key, remove the six bolts holding the spring plate and springs. The spring plate will be required for auto clutch installation.
    f. With a 6mm hex key remove the clutch center bolt, and remove the entire clutch assembly and washers, leaving only the basket in place. The pressure plate (hub) will be required for auto clutch installation.
3. Clutch cover removal to replace thrust washer & eliminate oil shield
    a. Remove the water pump impeller cover (four socket head cap screws with 4mm hex key).
    b. Remove the water pump impeller (4mm hex key with piston stop or use an impact driver)
    c. Remove the kick lever (10mm wrench)
    d. Remove the clutch cover (5mm hex key)

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NOTE:
It may be helpful to remove the front engine mount and/or the swingarm pivot bolt to aid in removal of the cover and/or access to the rear-most bottom cover bolt.

e. Remove the clutch basket and thrust washer behind it.
f. Remove the kick lever mechanism (#3 Phillips screwdriver & 5mm hex key)

NOTE:
The oil shield will not be used with the auto clutch installation.

4. Reassemble the clutch cover with new thrust washer & and no oil shield
   a. Install one of supplied 1mm (0.040”) thick thrust washers
   b. Reinstall the clutch basket
   c. Reinstall the kick mechanism and secure with the Phillips head and button head screws.
   d. Reinstall the clutch cover along with engine mounts if they required removal
   e. Reinstall the kick lever & water pump impeller and cover.

CAUTION:
Use high strength thread locker on the water pump impeller bolt.

5. Z-Ball clutch installation.
   a. Install three of the 1mm (0.040”) thick clutch thrust washers onto the main shaft.

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b. Install the spring loaded ball plate, with all the balls, into the clutch basket.

c. Place the thrust plate against the balls on top of the pressure plate. Make sure the 4 outer tabs do not rest in the same basket slots as the 4 outer tabs of the Pressure Plate. The machined side of the thrust plate must face up/away from the balls.

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d. Install the bearing and special thrust washer.

e. Install the clutch pack starting with a friction (fiber) plate and ending with a steel drive plate. Use 5 fibers, 2 x 1.2mm (0.047") steels, 2 x 1.4mm (0.055") steels and 1 x modified steel plate.

NOTE:
It does NOT matter what order the 1.2 & 1.4 mm steel plates are in as long as there is a steel plate between each fiber plate.

NOTE:
The modified plate should be on the top with the machined step facing the outward to match the step in the aluminum pressure plate.

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f. Install the stock aluminum pressure plate (also called the clutch hub).

g. Using the supplied pieces of measurement wire (one piece is 0.8mm the other is 1.0mm), measure the installed gap. The acceptable range is 0.8mm to 1.0mm. Using the supplied alternative thickness clutch thrust washers, add or remove as necessary to achieve this thickness.

NOTE:
Thrust washer stacks as low as 1.0mm and greater than 5.0mm have been observed. It is recommended to increase by 1.0mm increments until a gap is created then decrease by 0.5 and adjust as necessary.

NOTE:
As the gap will increase as the fiber plates wear, it is to your advantage to have the initial gap set closer to 0.8mm than 1.0mm. A 'tight' 0.8 is an ideal starting point.

h. Once the proper gap is achieved, install the **new 35MM long clutch center bolt** with spring washer and torque to 40 ft-lb (54 Nm).

CAUTION:
Use high strength thread locker on the clutch center bolt.

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i. Install the stand-off, making sure that the bearing locating feature at the base of the stand-off indexes and locates the thrust bearing and thrust washer.
NOTE:
It is helpful to center the thrust bearing with a small pick and a small application of oil will help to hold it properly centered before attempting to orient the stand-off.

j. Place the stall spring into the pocket on top of the stand-off.
   i. For an ECX70 the H4 spring is recommended.
   ii. Larger displacement engines will benefit from the M5 spring.

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k. Place the stock spring retaining plate and throw-out bearing over the wave spring.

l. Place the push rod into the throw-out bearing.

m. Install the clutch cover making sure the push rod and throw-out bearing stay located.

n. Install the adjuster plate with adjustment screw and canula vent fitting onto the clutch cover.

o. Attach the canula vent assembly as shown below

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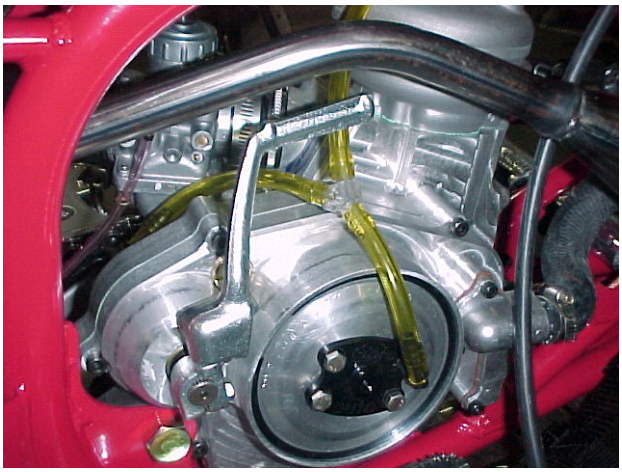
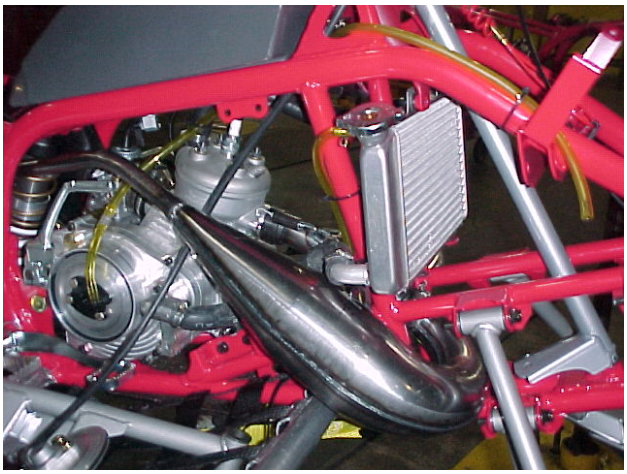
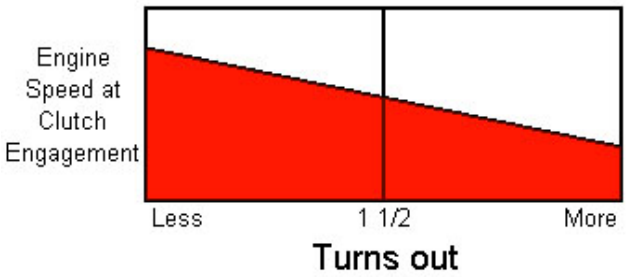




6. Set the stall spring preload adjuster
    a. For an **ECX70 with H5 stall spring**, adjust the screw all the way in (until it bottoms) and then adjust back out **1 ½ turns** and secure with the jam nut.
    b. For **larger displacement engines with the M5 stall spring**, adjust the screw all the way in (until it bottoms) and then adjust back out **½ turn** and secure with the jam nut.

NOTES:

- Recheck and the clutch 'gap' measurement frequently, adjusting as necessary.
- The clutch may drag while the bike is cold so give it an opportunity to warm up.
- For clutch engagement at higher engine speed turn the adjustment screw in from the 1 ½ turn setting. For low engine speed engagement, turn it further out.