

Rekluse Motor Sports

The z-Start™ Clutch

KTM 125/200

Installation Guide

Copyright 2002-2004 Rekluse Motor Sports
z-Start Revision 3.000
RMS137 – KTM 125/200

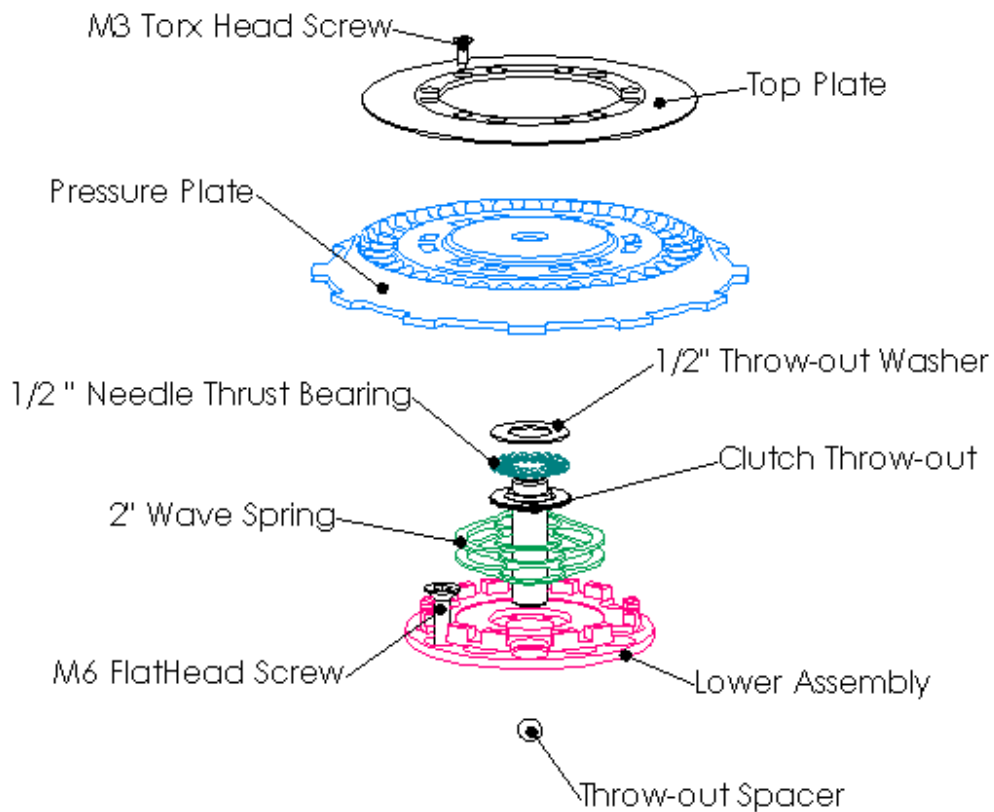
RMS100-237
Manual Revision: 101804

Rekluse Motor Sports, inc.
110 E. 43rd Street
Boise, Idaho 83714
208-426-0659
support@rekluse.com

Required Tools

| | |
|--|----------------------------------|
| 8mm socket | Fine tooth metal file |
| 10mm socket | 2 Sets of feeler gauges |
| 27mm socket | Inch Pound Torque Wrench |
| 4mm allen key socket | Torx T10 driver tip (included) |
| 3mm allen | Blue Loctite 243 (oil resistant) |
| 1/4 inch driver (for included Torx T10 driver tip) | Electric Drill |

z-Start Overview



Note: The Lower Assembly is packaged underneath the Pressure Plate and held in place with two screws through the Top Plate.

Included Parts for the z-Start Clutch

Note: spare screws, balls and shims may be included with your clutch

| | |
|---|--|
| Top Plate | 1 x 0.625" (15.9mm) Bellville Spring Washer |
| Pressure Plate | 5 x M6 Flat Head Screws |
| Lower Assembly | 1.375" (35mm) Wave Spring (C137L2) |
| Clutch Throw-out | 1.375" (35mm) Wave Spring (C137L3) |
| 5/16" (7.94mm) ball Throw-out Spacer | 40 x 5/16" (7.94mm) steel balls |
| 1.75" x 0.554" Guide Puck | 10 x 5/16" (7.94mm) Tungsten Carbide balls |
| Slotted Center Clutch Guide Plate | 10 x M3 #10 torx screws |
| 4 Rekluse .040" (1.0mm) steel drive plates | 2 x Clutch Cover Gasket |
| 3 Rekluse .047" (1.2mm) steel drive plates | 10 x M6 – 1.52mm washers (to go back to stock) |
| ½" (12.7mm) Throw-out Needle Thrust Bearing | 5/16 HSS Countersink Tool |
| ½" (12.7mm) Flat Throw-out Thrust Washer | |

Basic z-Start Clutch Operation

The z-Start Auto Clutch functions through centrifugal force. As engine RPM increases, the balls contained in the z-Start Pressure Plate travel up the ball ramps and push against the Top Plate. This action forces the Pressure Plate to engage the clutch pack.

Installation Tips

In order for the z-Start Clutch to perform properly, it must be mounted properly.

- Measuring and maintaining the Installed Gap is **critical**. If the Installed Gap is too big the clutch will slip excessively and cause rapid clutch wear. If the Installed Gap is too small, the clutch will drag and cause engine stall.
- Recognize that the Pressure Plate travels along the tabs of the Lower Assembly as it engages and disengages. Anything preventing this travel will prevent full engagement and cause the clutch to slip excessively.
- The z-Start only applies pressure to the hydraulic clutch system when the engine is running. **Pulling the clutch lever repeatedly during the install, or when the motorcycle is off and the z-Start is installed can damage your clutch system.**
- **Be very careful not to drop any screws, washers or springs into the crankcase opening!** It is surprisingly easy to drop a little screw or washer down into your crankcase. It is not always so easy to get it out. Make sure all parts going in and coming out are accounted for before you finish the installation. A strong magnetic probe can often be used to retrieve little parts if you happen to drop something in.

Bike Preparation and Disassembly

1. Turn the gas petcock to the off position and route the gas cap vent tube into the air. When you lay the bike over on it's side, the gas in the bowl will drain out of the overflow tube. Be prepared to catch the gas in a suitable container to prevent a fire hazard.
2. Remove the rear brake lever.
3. Remove the clutch cover bolts with an 8mm socket and carefully remove the clutch cover.
4. Using a 10mm socket, remove the bolts holding the pressure plate to the inner clutch hub. Lift off the pressure plate and the clutch lifter assembly. The clutch lifter assembly consists of the **Clutch Throw-out**, a **bearing**, and a **washer**.

Stock Pressure plate, clutch throw-out, 5 bolts, and 5 springs are not reinstalled.

5. Remove your clutch pack and set it aside. Try to keep it in order because it will be re-installed.

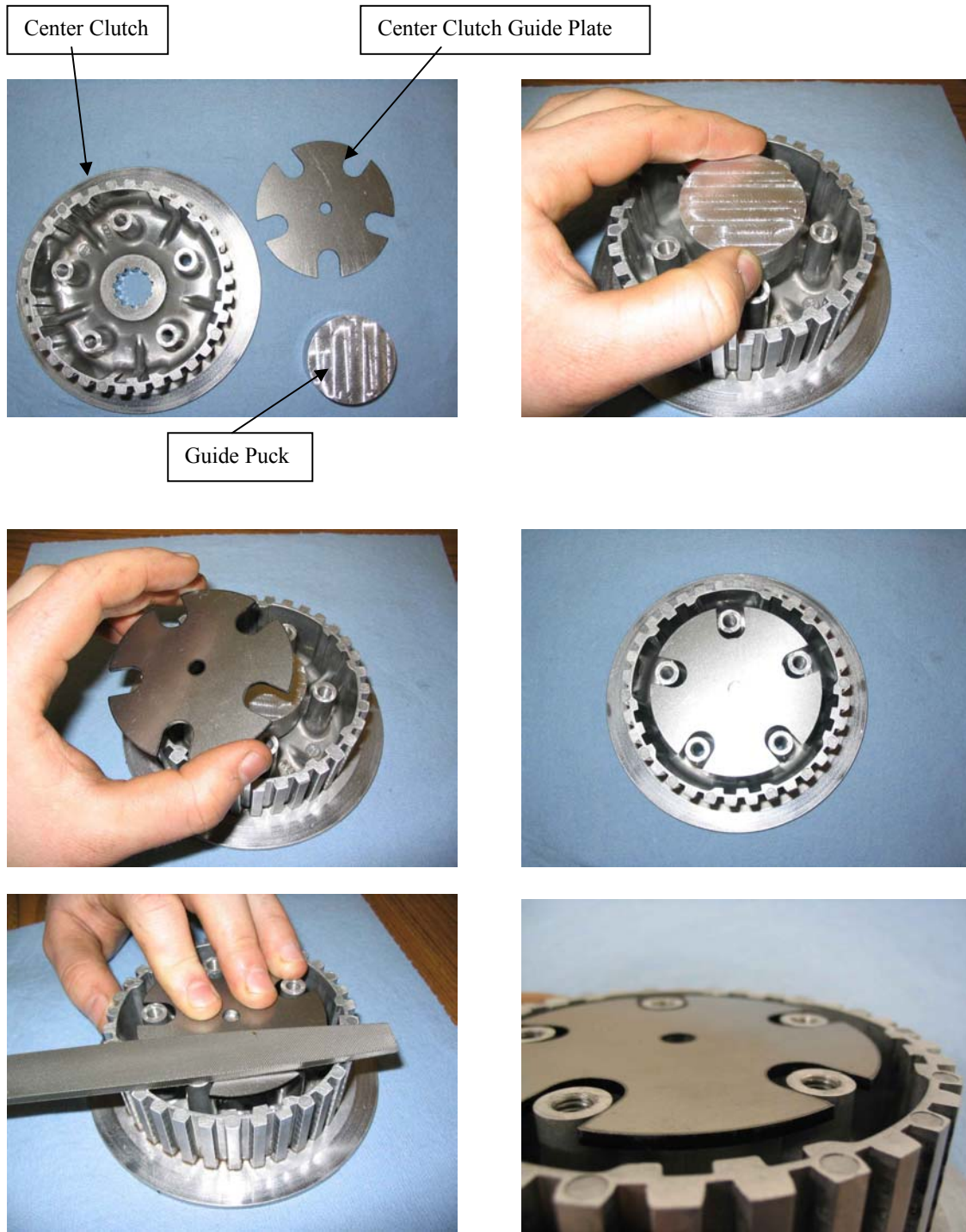
Modifying the Stock Center Clutch

6. Remove center clutch with 27mm socket and keep track of the nut and thrust washers because they will be re-installed later.

7. Take the center clutch to a place where no filings can be dropped into the crankcase opening. Place the included *Guide Puck* into the center clutch followed by placing the *Center Clutch Guide Plate* over the *Guide Puck*.

Index the center clutch standoffs into the slots in the *Center Clutch Guide Plate* and use a fine tooth file to file the standoffs down smooth with the *Center Clutch Guide Plate*. Remove the guide and use some emery cloth to smooth the studs' edges. **See following pictures.**

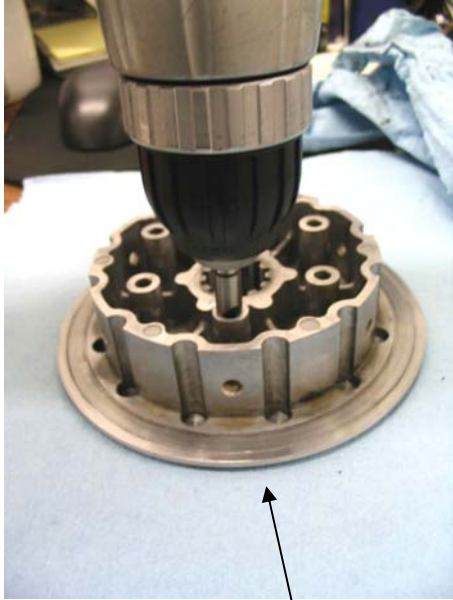
Warning: Insure that all standoffs are filed down level to insure proper z-Start performance.



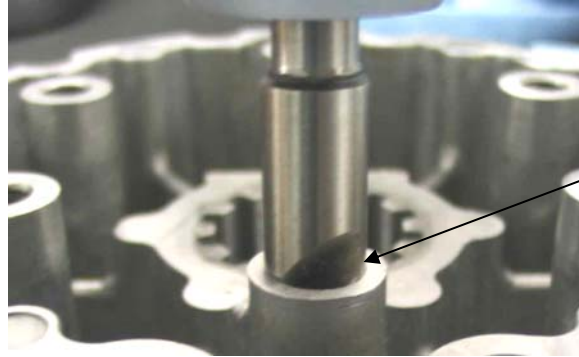
File studs down so they are flush with the Center Clutch Guide Plate.

Note: 10 x M6 x 0.06" washers are provided so the clutch can be re-assembled to the stock configuration.

8. It is necessary to counter sink the threaded holes of the standoffs so that they will accept the M6 Flat Head screws. Using the included 5/16" HSS Counter Sink and an electric drill, slowly counter sink each of the holes to the depth of the counter sink tool. **At low speeds and low downward force**, this should take about 4-5 revolutions of the counter sink tool. **See following pictures.**



Using electric drill at low speed to countersink the 5 threaded holes.



Countersink threaded hole to depth of Countersink tool.



Finished counter sunk hole.

9. Re-install the center clutch insuring that thrust washers are in proper configuration and torque the center clutch nut to 50 ft-lbs. Ensure it is free of chips and or filings.
10. Place the z-Start *Lower Assembly* over the 5 center clutch standoffs so that the countersunk holes line up. There are two sets of 5 countersunk holes in the lower assembly—use the inner set.
11. Fasten the lower assembly to the center clutch with the M6 flat head screws—**apply a small amount of blue Loctite 243 to each screw**. Torque the M6 screws to 96 inch pounds with a torque wrench. After screws are torqued-down, the *Rotating Hub* should spin freely and the Lower Assembly should be securely mounted to the center clutch standoffs.

Drive Plate Configuration

12. It is necessary to exchange out the stock aluminum drive plates in your clutch pack with the Rekluse .040" (1.0mm) steel drive plates. The stock clutch pack, from top to bottom, has two .059" (1.5mm) aluminum drive plates followed by two .059" (1.5mm) steel drive plates followed by two .059" (1.5mm) aluminum drive plates. The revised clutch pack setup, from top to bottom, will be two Rekluse .040" (1.0mm) steel drive plates followed by two Rekluse .047" (1.2mm) steel drive plates followed by two Rekluse .040" (1.0mm) steel drive plates. **When finished, the top of the clutch pack must be a friction disk and there can be no aluminum drive plates remaining in your clutch pack.** Refer to the following chart.

Stock Clutch Pack Configuration from top to bottom:

.118" Friction Plate
.059" Stock Aluminum Drive Plate
.118" Friction Plate
.059" Stock Aluminum Drive Plate
.118" Friction Plate
.059" Stock Steel Drive Plate
.118" Friction Plate
.059" Stock Steel Drive Plate
.118" Friction Plate
.059" Stock Aluminum Drive Plate
.118" Friction Plate
.059" Stock Aluminum Drive Plate
.118" Friction Plate

z-Start Clutch Pack Configuration from top to bottom:

.118" Friction Plate
.040" Rekluse Steel Drive Plate
.118" Friction Plate
.040" Rekluse Steel Drive Plate
.118" Friction Plate
.047" Rekluse Steel Drive Plate
.118" Friction Plate
.047" Rekluse Steel Drive Plate
.118" Friction Plate
.040" Rekluse Steel Drive Plate
.118" Friction Plate
.040" Rekluse Steel Drive Plate
.118" Friction Plate

Top (Outer most)



Bottom (inner most)

Assembling the Rekluse Throwout, Pressure Plate, and Top Plate

13. Guide the 5/16" **Rekluse throw-out spacer ball** followed by the **Rekluse Clutch throw-out** into the hole in the transmission input shaft. Be sure that the spacer ball is in place between the Rekluse Clutch throw-out and the throw-out shaft.

Place the 1/2" **Needle Thrust Bearing** on top of the **Rekluse Throw-out** followed by the 1/2" **Throw-out Thrust Washer**. Next, place the **bellville spring washer** concave side down on top of the flat 1/2" **Throw-out Washer**.

Finally, place the 1.37" **C137L3 Wave Spring** on top of the Lower Assembly. The C137L3 Wave Spring is the one that came packaged inside the z-Start and it is taller than the C137L2. **See following pictures.**



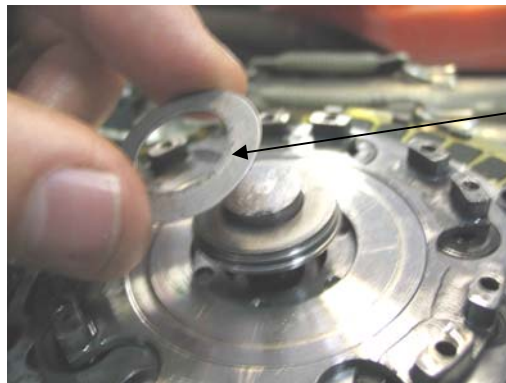
Throw-out Spacer

Throw-Out

Needle Thrust Bearing

Flat Throw-out Thrust Washer

Wave Spring



Belleville Spring Washer

Warning: Perform the next step away from the bike to keep the balls from falling into the transmission.

14. Place a small amount of oil in each of the **Pressure Plates** ball grooves. Place 1 **Tungsten Carbide ball** followed by 3 **steel balls**. Repeat the pattern until all slots contain a ball. **It is very important to have the Tungsten Carbide balls spaced evenly around the Pressure Plate.**

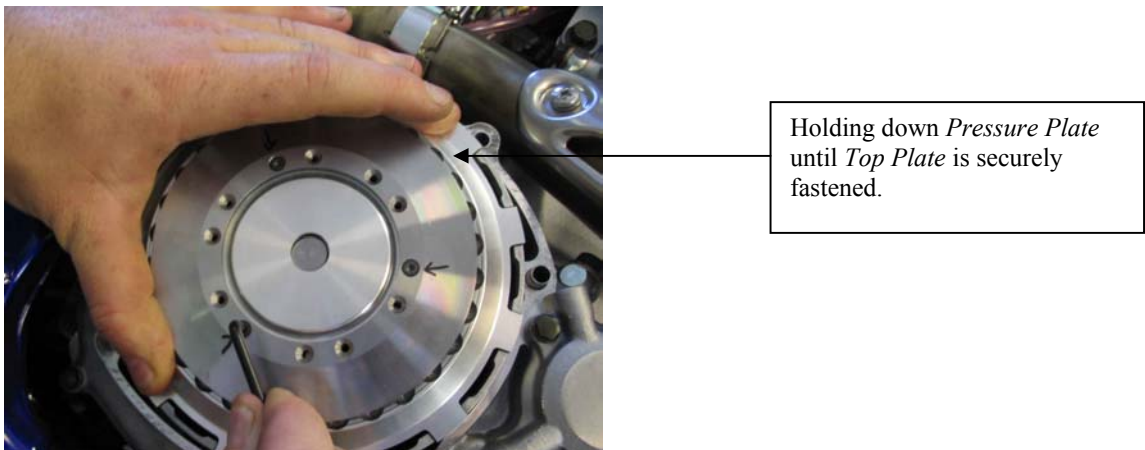
Note: Tungsten carbide balls are about twice as heavy as the regular steel balls and also have a slightly duller gray color.

15. Place the *Pressure Plate* with the 40 Balls in place over the z-Start *Lower Assembly*. Index the outer tabs of the *Pressure Plate* into the windows of the clutch basket. **The outer tabs of the Pressure Plate must rest in the same clutch basket windows that the outer tabs of the friction disks do.**

Also insure that the tabs of the *Lower Assembly* pass through the associated cut-outs in the *Pressure Plate*. Make sure the top of the *Rekluse Throw-out* assembly passes through the hole in the center of the z-Start *Pressure Plate*. **See following picture.**



16. While holding the *Pressure Plate* down place the *Top Plate* over the *Pressure Plate* and fasten it to the tabs of the *Lower Assembly* with three of the M3 screws, through the three marked holes in the *Top Plate*. Lightly tighten each screw using a 1/4 inch driver and the included Torx T10 driver tip. **See following picture.**



Note: You will have to overcome the z-Start *Wave Spring* and hold the *Pressure Plate* down until the 3 screws are securely fastened in order to tighten the *Top Plate* down properly.

Determine the installed gap of the Z-Start

17. Measure the installed gap of the z-Start. Two sets of feeler gauges are required to measure the Installed Gap. The feeler gauges must be placed between the top most **friction disk** and the top-most **steel drive plate** in the clutch pack 180 degrees apart. **See following pictures.**

Note: Insert the 2 sets of feeler gauges directly across from one another (180 degrees apart) to avoid the clutch pack from rocking resulting in an inaccurate measurement. Find the thickest feeler gauge that still slides back and forth with slight resistance.



The installed gap should be between .035" (0.89mm) and .045" (1.14mm). If the gap is correct, move on to the next step. If the installed gap measurement is off, then the installed gap needs to be adjusted due to manufacturing variances in the bike's center clutch. If the measurement is *greater than .045"* replace one *Rekluse .040"* (1.0mm) with one *Rekluse .047"* (1.2mm) drive plate or a stock *.055"* drive plate as necessary to get the correct installed gap.

Note: Be sure to review the included Break-in and Maintenance Guide for clutch pack wear adjustments.

Final Installation Steps

18. Using a small amount of Blue Loctite 243, install the rest of the M3 torx head screws and torque to 10 inch/pounds. 10 inch-pounds requires a good crank with the included Torx T10 driver tip, but be careful not to bend the head of the T10 driver tip. Remove the three marked M3 screws, add Loctite, and tighten.

Note: Use 243 Loctite (Blue, oil resistant) to secure all M3 Torx screws

19. Re-install your clutch cover with the two included gaskets—**both gaskets must be used or considerable clutch damage will result.** Tighten each of the clutch cover bolts, then torque to 6 to 8 foot-pounds in 2 steps. Re-install brake lever.

WARNING: After a 20 minute break-in period, the clutch plates will seat in and you must re-measure the Installed Gap to guarantee the Installed Gap is within the prescribed range—make drive plate adjustments if necessary. See step 16. Clutch break-in re-measurement of the Installed Gap is necessary whenever new clutch plates are installed.

WARNING: Refer to the "Safety Warnings" and "Break-in Tuning and Maintenance Guide" before operating the z-Start clutch.

Note: After testing your z-Start clutch, if it is desired to have it engage at a different RPM, then refer to the following chart for Wave Spring and ball combinations:

| | | |
|--------------------|-----------------|--|
| C137L2 Wave Spring | 10 x TC Balls | Low Engagement RPM (typically just above idle) |
| C137L3 Wave Spring | 10 x TC Balls | Medium Engagement RPM |
| C137L2 Wave Spring | All Steel Balls | Medium-High Engagement RPM |
| C137L3 Wave Spring | All Steel Balls | High Engagement RPM |

Key: -TC = Tungsten Carbide. The chart is based on having 40 total balls in the Pressure Plate at all settings.
-The C137L2 Wave Spring is shorter than the C137L3.