

# **Rekluse Motor Sports**

## **The z-Start™ Clutch**

### **KTM LC4**

**(1999 – 2005)**

### **Installation Guide**

Copyright 2002-2004 Rekluse Motor Sports  
z-Start Revision 3.000  
RMS630 – KTM LC4

191-280

Manual Revision: 103105

Rekluse Motor Sports, inc.

110 E. 43<sup>rd</sup> Street

Boise, Idaho 83714

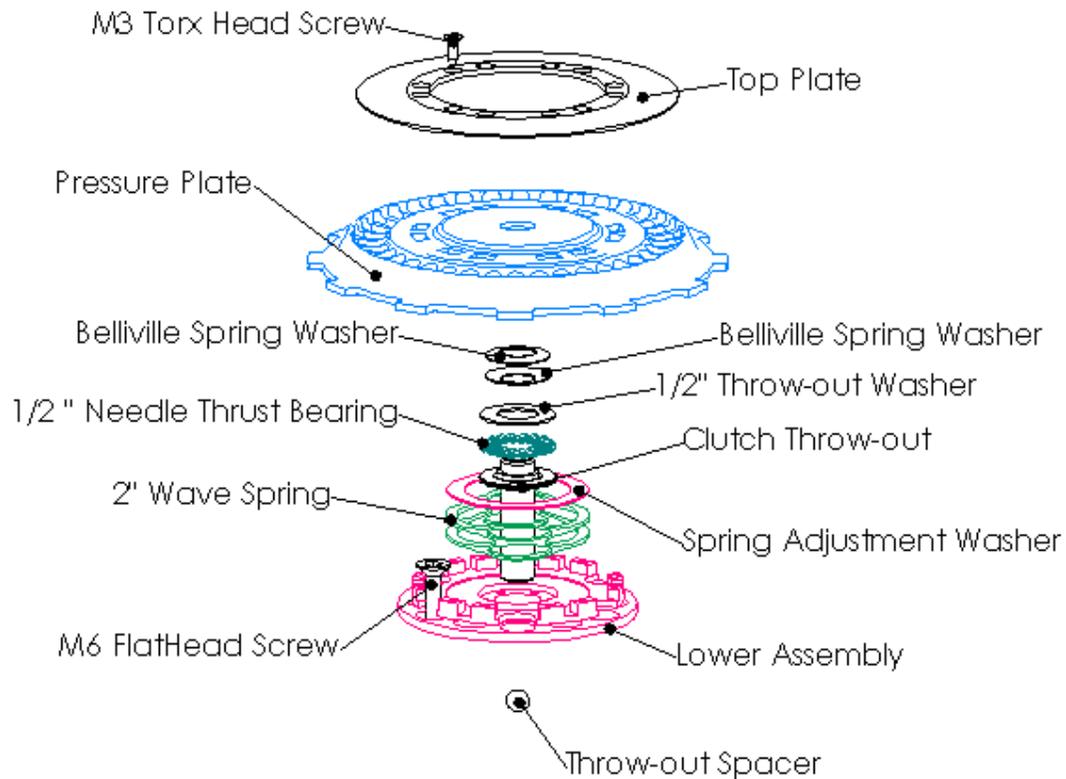
208-426-0659

support@rekluse.com

## Required Tools

8mm socket	1/4 inch driver (for included Torx T10 driver tip)
12mm socket	2 Sets of feeler gauges
27mm socket	Inch Pound Torque Wrench
4mm allen key socket	Torx T10 driver tip (included)
	Blue Loctite 243 (oil resistant)

## 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	2" (51mm) Wave Spring (C200L2)
Pressure Plate	2" (51mm) Wave Spring (CS200L1)
Lower Assembly	2 x 2" (51mm) Wave Spring Adjustment Washer
8.125-inch (206.4-mm) Clutch Throw-out Rod	12 x M3 #10 torx screws
8.5-inch (216-mm) Clutch Throw-out Rod	10 x 3/8" (9.53mm) balls
Clutch Throw-out	30 x 3/8" (9.53mm) Tungsten Carbide balls
7 x .040 (1.0mm) Drive plates	6 x .010" (0.25mm) Mounting Shims
2 x .047 (1.2mm) Drive plates	Replacement Center Clutch
6 x M6 Flat Head Screws	Clutch Cover Gasket
1/2" (12.7mm) Throw-out Needle Thrust Bearing	
1/2" (12.7mm) Flat Throw-out Thrust Washer	
1 x 0.625" (15.9mm) Bellville Spring 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 its 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. Carefully lay the bike on its right side so the clutch-cover faces up.
3. Using an 8-mm wrench remove the shift lever.

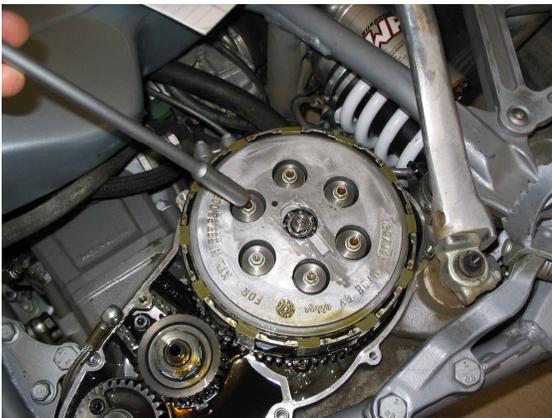
- Using a 12-mm wrench remove the oil line banjo bolt. Be sure to secure the 2 crush washers so they can be re-installed later. **See following picture.**



- Using an 8-mm wrench remove the left side-case cover bolts and carefully remove the clutch cover. **If you're careful you will be able to re-use the cover gasket. If you damage it, you will need to replace it with the provided Rekluse Gasket.**

**Note:** You will have to rotate the kick-start lever out of the way to remove the clutch cover. Or you can remove it if you want.

- Using an 8-mm wrench remove the 6 bolts and springs holding the stock pressure plate. **See following pictures.**



7. Lift off the pressure plate and the clutch lifter assembly. The clutch lifter assembly consists of the Clutch Throw-out and Throw-out Rod. The Throw-out and Throw-out Rod are connected to the Pressure Plate and will follow the Pressure Plate when you remove it. **See following picture.**

Pressure plate, 6 bolts and springs, and stock clutch lifter assembly are not reinstalled.



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

### Removing the Stock Center Clutch

9. Remove the stock center clutch using a 27-mm socket. When you remove the stock center clutch the **thrust washer that is between it and the basket will often stick to the back side of the center clutch**, ensure that you locate the thrust washer and place it around the transmission input shaft on top of the basket. See following pictures.



Placing Thrust Washer back over transmission input shaft on top of Clutch Basket.

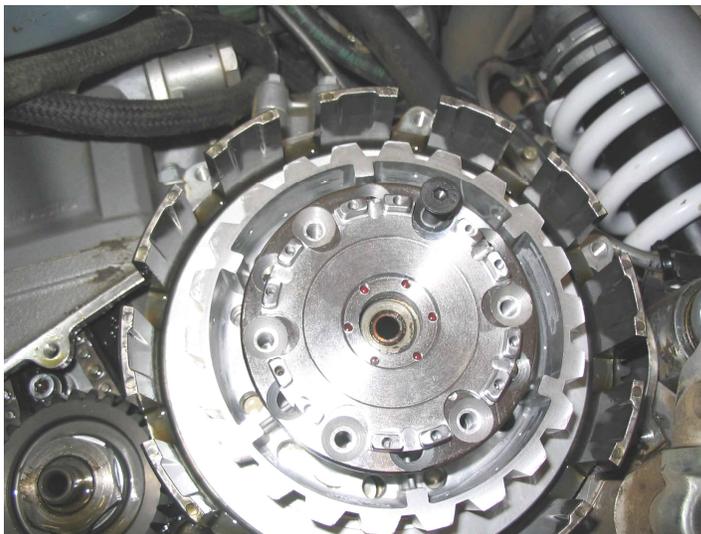
10. Install the replacement Rekluse center clutch. **Be sure the stock Thrust Washer is in place between the Rekluse center clutch and basket. See following picture.**



11. Re-install the stock tab lock washer and apply blue loctite 243 to the 27-mm nut. Torque nut to 50 foot pounds and fold up lock washer tab to secure.

### **Installing the Lower Assembly**

12. Place the z-Start *Lower Assembly* over the 6 center clutch stand-offs. There are two sets of 6 countersunk holes in the *Lower Assembly*. Use the inner set of holes to mount on the KTM LC4. **See picture below.**



13. Apply blue Loctite 243 to each of the 6 M6 flat head screws and insert them into each of the 6 center clutch standoffs through the corresponding set of countersunk holes in the *Lower Assembly*. Torque the M6 screws to 96 inch pounds. After the screws are torqued-down, the *Rotating Hub* should spin freely.
14. Follow the following charts when re-installing the clutch pack.

## Drive Plate Configuration

15. It is necessary to exchange out the stock steel drive plates in your clutch pack and replace them with the supplied Rekluse .040" (1.0mm) drive plates. **When finished, the top of the clutch pack should and must be a friction disk.**

**Note:** Do not re-install the o-ring that was at the bottom of the stock center clutch.

Refer to the following charts:

Stock Clutch Pack Configuration from top to bottom:

Stock Friction Plate  
*.059" Stock Drive Plate*  
Stock Friction Plate

New Clutch Pack Configuration from top to bottom:

Stock Friction Plate  
***.040" Rekluse Drive Plate***  
Stock Friction Plate

**Top (outer most)**



**Bottom (inner most)**

## Assembling the Rekluse Throwout, Pressure Plate, and Top Plate

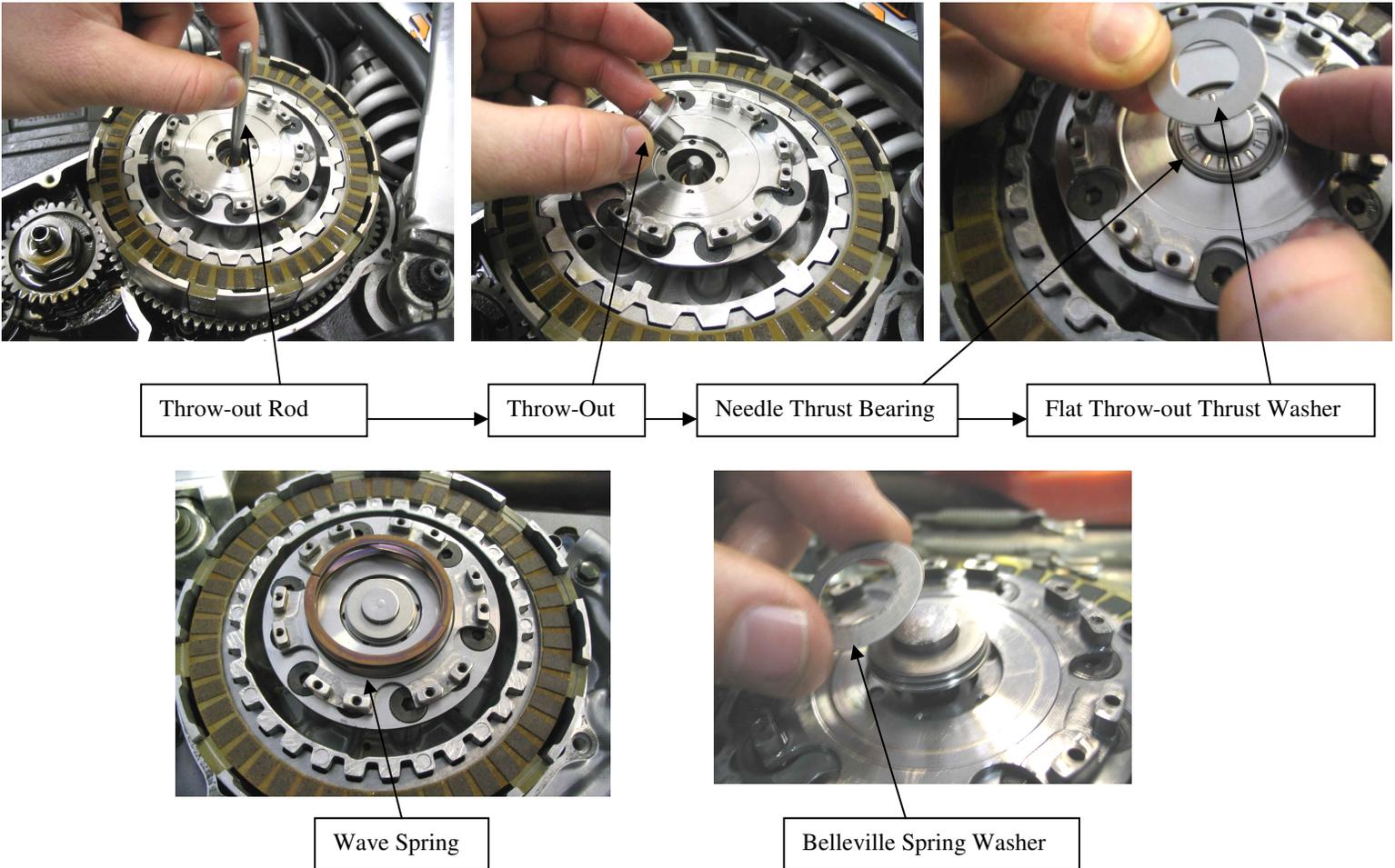
16. Guide the **Rekluse throw-out rod** (see following note) into the hole in the transmission-input shaft. Place the **Rekluse clutch throw-out** on top of the Rekluse throw-out rod. **See following pictures.**

**Note:** For hydraulic clutch equipped models use the 8.125-inch throw-out rod. For cable clutch equipped models use the 8.5-inch throw-out rod.

17. Place the  $\frac{1}{2}$ " **Needle Thrust Bearing** on top of the Rekluse **Throw-out** followed by the  $\frac{1}{2}$ " **Throw-out Thrust Washer**. The throw-out, with bearing and washers, will lean to one side—this is normal, and you will align it into the **Rekluse pressure plate** later. **See following pictures.**

**Hydraulic clutch equipped models only:** Place the Belleville Spring washer, curve side down, on top of the flat Thrust Washer. **See following pictures.**

18. Place the 2" **CS200L2 Wave Spring** on top of the Lower. The **CS200L2 Wave Spring** is the taller of the two wave springs provided with the kit. This is our recommended setting for engagement RPM—refer to the chart on the last page of these instructions for other adjustment settings. **See following pictures.**



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

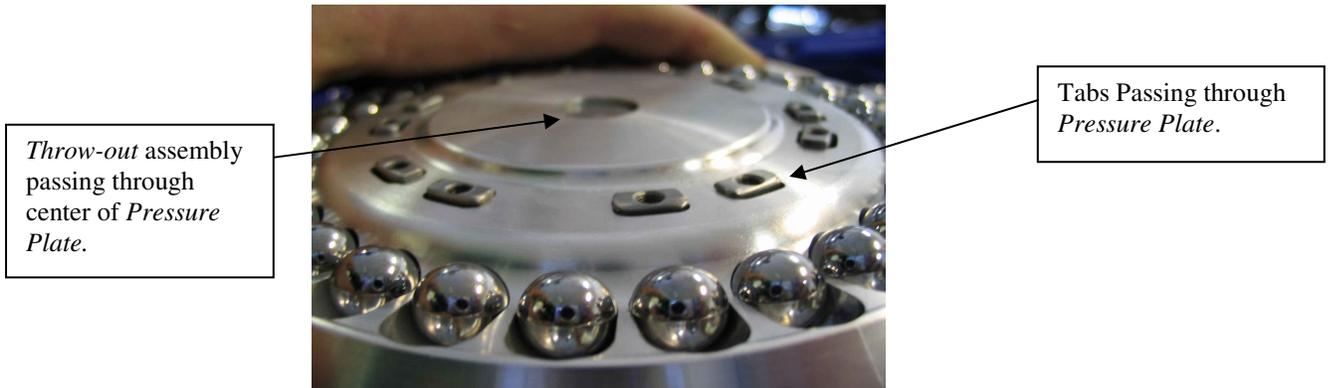
19. Place a small amount of oil in each of the *Pressure Plates* ball grooves. Place the 30 *Tungsten Carbide balls* into the 30 ball slots of the Pressure Plate

**Note:** The extra 10 steel balls are used for adjustment. See the chart on the last page of these instructions.

**Note:** Tungsten Carbide balls are twice as heavy as steel balls and are duller gray in color.

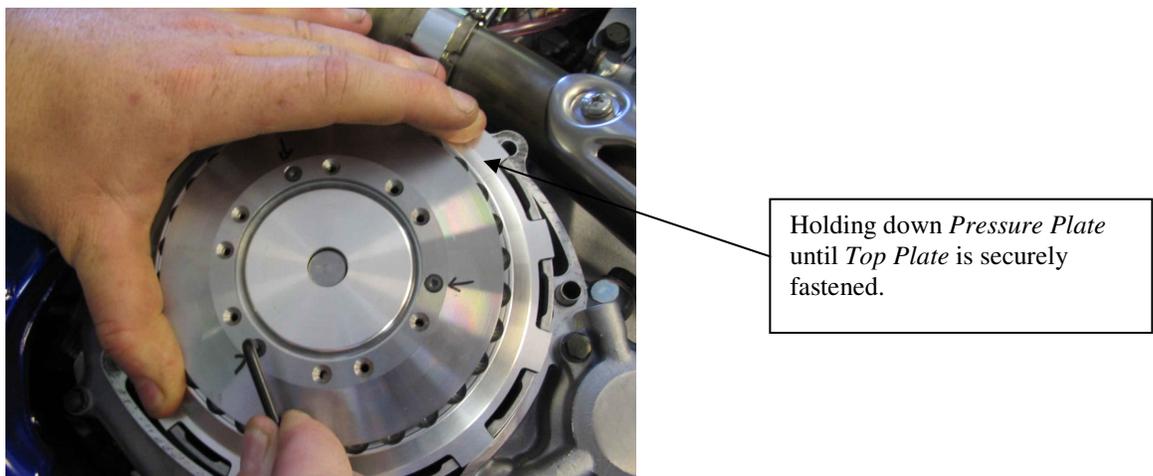
20. Place the z-Start *Pressure Plate* over the z-Start *Lower Assembly*. Index the outer tabs of the *Pressure Plate* into the windows of the clutch basket. **The outer tabs of the Pressure Plate must rest in the same clutch basket windows that the outer tabs of the friction disks do.**

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.**



21. While holding the *Pressure Plate* down place the *Top Plate* over the *Pressure Plate* and fasten it to the tabs of the Lower Assembly using three of the M3 screws in a triangular pattern through the 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 hydraulic clutch pressure (if applicable) to 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

22. 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.



**Your installed gap measurement above needs to be between .030" (0.76mm) to .037" (0.94mm). 0.032"—0.035" is ideal.**

**Adjustment:** If the gap is greater than .037", you need to remove one of the *Rekluse .040" (1.0mm) drive plates* in the clutch stack and replace it with a *Rekluse .047" (1.2mm) drive plate*. For further adjustment, exchange a stock .059" (1.5mm) drive plate with the *Rekluse .047" (1.2mm) drive plate* to get the correct measurement. Repeat steps 16 and 17 until measurement is within range.

## Final Installation Steps

23. 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 Loctite 243 (Blue, oil resistant) to secure all M3 Torx screws

24. Re-install your clutch cover with, if possible reuse the original stock gasket. Hand-tighten each of the clutch cover bolts, then torque to 6 to 8 foot/pounds in 2 steps. Re-install the shift lever using blue Loctite 243 on the bolt.

**Refer to the next page for further instructions and adjustment recommendations for the z-Start.**

25. **Cable clutch equipped models only:**

Re-attach the clutch cable to the clutch lever. It is necessary to adjust the slack in the clutch cable so that there is 5-10 mm of play at the end of the clutch lever when the engine is revved to at least 4500 RPM. **Start the engine and ensure the transmission is in neutral, rev the engine to 4500 RPM's, and adjust the clutch cable so that when the engine is revved there is 5-10 mm of play at the end of the clutch lever before you feel pressure in the clutch lever.**

**Warning:** The z-Start allows the bike to idle in gear just like if it were in neutral. Quickly revving the engine with the transmission in gear will cause the bike to lunge forward unexpectedly—always ensure the transmission is in neutral before adjusting the clutch cable slack.

**Warning:** Improper clutch-cable slack adjustment can cause excessive clutch slip and ultimately clutch failure.

**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 17. 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.**

### Adjusting the z-Start Engagement RPM

The engine speed at which the z-Start begins to engage the clutch, also called the stall speed, can be adjusted. Included with the z-Start are two 2" *Wave Springs* and two 2" *Spring Adjustment Washers* to fine tune the z-Start stall speed. The *Wave Springs* and *Flat Steel Washers* are located inside the z-Start between the *Pressure Plate* and *Lower Assembly*. To adjust the stall speed, it is necessary to remove the engine side cover and the M3 screws holding the z-Start *Top Plate* to access the *Wave Spring and Flat Steel Washers*. Refer to the z-Start Parts View and the installation instructions for detailed information on how to change the *Wave Spring and Flat Steel Washer* configuration.

**Use the following chart** as a guideline for setting the stall speed. Remember many factors can affect the stall speed from bike to bike so the following chart is only a guideline. You can also make fine tuning adjustments by adjusting your idle speed.

CS200L1 Wave Spring	0 x Flat Washers	Very Low Stall Speed (generally below idle)
CS200L1 Wave Spring	1 x Flat Washer	Low Stall Speed (typically just above idle)
CS200L1 Wave Spring	2 x Flat Washers	Medium Stall Speed
C200L2 Wave Spring	0 x Flat Washers	Medium Stall Speed (very near previous setup)
C200L2 Wave Spring	1 x Flat Washers	High Stall Speed

**Note:** do not use more than 1 Flat Washer with the *CS200L2 Wave Spring*.

**Note:** If you would like to adjust more slip into the clutch beyond the above spring chart, you can remove 5 of the Tungsten Carbide balls from the Pressure Plate and replace them with the 5 extra steel balls. Ensure that remaining Tungsten Carbide balls are evenly spaced around the pressure plate.