



Congratulations! You have purchased the finest clutch kit available. This **patented** "dual quadrant" and "dual pivot" pin technology is revolutionary to the industry! This technology is **ONLY AVAILABLE** from Super Torquer Systems, Inc.!

STS3YAM 38-20 & 50-20

How to Install and Use the Heel Clicker Two Speed™ Clutch Weight System and Most Frequently Asked Questions (Yamaha Clutch design only)



WARNING! READ BEFORE INSTALLATION!

Personal injury and damage to property can result from the improper installation and use of any product, including the Heel Clicker Two Speed Clutch Kit. Installation of this kit should not be attempted unless you are a trained service technician or have a thorough and complete knowledge of CVT systems and their repair and tuning. Novice tuner should not attempt installation. It is recommended that a qualified dealership or repair facility install this kit.

DEFINED WARNING: This is a high performance product for use in sanctioned racing events only and is not for installation or operation by "consumers" as defined by the Magnuson-Moss Warranty Act. **DO NOT** install any performance parts unless you have the technical ability to properly set up the entire machine to compensate for the installation of these parts.

The expertise and necessary work needed to install products varies from one product to another. Instructions (where provided) are given to assist in installation only and are not a substitute for mechanical expertise. References to performance gains, reliability, ease of installation and tuning are based on our experiences. This is **NOT** a guarantee of similar performance in every installation. While we sell tested and proven products, individual results may vary.

U.S. Patent # 6,346,056

Before you begin to install your Heel Clicker Two Speed™ clutch kit, please note the following:

- DO ACCEPT only genuine Heel Clicker™ parts. This kit is assembled with made-to-specification parts. Accept no substitutes.
- DO ALWAYS use the same combination of fasteners on each weight arm and shoulder. NO EXCEPTIONS.
- DO NOT put any part of your body in contact with the rotating primary clutch.
- DO ensure the bolt/washers are fully seated in place.
- DO Make sure the weight arms are balanced (weigh the same) before installation.
DO Make certain you have any excess side play shimmed out of the pivot area of your weight arm.
- DO make sure your pivot bolt and nut are in new condition and securely fastened.
- DO make sure your drive belt is in good condition. Also, verify that your center-to-center and offset adjustments are correct.
- DO use LOCTITE™ (not included in kit) or similar product on each fastener after you determine the proper combination for your setup.
- DO NOT use any combination of bolt and washers that exceeds 15.0mm wide.
- DO NOT grind or alter any portion of the weight arm or shoulder.
- DO NOT adjust the weight mass while the weight is mounted on the stationary pin in the clutch.
- DO NOT operate your machine without checking the full range of motion of each weight to make sure you clear the spider assembly and related areas.
- DO NOT exceed 9,000 RPM's.
- DO NOT allow an unqualified person to make any adjustments to your clutch kit.
- DO NOT install a Heel Clicker™ clutch kit in any clutch assembly that has excess wear, damage, or is in otherwise questionable condition.
- DO NOT operate the machine without proper guarding in proper placement. And ensure clearance to all guarding and chassis components.
- DO NOT use this product with overdrive helixes. These helixes allow the belt to ride higher in the primary clutch and possibly out of the primary clutch at full shift out. This will result in clutch and clutch weight damage.
- DO NOT allow the primary drive belt to ride over the top of the primary clutch at full shift out. The top of the belt should be no more than even with the top of the sheave faces.

Provided in this kit are the following items

Three (3) Bushed Heel Clicker™ weights

Two clutch springs (Red&Grey or White&Yellow) Yamaha Kits

Nine 1/4x28x3/8 button-headed stainless steel bolts 3.0 grams each

Fifteen M6 stainless steel washers Tip Center&Shoulder 1.0 grams each

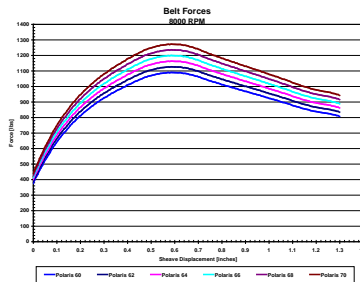
One Heel Clicker™ sticker

One set of installation instructions

NOW YOU ARE READY TO INSTALL YOUR NEW Heel Clicker Two Speed™ CLUTCH KIT.

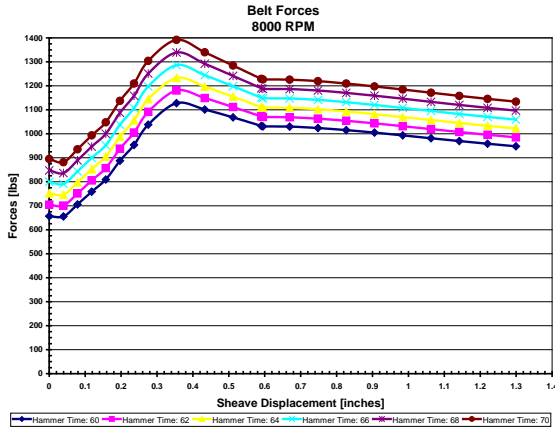
- 1) Remove the drive clutch from the machine. Disassemble the spring cover and remove the drive spring and clutch weights. When removing the spring, make sure to hold the cover plate down. The spring is preloaded and will cause damage or injury if precautions are not taken.
- 2) In some cases it will be possible to install this kit without removing the clutch from the machine. Just make sure you have room to compress the spring and start the cover bolts without damaging the cover bushing.
- 3) **You are now ready to tune the Heel Clicker Two Speed™ weights** for your particular application. The Heel Clicker Two Speed™ weights are adjustable in both the arm and the shoulder. At this time, it is important to understand the nomenclature of the Heel Clicker™ weights. The first number identifies how many grams just the arm weighs without any adjustment hardware (i.e., approximately 40 or 50 grams) and the dash number is the weight of the shoulder and pin combination (approximately 20 grams for steel).

To help understand how the Heel Clicker Two Speed Weights work, two graphs are shown below. The first graph shows force curves of 5 different Polaris clutch weights. Arctic Cat and Yamaha weights work the same with very small differences. Each weight from 60-70 grams is shown. The graph shows that standard OEM weights all work the same regardless of weight. They are designed to accelerate hard through the middle of the shift curve, but lacks belt squeezing and upshift force on the bottom and on top. All OEM and aftermarket, i.e., conventional-style, weights work the same way regardless of who made them.



The same force curve for the Heel Clicker Two Speed 40-20 weight is shown below. The 40-20 has a base weight of 60 grams as explained earlier. In the graph below, 2 grams are added to the shoulder for each line. This graph demonstrates that the Heel Clicker Two Speed weight flattens the force curve allowing for hard

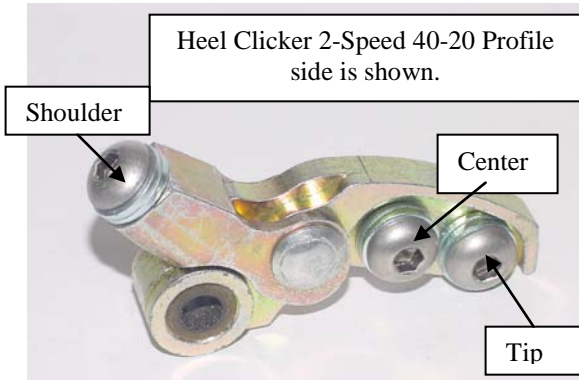
acceleration throughout the entire shift curve. It also shows that adding weight to shoulder effects the entire shift curve equally. This means total adjustment can be achieved at the shoulder location.



The above Heel Clicker Two Speed force curve is shown with no additional weight added to the center or tip location. A direct comparison between the OEM and Heel Clicker weight can be made. As you can see from this chart if we added the same weight to the tip location instead of the shoulder location. The force curve would be completely flat.

4) The arm will be adjusted first based on information from your old clutch weight or from the applications chart provided. We provide set up information for most stock sleds. This information is gathered from track dyno and field testing. Many customers add modifications to their sleds such as adding pipes. This changes the RPM band where the engine makes peak power. Adjustments will have to be made to our specs.

3B) To figure out how much mass you need to add to the base Heel Clicker™ clutch weight, just simply match the weight of your current weight arm, or see the applications chart listed below. For Yamaha applications use the chart provided for the initial set-up. Yamaha weights calculate very differently than Polaris and AC weights due to profile and pin location differences. For example the RX-1 has an OEM weight of 82 grams. The Heel Clicker Two speed weight will weigh 66 grams that replaces this weight. Make sure to check the applications chart for proper information. The springs provided with the Heel Clicker Two Speed kit are stronger than the stock OEM springs. This allows for upward adjustments in the weights if needed. The Heel Clicker Two Speed weight is adjustable 13-15 grams upward depending on the weight. Unless otherwise noted, use the stock OEM helix. It is always best to use the applications chart listed below. Many of these setups are dyno tuned setups and are meant for maximum horsepower transfer.



Thread the button headed bolts into the adjustment hole and add the washer (if needed). See photo (above) for placement. Never use more than one (50-20) and two (38-20) of the one gram washers in each center tip and shoulder hole locations. Spider clearance will become an issue if you exceed this specification. Bushing failure will occur.

The above picture shows a 40-20 weight with 5.0 grams added to the shoulder, 5.0 grams to the center, and 5.0 to the tip location. The bolts should be inserted from the profile or pocketed side (as shown) only.

3C) Application Chart for Heel Clicker Two Speed™ Clutch Weights

Yamaha Models

<u>Model</u>	<u>HC Part Number</u>	<u>Shoulder</u>	<u>Center</u>	<u>Tip</u>	<u>Spring</u>
RX-1/Warrior	38-20	0.0	0.0	0.0	White
RX-1 (Turbo)	50-20	3.0	0.0	4.0	White
Vector 1000	38-20	0.0	0.0	0.0	White
700 SRX (98&99)	38-20	0.0	0.0	0.0	Red
700 SRX (00&01)	38-20	0.0	0.0	0.0	Red
APEX models	38-20	3.0	3.0	0.0	White

******Note**** Use METAL Centering washers provided with this kit**

3E) As mentioned earlier, a maximum of one washer (Tip& Center) in the 50-20 and two washers for the 38-20 are allowable. A maximum of two washers can be added to the bolt at the shoulder location. Each washer weights 1.0 grams. The bolts should be inserted from the pocketed or profile side of the weight only. See picture above for profile side. Loctite (blue) can be used if desired. Adding more washers than the reccommended amount will result an interference fit in the spider and cause the weight to bind and stop shifting.

- 3F) Install The Heel Clicker clutch weights using your weight pins. Rotate the weights and check for any interference between the weight and spider. Make sure the weight and roller maintain contact through the entire shift out. If the weight sticks or stops rotating before full shift out occurs, check the bolts to make sure they are properly tightened and are flush with the body of the weight. Torque all stationary pins to the manufacturer's specifications.
- 4) Install one of the clutch springs supplied with this kit. Our Yamaha springs are measured at 2.9 and 1.6 inches. **Red Spring** is a 230-360. The **Gray** is a 230-330. We have a **Black** spring is 140-400, and the **White** is 170-300. The **Yellow Secondary** spring is a 40-100.
- 5) Install spring cap and torque all bolts to the manufacturer's specifications.
- 6) Install clutch on engine and torque clutch bolt to the manufacturer's specifications.

Yamaha Engagement Chart

<u>Set up</u>	<u>Grey spring</u>	<u>Red spring</u>	<u>White spring</u>	<u>Black spring</u>
No weight added	5400	5400	5400	5000
3.0 grams added	4900	4900	4800	4400
4.0 grams added	4600	4600	4400	4000
5.0 grams added	4300	4300	4000	3600

Most Frequently Asked Questions

I seem to have lost top speed? Make sure full shift out rpm has not changed. The Heel Clicker Two Speed Weight throws much harder on the top end which may pull the peak RPM down. For all RX-1 models 10,200rpm maximum, and APEX models 10600 rpm. Viper and SRX 8400rpm maximum Reducing the shoulder weight by 1.0 gram will increase engine rpm by 100rpm. This is why all our specifications have shoulder weight adjustments. They can be easily changed without removing the weights from the clutch in a matter of minutes.

When should I start adding Weight to the center and tip locations? In the applications chart you will notice that adjustments are made at the shoulder location. Remember the Heel Clicker Two Speed weight flattens the shift curve which means all the adjustments can be made at the shoulder location. If you need more than 5.0 grams added to the shoulder then add 3.0 grams at the center location and 3.0 at the shoulder location. **Never add more than 2 washers to the shoulder location! An interference fit may occur with some models.**

What Helix or secondary spring should I run with the Heel Clicker weights? We have found the stock helixes work fine for most. The Heel Clicker Two Speed weight works just like a multiangled helix. It pulls hard on the bottom just like putting in a steeper helix. When the shoulder rotates forward it acts like tip weight pulling the belt to full shift out faster over riding any stiff secondary spring or shallow helix. Yamaha RX-1 should install the Yellow secondary spring at 3-3 (90 degree) twist.

****** DO NOT use with overdrive helixes. These helixes allow the drive belt to run over the top and sometimes out of the primary clutch during deceleration. This will result in damage to your clutch and machine.**

Limited Warranty

Super Torquer Systems, Inc., (“Manufacturer”) warrants that the clutch arms sold hereunder will be free from defects in material and workmanship when subject to normal and proper use for the original purchaser’s ownership. If the clutch arms do not conform to this limited warranty during the warranty period of one (1) year from the date of purchase, the Buyer shall notify Super Torquer Systems, Inc., in writing of the claimed defect and demonstrate to Manufacturer’s satisfaction that said defects are covered by this limited warranty. If the defects are properly reported to Manufacturer within the warranty period, and the defects are of such type as to be covered by this warranty, the sole and exclusive obligation of the Manufacturer shall be, at its own expense, to furnish replacement product, or at Manufacturer’s option, replacement parts for the defective product. Removal, shipping and installation of the replacement product or parts shall be at the Buyer’s expense.

Manufacturer does not warrant against damages or defects arising out of improper or abnormal use or handling of the clutch arms; against defects or damage occurring from improper installation, against sudden impact arising from abnormal occurrences (ex., belt breaking or clutch slams shut unexpectedly); nor damages incurred to the machine from the use of this product.

Purchaser is responsible to do maintenance checks on the complete CVT system on a regular basis to ensure proper operation. Normal wear components including, but not limited to, springs, rivets and bushings are not covered by warranty.

U.S. Patent # 6,346,056

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Revised: 09/08