

HEEL CLICKER CLUTCH SYSTEMS

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

STS2HC 45,50,55-7&65-11

How to Install and Use the Heel Clicker™ Clutch Weight System and Most Frequently asked Questions

(Polaris P-85 clutch, Nine-Tower Arctic Cat and Comet designs 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 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™ 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 make sure the bolt/washers don't overhang on the ramp area of the weight arm where they could come into contact with the roller.
- DO ensure the bolt/washers are fully seated in place.
- DO make sure the weight arms are balanced (weigh the same) before installation. The steel and aluminum T-nuts are similar in size, but are different in color. Ideally, use a gram scale to check this. In a pinch, remember a magnet will not stick to aluminum.
- 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 new or in like-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/washers that exceeds 16.0mm 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.


Provided in this kit are the following items

Three (3) Bushed Heel Clicker™ weights	
Three primary clutch springs (Yellow, Gold, Black)	
Six 1/4X28X1/2 button-headed stainless steel bolt	4.0 grams each
Six 1/4x28 stainless steel nut	2.0 grams each
Three steel T-nuts (yellow)	3.0 grams each

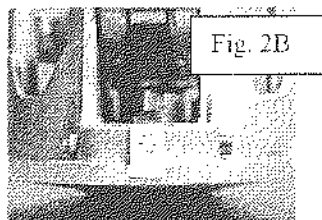
Six aluminum T-nuts		0.8 grams each
Nine M5x.8x12 stainless steel bolts	Tip&Shoulder adj.	2.2 grams each
Six M6 stainless steel washers	Tip adjust only	1.0 grams each
Three M5x12 stainless set screws	Shoulder adj.	1.3 grams each
Fifteen M5 flat washers	Tip&Shoulder a j.	0.5 grams each
Nine M5 lock washers	Tip&Shoulder adj.	0.5 grams each
Two custom spider shims (Not in 65-11, Polaris & Arctic Cat Nine Tower Clutches)		
One aluminum spring spacer	(45&50-7 kits only)	
One Heel Clicker™ sticker		
One set of installation instructions		

NOW YOU ARE READY TO INSTALL YOUR NEW HEEL CLICKER™ CLUTCH KIT.

- 1) Remove the drive clutch from the machine. Disassemble the cover and remove the drive spring. Leave the old clutch weights in the clutch for now.
- 2) **If you are a Comet clutch user, skip forward to Step 3.** The web of aluminum behind the clutch weight needs to be removed in all clutches (except the Comet that has no web). This is a simple process that will be done by simply drilling and filing the material away using basic tools (a hand drill with 1/8" and 7/16" drill bits, center punch, hammer, and metal file). A template is included for easy location placement. This one-time process will take approximately 30 min. Clutch balance and durability will not be affected (all test sleds have had this done to them and have shown no change in balance or durability even with thousands of miles of use). **Repeat steps 2A through 2F for each of the clutch webs.**

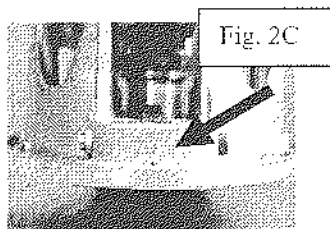
2A) Fold template at the fold lines. 

2B) Hang the folded template over the web behind the clutch weight as seen in Fig. 2B. Make sure the template is flush with the top edge of the web.

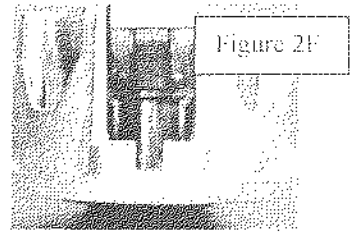


2C) Using a center punch and hammer, mark the web with a centering point using the template. Then remove template for use on other two webs. See Fig. 2C.

2D) Drill a 1/8" diameter hole through all three centering marks. These three holes will act as pilots for the next drilling operation.



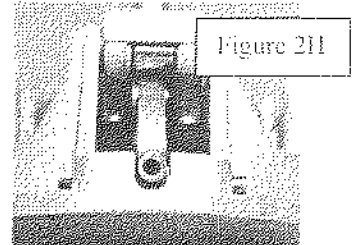
2E) **Carefully and slowly**, drill all three 1/8" pilot holes with a 7/16" drill bit. The old clutch weights will act as a stop for the drill bit. Remove the old clutch weight and stationary pin.



2F) File off the top edge to form a U-shaped pocket from the three holes as seen in Figure 2F. Shown is an A.C. clutch not Polaris P-85.

2G) Compare the three web pockets to **ensure that equal** material has been removed from each (so as not to affect clutch balance).

2H) Using your stationary pin, place a Heel Clicker™ weight in the clutch. Manually rotate the weight into the full shift out position. Check for proper clearance around the shoulder of the weight where the web material was removed. Remove weight(s) from clutch.

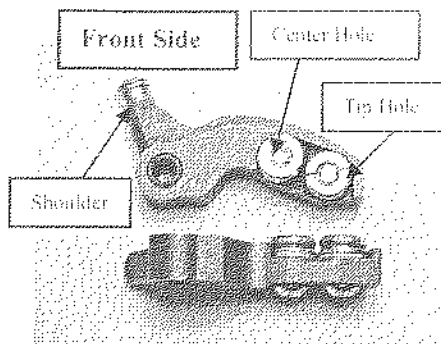


3) **You are now ready to tune the Heel Clicker™ weights** for your particular application. The Heel Clicker™ weights are adjustable in both the traditional arm and the new shoulder. At this time, it is important to understand the nomenclature of the Heel Clicker™ weights. The first number identifies how many grams just the arm weighs without any adjustment hardware (i.e., 45, 50, or 55 grams) and the "7" is the weight of the shoulder (in grams) without any tuning hardware attached. So a 55-7 will weight 55grams plus 7 grams for a total of 62 grams. The arm will be adjusted first based on information from your old clutch weight that is assumed to have been appropriate for your sled.

3A) Weigh your current clutch weight. This is the amount of weight you want just the arm (arm/head combo w/o shoulder; i.e., "traditional" weight) of your Heel Clicker™ weight to be.

3B) Figure out how much mass you need to add to the Heel Clicker™ clutch weight arm so that it matches your current weight arm. For example if you have a 61 gram weight in your XC 600, it will be replaced with a 55-7 Heel Clicker™ weight. The 55-7 weight should weight 62 (55+7) total grams, but we sinter in 2 additional grams of copper into the tip location to give the weight more top end push. That means the arm has an **actual** weight of 57 grams and a shoulder weight of 7 grams totaling 64 grams.

To adjust the Heel Clicker weight to the 61 grams place the .8 gram aluminum nut and one steel washer (weighing 1 gram) with the M5x.8x12 bolt weighting 2.2 grams in the center location ($57\text{gr} + (.8\text{gr} + 2.2\text{gr} + 1\text{gr}) = 61\text{gr}$). The 7 gram shoulder weight and any additional weight added to the shoulder will rotate to zero at the full shift point.



Insert the button headed bolts through the back side and add the T-nuts and washers (if needed) on the front side. See photo (left) for placement. Never use more than two (2) of the one gram washers in each center and/or tip hole location. Spider clearance will become an issue if you exceed this specification. This will result in bushing weight failure.

3C) Application Chart for Heel Clicker™ Clutch Weights

Polaris Models						
Model	HC Weight	Shoulder	Center	Tip	Spring	
XC 500	50-7	2.7	0.0	4.0	Gold	
XC 600VES	55-7	4.2	4.0	0.0	Gold	
XC 700	55-7	4.7	0.0	5.0	Gold	
XC 800	65-11	5.2	3.0	3.0	Yellow	
XCR 800	55-7	5.2	3.0	3.0	Gold	
XC 700VES	55-7	4.7	6.0	6.0	Gold	
XC 800VES	65-11	4.7	6.0	6.0	Yellow	
RMK 700	50-7	4.2	4.0	0	Black	
RMK 800	50-7	5.2	3.0	3.0	Black	
RMK800VES	55-7	4.2	4.0	3.0	Black	

Arctic Cat Models						
Model	HC Weight	Shoulder	Center	Tip	Spring	
440 SnoPro	45-7	1.3	3.0	0	Black	
500 ZR	45-7	2.2	0.0	3.0	Gold	
600 ZR EFI	45-7	2.2	0	4.0	Black	
600 ZRCarb	50-7	2.2	0.0	4.0	Gold	
600 ZRVEV	50-7	4.2	0.0	4.0	Gold	
600 ZRT	45-7	2.2	3.0	3.0	Gold	
800 ZR	65-11	4.2	6.0	6.0	Yellow	
900 ZR	65-11	4.2	7.0	7.0	Yellow	
ZRT 800	50-7	5.2	4.0	3.0	Gold	
Tcat 1000	55-7	5.7	3.0	0.0	Gold	
F7	65-11	3.7	5.0	5.0	Yellow	
800 Mtn.Cat	55-7	3.2	4.0	4.0	Black	
900 Mtn.Cat	55-7	3.7	5.0	5.0	Black	

3E) A maximum of two washers (center and tip) should be used with the T-nuts and bolts supplied with this kit on any single weight, and only placed in the pocketed side of the weight. See picture above for placement

- 3F) Install all three or four clutch weights using your weight pins. Check again for clearance of the weight to the spider and movable sheave. Torque all bolts to the manufacturer's specifications.
- 4) Install one of the two clutch springs supplied with this kit. The **Yellow spring** is a 160-290 spring and is intended to be used for large displacement Twin cylinder applications. The **Gold spring** is a 190-340 spring and is a drag racing spring. The gold spring will give you the highest engagement RPM. The **Black Spring** is a 170-360 spring and used for high revving engines, Snocross, and mountain applications. Other manufacturer's springs can be used with these weights, so don't be afraid to try other springs.
- 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.

The final adjustment involves tuning the shoulder for maximum performance. As explained earlier, the shoulder of the weight already weighs 7 grams. This means the Heel Clicker™ weight will already weigh 7 grams more than the weight you just replaced it with. This extra weight will prevent the belt from slipping and act as a progressive angled helix. Add as much weight as the engine can handle without losing responsiveness. Based on the power your particular engine, more weight can be added to the shoulder. Extra weight is provided in this kit in the form of a 1.3 gram set screw and button headed bolt weighting 2.2 grams. Use the ½ gram M5 flat and lock washers to achieve the proper shoulder weight shown in the set-up chart.

When using these fasteners always use the lock washer with the bolts and blue Loctite with both the set screw and bolts The addition of these fasteners will increase the load on the belt and make the clutches up shift faster. This additional weight will also drop the engine engagement RPM's. Listed below is the engine engagement RPM you can expect with these weight combinations.

<i>Set up</i>	<i>Yellow spring</i>	<i>Gold spring</i>	<i>Black Spring</i>
No weight added	5300	5700	5500
2 grams added	4900	5300	5100
5.4 grams added	4100	4500	4300
8.6 grams added	3700	4100	3900

Most Frequently Asked Questions

I seem to have lost top speed? Check the notch you drilled in your clutch. Make sure you have clearance between the shoulder of the weight and the movable sheave when the clutch weight is fully shifted out. Sometimes the drill will wonder off location and the pocket will not be deep enough (see Figure #2G). This clearance is critical for top speed. Also by adding all tip weight will increase top end speed.

How can I get more engagement RPM? See the engagement chart above. By removing weight from the shoulder location engagement RPM will rise. Also, using larger diameter rollers will tuck the weight and engagement RPM will also rise. Placing weight in the hole on the tip will also work, but your peak RPM will fall.

Can I use OEM spring shims to get a higher engagement RPM? No. All our springs are designed to work between 2.5-1.2 inches. Using shims will diminish the spring quickly. Only use the aluminum spacer provided in this kit when reshimming the Arco Nine tower clutch. **Never put this spacer in a Polaris clutch.**

What Helix or secondary spring should I run with the Heel Clicker weights? We have found the stock helixes work great for most applications. The right helix angles are usually found between 45-50 degrees for almost all snowmobiles. All Arctic Cats work well with shallow straight helixes. These are a stock item at most dealers. Polaris XC700 works good with an R-8 (50-34) . The XCR is one of our best applications. It requires a stronger secondary spring such as an Erlandson white. This will stop the belt from slipping in the secondary clutch.

I have a new F-5 or F-7 and the weights are sticking? We have observed that in several cases the weight pin holes in this clutch are not drilled in the proper location. Within the same clutch the pin holes can be in three different locations. This is not the fault of the weight. To resolve this simply remove the front lip in the clutch where the heel of the weight rests. This will allow for proper rotation of the weight. Reshimming this clutch is critical. Remove all spider shims except the large step spacer. This will properly set the belt to sheave clearance.

IMPORTANT Set-up Information:Shimming

The 45,50,55-7 Heel Clicker Clutch Kits Come with Two custom spider shims. One for the Polaris P-85, and the other for the Arctic Nine tower Clutch. The shims are marked. The installation of these shims is **critical** to the clutch performance if you put the Heel Clickers in engines of less than 700cc or low torque motors. The Heel Clicker throws much harder than a standard weight. So tucking the weight by reshimming is very important. The custom shims are much narrower than the shims in the two clutches. The shims provided in this kit properly set the belt to sheave face clearance, and roller to weight clearance. These dimensions are critical for proper performance in smaller engine. **Remove all existing shims and put in our custom shim only.**

The kit also contains an aluminum spring spacer. This spacer is used only on Nine Tower Arctic Cat clutches. Do not use the spring spacer on Polaris clutches or Arctic clutches that are not reshimed. Put the spacer into the spider tapered side down. The taper is needed to clear the under cut in the spider.

Terms and Conditions

Hours: We are open 9:00am to 5:00pm (EST) Monday through Friday. Orders and Technical calls will be taken during those hours.

Payment: All orders will be shipped COD. UPS will collect cash, certified check, or money orders. No personal checks will be accepted without prior authorization. We do accept VISA, and MASTER CARD. Please have card number and expiration date ready when placing your order. All credit card purchases are subject to a credit limit pre-authorization. All orders **outside** the U.S. must use one of the above credit cards when placing an order (no COD services available) and are subject to a \$15.00 customs preparation charge. Sorry no open accounts.

Shipping: All orders will be shipped UPS or US Mail. All rush orders must be received by 2:00pm EST. All rush orders will be subject to an additional \$10 rush handling fee. All pricing of shipments are based on size, weight, destination, and expedience. Therefore, shipping prices will vary.

Refused COD Shipments: Super Torquer Systems will charge your account for shipping both ways should you order merchandise, change your mind and refuse the package. These charges are the purchaser's responsibility.

Returns: All returns are for exchange only. No refunds given. Returns and overages for credit must be received within 20 days of shipment and must include a copy of the original invoice. All returns must be in new condition. No return on used merchandise and they are generally subject to warranty terms only. A 15% restocking fee will be charged on all return items.

Prices: All prices for products and services are effective August 1, 2002, and are subject to change without notice. We will always do our best to keep prices at a minimum.

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