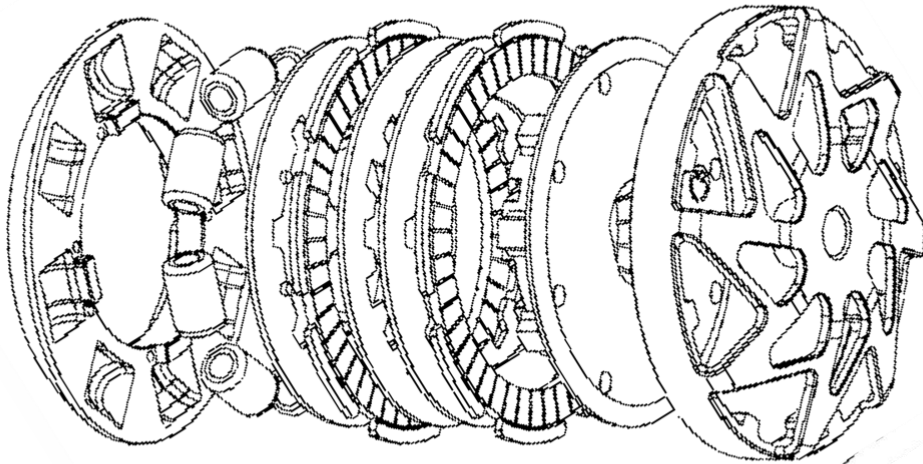




Technical Service Manual



Date of training:

Name:

2024 May Edition

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1. Operating Principle:

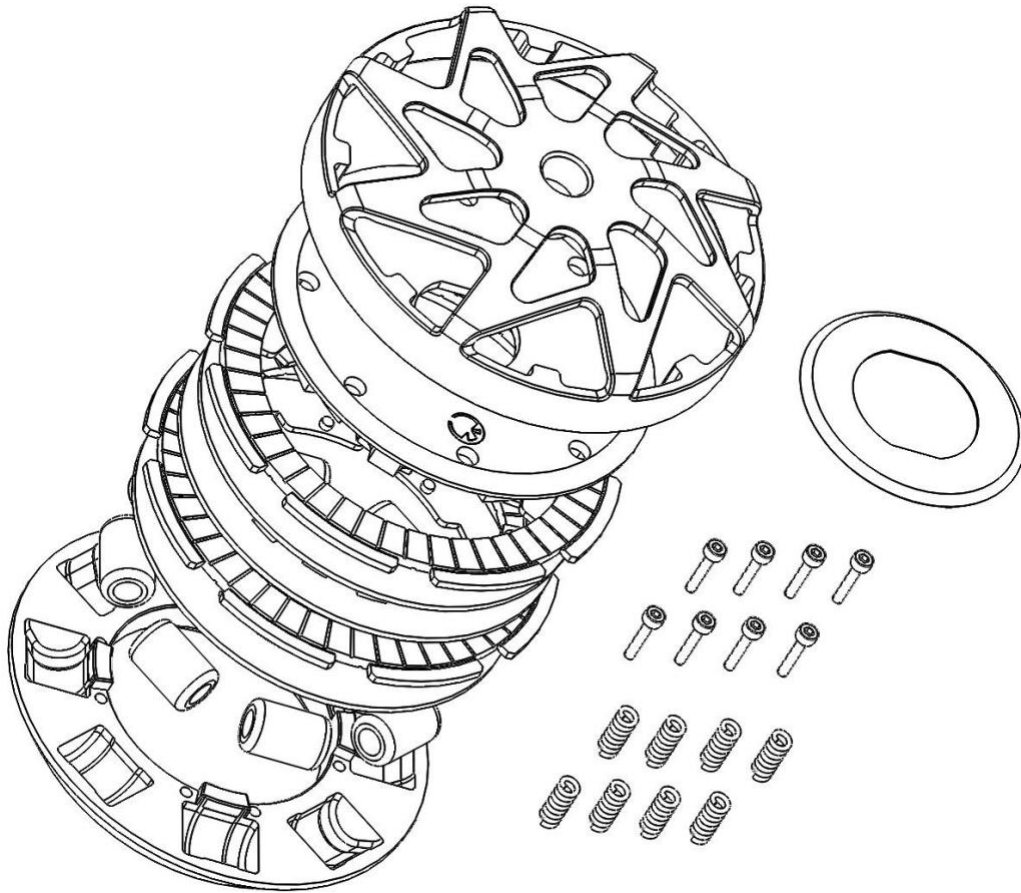
The STC is a centrifugal clutch that replaces the traditional weight bearing and provides positive clutch force by the speed of the engine.

$$F(\text{Friction}) = \mu(\text{coefficient of friction}) * N(\text{Positive force})$$

The higher the clutch speed, the greater holding force it has on the clutch. Therefore, it can be adjusted to the vehicle speed output by adjusting the spring compression. STC uses double clutch plates to greatly increase the friction area (2.5 times more than the conventional ones), providing higher transmission efficiency, the outer cover is only responsible for the transmission and is not subjected to any friction and pressure, which can make the STC have a longer life span. Also, there is no risk of the clutch outer exploding like that of traditional ones. Our products provide safety with better performance, the STC friction structure uses the same structure as that of a vehicle clutch and engages in a full-planar manner. Therefore, the STC can be said to be a CVT clutch that never shakes.

NOTE:

2. STC Product Composition Content



1.Clutch Outer*1

2. Clutch Gear*1

3. Roller Plate*1

4. Weight Roller*8

5. Clutch Plate*2

6. Spring Plate*2

7. Pressure Plate*1

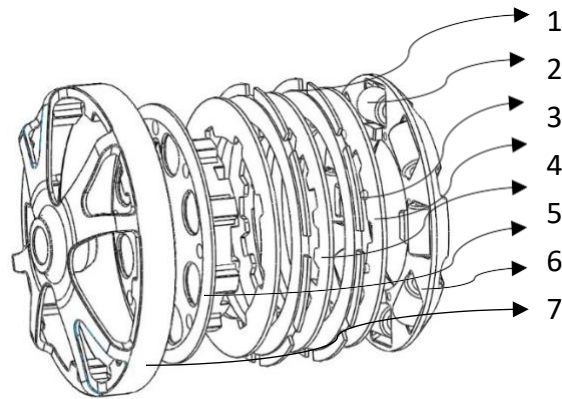
8.Clutch Spring*8

9.Spring Washer*1

10.Screw*8

NOTE:

3. Overall Structure (Single Piece) & Material Description



1. Clutch Plate :

The contact with the surface can be achieved without any wear and tear up to 1xxxx kilometers (original vehicle). (The clutch plate is made of compound rubber).

2. Weight Roller :

The weight ball replaces the traditional hoof block and provides a positive clutch force that can be adjusted accordingly to different vehicles. (The material of the weight ball is brass surface plating process)

3. Clutch Spring :

It is used to create resist generated by the rotating centrifugal force of the weight ball and achieve the automatic engagement speed setting. (Compressed springs made of white iron with heat treatment up to 300 °C)

4. Spring Plate :

It is used to adjust the compression spring and friction clutch plate to channel the power of the transmission to the clutch plate. (The material of the spring plate is iron)

5. Pressure Plate :

This is installed in-between the upper and lower of the two clutch plates to achieve power of the transmission to the clutch plate. (The material of the spring plate material is steel)



6. Clutch Gear :

It synchronizes the rotation of the spring plate and pressure plate by locking the opening and closing of the disk. (Material is made by CNC and heated treated aluminum T6 6061)

7. Roller Plate :

Through precise calculation of the slope angle, the weight of the bearings provides a positive force by rotating the centrifugal. (Material is made by CNC and heated treated aluminum T6 6061)

8. Clutch Outer :

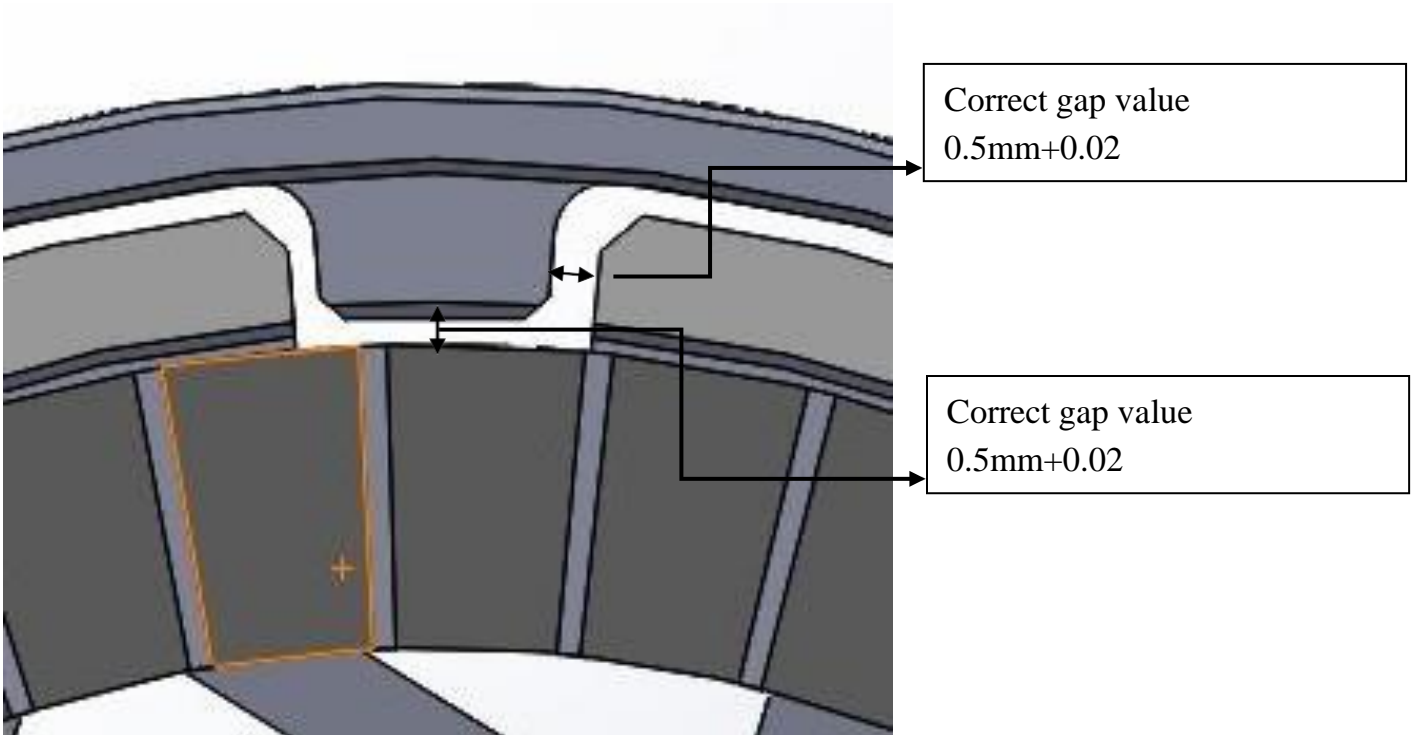
The outer clutch is locked on to the shaft of the rear deceleration pinion and is snapped into the eight card slots on the clutch plate. The engine power is transmitted through the clutch to the rear deceleration tooth and the rear wheel. (Material is made with forged steel CNC cutting)

NOTE:

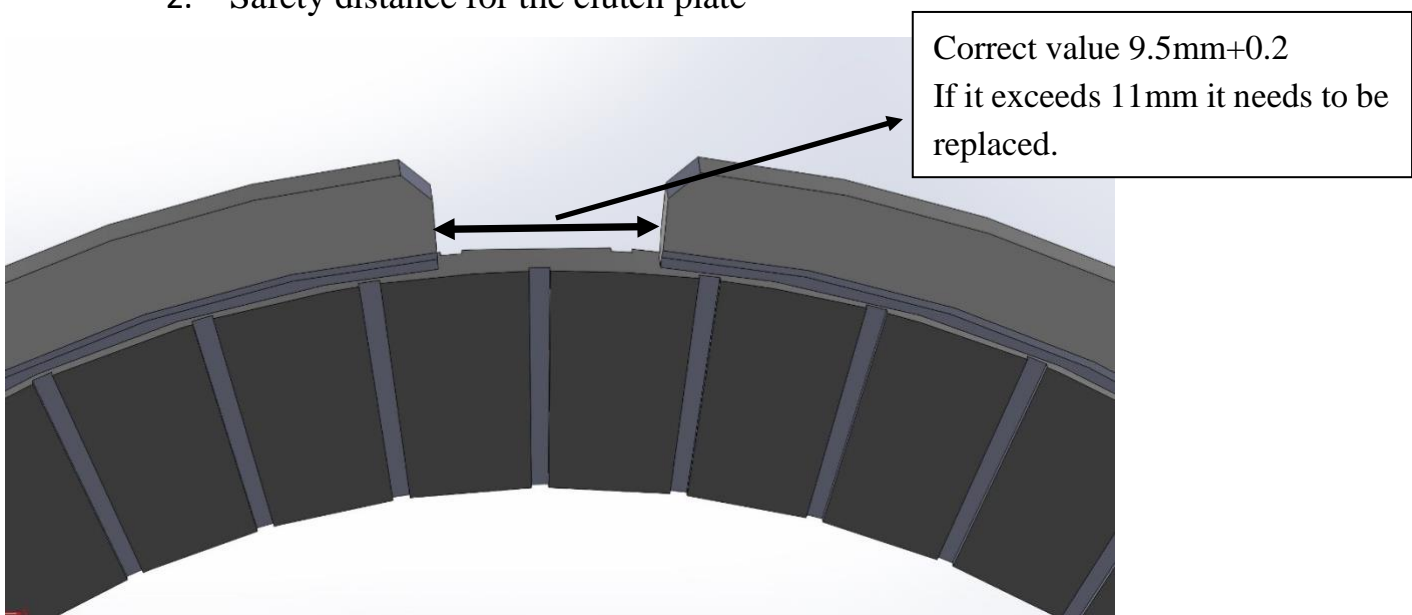
4. Specification for the Corresponding Gap Level for Each Assembly

Pay attention to the safety clearance of the clutch as follows :

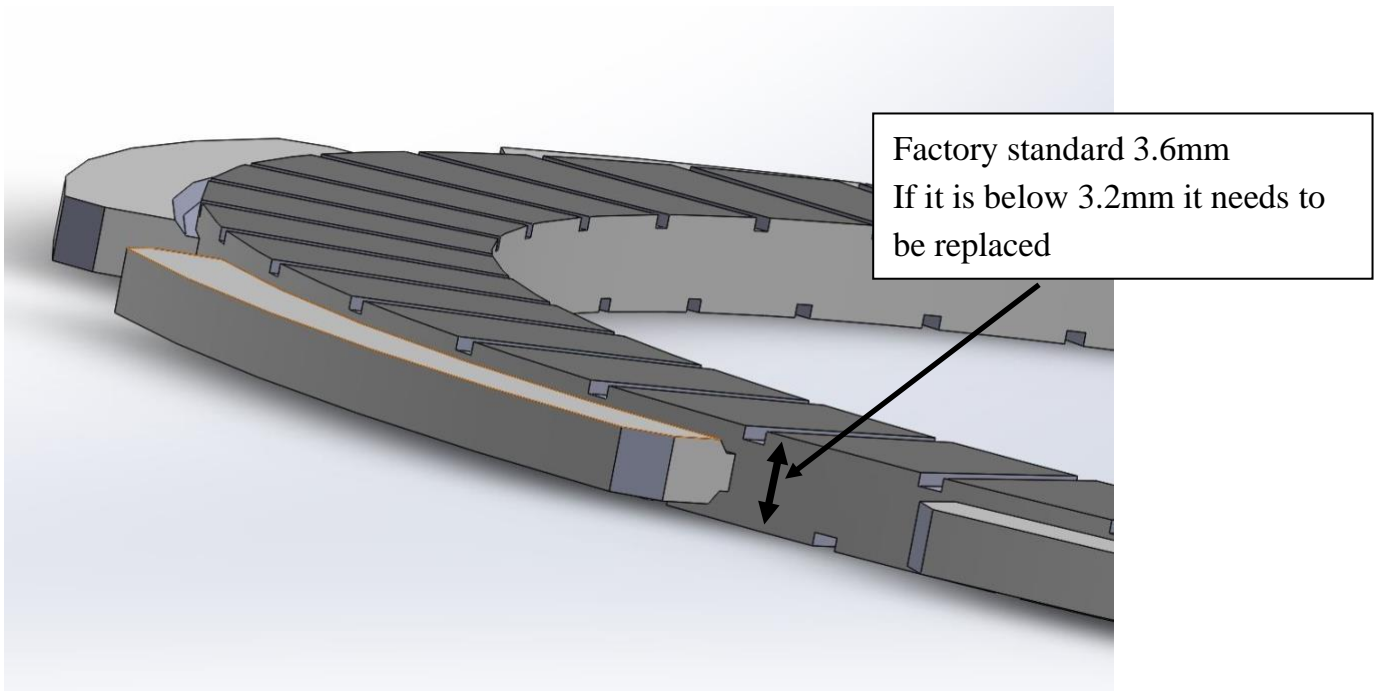
1. The gap between the clutch plate and the cover (The clearance on all three sides is 0.5 mm)



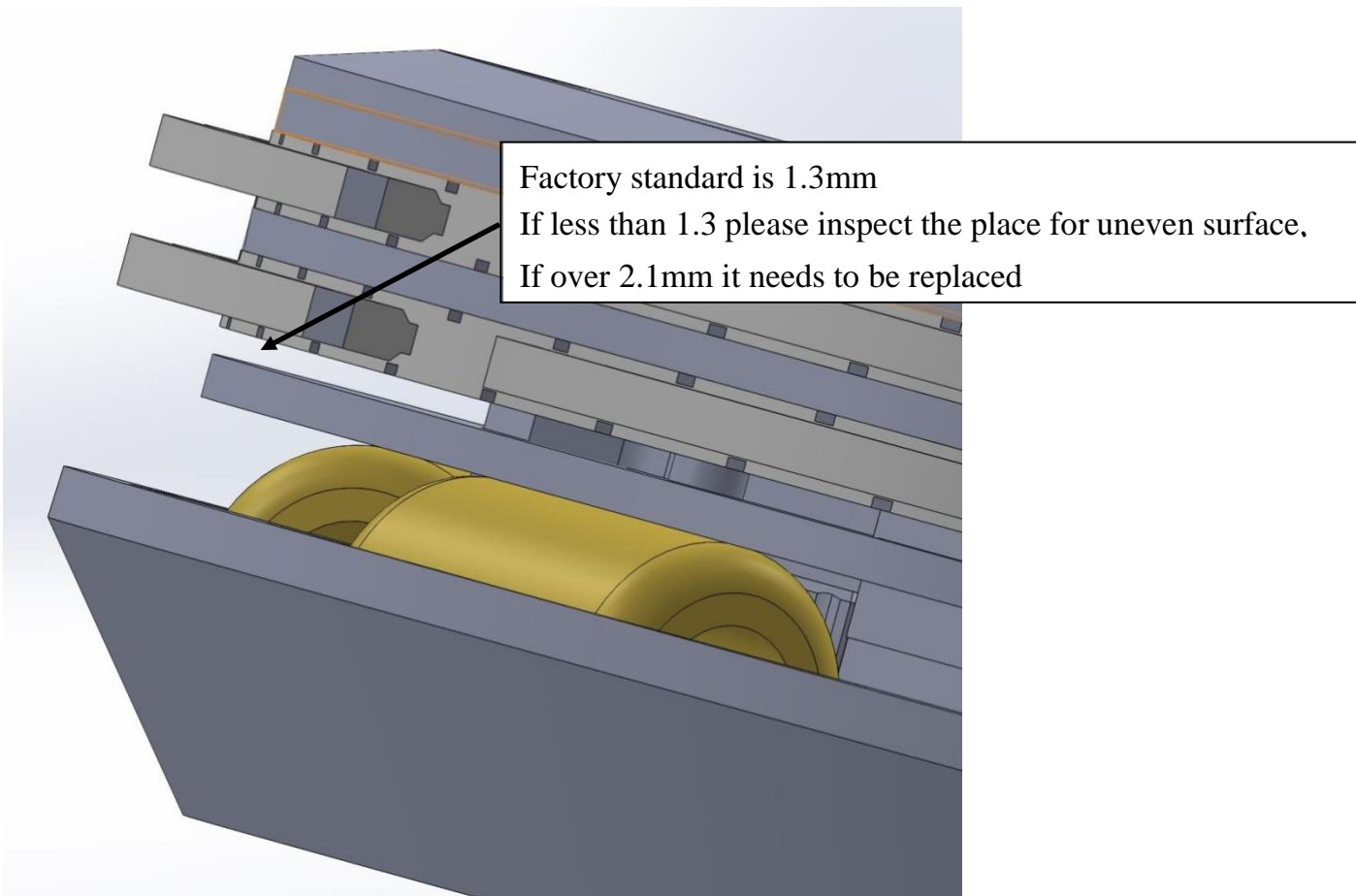
2. Safety distance for the clutch plate



3. Safety thickness of the clutch plate



4. The free clearance after clutch assembly



5. Consumables Criteria and Values

STC clutch consumables :

1. Clutch Plate

Mini Scooter :

Ø108.5 Factory thickness: 3.0mm safety value: 2.7mm

Tooth slot width. Factory thickness: 7.2mm safety value: 8.0mm

Scooter/Vespa :

Ø125.5 Factory thickness: 3.6mm safety value: 3.2mm

Tooth slot width. Factory thickness: 9.5mm safety value: 11.0mm

Maxi Scooter :

Ø146.5 Factory thickness: 2.5mm safety value: 2.2mm

Tooth slot width. Factory thickness: 9.8mm safety value: 11.0mm

2. Spring Plate

Surface exceeding +/-0.2mm

Mini Scooter : Ø101.5 Factory thickness: 1.5mm

Scooter/Vespa : Ø115.5 Factory thickness: 2.0mm

Maxi Scooter : Ø131.5 Factory thickness: 2.0mm

3. Pressure Plate

Surface exceeding +/-0.2mm

Mini Scooter : Ø101.5 Factory thickness: 1.5mm

Scooter/Vespa : Ø115.5 Factory thickness: 2.0mm

Maxi Scooter : Ø131.5 Factory thickness: 2.0mm



4. Compressed Spring

Mini Scooter : Ø108.5 Factory length: 16mm Safety value: 11mm

Scooter/Vespa : Ø125.5 Factory length: 16mm Safety value: 14mm

Maxi Scooter : Ø146.5 Factory length: 18mm Safety value: 16mm

5. M3 Screws

Locking torque 1.65 N.m

Mini Scooter : M3 12mm

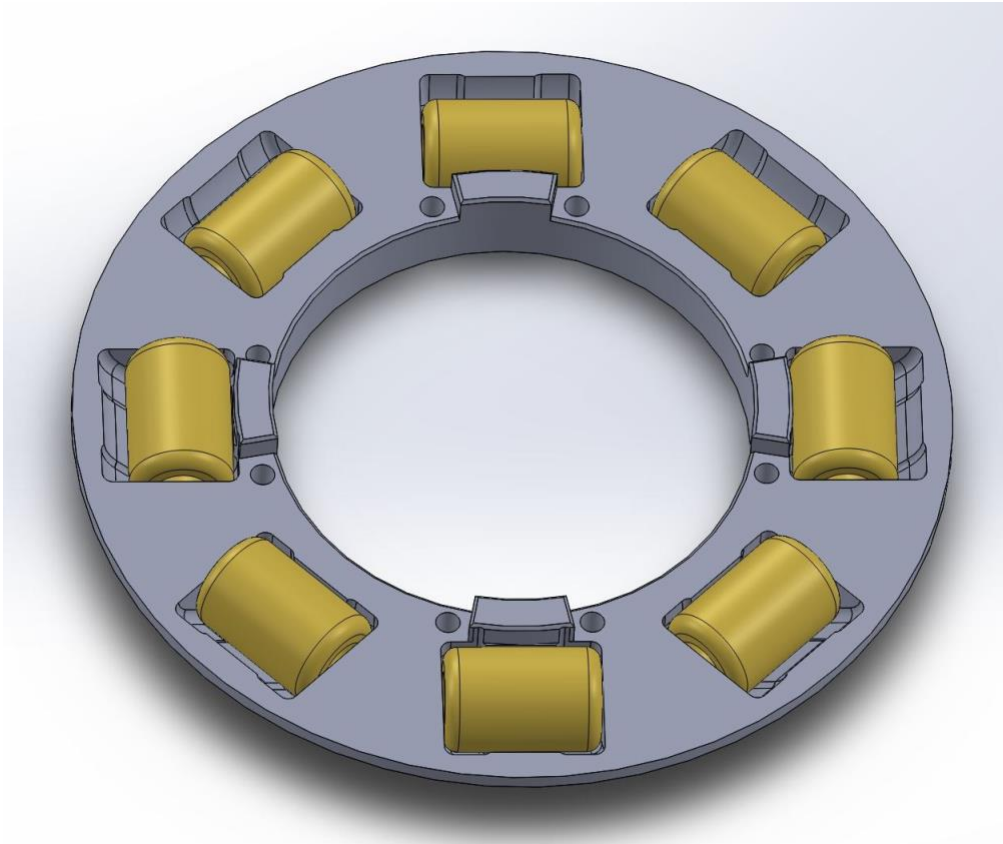
Scooter/Vespa : M3 16mm

Maxi Scooter : M3 18mm

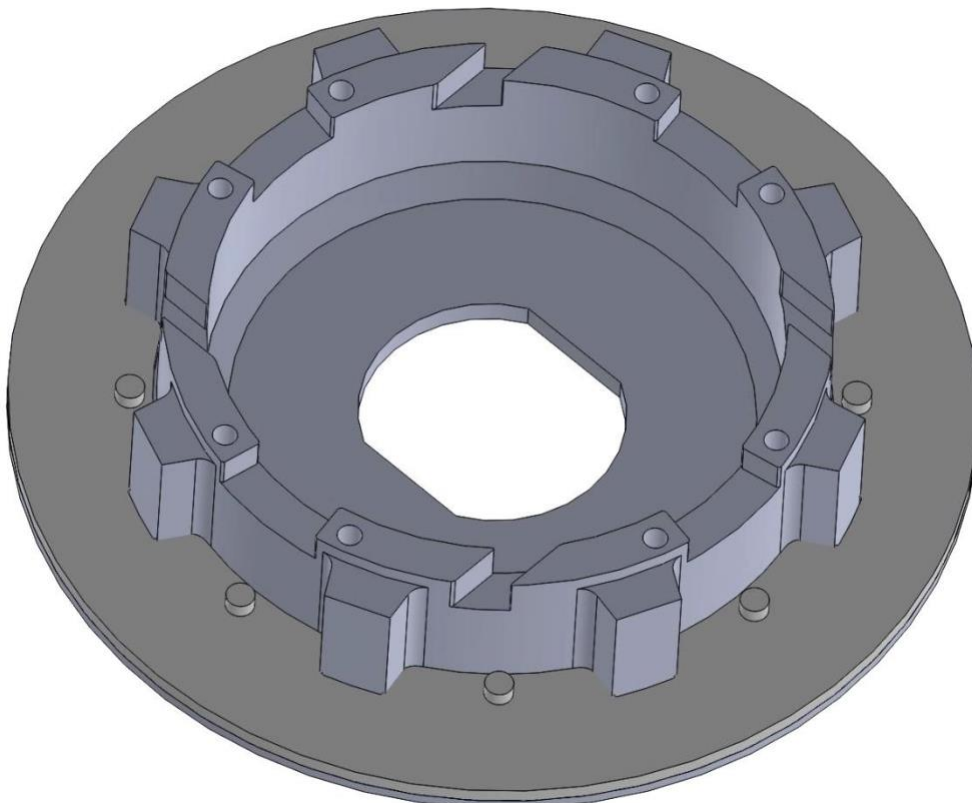
NOTE:

6. Disassembly and Assembly

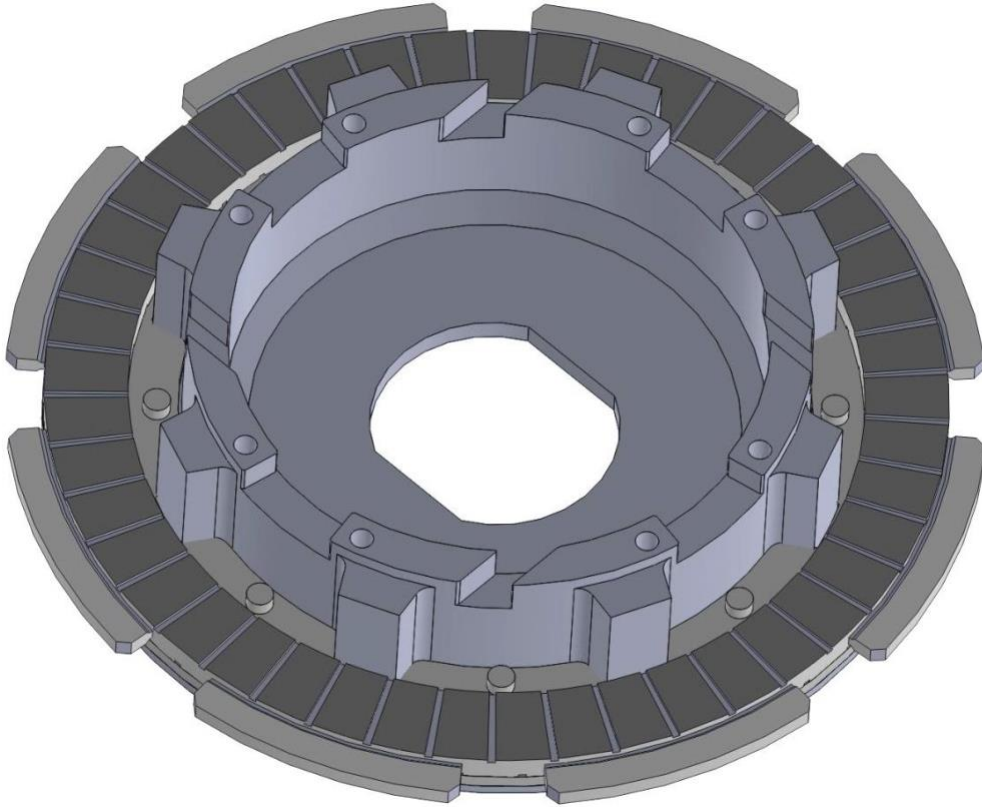
1. Put the weight roller into the roller plate



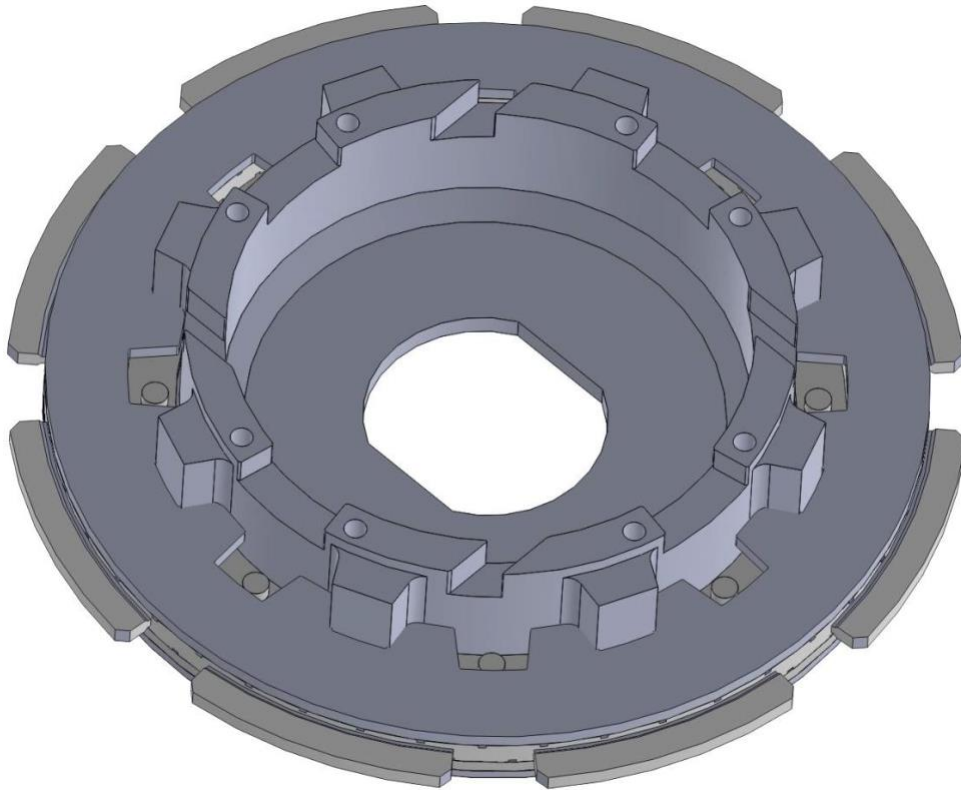
2. Place the spring plate into the clutch gear and place the compression spring facing in the upward position.



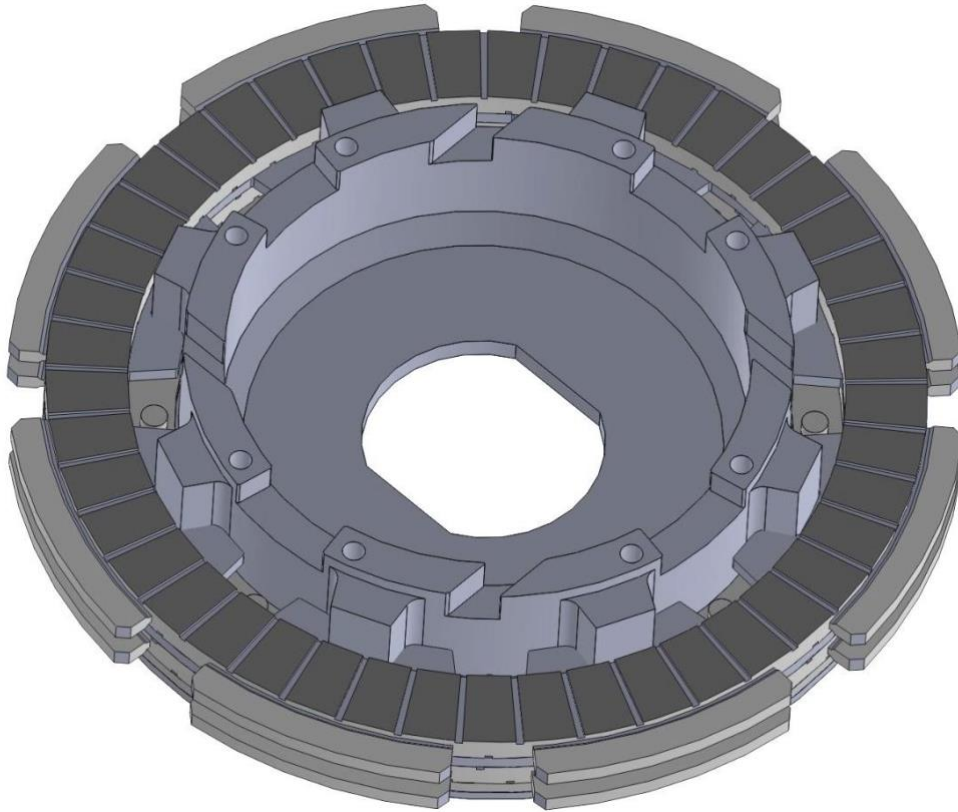
3. Place the clutch plate on to the spring plate in an orderly fashion.



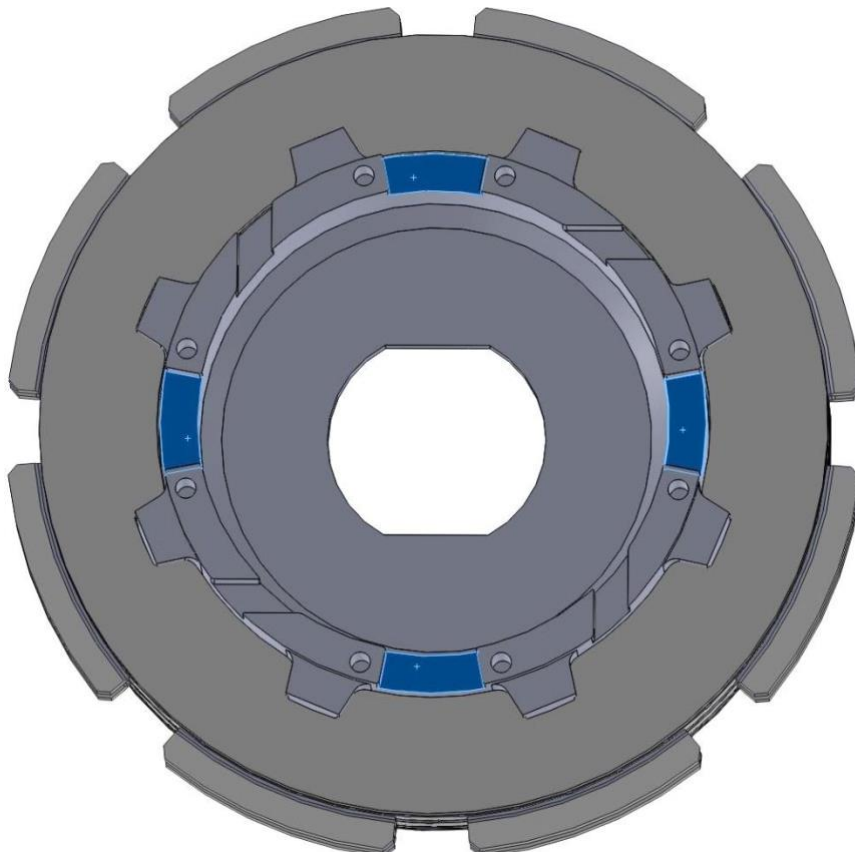
4. Place the pressure plate on the clutch plate.



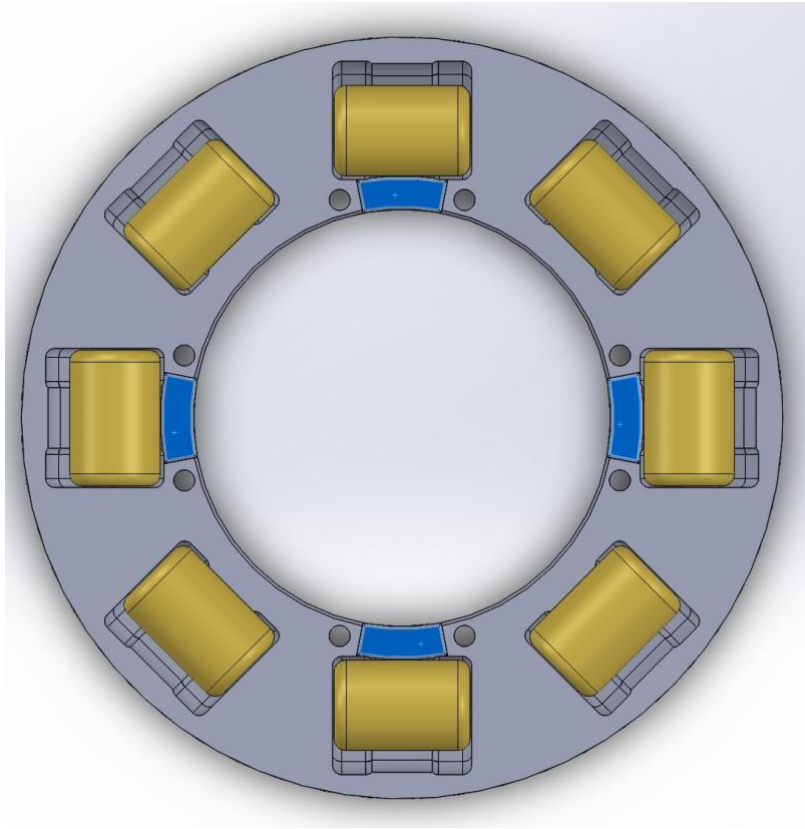
5. Place the clutch plate onto the pressure plate and then place the compression spring onto the positioning column.



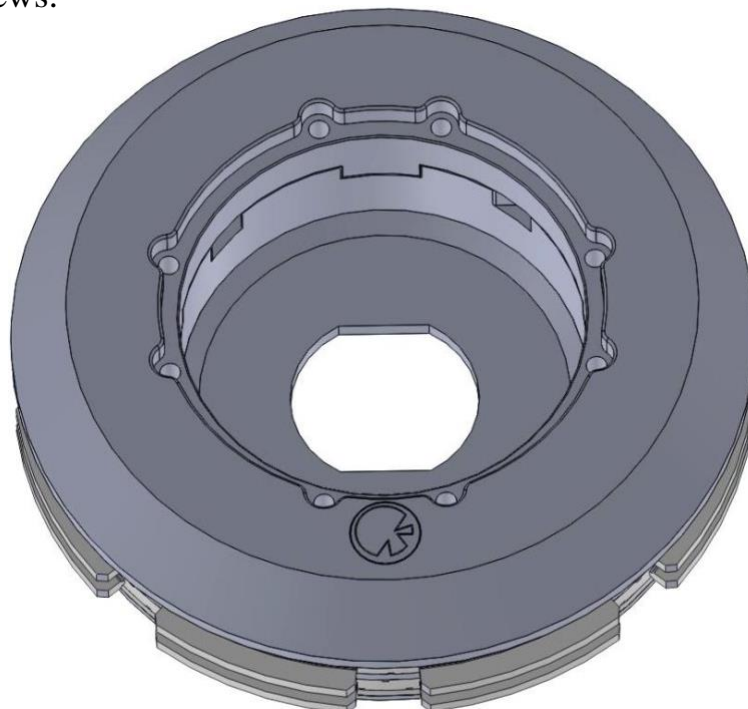
6. Place the spring plate against the compression spring and then place the compression spring onto the positioning column.



7. Place the clutch gear and the fixing plate on the weight roller holder and align it with each other. Then lift the inner set teeth and reversely place it on the weight roller holder.



8. After the placement is completed, please align it with the fixed jaw and press it to make sure it is alignment. Then you can go ahead and tighten the two screws. After tightening the screws, pick up the clutch and carefully inspect it thoroughly. Now check to see if the springs are installed correctly and then lock all the eight screws.



7. Transmission Adjustment and Theory

The overall weight of the STC is much lighter than the conventional clutch; the transmission efficiency of the STC is also increased. So, there is a difference in the clutch configuration. Reveno has conducted many tests over a long period of time and have the following recommendations to provide you with the best configuration.

We recommend lowering each weight rollers by 1 to 2 grams (each) on the front weight roller disk. It should be adjusting according to the weight of the rider.

Suggested Values :

If the rider weight is less than 80 kg, we recommend reducing each weight roller by 1 gram. If the rider is 80 kg or more, we recommend reducing each weight roller by 1.5 grams. (The above recommendations are values gathered from the original pulley plate and largespring setting.)

Adjustment and Theory :

The so-called CVT is a seamless transmission system. Although seamless transmission has no stages, but the timing and curve of the transmission are important keys elements of the output from the engine to the wheel!!

All the components in the transmission box needs to be viewed from the perspective of the system as a whole. The front weight roller plate is considered to be the key element to the gear shifting mechanism of the vehicle, and the rear opening and closing disk is the key element to the timing of gear changing! !

1. Pulley Rollers Adjustment :

According to data from 小老婆 motorcycle website, the SMAX 155 for example has a maximum horsepower of 14.75HP/7500rpm and the highest torque is 1.4kg-m/6000rpm.

From the published data, the maximum torque is at 6000 RPM (the torque represents the acceleration of the vehicle.) Therefore, the starting speed needs to be changed to get the maximum torque, which is 6000 RPM. So regardless of the angle of use and the brand of weight roller, the weight rollers will need to be

readjusted to start the acceleration and then shifting to the speed domain when the initial torque point is met.

2. Pulley Contra Spring Adjustment :

After adjusting the front weight rollers to the ideal weight, then take it to the road to determine which direction to adjust the contra spring.

How to determine if the contra spring is too soft or too hard :

A. Too Soft :

When at riding speed you let go of the throttle and then accelerate. If you feel the accelerating is weak then it means that the contra spring is too soft.

Reason: Due to contra spring not reversing the gear in a timely manner, it does not return the belt to the previous gear when accelerating again, resulting in poor acceleration.

Example: When a vehicle is on the highway and the speed is maintained at 100 km/h. When the back vehicle wants to overtake the vehicle in front, the back vehicle would put the gear into OD but if the gear did not kick down into lower gear, then there would be no acceleration when at full throttle.

B. Too hard :

When the vehicle is at high speeds and in the maximum horsepower speed range, but speed does not continue to increase. This would mean that the contra spring is too hard.

Reason: Due to the feedback force of the large spring resulting in the belt not being able to open the inner ring of the pulley. This means that the front of the belt cannot be opened to the outermost of the ring. So, the speed is limited and cannot reach the full range of speed.



3. Belt Gear Control :

For example, when the engine is idling the RPM is at 1000, the rear pulley disc RPM is from 250 to 300. The CVT clutch will generate centrifugal force through the rotation and convert it into positive force to provide friction (Friction = coefficient friction * positive force). From the example above, if the belt speed is lower than 250-300 RPM when the belt gear is in the outer ring of the pulley disk position when idling, the clutch engagement will become higher.

4. Clutch Engagement with RPM Control :

Regular 125cc scooters that use factory clutch will engage RPM speeds that fall around 3800 (durable configuration), the traditional after-market custom clutch modification will increase the engagement speed of the clutch. The purpose is to increase the engagement speed to produce the maximum torque and horsepower of the vehicle. Even at a lower speed, it can provide abundant torque and horsepower output when needed. Therefore, the clutch engagement speed does not need to be too high because in city riding will be constant stopping and accelerating which might cause the friction of clutch to overload (dynamic friction to static friction time is too long, resulting in the clutch temperature to rise causing the performance to decline).

NOTE:

8. Installation Instructions

1. After disassembling the traditional clutch from your vehicle, place the contra spring washer above the contra spring, then press the STC to open and lock it in place by tightening the disk bolt. (The correct installation method of the sliding sheave disk nut is to lock the arc or chamfered surface downward, and the nut locking value is 60 N.m) Now the belt can now be placed on the disk surface and mounted onto the vehicle.

(Because the traditional clutch is a steel body, the friction of the large spring is relatively low and non-destructive. The STC is an aluminum alloy body so it can easily be damage due to the friction of a large spring. It needs to be protected by placing the body in a protective gasket)

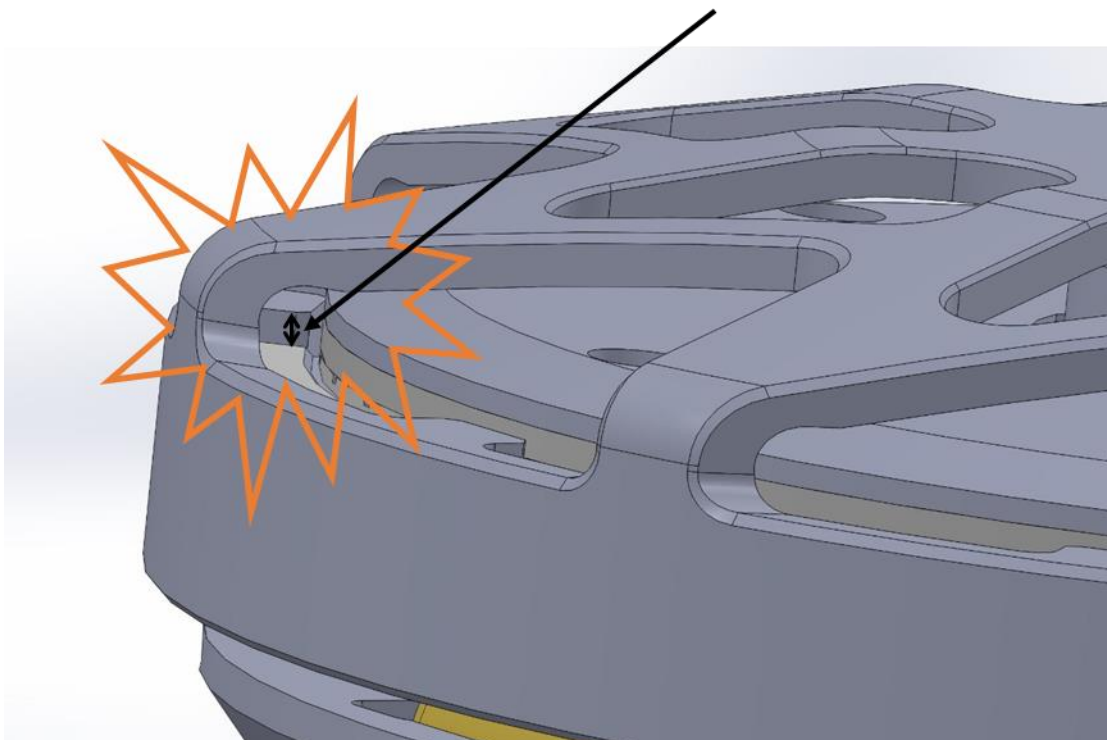


2. First, set the belt in the correct position of the sliding sheave, and then align the two front and rear snap-fit gaps of the clutch plate. The inner edge of the outer edge of the cover is aligned with the clutch notch and placed on the clutch body. Place the whole set on the vehicle. After the tooth is mounted on the pusher and fixed into position, install, and lock the central gear nut.



Precautions:

Because most of the current sliding sheave have been modified to increase the stroke to correspond to STC, the clutch outer must be raised. The upper edge of the inner edge teeth of the clutch outer must be parallel to the junction of the inner seat clutch gear and the spring plate.



9. STC Trouble Shooting

Clutch Unsmooth Release

1. Possible Rust on the Spring Plate :

Evenly rub/grind off the rust until the surface is smooth and then apply oil. This should solve the problem.

2. Clean Rust off the Weight Roller :

Cleaning the rust off the 1.0 weight roller will solve this problem.

The rust of the bearing steel in the 2.0 concentric roller's structure may cause uneven movement. If the rotation is not smooth or dry, please use ester lubricant (appropriate amount but not too much) to apply a needle in the gap of the concentric roller to make it smooth. It flows into the center bearing steel part for lubrication and anti-rust. It is recommended to perform maintenance every 5000km.

3. Clutch Plate and Clutch Outer Gap :

The heat will cause the clutch plate to expand and will become uneven on the surface. It will cause it to have friction and problem with detaching from the outer. Grind it until smooth; re-align it with the clutch plate to the proper angle to solve the problem.

4. Moist Clutch (Weather) Condition :

If the vehicle is at a standstill, starting it on a cold early morning (vehicles that are driven by fuel supply will have sounds, it is normal for rear wheel to rotate when speeds increase) or if when water floods above the transmission case. When engine is restarted, there will be adhering of the surface of the clutch plate causing it to be unable to detach and separate to allow the vehicle to stand still.

Instructions :

First, lift the vehicle off the ground so that the back wheel is

suspended and attend to start it. If it starts successfully then the rotation of the rear wheel should be normal. Hold the brake while accelerating; this will create temperature and rotation. After a few cycles, the water in the chamber will be solved.

5. Flooded Transmission Box :

Vehicles that go through deep water areas, some water will enter the transmission box, causing the friction of the transmission to drop.

Instructions :

If water has entered the chamber, hold on to the brake while accelerating to increase the RPM. This will force the water out and not enter the muffler. Following the instructions above will help you restore friction.

6. Gear box being in water for a long period of time :

This can easily cause rust on the internal metal pressure plate, metal will swell after rust, resulting in insufficient clearance, and clutch will be stuck together and cannot separated. When washing or cleaning the vehicle, it is not recommended to directly flush water into the transmission box.

Instructions :

Please use the above-mentioned 4th and 5th points immediately. If the condition still cannot be improved, it must be removed for detailed cleaning. You must purchase a consumable replacement kit if the consumables can no longer be used.

High temperature clutch plate condition :

1. Regular daily riding is constantly go and stop (Throttle is jerked back and forth)
2. Mountain roads (slow speeds with heavy loads for an extend period of time.
3. Long period of riding straight. (fixed speed for long periods) .

Dissolve and smoke occur: The inside surface of the clutch skin

is phenol resin, which is industrial grade adhesive. This material is organic and will produce smoke when it exceeds the load temperature.

Instructions :

1. The Reveno clutch is lighter than other clutches on the market. Therefore, in the initial configuration, the left and right transmission output parts must be balanced to a certain degree using weight rollers and springs.
2. When in the riding state, you feel it is soft and weak when applying gas and speed is not accelerating as usual. This is a sign of overheating. Allow rapid air intake to the transmission box by slowly increasing the speed of the vehicle to lower the temperature. (safety is of the utmost importance)
3. We should minimize the bad habit of applying full throttle going up steep slopes and roads. Do not apply full throttle at once, because it will cause a large frictional force and will inevitably generate heat when it recovers to static friction. Repeating use of bad habits will slowly build up the temperature and cause overheating.

Precautions :

When the clutch encounters high temperature, the glue in the clutch plate will melt and leak out. Before changing the consumable replacement, please thoroughly clean the residual of the three major parts of the clutch body (so as not to affect the operation) then reassemble it. We recommended to using any major brand of cleaning detergent.

10. Warranty Information

What is covered by this warranty?

1. The warranty is limited in duration to 6 months or 10000 km from the date of purchase and install, whichever comes first. Regular expendables such as clutch plates, weight rollers, clutch springs, spring plate and pressure plate are not covered by warranty.
2. If the product malfunctions under normal use by the customer, and it is identified as a problem with the product itself, Reveno will be responsible for repairs within the warranty period.
3. Reveno reserves all the rights to alter, modify, and change the design to the product, and holds no obligation to alter, modify and change any previous manufactured product.

Returns and Exchange Policy:

The following contents are not within the scope of new product warranty.

1. Damages caused by human errors.
2. Warranty sticker is altered, removed, or displaced.
3. Flood, fire, earthquake or other natural disaster and human error.
4. Any corrosion that caused by placing in moisture environment or liquid damage
5. The return sheet should notify with name of the dealer, serial number, purchase date, and reason (shall be judged by the manufacturer)

The appearance of the Product shall stay intact (no scratches and damages), along with complete accessories and gifts, otherwise there will be fees charges according to actual scenario.

Warranty Period

Reveno provides 6 months or 10000 km product warranty, whichever comes first. However, to ensure the buyer's rights, please register the serial number of the product at the homepage of Reveno to complete the activation of warranty.

Exclusion from warranty coverage

The following contents are not covered by the warranty, the company can use discretionary fees or inadmissible.

1. Warranty sticker is altered, damaged, or removed.
2. Damages caused by fire, flood, earthquake or other natural disaster, and other cause beyond Reveno's reasonable control.
3. Any damage caused by the unauthorized adjustment, repair, or service of the equipment by anyone other than personnel of Reveno or its authorized repair agents.
4. Any damage occurring, at any time, during shipment of equipment unless provided elsewhere.
5. Any damages and malfunction when warranty period expired.
6. Any corrosion that caused by placing at moisture environment or liquid damage.
7. Any damages caused by human errors (e.g. serious breakage or scratches).
8. Appearance scratches, paint peeling, or damage caused by natural disasters or human factors are not covered by the warranty.
9. Damage caused by accidents, man-made sabotage, improper installation, self-changed components, or natural disasters will not be replaced if it is damaged by human factors. However, repair fees or replacement supplies may be charged as appropriate.

This Limited Warranty does not apply to: any damage to the product caused in whole or in part by abuse, accident, fire, chemical corrosion, use for other than its intended purposes, unlawful use, use in a model for which it was not designed, faulty installation, installation contrary to the manufacturer's published instructions, or failure to maintain the product in accordance with the manufacturer's published instruction.