



# CVT Parts





- The arrow on the governor cup indicates not the rotation direction of the engine, it shows the insertion direction of the sleeves. They should be pushed out against the arrow direction. Each time when replacing the roller sleeves mark the box next to the arrow with a tick. If the two boxes are already marked, the governor cup needs to be replaced.
- Important: Always replace the drive pulley screw when assembling. Never substitute conical spring washer and/or screw with aftermarket parts. Tightening torque is 120 Nm.
- The green arrow is showing the rotation direction of the engine.





- The newest version of the Governor Cup (P/N 420280522) consists of the cone which is completely metal with a metal sleeve (this replaces the version with the alloy cone P/N 420280519). The new Vespel Rollers have been built into this new version
- These new Rollers become a flat spot after a short time of usage. This spot is uncritical. There is no need to change to roller unless the spot becomes bigger than ?mm? (awaiting answer from Rotax 12.06.2012) .
- The rollers can be replaced without replacing the lever arms
- The right pic. shows a roller after 500 km.





- The new rollers have no washers any longer.
- The surface of the sleeves is high gloss polished.
- Only assemble new rollers with new sleeves. Don't mix them!







- A new version of slider shoes will be installed as a running change.
- SSV 800 & 1000: starts with MY12
- ATV G2 800, 1000: also starts with MY12
- ATV G2 650: starts with MY13
- ATV G2 500: still old version build in at rotax
- The P/N 420281293 will stay the same.
- The new slider shoes have 16 edges and no mounting support anymore.
- The new slider shoes will be hold on the outside by the governor cup.
- The slider shoe towards the engine rotation will have more wear than the opposite one. This is normal, because of the rotation and torque of the engine
- Always change all 12 slider shoes at the same time.





- The latest execution of the outer half P/N 420280467 is reinforced at the lever arm support.
- The lever arm pivot bolt is now free of slackness, not like the old version where the bolt is **floating mounted**.
- If a lever arm needs to be replaced, always replace all lever arms to avoid an unbalanced drive pulley.
- The lever arm which is hard to operate after the installation becomes low-friction after short usage.
- The pivot bolt should be installed from the right to the left (top view).
- When replacing the lever arms the bolt and the rollers needs to be replaced.





- Two versions of spring seats are built into ATV engines. The difference is that the spring seat for the V2 engines have a collar at the outer edge. (red mark)
- The friction washer is mounted on all engines except the 1010 and the 810 commander engine.
- The friction washer must be installed with its collar towards the one-way clutch.





- The one-way clutch operates only in the red marked area.
- At the 400 cc engine the ramp has a reverse direction like the V2 engines. This is due to the inverse engine rotation.







- The 2 ball bearings used in the one-way clutch are double side sealed. (except 1010 engine and Commander 800)
- The 2 ball bearings in the 1010 and Commader 800 engine are only sealed on one side (P/N 420632377). This was done because with the introduction of the new transmission, less drag is needed on the driven clutch. If there is too much drag on the new transmission, shifting will be adversely affected.
- The maintenance interval has been decreased from 2 years or 6000 km to 1 year or 3000 km.





- The compression springs at the V2 engines are all the same types, regarding windings, length and compression rate.
- The compression springs at the 400 cc engine (P/N 420239135) have the same winding, length and compression rate like the V2 springs. But the winding direction is inverted. This is due to the reverse rotation direction of the engine.
- Take care not to install the wrong springs. If you have (for example) installed a 400 cc Spring on a 800 cc V2 engine, the spring will unwrap and loose their compression rate.
- The result of a damaged unwrapped spring is that you will lose the engine brake effect.





- If the spring sleeves are damaged or notched in the marked area, they need to be replaced.





- Before you reassemble the one-way clutch inspect the sleeve holes for wear.

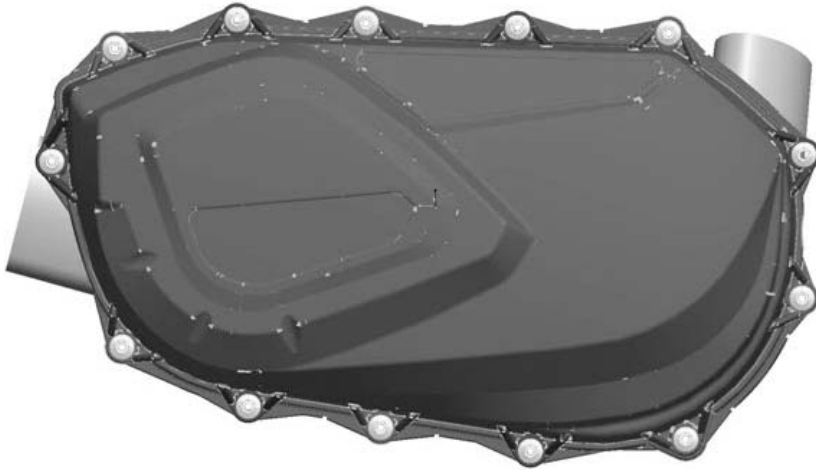




- There are many different types of springs build in the drive clutch. The springs can be determined by the different colour.
- Black –Yellow is only mounted at a SSV
- Black – Green is installed at G2 800 – 1000 ccm Outlander and Renegade
- The Silver spring is desinged to fit into a G1 650 – 800 ccm Outlander and Renegade
- Black spring can be found at the G1 400 – 500 ccm Outlander and Renegade.
- Refer to the Service Bulletin 2013-4 (spring chart) to determine the correct spring specification.







- The new seal of the CVT cover (P/N 420430126) has a new material mixture to avoid leakage. The replacement was done as a running change.
- Nevertheless these new seal retrofits the old 7 bolt CVT cover. The sealant is guranteed.
- The new CVT cover ( P/N 420611394) can be used with the old 7 bolt CVT air guide. The sealant is also guranteed.
- The crosspiece inside the CVT cover is related to the air flow and cooling of the CVT. If the crosspieces are damaged the CVT cover needs to be replaced.





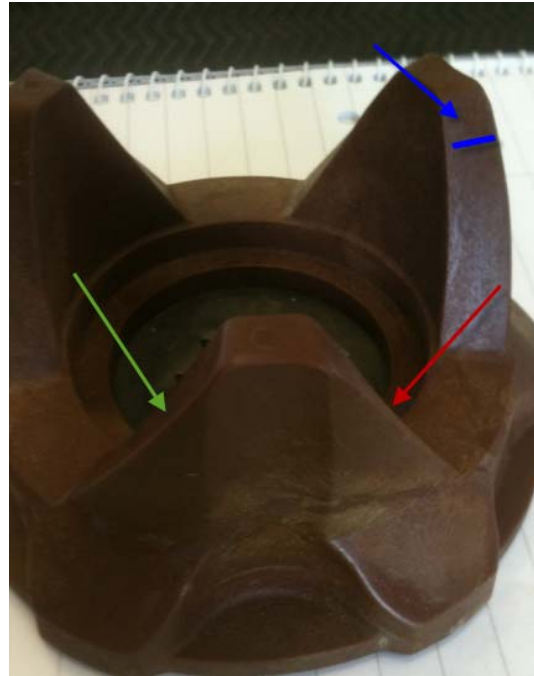
- On the top right you see a belt with a very frequent failure „belt spotting“. This failure occurs when
  - Inappropriate transmission gear selection during towing, steep incline or in deep mud/snow
  - Drive train locked or frozen
  - Accelerating motor while vehicle is stuck
  - Vehicle overload including excessive towing loads
  - Incorrect pulley operation from modified or dirty CVT components
  - Using high gear while climbing a hill.
- In this case the belt is held by the driven pulley and the drive clutch is slipping. Then there is too much temperature at the belt. As a result of this, the belt makes a squeezing noise during acceleration.
- For more information regarding belt damages refer to the Administrative Bulletin 2012-1





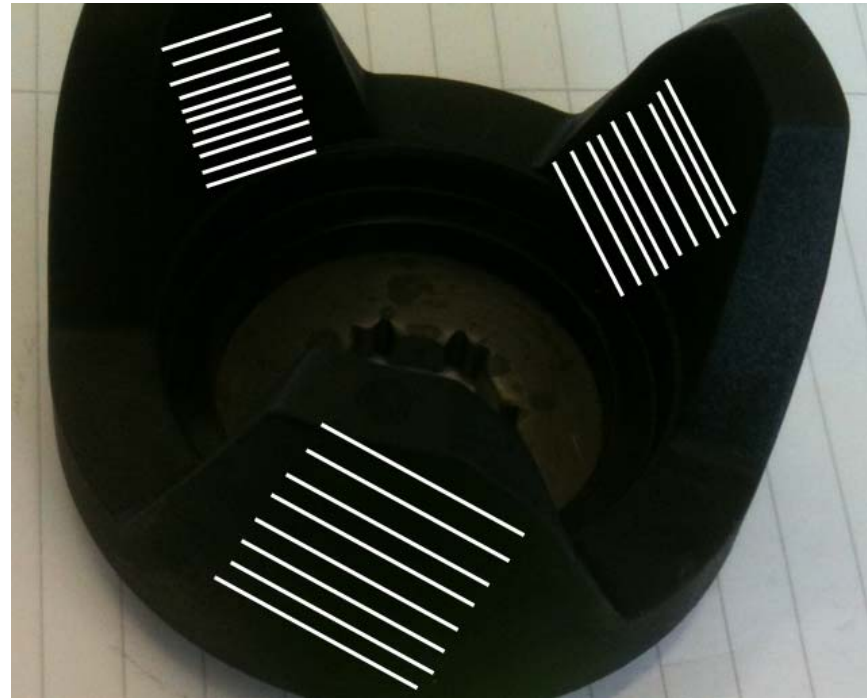
- At the drive pulley there are 2 different ramps.
- Red marked ramp: These ramp is responsible for the engine braking force. The wear on this ramp is low, because there is only a few torque transfered on this ramp.
- Green marked ramp: This ramp is used for acceleration. The wear is higher than at the braking side due to the engine torque that is working on the surface.





- Here you see a cam from an Outlander 650 (P/N 420280199).
- The green arrow shows the ram which is used during acceleration.
- The green arrow marks the acceleration ramp, which interferes into the Sliding Pulley. The acceleration ramp determines - in alliance with the springs and the leverarms - the speed ratio as a function of engine speed and engine torque. The flatter the ramp is prepared, the higher is the wedge power on the driving belts. With a flat acceleration ramp the number of revolution level is higher than with a steep ramp.
- The red arrow marks the decelleration ramp. The way of function is reverse to the acceleration ramp. The steeper the decelleration ramp the fewer is the impact of the engine brake.
- There are 2 different pairings of sliding pulley and cam. In the version shown above, a 650 engine, the locating surface is ounctual. This means the cam ramp touches the sliding pulley only at a very small face. These results a higher wear.





- On the left you see an Outlander 800 cam.
- Due to the higher power and torque the cam has contact on the complete surface of the sliding pulley (blue area). This reduces the wear of the sliding pulley and the cam.
- On the right you see an Outlander 1000 cam (P/N 420280472). The newest version of this cam is reinforced with a metal core in the teeth (white area). This makes the cam more resistant against shear off.







- This picture shows a cam of a G2 model. On this cam is a drilled hole where the top end of the compression spring needs to be installed. This new compression spring (P/N 420238177) effects that the accerelation ramp has contact with the acceleration ramp at the sliding pulley at idle speed. This effect avoids the metallic noise when starting to ride.
- You have to pay attention regarding the preload direction of the spring. A wrong preload direction results in contact between the brake ramp and the sliding Pulley a idle speed.





- There are many different types of compression springs build in the driven clutch. The springs can be determined by different free length and wire diameter.
- On the left you see the compression spring of the G2 models. This spring (P/N 420238177) effects contact of the accerelation ramp of the cam with the acceleration ramp at the sliding pulley at idle speed.
- The middle spring is mounted at 400 ccm and 500 ccm engines. The free length is longer than the G2 spring.
- The spring on the right is mounted at the current G1 650 ccm – 800 ccm and the Commander 800 ccm – 1000 ccm. The compression rate is much higher than the 400 ccm – 500 ccm spring due to a higher torque and power.
- Refer to the Service Bulletin 2013-4 (Spring chart) to determine the correct spring specification.





- While reassembling the driven pulley from the G2 model it is very important to twist the cam against the sliding sheave as shown at the picture.
- Turn the driven pulley 20° clockwise while the cam is blocked by a wrench until the cam engages in the driven pulley sliding sheave. Be careful when mounting the driven pulley to prevent damages at the cam or sheave.
- If you turn the pulley 20° counterclockwise you can assemble the driven pulley as well, but each time you start driving you will hear a loud noise from the CVT. This is caused by the cam which is striking against the sheave. This increases the wear and can damage the cam.
- A not correctly engaged cam will cause damage to the driven pulley and cam itself.





- When servicing the driven pulley on a vehicle equipped with a 1000 cc engine, install a NEW retaining screw.
- Strictly adhere to the tightening procedure. Step 1 tighten with 20 Nm. Step 2 turn 180° clockwise.
- When you see the driven pulley mounted with a tab washer, replace the screw through the current version.





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