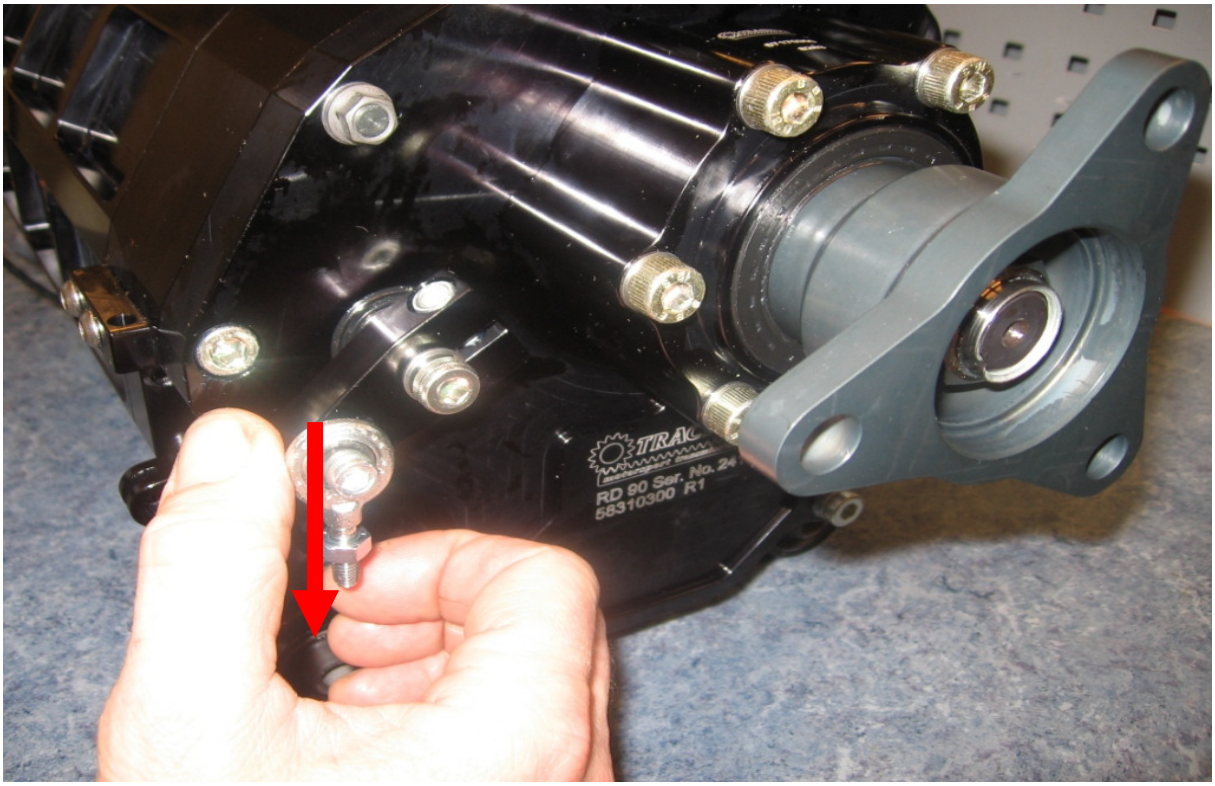
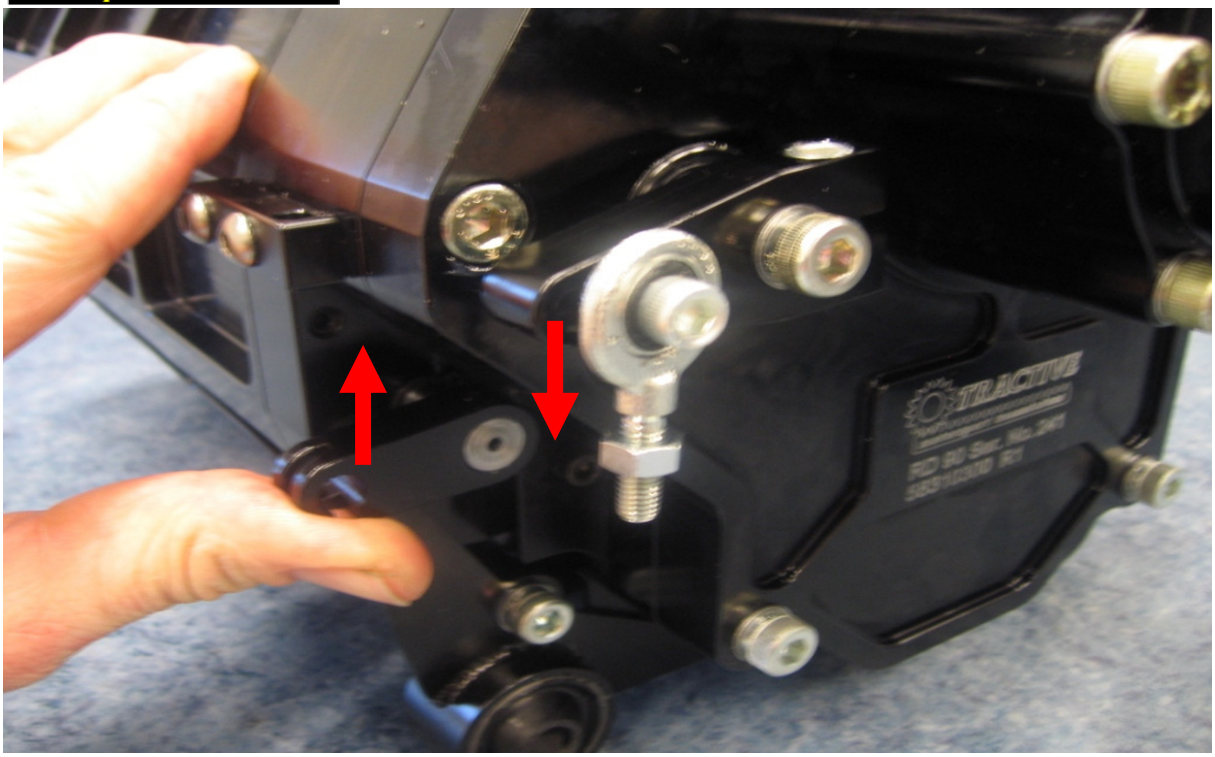
RD 906 Workshop manual

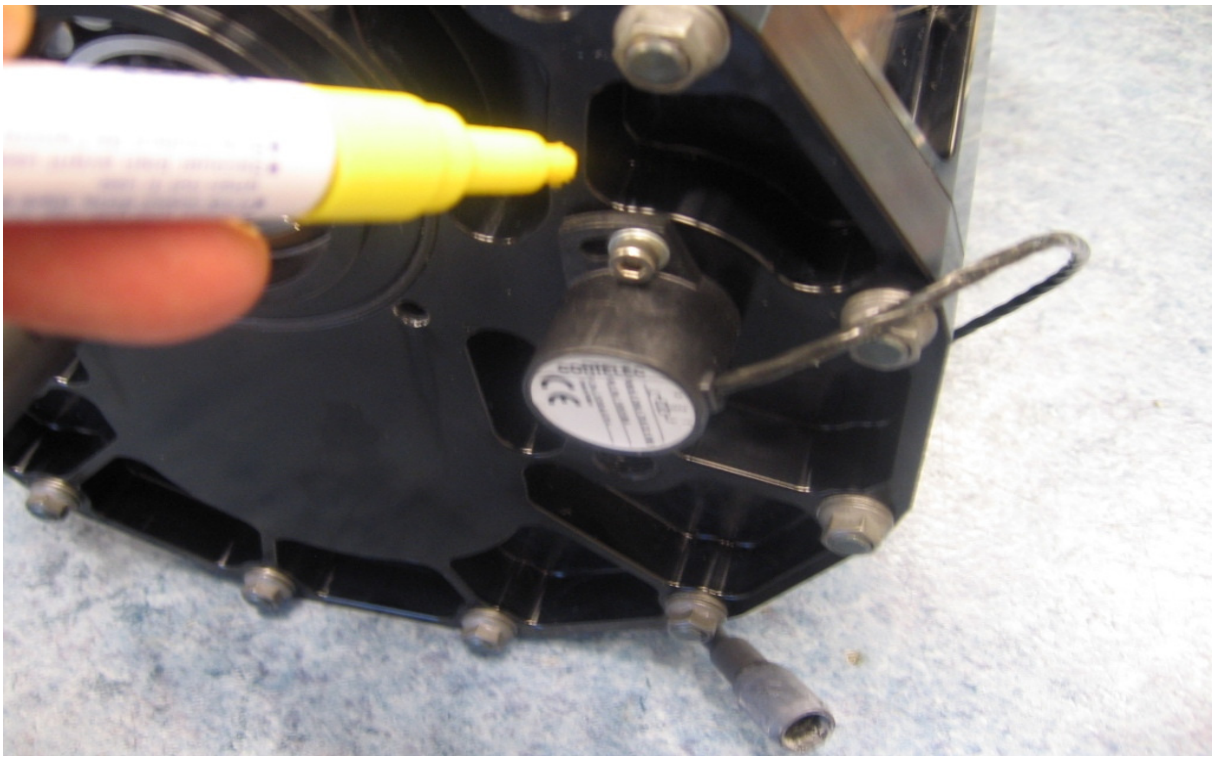


Before removing the potentiometer or stripping the gearbox engage reverse gear, while turning the clutch shaft move the selector lever in a downwards motion then back to centre to reset the ratchet (this will downchage the gears)

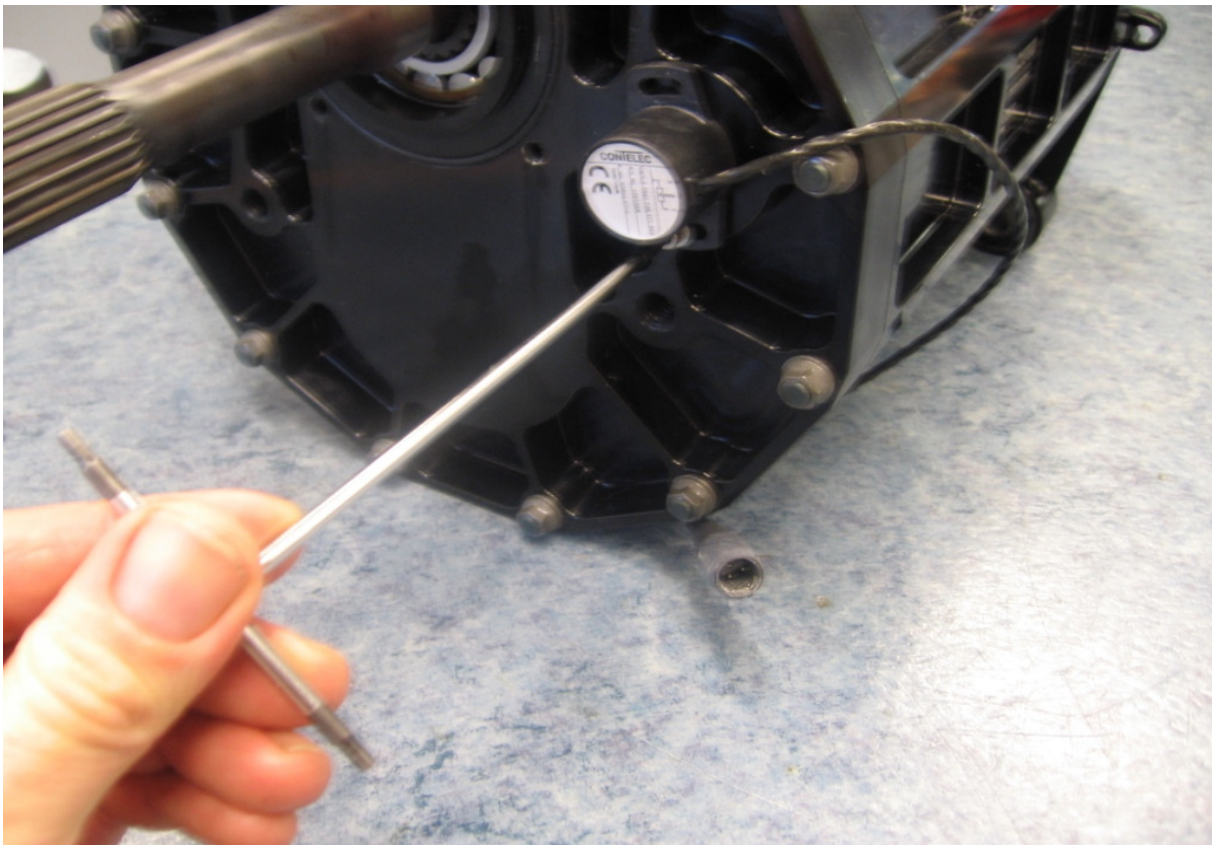


When you get to 1st gear the selector lever will not move any further down without releasing the neutral reverse blocker, push this arm up against the spring. (It will only move about 2,5mm) you will be able to move the selector lever down to neutral and then reverse.

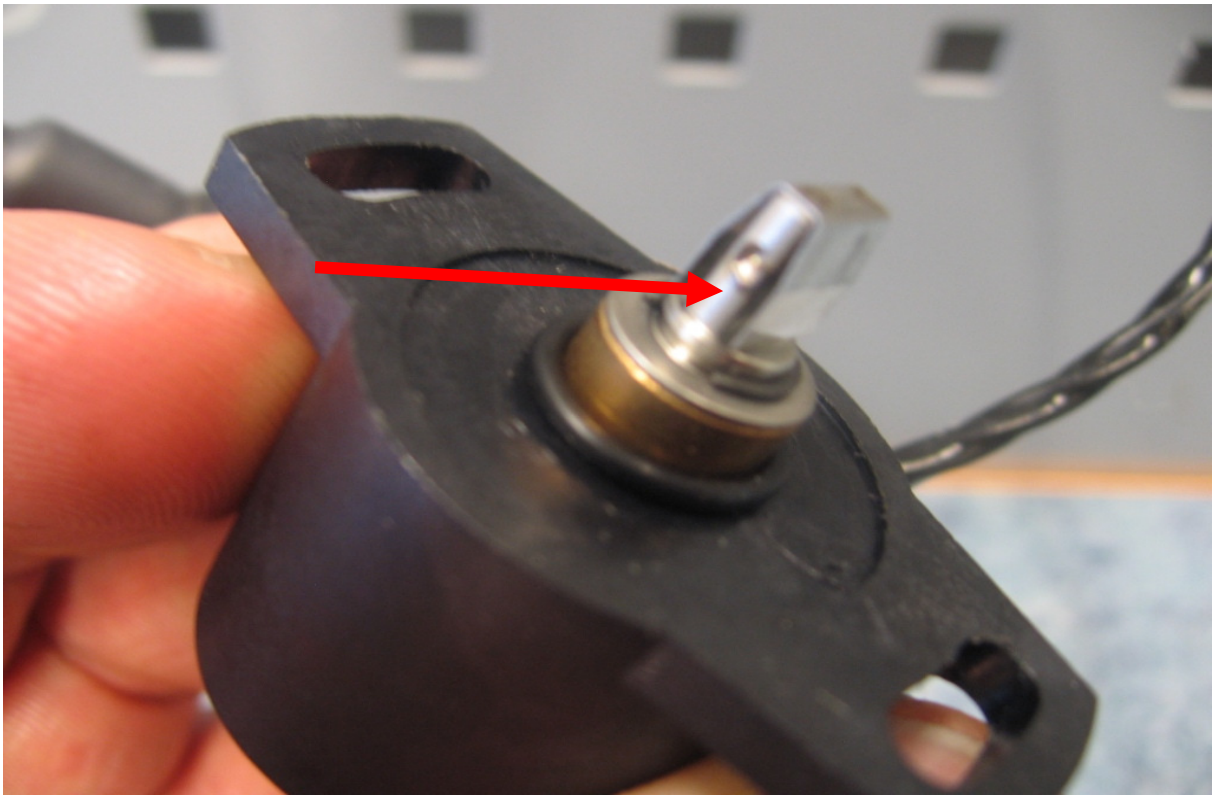
NOTE- Reverse gear although fully engaged with the dog ring will not be fully engaged with the ratchet system and might try to spring back to neutral, this is normal. Driving the car you will have to hold the gear lever in the reverse position.



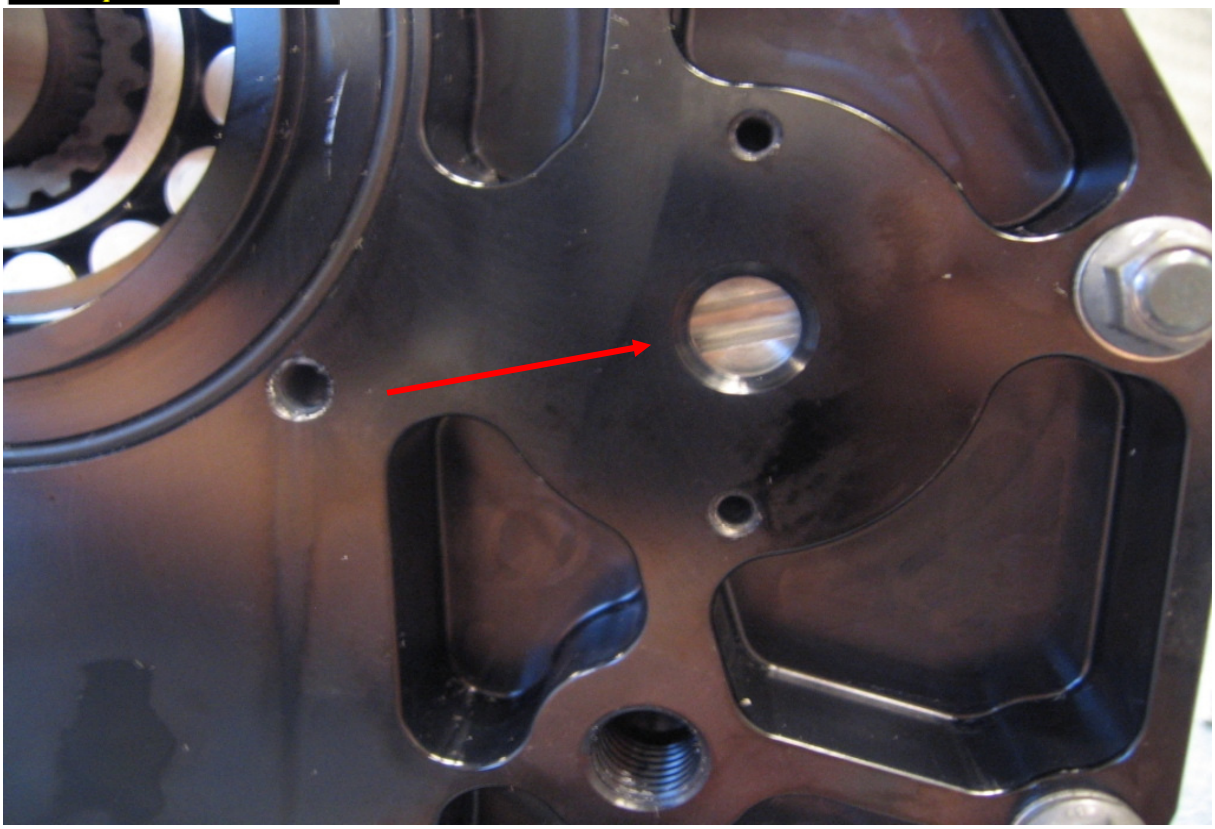
When reverse or a noted gear is engaged mark the potentiometer.



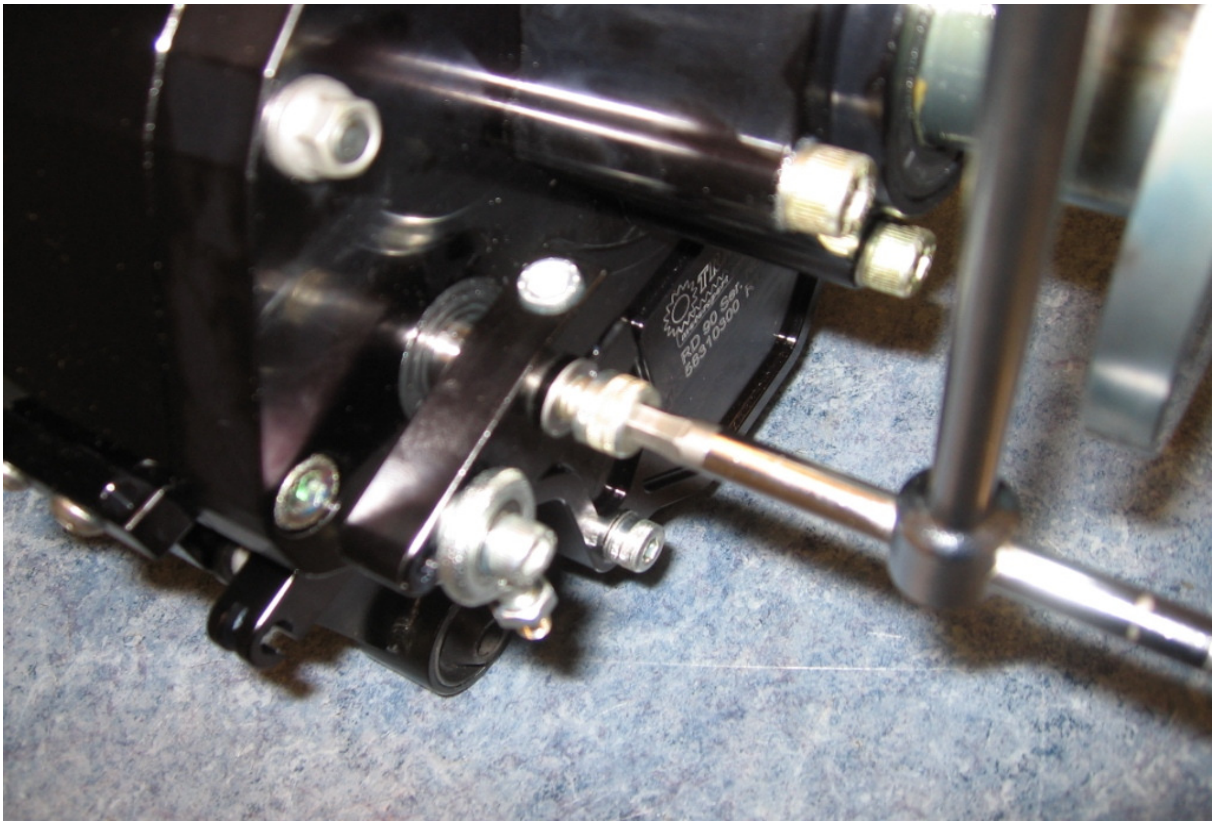
Remove the two M4 cap screws



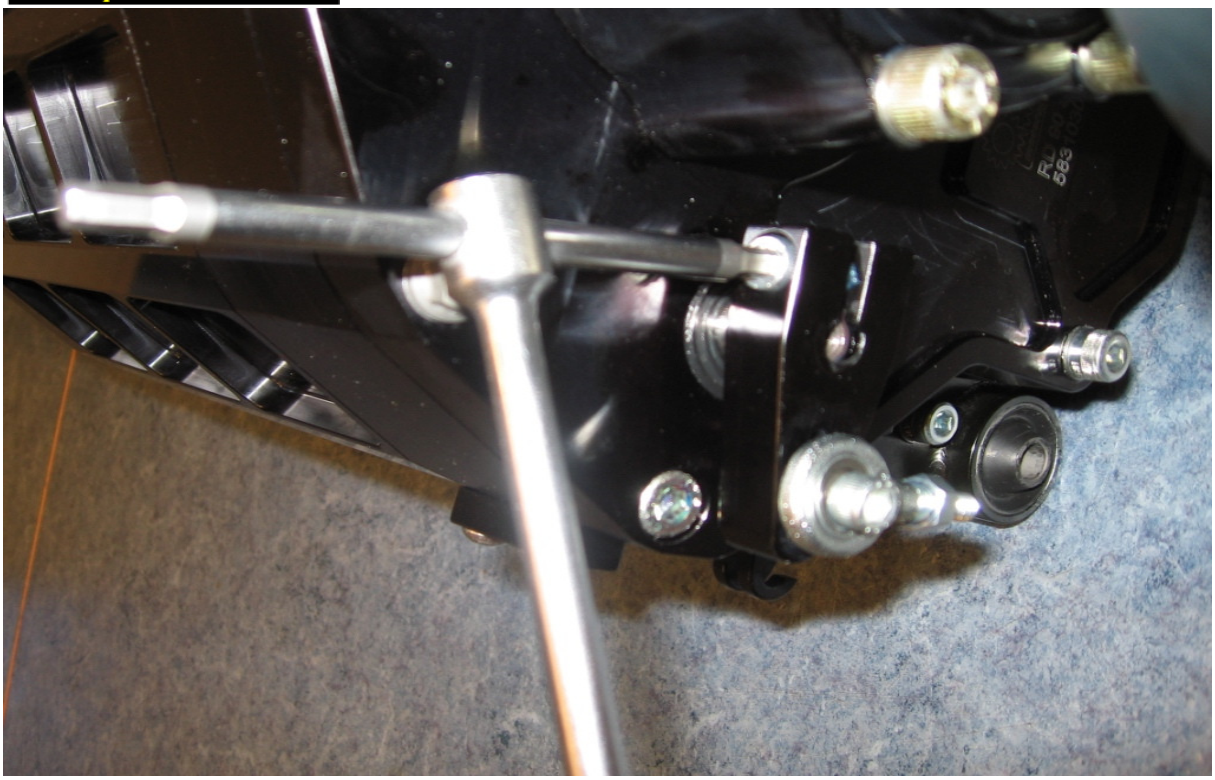
Note the position of the indent in the potentiometer blade, other side has no mark. ”O” ring should also be fitted.



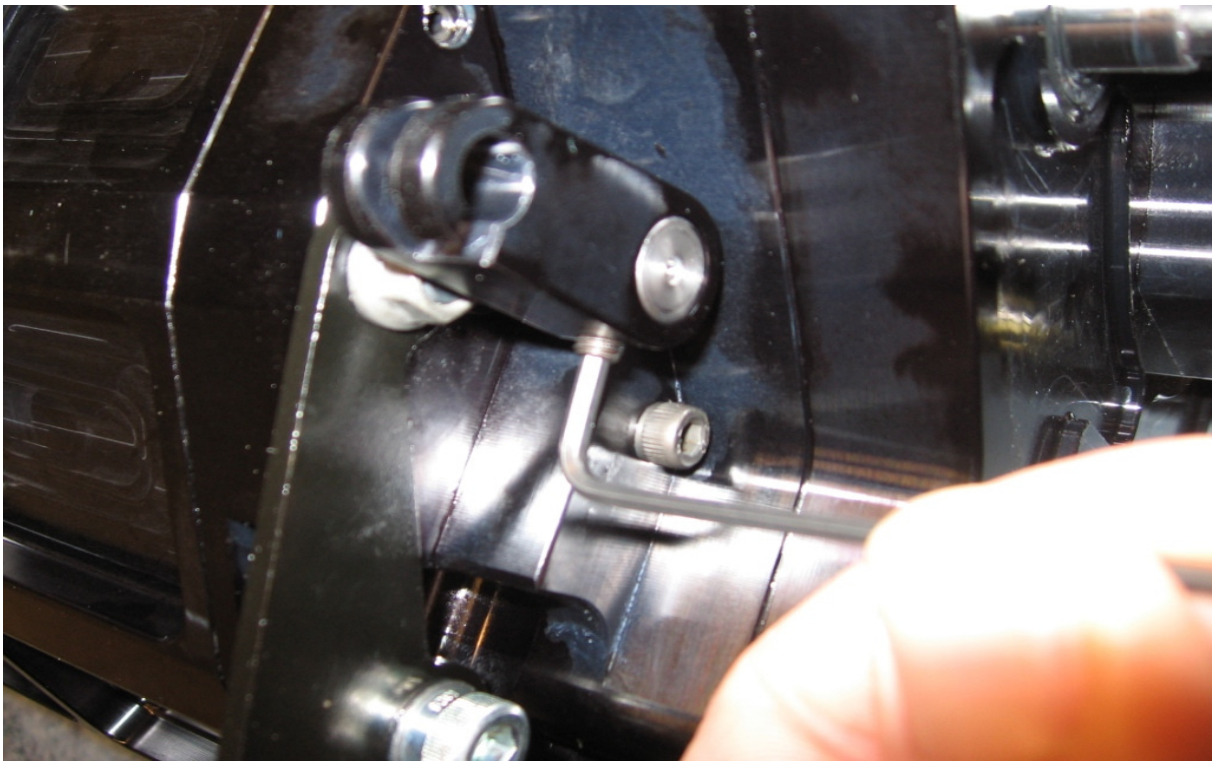
Note position of potentiometer drive peg.



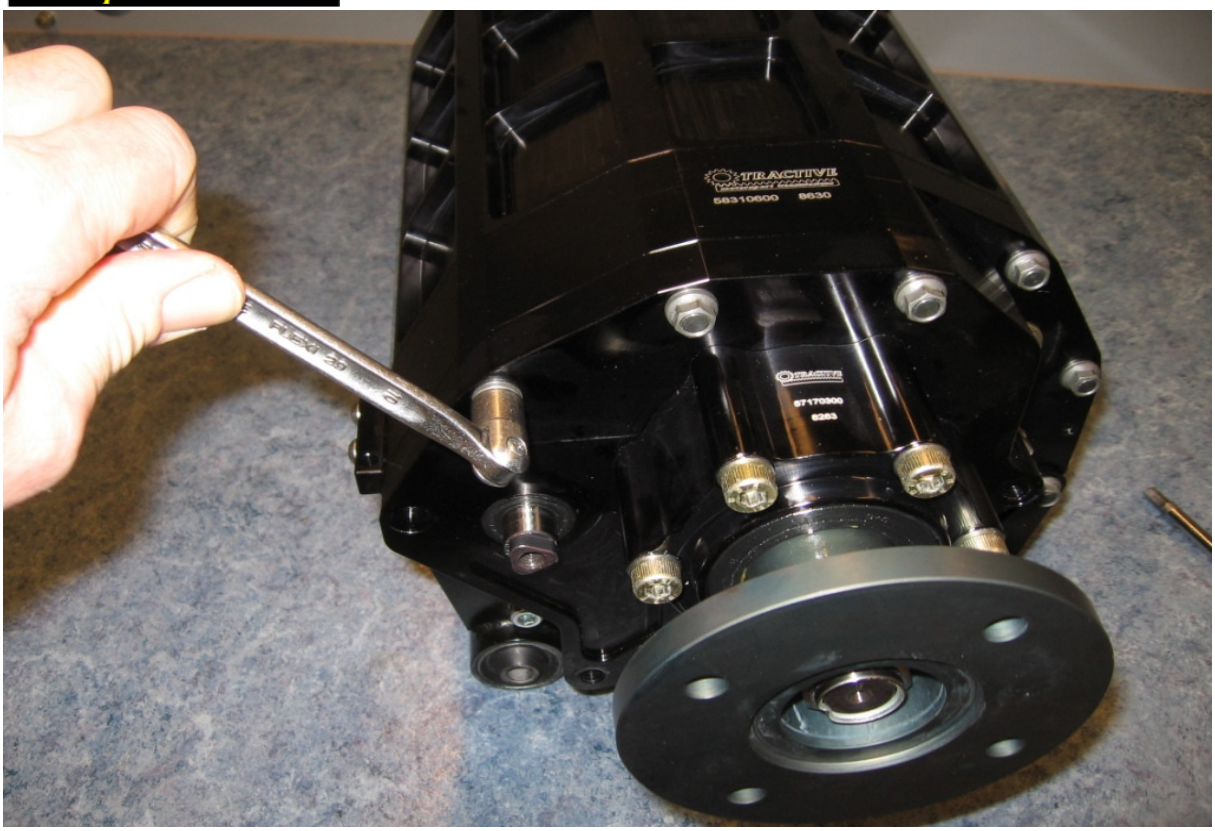
Remove the selector arm M8 screw; it is not a problem if gears are changed now.



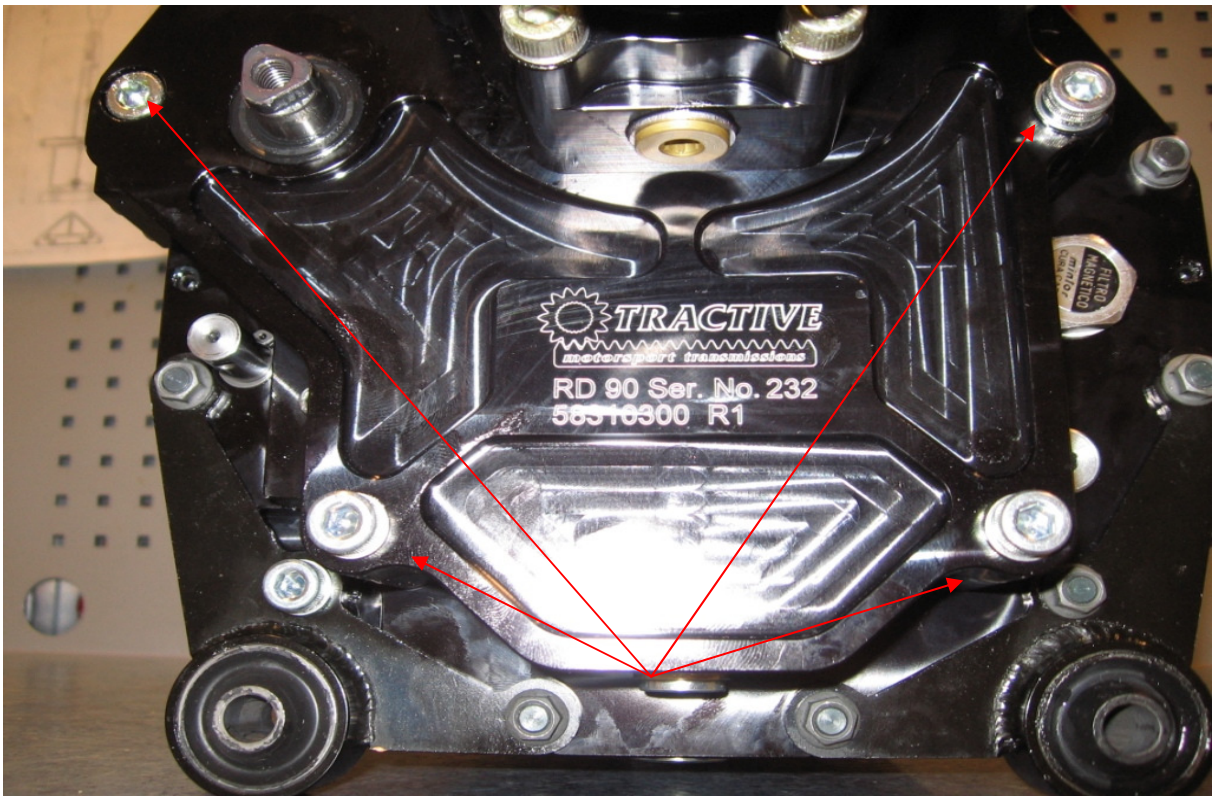
Loosen the M6 pinch bolt; the selector arm can now be removed.



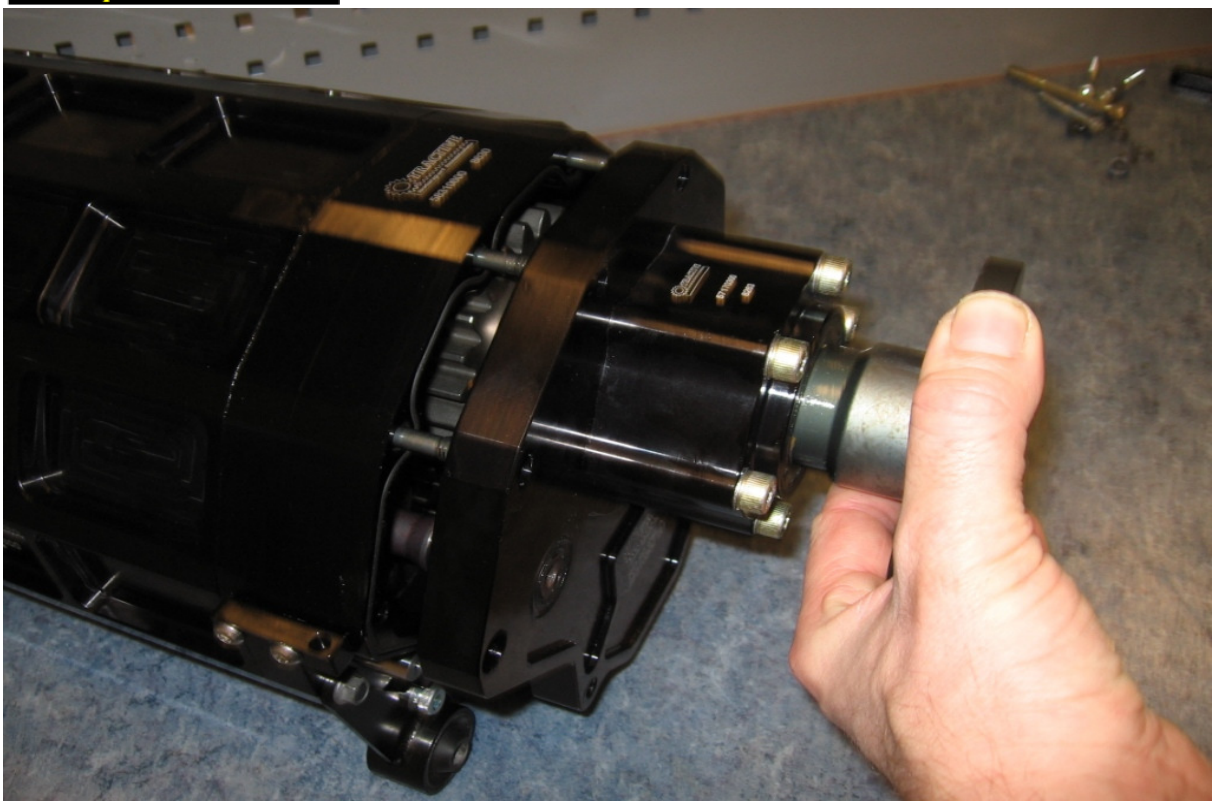
Remove the M4 grub screw from the neutral reverse blocking lever. Note – early versions of the RD gearbox had a spiral pin instead of a grub screw.



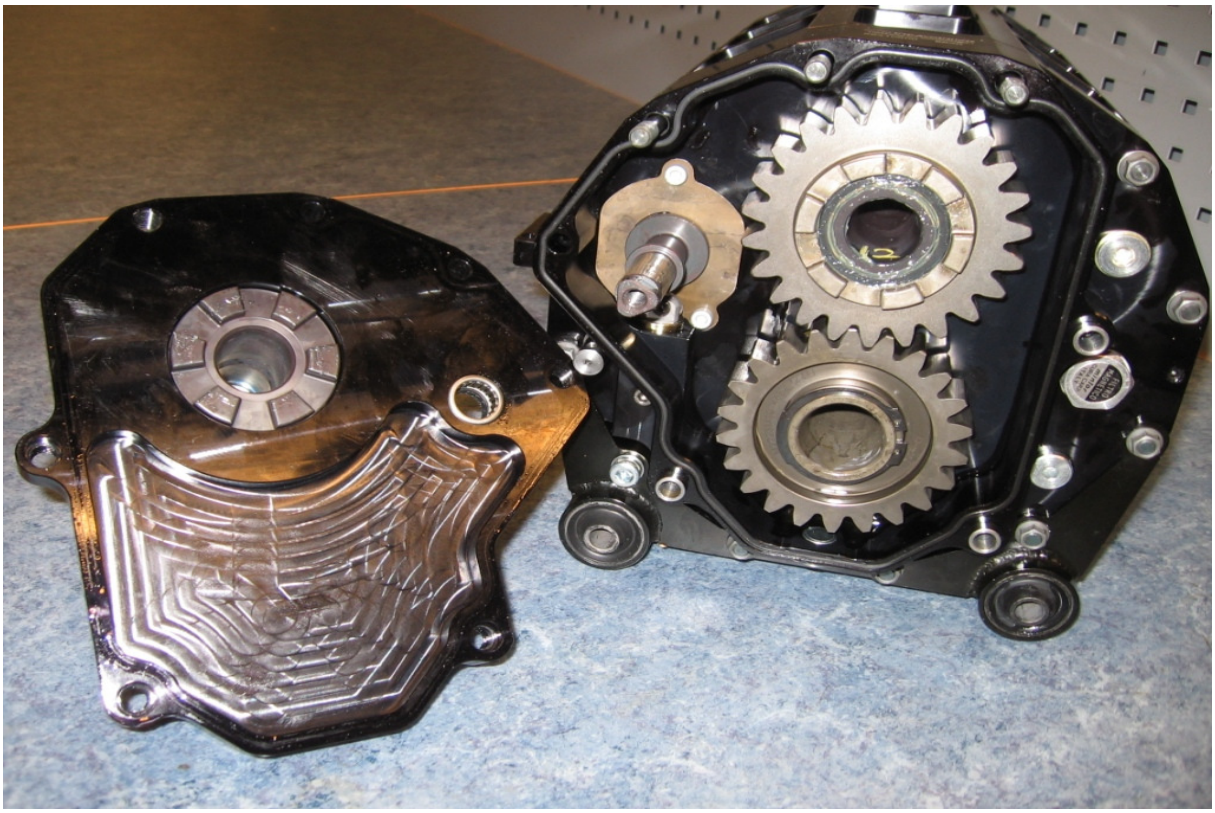
Remove the 3 ”K” nuts from the top of the drop gear cover.



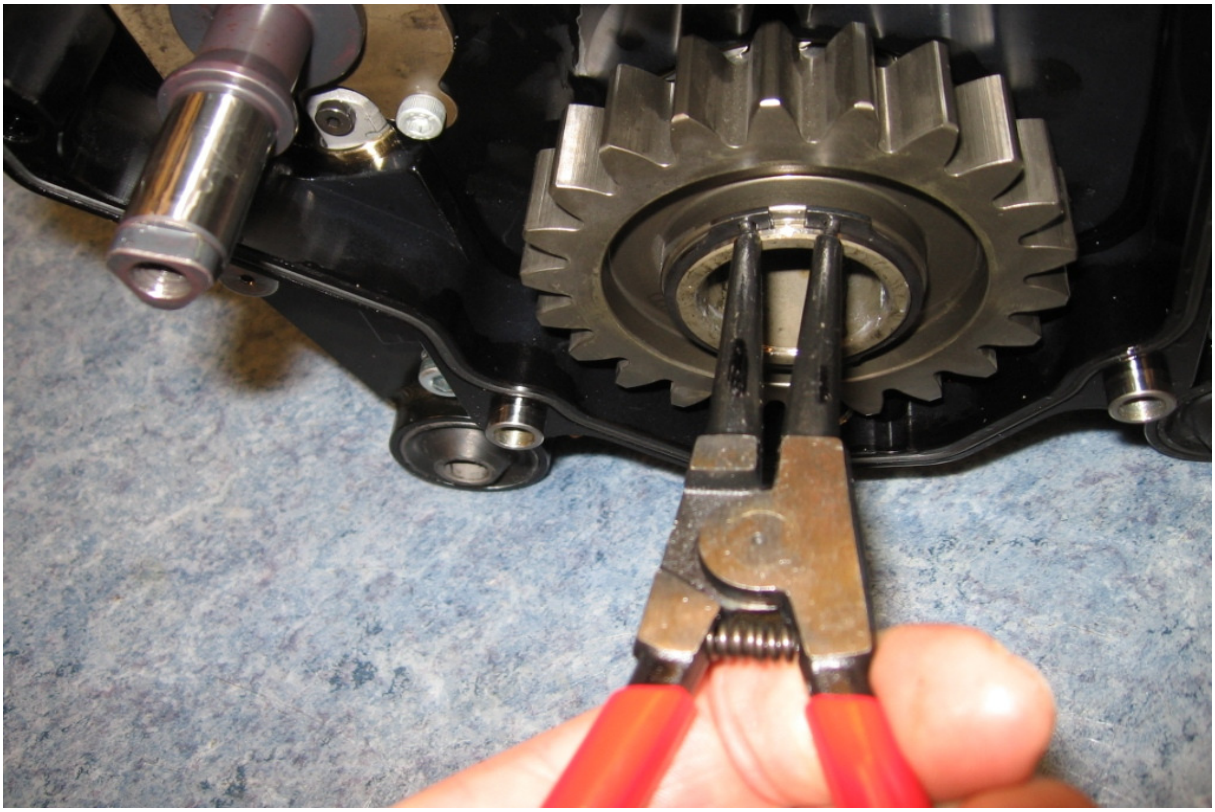
Remove the 4 x M8 cap screws from the drop gear cover



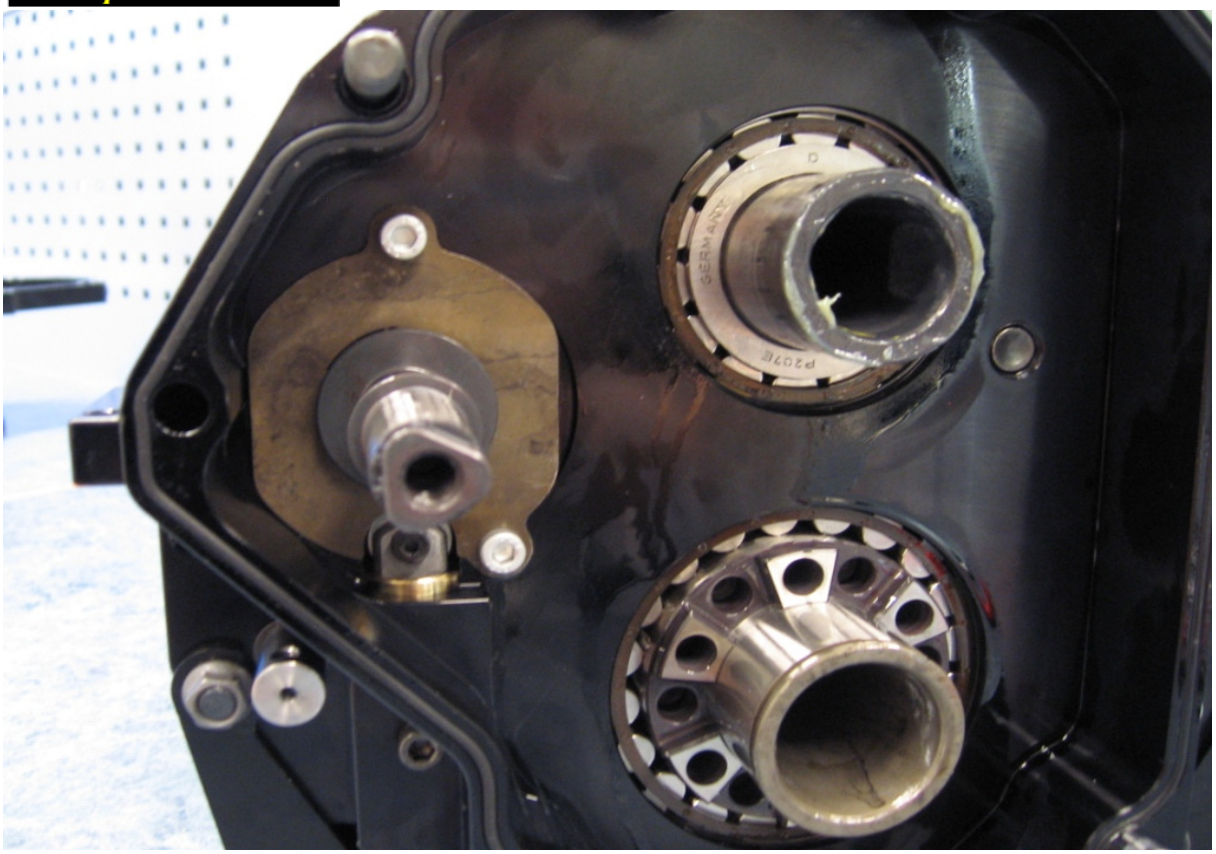
The drop gear cover and flange assembly can now be removed from the gearbox.



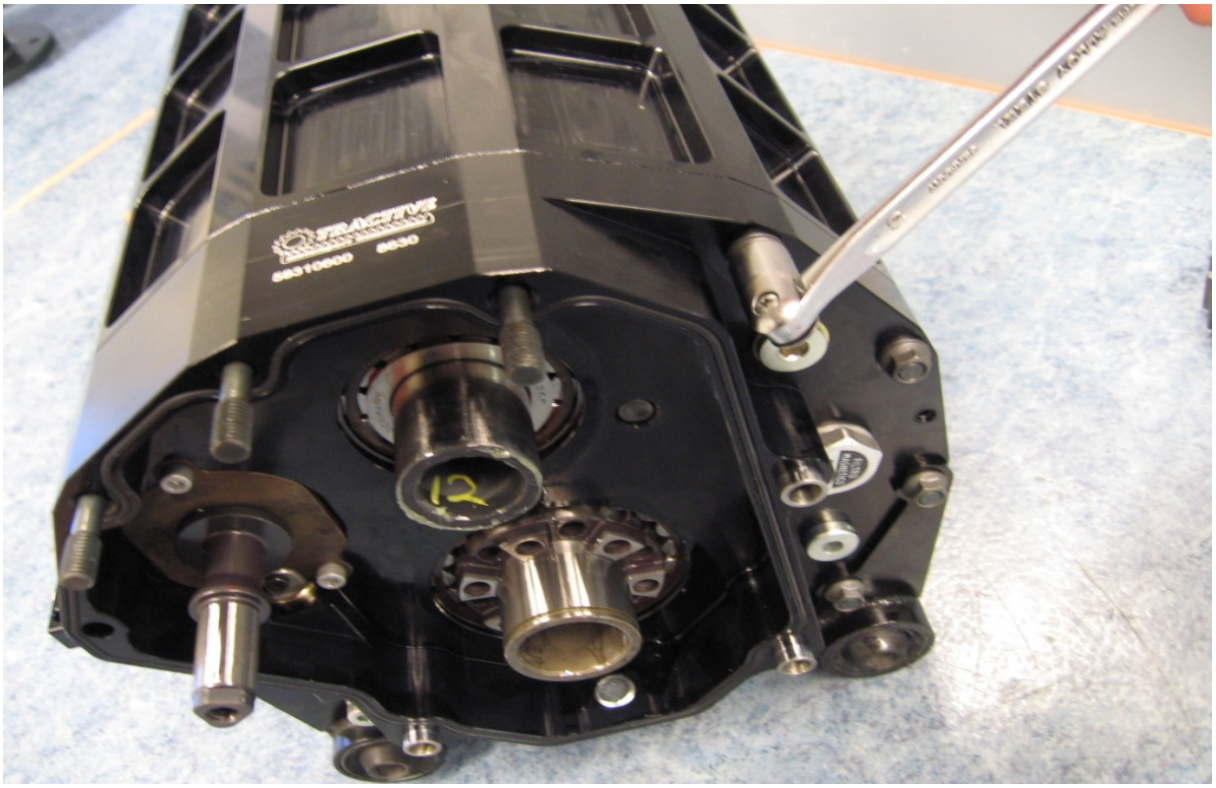
The upper drop gear is not fixed on the shaft and can be removed with the bearing.



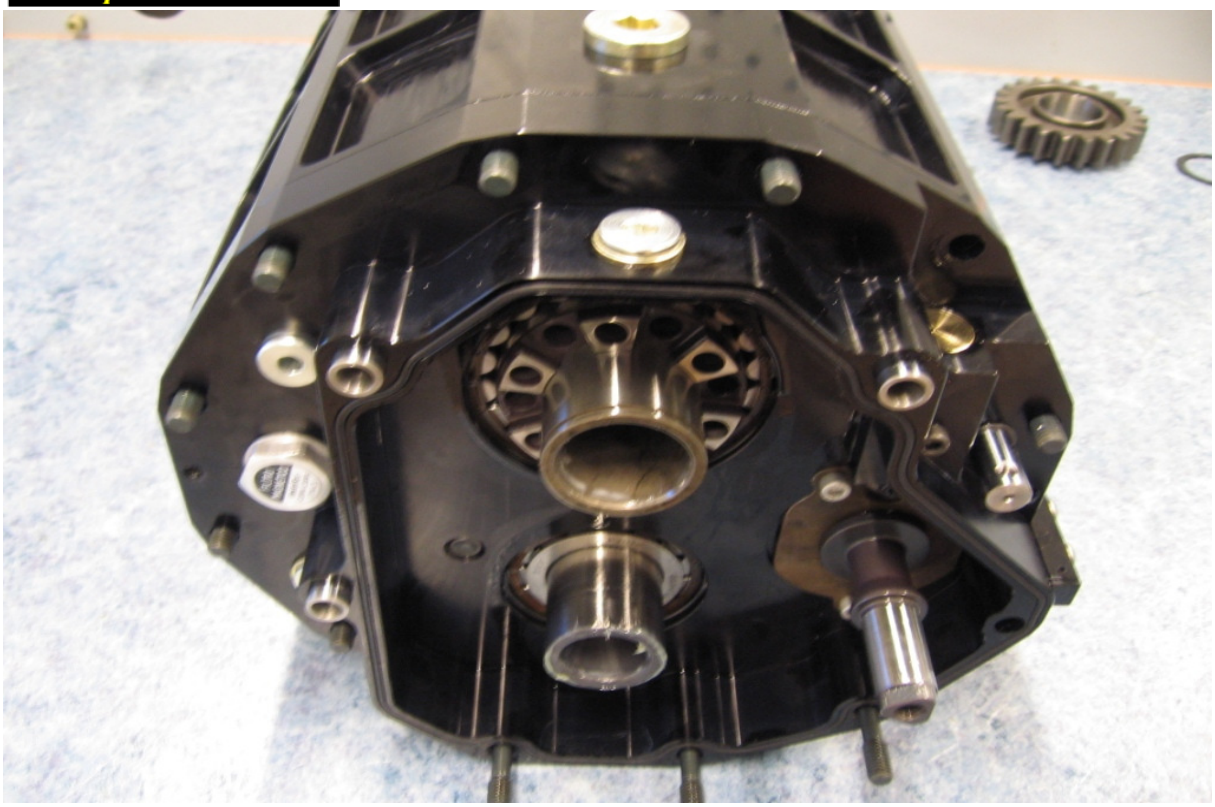
Lower drop gear is held in place by a circlip

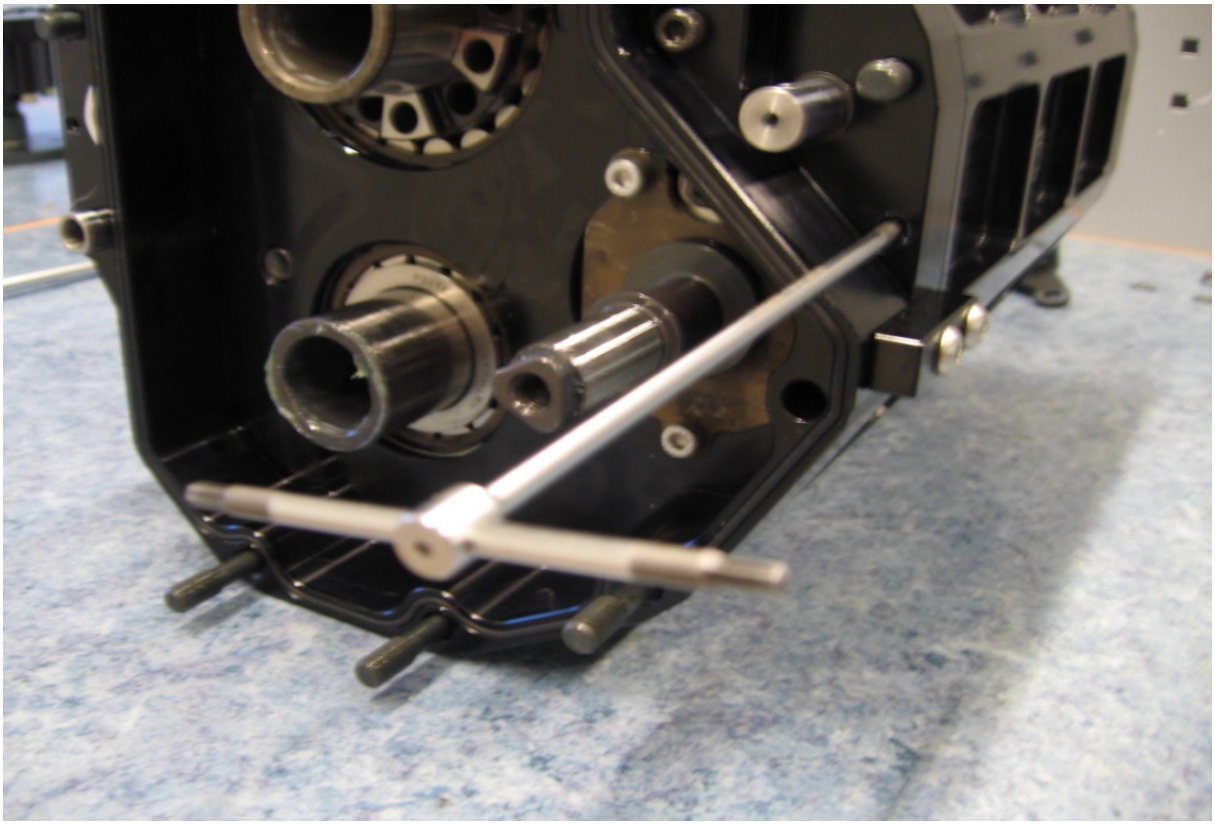


Showing drop gears removed and selector mechanism.

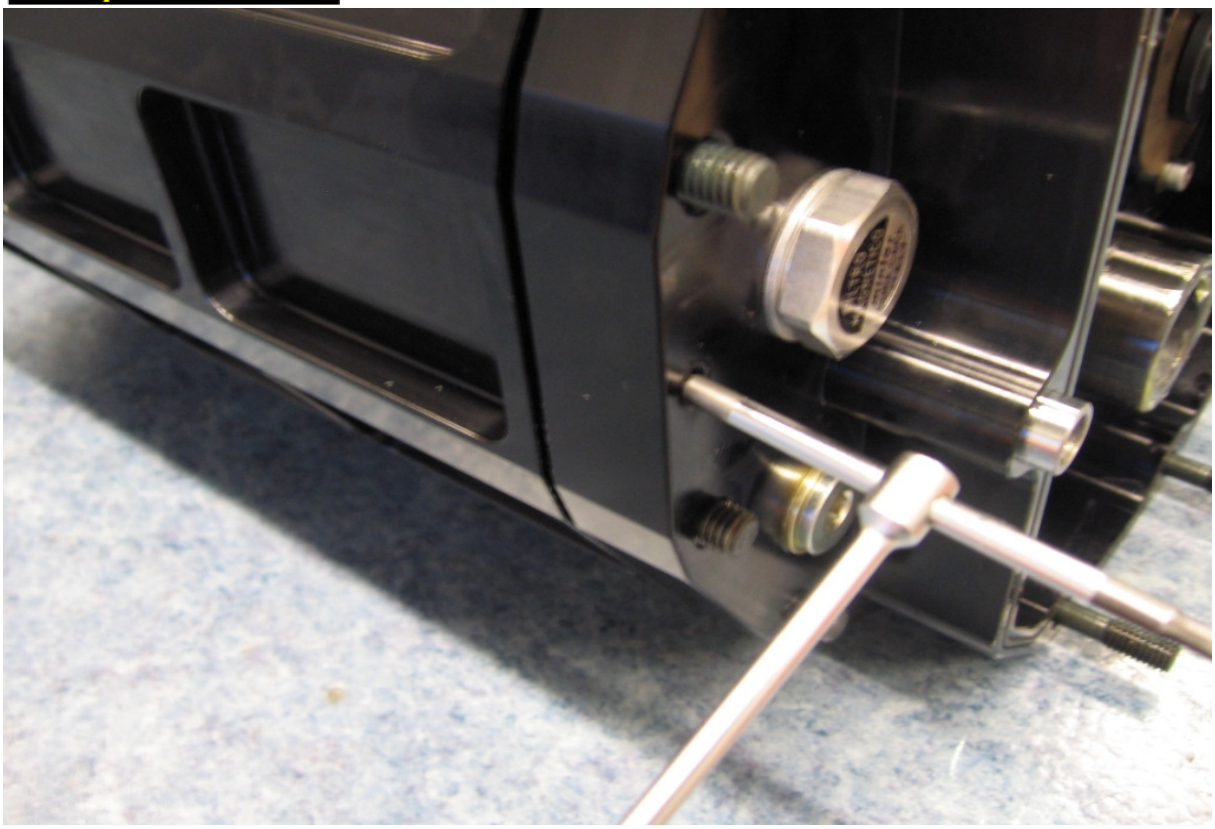


To remove the cluster first remove the remainder of the ”K” nuts (x 7) and 1 M8 cap screw

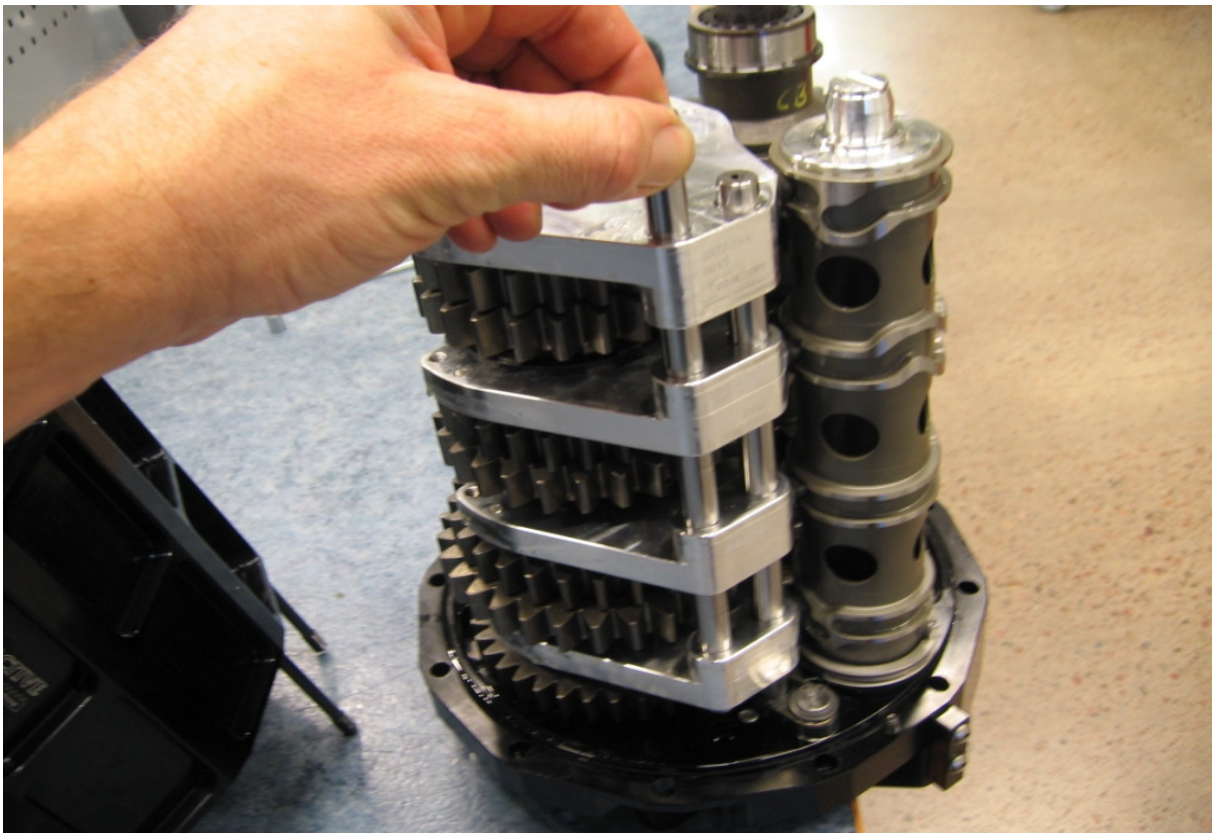




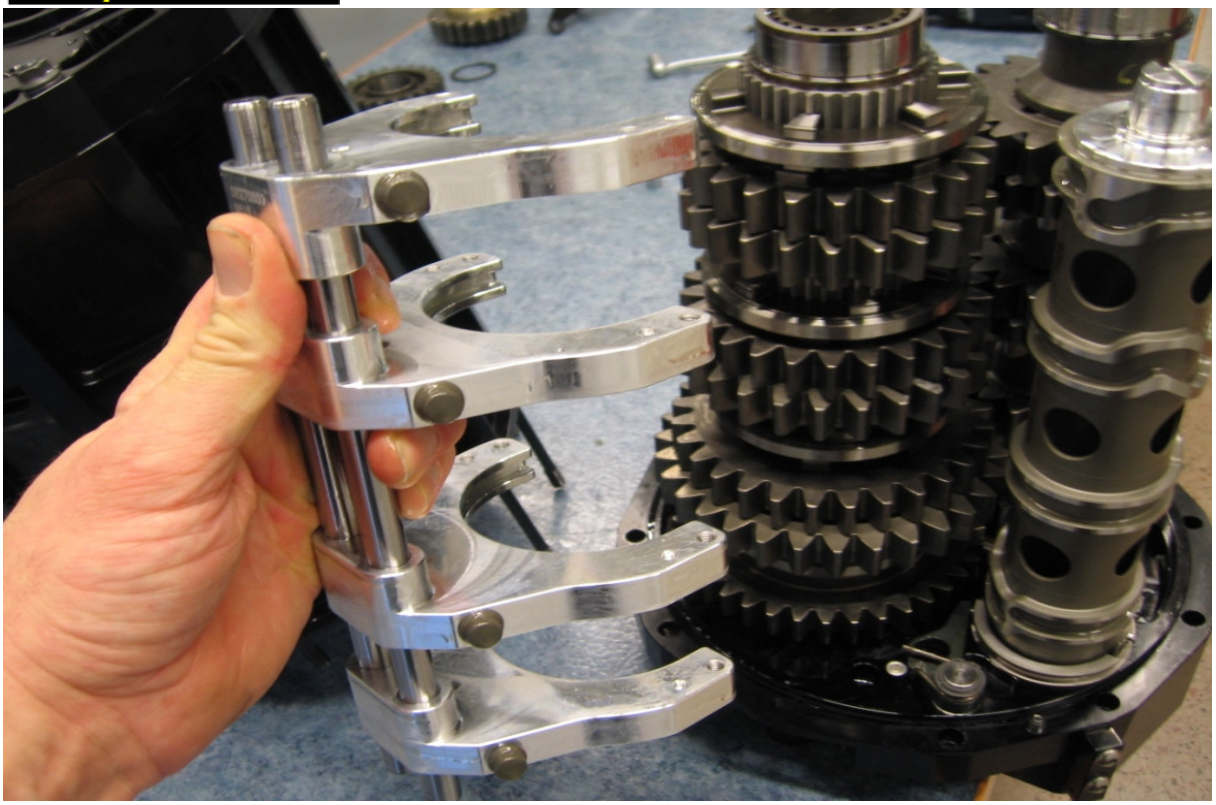
Using the M4 jacking screws, free the main assembly plate from the cover housing.



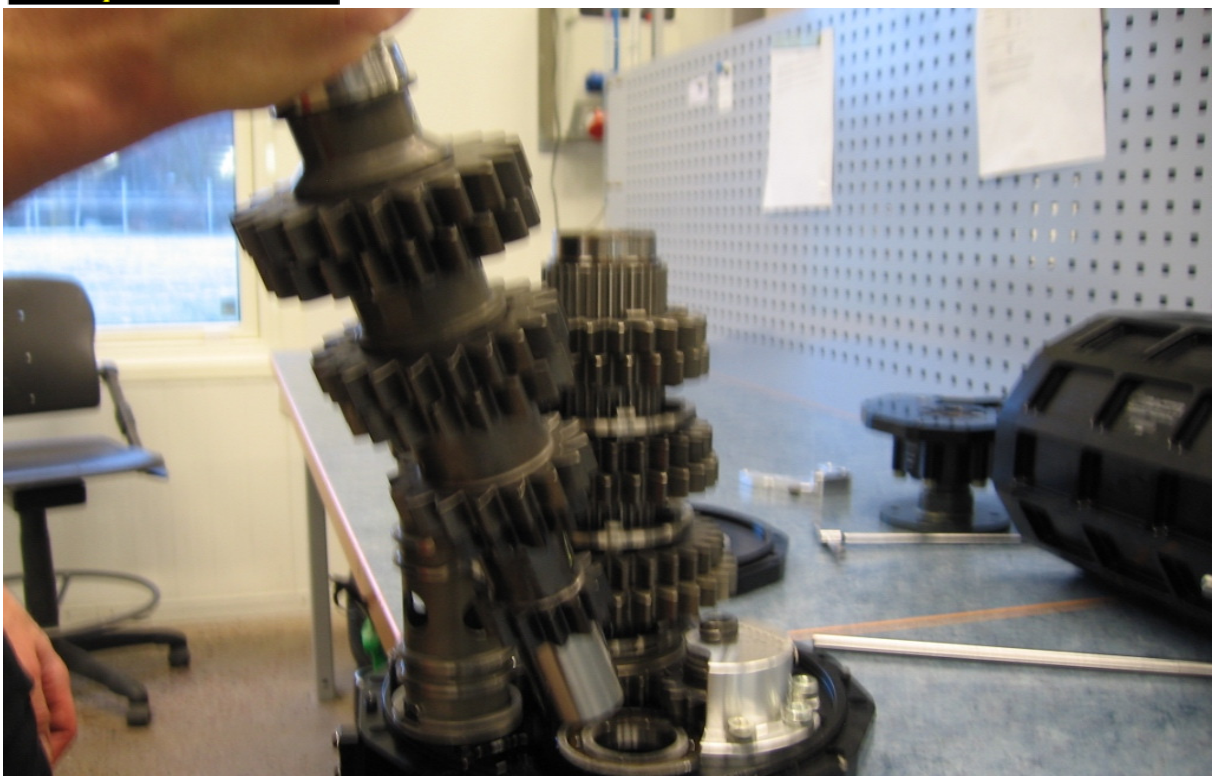
When you feel the cover housing become loose stand the assembly upright overhanging a bench the lift off the cover housing.

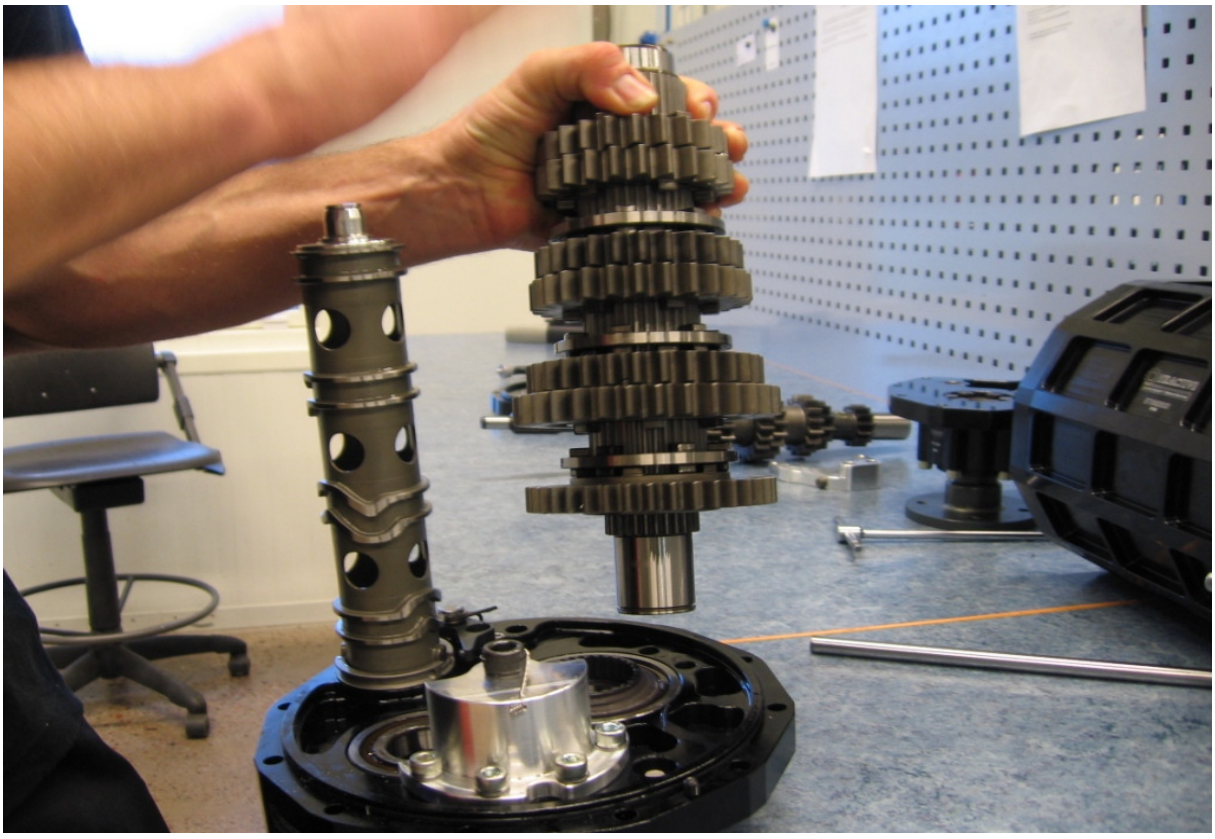


Draw up the two selector rods to remove the forks.



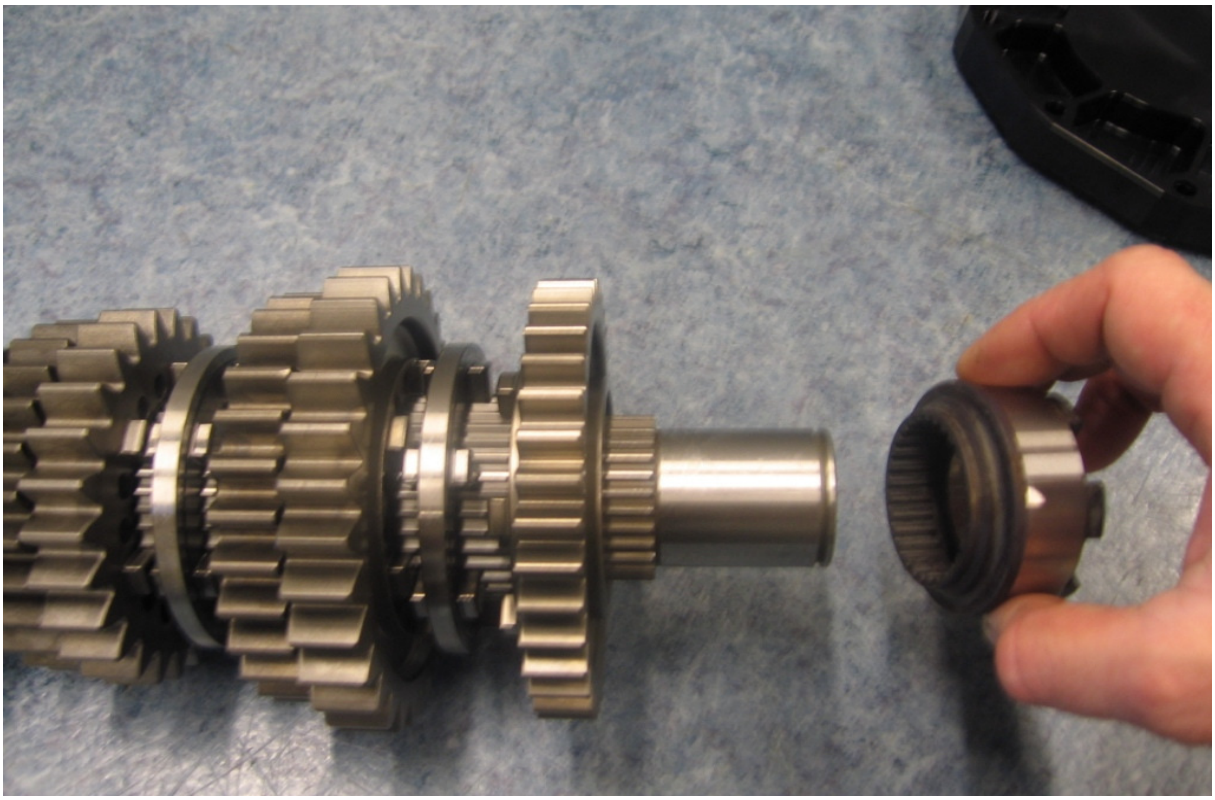
Tap down with a plastic mallet on the main assy housing while pulling up on the input shaft to remove.





Main shaft can now be removed

Mainshaft assembly

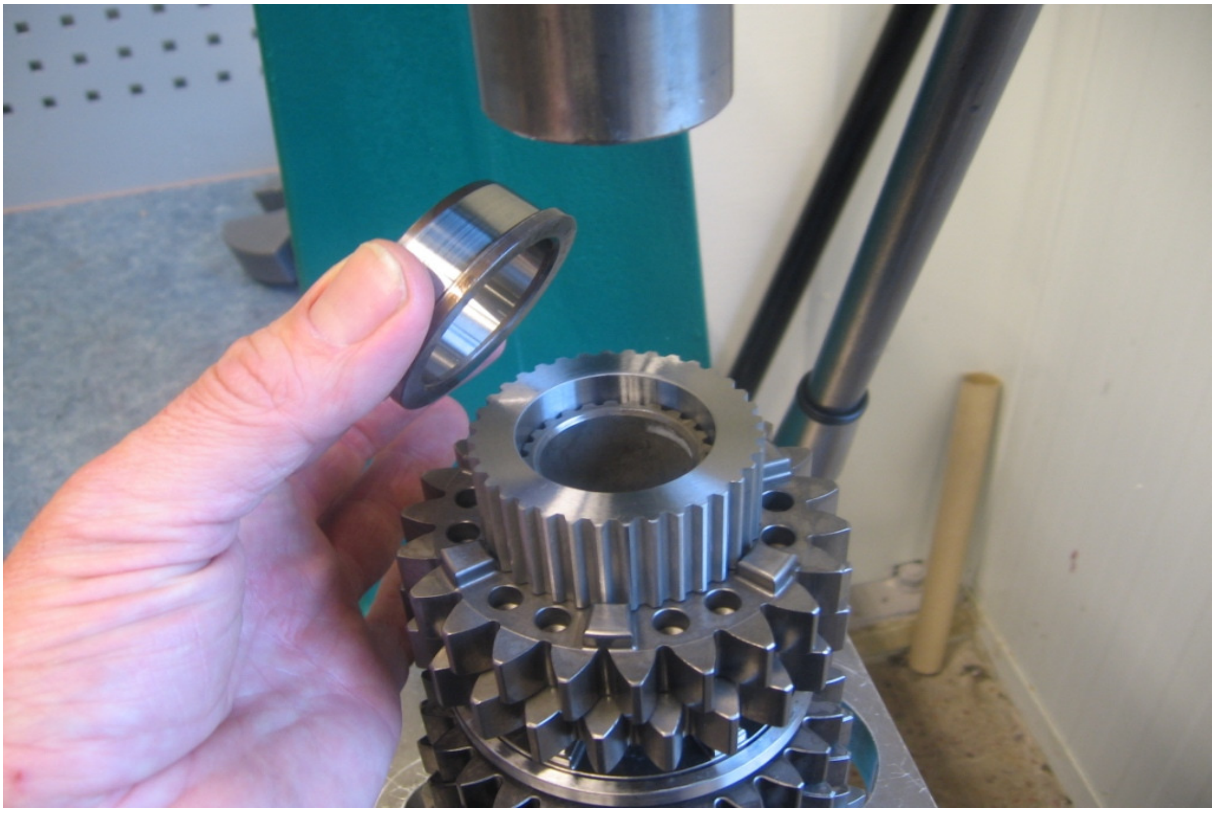


Remove the bearing hub from the end of the shaft, (it may still be in the cluster housing)

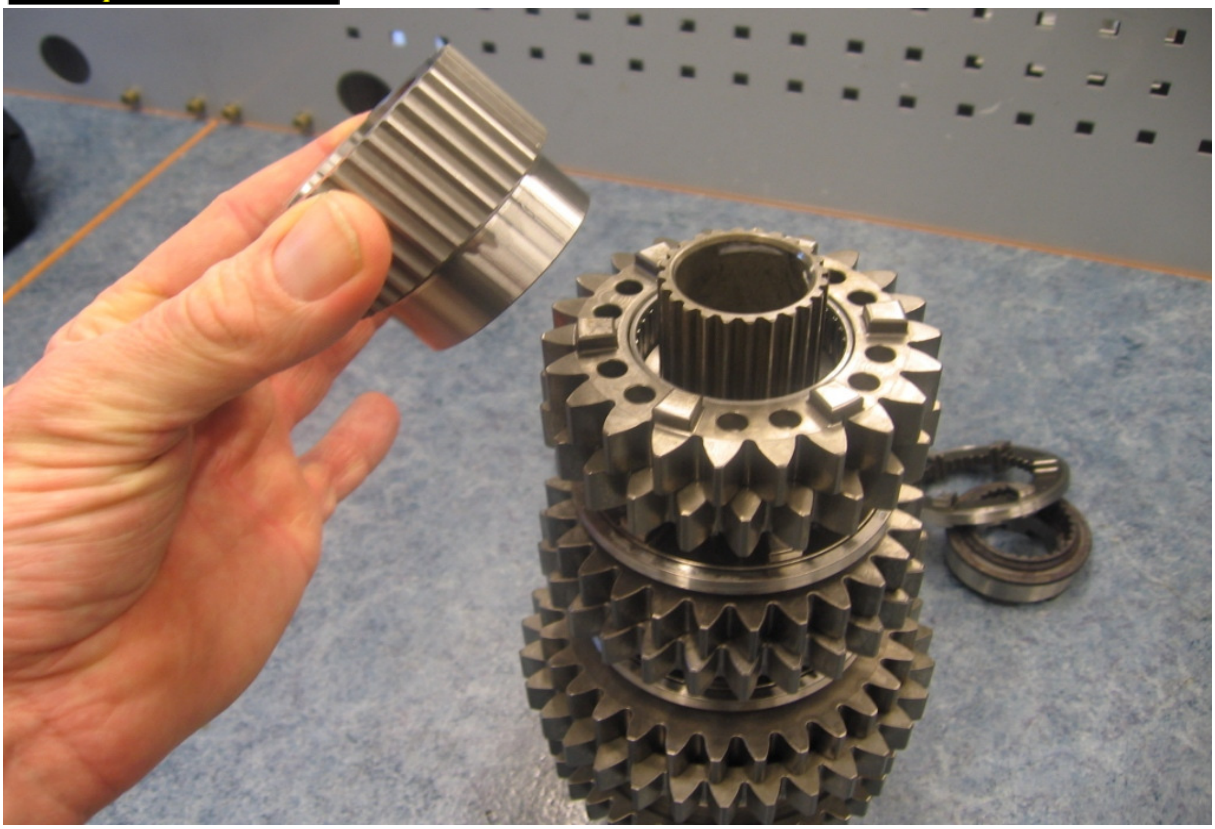
Lift off the 6th gear dog ring, Note- only one side of this dog ring is used

Support the reverse gear on the arbor press

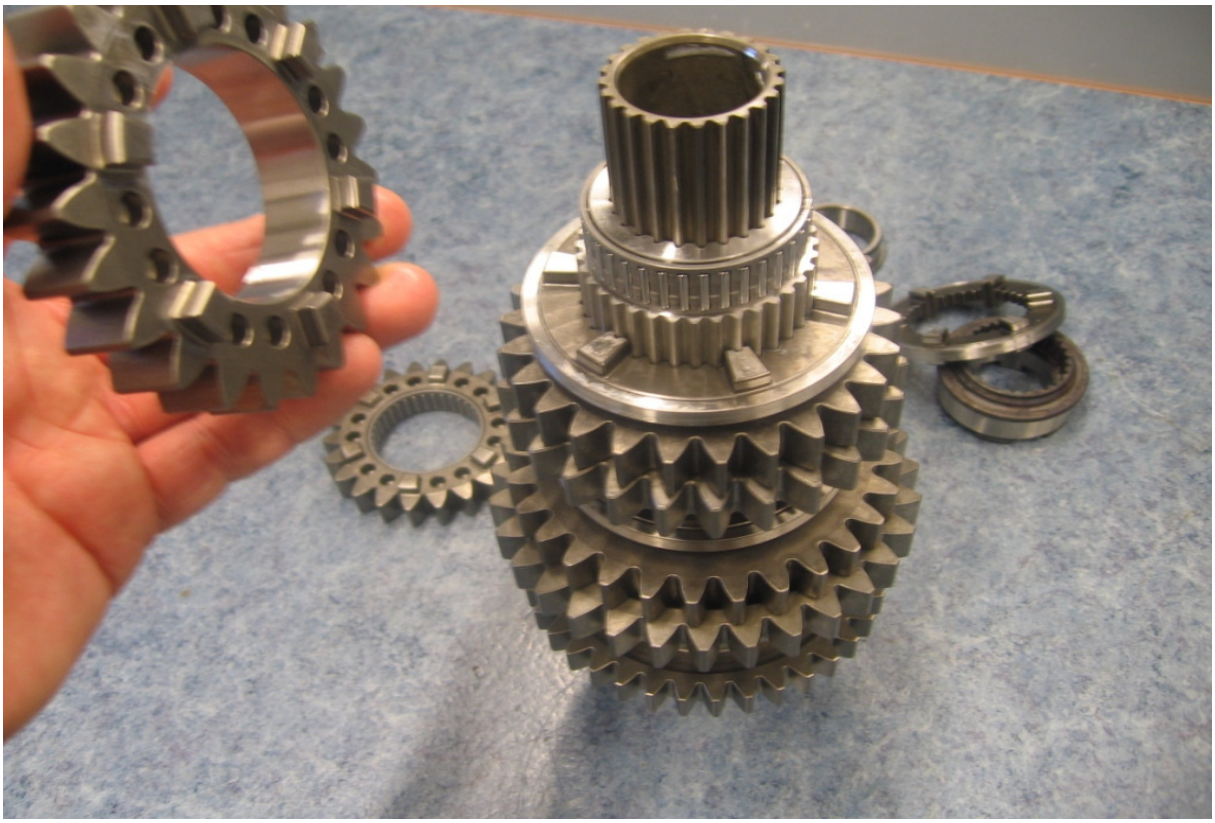
With a suitable tool press the mainshaft past the bearing race, this is enough for now.



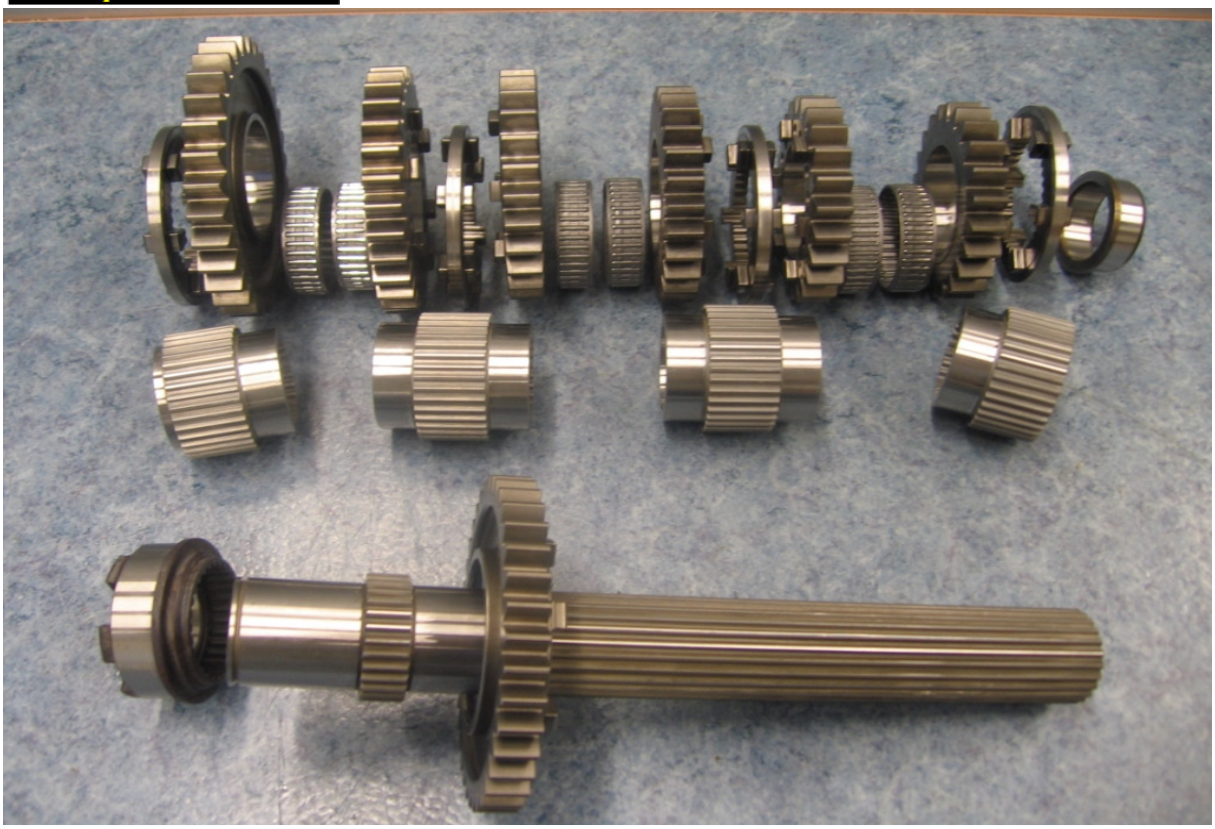
Lift off the bearing race.



Lift up the 6th gear hub and remove gear and bearing

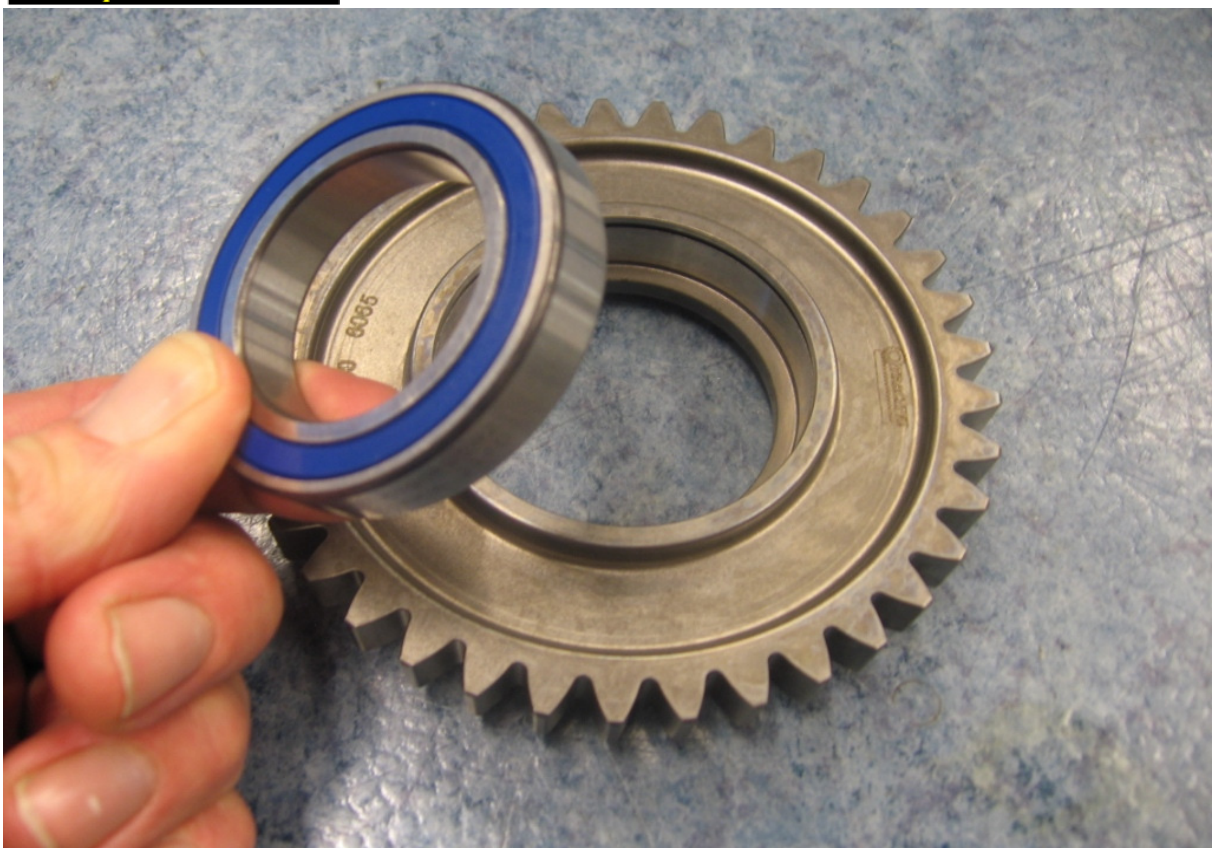


Repeat process to strip the mainshaft.



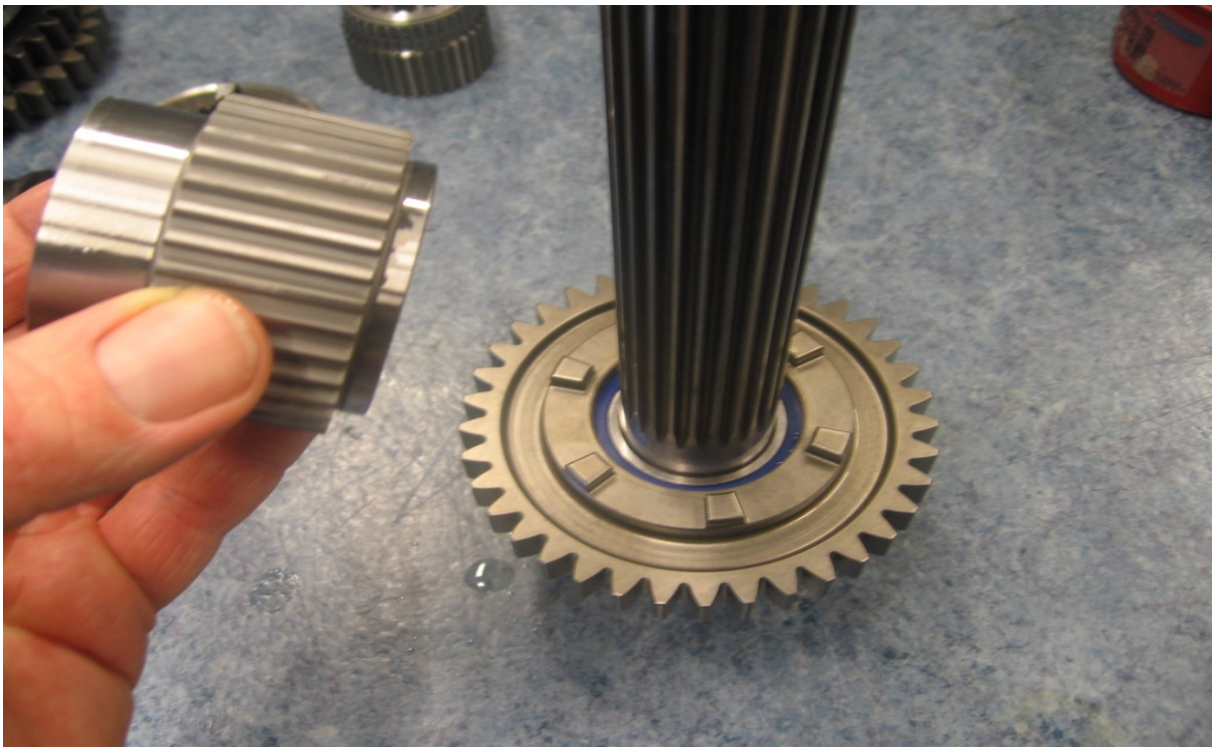
Press mainshaft through the reverse gear.

Remove the clip retaining the reverse gear bearing.

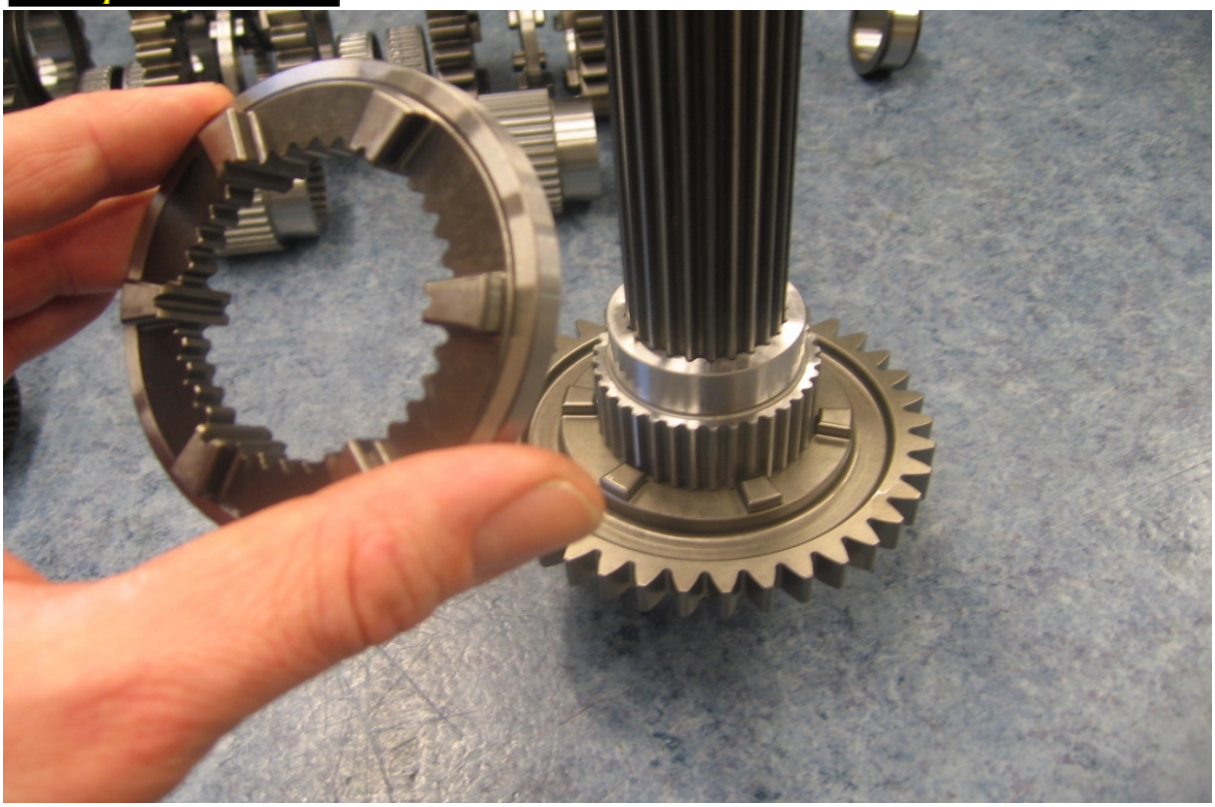


Bearing can be removed from the reverse gear.

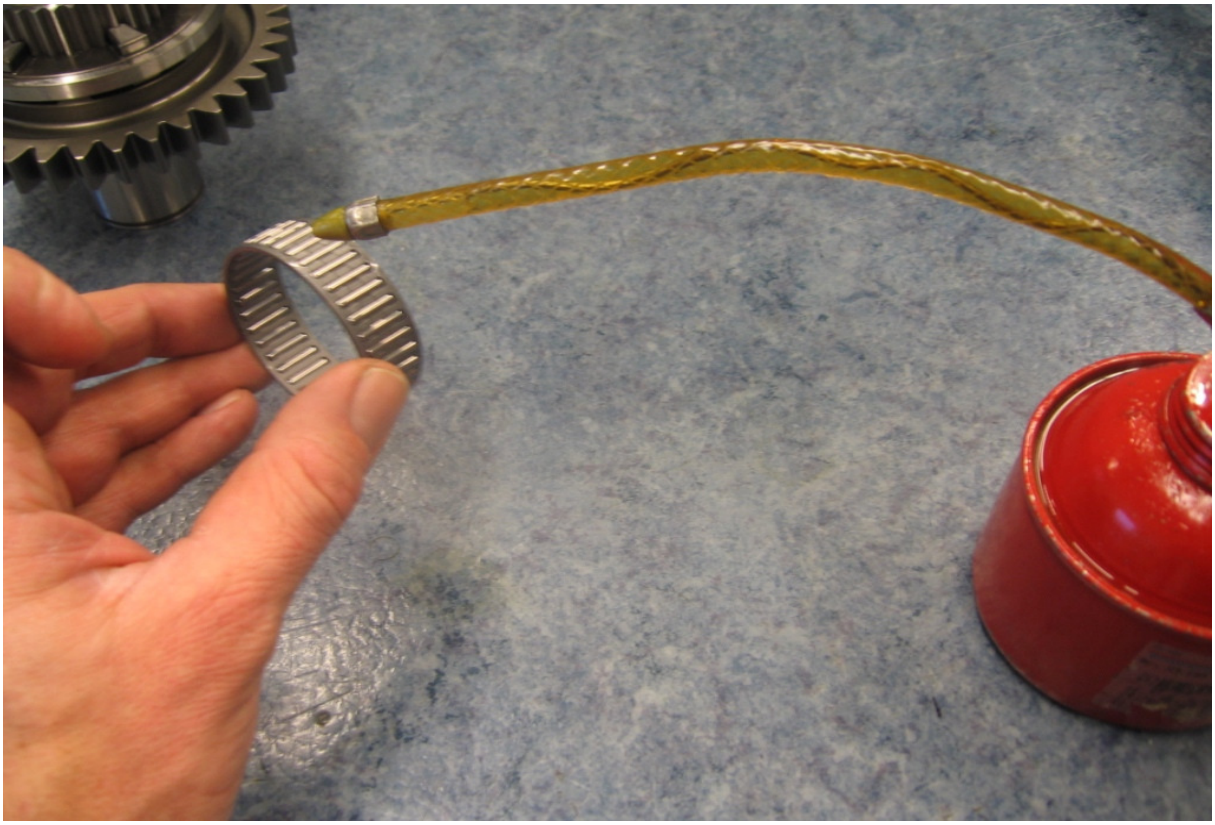
Building Up the main shaft.



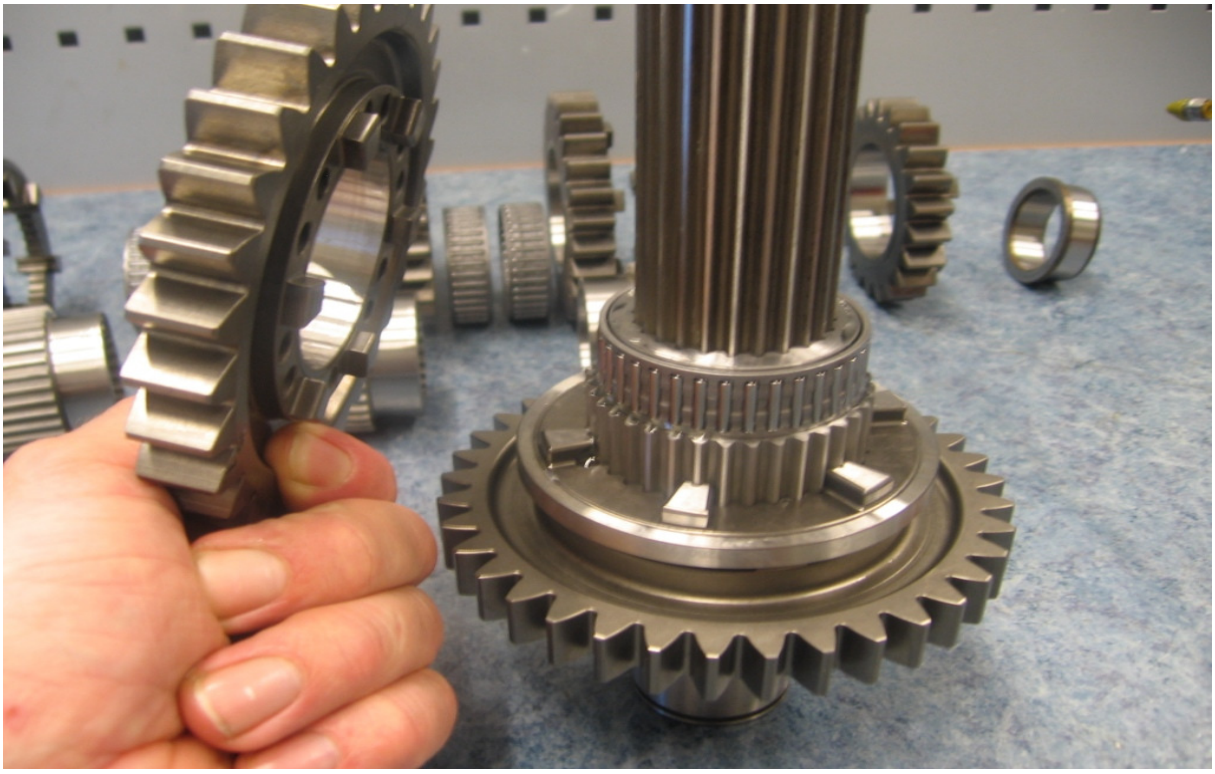
Press on the reverse gear; fit the hub with the small shoulder towards the reverse



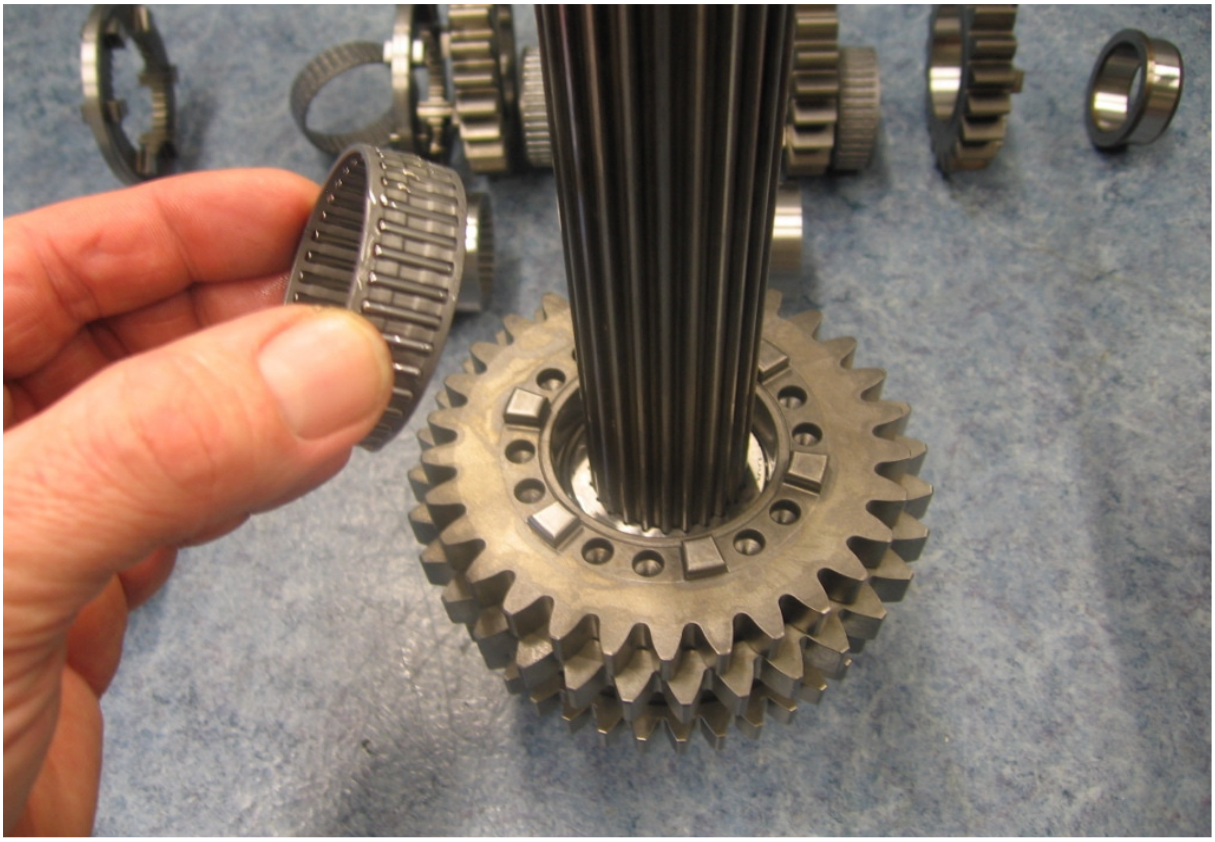
Fit the first dog ring (they are all the same and can be fitted in any position)



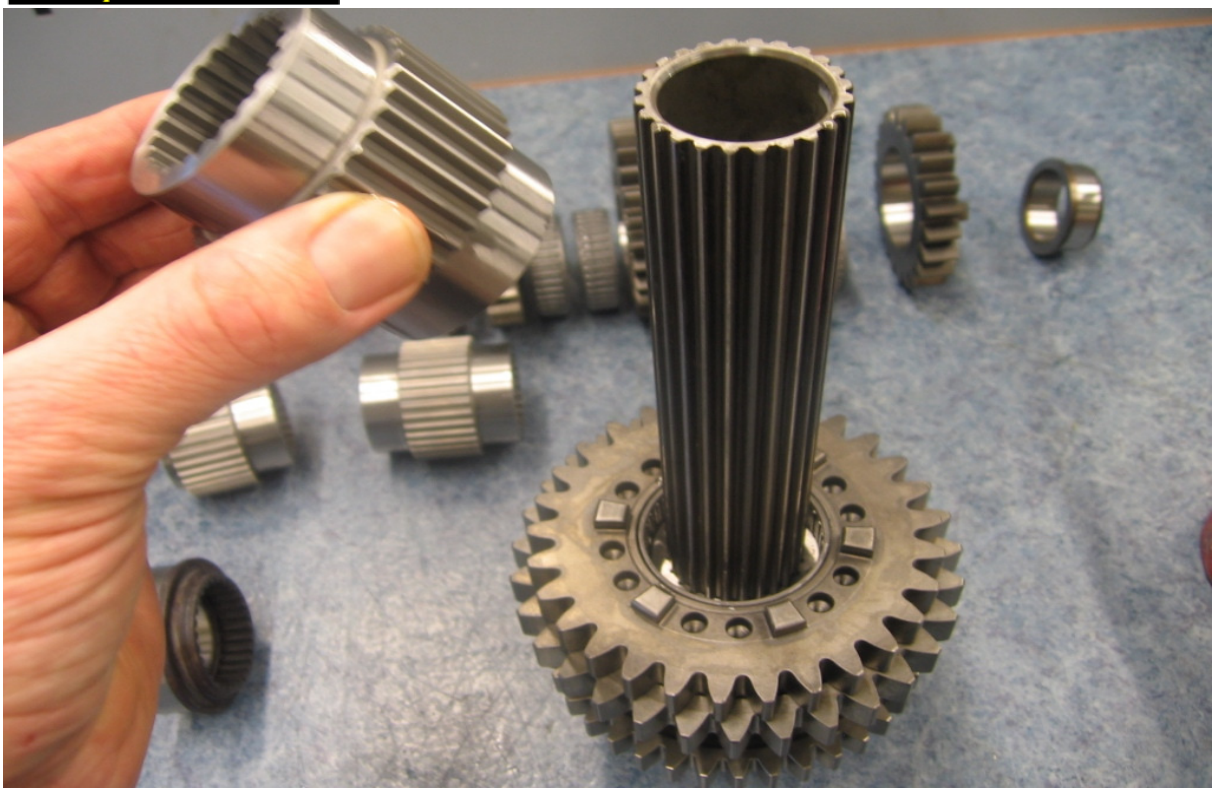
Lubricate the bearings.



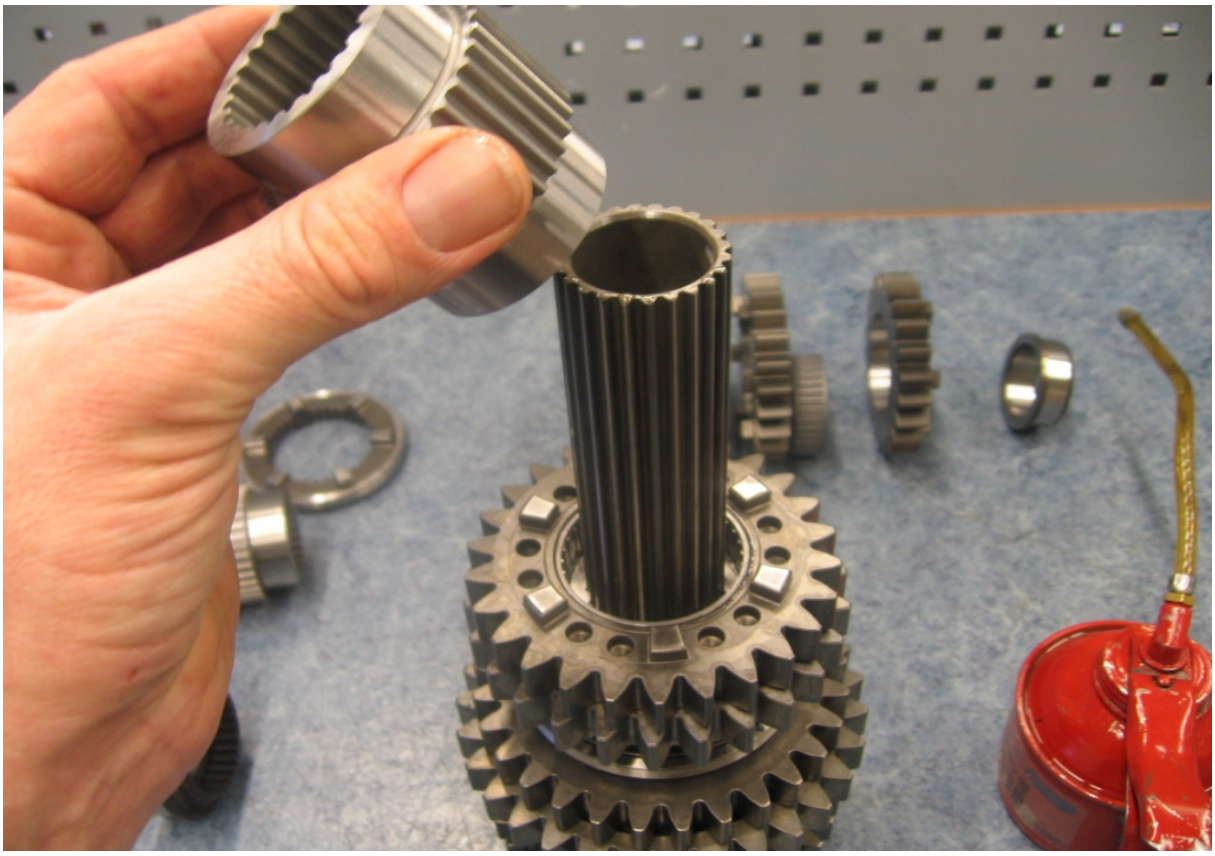
Fit 1st gear (dogs facing the dogs)

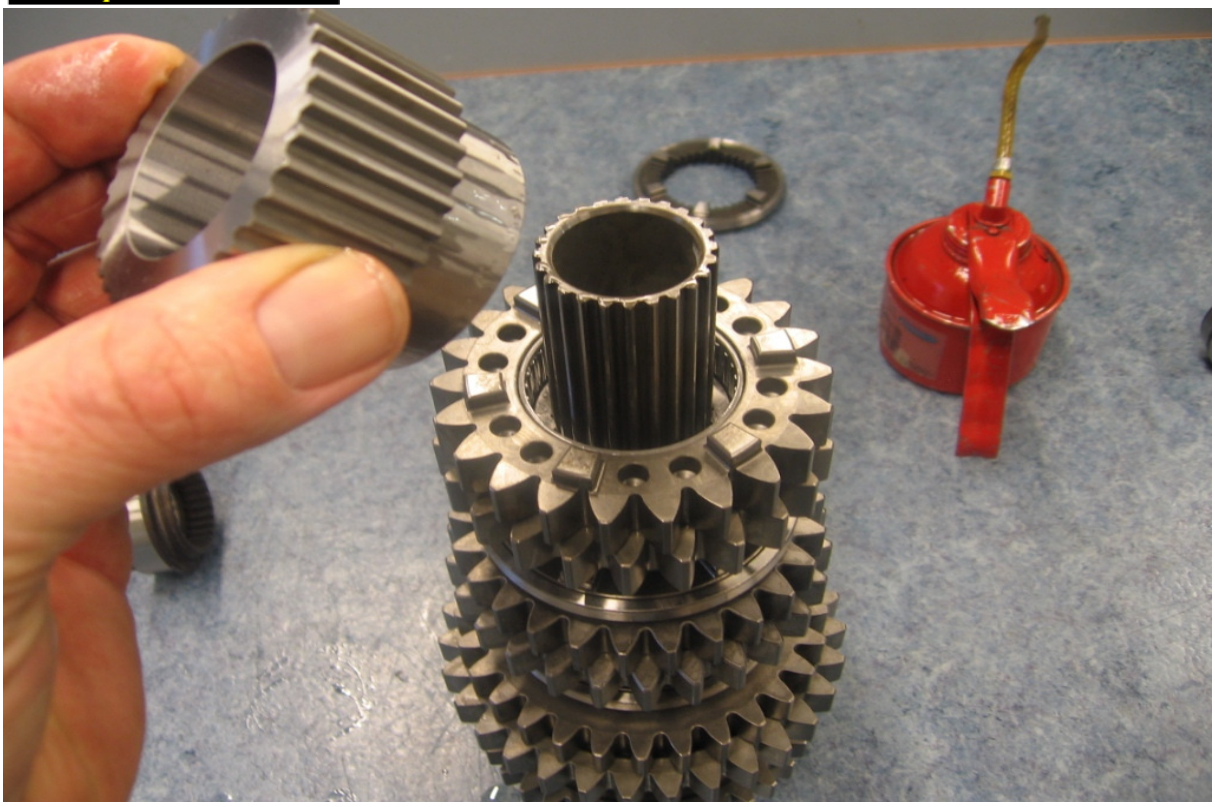


Fit 2nd gear and bearing

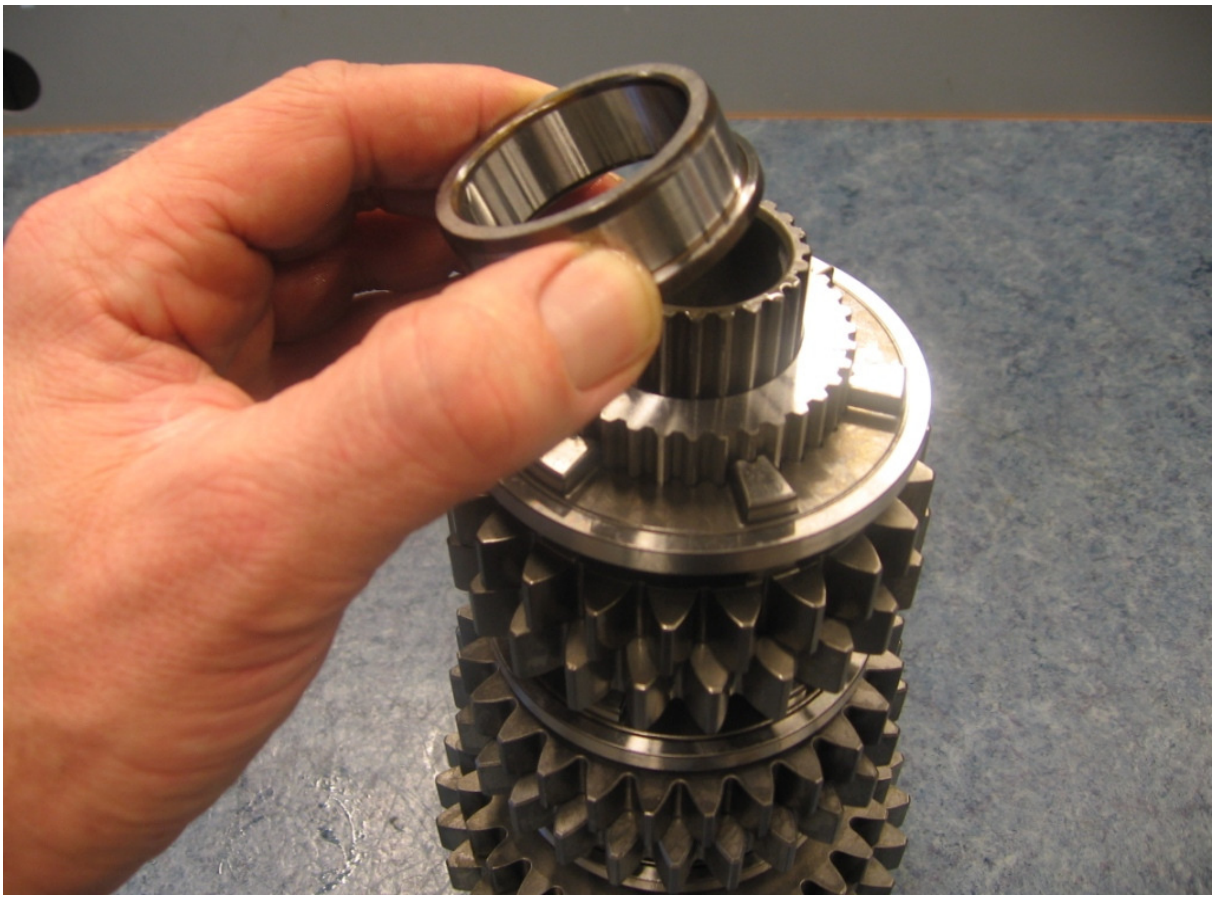


Slide on the double hub (there are two the same, one for 2nd & 3rd the other for 4th & 5th.





Fit 6th gear, bearing and 6th gear hub (flat on one side)



Fit bearing race

Should be pressed on flush with the shaft.

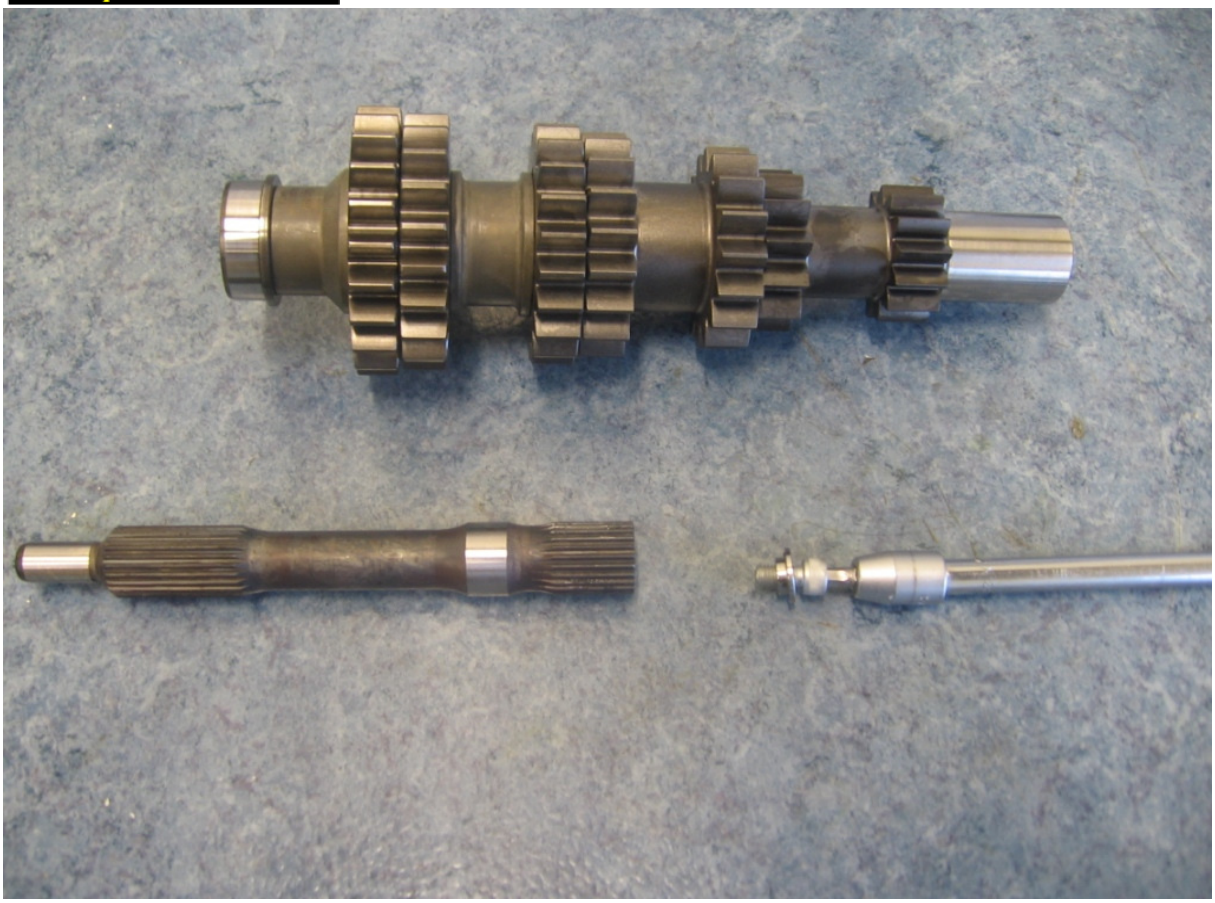
Fit hub for main housing bearing.

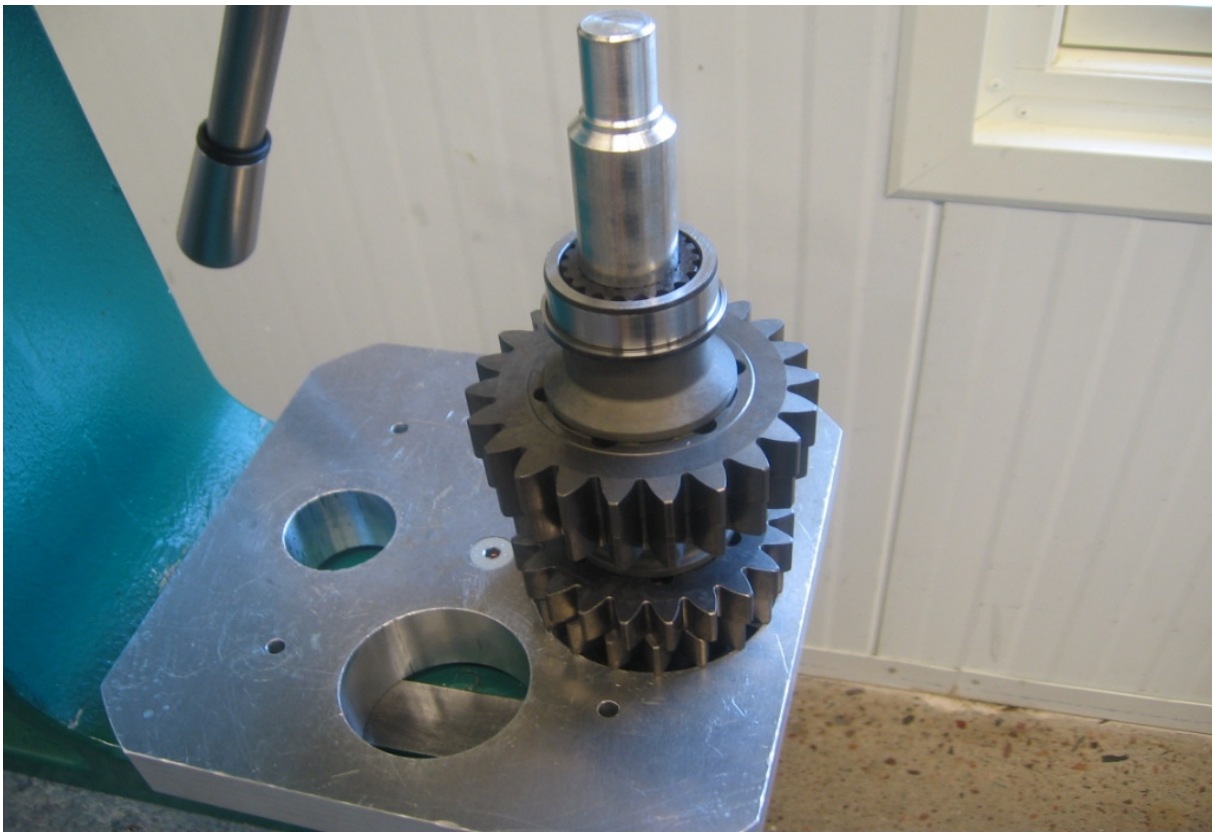
Input shaft.

Hold the clutch shaft in some soft jaws.

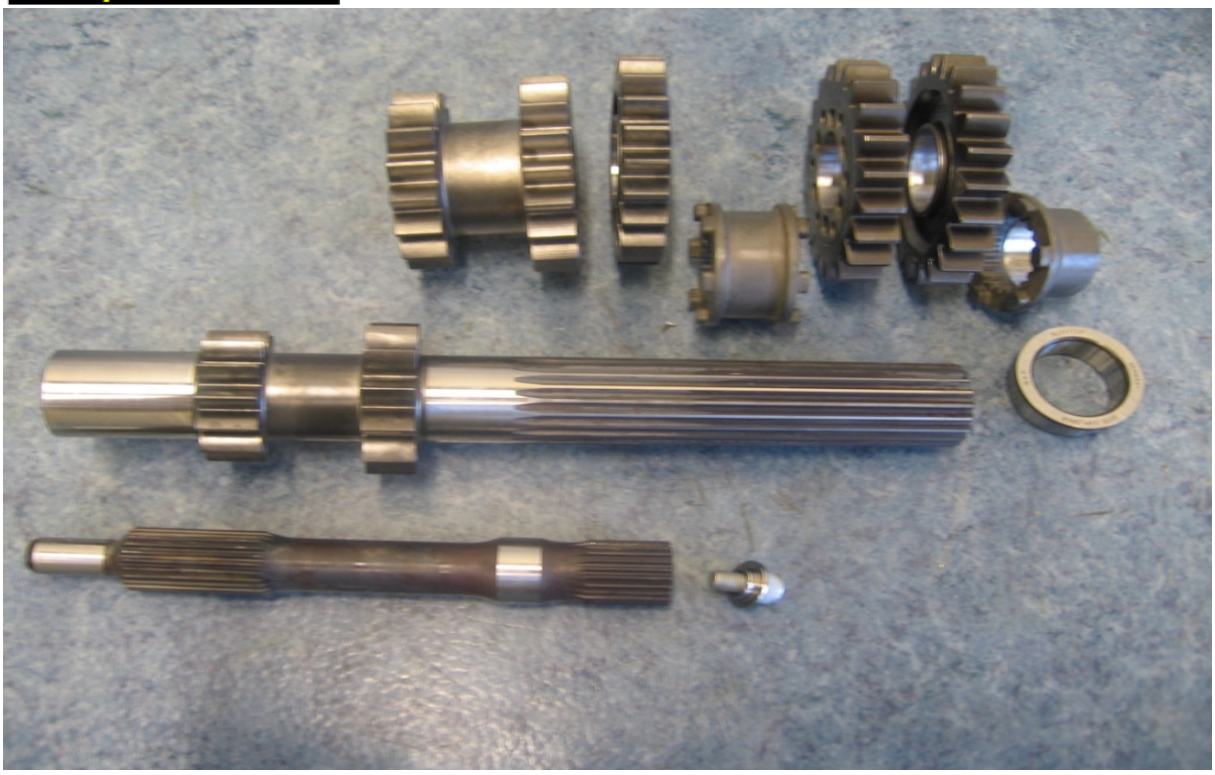
Use a 6mm Allen socket on a long extension

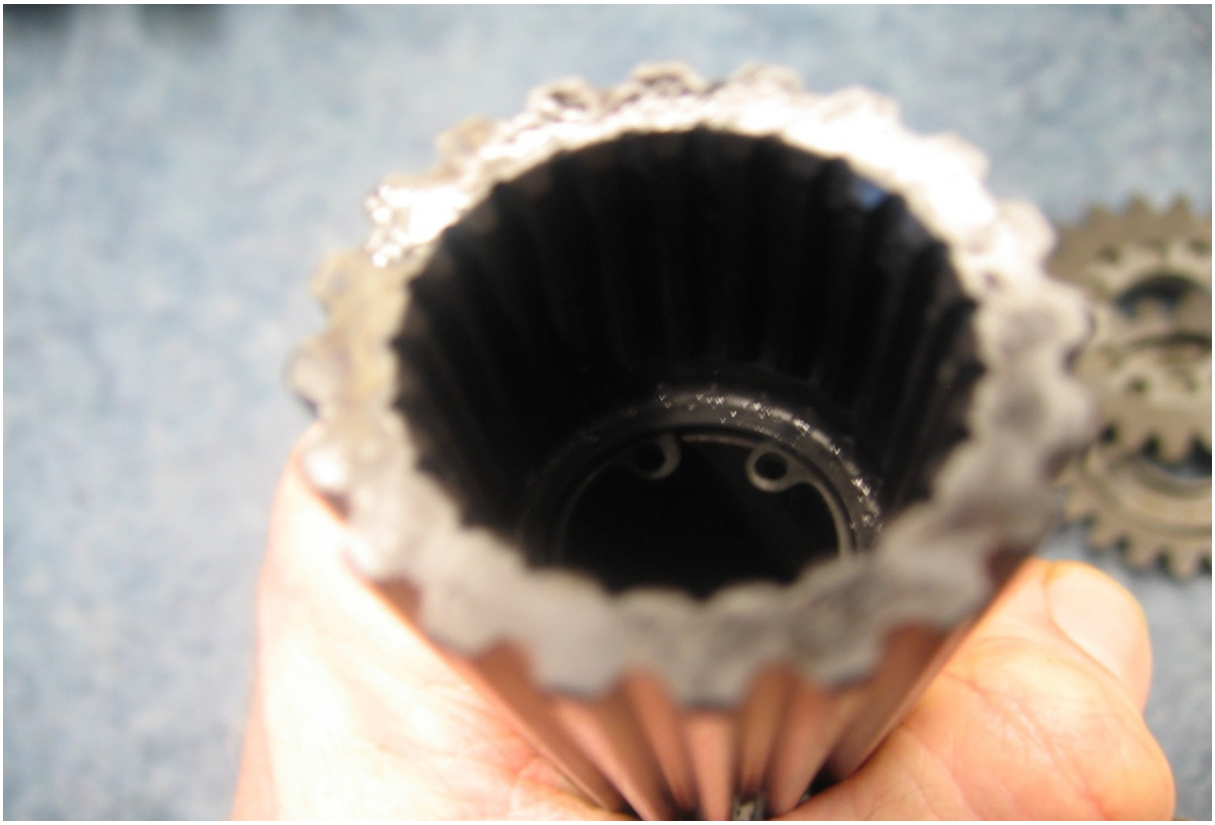
Remove the retaining bolt and top hat washer from clutch shaft. (Normal thread)



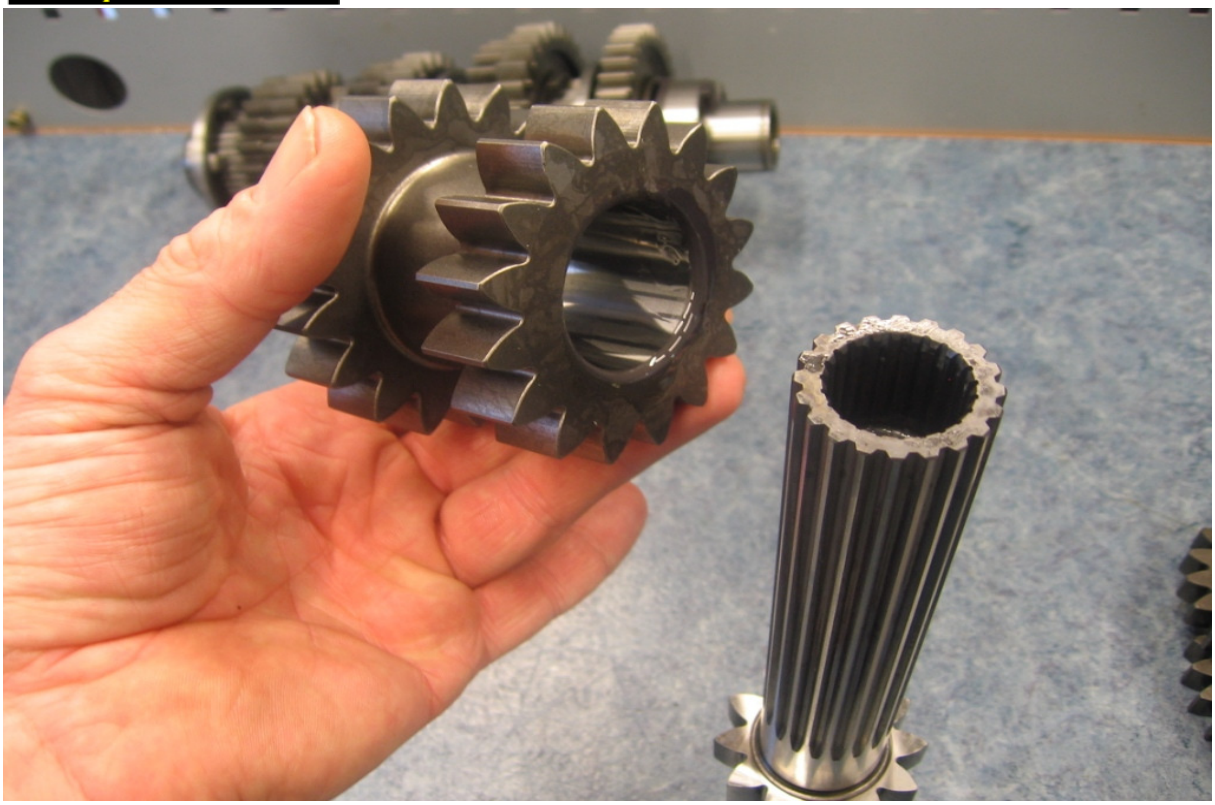


Support the input shaft under one of the “loose” gears on the shaft, using suitable tool press the shaft through the bearing race.

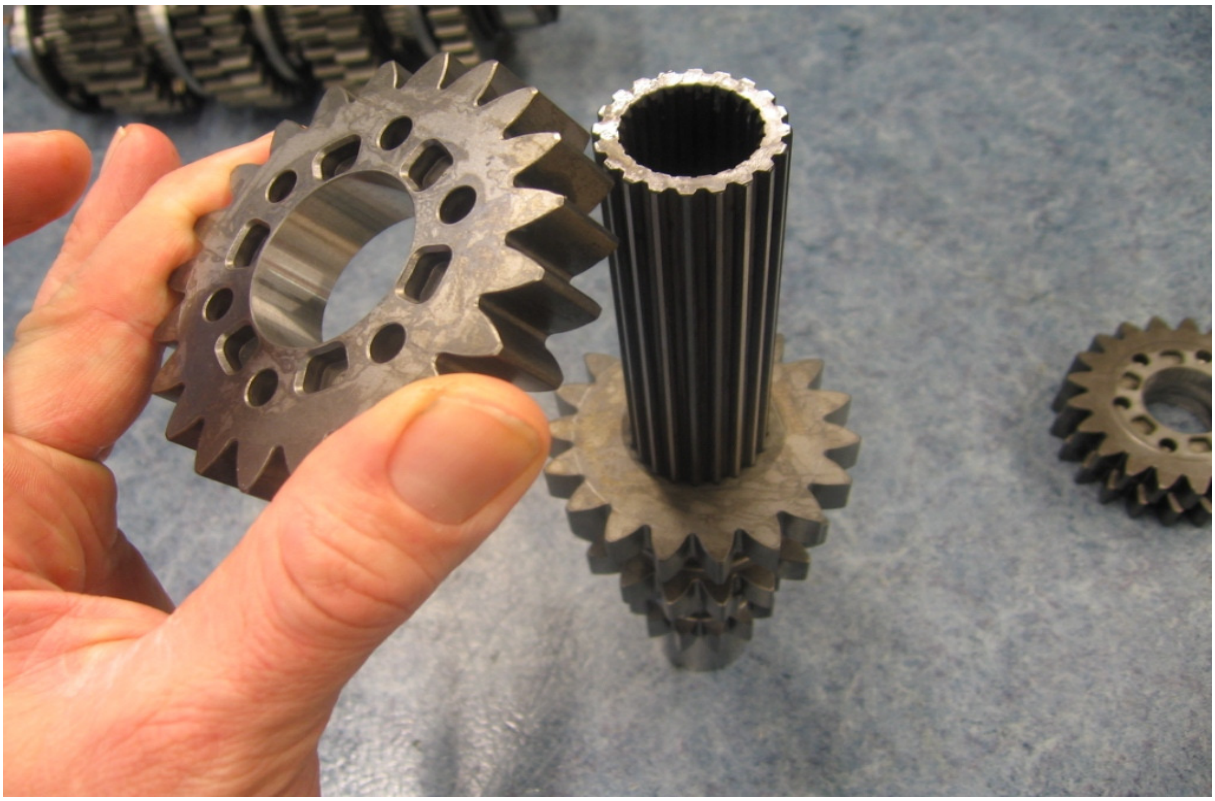




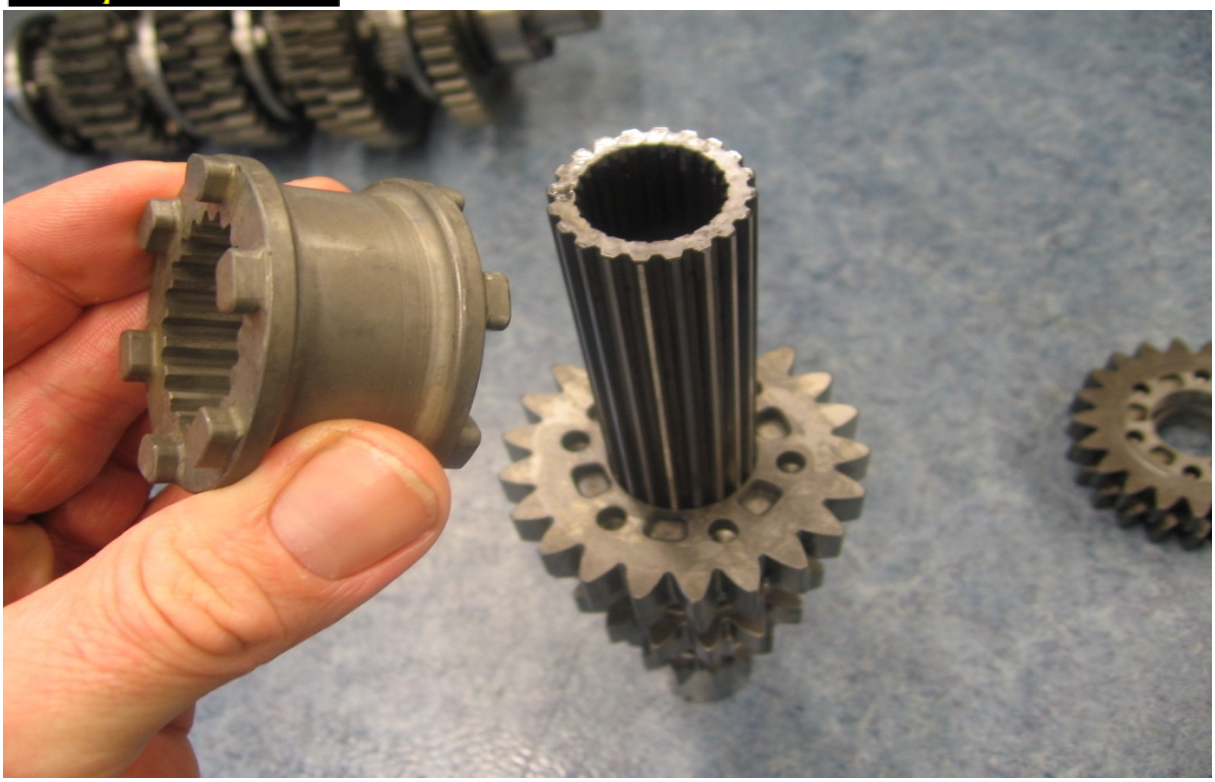
Note circlip, this is between the clutch shaft and the top hat washer on the retaining bolt.



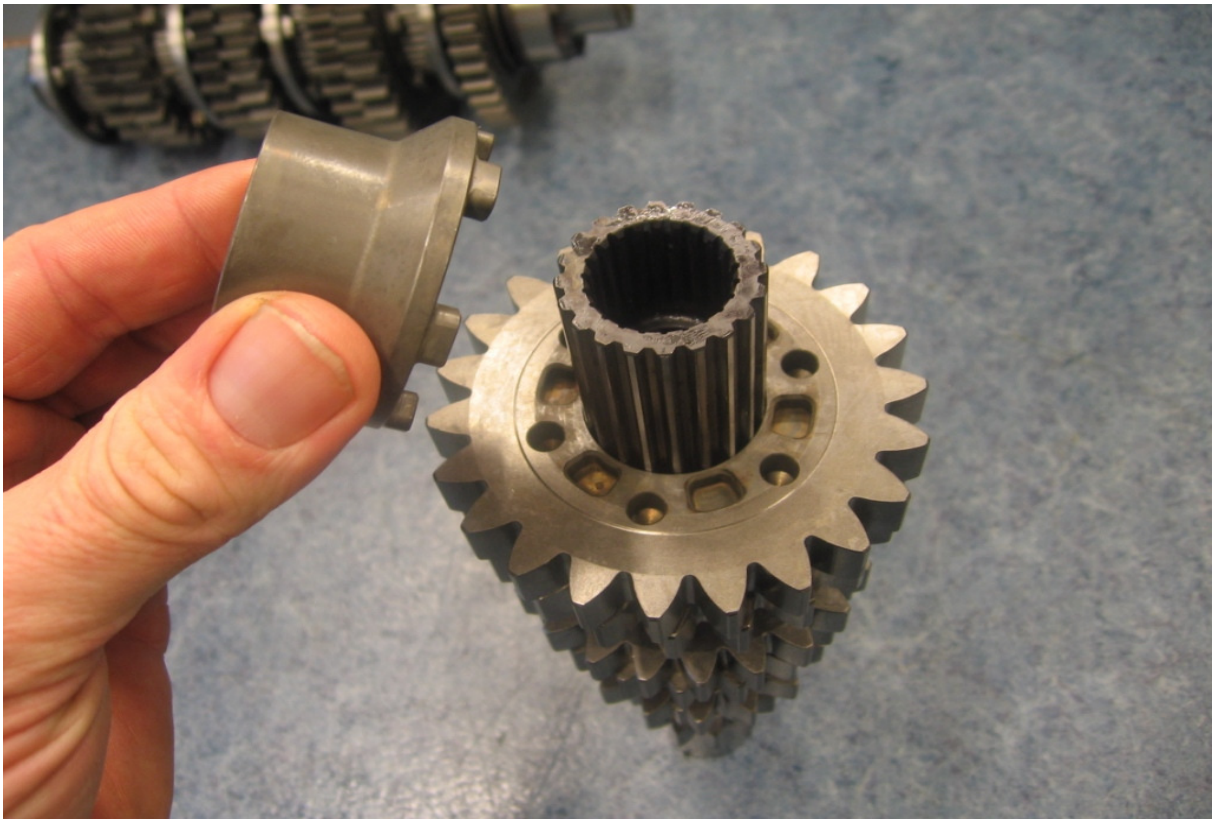
Slide the double gear (2nd and 3rd gear) onto the input shaft.



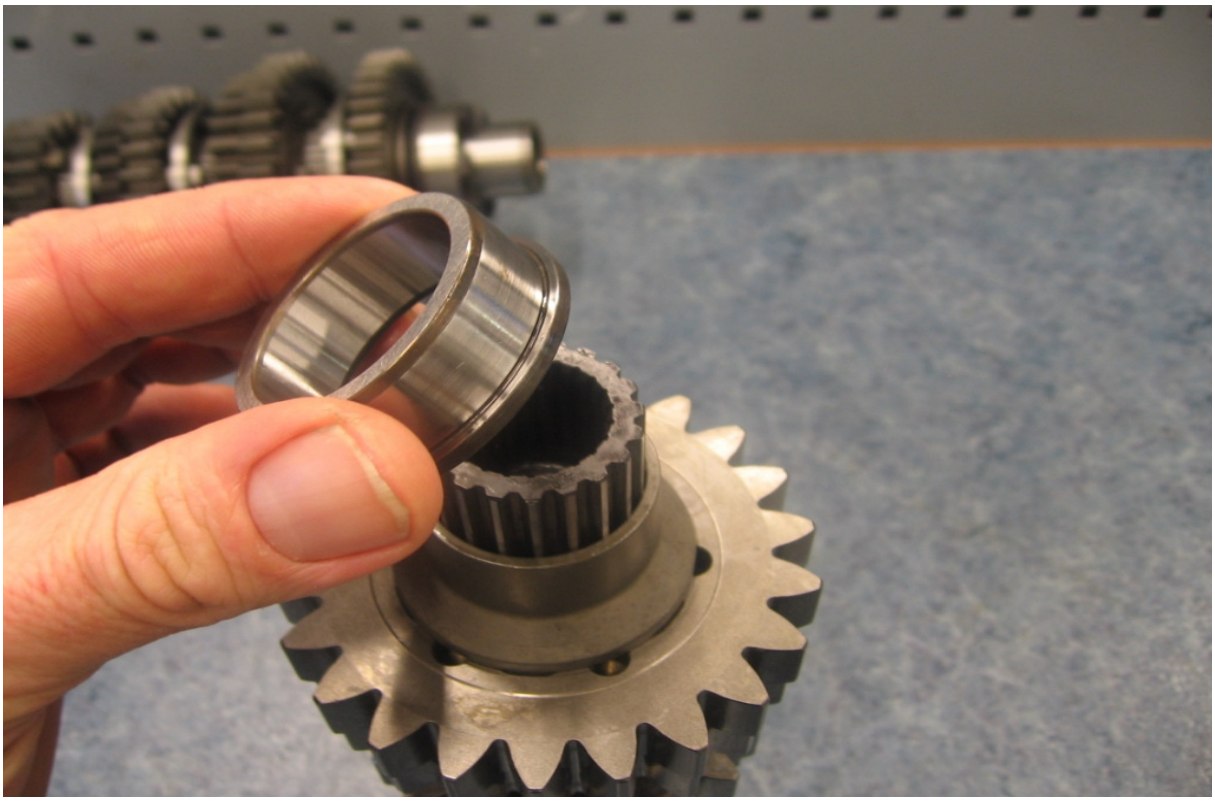
Fit 4th gear, dogs facing up.



Fit the double hub.



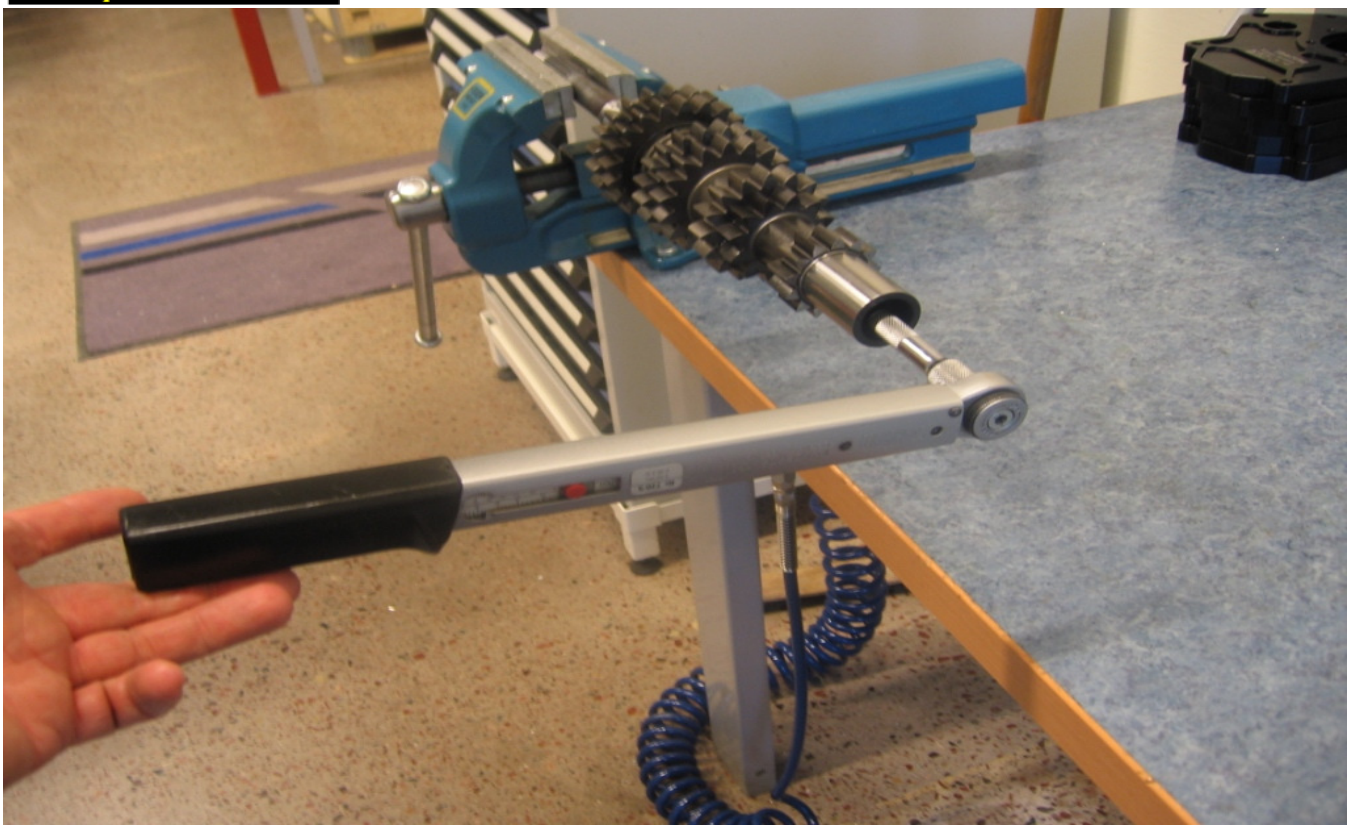
Fit 6th gear and 6th gear hub



Press on the bearing race.

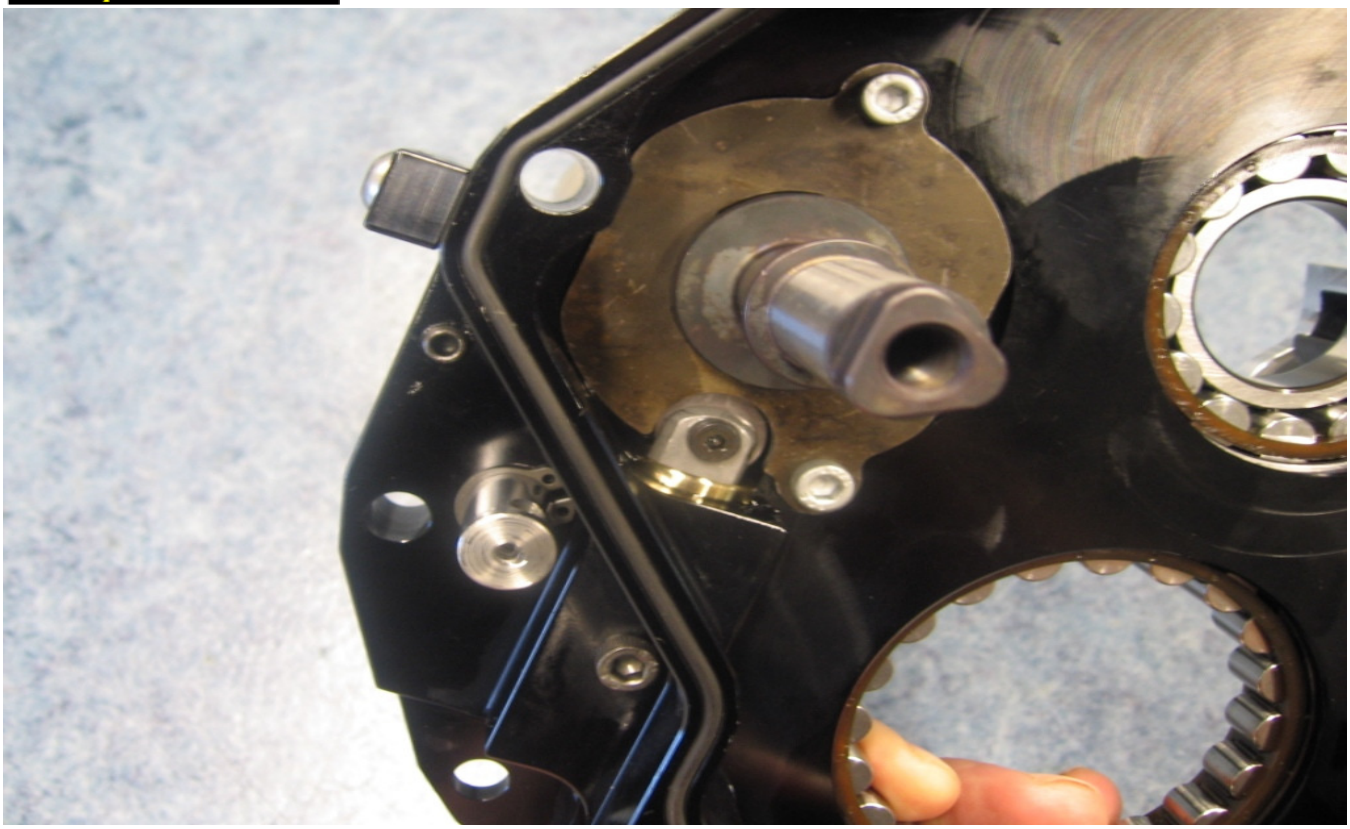
The race should be flush with the end of the shaft.

Apply Loctite 270 to the clutch shaft retaining bolt.



Torque bolt to 38 Nm.

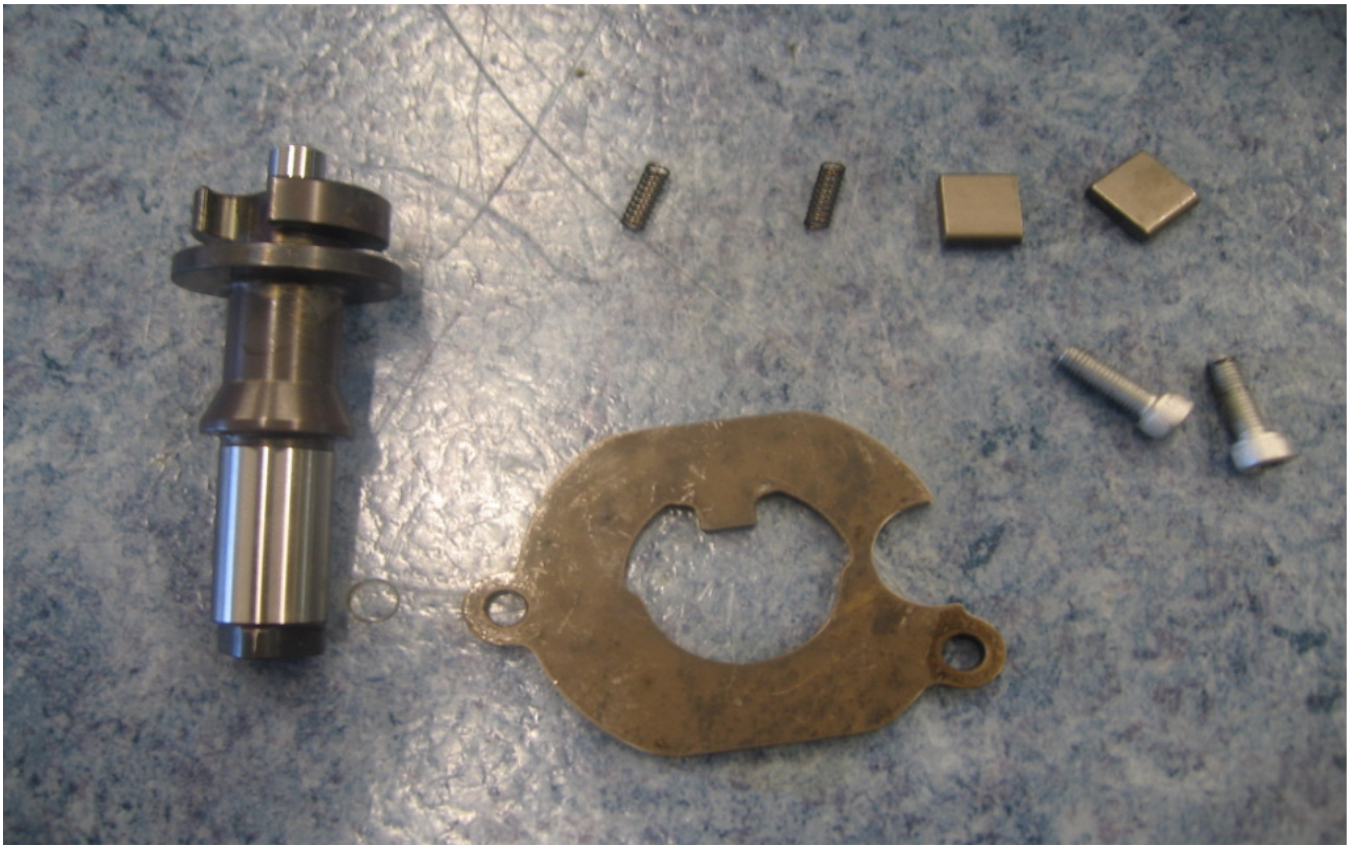
Make sure the clutch shaft has some free play and not solid in the input shaft.



Selector mechanism.

Remove the two M5 screws from the stop guide plate

Remove the ratchet assembly



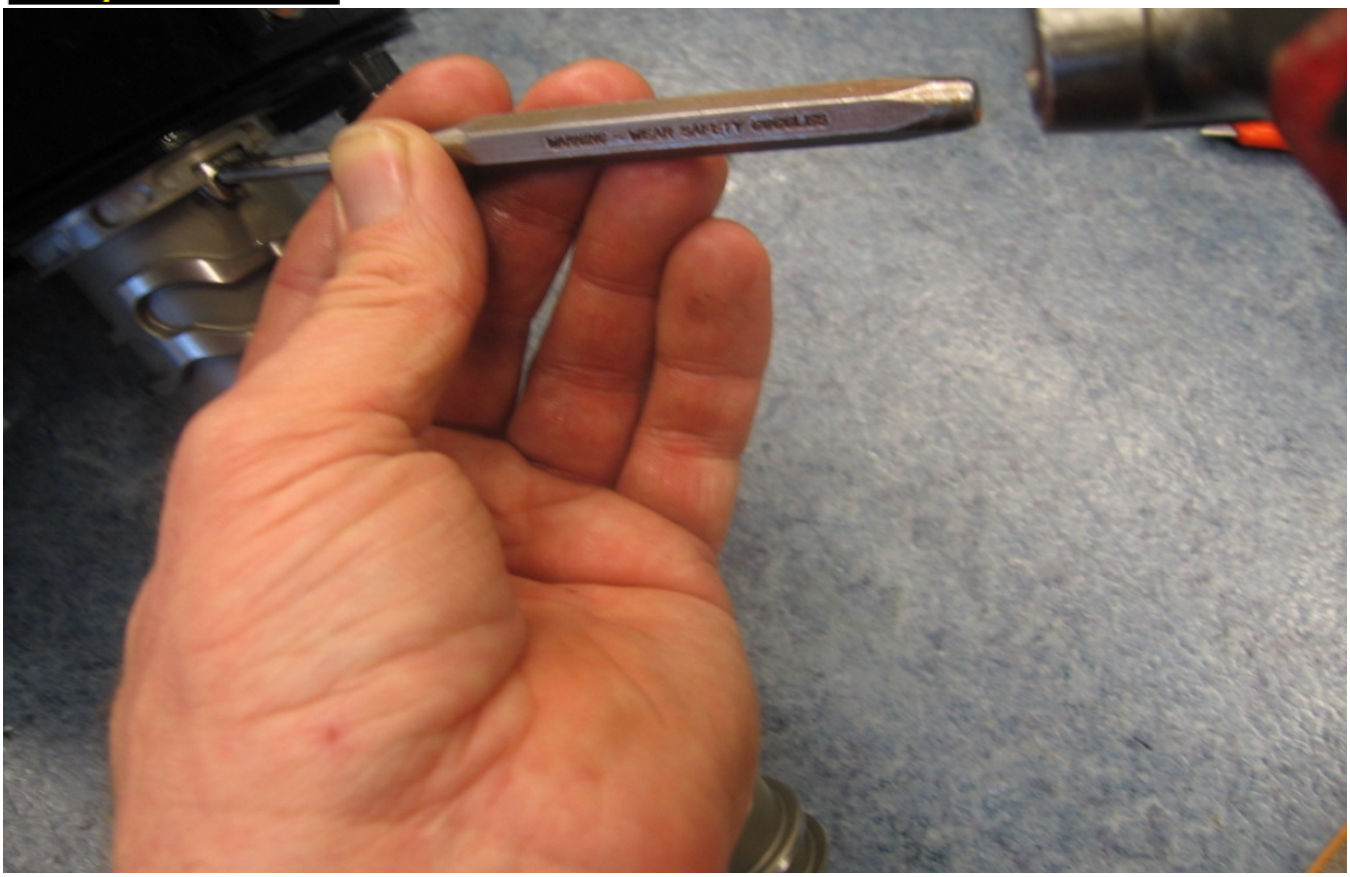
Ratchet assembly parts

Carefully remove the M5 detent retainer screw.

Pull out the detent plunger

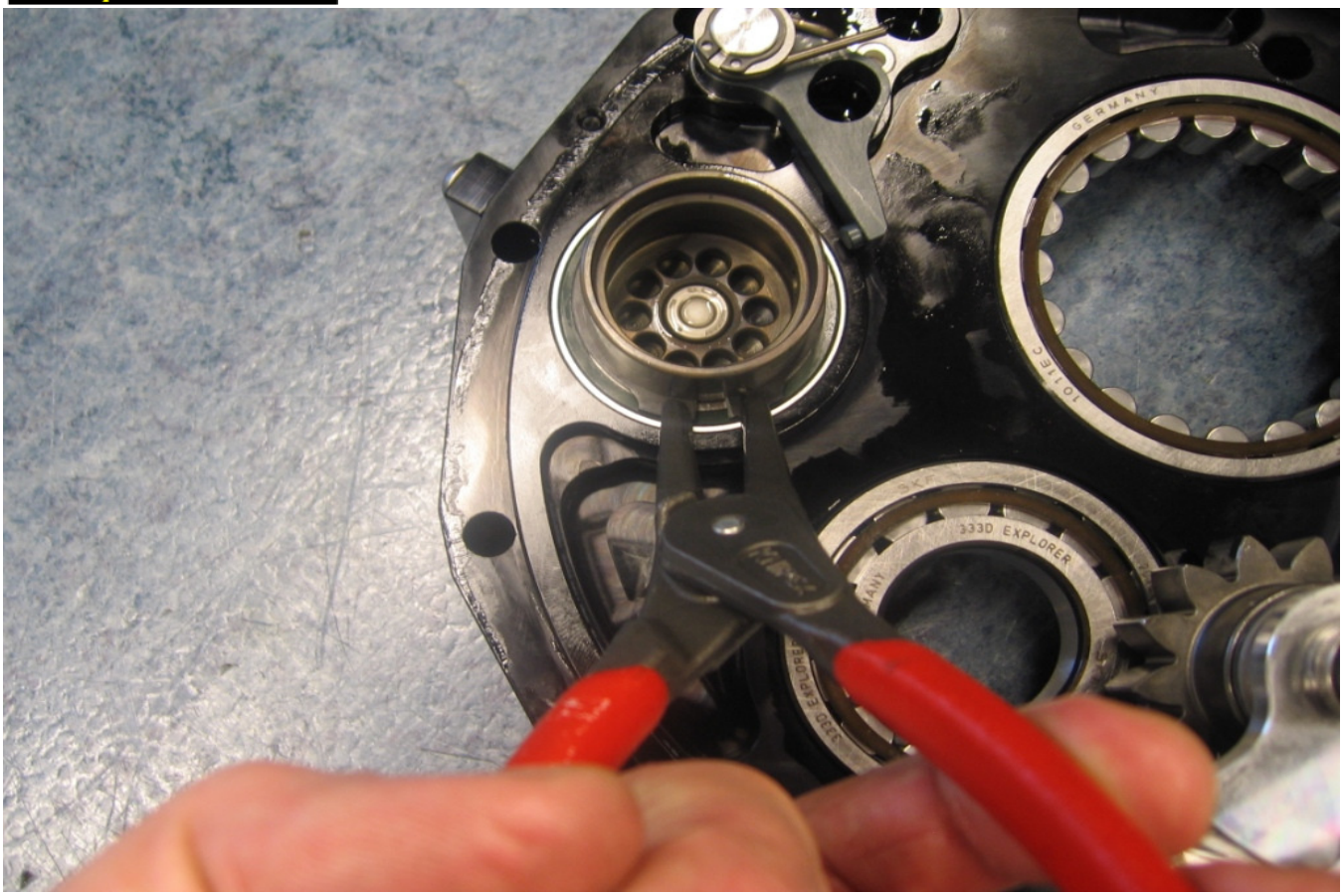
Detent plunger parts

Selector drum



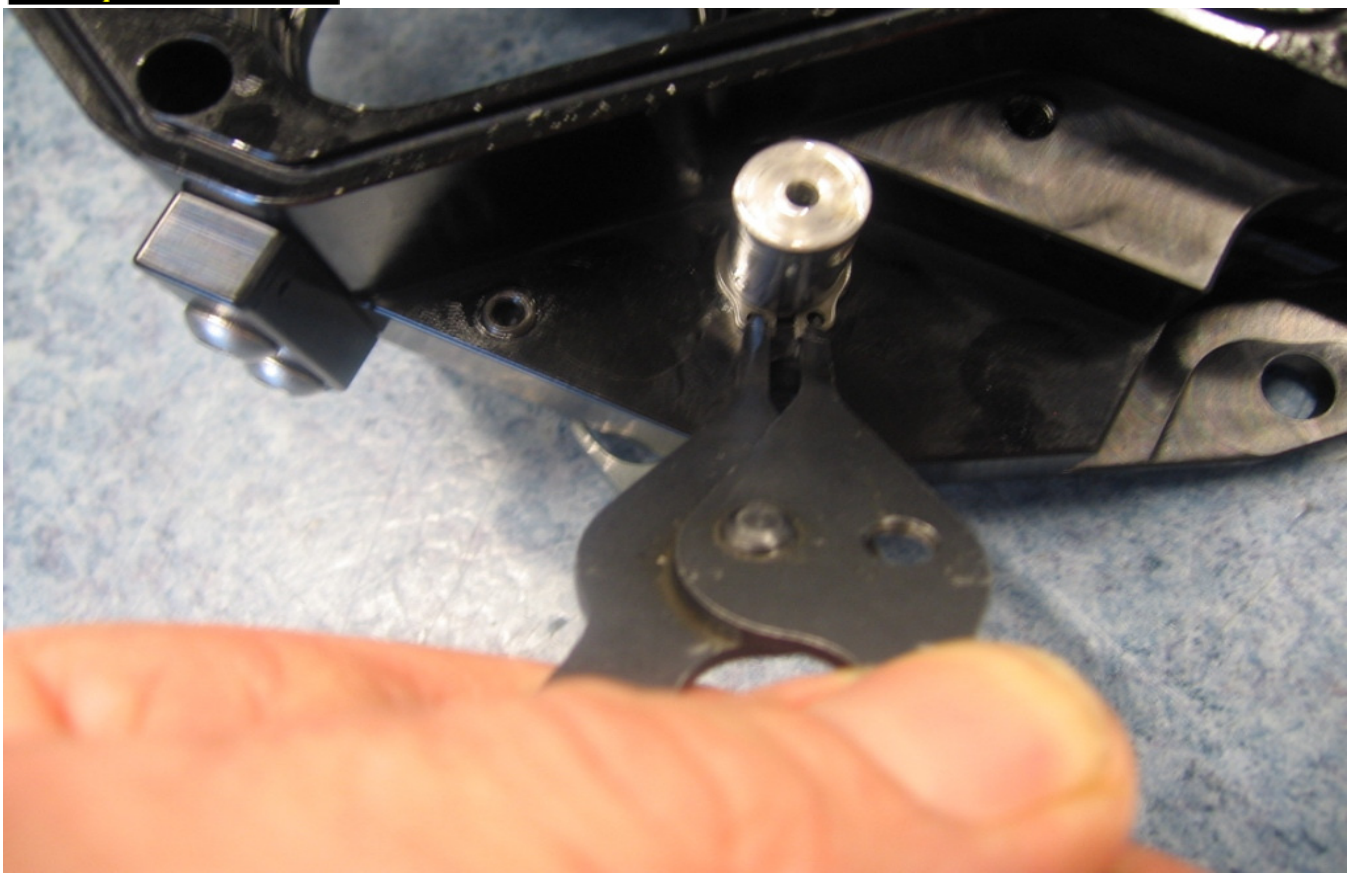
Carefully knock out the two spiral pins from the selector drum, they will fall inside and can be retrieved when the drum is removed.

Drum removed with blocker ring and spiral pins.



Remove circlip from detent housing and push through bearings.

Detent housing and bearings

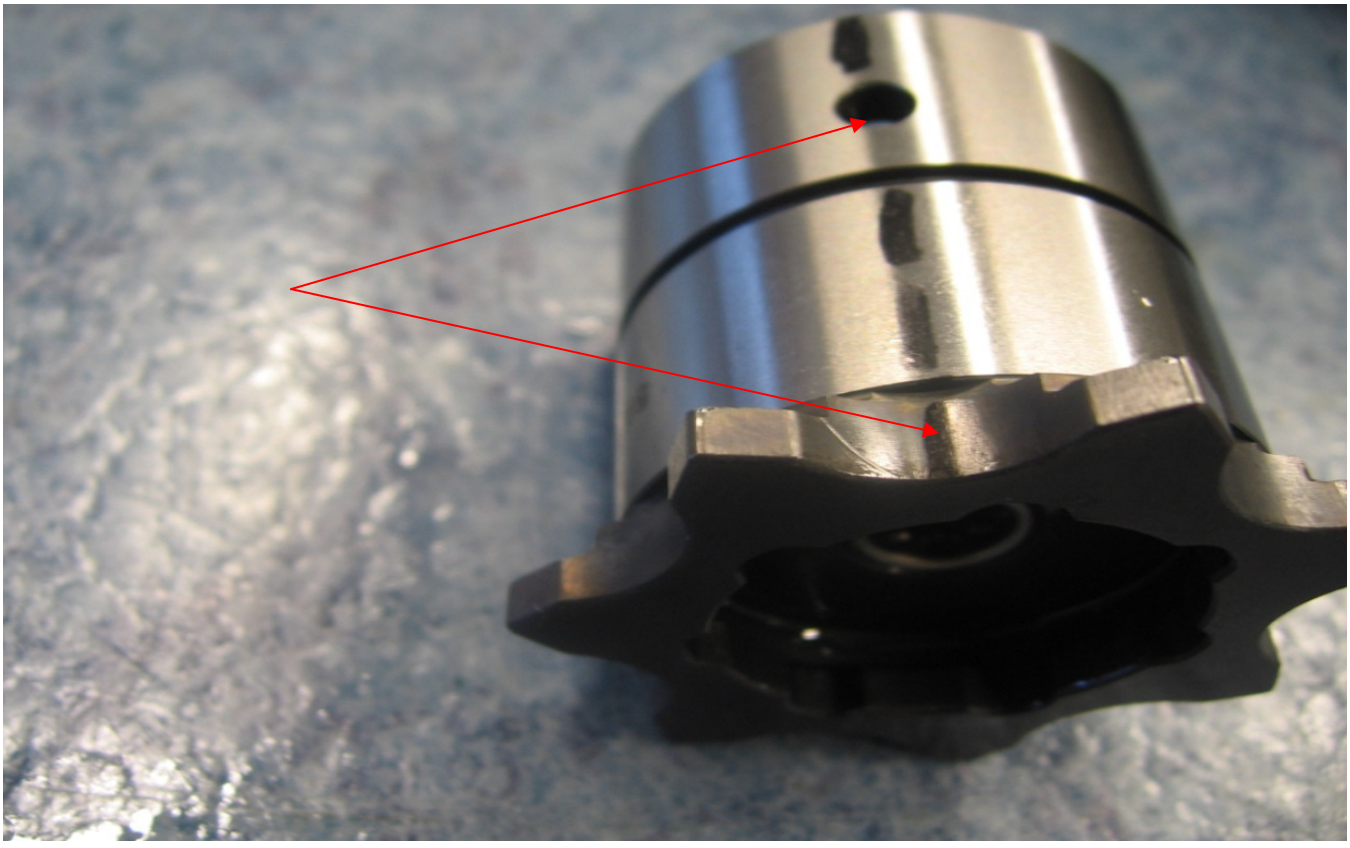


Remove circlip from neutral reverse axle.

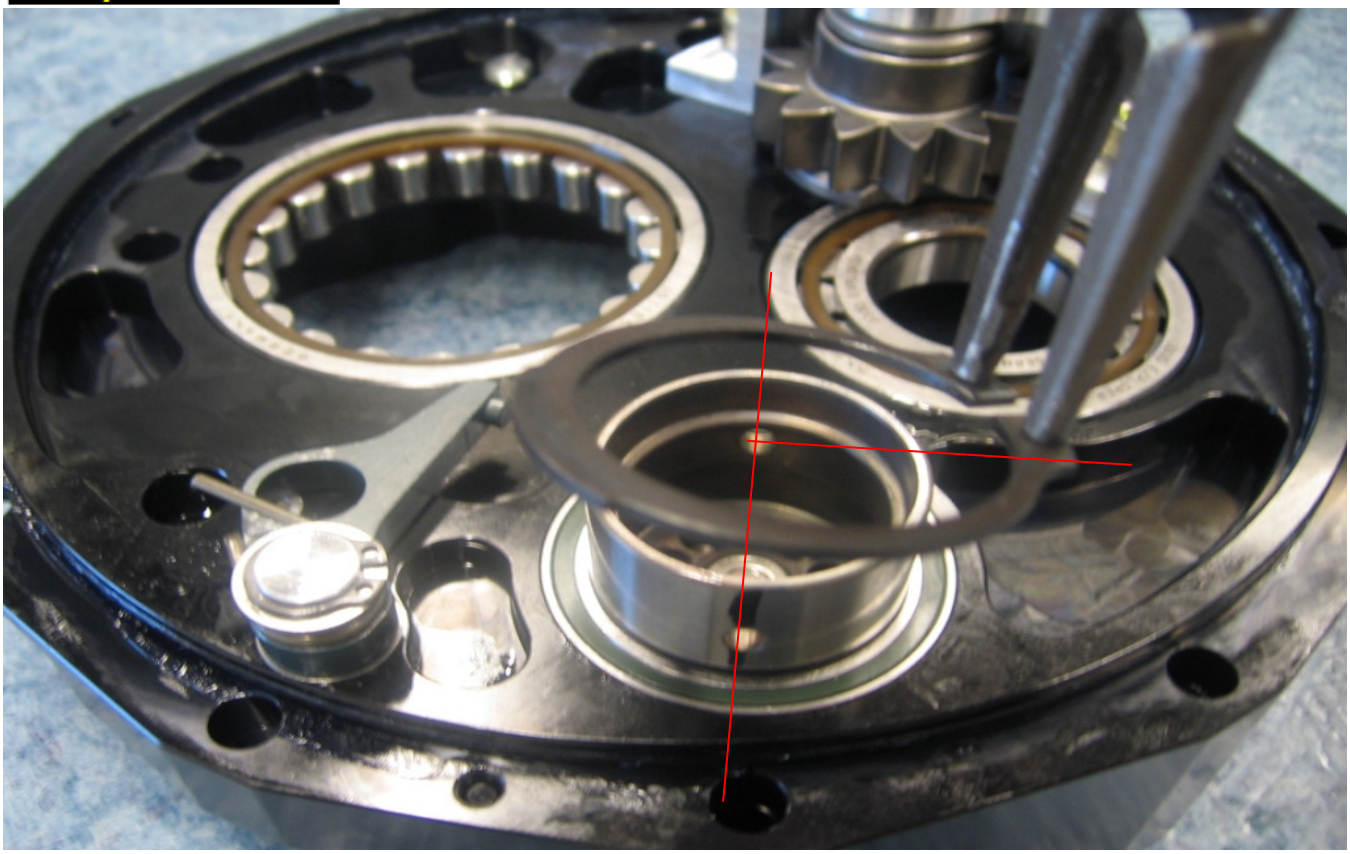
Potentiometer drive, do not remove this part or turn it otherwise the display will have to be reset.

Neutral reverse axle, note “O” ring (9 x 1,5) and position of 0.5mm spacer.

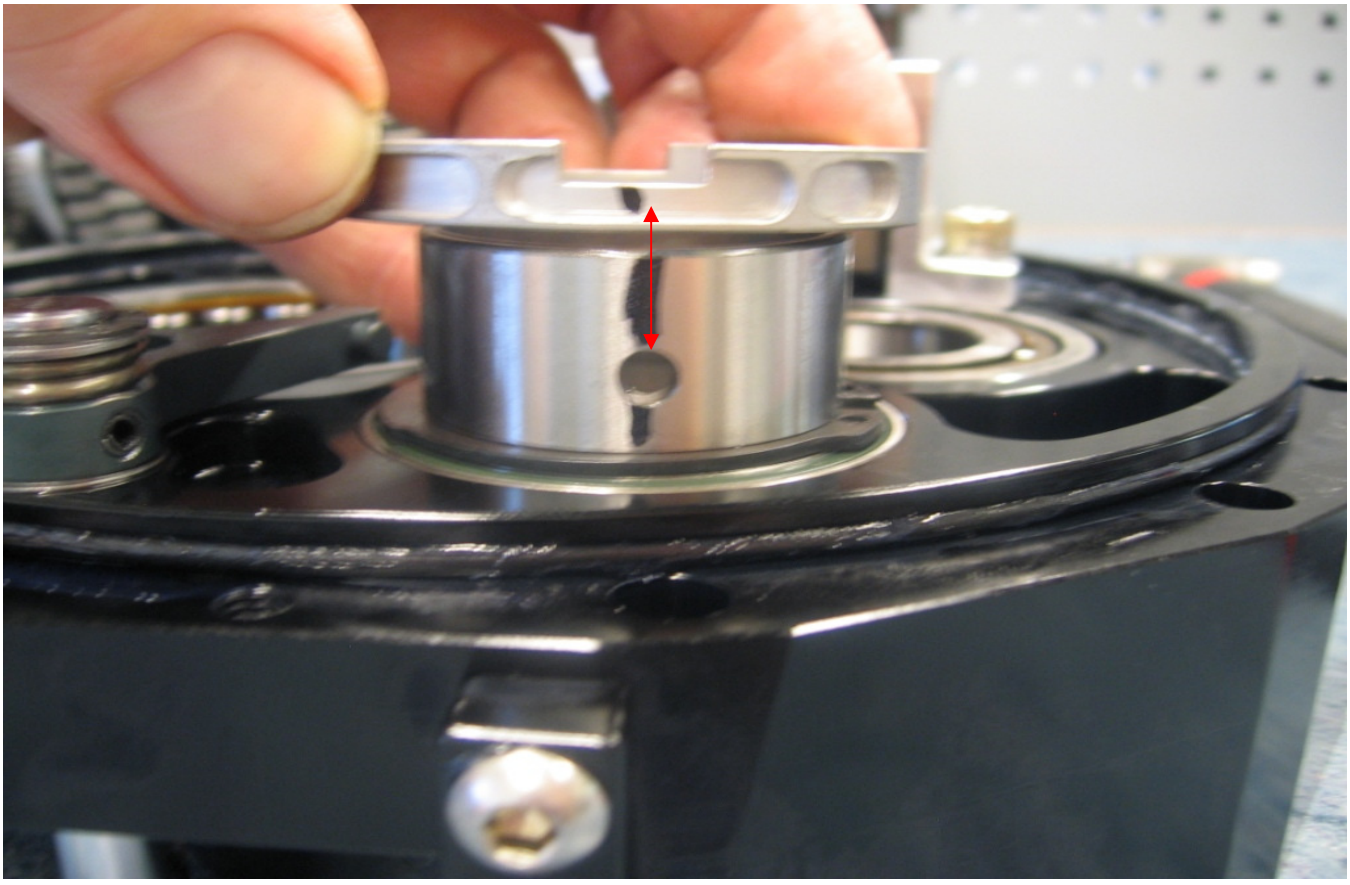
When fitting the circlip make sure that the “ears” are away from the stud hole otherwise the rear mounting can clamp the axle when fitted.



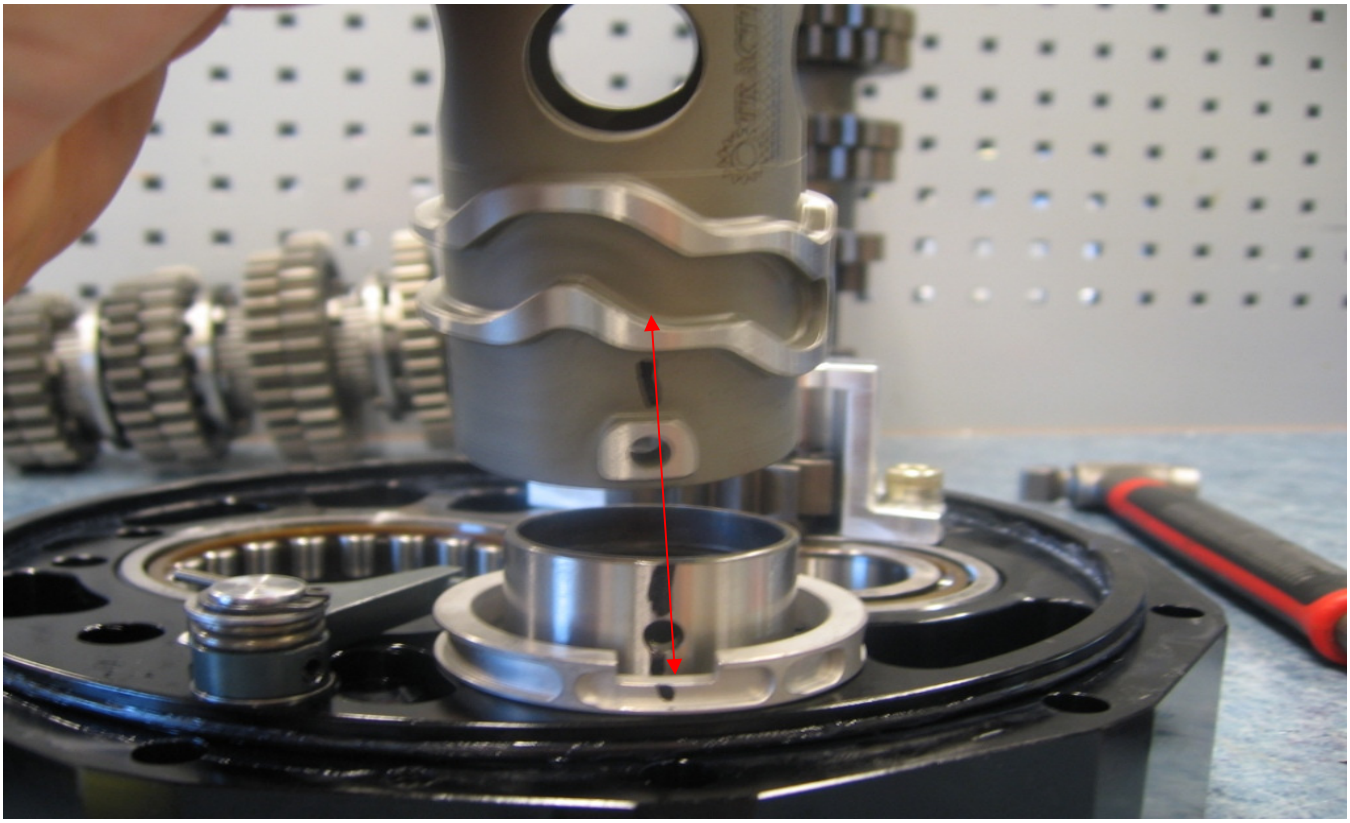
Detent housing, it is very important the this is “timed” with the detent ring and the selector drum



Fit the circlip 90 deg to the holes

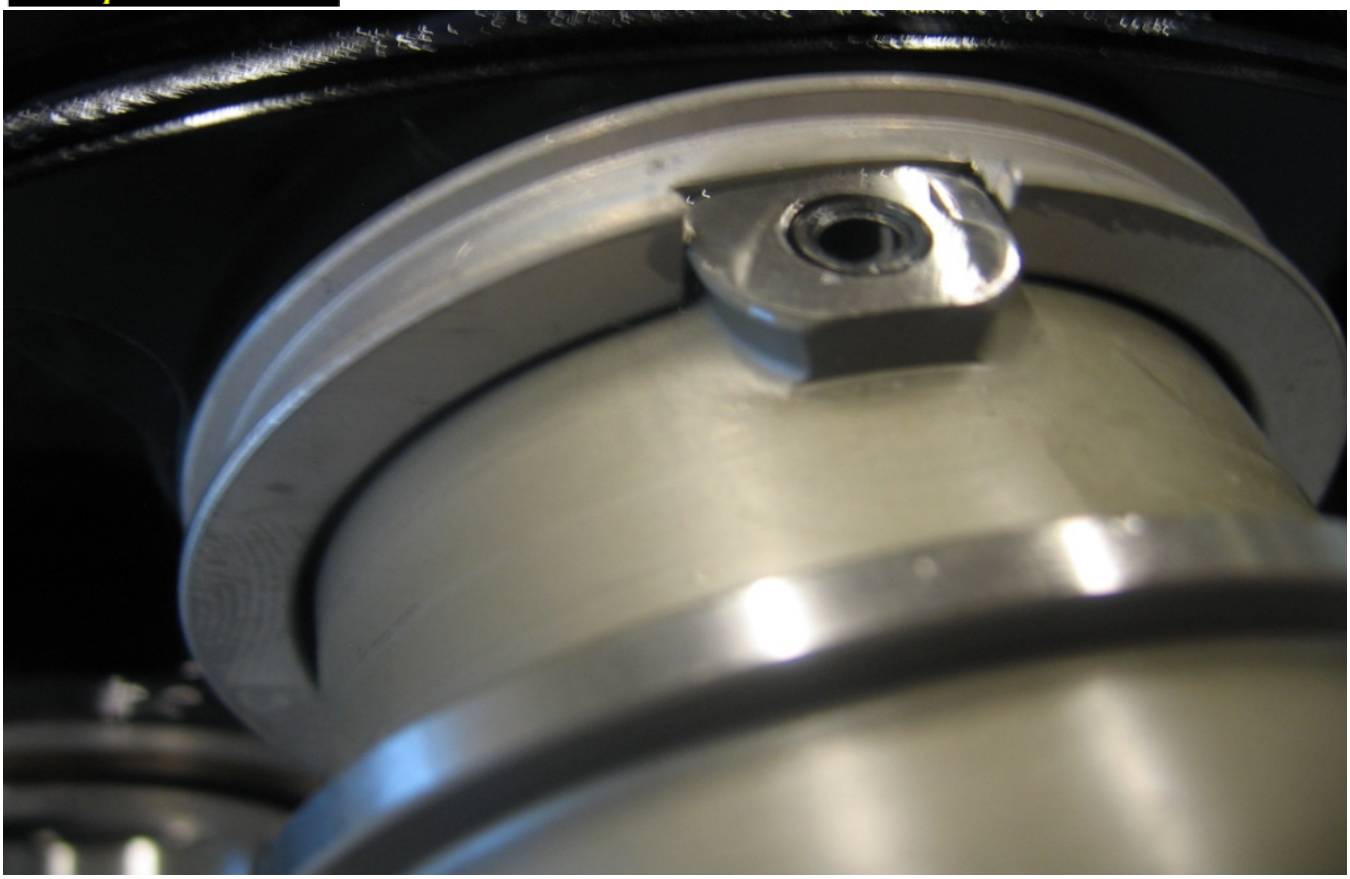


Fit the detent ring in position as shown.



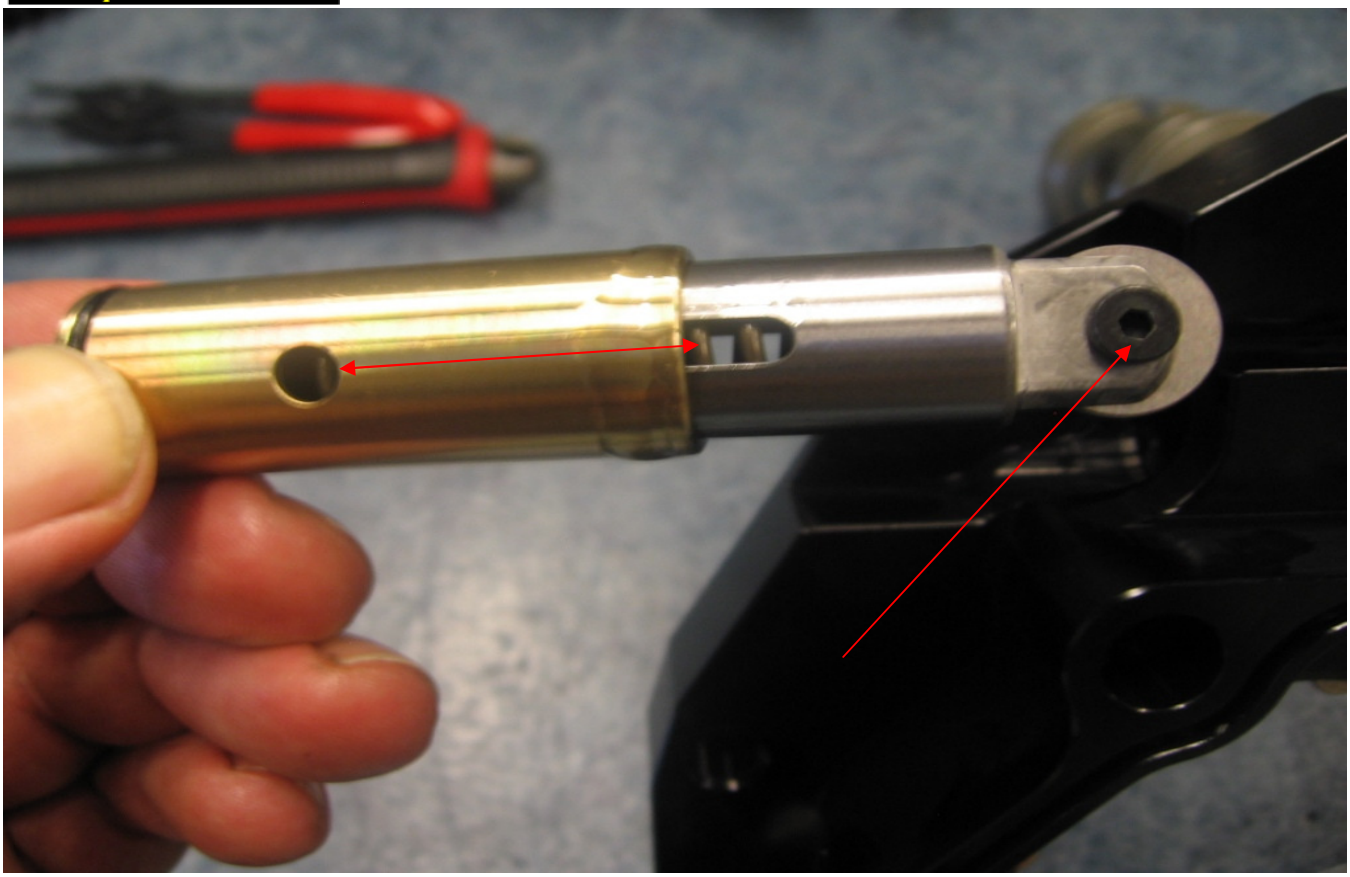
Slide on the selector drum in position as shown.

Fit the two spiral pins to the selector drum



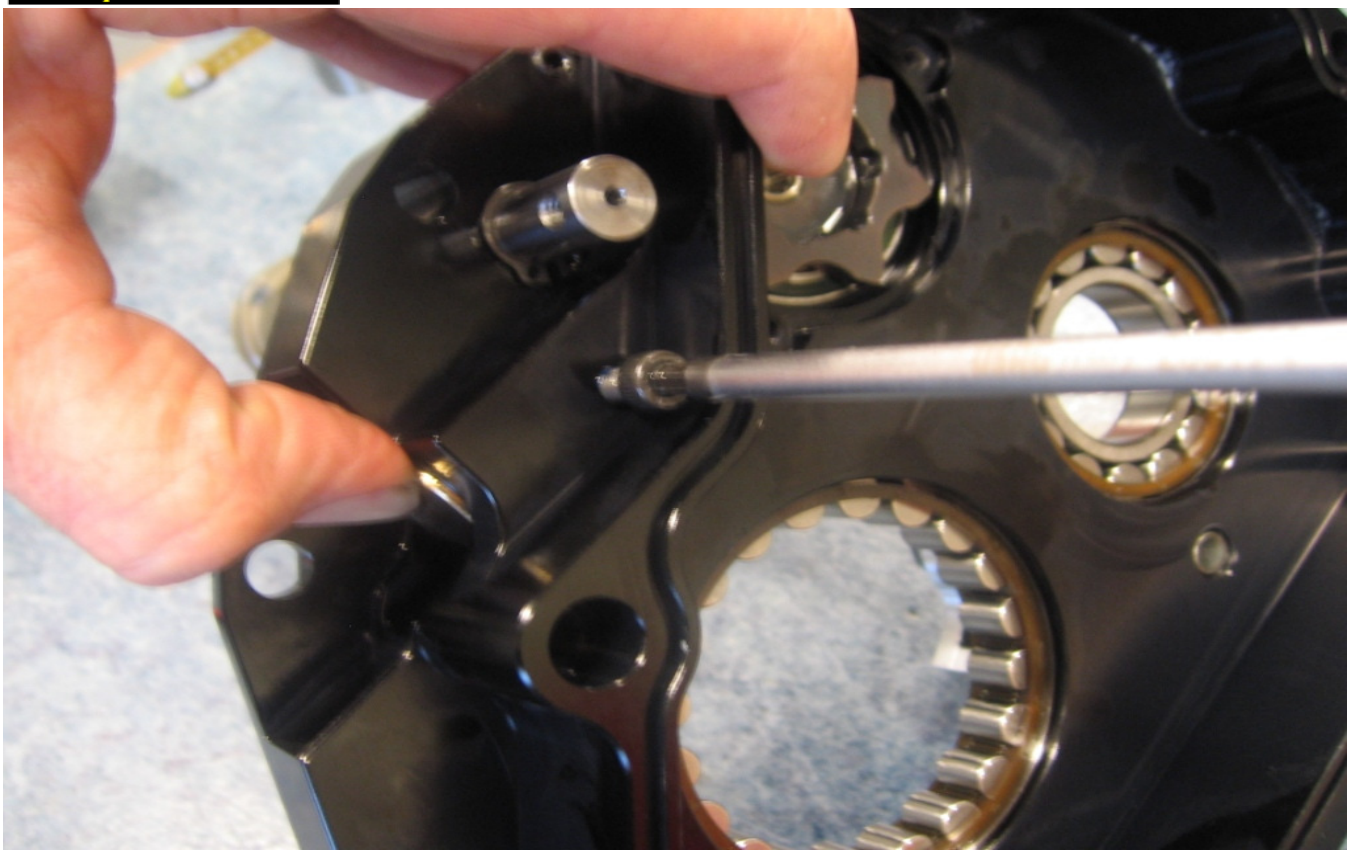
Make sure the pins are flush with the drum, the drum should rotate freely when the plunger is not fitted, and there should be **no** resistance

Make sure that the plunger housing is free from debris and the plunger slides freely inside

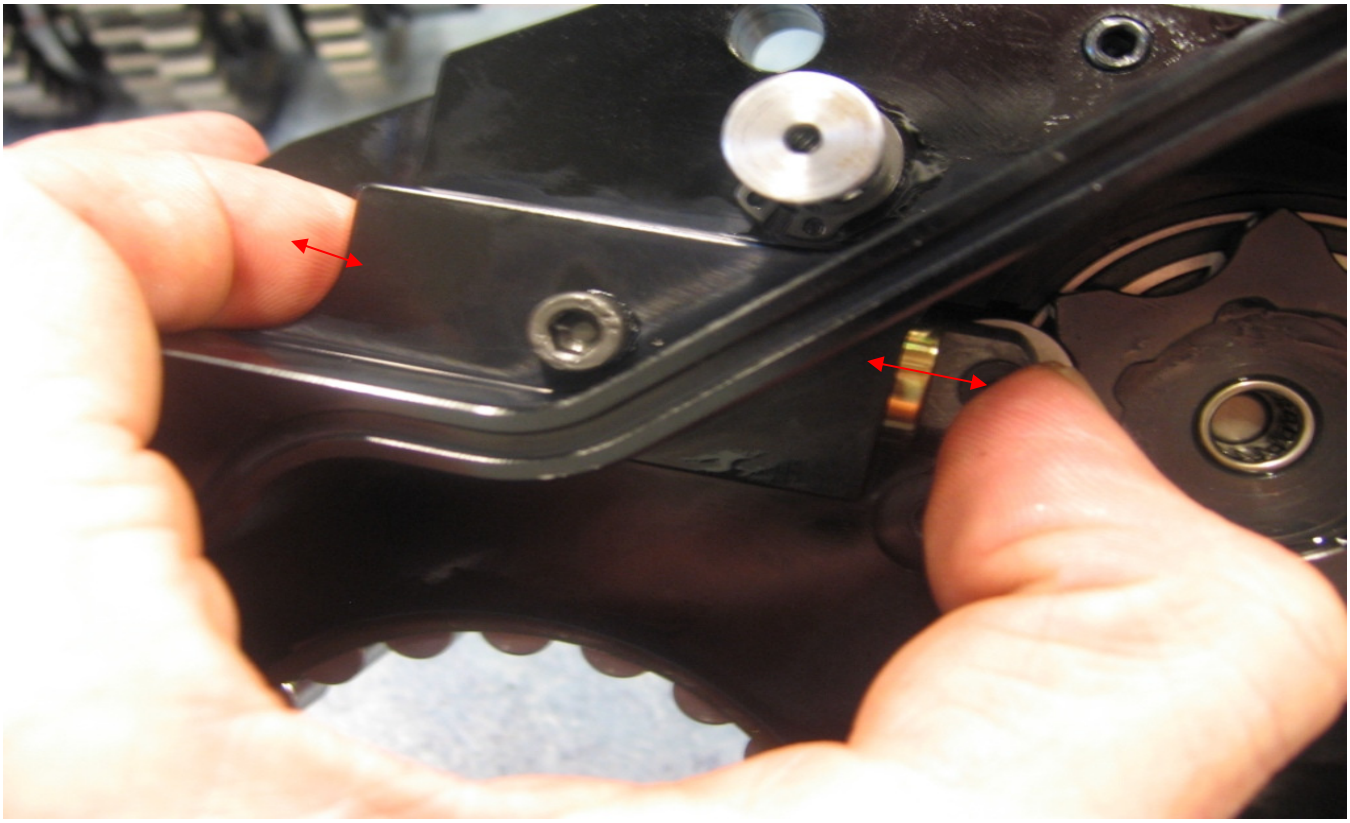


Lubricate and assemble the plunger and spring, make sure “O” ring (17 x 1,5) is in place, slot in plunger should be in line with the hole in the plunger housing, the screw in the roller should face rearwards as shown.

Apply some Loctite 243 to the special M5 plunger screw.

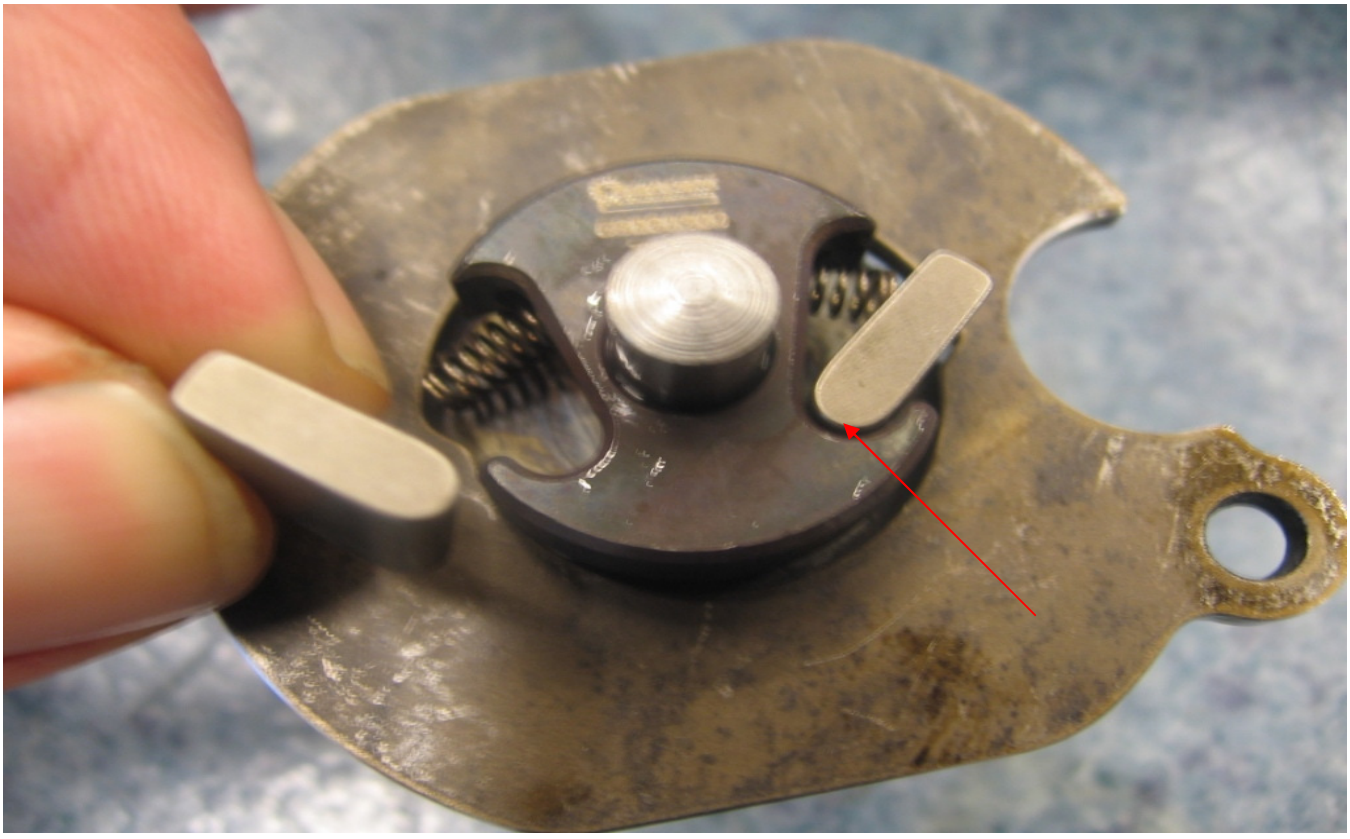


CAUTION- When fitting the plunger screw make sure that it goes through the hole in the plunger housing and the slot in the plunger and does not nip either, no torque on this screw just carefully tight.



When the screw is tight the plunger should move freely against the spring and the brass housing should also be able to move slightly.

Place the stop guide plate over the ratchet axle

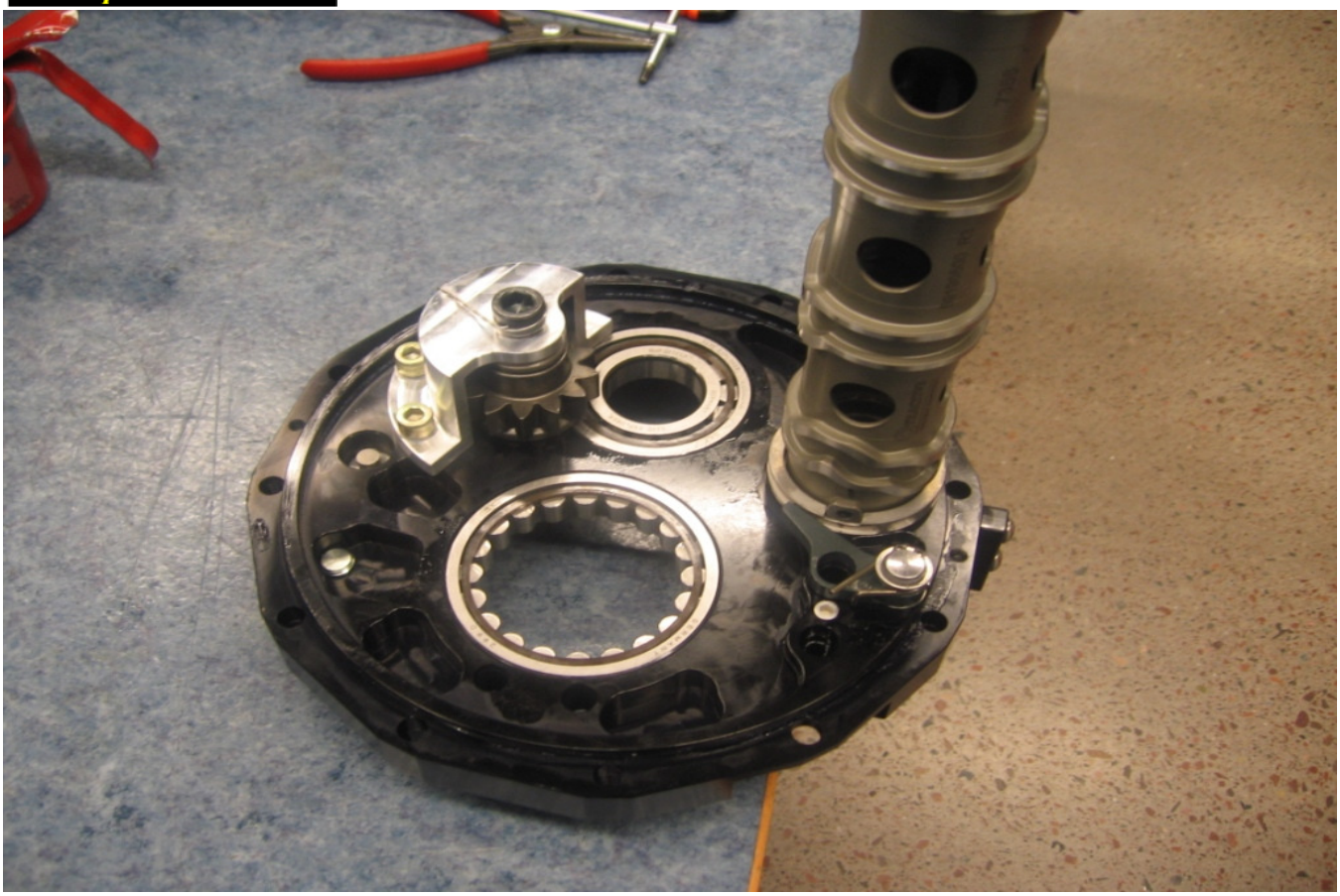


Fit the two springs and pawls as shown, note curved edge of pawl to the axle.

Place the ratchet assembly in the detent housing; plate should be flush with the housing.

Fit the two M5 screws with 243 Loctite.

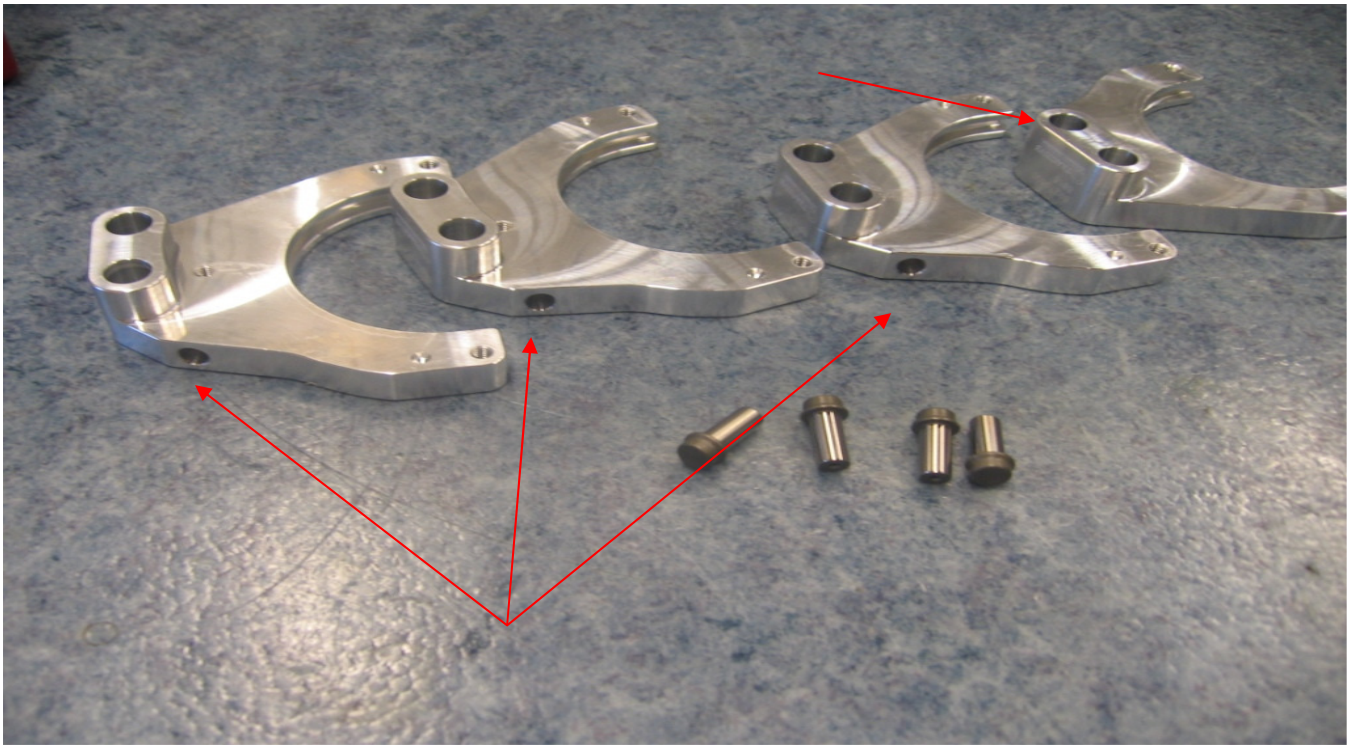
Torque screws to 10 Nm



Refitting cluster.

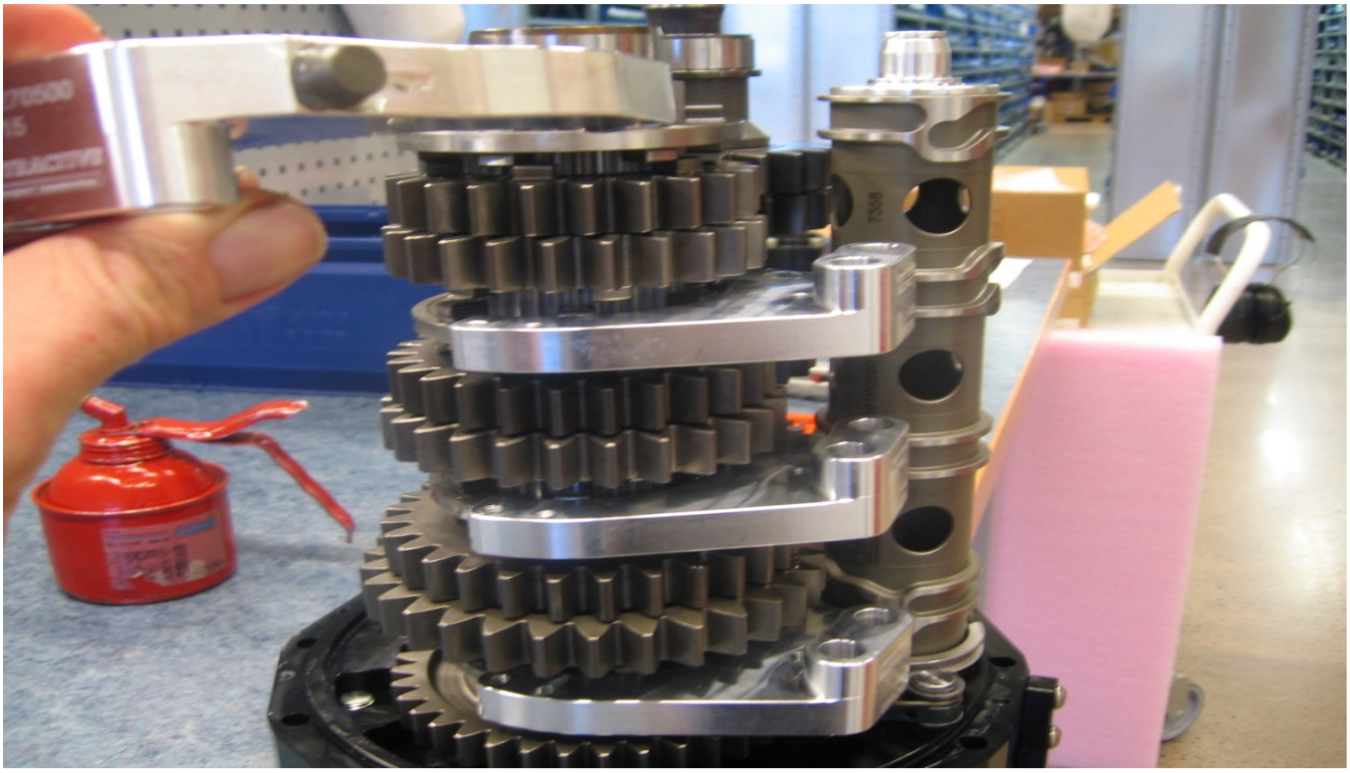
Fit the mainshaft into its bearing engaging the reverse idler.

Fit the input shaft into its bearing, pushing down and turning the shaft to mesh the gears, some dog rings may have to be lifted to do this, do not use excessive force.

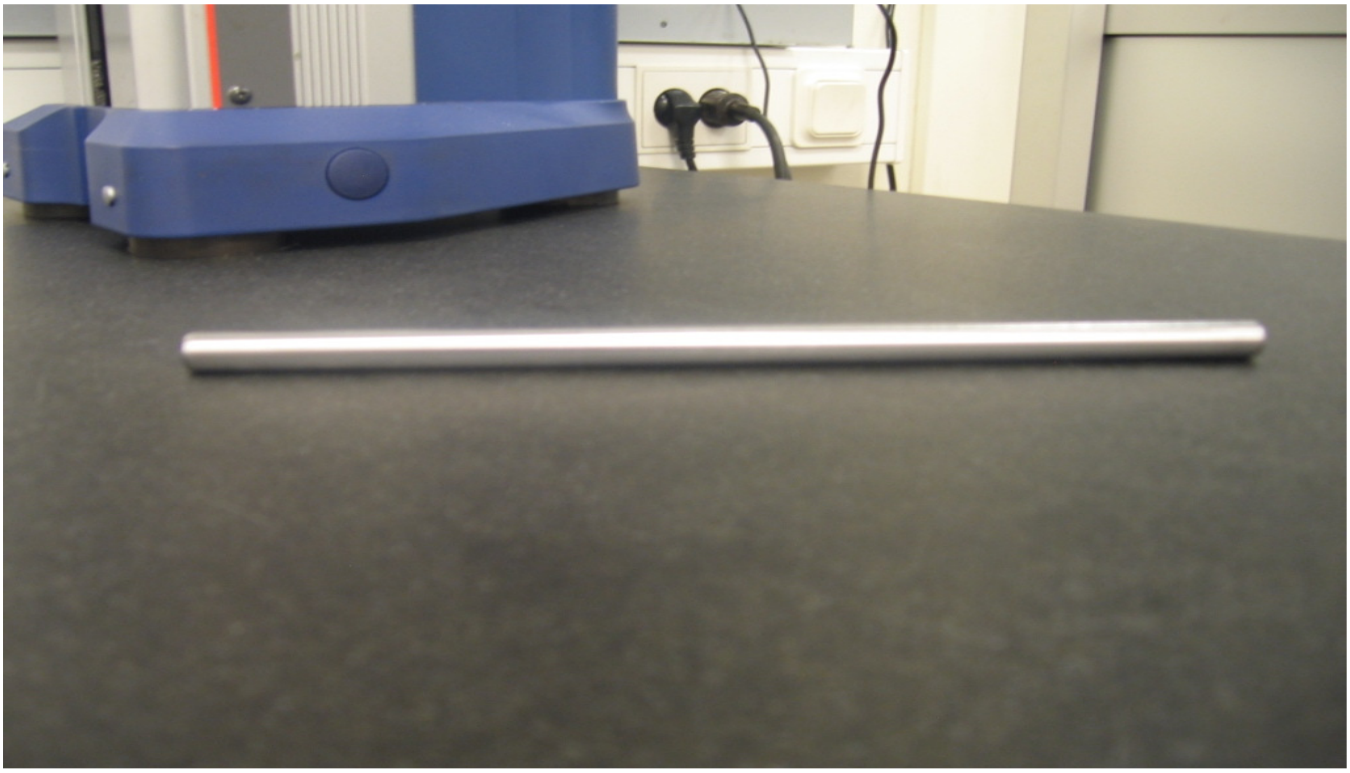


Selector forks and selector pins, 3 forks are the same 6th gear fork is reversed.

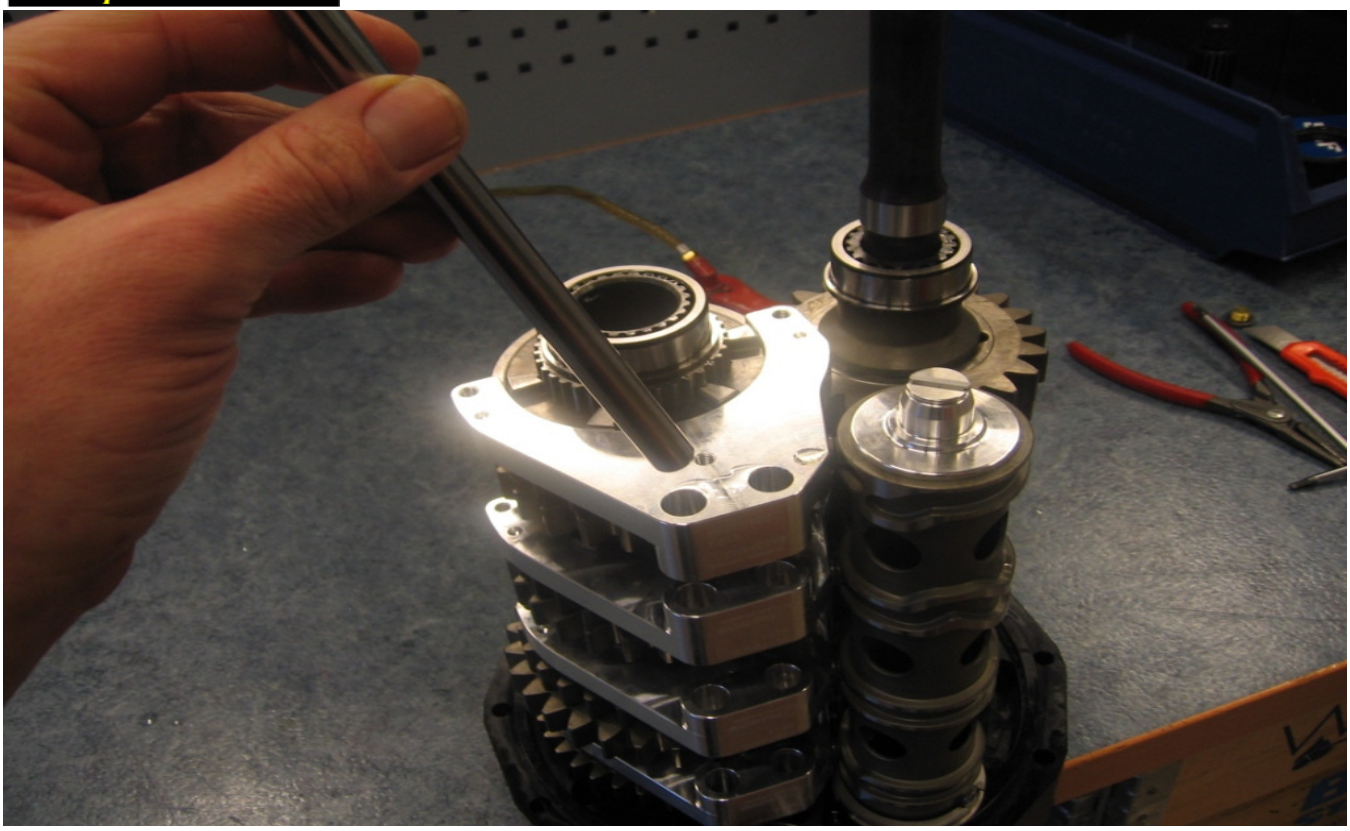
Lubricate and place the forks on the dog rings and locate the pins in the selector drum.



6th gear fork

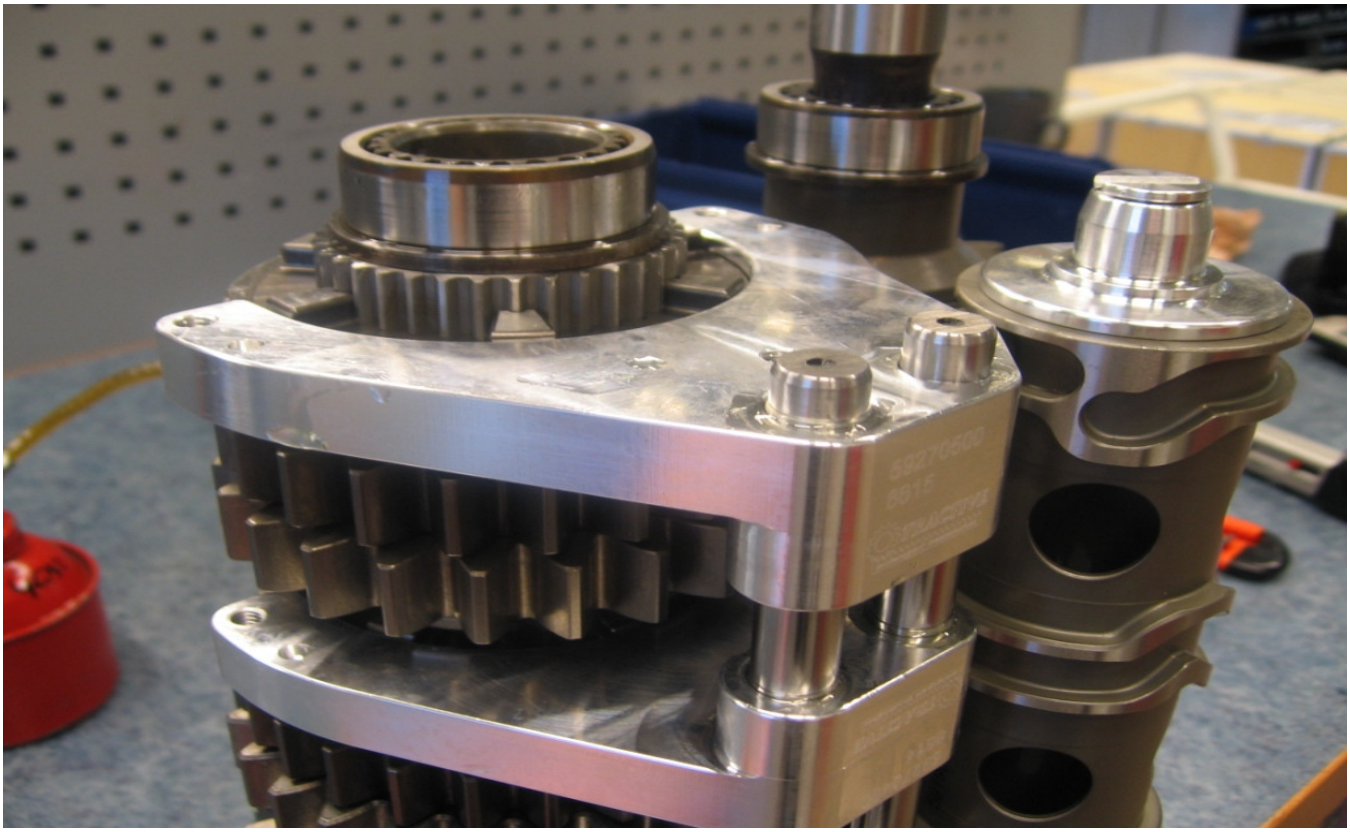


Important – carefully check that the selector rods are not bent on a surface table.

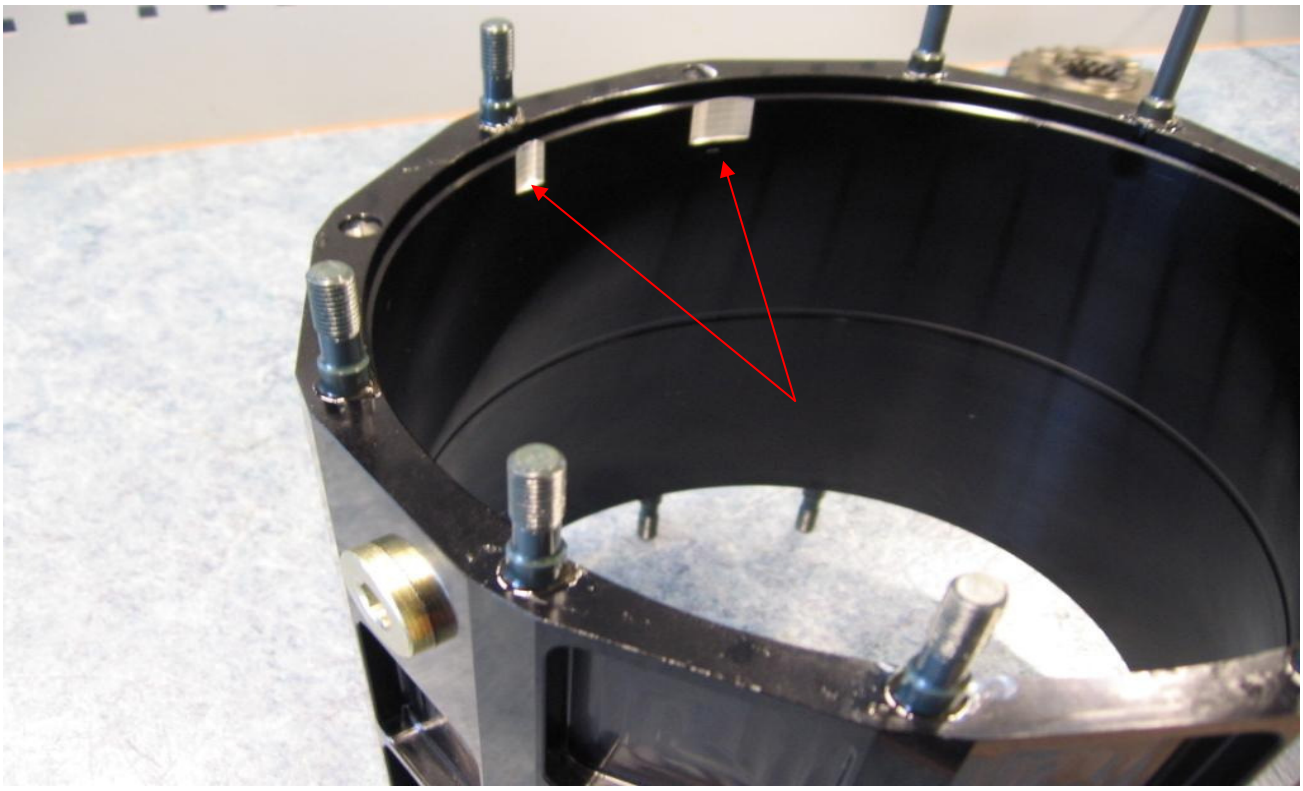


Lubricate and slide in the selector rods, start with the outer rod.

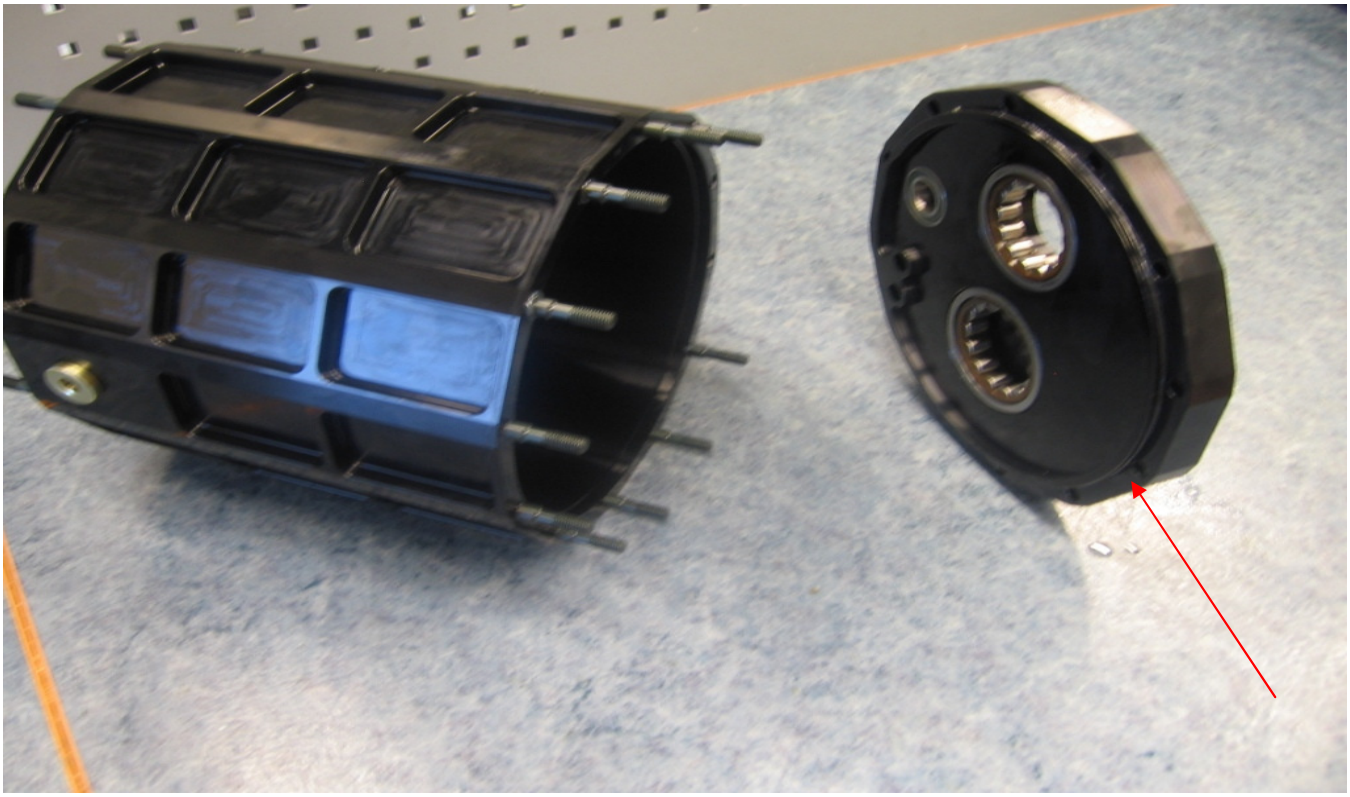
The inner rod should be placed just above the spring then using a screw driver push the spring to the other side of the rod then push down the rod.



Selector rods should be pushed down fully into the housing but will protrude above the 6th fork, do not hammer these rods down as it may damage the detent plunger that is in a thin wall beneath them.

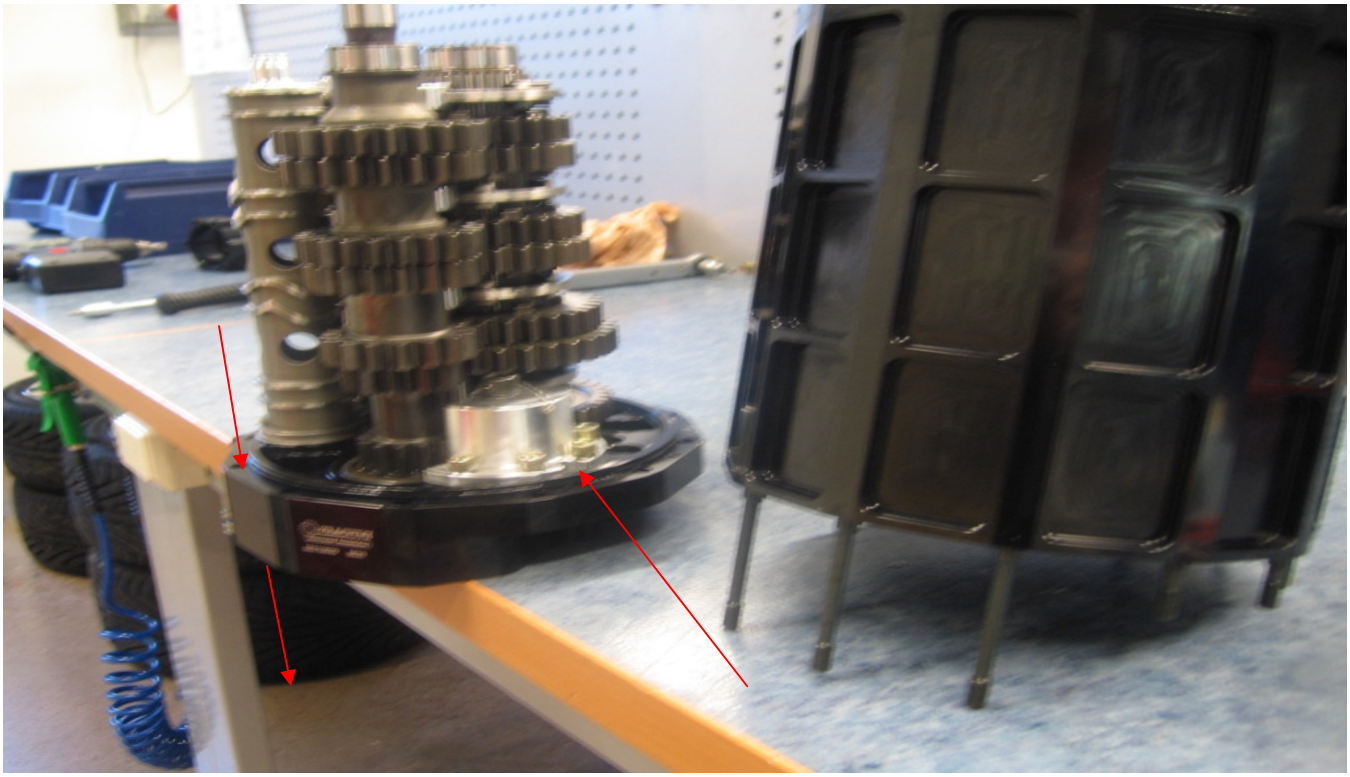


Note – There is relief machined into the centre housing for the detent ring and the spring on the neutral reverse blocking axle.



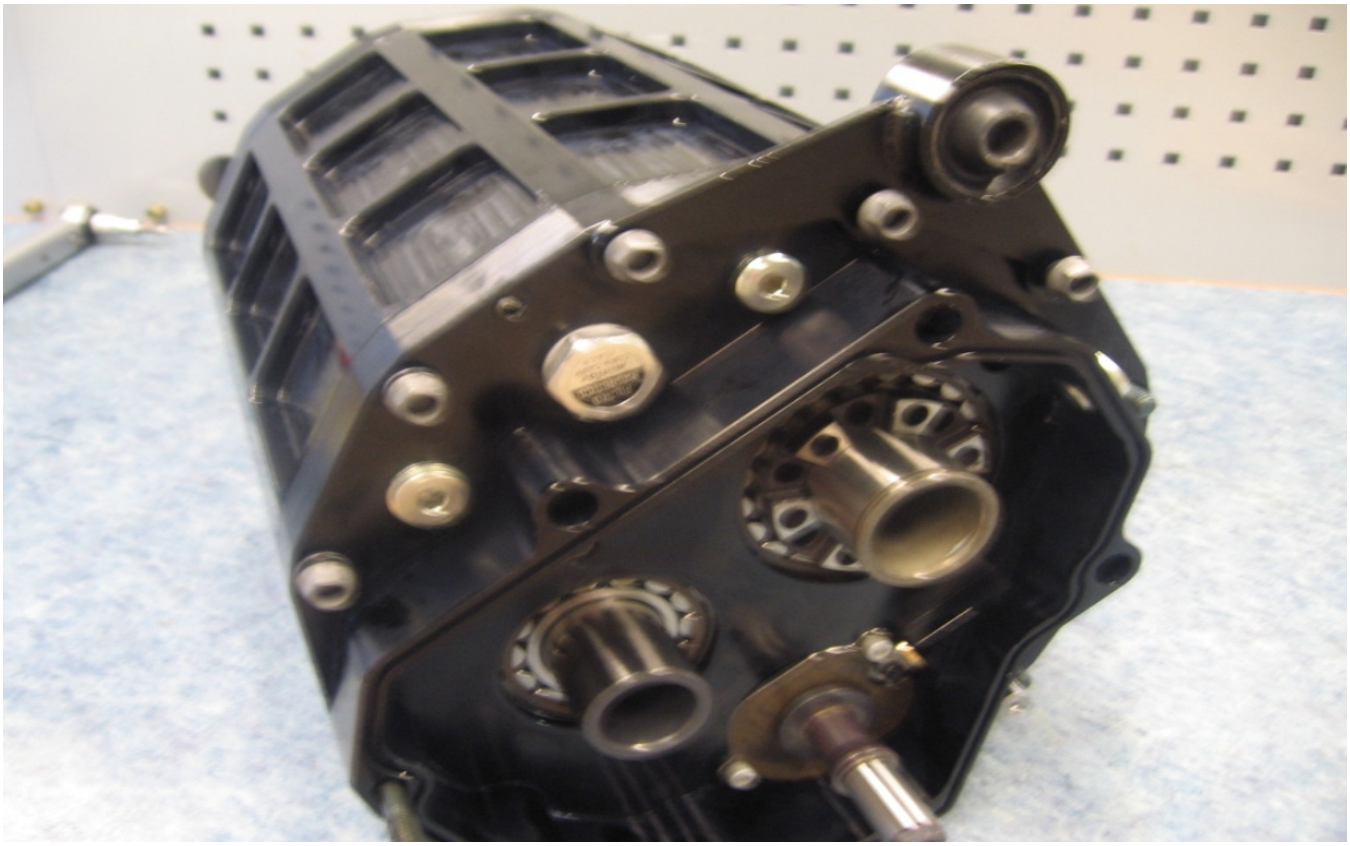
Front housing removed from centre housing, not necessary unless changing bearings, note “O” ring 3mm x 210

Torque on “K” nuts for front cover 20 Nm torque for the Allen screws 30 Nm

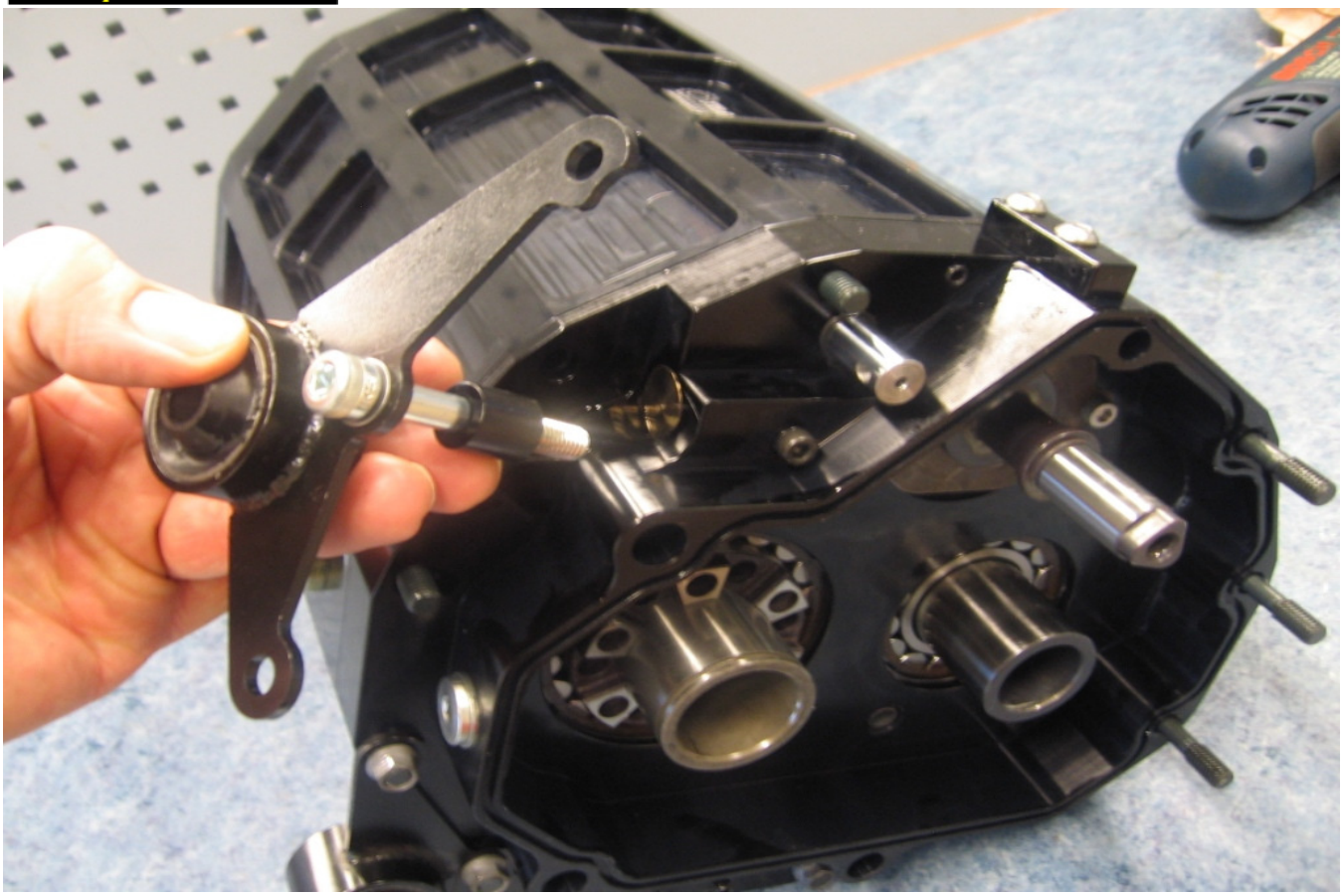


Overhang the cluster housing so the centre housing studs can pass through; make sure “O” ring is fitted (210 x 3)

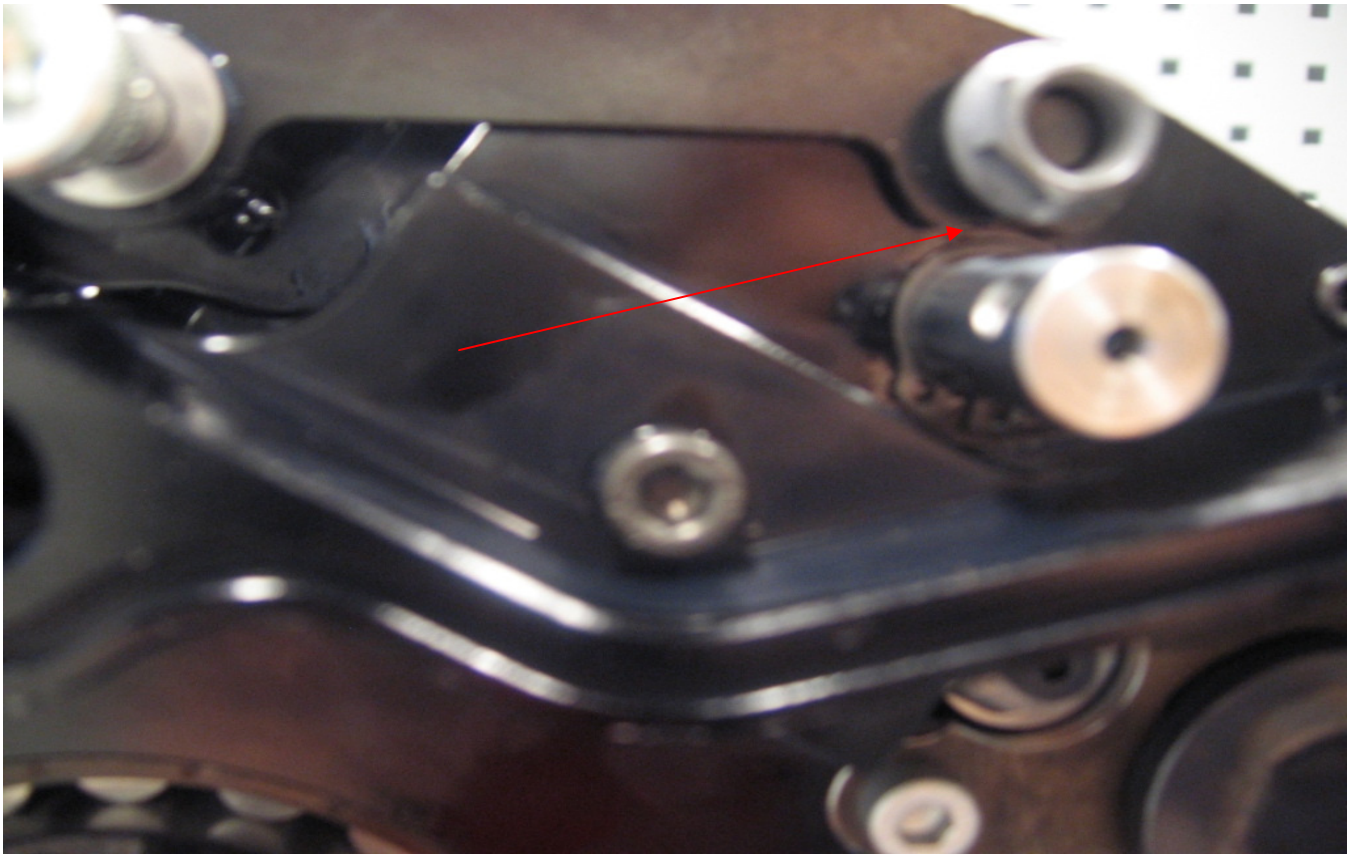
Lower the centre housing over the cluster, light knock with plastic mallet should seat. Do not use excessive force and make sure that shafts have engaged bearings.



Fit “K” nuts and rear mounts, make sure jacking screws are screwed out

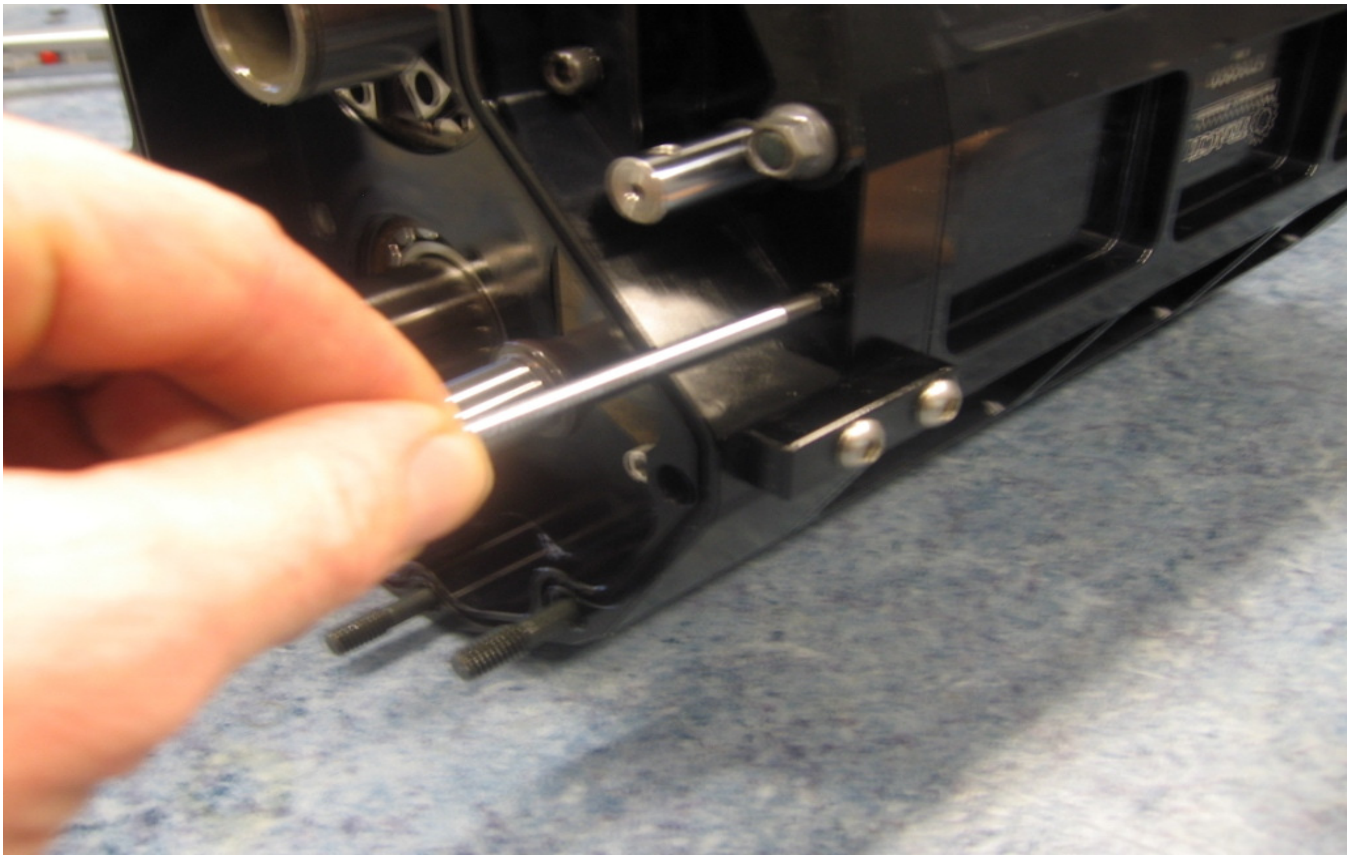


Note spacer on the L/H rear mount

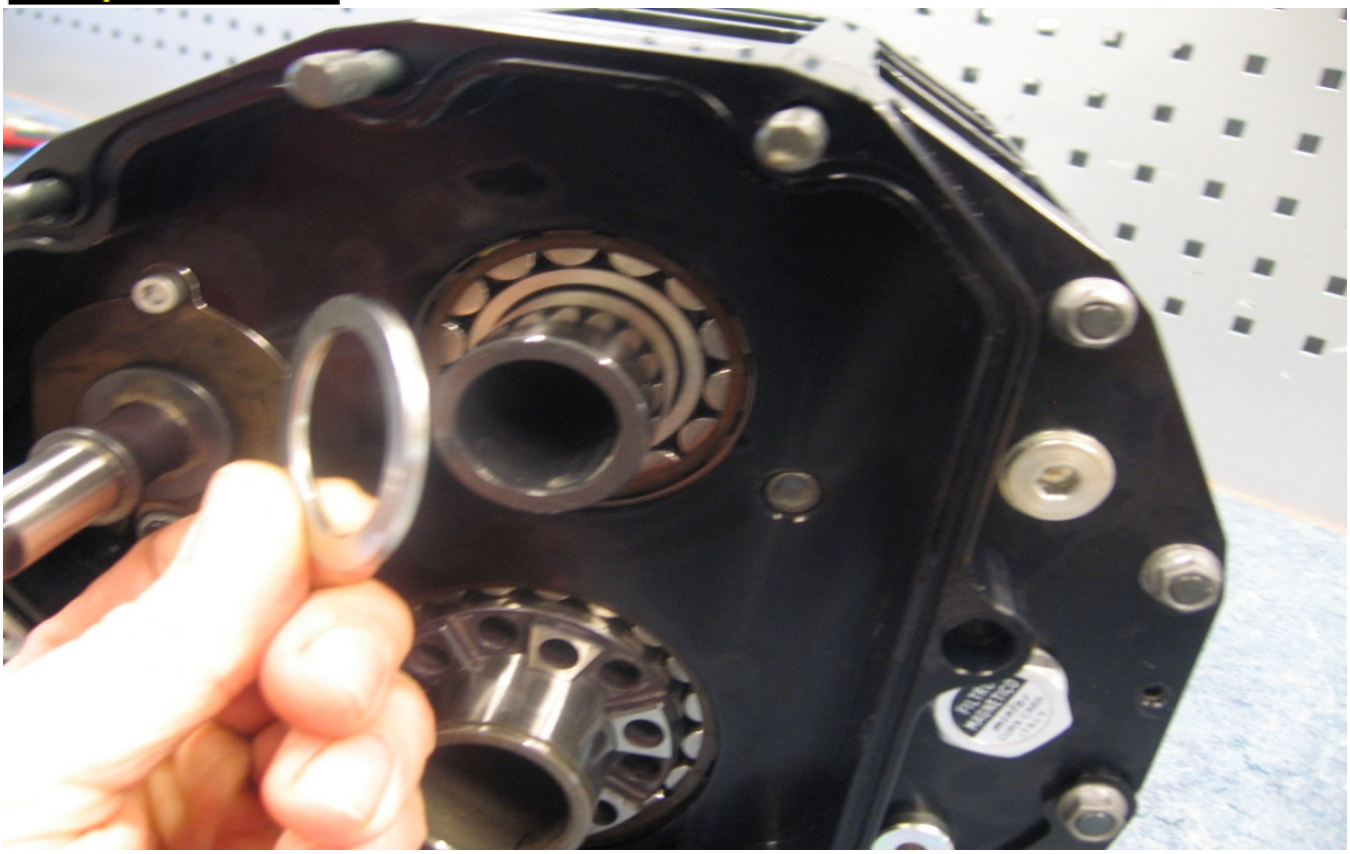


Make sure circlip is not clamped by rear mount

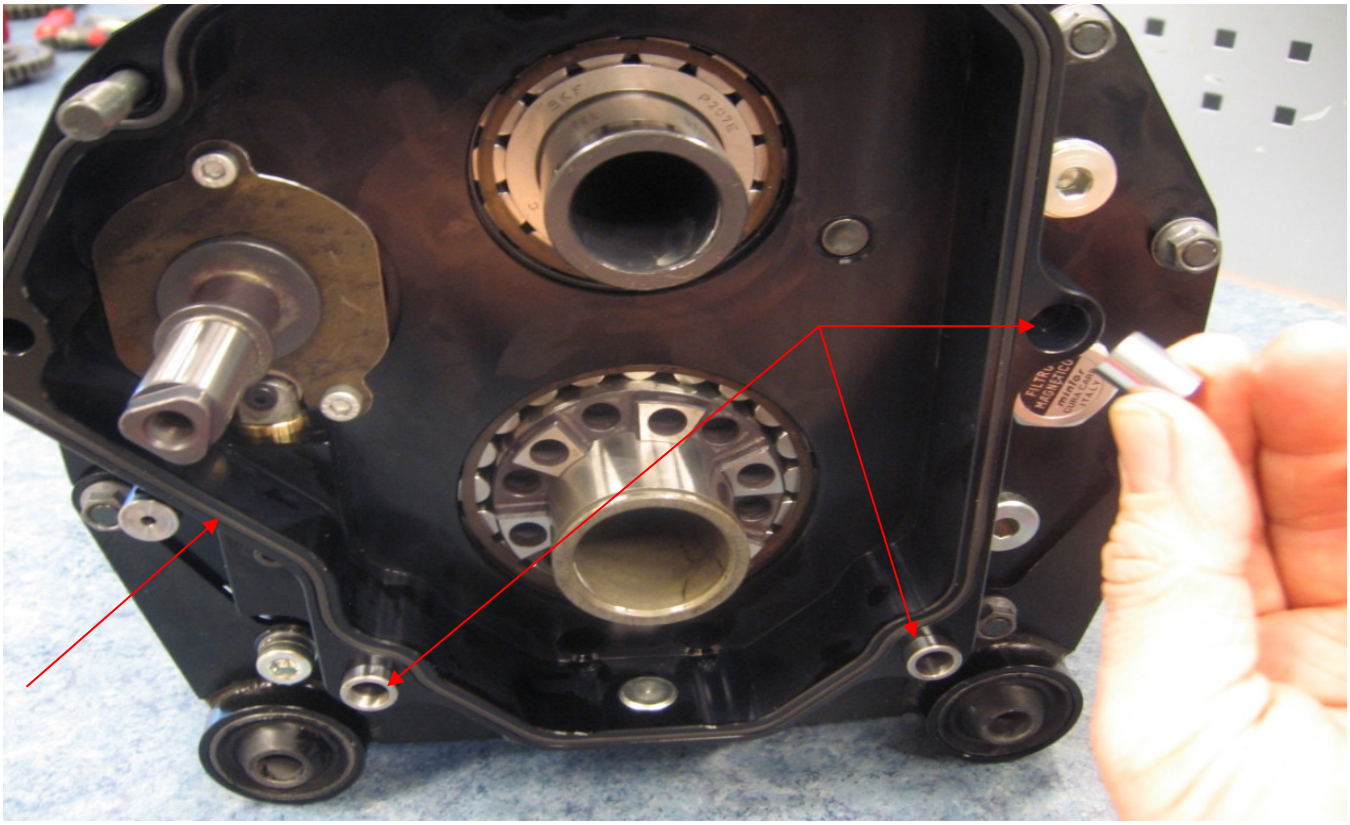
Torque “K” nuts to 20 Nm & Allen screw to 30 Nm



Screw in the jacking screws; lightly nip to prevent falling out.

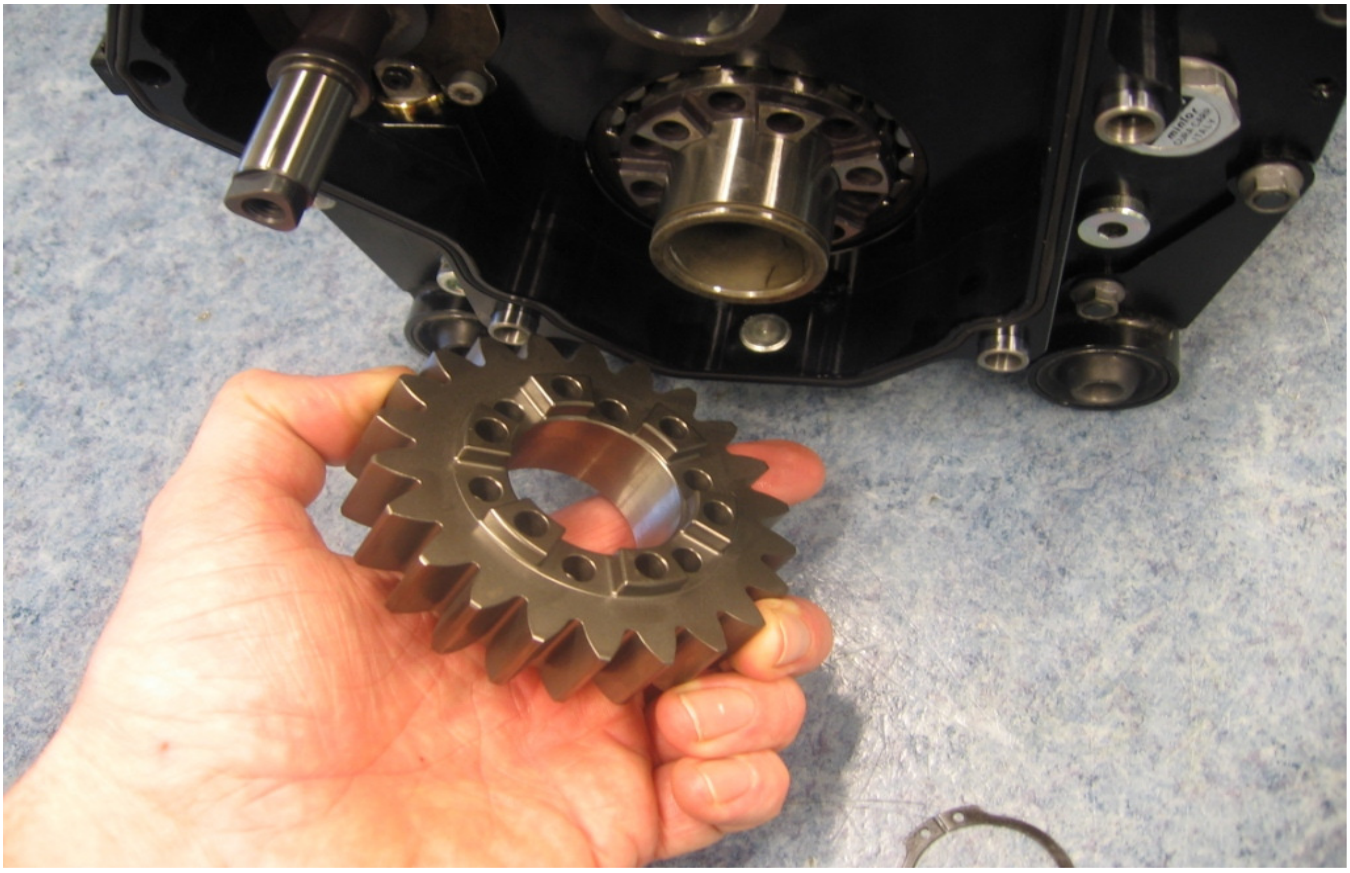


Fit the bearing washer.



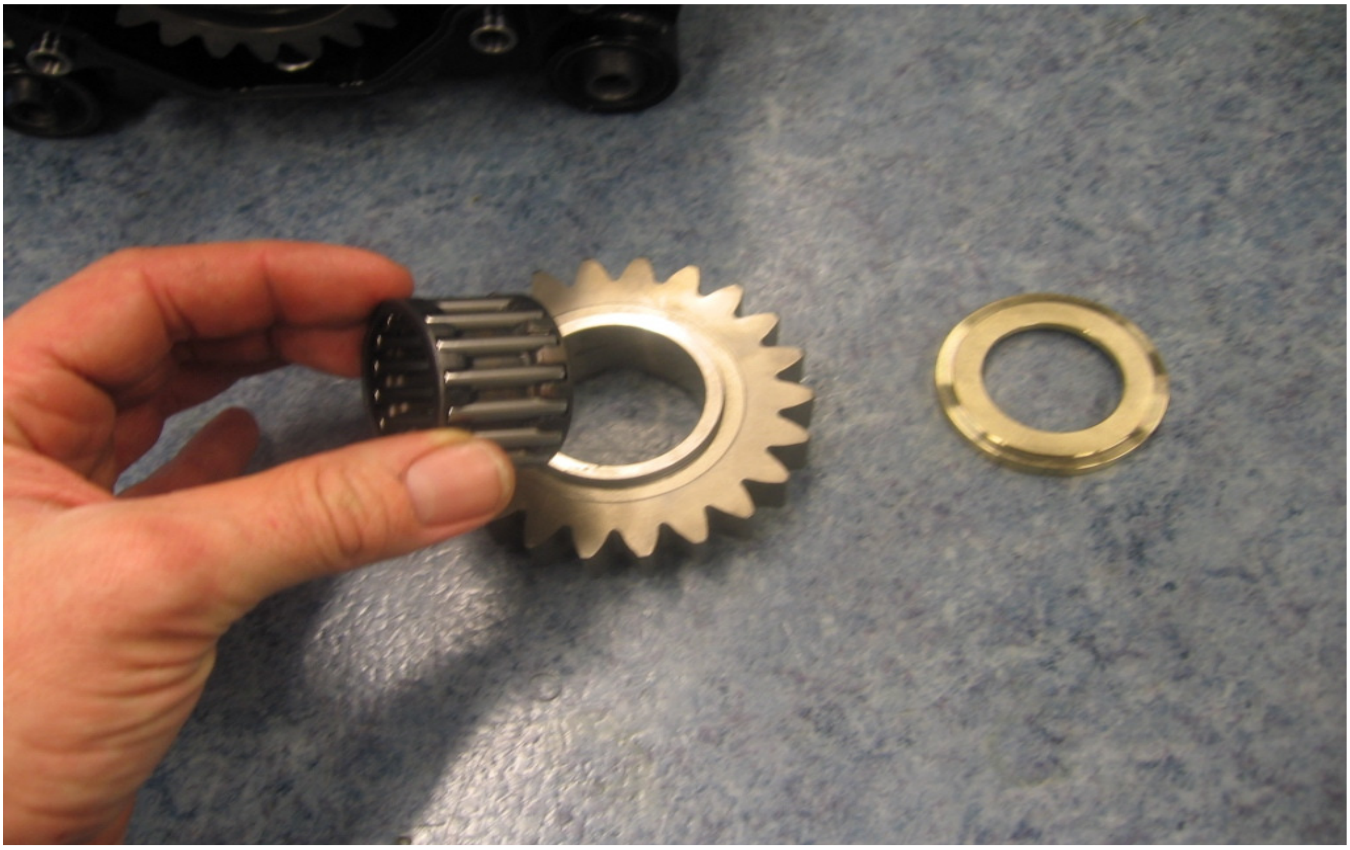
Make sure that the 3 steering dowels are fitted and the 212 x 2.5 mm “O” ring.

Drop gear options, lower drop gear is the same but there is two types of upper gear, the roller bearing type to the right is more for circuit or long distance racing but will replace the needle type (left)



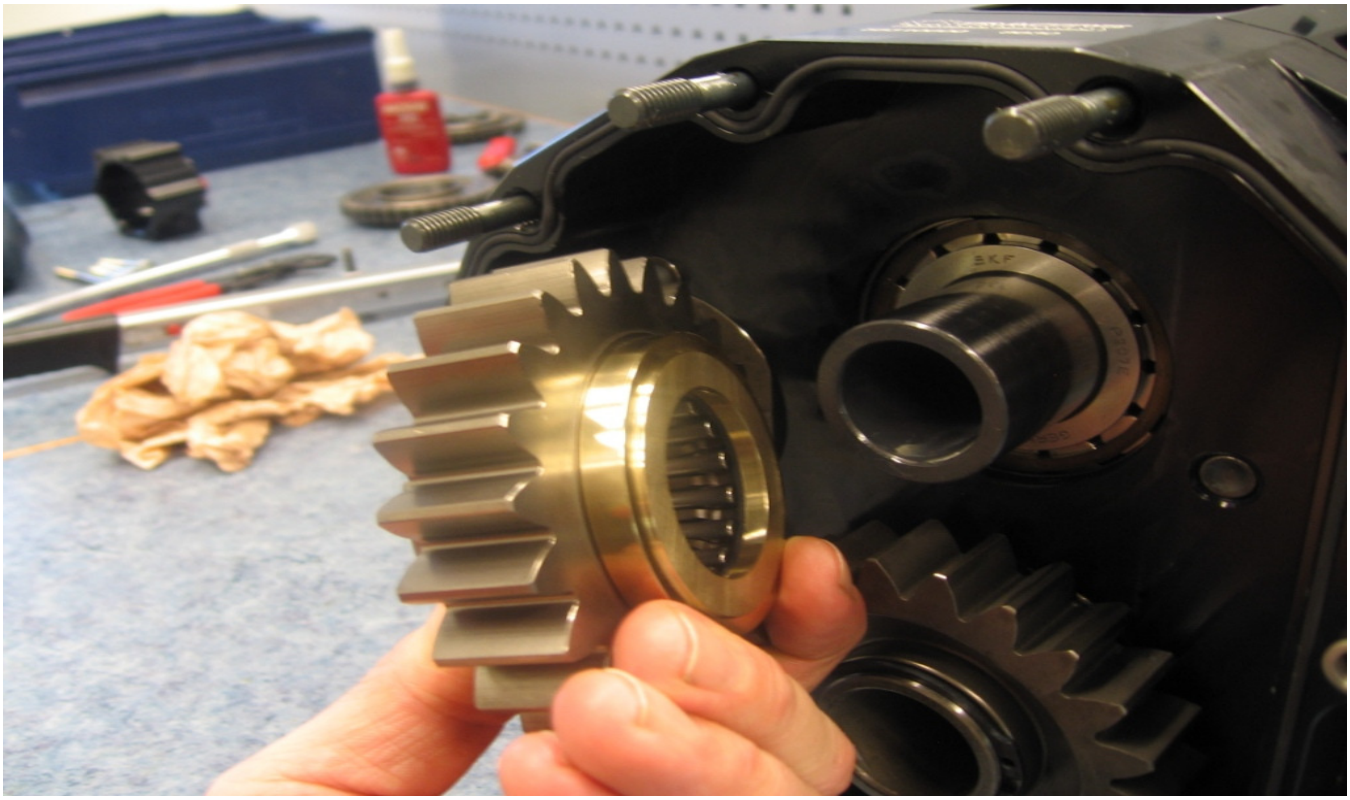
Fit lower drop gear

Fit circlip to lower drop gear, SGA40

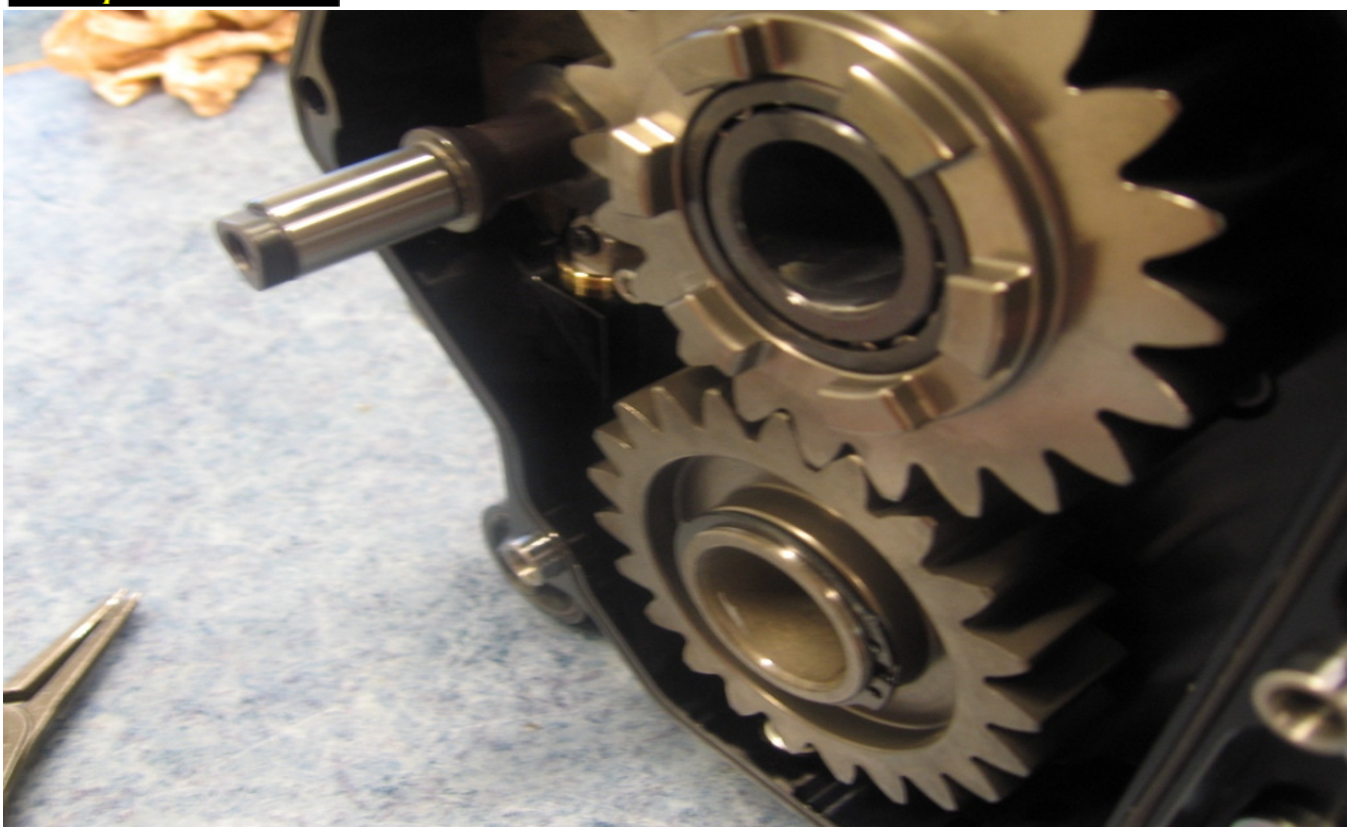


Needle bearing type upper drop gear

Fit bearing and brass thrust washer



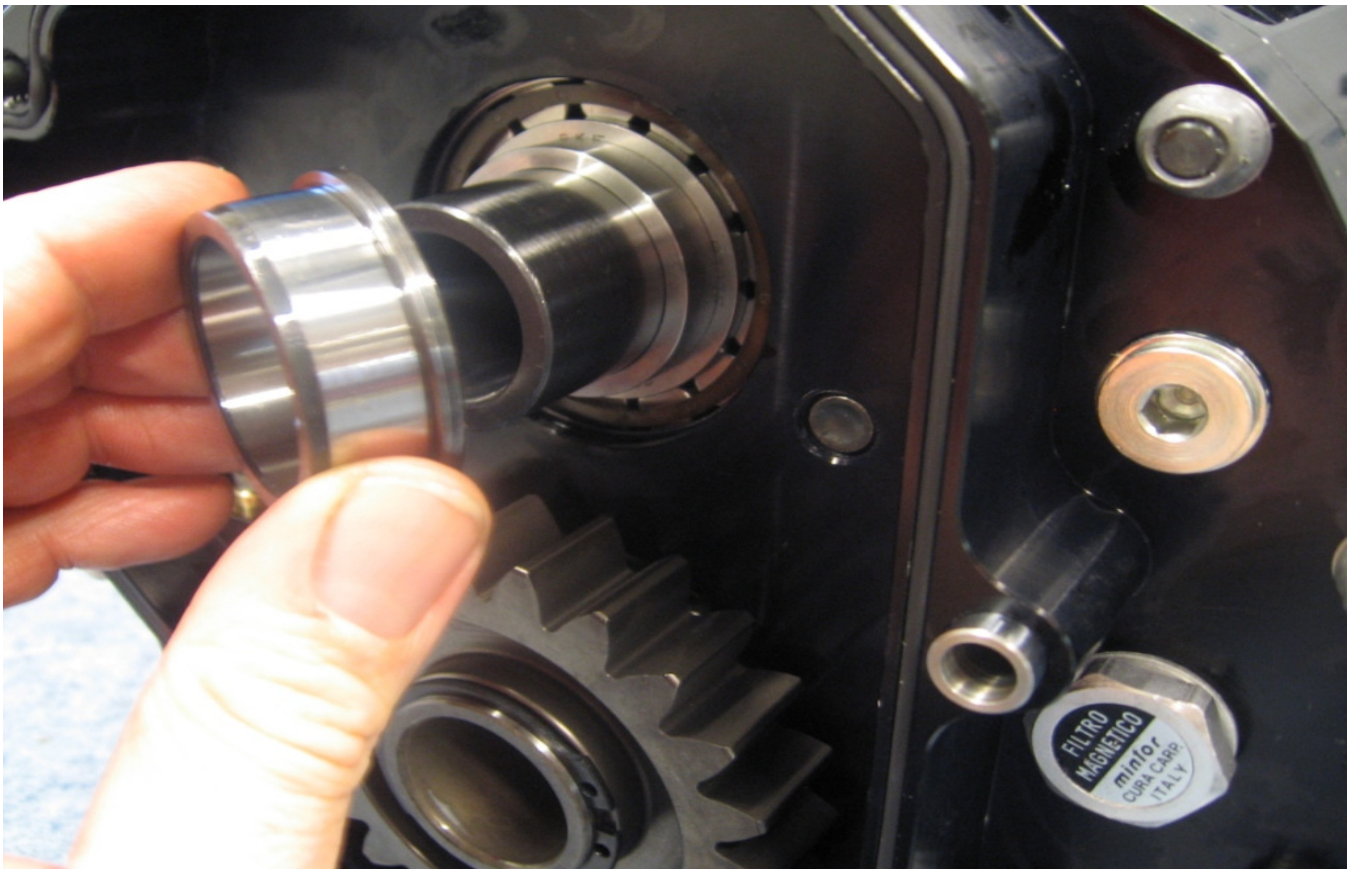
Lubricate and fit to upper shaft.



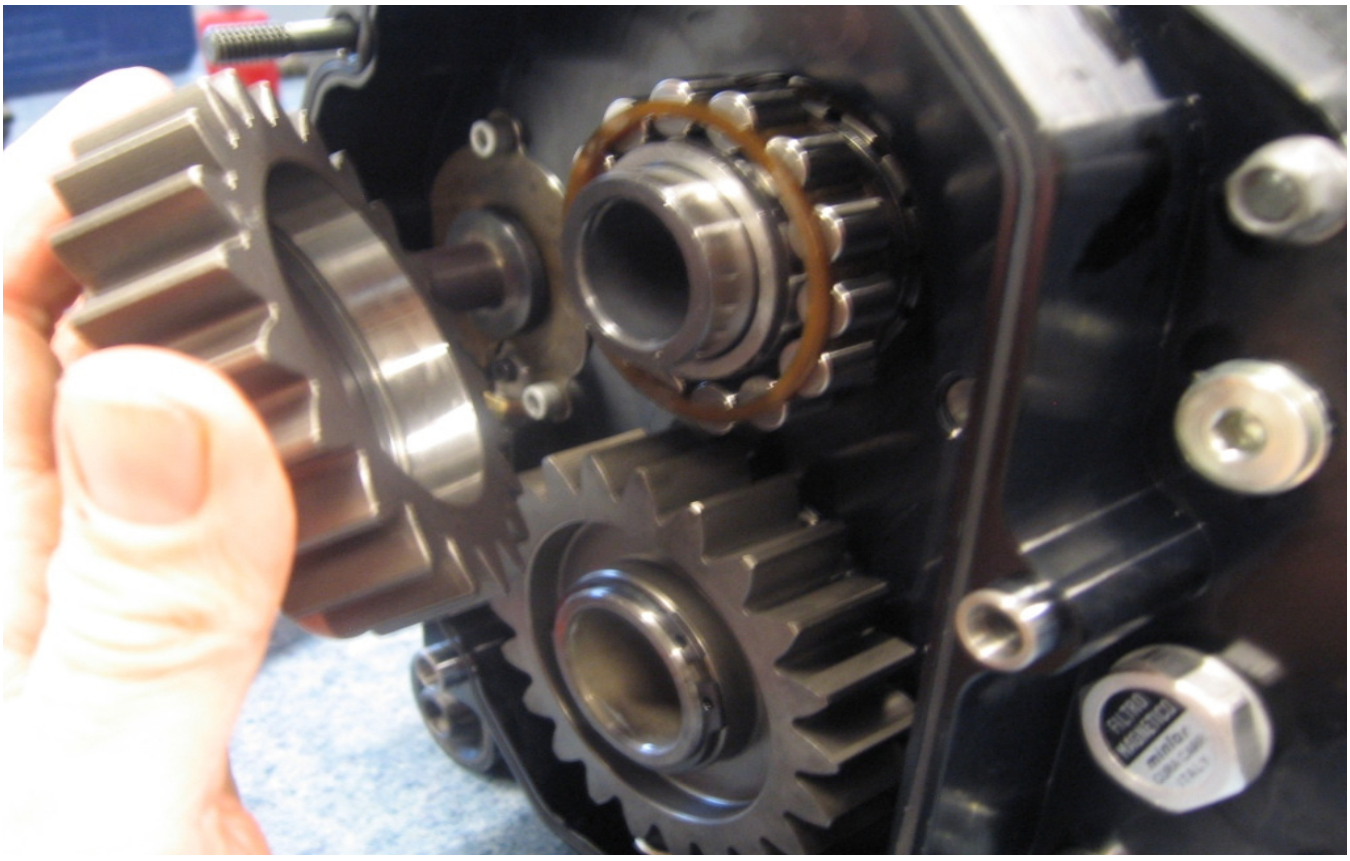
Drop gears fitted

Roller type upper drop gear parts

Fit the 8mm steel spacer to the upper shaft

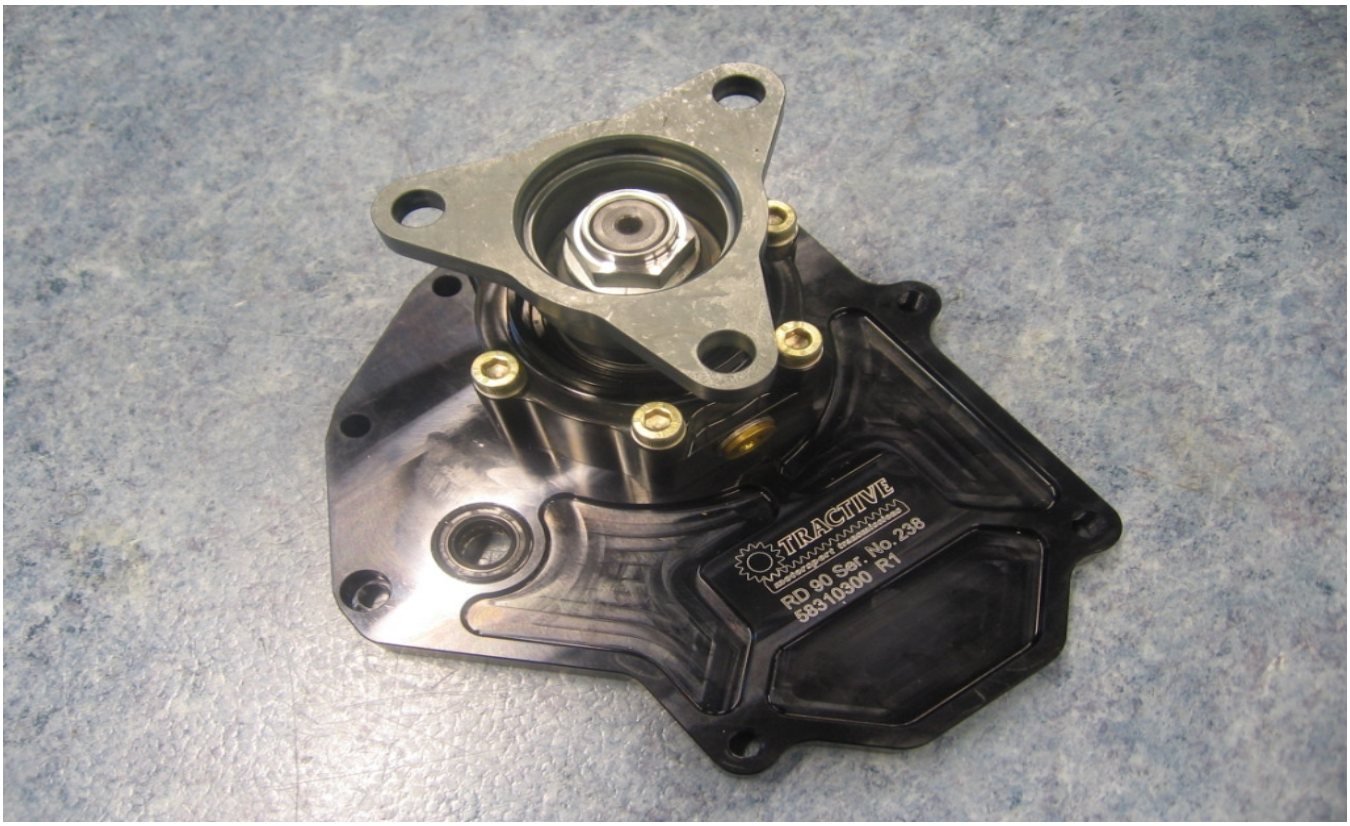


Fit the NJ207 type inner race

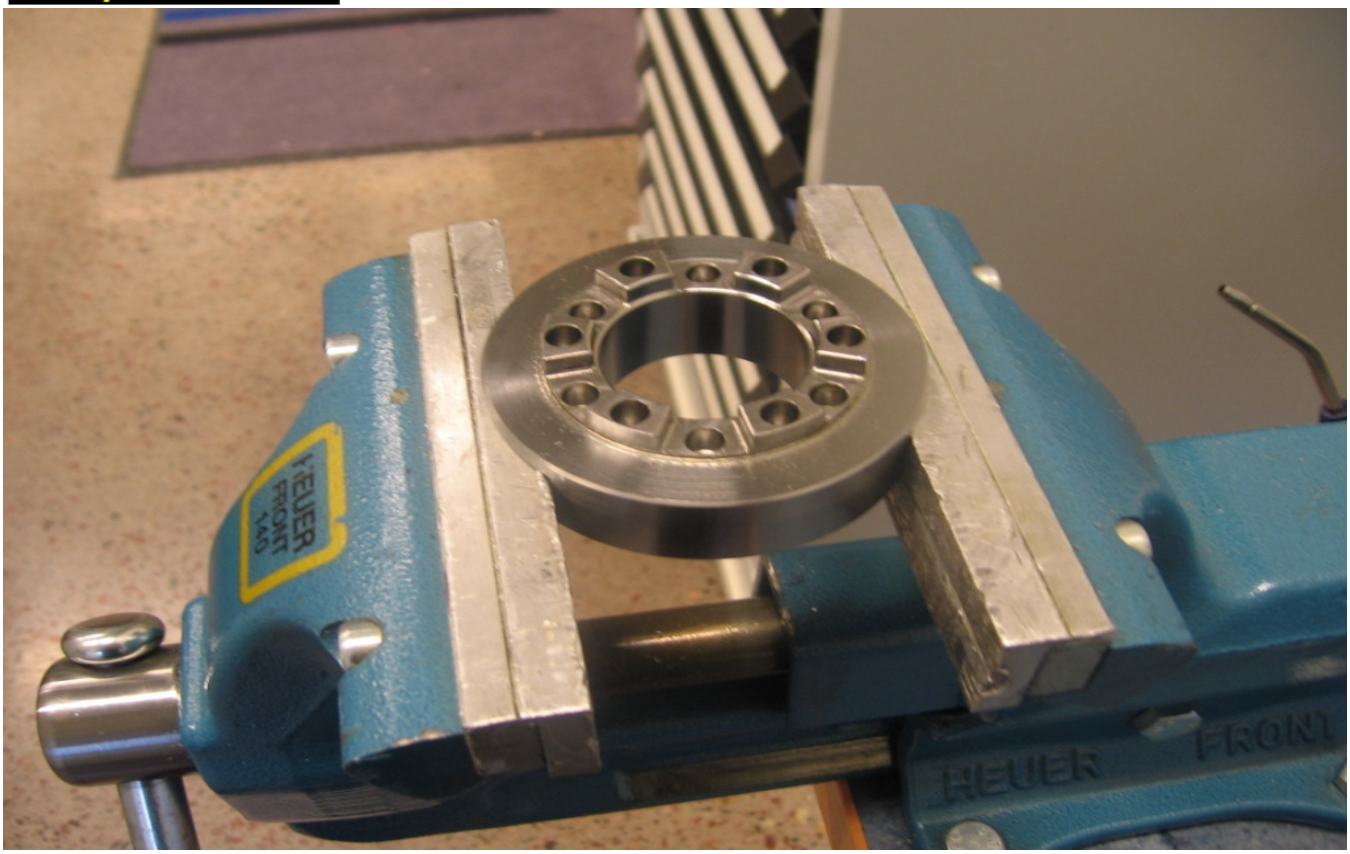


Fit the bearing and gear

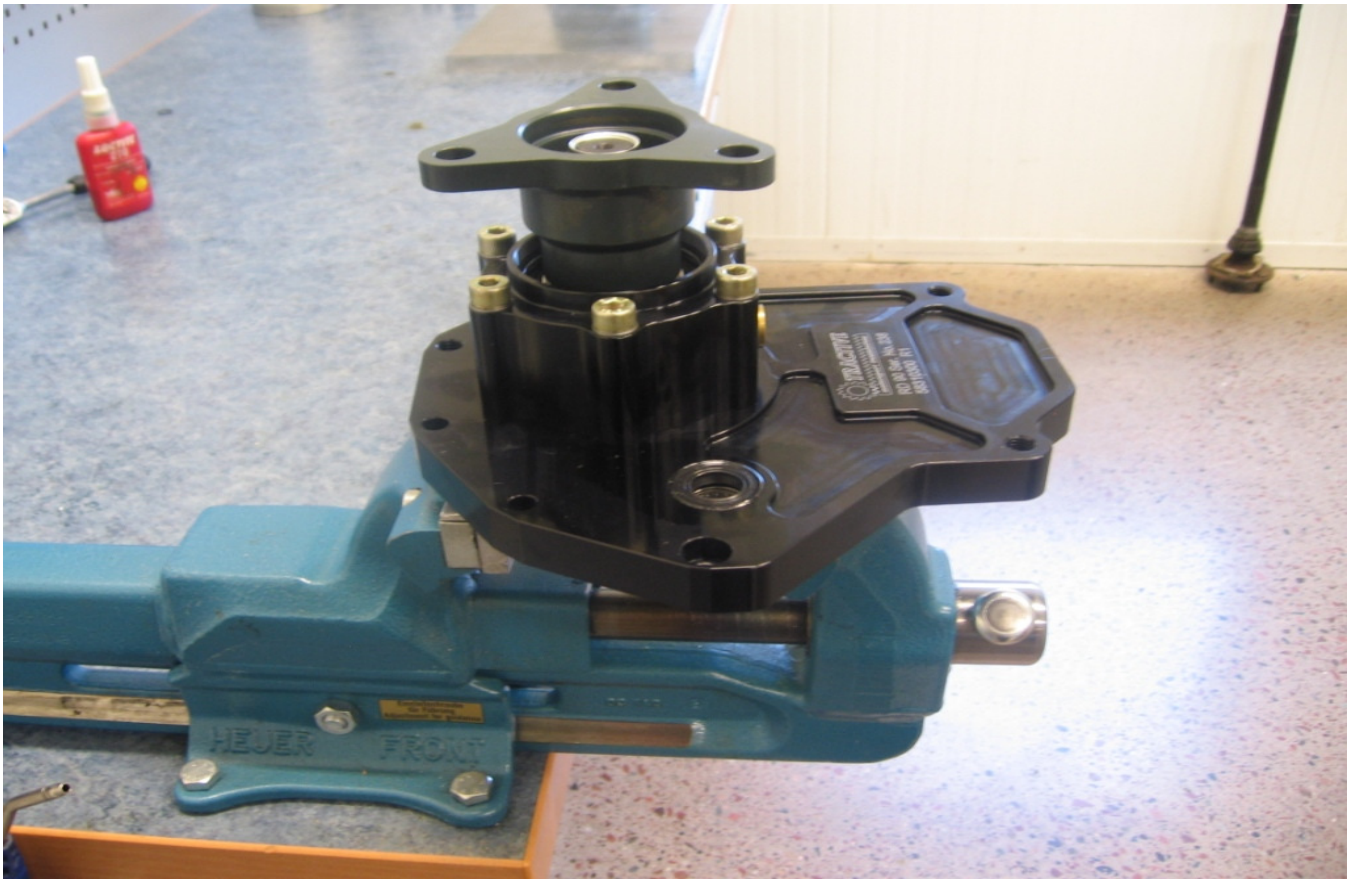
Roller type drop gears fitted.

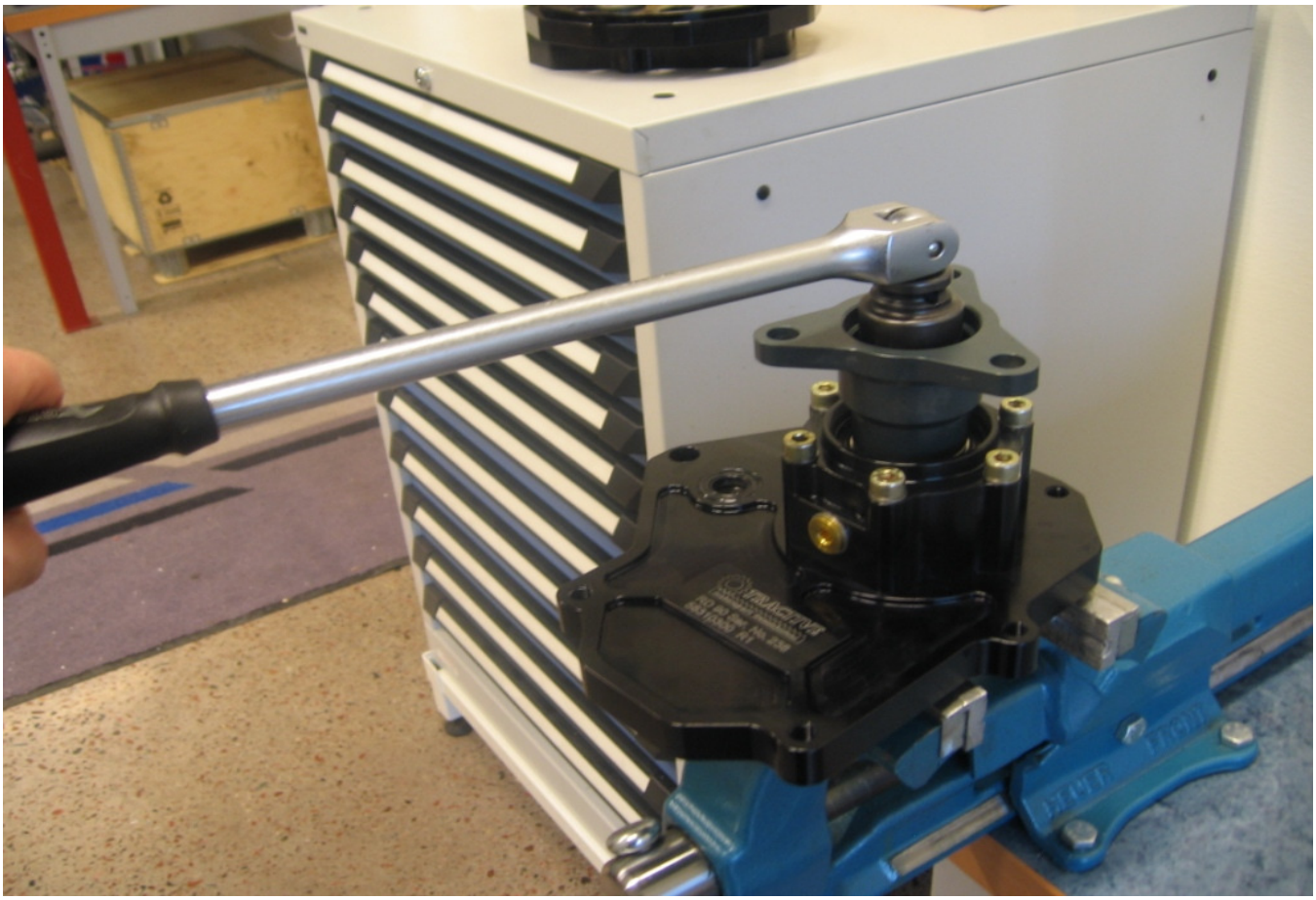


Drop gear cover assembly.



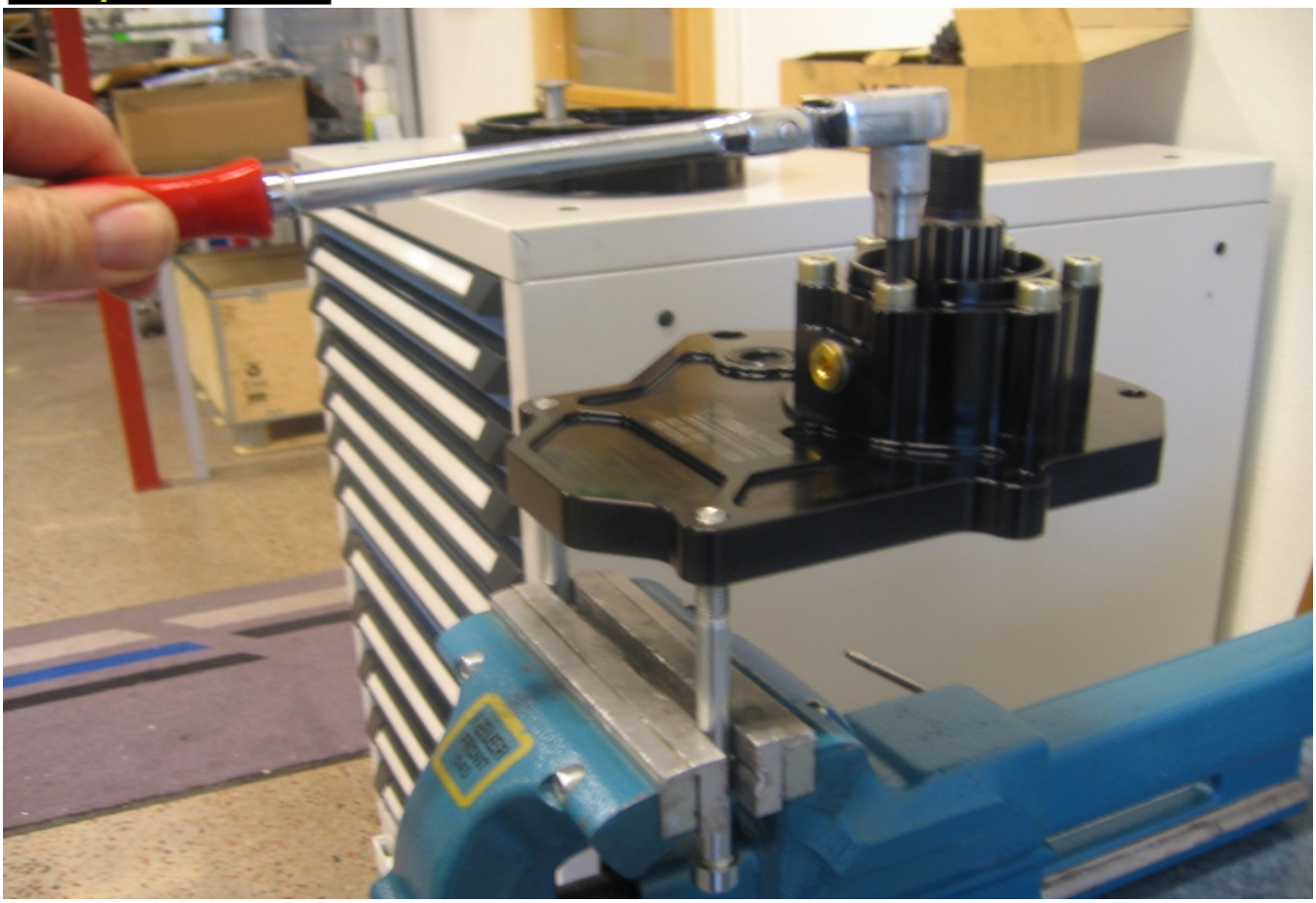
At Tractive we use a special tool for removing and fitting the rear flange although you can use a suitable tool to hold the rear flange



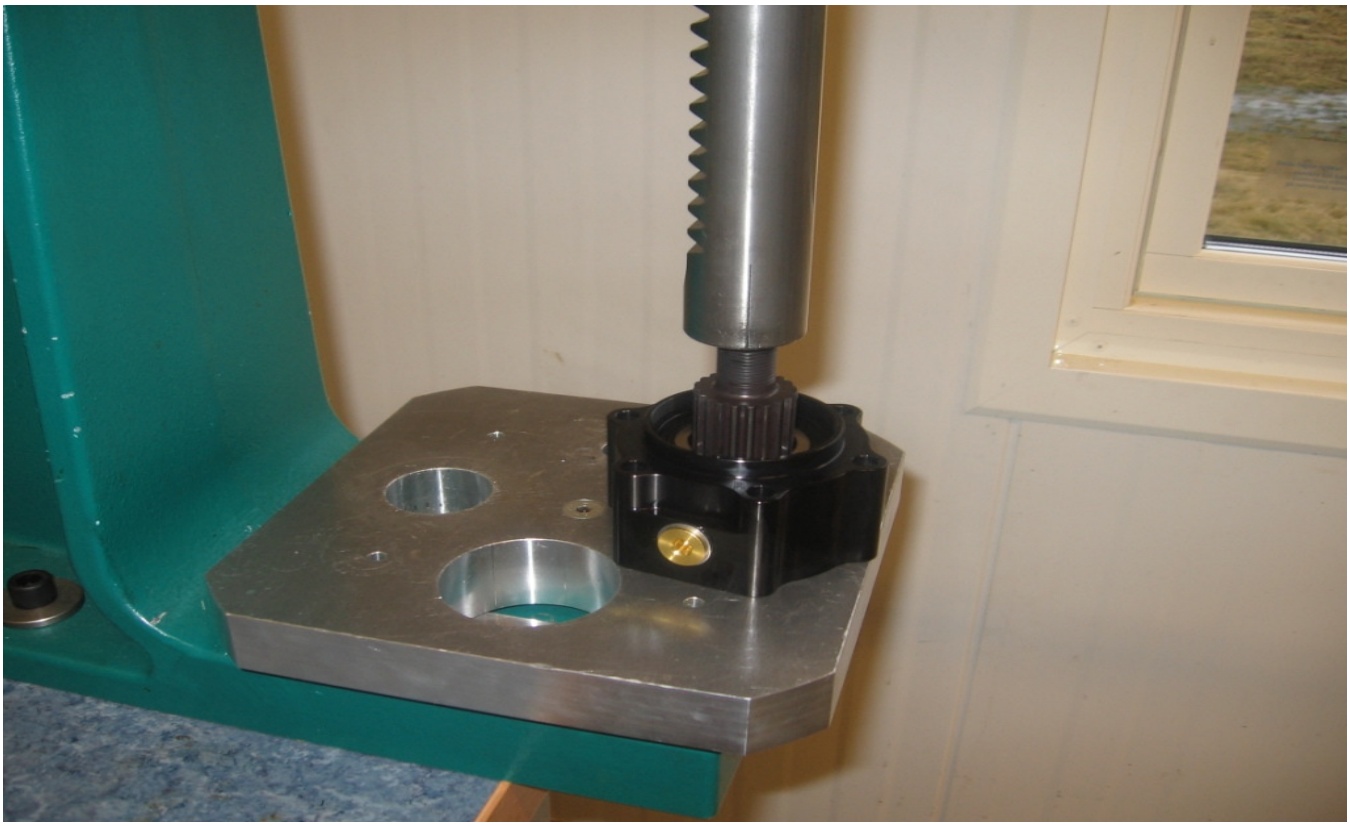


Remove the flange nut with a 27mm socket this may be quite tight! Normal thread.

Rear flange, nut and washer



To remove the flange bearing housing you can use two M10 screws to hold the assembly, remove the six Allen screws.



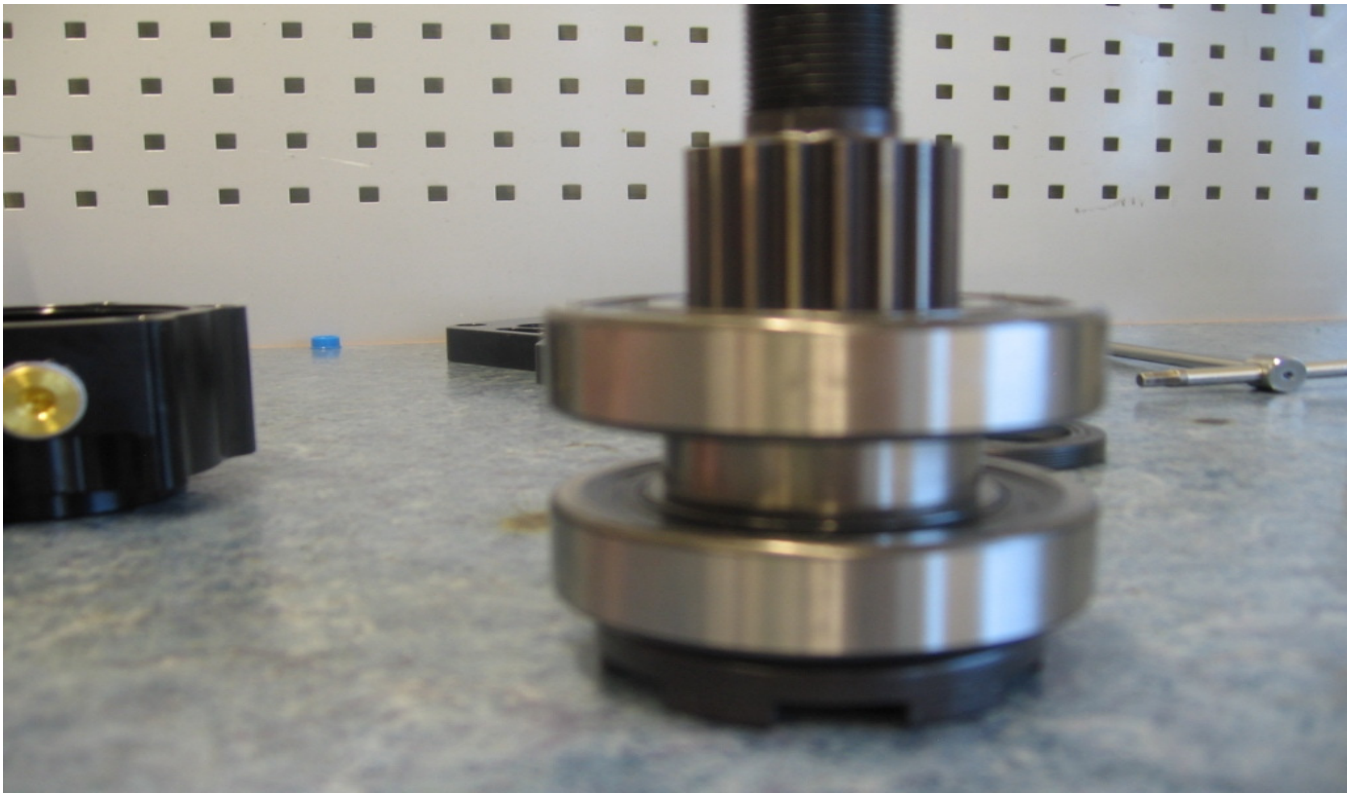
Press out the output shaft from the bearings

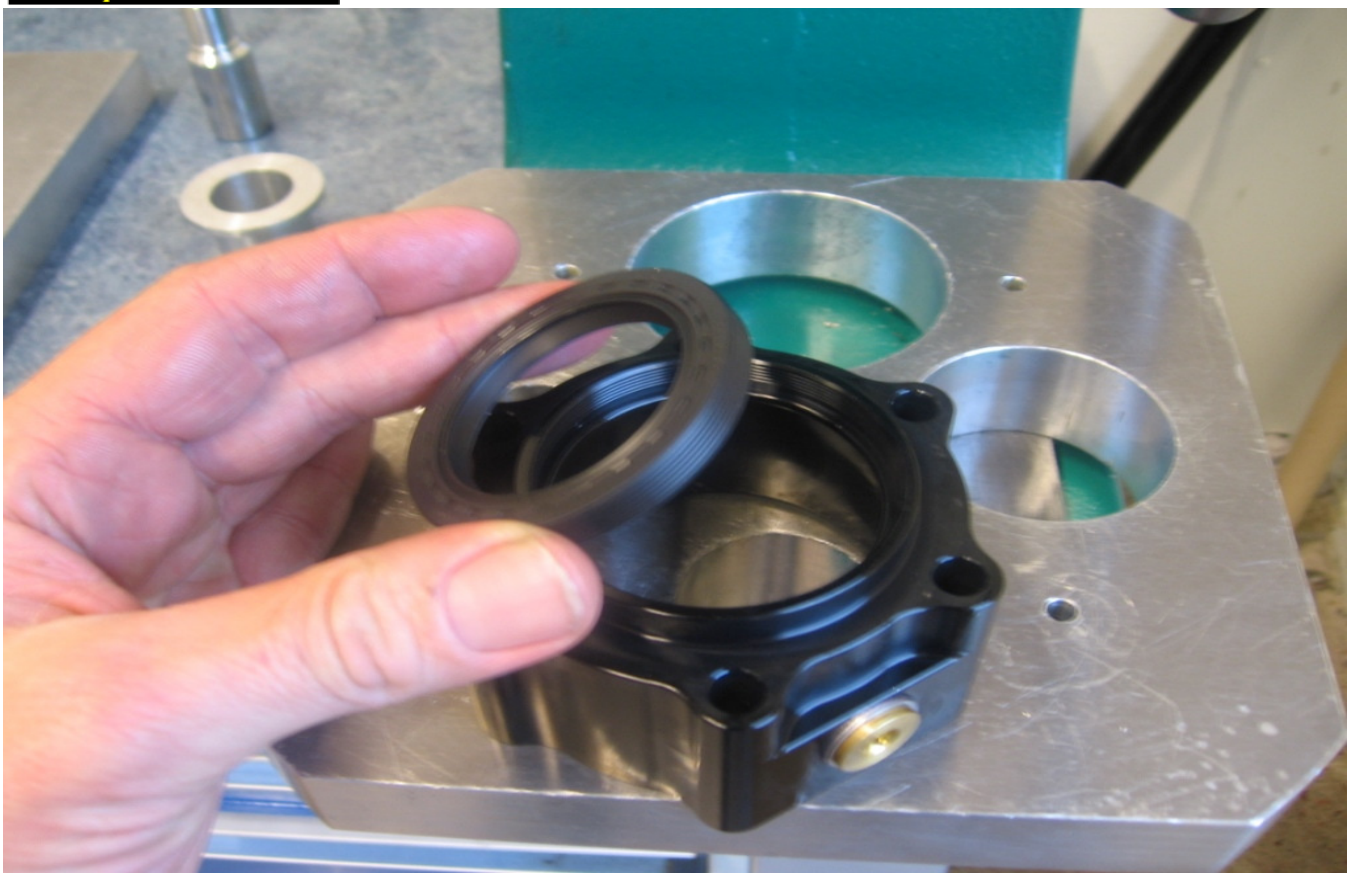
Output shaft assembly parts

To assemble press on one of the bearings to the output shaft

Fit bearing spacer

Press on the other bearing

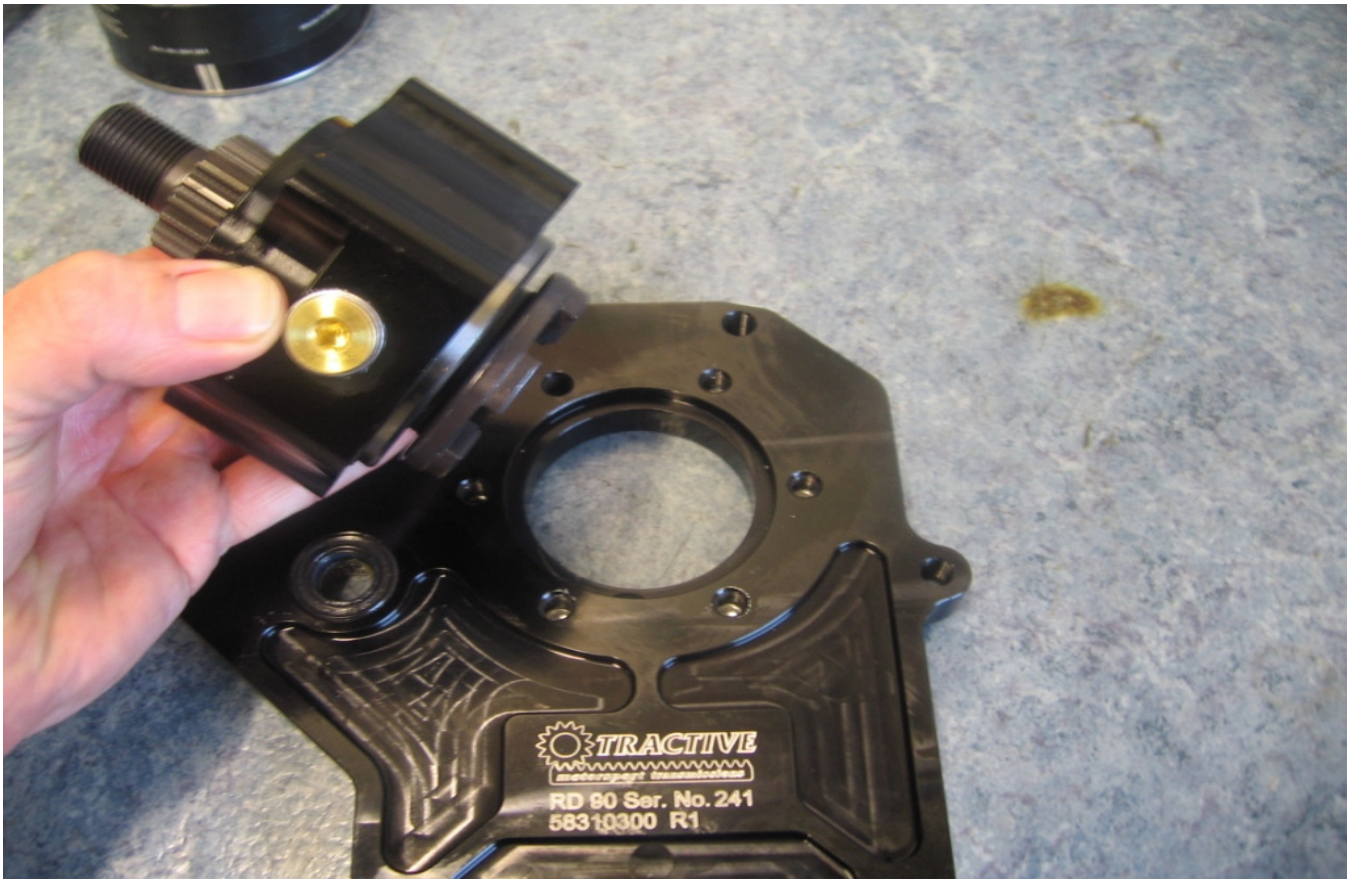




Fit the correct seal

Press in the flange assembly to the bearing housing.

Fit “O” ring 72 x 2

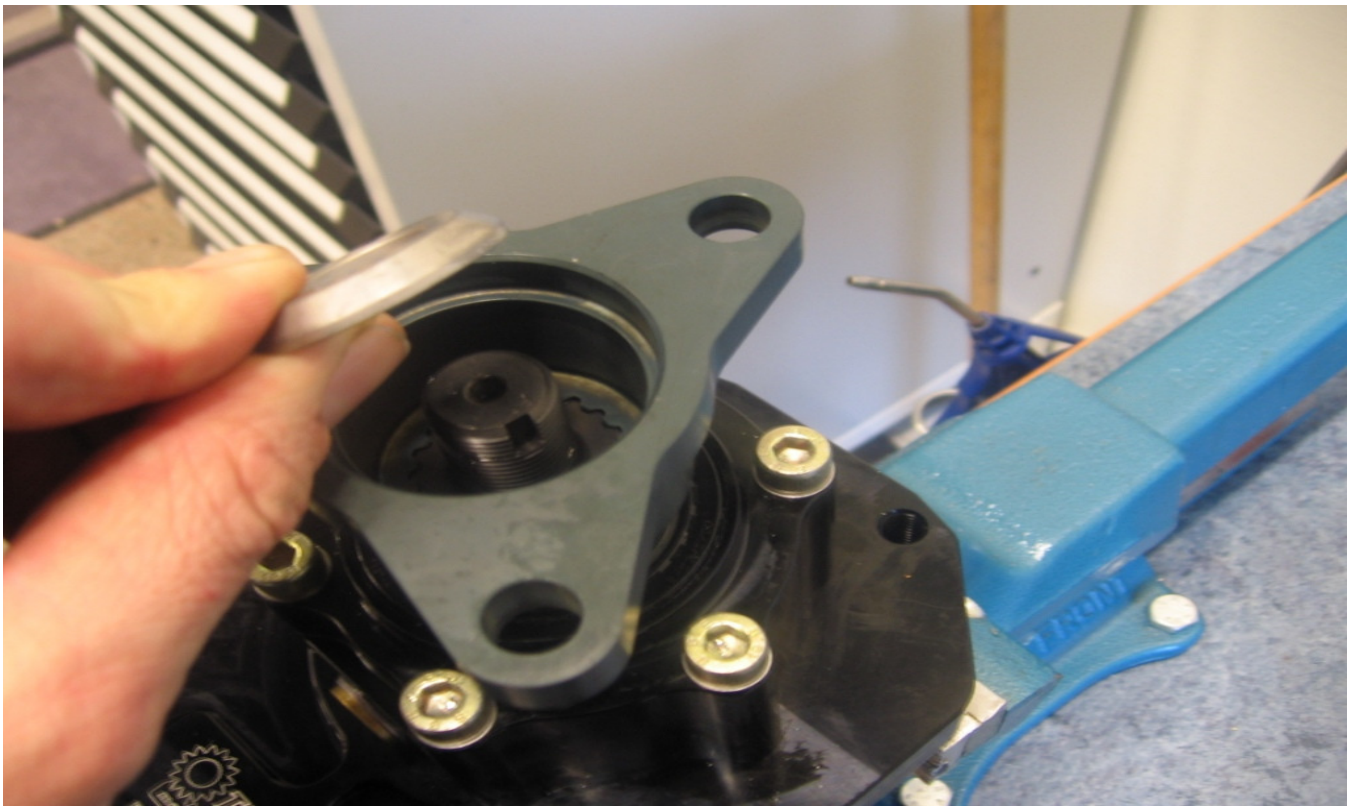


Fit the flange housing assembly to the drop gear cover, blanking screw down.

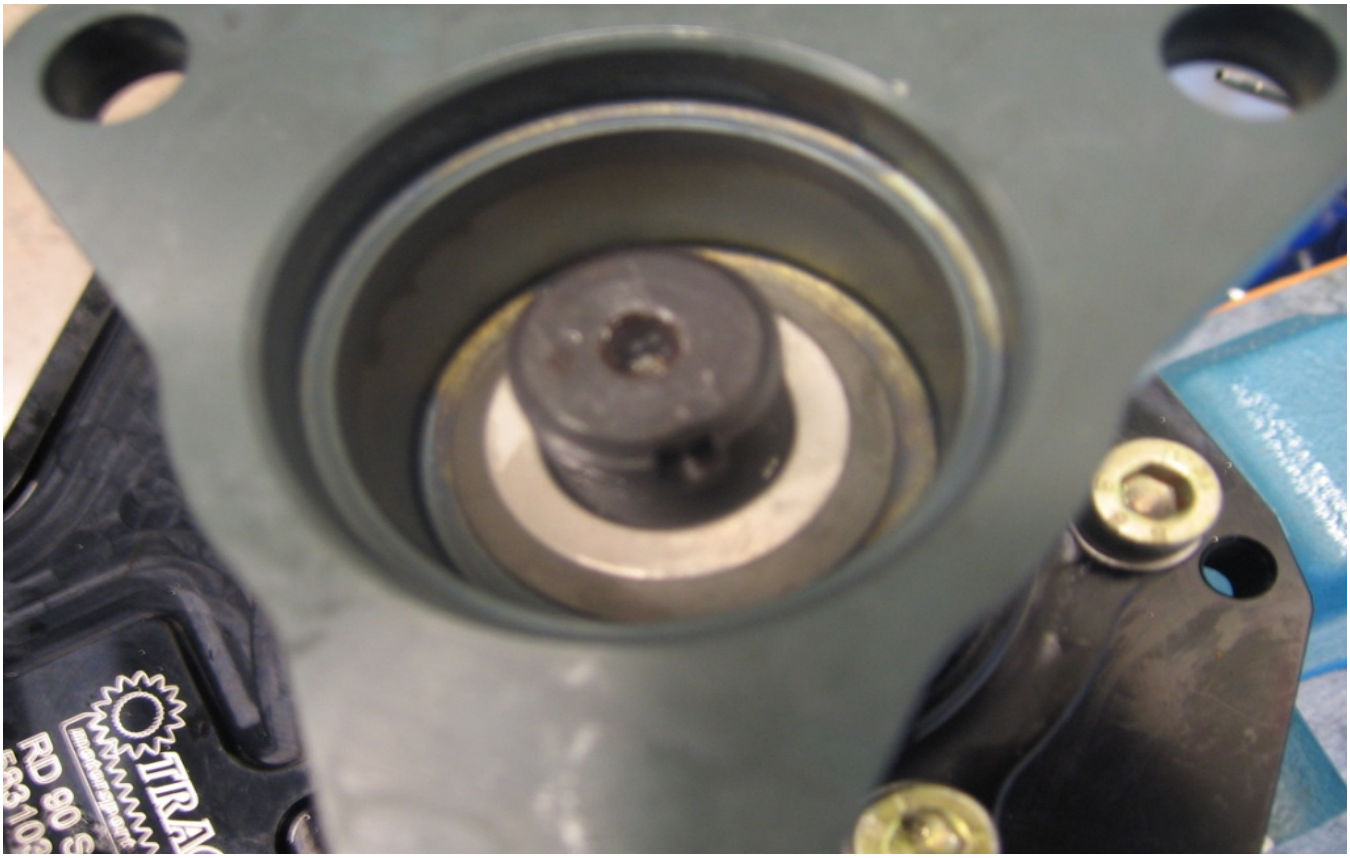
Torque the six bolts to 36 Nm

Apply 270 Loctite to the threads of the output flange (make sure threads are free of oil and grease)

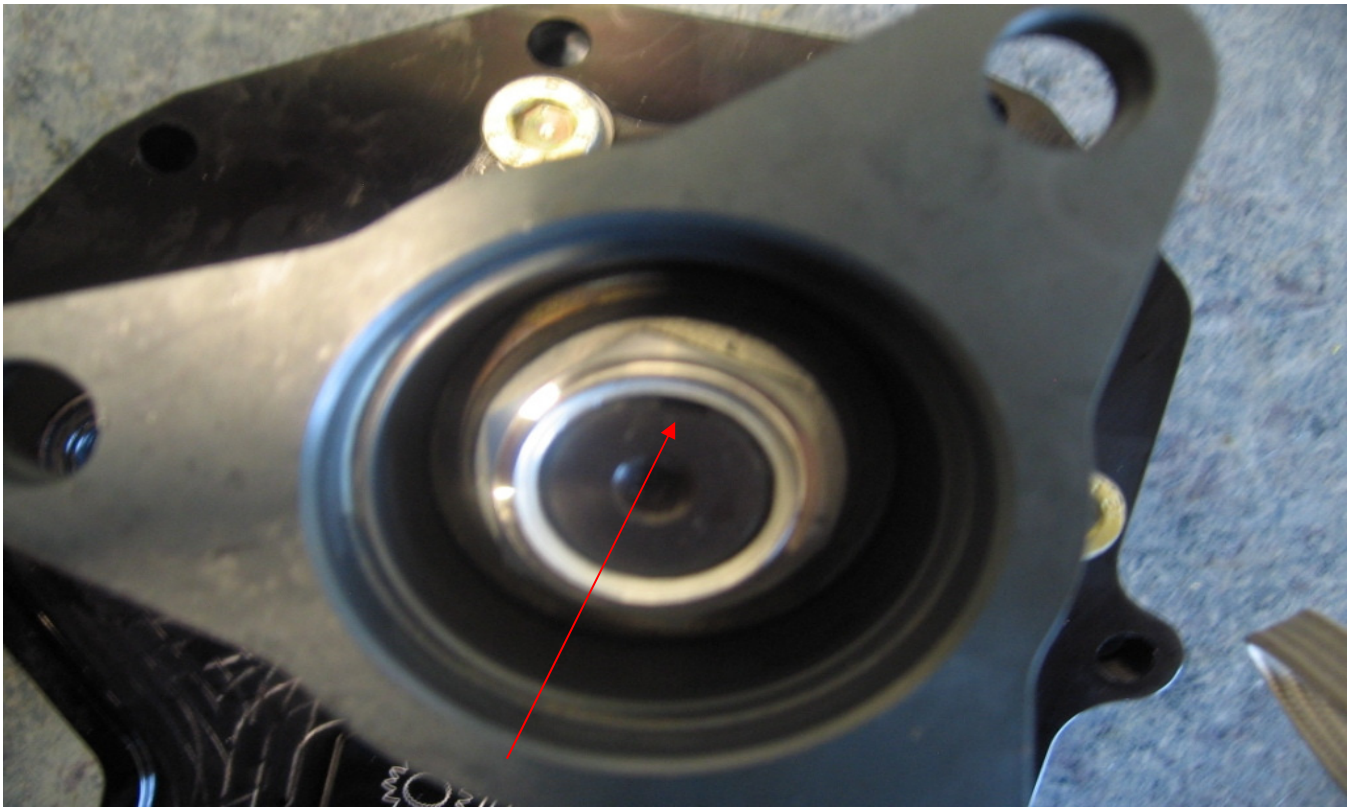
Fit the rear flange



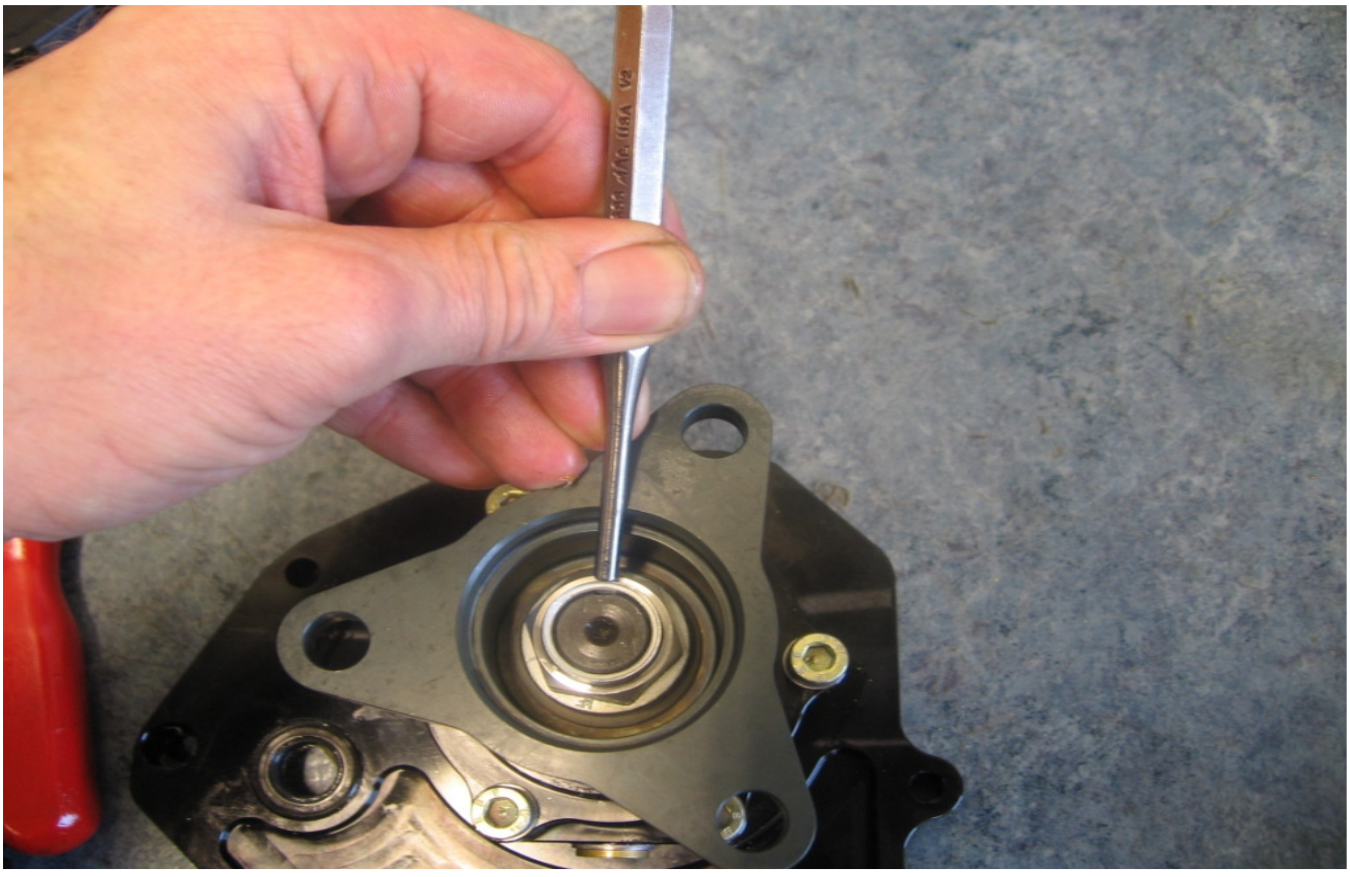
Fit the washer

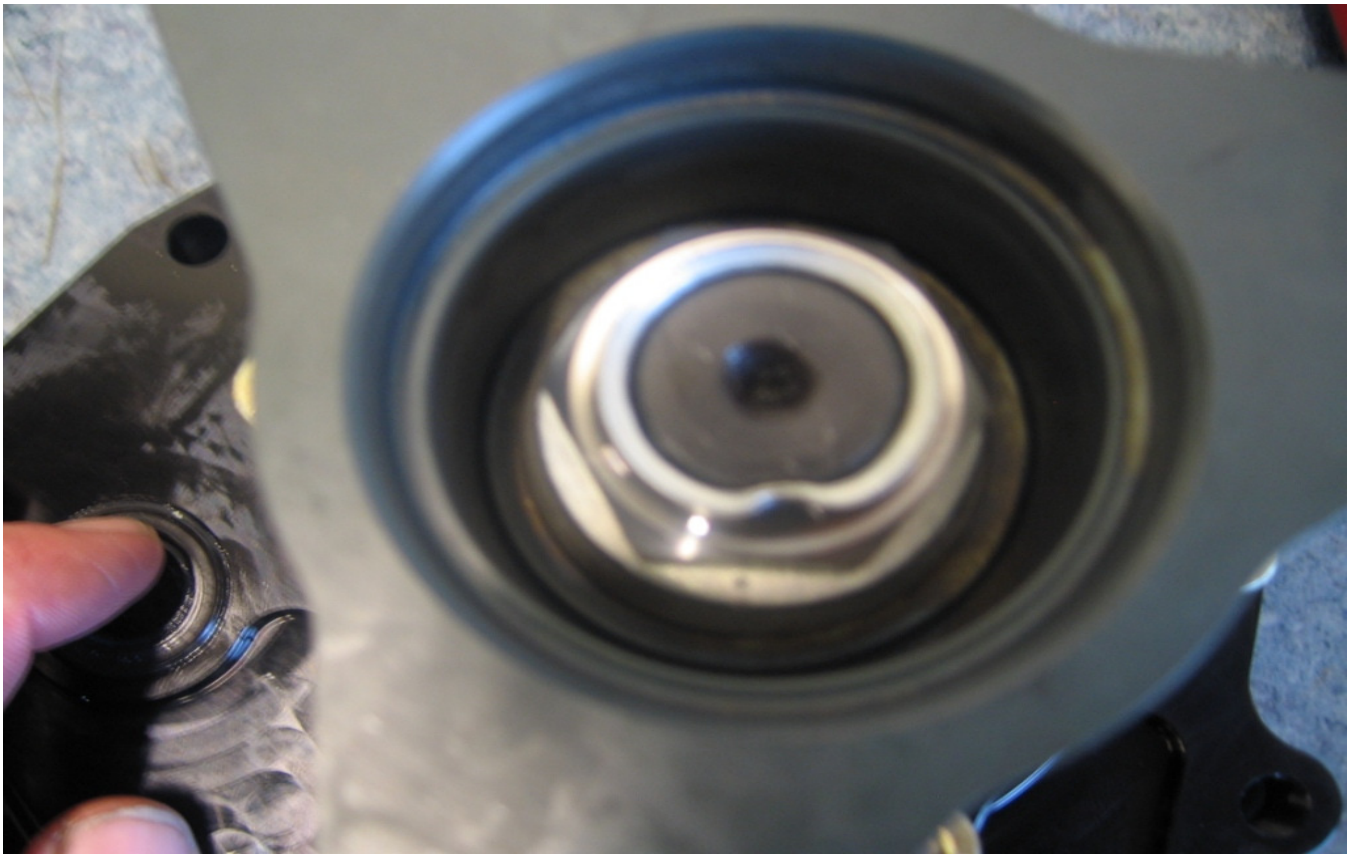


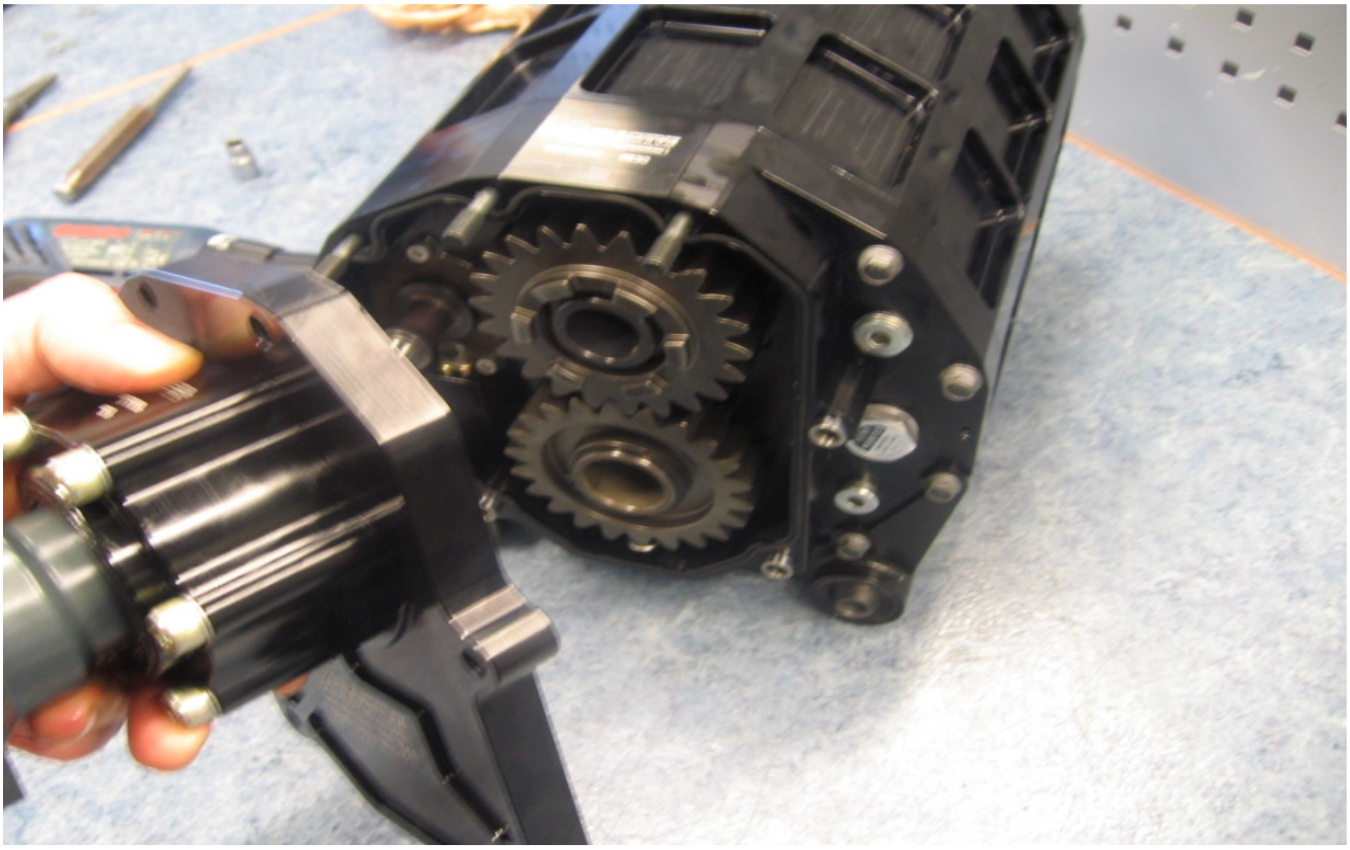
Torque nut to 200 Nm



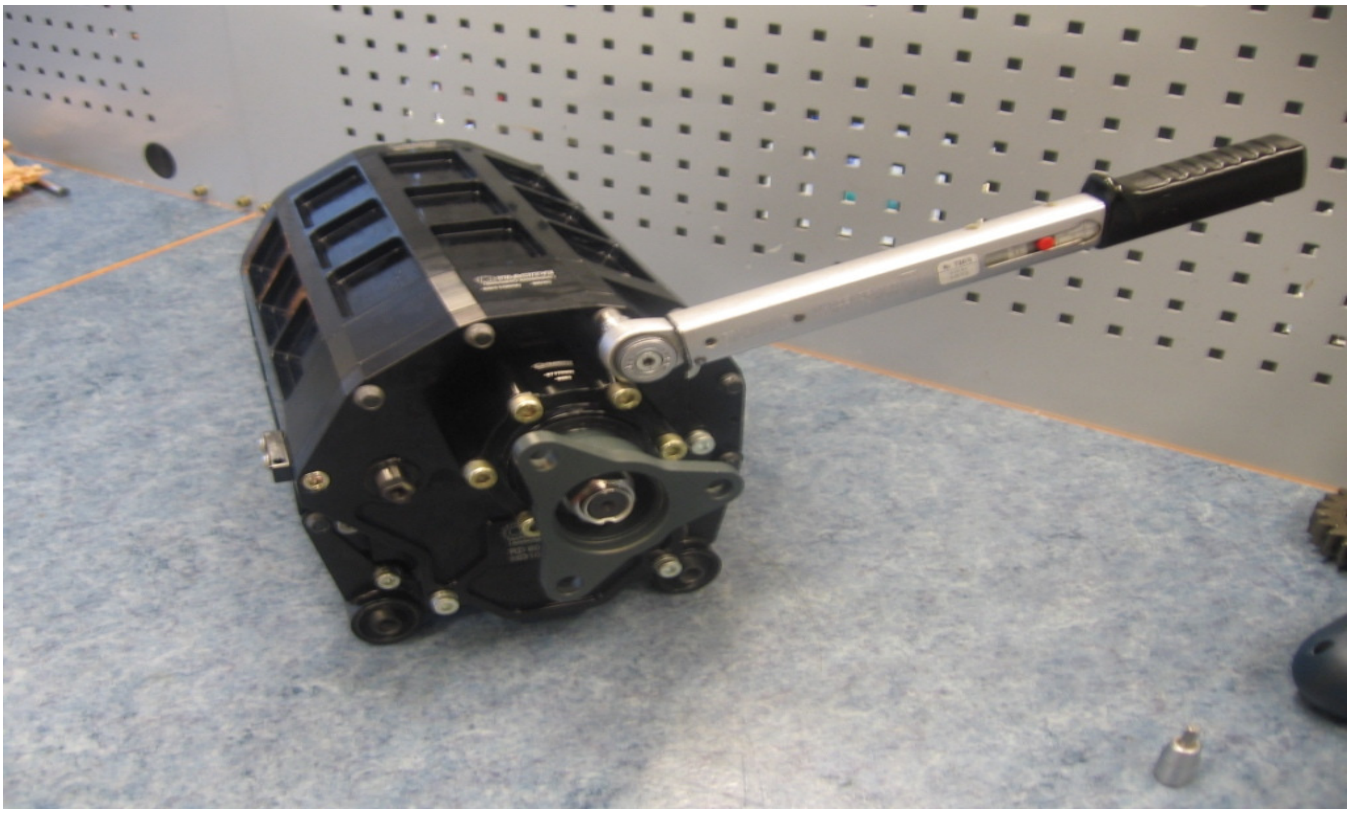
Later versions have a cut out in output shaft so nut can be peened.



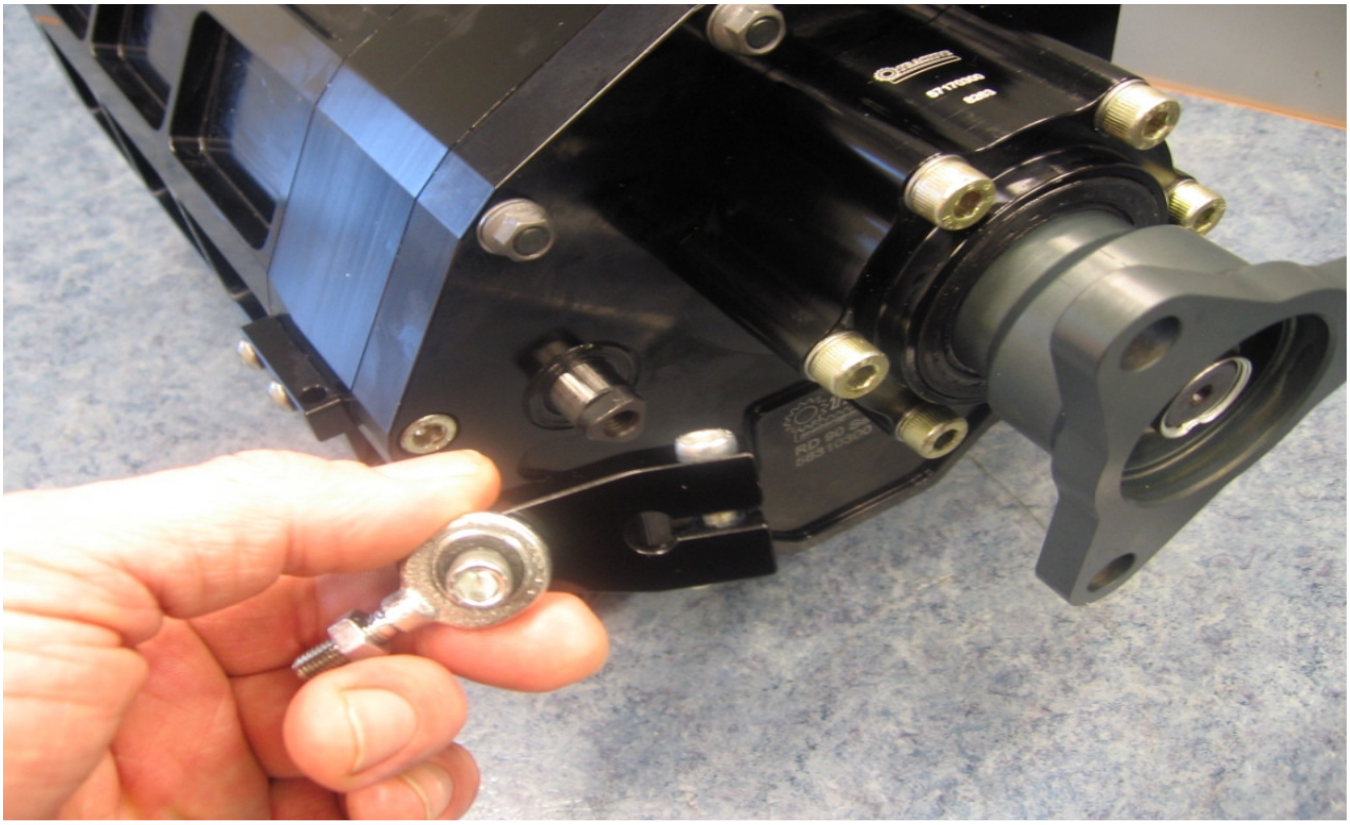




Fit the drop gear cover

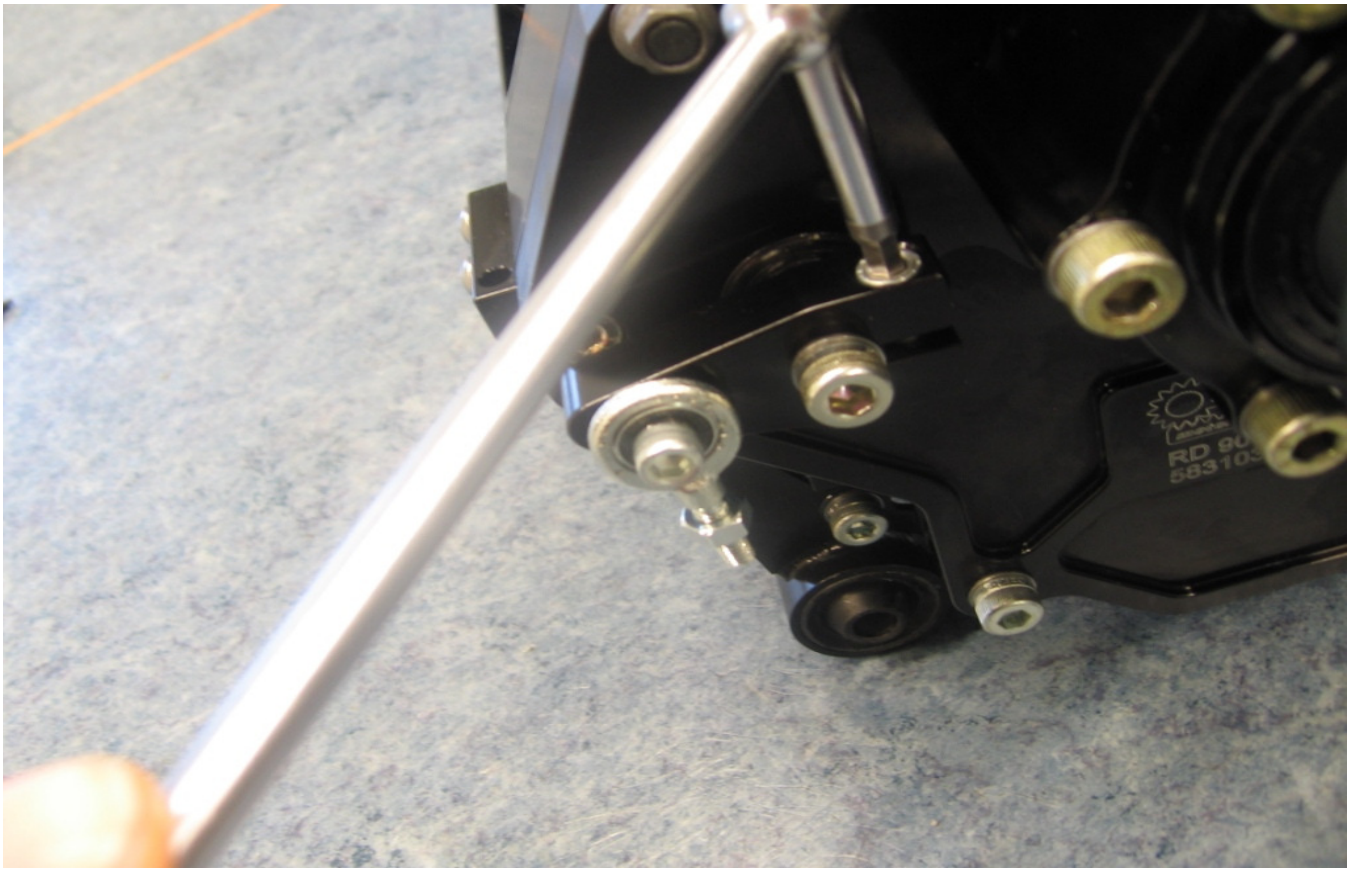


Torque the 3 upper “K” nuts to 18 Nm and the four Allen screws to 30 Nm

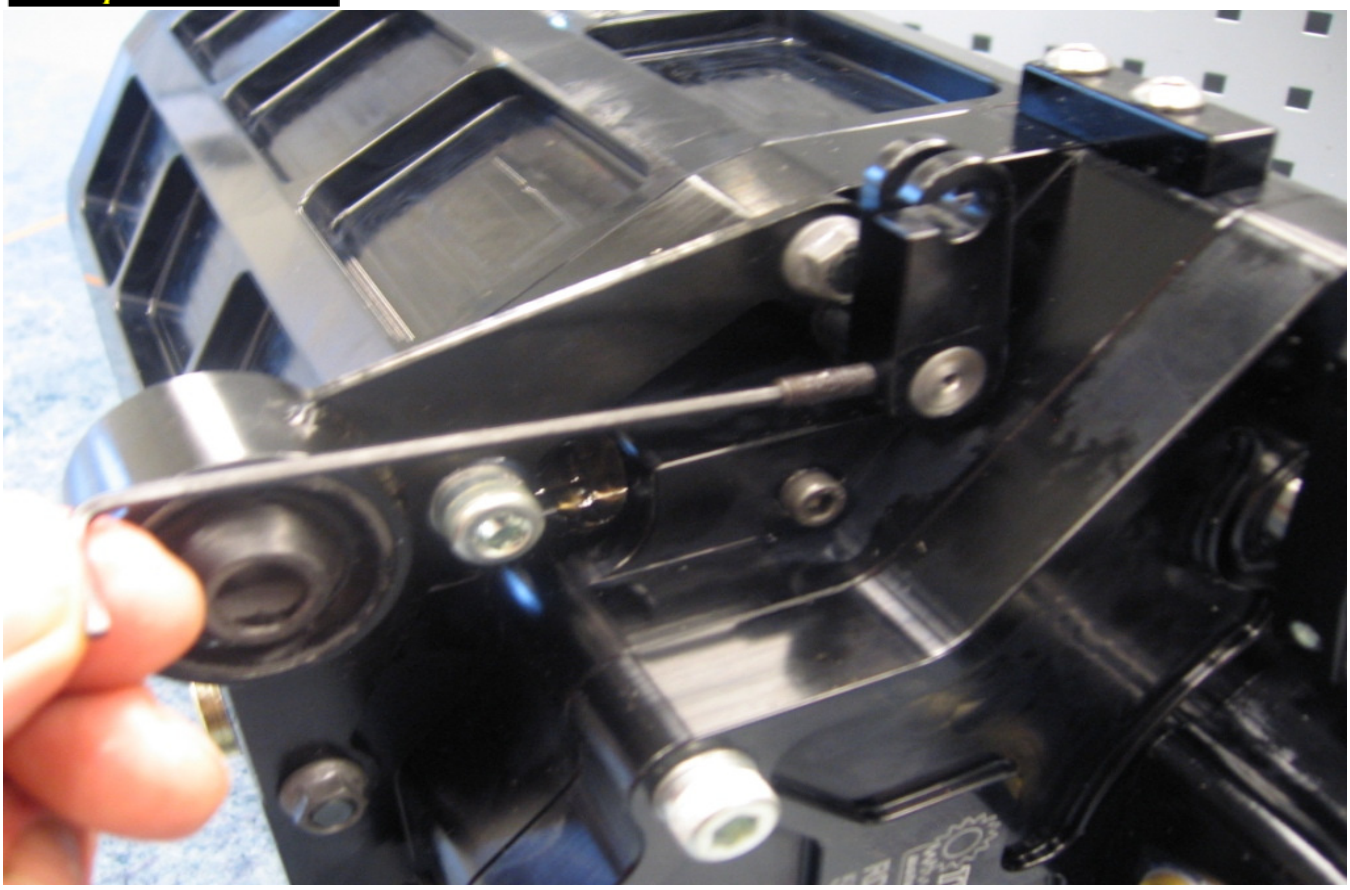


Fit the selector lever

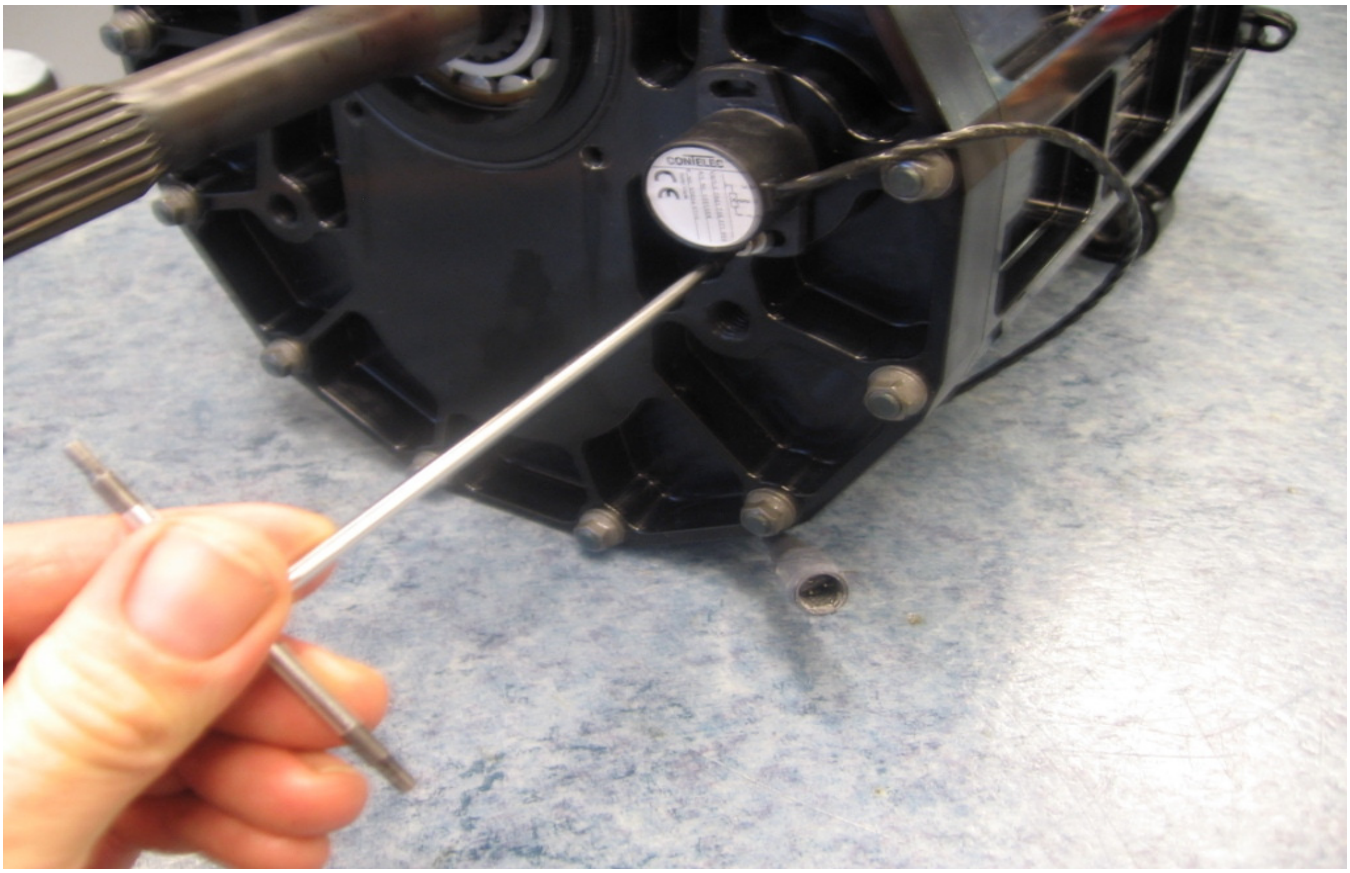
Tighten the M8 screw first



Tighten the pinch bolt, not too hard otherwise the lever will crack on threads.



Fit the neutral reverse arm, (2,5 mm Allen key)



Fit the potentiometer in correct position.