

IVECO 55S17W TRANSFER CASE from MY2009

LOW RANGE CIRCLIP MODIFICATION TO PREVENT CATASTROPHIC FAILURE IN-SITU PROCEDURE

Read Complete Instructions before starting.

Transfer cases affected include all Australian delivered versions, MY2006 have an earlier TC version that does not suffer circlip failure.

CAUTION, Any modification not authorised by Iveco Australia may result in warranty invalidation, approval was granted by Iveco to have this solution carried out under their supervision in one case, although they deem the solution un-necessary.

The procedure describes the process with Transfer Case still mounted in truck. If you have Aftermarket Fuel Tank the rear crossmember mount bolts may be inaccessible due to tank location. It is less labour intensive to remove complete Transfer Case from truck than to move some fuel tanks enough to access crossmember bolts. If removing a fuel tank ensure it is empty (due to weight) In the case of complete TC removal, note it is approx 60kg, you will need suitable transmission cradle & jacking equipment.

1 Pressure wash around Transfer Case, including inside & outside of chassis rails where rear crossmember attaches.

2 Park truck on Level ground. Chock wheels. Handbrake off. Gearbox in neutral.

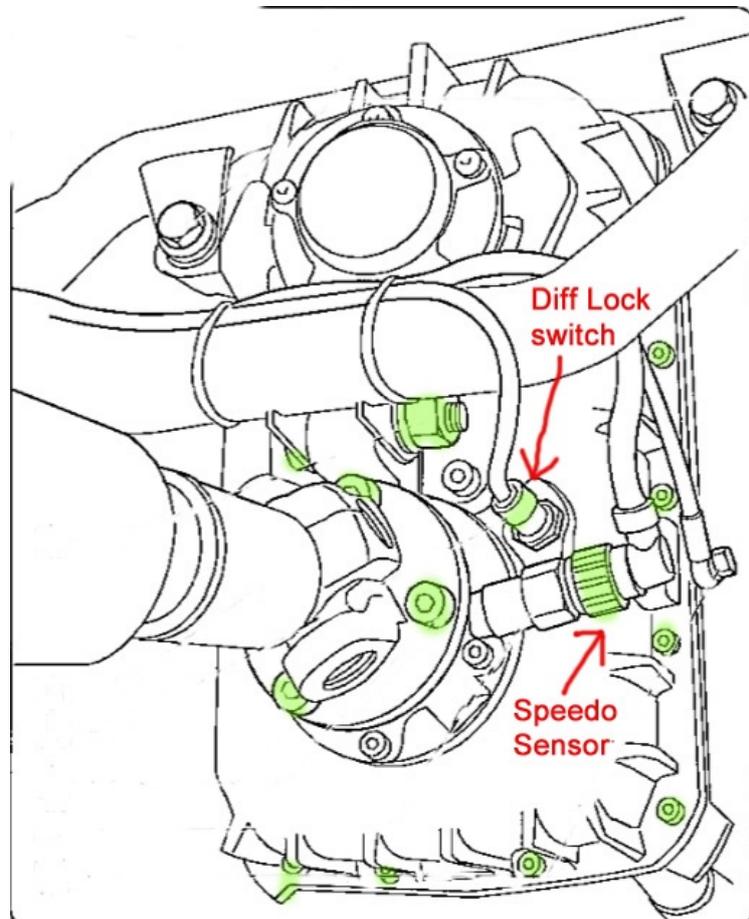
3 Drain & dispose oil.

4 Disconnect speedo sensor cable (Turn knurled ring & pull) & DiffLock switch cable.

5 Remove cable ties around rear crossmember. Tie cables up out of the way.

6 Unbolt and remove TC rear mount crossmember, (4 bolts each side & bolt through silentblock or poly bush).

7 Unbolt rear propellor shaft from transfer case & lay to one side; will require jacking of one rear wheel to rotate propshaft as bolts are removed.





8 Remove PTO if fitted to rear of Transfer Case, release circlip and drive dog.

9 Fit a safety strap around the front half of the transfer gearbox and the upper supports to hold the front section in place while you unbolt the gearbox halves. The gasket sealant used is very strong and should hold this section together.

10 Remove the 13 nuts from all of the transfer case bolts around the centre section. Leave some bolts in place to help secure the front section.

There are top and bottom dowel pins in the centre section frame that will also help with this.

11 Remove the additional 3 bolts that have no nuts. One bolt from the rear that threads into the front case adjacent to the sight glass. Two bolts (pictured at left) from the front top of the Transfer Case. They are threaded into the casting of rear case.

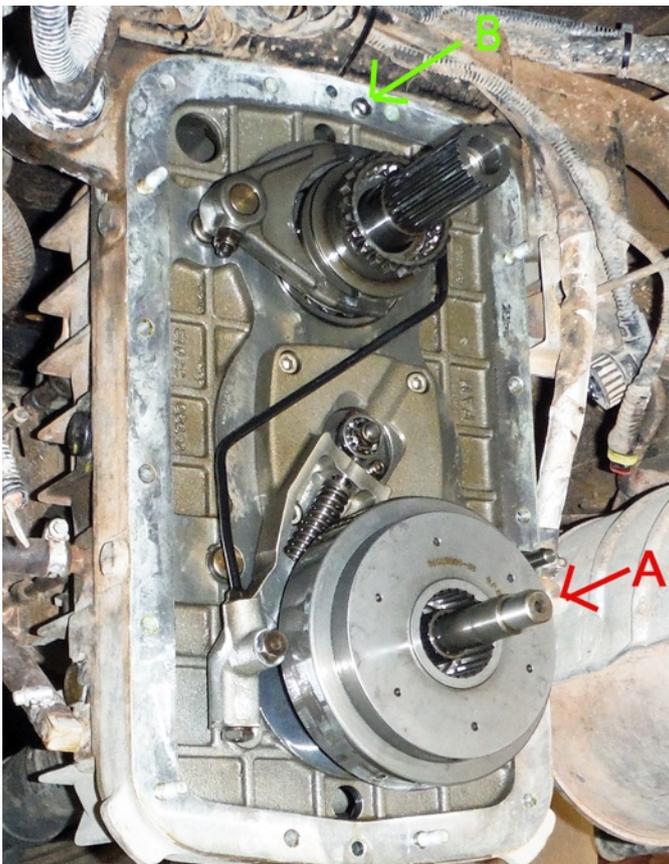
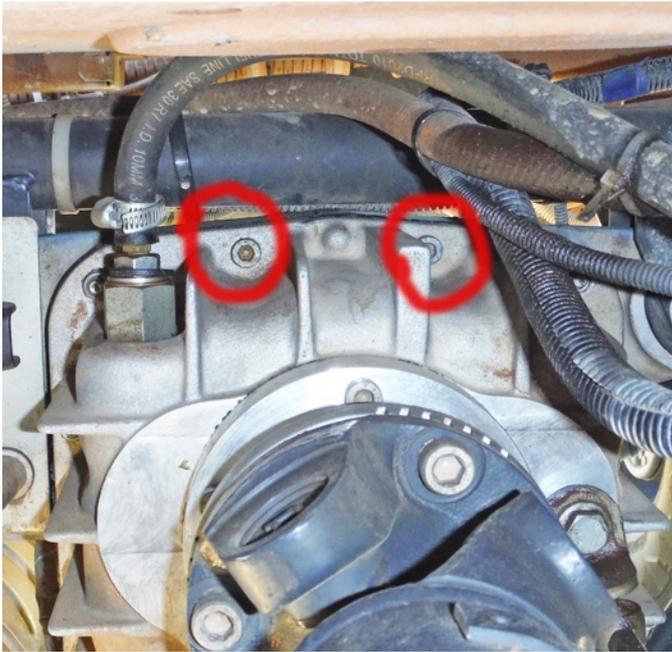
12 The rear section can now be removed. This will be difficult as the sealant is quite strong. Once the gasket seal is broken keeping the rear case vertical as you move it, gently ease it straight back, do not lower it until it is clear of the Input & output shafts. Weight of rear case approx 15kg.

13 Firmly fit at least 2 nuts back on the bolts to prevent front case from coming loose.

The following will stay on the central frame:-
 a. Centre differential
 b. Hi/Low gear selector sleeve, held in place by the selector fork.

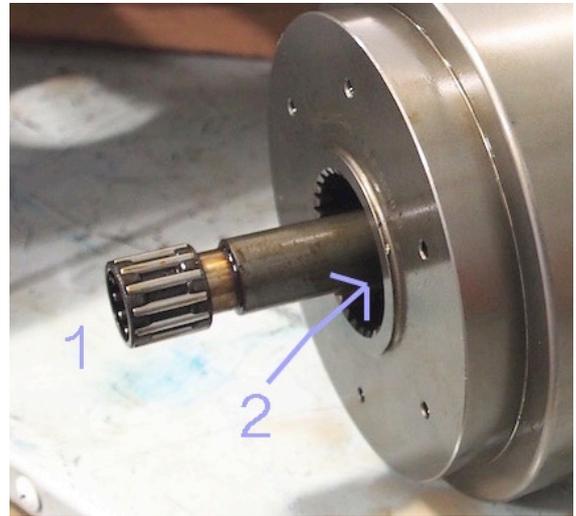
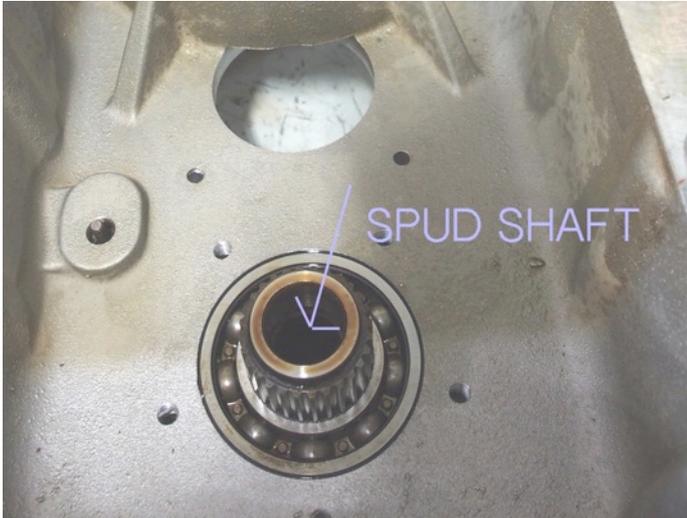
Ensure the Center diff stays put, it can easily be removed by sliding rearward.

14 Be aware there is a pair of needle rollers on the output shaft, One can be seen inside the Center Diff at left. The other one will most likely be sitting inside the output spud shaft.



Holding the rear case vertical upon removal will ensure these bearings do not fall out onto the ground.

Retrieve the bearing from inside the spud shaft (in middle of output housing inside bottom of rear case) put a dab of grease inside it & slide onto the end of the output shaft as shown in the images below.



To effect a Circlip solution the rear case needs to be stripped, to enable it to be laid flat on a work table and remove any possibility of polluting the bearings and gears with metal swarf or other particles.

15 Remove TC rear mounting bracket by undoing the 4 x M8 cap head bolts. Tap out of case with soft head (nylon) hammer. Note which way is up.

16 Remove Diff Lock Switch from rear of case.

17 Remove PTO cover from rear of case, 5 x M8 cap head bolts. (unless done in step 8)

18 Remove rear output housing / spud shaft by undoing the 5 x M8 bolts, (Allen key through the Drive Flange / Prop-shaft bolt holes). Tap out of case from inside with soft hammer

It is good practice to clean the green Iveco sealant from all the TC bolts. (Wire wheel in bench grinder).



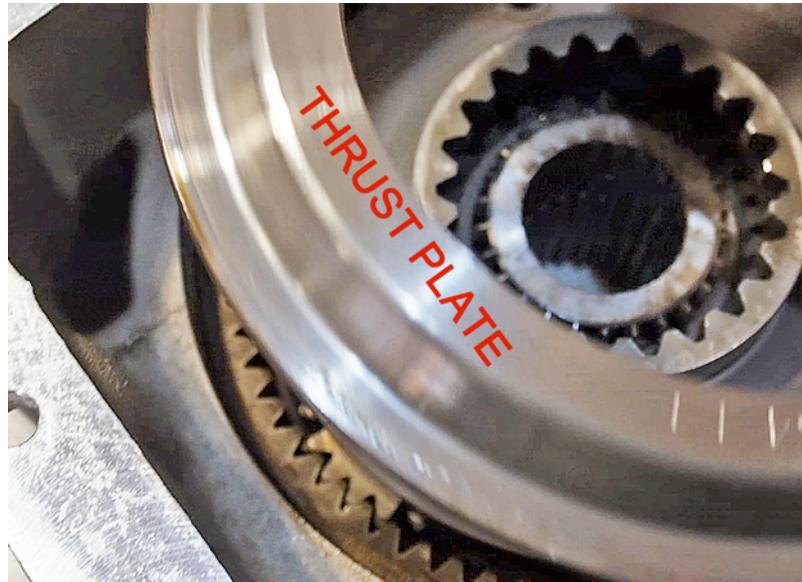


19 Remove cluster circlip by prying up the sharp end with a small screwdriver or scribe & remove circlip with pointy nose pliers or fingers.

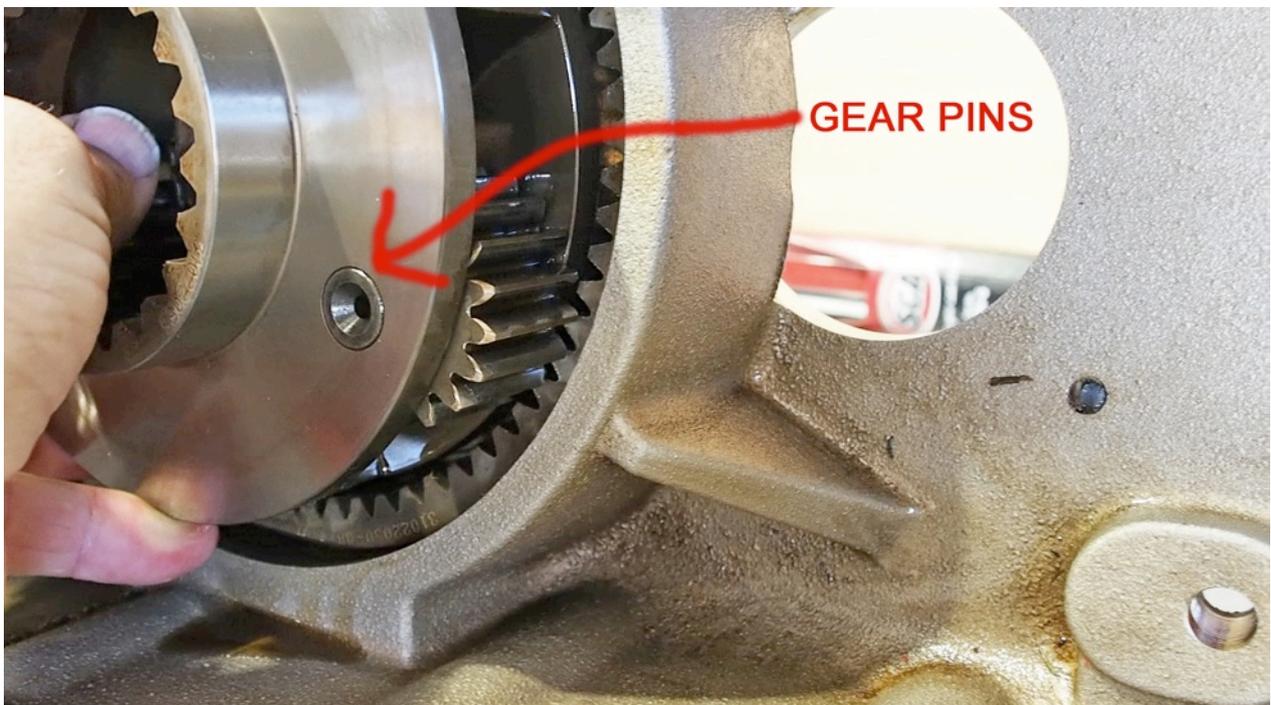
In some cases the circlip may be very loose which indicates you have averted imminent failure.

If the circlip was tight in its groove it may have remained so but after installing solution you will have peace of mind that the TC won't fail and you will no longer be hesitant with use of Low Range.

20 Remove the forward thrust plate, lift up the inner edge with scribe or knife. Once the circlip is out the thrust plate is only held in place with oil surface tension.

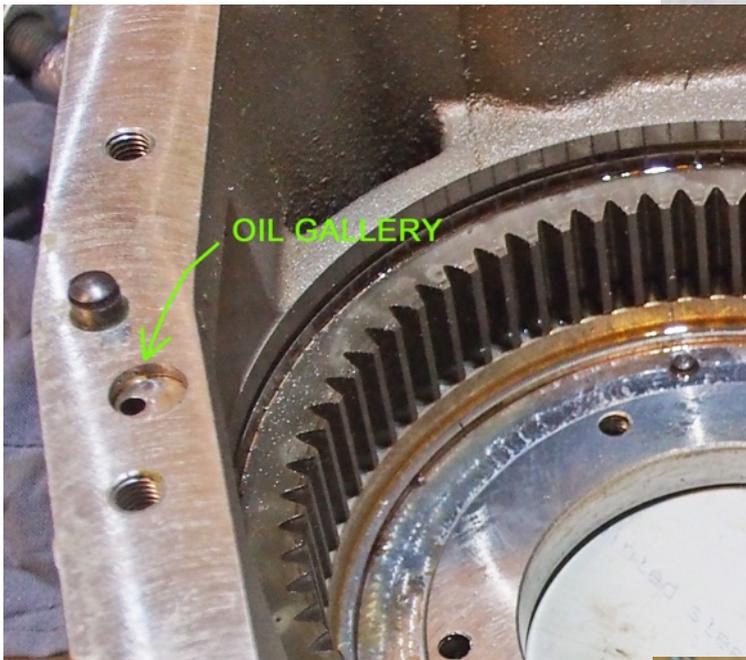
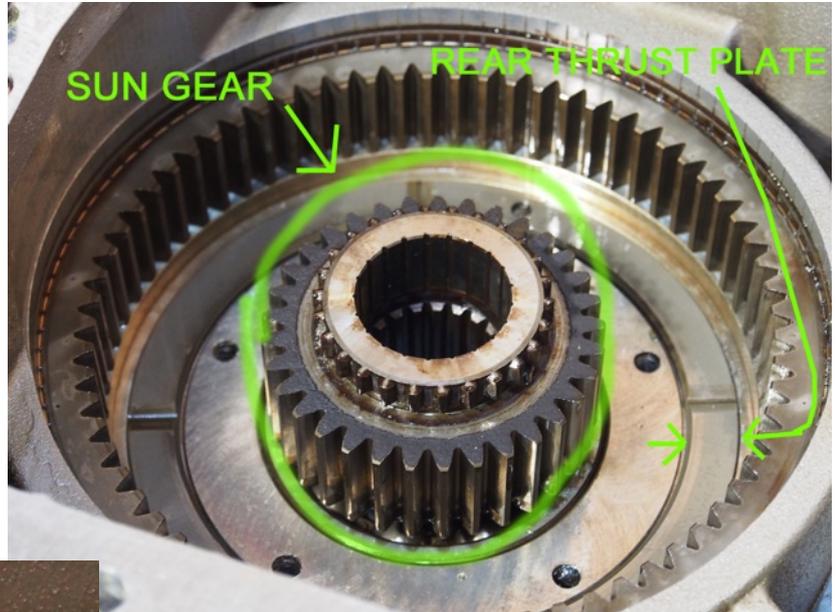


21 VERY IMPORTANT: To remove the Low/High range gear cluster the rear case half must be positioned on its SIDE or upright position SO AS TO KEEP THE GEAR CLUSTER VERTICAL.



Remove the gear cluster with caution, keeping it vertical. The slippery gear pins can slide out either side with gravity. This will be disastrous as the needle bearings inside are not captive or caged . Move to a safe / clean / dust free location. Place the forward thrust plate back on cluster and retrieve the rear thrust plate from back of case & place that over the rear of cluster. Large ziplock bag is a good idea.

22 Tap out sun gear / PTO drive from inside with a soft (nylon head) hammer.



23 The rear case is now stripped and can be cleaned, degreased , washed & dried. Ensure there is no residue in the Low Range oil gallery. (Air blow gun to clean / dry it).

24 The rear case is now ready to be machined and drilled to accept your Circlip locking solution.

I prefer to mill the right side ledge as the left side is in close proximity to the High/low range selector rod / fork.

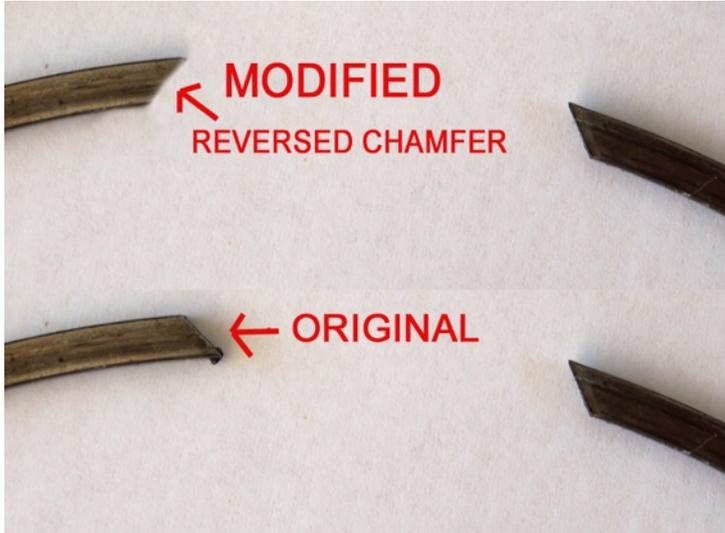
A die grinder could also be used to perform this task.



25 You can make your own "Lock" for the circlip from Aluminium, *Marcus Tuck* hand made his in the Amazon Jungle from steel using only a hacksaw and files.

The following instructions apply if you have purchased one of the \$30 locks

Each lock varies slightly and will need to be hand finished to size with a file because of the sand casting technology used, the thickness of the ledge above the circlip varies on each Transfer case .



26 Grind an opposite chamfer on the end of the circlip, using a bench or angle grinder.

The Lock presses against the chamfer of the circlip making it impossible for the circlip to loosen & fall out of its groove.

If you choose not to modify the circlip you could fashion a recess into the unfinished edge of the circlip lock to accommodate the original circlip barb, it should be just as effective.



27 Adjust the ledge height so that the tang of the lock fits into the circlip recess. The tang thickness may also need some thinning .



28 Approx 1.5mm relieved from ledge.



29 When satisfied there is a good fit of lock tang into circlip groove, drill two 5.0mm x 20mm deep holes and tap M6x1

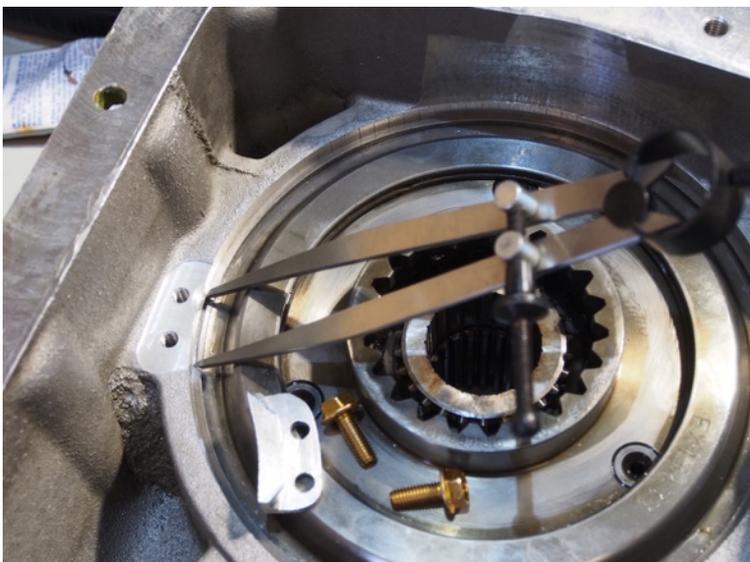
30 Clean rear case again, degrease / wash as necessary, Blow out Oil Gallery. Ensure swarf / metal dust is blown clear from circlip groove.

31 Reinstall Sun gear / PTO drive, If necessary heat Case with a hot air gun. Cool bearing in freezer if necessary, gentle tapping to bed it home.

32 Lightly oil or grease both sides of rear thrust plate, insert into clean casing, Positioning rear half case sideways insert gear cluster , using previous mentioned precautions avoid loss of gear pins. Oil rear face of front thrust plate. Fit circlip with gap in line with circlip lock . Bed circlip home all the way around its circumference with gentle tapping.



33 Measure and form bevel with fine bastard file using marking dye / bearing blue on circlip ends to match underside of circlip lock.



34 Once satisfied that bevels sit against circlip ends, with tang in groove use medium strength thread locker (loctite 243) with M6x1 high tensile bolts. torque to 6 nm



Job Done

35 Reassemble in reverse order, You will need to use liquid gasket sealant. Use Iveco sealant or a compatible such as Hylomar or Permatex "Fuel Resistant Gasket Sealant" - 85420 (Super Cheap Auto)

Some of the drive flanges may need to be turned to get the gears to align while sliding the gearbox back together. Do not force gearbox together by tightening bolts.

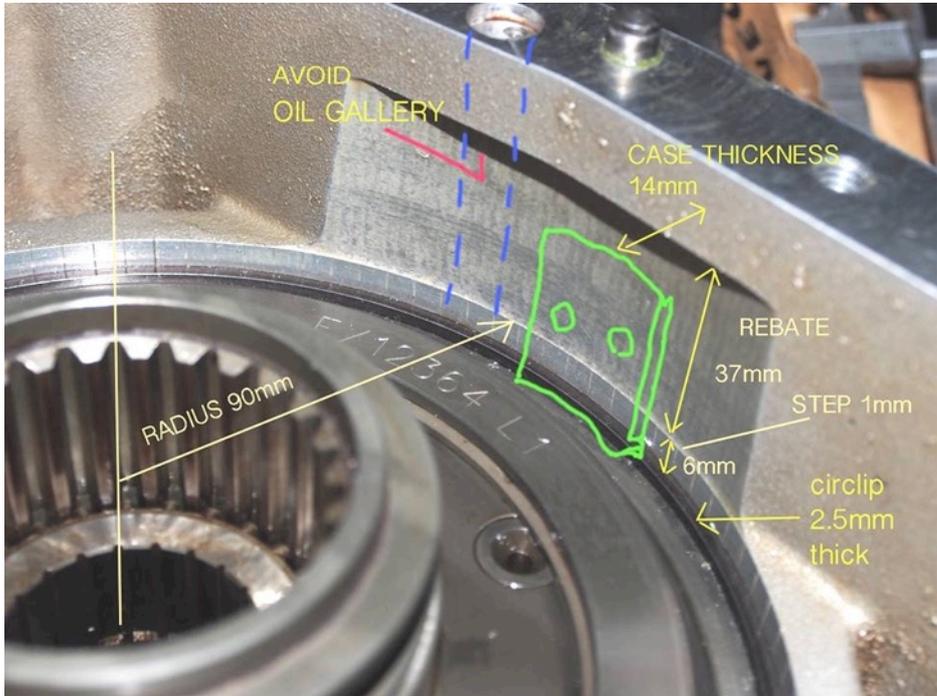
Tightening torques

all M8 bolts into Alloy to 15Nm
 13 x M8 bolts and nuts to 25Nm
 Diff Lock sensor to 50Nm
 Prop Shaft bolts 75Nm
 Silentblock to crossmember bolt 130Nm

36 Fill transfer case with 3.0 Liters of GL5 75W90 Synthetic (or Semi Synthetic) Transfer case / Transaxle oil , eg Castrol Syntrax (Not Syntrans) or Penrite TransGear or ProGear 75W90

37 Prime Transfer case oil pump & flood Low Range gear cluster by running truck in first gear with transfer case in Neutral for a few minuets. (Oil level will lower slightly.)





Alternative method to lock circlip in place, requires less machine work but needs drilling through Transfer case with external fixings.



Marcus Tuck installed this effective circlip solution as a roadside repair in subtropical South America, to allay fears of TC failure in anticipation for some extensive low range jungle touring through the Amazon.

Refer

<http://www.tuckstruck.net/truck-and-kit/modifications-and-repairs/transfer-gearbox-circlip-modification/>

<http://www.goingbush.com/iveco4.html>



Disaster Averted