

Emotator 747 Overhaul

My rotator is around 20 years old, and had finally stalled after grinding to a halt. This was caused by the grease used to lubricate the 2 ball races congealing and behaving more like glue! My observations suggest that the process described here probably should be carried out at least every 10 years. As the machine normally turns quickly, signs of slowing will give an early warning. It is a tribute to the motor that it survived this treatment.

There is an issue for which I was indebted to Phil, IC8POF, on whose web site I found some valuable comments, although his conclusion was not so positive as mine. At the end of the motor is a disc with 2 lugs on one side and the tiny drive gear which engages with the main gear train. The disc fits on the motor spindle and the lugs engage in the gaps of a rotating double cam. The mystery is the purpose of a spiral from which the ends project as “tongues”. I was not immediately clear why it played a part in my motor having stalled, but cleaning the spiral and the cylinder and re-fitting the compression washer just above the drive gear, restored operation to the motor. Thanks to John, G8MM who overheard my sharing the problem with others on 80m, and who has now advised me that this is a familiar device for buffering the motor especially during start and stop operation, as there is no braking mechanism other than the resistance of the gear train. As the spiral in my rotator was near enough stuck, cleaning and light lubrication allowed the motor drive to operate.

Re-assembly of the rotator is just the reverse of disassembly, but beware of losing the direction indicator settings, as it can be quite time consuming to reset the potentiometer by trial and error.

One other repair which I have had to carry out was in the controller case and concerned the the direction indicator repeater mechanism. In my case the belt had broken so no pointer movement. Replacement is just plain fiddly. My replacement belt came from a pack of mixed cassette drive belts and the device seems fairly tolerant, provided there is good grip and tension.

Produced by G3MSW with assistance from IC8POF and G8MM



The rotator is mounted in a vice bell down, and the motor housing is marked to show it's position in line with the bell housing. All settings must be maintained and the gear train not rotated if the direction indicator potentiometer is not to be disturbed. Keep it level!



Remove the 6 bolts holding the lower ball race holder. Do not lift off yet it or the balls will drop out!

One of six bolts removed



Holding the now un-bolted lower ball race with both hands invert it and place it in a tray standing on the bottom flange of the motor housing. Gently drop the ball race holder to the tray with the balls still loaded. If your rotator is like mine, the grease will need to be cleaned off and the ball race re-greased.



Showing the ball race holder being lowered on to the tray.





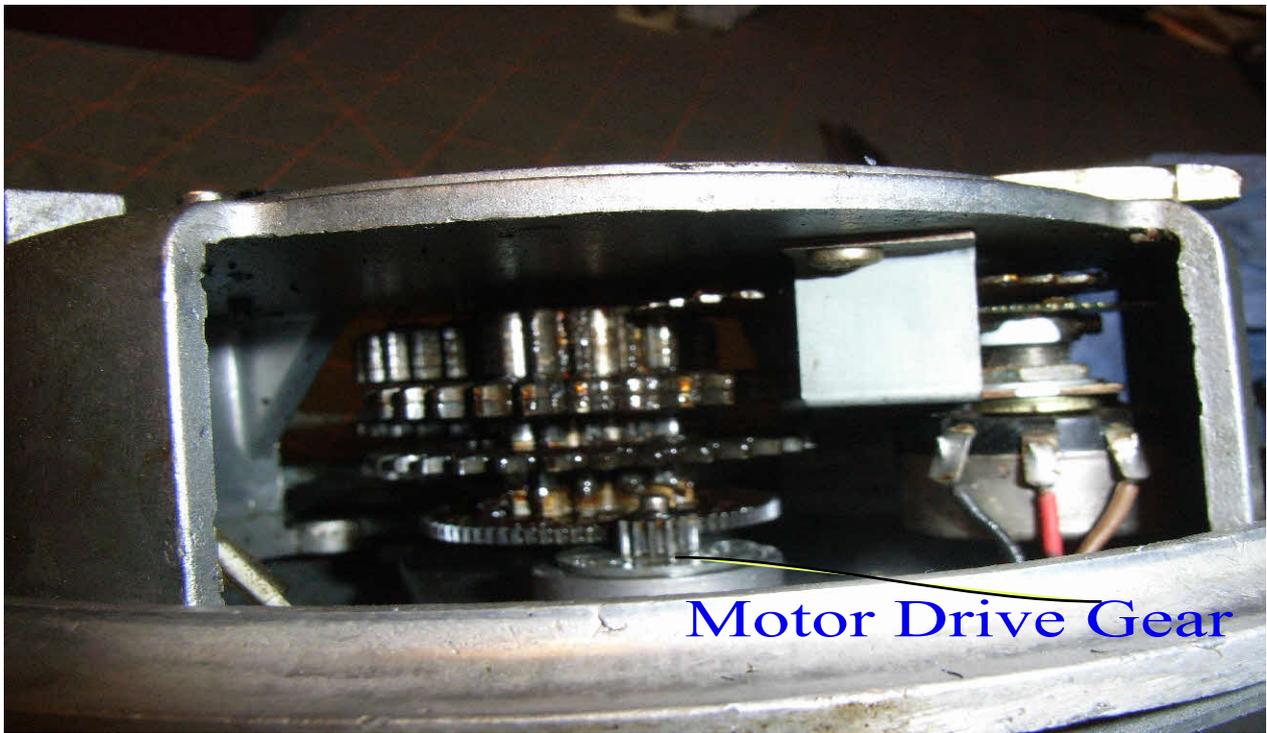
With both hands holding the motor housing in place, invert the rotator so the bell housing is at the bottom and refit in the vice. Note, the motor housing must be refitted in the same line as the bell so make sure the markers are clear. Lift the motor housing to reveal the second ball race. Some balls may be held by the grease to the motor housing so ensure you do not lose any.



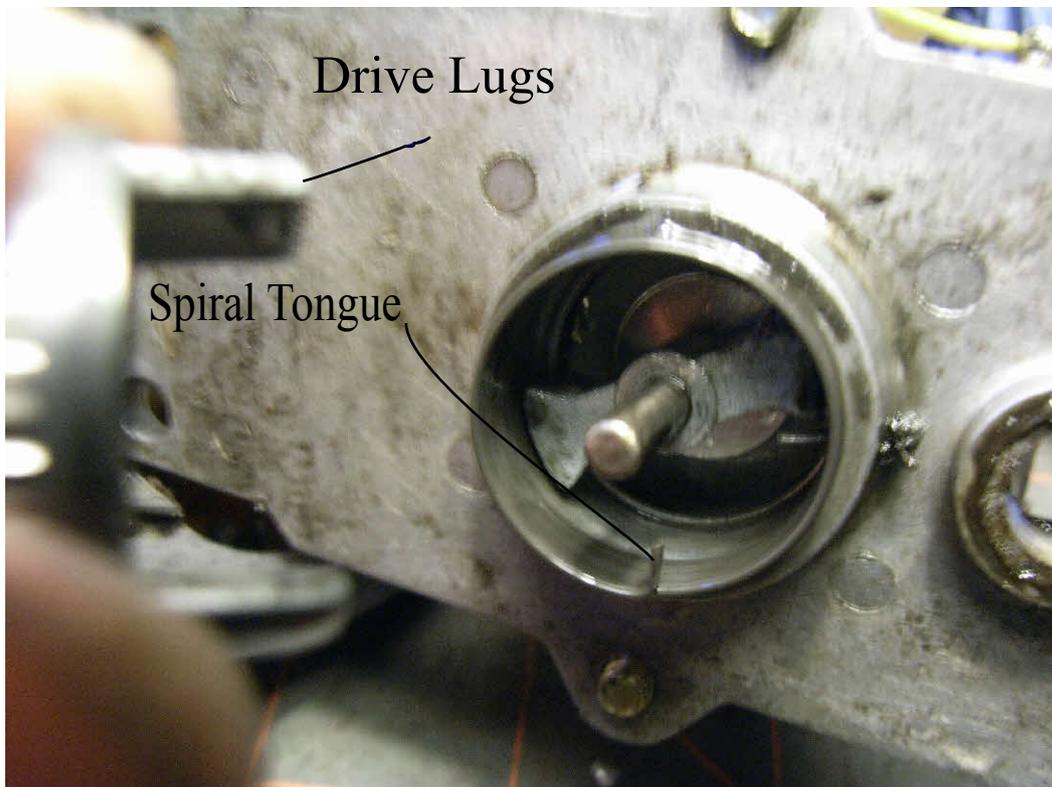
The second ball race is now visible and may be cleaned and re-greased.



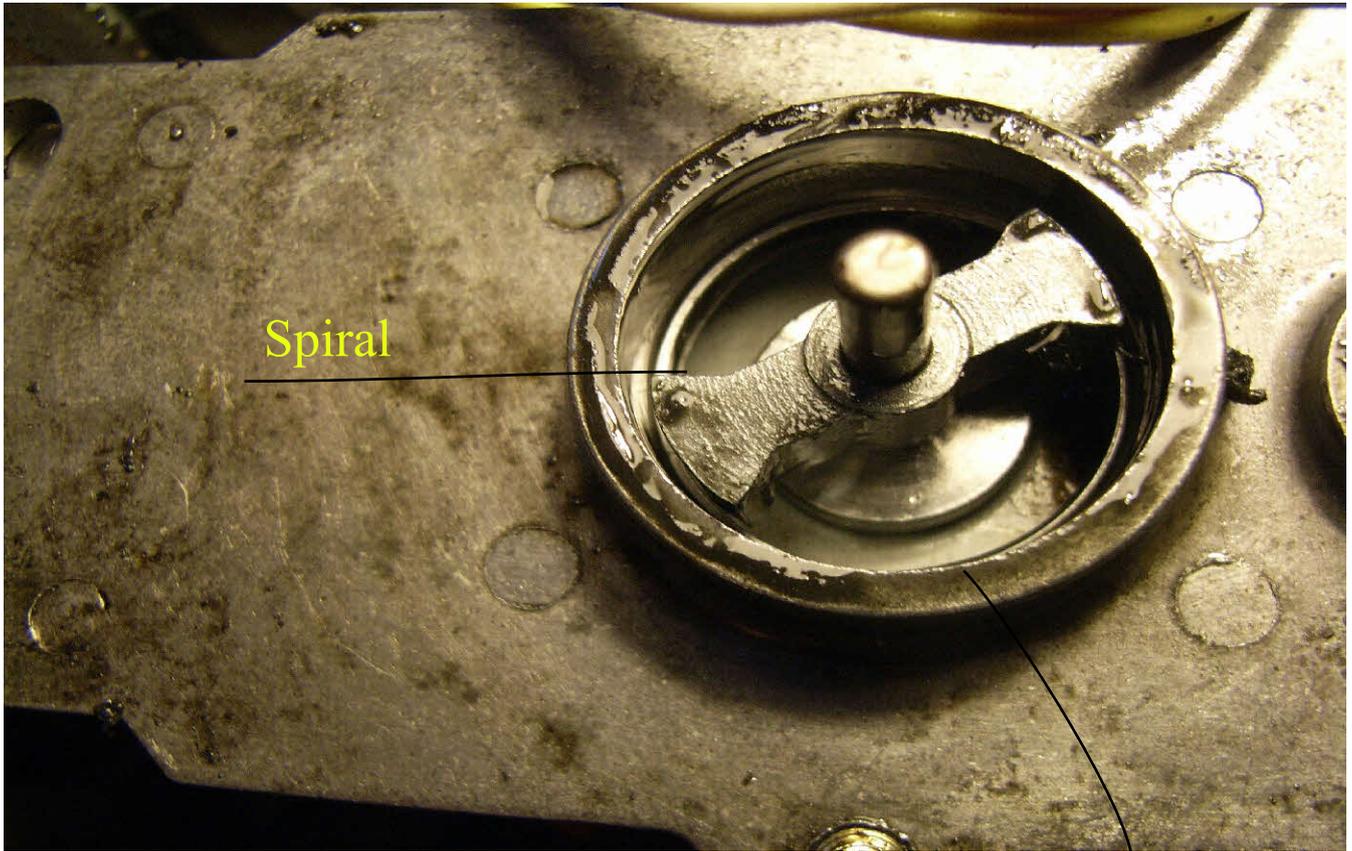
The motor unit is now ready for the last checks and clean



The motor and gear train are seen here from the side. The motor and drive gear is bottom centre, and the potentiometer is on the right. Two screws allow the motor to be removed on it's mounting strip. At the end of the motor shaft is a compression washer which might have to be eased off to remove the motor.



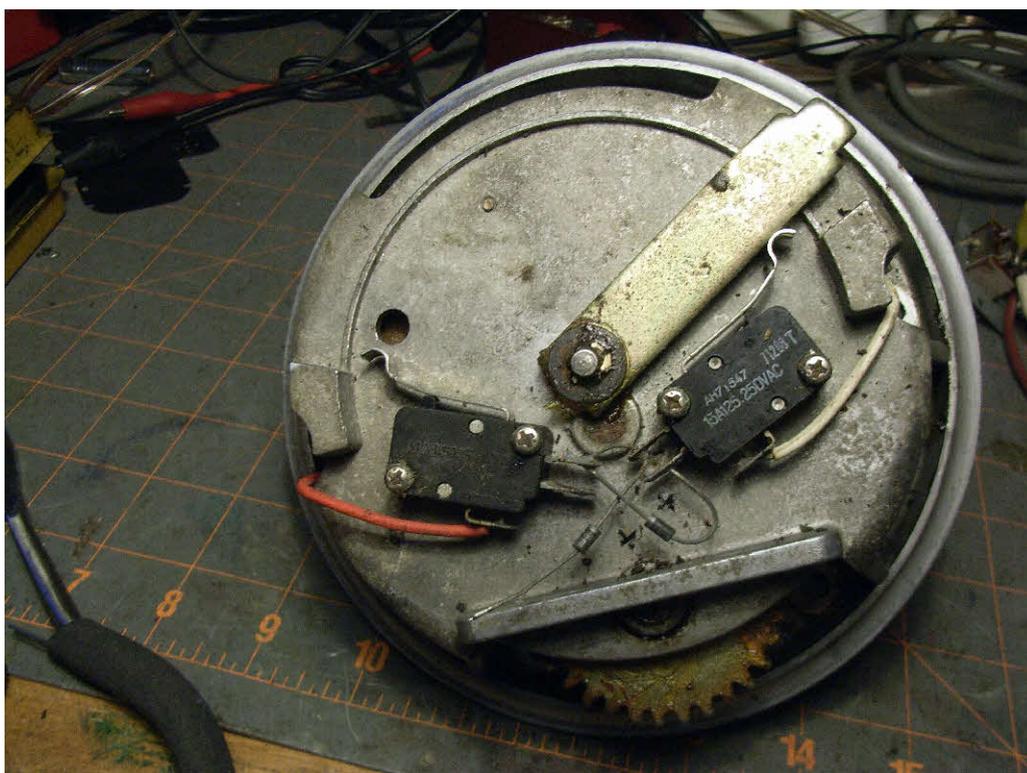
It has to be removed in order to release to top plate of the motor shown left. It contains the small drive gear and 2 cams which engage between the spaces of a rotating double cam. The spiral should be removed and it and the cylinder cleaned.



Spiral

Cam Gap

Another shot of the spiral which can be seen clearly in the gaps between the cams or lugs on the motor spindle. The tongues are more difficult to see but should project into one of the 2 cam gaps. The lugs on the cap which fits between the cam gap have to be dropped in and will find their own place.



Top of the motor housing. The lever is moved by a lug in the bell housing and the arc shows the permitted over-run. The micro switches are to stop at end of run and a replaced diode is visible.

The motor support strip is underneath.