

LAND ROVER DISCOVERY 3/4 (LR3/4), RANGE ROVER SPORT

SPARE WHEEL WINCH REPAIR

Like many Land Rover Discovery 3/4, Range Rover Sports owners, most of us have had the spare wheel winch curse. I, like many others, did not heed the warning in the handbook, that weight must be applied at all times and I ended up kinking the cable and in my case stuffed the shaft as well. It wasn't until I stripped the clutch ratchet, that I understood how the whole thing worked or should have worked.

Being a tight a**e and do not like parting with my dollars if I do not have to, I set about repairing mine and documenting the procedure as follows:

NOTE

This procedure is written with the understanding that the spare wheel is on the ground and the cable has not been cut.

NOTE

The hole in the shaft was added by me as I had other ideas for this repair initially. I have measured everything just in case I need to make a new one.

1. Remove the four 10 mm lock nuts securing the winch assembly to the vehicle floor and remove the two 10 mm screws securing the cable guide to the vehicle floor. Unhook the spare wheel.
2. Place the winch in a vice by securing the shaft hex head with the jaws.
3. Drill out the rivets that secure the casings together.
4. Using two levers or flat screwdrivers, prise the two casing halves apart. The plastic spool with the cable will be in one half.
5. Lever the spool out and check the cable condition. This is a photo of mine (Fig 1). It can be repaired with patience.
6. The cable can be repaired by securing the good section carefully in the vice, using vice grips, apply tension to the cable and twist in an anti-clockwise direction and using pliers, straighten any kinks. When the cable appears to be almost there, insert the nipple/cable end in the plastic spool and feed the cable into the grooves. It may need tapping with a light hammer. When you have 2-3 strands wound on, insert the spool into the casing and secure with a length of string through the shaft hole. You do not want to go through that again do you?



Figure 1 My Winch Cable Kinked

7. Place the casing base over the vice jaws, allowing enough room for the shaft to be tapped through.
8. Carefully tap the shaft through the clutch ratchet unit. The locking retaining clip will not survive, but it does not matter if it doesn't. I didn't use one. Figure 2 shows the dismantled shaft and Figure 3 shows the damaged square.

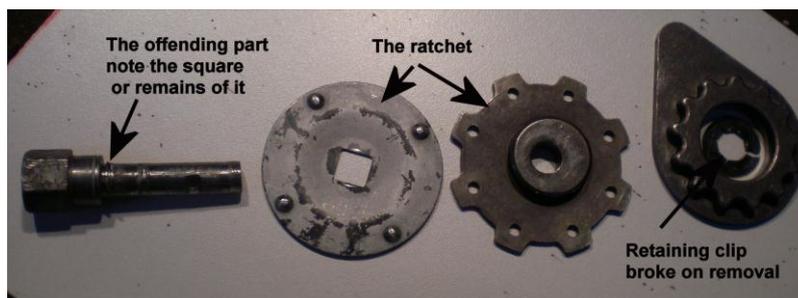


Figure 2 Dismantled Shaft and Clutch Ratchet

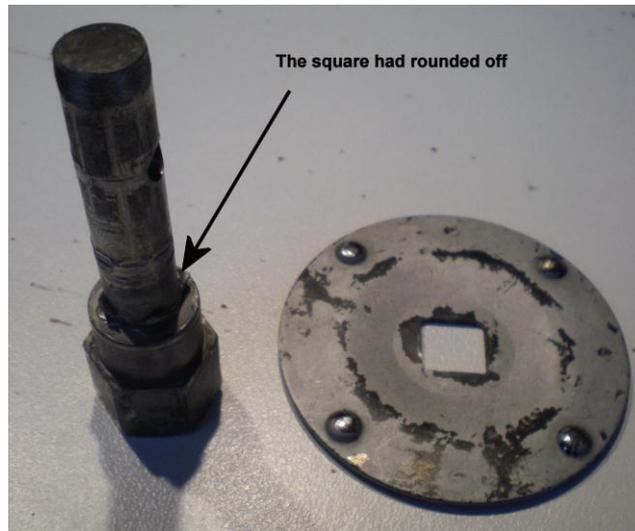


Figure 3 The Damaged Shaft

9. You will probably notice that the square drive on the shaft is beyond help. It is only locked in place during manufacturing on the clutch ratchet plate by centre pop marks. **NOT A GOOD DESIGN**. This explains why the winch will not lift any load and just spins around.

10. Place the hex head of the shaft in the vice and clean the shaft up with a file. File the shaft shoulder down to a depth of approximately 3 mm to form the square again (See Figure 4) (The shaft steel is fairly soft and files easy). Continue filing the shaft until it fits snugly in the clutch ratchet plate (See Figure 5). Do not file it too much as the square will fowl the top clutch ratchet plate.



Figure 4 Repaired Shaft

11. Place the two clutch plates on the shaft. Ensure they contact each other and the ratchet works. The top toothed clutch plate must spin freely on the shaft.

12. Remove the clutch plates, apply grease on the shaft and insert into the winch casing base, then add the lower clutch plate and fit onto the shaft square. Ensure the dimples are facing up.



Figure 5 Repaired Shaft and Clutch Plate before installing in the Casing



Figure 6 Shaft and Lower Clutch Plate Installed

13. Carefully tack weld at least two corners of the shaft square to the clutch plate ensuring the plate is at right angles to the shaft (See Figure 6). Do not apply too much weld as you will only have to file it off to prevent the top plate fowling. The two clutch ratchet halves must be in full contact and the dimples must be able to locate in the top plate holes.
14. When satisfied with the clutch ratchet operation, apply grease onto the shaft and plates then install the toothed cam plate.
15. If the locking washer survived the dismantling, fit that onto the shaft, if not add a suitable flat washer that will fit the shaft, apply grease, and install a suitable wave or spring washer (See Figure 7). Add another flat washer approximately the same size as the first. Ensure the washer is proud of the toothed cam plate (See Figure 8). These washers will apply tension to the clutch plates when the casing halves are assembled.

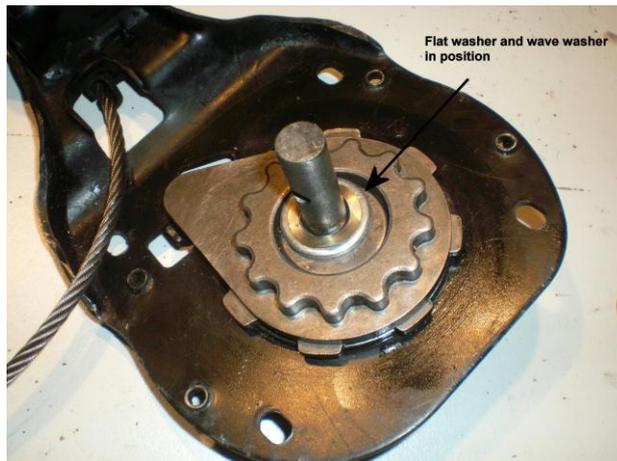


Figure 7 Flat Washer and Wave Washer in Position

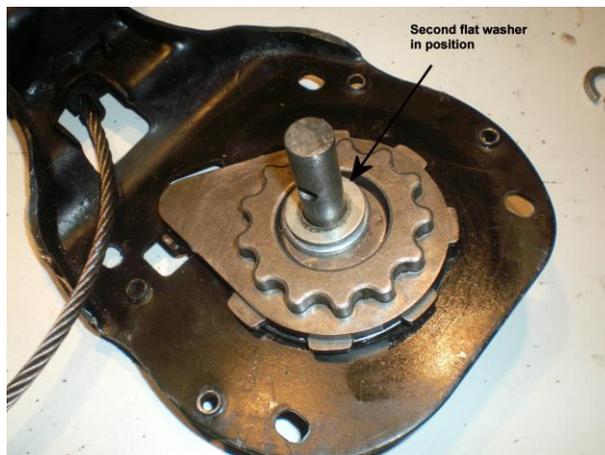


Figure 8 Second Flat Washer in Position

16. Apply grease to the washers and toothed cam plate.
17. Remove the string keeping the spool and casing together.
18. Install the spool and casing onto the case base ensuring the shaft is aligned and the toothed cam plate engages the spool teeth.
19. Push the two halves together, align the old rivet holes and insert a couple of small bolts and nuts to keep the unit together while testing.
20. Place the unit in a vice by securing the spool base in the jaws. Do not overtighten.
21. Apply a reasonable load on to the cable end. The spare wheel would be good.
22. Using a 22 mm socket and ratchet or the wrench included in the vehicle tool kit, wind the winch clockwise as far as possible. If it reaches the end of travel, the clutch ratchet should operate, you will feel it.
23. Try raising and lowering a couple of times and when satisfied that there is no clutch ratchet slippage, the cable is feeding in the spool okay, it can be installed on the vehicle. Ideally the cable should be wound out (with a load) 1-2 feet (or 300 – 600 mm) prior to installation.
24. Install the winch unit on to the vehicle and tighten the four locknuts and two screws securely.
25. Insert the cable end attachment into the spare wheel (good side of the wheel uppermost don't forget), pull the wheel to apply tension to the cable.
26. Using a 22 mm socket and ratchet or the wheel wrench, wind the winch clockwise until the wheel is secured into the correct position. The clutch ratchet should operate.

Remember next time, keep a load on the winch at all times when operating.