

# Unit 13 Replica Technical Service

## -Shimming-

Shimming is often forgotten when upgrading / maintaining the replica. The shimming of the gears / gearbox is essentially the adjustment of the distances of the gears from each other and the gearbox. Failure to properly shim your gearbox can result in serious damage to the gears. There is also a risk of overloading the wiring due to gears that run too tightly. Perfect shimming leads to a long life of your gears, with an efficient consumption and ideal rate of fire

### Let op!

- Every gear set and gearbox is different! There is no "default" setting for shim! When changing gears it is therefore important that you re-shimmed.
- When installing new gears and / or bushings / bearings, it is important that you shimmed again. Re-greasing is also a good idea.
- Shim sets come in different thicknesses. Often there are 3 to 4 different thicknesses in the package. Take this into account when shimming.

OUTDOOR ADVENTURES



## How To:

This guide is a basic guide to shim your gears. The example uses a Version 2 gearbox, but this guide can also be used with other gearbox versions and other gears.

Parts required:

- Screwdriver for the gearbox
- Screwdriver for the motor adjustment
- Shim Set (preferably with 4 different thicknesses)
- Degreaser and gear grease to re-grease the gears

**1:** Disassemble the gearbox, and take the left side (side where the selector plate and wiring is attached).

To make it easy for yourself, we recommend removing all non-essential parts from your gearbox. The selector plate, spring, spring guide, piston, piston head, cylinder, cylinder head, nozzle, tappet plate, anti-reversal latch and trigger can all be removed. (Possibly even the wiring) Take all shims from the gearbox!

Pay attention! Leave the cut-off liver on! (we need this in this guide)



**2a:** Place the spur gear in the gearbox. Make sure that the spur gear has enough space to turn freely from the gearbox. If not, the spur gear will hit the gearbox. This can be seen from a circular sanding spot under the gear, on the gearbox.

**Tip: Shims stick to gears more easily if you apply a little grease to them! This way you will not lose them so quickly! Grease the gears well, after or during shimming. The best result is achieved by removing the old grease with a degreaser and then greasing the gears again with gear grease.**



**2b:** Now place the other gearbox half on it. Screw it in with the screws that are around the gears (often 5 or 6 screws). Tighten it properly!

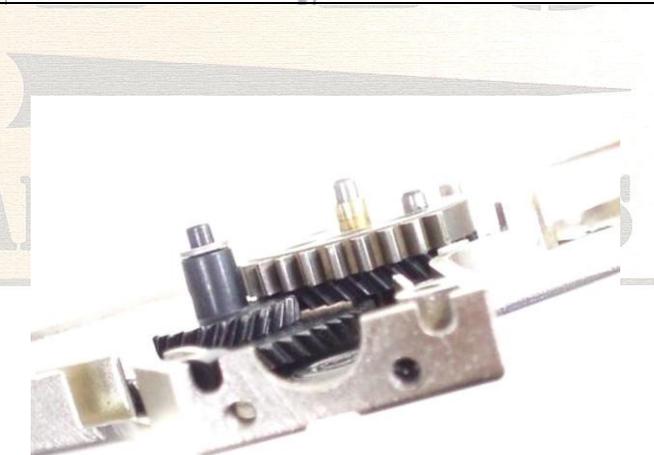
Now test the distance by pushing the shaft of the gear (which comes through the bushing / bearing) with a small screwdriver. The gear will probably be able to move a lot inside the gearbox. Guess how many shims you need. You will fill this distance with shims. Also try to turn the gear manually, and see if it turns smoothly. If it no longer runs smoothly, you have too many / too thick shims.

Remove the right gearbox half, and place or remove shims on the gear. Repeat this step until the gear moves minimally up and down and spins smoothly.

**Pay attention! Don't shim the gear too tight! The gear should continue to move smoothly, without excessive play in the gearbox.**



**3:** Put the sector gear in place. Check that the sector gear does not hit the spur gear and does not hit the cut off lever. If the sector gear hits the cut off lever and / or the spur gear, place more shims under the sector gear. Note that the teeth of the sector gear still maintain maximum contact surface with the teeth of the spur gear! Now repeat step 2b with the sector gear.

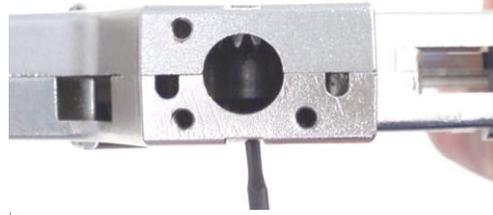


**4:** Finally, the Bevel Gear. Place it in the gearbox check if it touches the spur gear and has maximum contact surface with the teeth of the spur gear. Make sure the height of the bevel gear is correct. (See pictures)

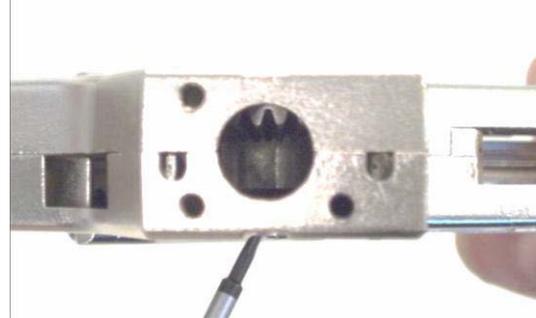
Now repeat step 2b with the bevel gear.



***Te hoog***



***Correct***



***Te laag***

**5:** Now that all gears are shimmed, test with all gears installed again if you can turn the gears freely. (Gearbox screwed shut) If there is too much play in the gears, or the gears don't rotate smoothly, shim your gears again. If everything is put together properly, you can install everything again. You only have to adjust the engine. You can do this by a set screw that is often behind the motor. Try to adjust it so that the gearbox no longer makes a "screaming" sound.

**Tip: Adjust this roughly by shooting at single shot, and fine tune it at full auto. This is the best way to hear if you're good!**

