

CAE Performance Products

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CAE Gear Reduction Starters

Procedure on how to change a pinion

Please read the following steps before going ahead with this task

NOTE: The starter and pinions used in this example may differ to the product being worked on.

Step 1: At a clean and clear work bench, remove the three (3) hex head bolts or screws, depending on starter, and the back solenoid plate (*see Photo 1*) and set aside



Photo 1 – Removing the rear solenoid plate

Step 2: Remove the solenoid plunger and spring and set aside (*see Photo 2 and 3*)

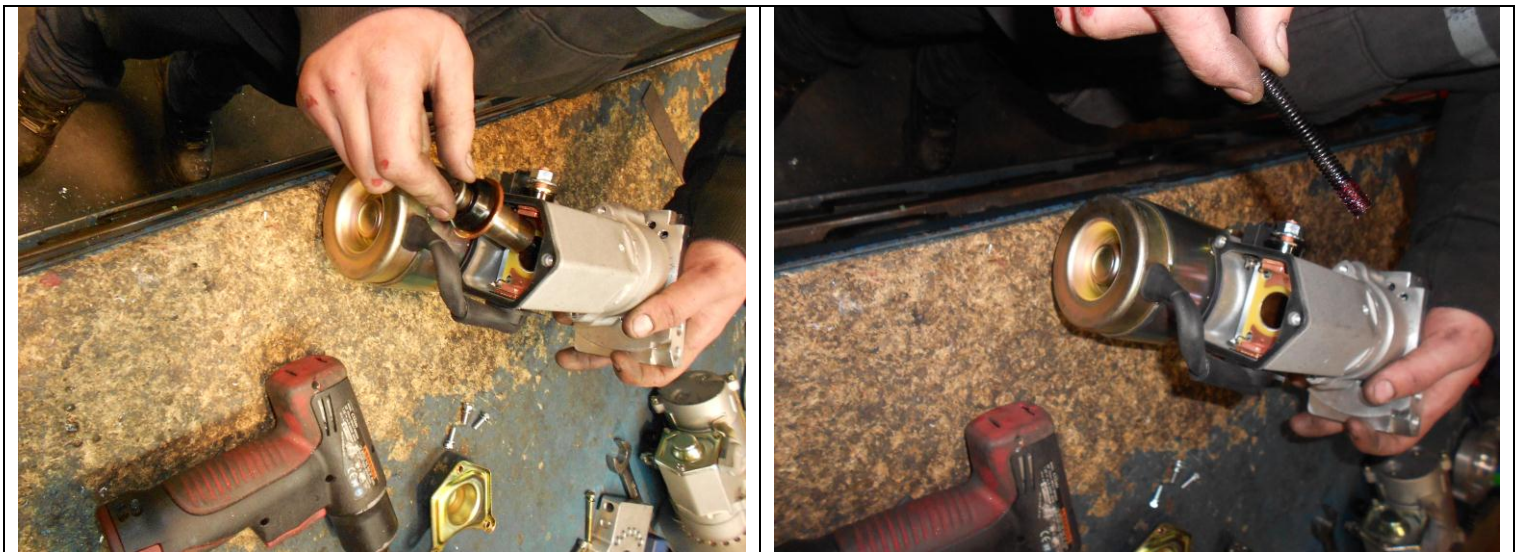
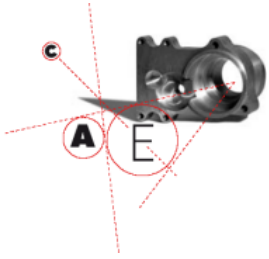


Photo 2 and 3 Removing the plunger and spring

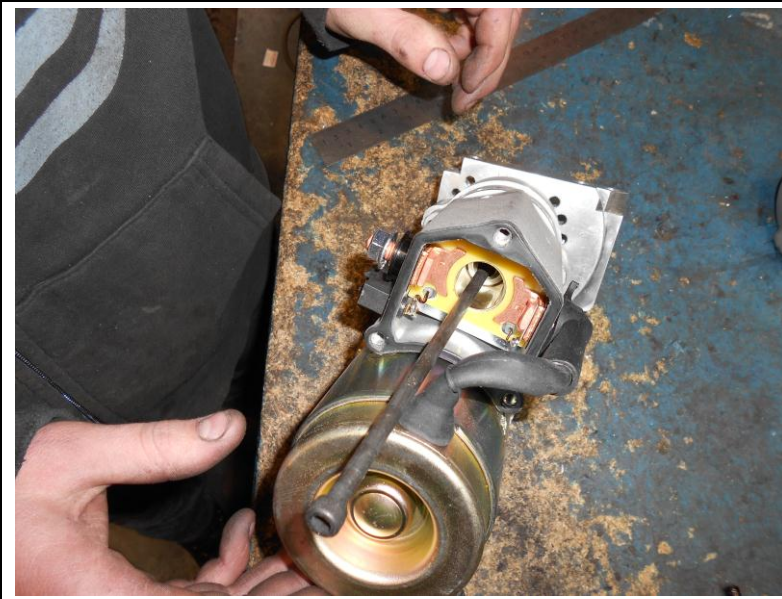


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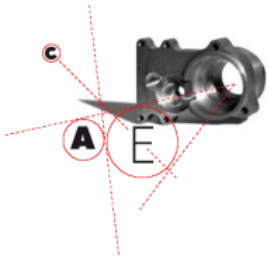
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Step 3: Secure a long bolt (around 180mm or 7" long) or a screwdriver in a vice (see photo 4 & 5) and mount the starter on to the bolt or screwdriver to push the drive out to full extension. (See photo 6)



Clockwise from Top Left: Photo 4; Fitting a bolt up the centre of the drive. **Photo 5;** Bolt secured tightly in a vice to push the drive out. **Photo 6;** The drive at extension



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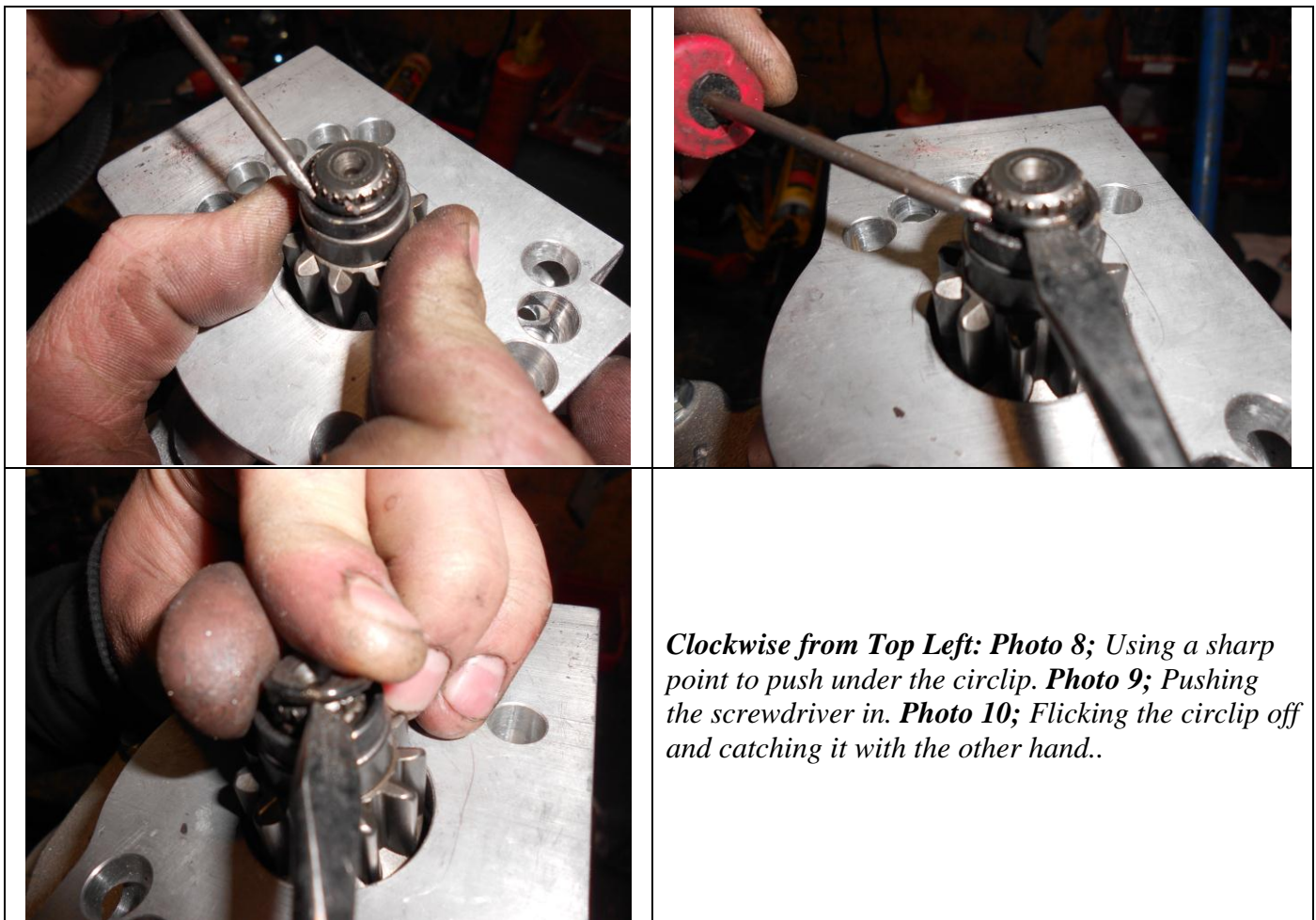
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Step 4: Pushing the pinion down the drive with one hand, gently tap, with a hammer, the circlip retainer down to reveal the circlip (*see Photo 7*)

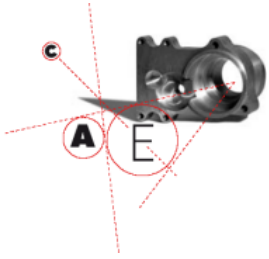


Photo 7 – Gaining access to the circlip

Step 5: Using a scribe or a sharp point, prise the end of the circlip out of the circlip groove (*see Photo 8*) and force the blade of a screwdriver under the circlip (*see Photo 9*). Twist the screwdriver to remove the circlip (*see Photo 10*) and set aside.



Clockwise from Top Left: Photo 8; Using a sharp point to push under the circlip. Photo 9; Pushing the screwdriver in. Photo 10; Flicking the circlip off and catching it with the other hand..



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Step 6: Remove circlip retainer and pinion. Ensure the spring stays on the drive shaft and not inside the pinion. Keep the circlip and circlip retainer aside (*see Photo 11*).



Photo 11 – Removing the pinion, circlip and retainer.

Step 7: Fit new pinion to the shaft with the machined surface down as shown in Photo 12

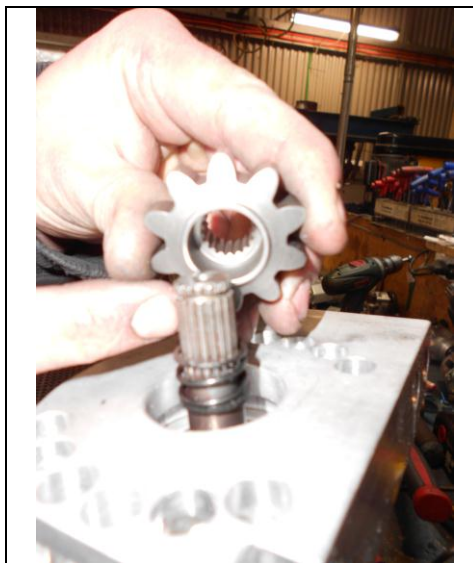
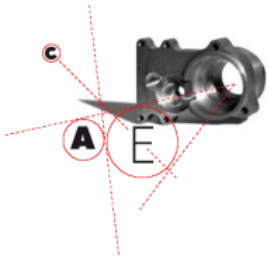


Photo 12 – Fitting the new pinion

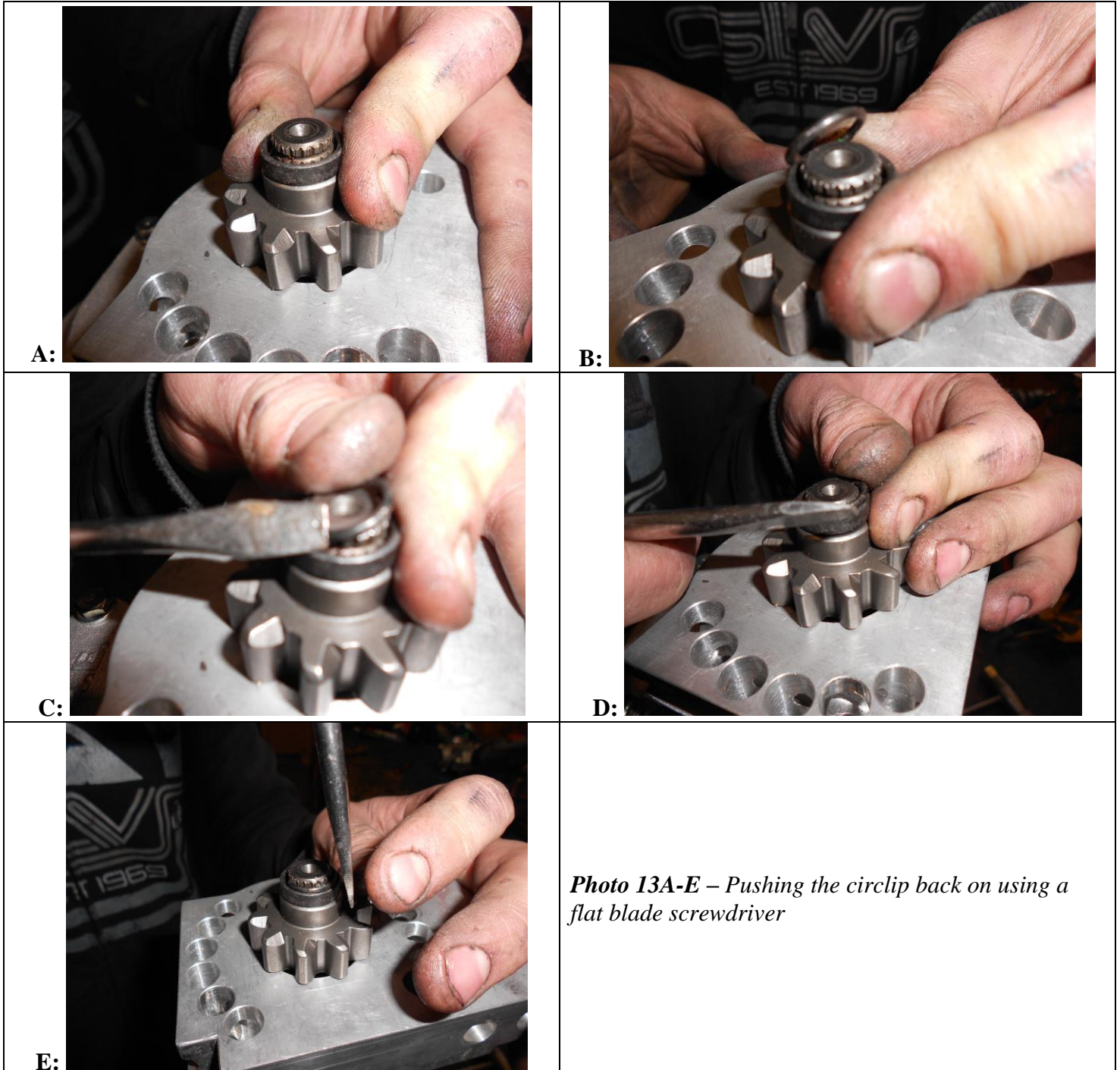


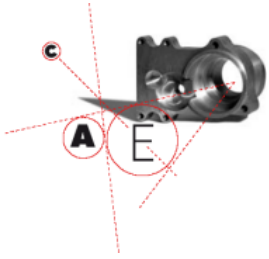
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Step 8: Slide the circlip retainer on to the shaft and refit the circlip. (See Photo 13 sequence A to E)





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Step 9: Using a pair of pointy nose pliers, squeeze the circlip back into shape to allow the retainer plate to fit back over the circlip (*See Photo 14*)

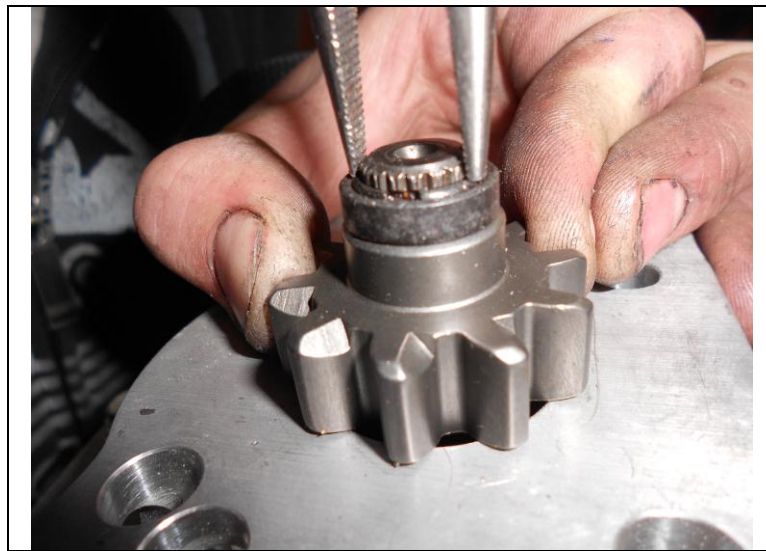


Photo 14 – Squeezing the circlip to shape

Step 10: Tap the top of the drive spline to push the circlip into the retainer (*see Photo 15*) so that the circlip is inside the retainer and approximately 1mm of the end of the spline shaft exposed out of the face of the retainer.

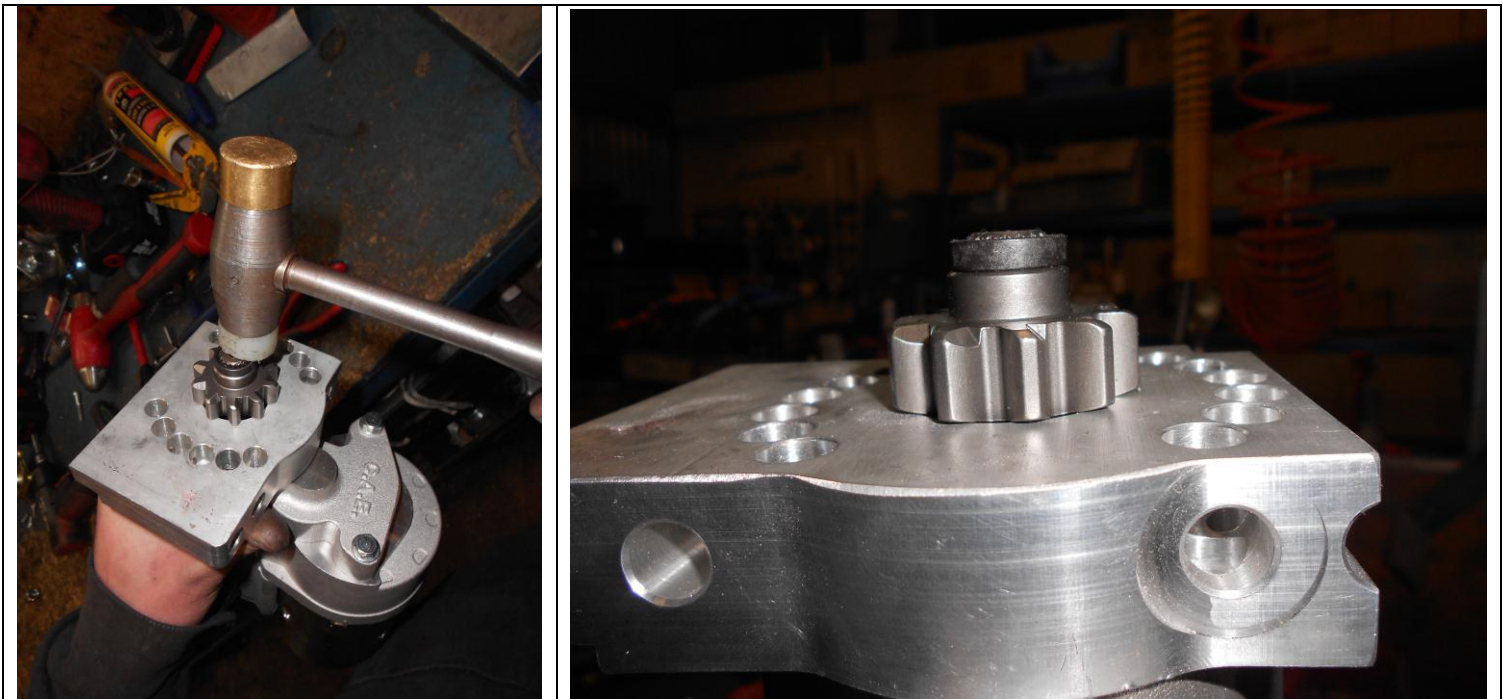
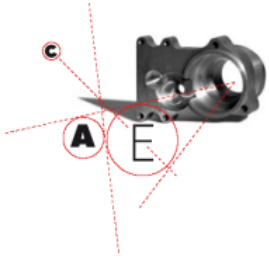


Photo 15 – Tap the circlip home.



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Step 11: Refit the spring to the solenoid plunger (*Photo 16*) and refit into the end of the drive (*Photo 17*).



Photo 16 & 17 – Refitting the solenoid plunger and spring

Step 12: Refit the back solenoid plate, ensuring the gasket is in place, (*see photo 18*), and fit and tighten the three (3) hex head bolts or screws. (*See Photo 19*). Be sure not to over tighten these bolts or screws as they may break.



Photo 18 – Ensure the gasket in place



Photo 19 – Refitting the rear plate

Step 13: Refit the stator to the vehicle.