

Fig. 32. Using adaptor No. S.100 with Handle No. 550 to refit differential bearings

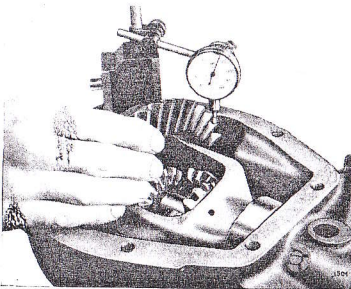


Fig. 33. Measuring crown wheel backlash

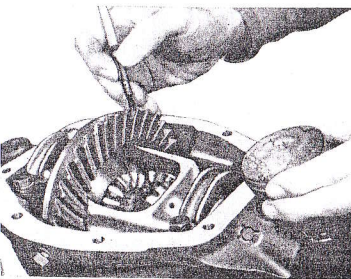


Fig. 34. Painting crown wheel teeth to check pinion marking

Crown Wheel Backlash

Using the axle spreading tool and observing the same precautions in respect of overspreading, re-insert the differential unit into the casing. Remove the axle spreader, assemble the caps and tighten the securing bolts (2) to the specified torque.

Check the crown wheel backlash by mounting the dial gauge and moving the crown wheel in alternative directions as shown on Fig. 33. Measure the backlash at several positions each of which should be within the limits of 0.004" - 0.006" (0.1 - 0.15 mm.).

Should the backlash be excessive, reduce the thickness of the shim pack at "X", Fig. 31, and add an equal amount to "Y". If the backlash is insufficient, reverse the procedure.

Tooth Markings

After setting the backlash to the required figure, use a small brush to lightly smear eight or ten of the crown wheel teeth with engineer's blue. Move the painted gear in mesh with the pinion to obtain a good tooth impression.

(a) Correct Markings (Fig. 35)

When the gear meshing is correctly adjusted, the markings obtained should closely approximate those shown in Fig. 35a, this being the ideal contact.

The area of contact is evenly distributed over the working depth of the tooth profile and is located slightly nearer to the TOE than the heel.

(b) High Contact

The markings shown at (35b) are those produced by high contact, i.e., when the tooth contact is heavy on the crown wheel face or addendum and caused by the pinion being too far out of mesh. To rectify, move the pinion deeper into mesh by adding shims under the pinion head bearing outer ring. To maintain the existing pinion bearing preload, an equal amount of shims must also be added between the tail bearing inner cone and the bearing distance piece.

(c) Low Contact

Fig. 35 (c) shows heavy markings on the crown wheel flank or dedendum, this being the opposite to that shown in (b). Rectification of this condition necessitates moving the pinion out of mesh by removing an equal amount of shims from the positions described in (b).

NOTE :-When correcting for (b), the new position will tend to move the tooth contact towards the toe on drive and the heel on coast, whilst correcting for (c) will tend to move the tooth contact towards the heel on drive and the toe on coast. In either case it may be necessary, after correcting the pinion mesh, to re-adjust the crown wheel as described in (d) and (e).

(d) Toe Contact

The markings shown in Fig. 35 (d) result when the tooth contact is concentrated at the small end of the tooth. To rectify this condition, move the crown wheel out of mesh, i.e., increase backlash by transferring shims from the crown wheel side of the differential to the opposite side.

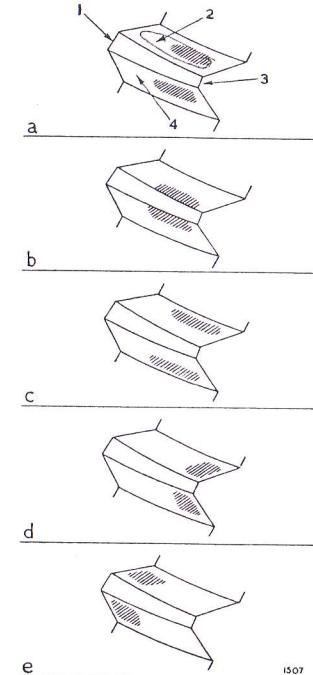
(e) Heel Contact

Fig. 35 (e) shows the markings obtained when the tooth contact is concentrated at the large end of the tooth. This condition is rectified by reducing backlash, i.e., by transferring shims in the opposite direction as for (d).

IMPORTANT :-Whatever corrections are necessary, it is most important that the backlash at all times is within the specified limits.

- (i) **Backlash** When adjusting for backlash, always move the crown wheel as this member has more direct influence on backlash.
- (ii) **Crown Wheel Movement** Moving the gear out of mesh has the effect of moving the tooth contact towards the heel and raising it slightly towards the top of the tooth.
- (iii) **Pinion Movement** Moving the pinion out of mesh raises the tooth contact on the face of the tooth and slightly towards the heel on drive, and towards the toe on coast.

ADDENDUM - upper part of tooth profile
DEDENDUM - lower part of tooth profile



- 1 Heel (outer end)
- 2 Coast side (concave)
- 3 Toe (inner end)
- 4 Drive side (convex)

Fig. 35. Typical gear tooth markings