59. To set the excessive backlash for the normal one depends on the average ratio of normal backlash to the ring gear axial movement which is between 1.0–1.4. Consequently, axial movement (Z) is :

$$Z = (G - 0.21) \times 1.4$$

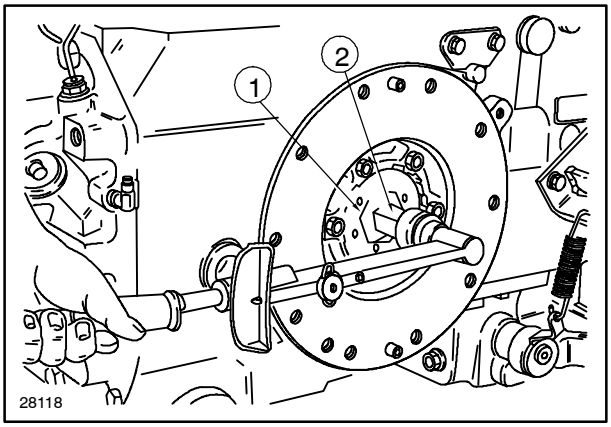
where :

G = clearance between the teeth of the bevel gear pair, as previously measured.

When **Z** calculated :

If **Z < 0** then take the ring gear away from the bevel pinion. If **Z > 0** or if **Z = 0** then place the ring gear closer to the bevel pinion.

60. Unscrew the RH ring nut (1) using tool **50027** (2) and tighten LH ring nut equally until the recommending backlash is achieved. Check the backlash again, as previously described.



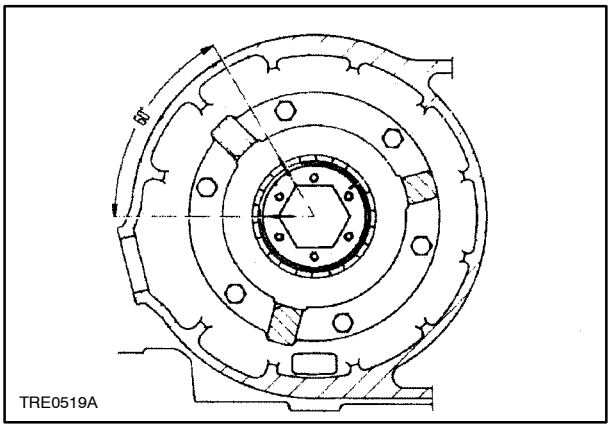
104

61. If a ring nut tightens to a certain angle (A) using tool **50027**, then ring gear axial distance is calculated by the equation :

$$Z = A / 180$$

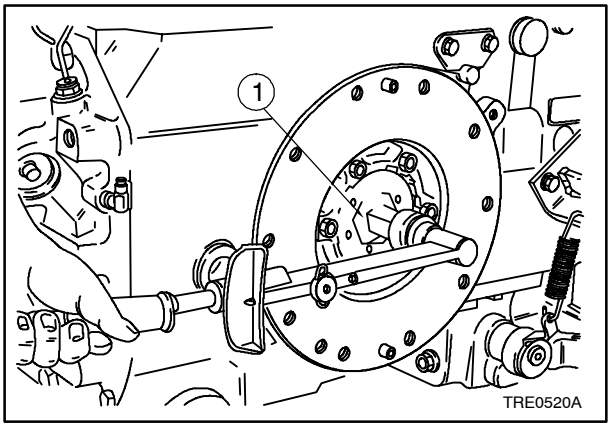
NOTE: One complete turn of the ring nut corresponds to 2 mm ring gear axial movement. A 60° turn of the ring nut, equivalent to one side of the ring nut hexagon, corresponds to a ring gear axial movement of:

$$Z = 60 / 180 = 1 / 3 = 0.33 \text{ mm}$$



105

62. Unscrew the LH ring nut and tighten RH ring nut equally until the recommended backlash is achieved. Once the backlash is achieved, lock the RH and LH ring nuts using the safety ring (1) inserting the tab into one of the keyways of the differential support.



106

ADJUSTING THE BEVEL GEAR PAIR

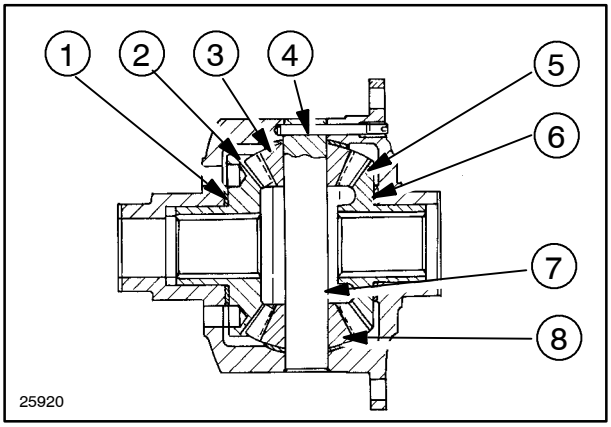
Differential pinion and side gear backlash adjustment

With the distmantled differential on the bench, proceed as follows :

IMPORTANT

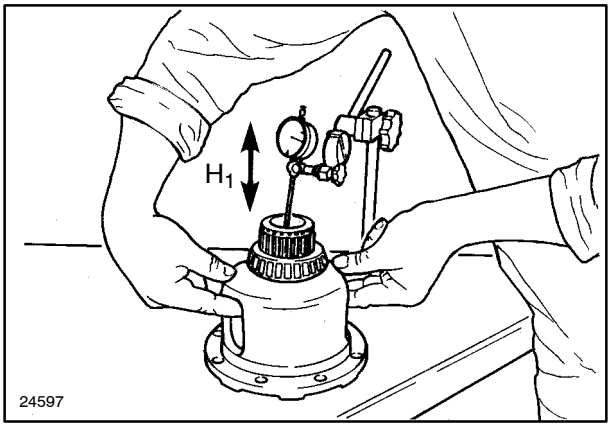
All parts of the differential must be cleaned so that oil residue does not effect the accuracy of the adjustment.

63. Mount the side gears (2) and (5) without rings (1) and (6) on the differential box. Insert the differential pinions (3) and (8) complete, with their related clearance rings and with the pin (7). Tighten the retaining bolt (4) by a few turns in order to prevent the pin from moving.



107

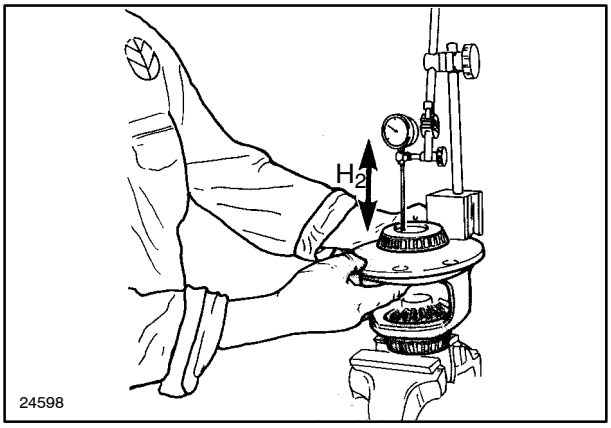
64. Move the LH side gear to bring it in complete contact with the differential pinion, then push it up against the differential box. Use a dial gauge to measure the distance. Make two measurements at diametrically opposite positions and take the average of the two values as H_1.



108

65. Push the side gear into contact with the differential box and measure the distance H_2.

66. Repeat on the RH side gear.



109

67. Axial movement of each side gear (2) and (5) without shims is given as :

$$G_s \text{ or } G_d = H_1 - H_2$$

where :

Gs = axial movement of LH side gear;

Gd = axial movement of RH side gear;

H_1 and H_2 = distances measured on LH or RH side gear (steps 64 and 65).

Normal clearance between the sides of the side gear and differential pinion teeth is 0.18 mm.

Bear in mind that the average ratio between the normal clearance of differential pinion-side gear and the equivalent axial movement of the side gears is 1-1.7.

The axial movement of the side gears corresponding to the normal prescribed clearance between the teeth is :

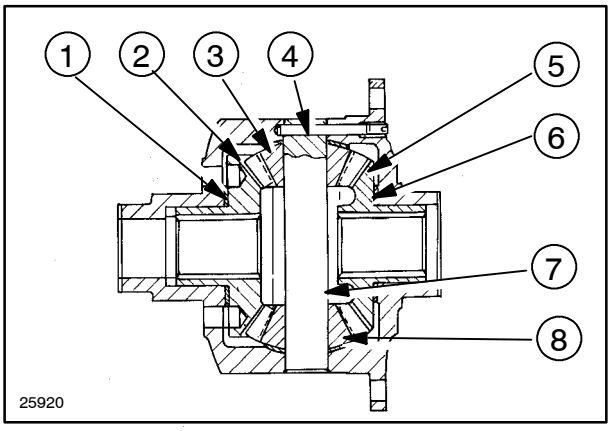
0.18 x 1.7 = **0.30 mm**

Thickness of the spacer rings (1) and (6) to be inserted on the differential box are :

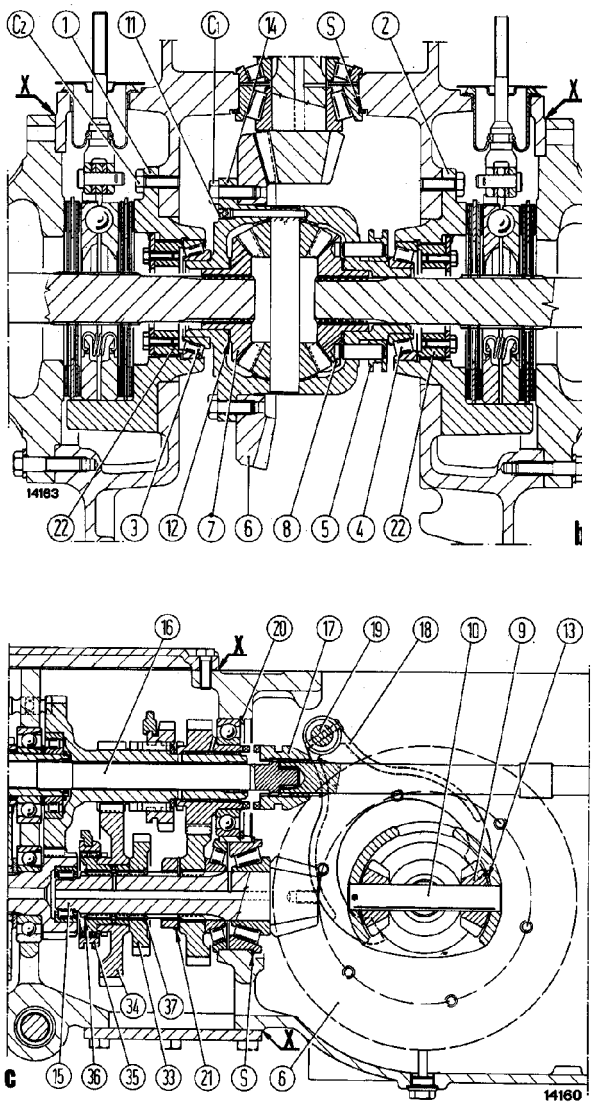
S_s = **G_s - 0.30 mm**
(for LH side gear of TD 5040 and TD 5050 models)

S_d = **G_d - 0.30 mm**
(for RH side gear of TD 5040 and TD 5050 models)

Available shims are 1.5 and 1.6 mm to use for the side gear as shown on page 2. Fit shims of the closest thickness for the LH and RH side gears according to calculations).



110



TRE0554A

111

Longitudinal and Cross Sectional Views of Bevel Gear Pair and Differential Unit

b. TD 5040 and TD 5050 models
c. Longitudinal section for all models
C_1. Ring gear retaining screw
C_2. Differential support retaining screw
S. Bevel pinion positioning shim
1. Differential support
2. Differential support
3. Taper roller bearing
4. Taper roller bearing
5. Differential lock sleeve
6. Ring gear
7. Side gear
8. Side gear
9. Differential pinion
10. Differential pinion shaft
11. Differential pinion shaft retaining screw
12. Side gear shim
13. Side gear shim
14. Differential box
15. Bevel pinion shaft
16. PTO shaft
17. PTO control sleeve
18. Fork
19. Differential lock shaft
20. Range gear retaining ring
21. Bevel pinion securing plate
22. Differential bearing ring nut
33. Reverse driven gear
34. Driven gear for slow speed gears
35. Engagement sleeve for slow and fast speed gears
36. Transmission driven shaft ring
37. Retaining half-ring