Computing Thickness for Differential Spacers

Special Tools:

VW 287 Gauge for differential carrier

12 RA

Determine distance between differential carrier bearings using tool P 33 (see Fig. 98 and the following example) and record.

Example:

F = 143.50 mm
+ H = 1.71 mm
J = 145.21 mm

Measuring the differential carrier length "L".

1. Adjust gauge VW 287 on master gauge.

2. Measure differential carrier and add or substract from measurement on master gauge.

Nominal dimension for L	=	138.00 mm
Reading	= −	0.15 mm
Length of differential carrier L	=	137.85 mm

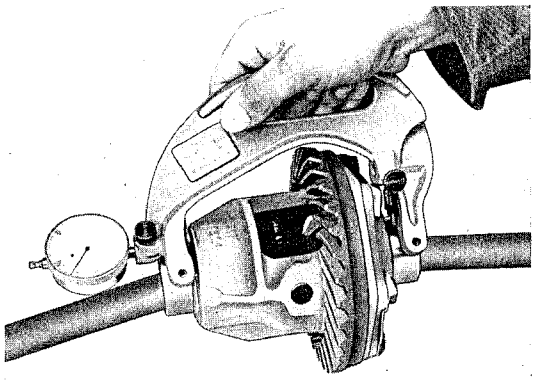

Fig. 99

To obtain the proper clearance between ring and pinion, spacer "S_1" will be 0.10 mm thinner than spacer "S_2" (Fig. 97).

Example

J Total depth of housing		145.21
L Length of differential carrier		−137.85
	Difference	7.36
	Preload	+ 0.15
Necessary thickness of spacers $S_1 + S_2$		7.51
Thickness of spacer S_2 =	7.51 mm / 2	= 3.755
		− 0.10
		3.655
Thickness of spacer S_1 =	7.51 mm / 2	= 3.755
		+ 0.10
		3.855

General

The spacers are available in thicknesses from 2.90 mm to 4.50 mm in 0.10 mm increments.
A shim 0.25 mm thick makes it possible to vary spacers within 0.05 mm. The calculated measurements for spacers should be selected so that shims "S_1" and "S_2" and the preload on the ball bearings for the differential are within the tolerance of 0.13 to 0.17 mm.

Example:

Calculated thicknesses

$S_1 + S_2 = 3.655 + 3.855 = 7.510$ mm

Selected thicknesses

$S_1 + S_2 = 3.65 + 3.85 = 7.50$ mm

Measure spacers with micrometer at four different places around the circumference. Permissible deviation: 0.02 mm. Make sure before measuring that burrs have been removed.