10.11. SOLVED EXAMPLES

Example 1. *A 25 mm H8--f7 fit is to be checked. The limits of size for H8 hole are : High limit 25.033 mm, low limit 25.000 mm. The limits of size for f7 shafts are : High limit 24.980 mm, low limit 24.959 mm. Taking gauge maker's tolerance to be 10% of the work tolerance, design plug gauge and gap gauge to check the fit.*

Solution.   Tolerance for hole = H.L – L.L.

$$= 25.033 - 25.000 = 0.033 \text{ mm}$$

∴ Gauge makers tolerance for plug gauge = 0.1×0.033 mm = 0.0033 mm

$$= 0.003 \text{ mm (rationalised)}$$

Gauge makers tolerance for gap gauge = 0.0021 mm = 0.002 mm (rationalised)

As the work tolerances are less than 0.09 mm, wear allowance may not be provided.

(*i*) **Plug Gauge**

Basic size of 'Go' plug gauge = L.L. of the hole (MMC) = 25.000 mm

∴ In unilateral system,

$$\text{Dimensions of 'Go' plug gauge} = 25.00 \text{ mm} \begin{array}{c} + 0.003 \\ - 0.000 \end{array}$$

That is,

High limit of 'Go' plug gauge = 25.000 + 0.003

$$= 25.003 \text{ mm}$$

Low limit of 'Go' plug gauge = 25.000 mm

Now,

Basic size of 'Not Go' plug gauge = 25.033 mm

∴ Dimensions of 'Not Go' plug gauge = 25.033 mm $\begin{array}{c} + 0.000 \\ - 0.003 \end{array}$

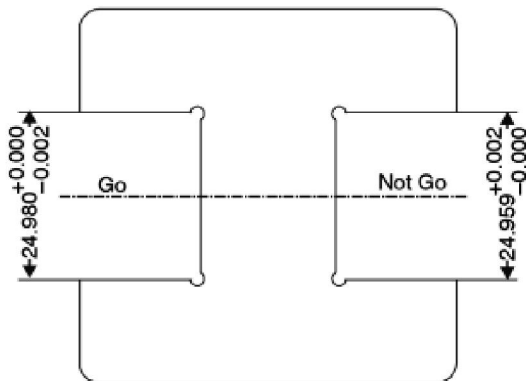(Fig. 10.40 shows a sketch of combined 'Go' and 'Not Go' plug gauge.)
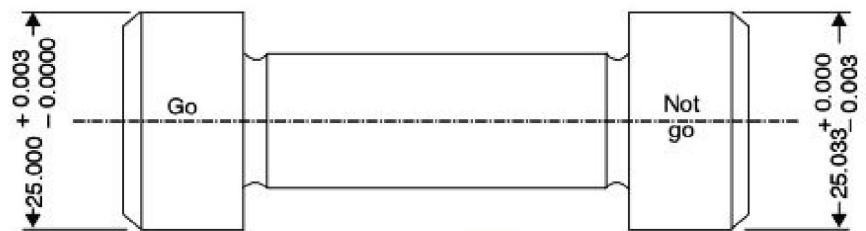

Fig. 10.41. Gap Gauge (combined type).

Fig. 10.40. Plug Gauge (combined type).

(*ii*) **Gap Gauge**

'Go' side = H.L. of shaft (MMC)

= 24.980 mm.

∴ Dimensions of 'Go' gap gauge = 24.980 mm $^{+0.000}_{-0.002}$

'Not Go' side = L.L. of shaft = 24.959 mm

∴ Dimensions of 'Not Go' gap gauge = 24.959 mm $^{+0.002}_{-0.000}$

(Fig. 10.41 shows a sketch of combined 'Go' and 'Not Go' gap gauge)

Example 2. *Shafts of 75 ± 0.02 mm diameter are to be checked by the help of a Go, Not Go snap gauges. Design the gauge, sketch it and show its Go size and Not go size dimensions. Assume normal wear allowance and gauge maker's tolerance.*

Solution. High limit of shaft = 75.02 mm

Low limit of shaft = 74.98 mm

Work tolerance = 75.02 − 74.98 = 0.04 mm

∴ Gauge makers tolerance (10%) = 0.004 mm

Wear tolerance = 0.002 mm

'Go side' of snap gauge = H.L. of shaft, (MMC) = 75.02 mm

'Not Go' side of snap gauge = 74.98 mm

Wear allowance is to be applied first to 'Go' side, before gauge maker's tolerance is applied. (Refer to Fig. 10.8).

'Go' side of snap gauge after considering the wear allowance

= 75.02 − 0.002 = 75.018 mm

∴ Dimensions of snap gauge are given as :

Unilateral System

'Go' 75.018 mm $^{+0.000}_{-0.004}$ 'Not Go' 74.98 mm $^{+0.004}_{-0.000}$

Bilateral System

'go' 75.018 mm $^{+0.002}_{-0.002}$ 'Not Go' 74.98 mm $^{+0.002}_{-0.002}$