Gauges

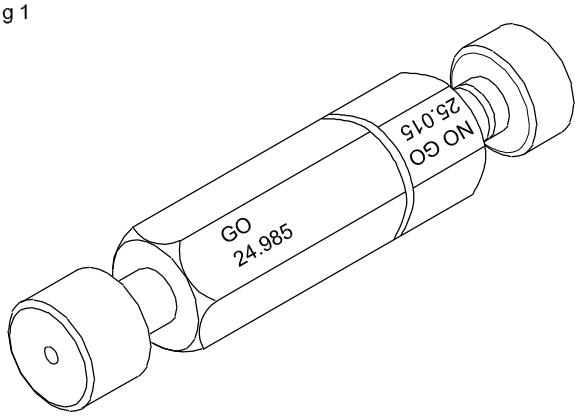
Objectives : At the end of this lesson you shall be able to
- **state the features of Go and No - Go gauges**
- **list the types of gauges used in production**
- **explain about the selective and non - selective asembly**
- **state the hole basis and shaft basis system.**

Features of Go and No- Go gauges

Componenets manufactured using mass production methods are checked only to ensure that the sizes are within the prescribed limits. The most economical method of checking such components is by using limit gauges. These gauges are used in inspection because they provide a quick means of checking.

Go and No - Go principle (Fig 1)

Fig 1



The Go and No -Go principle of gauging is that the Go - end of the gauge must go into the feature of the component being checked and the No - Go end must not go into the same feature. The dimensions of the Go and No - Go ends of gauges are determined from the limits stated on the dimension of the component to be gauged. The dimension of the Go -end is equal to the minimum permissble dimension and that of the No -Go end is equal to the maximum permissble dimension.

Essential Features

These gauges are easy to handle and are accurately finished. They are generally finished to one tenth of the tolerance they are designed to control. For example, if the tolerance t be maintained is at 0.02mm, then the gauge must be finished to within 0.002mm, of the required size.

These must be resistant to wear, corrosion and expansion due to temperature. The plugs of the gauges are ground and lapped.

The Go -end is made longer than the 'No -Go' end for easy identification. Sometimes a groove is cut on the handle near the 'No -Go' end to distinguish it from the 'Go' end.

The dimension of these gauges are usually stamped on them.

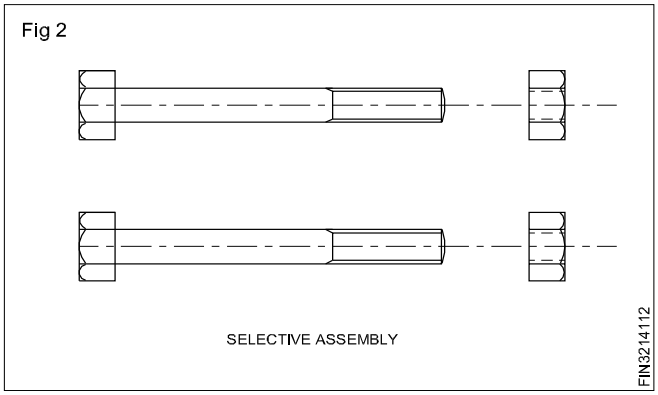
Types of gagues used in production

1 Limit gauge
2 Radius gauge
3 Centre gauge
4 Drill gauge
5 Drill grinding gauge
6 Feeder gauge
7 Screw pitch gauge
8 Angle gauge
9 Wire gauge.

Selective assembly

The figure illustrate difference between a selective assembly and a non - selective assembly. It will be seen in (Fig 2) that each nut fits only one bolt. Such an assembly is slow and costly,and maintainence is difficult because spares must be indiviually manufactured.

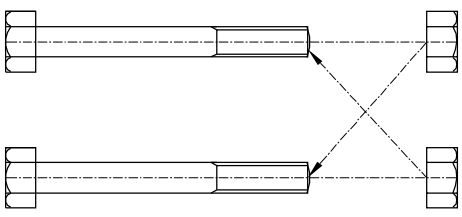
Fig 2



Non - selective assembly

Any nut fits bolts of the same size and thread type. Such an assembly is rapid, and costs are reduced. Maintenance is simpler because spares are easily available. (Fig 3)

Fig 3



NON-SELECTIVE ASSEMBLY
INTERCHANGABILITY

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Non - selective assembly provides interchangeability between the components.

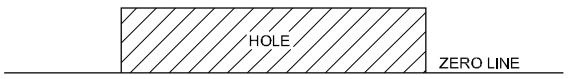
In modern engineering production, i.e. mass production, there is no room for selective assembly. However, under some special circumferences, selective assembly is still justified.

Hole basis system

In a standard system of limits and fits, where the size of the hole is kept constant and the size of the shaft is varied to get the different class of fits, then it is known as the hole basis system.

The fundamental deviation symbol ‘H’ is chosen for the holes, when the hole basis system is follwed. This is because the lower deviation of the hole ‘H’ is zero. It is known as ‘basic hole’ (Fig 4).

Fig 4



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Shaft basis system (Fig 5)

Fig 5

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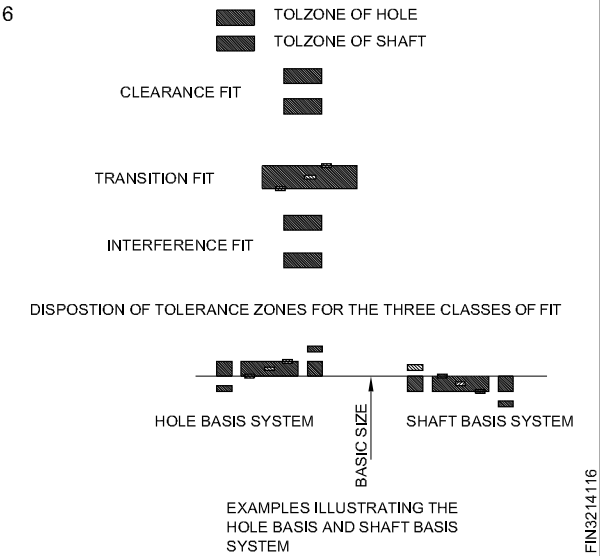
In a standard system of limits and fits, where the size of the shaft is kept constant and the variations are given to the hole for obtaining different class of fits, then it is known as shaft basis. The fundamental deviation symbol ‘ h’ is chosen for the shaft when the shaft basis is follwed. This is because the upper deviation of the shaft ‘h’ is zero. It is known as ‘basic shaft’.

The hole basis system is followed mostly. This is because, depending upon the class of fit, it will be always easier to alter the size of the shaft because, it is external but it is difficult to do minor alterations to a hole. Moreover the hole can be produced by using standard toolings.

The three classes of fits, both under hole basis and shaft basis, are illustrated in figure 6.

Fig 6



EXAMPLES ILLUSTRATING THE HOLE BASIS AND SHAFT BASIS SYSTEM

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