INTRODUCTION TO JIGS

• JIGS and FIXTURES are production work holding devices used to manufacture duplicate parts accurately.

• A jig is a special device that holds, supports, or is placed on a part to be machined.

• Jig is a production tool made so that it not only locates and holds the workpiece but also guides the cutting tool as the operation is performed.
Jigs using drill bushings
PLATE JIG

- Plate jigs have built-in clamps to hold the work. These jigs can also be made with or without bushings, depending on the number of parts to be made. Plate jigs are sometimes made with legs to raise the jig off the table for large work.

- Plate jigs mainly consist of a single bush plate with a provision for location and the clamping of workpiece. So the drill bushes guide the drills.
• Plate jigs are employed to drill holes on large parts maintaining accurate spacing with each other.

• Plate jigs are also used to secure the part so they provide high degree of accuracy and repeatability.

• Plate jigs are actually from family of jigs, such as plain plate jigs, table jigs, sandwich jigs etc.

• Plain plate jigs is the simplest and the most basic type. It uses a flat plate as one of its structural member, and all details are attached and referenced to this plate.
Plate type Jig

Bush plate
ADVANTAGE::
--Minimal design
Fabricator time

DISADVANTAGE::
Only one surface can be drilled at one loading and drilling forces are generally directed toward the clamping device. It is therefore necessary that the clamping device be rigid enough to withstand drilling forces.
FLAT PLATE JIG
Base plate circle jig
Channel jig

• Channel jig is of channel shaped and sometimes made from standard channel section material. The workpiece is fitted with the channel. It is located and clamped by rotating knurled knob.

• Disadvantage:

• Channel jig is limited to workpieces having simple symmetrical shape.
BOX JIGS AND TABLE JIGS
• Box jigs (sometimes called closed jigs) usually resemble a box like structure. They can be used where holes are to be drilled in the work at various angles. Work pieces having holes on number of sides can be can be drilled economically with box jigs.
BOX JIG FOR ANGULAR DRILLING

• A box jig for angular drilling is easily designed by providing the jig with legs of unequal length, thus tilting the jig to the desired angle. This type of jig is used where one or more holes are required to be drilled at an angle with the axis of the work. As can be seen in Figure below, the holes can be drilled in the work with the twist drill in a vertical position.
Figure 1-9  A box jig with legs of unequal length, used for drilling holes at an angle.
BOX JIGS OR TUMBLE JIGS

• This type receives its name from its shape, which in general resembles to a box.
• The work piece is a steel block used as a specimen in an oil testing.
• The hole is drilled and then reamed
• The loading in jig is as follows,
PROCESS INVOLVED IN LOADING

• A box jig with a hinged cover or leaf that may be opened to permit the work to be inserted and then closed to clamp the work into position
• This holds the work piece firmly so that drilling operation can be performed.
• Drill bushings are usually located in the leaf. However, bushings may be located in other surfaces to permit the jig to be used for drilling holes on more than one side of the work.
• When a box jig contains bushings on two or more sides, for the purpose of drilling hole on different sides of the part, and is referred to as TUMBLE JIG.

• Such a jig feet on opposite sides of the work faces.

• After one face is drilled, the next side may be drilled by simply flopping the jig to expose to drill spindle.
ADVANTAGE OF TUMBLE JIG

- Greater accuracy can be obtained and
- Less part handling necessary.