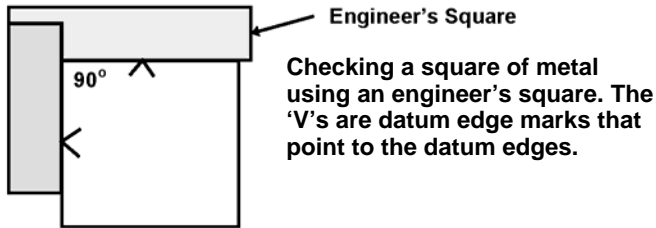


MARKING OUT METAL

Pens and pencils do not work well on metal, they rub off easily and don't show up well. Marking out is shown by scratched lines. To help the scratches to show up, before marking out, the surface of the metal can be covered with a thin layer of a quick drying ink called **Engineer's Blue**. Marking out tools scratch away the blue layer to show the contrasting metal colour underneath.

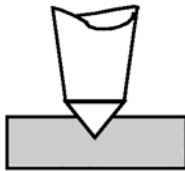
Before marking out, the metal should be prepared by filing two **datum edges**, from which all measurements are made. These edges should be perfectly straight and be at 90° to each other.



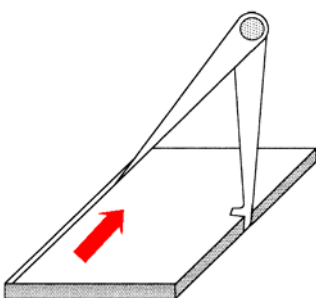
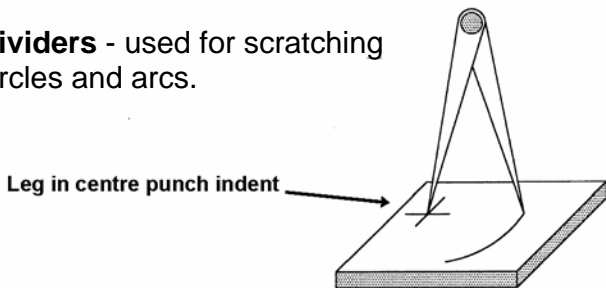
Scriber - used to scratch lines



Centre Punch - when hit with a hammer, it is used for making indents that position divider legs and drill points and stop them slipping.



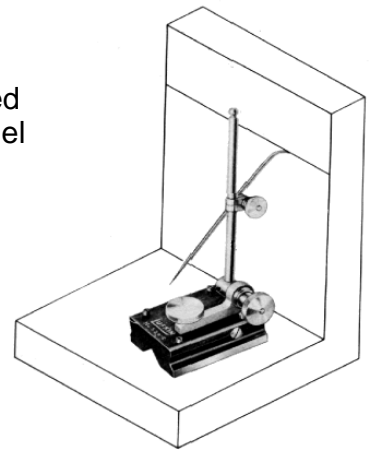
Dividers - used for scratching circles and arcs.



Odd-leg Callipers

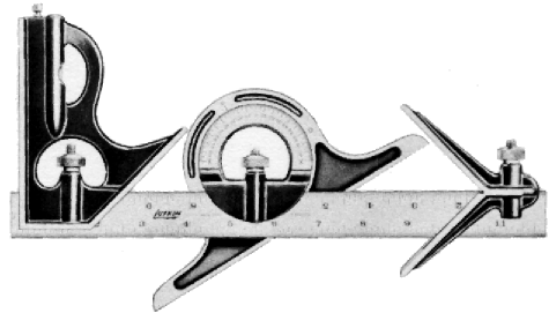
Used for scratching lines parallel to a datum edge

Scribing Block - a fully adjustable device for holding a thin scriber used for scratching lines parallel to a surface.



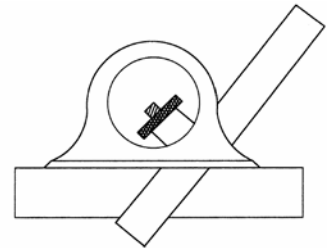
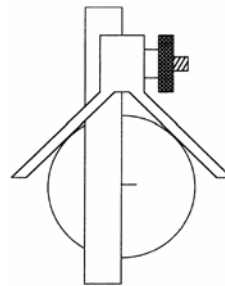
Combination Square

The photo shows all three heads on the rule. In use, only one head at a time would be on the rule.



Centre square being used to find the centre of a disc. With the disc edges touching the arms, draw two lines at different angles, where they cross is the centre.

The angle head being used to draw a line at a set angle.



1. Which tools are used to scratch lines on metal?
2. How can scratches on metal be made to show up more clearly?
3. How is the pivoting leg of a pair of dividers stopped from sliding over the surface of metal?
4. Which tool would you use for marking a line parallel to a long edge?
5. What is the 'odd-leg' for in a pair of odd-leg callipers?
6. Why is a scribing block adjustable?
7. Why is a combination square called 'combination'?
8. Show how the centre square is used to find the centre of the end of a length of round bar.
9. Show how you can scratch a line at an angle of 25° to the edge of a bar of metal.
10. Show how the 'square' head can be used to scratch a line at right angles to the edge of a bar of metal.