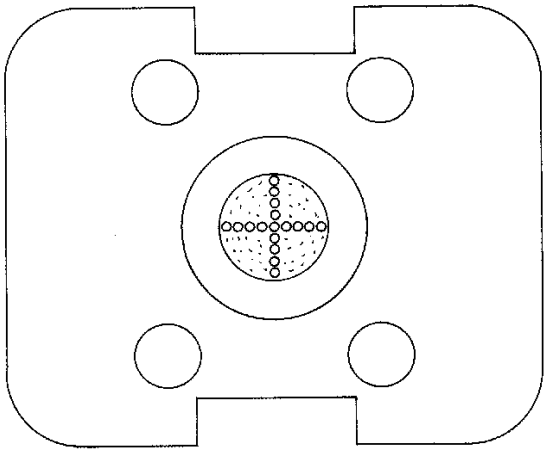
Vulcan Foundation Equipment
Replacement of Ram Point

Removing Old Ram Point

In order to remove an old point, the side pins (if any) will have to be drilled out before any force is applied to the Ram Point. A force of 50-200 U.S. Tons or even greater may be required against the flat end of the neck of the Ram Point inside of the Ram. If sufficient force is not obtainable to press the old point out, closely spaced (1/4" (6 mm) apart) holes should be drilled in the neck of the ram point for the full depth as shown below. This will immediately reduce the radial gripping action of the surface of the neck of the Ram Point in contact with the Ram, and thus lessen the pressure necessary to dislodge the old Ram Point in pressing it out.



Inserting New Point in Ram

Preparation of Ram Bore and Point

After removal of the stub, align the ram centre bores front and rear to 0.002" T.I.R.[1] Machine the face of the counterbore smooth. Machine the chamfer at the start of the ram point bore to its original size, but insure that the chamfer is slightly larger than the fillet radius on the Ram Point. If the surface of the hole in the Ram has been damaged while removing the old Point (which is usually the case,) it should be rebored with light machining cut for a smooth finish. This is to remove any scoring marks and insure a concentric bore.

All replacement Ram Points are furnished with the necked portion rough turned to approximately 5/16" (8 mm) larger than the original finished diameter of the hole in the Ram. Set up and indicate the ram point to 0.001" T.I.R. Machine the smaller diameter end which will fit into the

1 Runout is defined as the radial difference between two concentric circles centred on the datum point and drawn such that one coincides with the nearest and the other coincides with the farthest point on the profile. Runout is also known as Total Indicated Reading (TIR).

ram so that the finished diameter of the neck exceed the finished diameter of the hole in the ram by 0.001" for every inch of finished hole diameter. The surface around the centre hold at the top of the ram point neck should be ground flat with the rest of the surface.

Press Fitting Ram Point into Ram

On smaller hammers, a pressure varying between 50-150 U.S. Tons is usually required to press the Ram Point into the body of the Ram. Before inserting the new Ram Point, lubricate both the surface of the hole in the Ram and the surface of the neck of the new Ram Point with Molykote Type G or equivalent grease. The pressures quoted above presuppose the use of this kind of grease and no other is recommended.

Shrink Fitting Ram Point into Ram

On larger, offshore, hammers, the use of a press to insert the ram point is impractical; therefore, either the ram point can be cooled and shrunk or the ram heated and expanded to insert the ram point.

To insure a proper fit between the Ram and Ram Point neck, a light machining cut should be taken on the Ram bore to remove any scoring marks and to insure a concentric bore.

The diameter of the Ram Point Neck should first be machined to have an interference of 0.012"-0.015" (040, 340, 540) and 0.017"-0.019" (060, 360, 560, 5110, 3100, 5100) on the diameter of the Ram bore.

- *Shrinking the Point*: After machining the Ram Point, insert the Point into dry ice and an insulated container. It should remain there for approximately 24 hours in order to shrink the Ram Point small enough to insert it into the bore. After insertion, the Ram and Ram Point should be allowed to set for an additional 24 hours, or until both have reached the ambient temperature.
- *Expanding the Ram*: The Ram can be heated to approximately 400º-500ºF in order to expand the bore large enough for the ram to drop in smoothly. The ram should be heated at a rate of 50ºF until it reaches 500ºF. Hold this temperature for five (5) hours. After this check to see if the bore is at least 0.020" larger than the finished ram point neck. If available, a pressure of 200 U.S. Tons should be kept on end of ram point to insure seating. Once inserted, cover with an insulating blanket and allow it to cool to ambient temperature. *This is a very specialized operation and must be carried out with experienced personnel and organizations, as the ram is easily cracked with excessively rapid heating and cooling. It is also recommended that a Vulcan service representative be present to insure the work is done properly.*

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Inspection

After insertion of Ram Point, the seating of the point must be verified. This is done by looking at the Ram at the point end and locating the inspection "semicircles" adjacent to the point. A feeler gage can be used to ascertain that excessive gap does not exist between the shoulder of the Point and the mating surface of the Ram.

Once this is done, the ram can be reassembled in accordance with instructions given in the applicable Vulcan Field Service Manual. Diagrams for both types of assemblies are given below to illustrate the components and their assembly.