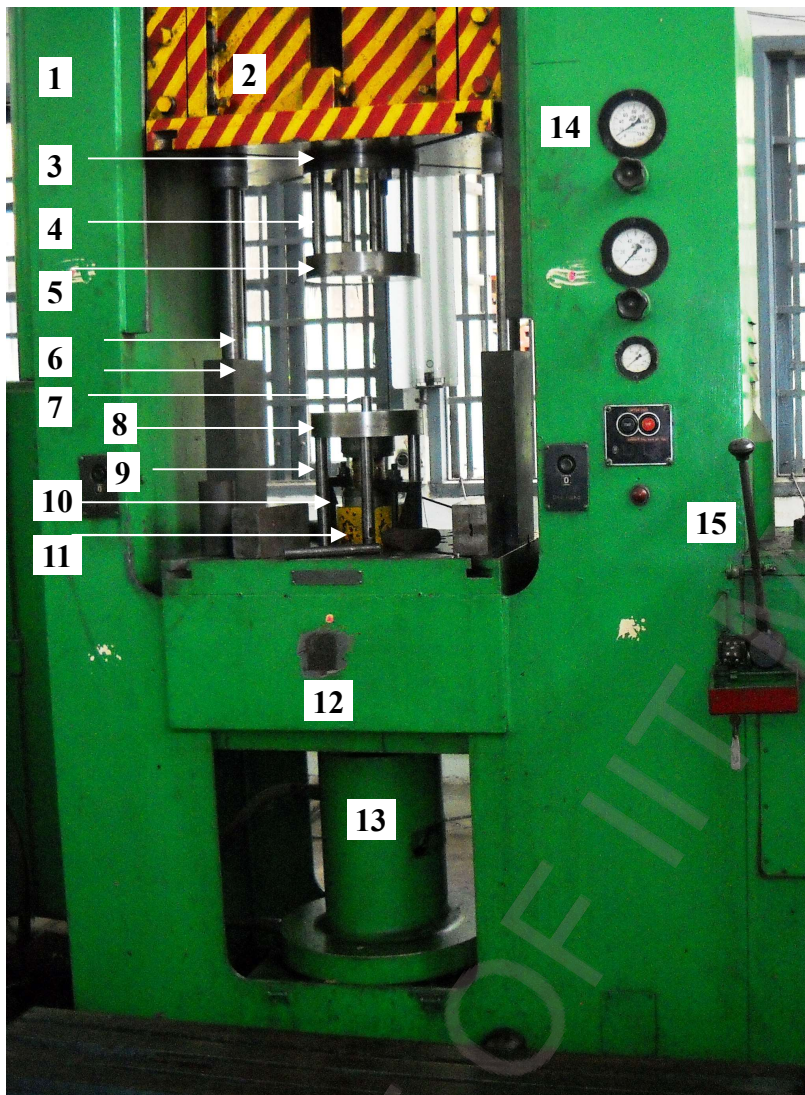


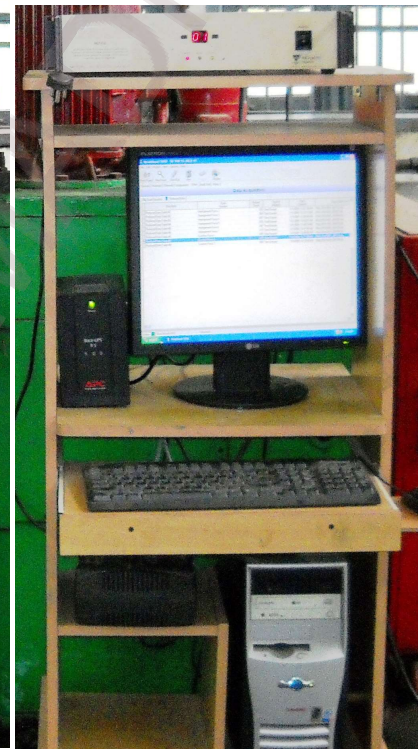
1. Blank holder rod of four nos of 25 mm dia, 2. Main Piercing punch of med.carb.steel of 12, 16, 18 & 20 mm dia, V ring holder block of M.S, 4. M4 screws of four nos, 5. guide plate of med.carb steel of four nos, 6. Cap plate for rubber of M.S, 7. M4 screws of four nos, 8. Spacer rods of M.S of four nos to accommodate shut height of press, 9. Rubber of shore hardness 120 to 150, 10. Punch guide ring of med.carb.steel of four nos, 11. V Ring of med.carb.steel, 12. M6 Screws of four nos, 13. Securing screws of M4 of four nos, 14. M8 Screw to secure punch to load cell, 15. Holes in bed at different pitch circle, 16. U Clamps.

All Dimensions are in mm. Kindly avoid scaling the drawing	Fine Piercing Tool Assembly in a Double Action Becker und Von Hüllen Deep Drawing Hydraulic Press	Design and Drawn by C. K. Gopalakrishnan & Em. Prof. Dr. P. Venugopal of Materials Forming Laboratory, MME Department, IIT Madras, Chennai – 600 036, India
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The 50 year old versatile hydraulic press is used for curricular activities. Besides, in this press, several sub-press equipments have been used including the presently (2010) fine piercing novel tooling.

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1. Hydraulic Press, 2. Slide/Ram of Press to ensure the total force for fine piercing, 3. Upper Clamp Plate, 4. Four Clamp Rods to accommodate shut height, 5. Upper half the fine piercing tool containing rubber holder and ceiling cover for rubber to ensure the third action of counter force, 6. Ram Stopper for controlling stroke, 7. The Cutting Punch or Piercing Punch of 25 mm diameter, 8. Impingement holder plate containing the V Ring secured in it, 9. Blank Holder Rod for effecting the Impingement force, 10. The strain gauge load cell, 11. Bottom Block to enable clamping on to bed of press, 12. Press Bed, 13. Hydraulic Die Cushion to ensure the Impingement force, 14. Manometer to read the total force, 15. Hand lever to ensure the servo-control of the Variable Displacement Pump (Bi-Directional Axial Piston Type) infinitesimally, 16. The Data Acquisition System to Register the Force and Stroke against time during the fine piercing.

The Linear Variable Differential Transformer attached to the Ram behind the press is not shown.

Photographic View of the Experimental Set - Up concerning the Fine Piercing with a Double Action Hydraulic Press at the Materials Forming Laboratory, I.I.T Madras, Chennai - 600 036 (Based on the presently suggested use of rubber to ensure the third action).