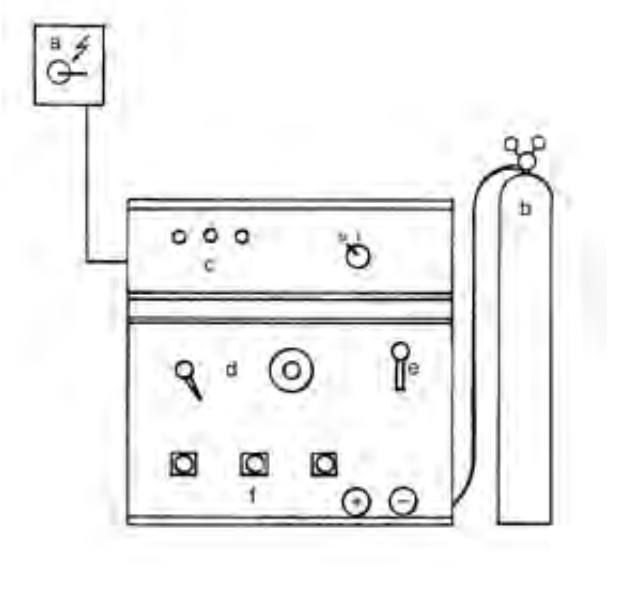
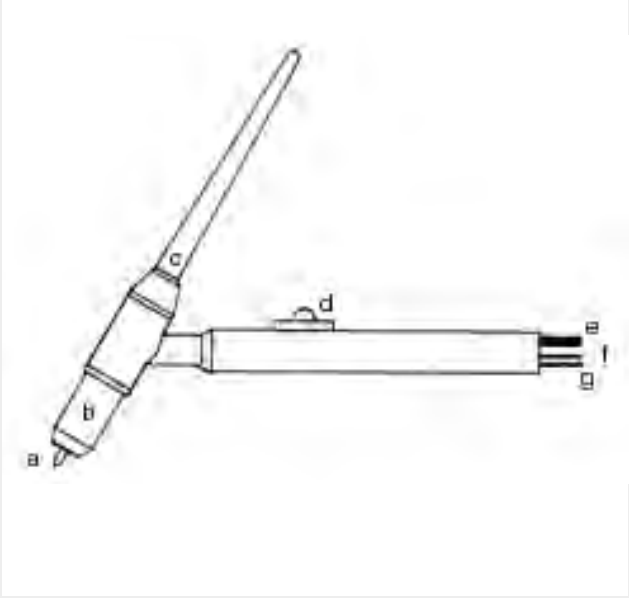


Fig 8

Fig 8 (left) shows the layout of a typical TIG welding set. A step-down transformer is connected to the mains. The power required to satisfactorily weld heavy copper alloy casts is such, that most TIG sets used in foundries are 3 phase/415v supplied. The transformer converts the high voltage/low amp input, to a high amp/low voltage output. The weld current control, weld current range shunt and ac/dc delivery shunt is located on the front panel (d & e). The on/off switch, and controls such as high frequency, gas purge timer etc, are located on panel (c). The water (out), gas (out) and water (return) sockets to the torch are located on the panel at (f). The power lead socket (-) and return lead socket (+), for direct current electrode negative welding, are located near by. Gas (ie high purity argon), connects to the set and is routed to the torch via a regulator and solenoid switch.

Fig 9

Diagram of a typical water cooled TIG torch. Small portable sets which use air cooled torches are available up to about 160 amps output, however, most castings are of a thickness requiring somewhat higher welding currents and a heavy duty water cooled torch. Leads from the transformer supply the torch with a water cooled power supply (e). The water then circulates the torch head, and returns to a fan cooled reservoir (f). Gas via a regulator /flow meter system is also supplied to the torch (g). The welding current and gas flow are initiated by depressing a control switch (d) mounted on the torch body. The torch head consists of a tungsten electrode (a), a ceramic shroud (b) and cap (c), all of which can be removed from the torch body for replacement. Within the torch head, a copper collet matching the electrode's diameter conducts heat away from the tungsten.



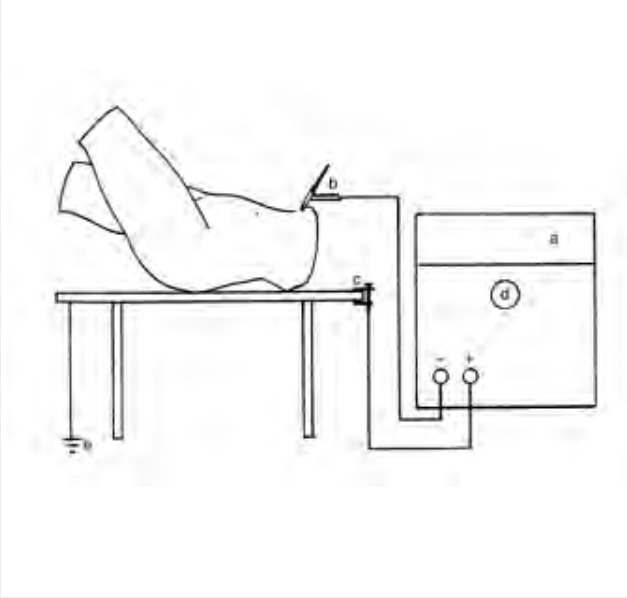


Fig 10

This diagram shows the correct set-up of a TIG set for welding a copper alloy cast. The transformer is connected to a high purity argon gas supply (not shown) regulated to about 10-15 litres per minute. The high frequency facility is set to 'start only' and the ac/dc shunt to 'dc'. The return lead runs from the positive terminal on the set (+), and is clamped to the workpiece (c) . If a bench is used, ensure the cast is not in contact with any steelwork, as this may transfer ferrous contamination. The TIG torch (b) is connected to the negative terminal (-). This set up is known as Direct Current Electrode Negative (DCEN) welding. For safety, the workpiece or bench should also be grounded to earth (e). This is done by running a high conductivity copper strip to ground, and connecting the workpiece via a clamp and lead. Most people confuse the 'return lead' with the 'earth lead'.

< RETURN TO TEXT