

ALIGNMENT JIG FOR EPA MAGNETS

Drawing No. EPA.7ME.0000.1009.3

G. Betty

INTRODUCTION

Two portable alignment jigs are required to enable the EPA magnets drawing No. EPA.7ME.DHZ0.0150.0 to be positioned in the machine. The jig will define the position of the magnetic axis.

SPECIFICATION

1. The jig will enable the magnetic axes to be placed within ± 0.1 mm of its nominal position in the machine.
2. The jig positions 2-Taylor/Hobson spheres $\emptyset 88.9$ mm at a height of 550 mm above the axis of the magnet. The centre distance between the spheres is 500 ± 0.03 mm. The spheres are equally spaced about the magnetic centre.
3. A precision spirit level is located on the jig, enabling the transverse horizontal plane to be defined.
4. The jig can be handled and placed in position by 2 persons.
5. The jigs are pre-aligned during assembly in the workshop, no further adjustment being necessary.
6. The jigs can withstand a horizontal force of 5 kg in any direction at a height of 580 mm above the axis of the magnet, without tipping or becoming excessively distorted.
7. The jigs may be used for all magnets of the type specified above.
8. Each magnet will carry a slotted locating block that will axially position the jig.

DESCRIPTION

The jig is built in the shape of an "A" frame, from Ac.37 square tubes 80 x 80 x 3.. and flat plates. A minimum of welding is used on the assembly. The weight of the frame is ~ 30 kg.

The jig sits on 3-brass pins. These pins are non-adjustable. Two pins bear on the vertical face of the magnet; and are to be machined to adjust the position of the Taylor /Hobson spheres.

An over-centre spring loaded lever locks the assembly in position with a spring force of ~ 20 kg in the radial direction.

The axial position of the jig on the magnet is assured by means of a rotating key which is a part of the "A" frame, and a slotted locating block which is bolted to the end face of the magnet. A 10 mm shim between the slotted block and the end face of the magnet permit the jig to be aligned according to the position of the magnetic axis.

ALIGNMENT OF THE JIG IN THE WORKSHOP

1. Adjust the Taylor/Hobson spheres to the required centres, pin and bolt the bushes in position (500 ± 0.03 mm).
2. Adjust the height of the spheres by machining the shims under the bushes (291 ± 0.03 mm).
3. Adjust the brass pins to bring the spheres parallel and to the specified distance from the pins (409 ± 0.03 mm).
4. Adjust the shim locating the rotating key to the correct distance from the sphere (284.45 ± 0.03 mm).
5. Make the necessary adjustment to the shims under the plate for the precision spirit level until the plate is in the horizontal plane.

ADJUSTMENT OF SLOTTED LOCATING BUSH ON THE MAGNET

The shim between the end face of the magnet and the locating bush will be calibrated for each magnet. In principle the thickness of the shim will be reduced by an amount equal to the displacement between the geometrical and the magnetic axis.

COST

Each frame will require ~ 15 hours to manufacture.

Cost at 40 SFr/h will be ~ 600 SFr (excluding the spheres and locating bushes).

