

**BHARAT HEAVY ELECTRICALS LIMITED UNIT:BHOPAL**  
**TOOL AND GAUGE DIVISION**

**CNC VERTICAL JIG BORING MACHINE**

**ANNEXURE 1**

**PURPOSE : ( OPERATIONS / JOBS INVOLVED )**

The CNC controlled vertical spindle jig boring machine is required to perform the following operations:

1) Drilling, boring and machining operations on jigs, fixtures, drill plates etc. for all the products like Hydro turbine & Generator, Large Electrical machines, AC motors, Traction motors & alternators, Steam turbine, Switch-gear etc.

2) Drilling, boring and machining operations on components of large compound press tools for laminations for electrical machines

3) Jig-grinding of holes and I/D

The operations involved are face milling, end milling, slot milling, drilling, boring, counter boring, reaming etc. and jig-grinding.

The CNC Jig Boring shall be provided with one axis movement of the table, one axis movement of the spindle.

The typical operations to be done are shown in the drawings below:

**A) For Boring operations:**

Tool drawing no.

1596199 ( For all holes with positional accuracy within 0.02mm )

1611121 (For holes sl. No. 1 to 378 size 8 H7 and G holes with positional accuracy within **0.01 mm** )

**B) For slot milling operation:**

Tool drawing no. 1612530 ( size 16mm within **H7 tolerance** )

**C) For flat milling operation:**

Tool drawing no. 1596748 ( surface milling of die plate. Accuracy: **Parallelism - 0.02mm**  
**Flatness - 0.01 mm** )

**D) For Jig-grinding operation:**

Tool drawing no. SK 1447 ( tool no. 1610712 ) ( For holes B with positional accuracy within 0.006mm )

Above mentioned components or similar components to be machined at BHEL works to prove the machining cycle time, accuracy and finish etc. Actual component may vary depending on their availability at the time of commissioning of the machine.