

## Cylinder head Manufacturing & Assembly

### Details on Quality control process:

As part of the process plan all alloy and cast iron bare castings go through series of quality check process to meet OEM specification. As a part of ISO9002 procedure these checks take place on every single casting with job card serial number.

#### Pressure Test:

All the casting received from casting factories is machined, washed and water plugs fitted. The job number is stamped on the cylinder head. The head casting is then pressure tested with air in water to @ 80-100 PSI to double check the casting quality and signed off by the person in-charge.

#### Hardness Test:

All castings again go through hardness test to check the casting quality achieves 170 to 200HB. Any extra machining takes place during the QC process followed by hardness test.

#### Surface finish and gasket faces:

Each head then gets measured with relevant jigs on the gasket faces and machined holes. Valve guide holes, push rod holes, rocker pedestal holes and air conditioning holes' size and position get checked. If surface finish is not within specs, then head casting get re-machined on the surface.

#### Cam Tunnel diameters:

All the cast iron and alloy heads re-machined with **BERCO BT6** line bore machined to achieve the OEM spec cam tunnel clearances. All cam bearing size and thrust face size is measured by qualified engineers to make sure cam shaft turn as required.

### Bare Cylinder head production process.

After heads have passed the checks, the seat inserts, pre-coms and valve guides are fitted. Valve guides are **Sunnen diamond honed** to OEM specs. Valve seats are Serdi machined to OEM specs using OEM genuine valves to check valve head heights above or below head face which ever applies. Then all seats are vacuum tested. All information on each head is recorded on every job card.

The heads are then checked and measured; OEM camshafts are test fitted when applicable to see that they fit and turn correctly, the job card is then signed by the engineer.

The heads are then finally pressure washed, dried and hung on racks ready for packing.

Before heads are packed they are given a final check for size correctness and cam fit. Final air blows off in all water ways and oil ways, head surface finish checked, heads are then sprayed with a protective coating then wrapped in protective paper, then bubble wrapped and packed in thick card board cartons.

All cylinder heads are supplied with heat tab and are branded with Acme's logo and a unique serial number which corresponds with the job card number.

All our heads for export are packed on plastic pallets, shrink wrapped and steel strapped. No wooden pallets are used to ensure MAF regulations are met.

[Please refer to the attached file for further information.](#)

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### Complete cylinder head production process:

- All heads that get assembled go through the bare head check list process.
- Alloy and Cast Iron heads are cleaned and assembled in a separate room.
- All components for the heads are first checked for the size and material.
- Cam shafts are checked first for hardness and then for size.
- Valve springs are tested for size and tension.
- Inlet & Exhaust valves are measured and checked for finish.
- Spring seats, spring retainers and valve collets are checked for size and hardness.
- After all components have been checked then the assembly process starts.
- Valve's above or below main head surface whichever applies are first checked to within OEM heights.
- All valves are vacuum tested.
- Valve stem seals are fitted using viton seals.
- Valves are fitted using Teflon based lubricant on the valve stems and engine oil on the valve contact face.
- Springs are fitted and then checked for installed heights to OEM specs.
- Cams are fitted using a Teflon based lubricant on the bearing surfaces and cam lobes, as well as the lifter surfaces.
- After head is assembled to this stage all valve clearance are checked and shimmed to the correct OEM specs or adjusted with threaded adjusting screw depending on the type of head.
- After completion of assembly, the heads are lightly oiled with an anti rust type lubricant ready for packing.

[Please refer to the attached images for further information about the assembly process.](#)