PRE-QUALIFICATION CRITERIA FOR CYLINDER BLOCK CRANKCASE (CASTING & FULLY MACHINING) TO DRG No.SB 20-01-02-9

- 1. EFA plans to develop vendors for aluminium alloys casting for Cylinder Block Crank Case (Casting & fully machining).
- 2. The prospective vendors must be supplying or must have supplied large intricate aluminium engine casting to reputed engine manufactures.
- 3. The vendors, who are interested in supplying such castings, with fully machining should have their own manufacturing facilities or getting the casting from reputed manufacturers should have tie-up with them. The firm should have a large manufacturing base, adequate financial strength as a well-documented quality system. The manufacturer should have adequate infrastructure like large area industrial shed, power backup, air compressors etc.
- 4. The casting manufacturer shall buy all input materials for liquid metal as well as for moulding and core making from reputed manufacturers only. Necessary material certificates for all input materials and additives should be available.
- 5. The vendors must have adequate trained, experienced and skilled manpower.
- 6. It is preferable that the firm is registered with any government organization like DGQA/Depts/PSUs.

Cylinder Block Crank Case Casting to Drg. No. 20-01-16-10

- 7. THE FIRM SHOULD HAVE FOLLOWING FACILITIES AND REGULARLY MANUFACTURING OF ALUMINIUM CASTINGS.
- a) Aluminium melting (Electrical resistance or LPG fired only) furnaces with control systems of adequate capacity from 500 kg to 1 ton.
- b) Transfer Ladles, holding (preferably with dosing facility) furnaces.
- c) Resin sand moulding.
- d) Capacity of the Auto resin mixer should be 5 to 10 ton preferably.
- e) Suitable core making facilities (like hot box, cold box and shell core) with latest core shooter and related mixers, core ovens etc.
- f) Ladle and dies LPG pre heating facilities.
- g) The firm should have Argon Degassing (MDU) plant.
- h) The firm should have density meter to check the effect of the degasification.
- i) Facilities for backelizing.
- j) Hydraulically operated gravity die casting machines.
- k) Heat treatment (solution sign aging facilities.)
- I) Vacuum Impregnation plant for sealing to eliminate of micro porosity.
- m) Firm should have or create autoclave chamber with 6 bar pressure (Firm to indicate the commitment in the tender alternative facility (incase autoclave chamber not available for making the casting).
- n) The general quality requirement of the casting to be manufactured by the vendor shall confirm to the technical document TTM 27-87 (copy enclosed).
- o) Pressure testing facilities.
- p) Abrasive blasting *I* surface cleaning facilities.
- q) Fettling facilities like band saw, mechanical grinders etc.
- 8. THE FIRM SHOULD HAVE THE FOLLOWING FACILITIES COMPULSORY AT THEIR PREMISES FOR FULLY MACHINING Cylinder Block Crank Case Assembly to Drg. No SB 20-01-02-9.
- a. HMC/VMC /VTL with axes strokes to accommodate component size 900x1000x700 mm and weight 160 Kg.-
- b. CNC horizontal boring / HMC size 1.5 m x 1.5m x 1.5m minimum.
- c. CNC vertical machining centre size Im X Im minimum.
- d. CNC VTL swing dia 1 m minimum.

- e. Firm should have electrical furnace to heat the component up to 250® C for fitment of bearing races.
- f. Radial drilling machine.
- g. Firm should have expertise in designing of complex fixtures, special tools and gauges in house or tie up with for designing and manufacturing of complex fixtures, special tools.
- h. Firm should have sufficient space and facilities for deburring and checking the components.
- i. Firm should have skilled fitters to carried out the critical fitting operations.
- j. Adequate material handing facilities like EOT cranes forklifts etc.
- k. Component washing facility like jet washing facilities should be available / created.
- I. Firm should be capable to design and develop the fixture and other facilities required to carry out the pressure testing operation. Firm should have (or) create pressure testing facilities at their premises after receipt of the supply order. After completion of all machining operation the last operation pressure testing should be carried out. Final acceptance of the component / Assembly may be decided based on Water pressure testing outcome. Water temperature, Pressure and duration of testing should be maintained as per drawing / process sheet.
- m. Firm shall be full responsibility for the quality of the component supplied to Engine factory till final engine performance clearance in the field.

QC CRITERIA

Testing facilities and test equipment's and lab (preferably NABL accredited) includes following facilities:

- i) Radiography testing equipment.
- ii) Sand be for green sand and core sand testing and analysis.
- iii) Wet gravimetric chemical analysis.
- iv) Spectroscope.
- v) The firm should have Mechanical testing lab & Ultrasonic testing lab.
- vi) Microscopes for micro structural analysis.
- vii) Macro analysis facilities.
- viii) Firm should ensure the supply of items as per drawing dimension and technological requirements.
- ix) CMM to check the Cylinder block crank case after fully machining.
- x) Instruments / gauges to check the critical parameters of the component
