

ENGINEERING BULLETIN

EBO04/2016



ACL RACE SERIES BEARINGS



Set Numbering

ACL RACE Series bearing sets are identified by the 'H' after the set number e.g. 8B663H-Std.

Most ACL RACE Series bearings are also produced in a 'HX' version e.g. 8B663HX-Std. The 'X' signifies the set will give an extra .001" (.025mm) oil clearance on a standard size shaft when compared to the H-STD set. The wall size of these HX-STD bearings is .0005" (.013mm) thinner than the H-STD Bearings, in all other respects the HX set is identical to the H-STD set.

There are selected con rod bearing sets that are manufactured with a dowel hole in the lower shell, to suit a dowel location in the con rod cap. These are designated with a 'D' in the set numbering e.g. 8B663HD-Std or 8B663HXD-Std etc.

Appearance

Questions about the appearance of the RACE Series bearings are quite common, as this series of trimetal copper lead bearings have a very different appearance to regular aftermarket "ACL Duraglide" trimetal bearings, which have a light silver /grey appearance.

The RACE Series performance bearings as manufactured have

an appearance that is a dark tarnished colouration, which can vary from dark black/brown/blue colours. This colour comes from the electroplating which is the last manufacturing process. The electroplated overlay has copper as one part of its composition, which tarnishes to the dark colours described above. This tarnish colouration has negligible thickness, so once installed in the engine, the crankshaft journal contacting the bearing, will polish the bearing surface, removing the surface colour and leaving the bearings with a polished silver appearance.

Performance bearings do not start out with the silver grey appearance of regular aftermarket bearings, as there is no final silvery tin flash applied to these bearings. Not applying a silvery tin flash to these high performance bearings is a specific design feature. A silvery tin flash for appearance and long term corrosion protection, as applied to the regular aftermarket bearings, can under high loading and heat, move, with the plate migrating and causing high spots on the back of the shells, and distorting the bearing. For this reason the ACL RACE Series performance bearings do not have a cosmetic silvery tin flash applied, so there is no risk of any overlay plate movement on the backs of the shells, giving better bearing to housing contact and better bearing performance and function.

AUSTRALIAN ENGINEERING EXCELLENCE

Installation of ACL RACE Series bearings – Oil Clearances

Oil clearances are most accurately measured using micrometres and bore gauges. Bearing wall thickness measurements are taken at 90 degrees to the parting line (i.e. at the crown of the bearing) using a micrometre with a ball anvil, for use on the curved ID of the bearing.

Vertical oil clearance is best measured by assembling the bearing in its housing, with bolts torqued to specification, then using a bore gauge measure the assembled ID of the bearings at 90 degrees to the parting faces. The mating crankshaft journal size is measured, and subtracting this measurement from the bearing ID bore size, gives the assembled oil clearance.

ACL RACE bearings can be assembled with .00075-.001" per 1" of journal diameter (0.020-0.025mm per 25mm of journal diameter) plus .0005" (0.013mm).

As an example for a 2.000" (50mm) journal diameter, $2.000 \times .001 = .002 + .0005 = .0025$ ($50/25 \times 0.025 = 0.050 + .013 = 0.063$ mm)

Bearings should not be polished with abrasive pads or paper, on the bearing surface, to change the oil clearance.

Select Fitting of ACL RACE Series Bearings

It is common practise to adjust oil clearances by mixing bearings of adjacent grades i.e. HX-STD with H-STD or H-STD with H-001 or H-.025, to obtain desired oil clearance. Using the HX-STD with H-STD will give .0005" (0.013mm) additional clearance than using two H-STD shells, and similarly using H-STD and H-001 will reduce clearance .0005" (0.013mm).

Bearing shells with wall size .0005" (0.013mm) or less can be assembled on one journal. The thicker wall size bearing is fitted to the most heavily loaded position i.e. the upper half con rod shell and the lower half or cap position main bearing.

When using a crankshaft that is to be reground to an undersize, first measure the assembled bearing ID's, then have the required journal sizes ground to match the bearing measurements, with the desired oil clearance.

Bearing Design Enhancements

Crush increased for:

Improved bearing retention from higher radial contact pressure. Locks the bearing into the housing.

More effective heat dissipation through improved thermal transfer.

Bearing Eccentricity

Definition: Gradual reduction in wall thickness between the crown and parting line.

Race Series performance engine bearings feature increased eccentricity to improve shape adaptation to compensate for bore distortion at high speed operation.

Assists in the formation of hydrodynamic oil film.

Main Bearings with Extended Grooves

Full (180°) grooved uppers with matching partial groove in lowers.

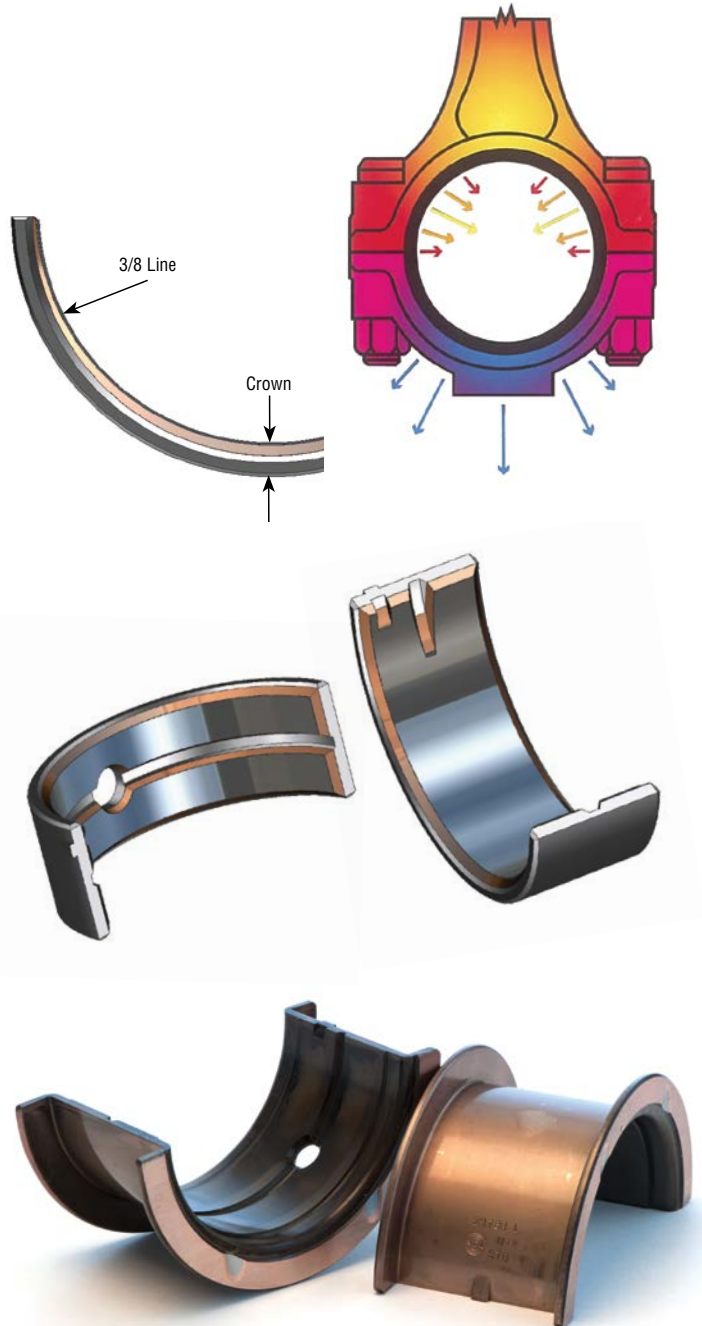
- Reduces interruption to big end oil supply.

Tapered groove run-out.

- Smooths big end supply cut-off avoiding pressure pulsing and cavitation.

Enlarged ID Chamfers

Accommodate larger fillet radii on performance crankshafts.



ACL Bearing Company

(Australia) Pty Ltd

253 George Town Road, Rocherlea,
Tasmania 7248 Australia

Tel: +61 (0)3 6326 0500

Fax: +61 (0)3 6326 6666

www.acl.com.au

www.aclperformance.com.au

