



FLEXIGAUGE

Flexigauge is precision manufactured plastic strip, and can be used to check the clearance of connecting rod and main bearings where there is no access to traditional measuring equipment such as micrometers. It is available in four sizes, and is suitable for Automotive, Marine and Industrial applications.

The four sizes available together can cover clearances ranging from .001" to .016", or .025mm to .406mm, sizes are as follows:

Reference	Clearance range:
AG-1 - (RG-1) (Green Pack)	.001 - .003in or .025 - .076mm
AR-1 - (RR-1) (Red Pack)	.002 - .006in or .050 - .150mm
AB-1 - (RB-1) (Blue Pack)	.004 - .009in or .10 - .23mm
AY-1 - (RY-1) (Yellow Pack)	.008 - .016in or .203 - .406mm

Flexigauge strips – 12" long – are packed in individual envelopes, which are marked in appropriate graduations – one side in thousandths of an inch and the other in millimeters. Ten strips in their envelopes are packed in their appropriate colored carton.

Directions for use, which are printed on the outside of each carton for easy reference, are as follows:

1. Remove the bearing cap, wipe the journal and bearing shell clear of oil.
2. Place a piece of Flexigauge across the bearing at the crown.
3. Install the bearing cap and using a Torque Wrench tighten the bolts to the correct tension.

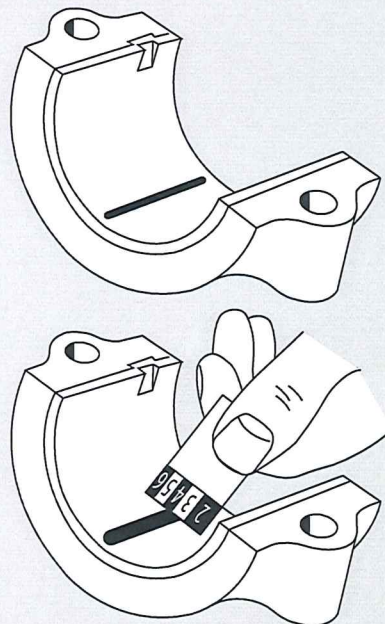
DO NOT ROTATE THE SHAFT OR BEARINGS.

4. Remove the bearing cap. The Flexigauge will stay on either the bearing or the shaft.
5. Compare the width of the flattened Flexigauge with the graduation on the envelope. The figure within the graduations indicates the clearance in thousandths of an inch or millimeters, depending on which side of the envelope is used.
6. Taper is indicated when the Flexigauge is wider at one end than the other, the amount of taper is equal to the difference in the two readings. The widest part of the Flexigauge represents the area with the least clearance. 'Barrelling' of the shaft is present when the Flexigauge is wider in the center of the bearing.

PRECAUTION

When checking main bearings, with the CAP supporting the crankshaft, the weight of the crankshaft and flywheel must be taken off the bearing caps to avoid inaccurate results. This can be done, for example, by 'jacking' on the crankshaft balance weight.

Main and connecting rod bearing clearances should be checked on the area of least journal wear. Main bearing checks should be made with the adjacent crankpin situated about 30 degrees after bottom dead center.



FITTING INSTRUCTIONS

To ensure a satisfactory bearing life, there are certain simple but necessary rules which must be closely observed. Since extreme accuracy is built into precision insert bearings, they must not be filed, scraped or machined in any way.

They are machined to tolerances as fine as 0.004mm (0.00015") and cannot be improved upon by any hand work, however skilful it may be. Follow this procedure for a satisfactory bearing assembly.

1. Dismantle

Before dismantling the old bearings, mark the bearing housings for reassembly identification – the caps must be reassembled exactly as removed.

2. Inspect

Remove the crankshaft and bearings for careful assessment of the extent of wear or other damage. If either the crankshaft journal or bearing tunnel sizes are found to be outside the dimensions shown in this catalog, re-machining is recommended. If the used bearings exhibit signs of damage due to poor engine conditions, the source of these problems must be identified and rectified to eliminate further problems.

Common faults that can be highlighted by the old bearings include bent or twisted connecting rods, bent crankshafts, misaligned tunnel bores, poor journal surface finish, insufficient or excessive nip, poor tunnel seats, mixed or reversed caps, etc.

3. Clean

Careful cleaning of the engine block and all components must be undertaken to be sure of a successful bearing replacement. By far the best way is to remove all gallery plugs and allow the dis-assembled engine to soak in an agitated chemical bath (iron and aluminum-alloy components require different chemical cleaners). In this way, all sludge and dirt accumulations are removed. If chemical cleaning facilities are unavailable, a less thorough, and therefore less desirable method, is to remove gallery plugs and then remove all visible dirt and wash down with a solvent such as Kerosene. It is imperative to ensure that the entire lubrication system is completely clean and free of obstructions.

4. Check dimensions

- Always accurately measure all journals, conrod and main tunnels prior to assembly to be sure they are within the required tolerances, particularly if any resizing is to be performed. Remember, the bore of the assembled bearing can only be as accurate as the housing into which it is fitted.
- Check that replacement bearings are correct in all detail to the bearings removed i.e. oil holes, grooves, and locating notch.

5. Check crush

It is good practise to check for crush at assembly.

The procedure for this operation is:

- Assemble the pair of bearings in their housing and tighten the bolts to the recommended torque figure.

- Release one bolt, and the joint face will open to the extent of the crush. Measure the crush by selecting a feeler gauge that neatly fits this gap. The value of the crush measured should be 0.075 – 0.150mm (.003 – .006").

6. Check oil clearance

With tunnel sizes correct to specification and shaft journals unworn or correctly ground undersize, ACL finished-to-size bearings will provide a correct operating clearance which can be quickly confirmed on assembly with the use of Flexigauge.

Where any doubt exists, or in special cases, oil clearance should be checked by accurately measuring and writing down each journal diameter and then subtracting this from the corresponding internal bearing diameters that were noted when checking the amount of nip or crush. The difference between the two diameters represents the vertical oil clearance and this must fall within the desired clearance range. Where recommended oil clearances are unknown, our normal recommendations are as follows:

0.019 – 0.025mm / .00075 – .001" of clearance per inch of journal diameter.

For example, given a 76.2mm/3" shaft, the clearance recommendation would be:

0.057 – 0.075mm / .00225 – .003"

These are valid for normal passenger light vehicle applications.

For high performance modified applications it is recommended to add at least 0.013mm/.0005" to the clearance figure.

7. Assemble

Assemble the bearing shells with the **SHELL BACKS AND THE HOUSING SEATS PERFECTLY DRY**, but apply a liberal coating of heavy oil between the surface of the bearing and the shaft. Apply a light tension on all the bolts before finally tightening them evenly to the vehicle manufacturer's specified tension.

8. Check end float (thrust clearance)

The recommended end float clearance differs from engine to engine although the following table provides a good guide. It is advisable to check thrust clearances at both thrust faces to ensure an accurate measurement.

Journal Diameter	Recommended Clearance
50 – 70mm / 2.000 – 2.750"	0.10 – 0.15mm/.004 – .006"
70 – 90mm / 2.750 – 3.500"	0.15 – 0.20mm/.006 – .008"
90mm up / 3.500" up	0.15 – 0.25mm/.006 – .010"

Copper-Lead thrust bearings should be given a slightly higher clearance than bi-metal thrusts and hard working engines should have a bit more than normal duty engines, but always within the recommended figures shown.

Some thrustwasher sets and flanged mains are available in an oversize, this is normally noted in the part listing. Contact your distributor or ACL if this is not clear.

WARNING: DO NOT ATTEMPT TO ROTATE THE CRANKSHAFT UNTIL ALL BOLTS ARE FULLY TENSIONED.