

Previous Screen

Product: NO EQUIPMENT SELECTED
Model: NO EQUIPMENT SELECTED
Configuration: NO EQUIPMENT SELECTED

Reuse And Salvage Guidelines

Visual Inspection of Main Bearings and Connecting Rod Bearings{1202, 1203, 1225, 1230}

Media Number -SEBF8009-05

Publication Date -13/11/2008

Date Updated -02/12/2008

i03377923

Visual Inspection of Main Bearings and Connecting Rod Bearings {1202, 1203, 1225, 1230}

SMCS - 1202-040; 1203-040; 1225-040; 1230-040

Engine:Commercial All Diesel

Engine:Truck All

Engine: All Commercial Gas Engines

Generator Set: All

Industrial Engine:with Turbochargers All

Machine Engines: All

Marine Engine: ALL

Introduction

This Reuse and Salvage Guideline contains the necessary information in order to allow a dealer to establish a parts reusability program. Reuse and salvage information enables Caterpillar dealers and customers to benefit from cost reductions. Every effort has been made in order to provide the most current information that is known to Caterpillar. Continuing improvement and advancement of product design might have caused changes to your product which are not included in this publication. This Reuse and Salvage Guideline must be used with the latest technical information that is available from Caterpillar.

For additional information about this guideline, consult Repair Process Engineering of the Marketing & Product Support Division at 1 (309) 675-5434.

Summary

This guideline will provide visual criteria and recommendations in order to show the difference between a reusable bearing and one that is not reusable. This guideline must be used to determine whether a bearing is reusable. Bearings that show unacceptable wear must be replaced. If a bearing meets the specifications in this guideline and other applicable guidelines, the bearing can be expected to give normal performance until the next overhaul.

This guideline may not be used for failure analysis. To make the illustrations more clear, descriptions of possible failures have been included. More information on failure analysis can be found in Applied Failure Analysis, SEBV0544, "Engine Bearings".

References

Applied Failure Analysis, SEBF0544, "Engine Bearings"

General Information

Carefully inspect all bearings. It is also necessary to inspect crankshaft journals and bores. While it is acceptable to replace only one bearing, you must replace both halves of the bearing. Clean all parts and passages. Debris from bearings can damage piston skirts. New bearings are necessary when a crankshaft has been straightened, ground or polished. A new bearing is also necessary when a bore has been machined.

Nomenclature

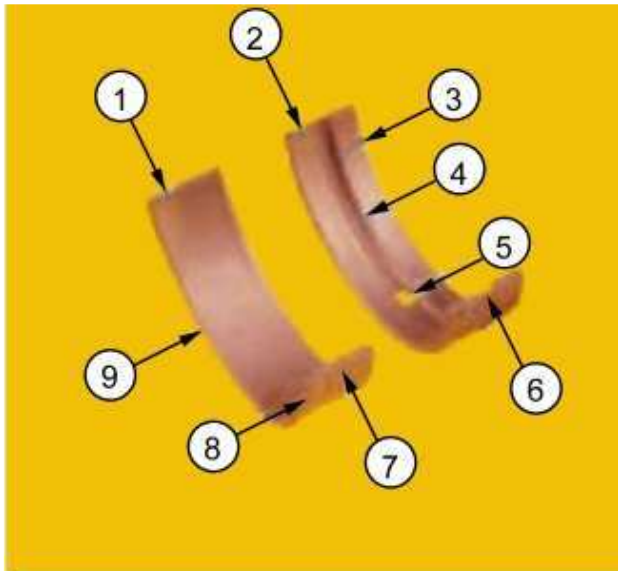


Illustration 1
Main bearing

g01693334

- (1) Lower bearing half
- (2) Upper bearing half
- (3) Bearing surface
- (4) Oil groove
- (5) Oil hole
- (6) Locking tab
- (7) Mating face
- (8) Tab slot
- (9) Edge



Illustration 2
Thrust bearing

g01694173

Machining all bearing journals is recommended if you must machine a bore or a crankshaft in order to remove damage. Always follow the instructions for reconditioning. Instructions for reconditioning can be found in applicable service manuals.

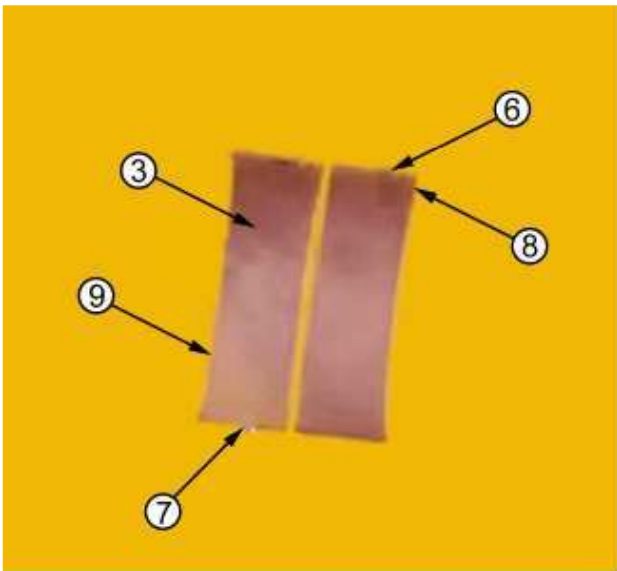


Illustration 3

g01694238

(3) Bearing surface

(6) Locking tab

(7) Mating surface

(8) Tab slot

(9) Edge

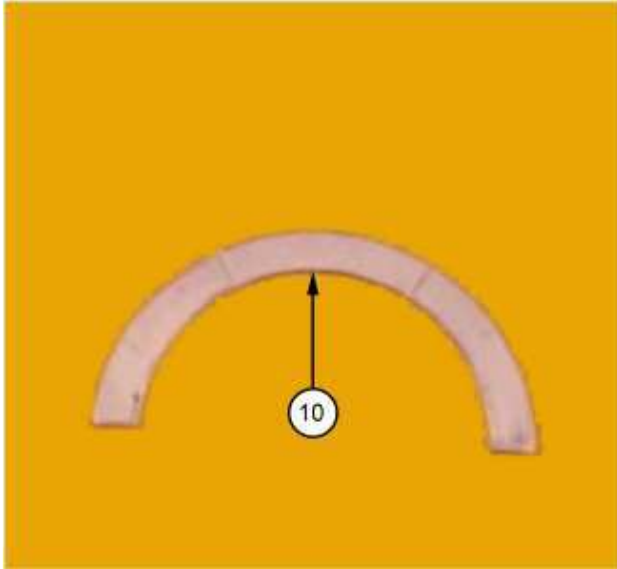


Illustration 4

g01694261

(10) Thrust surface

Characteristics of Construction

There are a wide variety of materials and layers that make up bearings. This overview is a basic description of the layers and materials that make up bearings, starting with the steel backing and working up to the surface.

- The steel backing is relatively thick. The steel backing also provides strength to the bearing surface.
- The bonding agent is a thin metallic layer of material, which allows the lining of the bearing to be bonded to the steel backing. Directly bonding the lining to the steel may not always be possible. A bonding agent that is made from aluminum is used on aluminum based material.
- Bearing material is a nonferrous material. Successful operation of the bearing requires bearing material to give a phase of softness and a phase of hardness. The lining of the bearing can consist of copper, aluminum, tin, or lead.
- A bonding agent may be a very thin layer of nickel or copper.
- Overlays are typically very soft lead based alloys. Overlays provide a soft layer between harder materials in the bearing. Lead overlays are also resistant to corrosion.
- Flash coatings typically consist of tin. Flash coatings coat the whole bearing for long term storage. Flash coating is about two microns thick. Flash coating can aid the process of break-in by wearing materials more gently.

Although bearings are constructed similarly, there are differences between standard bearings and thrust bearings.

- Thrust bearings do not have an overlay of lead tin on flanges of the thrust bearing or thrust plates.
- The bonding agent is different on some bearings. Older bearings have a second layer of bonding agent between the steel back and aluminum.
- The lead, or lead tin preventive coating gives bearings a dull gray or white color. Bearing operation may cause a color change of the bearing.
- Bearing color is also determined by the flash type. Lead tin coated bearings will typically be darker in color, while tin coated bearings will be lighter in color. Operation of moving parts in an engine will also change the color of the bearing.

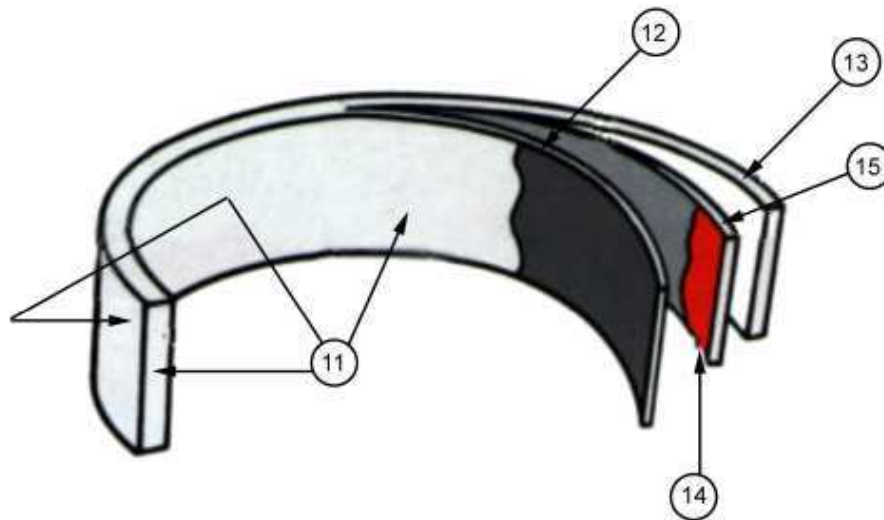


Illustration 5

g01694319

Layers of material

(11) Tin or lead tin flash

(12) Lead tin overlay

(13) Steel back

(14) Bonding agent

(15) Aluminum bearing material