

Title: Dangers of contamination from Glass Bead Material

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Technical portions are approved by Airmotive Engineering Corp.



1.0 **PURPOSE:** To help prevent engine failures

2.0 **SCOPE:** To alert technicians and mechanics about the perils related to *glass beads*

APPLICATION: Maintenance of aircraft piston engines. 3.0

- 4.0 **REFERENCE:** Engine Manufacturer's overhaul manuals and service bulletins, service instructions and service letters (Continuing Airworthiness Instructions) should always be consulted as the principal authority for any engine overhaul and maintenance information.
- 5.0 **DISCUSSION**: One of the methods used by technicians and mechanics to clean component parts is to shot blast using glass beads. This procedure has some benefits over other cleaning procedures, but all of the benefits pale in comparison to the devastation that glass beads cause when they are introduced in any manner into the inner workings of an aircraft piston engine. Even one glass bead can cause significant damage before it breaks up into glass dust. If it is trapped in a bearing it does its damage and then can re-circulate to do some more.

Many shops keep glass bead blast media and only use it to clean external parts. Others believe that proper cleaning will eliminate the hazard. There are two axioms that should be posted in every engine shop:

- 1. If glass beads are any where in any quantity in an aircraft repair facility, they will end up in aircraft engines!
- 2. The only thing that loosens up and moves glass bead media from the nooks and crannies of aircraft engines and into areas where they cause the most harm is hot engine oil!

Most engine overhaulers or repairers have experienced problems related to glass beads. However, many were never aware of the root cause for their problems, and either gave up on the search for a cause or attributed the cause to something else. This is because glass beads will defy cleaning efforts and are difficult to identify after the damage is done. Airmotive Engineering Corp. and Engine Components, Inc. have experienced the problems caused by glass bead blast media many times over the years. Because of these experiences (i.e. warranty claims), our technicians have developed highly effective evaluation techniques, and it is rare that positive evidence of glass beads cannot be found.

The photograph below shows glass beads that were solvent washed from behind piston rings of cylinders sent back to ECi for warranty consideration. The pistons, rings, cylinder bores, and bearings were severely damaged and unserviceable.

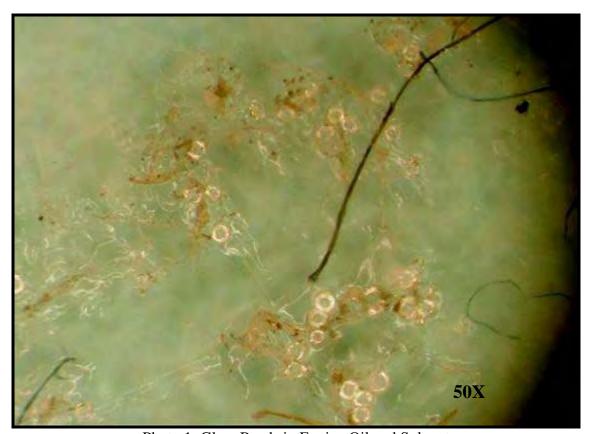


Photo 1: Glass Beads in Engine Oil and Solvent

Conclusion: It is of utmost importance that glass beads not be used in any manner to clean piston engine parts. Even one glass bead can cause significant damage, and failure to comply with this instruction will result in denial of a warranty claim.