BARRY CONTROLS

Inspection and Maintenance of Barry Controls Aerospace Engine Vibration Isolators

This guide is intended to provide instructions for the inspection and maintenance of the general aviation engine vibration isolators manufactured by Barry Controls Aerospace. If the aircraft manufacturer's maintenance manual's instructions are different, or if a Barry Controls Aerospace Component Maintenance Manual is available for a particular isolation system, those instructions will take precedence.

Description and Operation

Most of the engine vibration isolators manufactured for light, piston powered aircraft are very similar in construction. Each isolator is made up of two molded assemblies and a spacer. Each of the molded assemblies consists of a metal washer with elastomer bonded to it. The metal washers serve two purposes. First it's to provide a mounting point for the through-bolt and second, to make the mount "fail-safe". If an engine fire were to burn away the elastomer, the engine will still be restrained by the metal washers and through-bolt. The spacer's purpose is to set the preload on the elastomer by regulating how much the isolator is compressed when the through-bolt is torqued. This preload determines how the mount will perform in a particular application.

Some isolators will incorporate one or more shims molded into one of the molded assemblies. This molded assembly is stiffer due to the shim(s) and is intended to support the weight of the engine while the aircraft is on the ground.

Maintenance of Engine Mounts

Maintenance of engine vibration isolators is very simple. Dirt and hydrocarbons should be removed by wiping with a clean rag. Soap and water or isopropyl alcohol can be used, but any other solvents should not be used as they can damage the elastomer or the elastomer-to-metal bond. Any lubricants or solvents spilled onto the isolators should be removed from the isolators as soon as possible

Inspection of Installed Mounts

During annual or 100-hour inspection of an aircraft or scheduled inspections of an aircraft's engine(s), the engine mounts should be inspected. The inspection can be accomplished with the isolators mounted on the aircraft with the isolators supporting the weight of the engine. The criteria for inspection include:

- Condition of the elastomer: The elastomer should free of damage, cracking, or other deterioration.
- Integrity of the metal-to-elastomer bond: The elastomer should remain bonded to the metal washers. Failure of the bond can cause excessive drift of the powerplant. If delamination is suspected, it can be

investigated by probing with a blunt-edged instrument. If more than 30% of the edge of a bonded interface is debonded over ¼" in depth, the isolator should be replaced.

- Inspect the metal washers (as visible) for corrosion or damage such as nicks, dings, etc. Minor damage can be blended out by hand, as long as depth of rework does not exceed 10% of material thickness.
- Check structure around engine (such as the cowling, prop spinner) for signs of damage caused by excessive drift of the engine. If damage is found, investigate cause. Excessive drift can be caused by a too-soft isolator, delamination, or by elastomer creep that occurs over time.

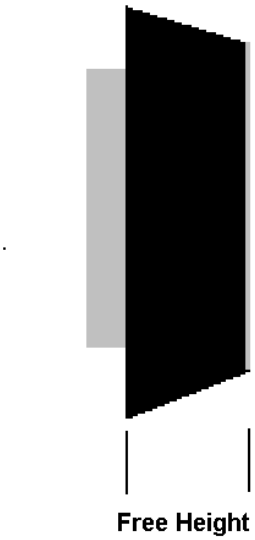
If any of the above conditions are noted, the isolators should be removed, disassembled, inspected, and repaired or replaced.

Bench Inspection of Mounts

Engine vibration isolators should be removed and inspected under the following circumstances:

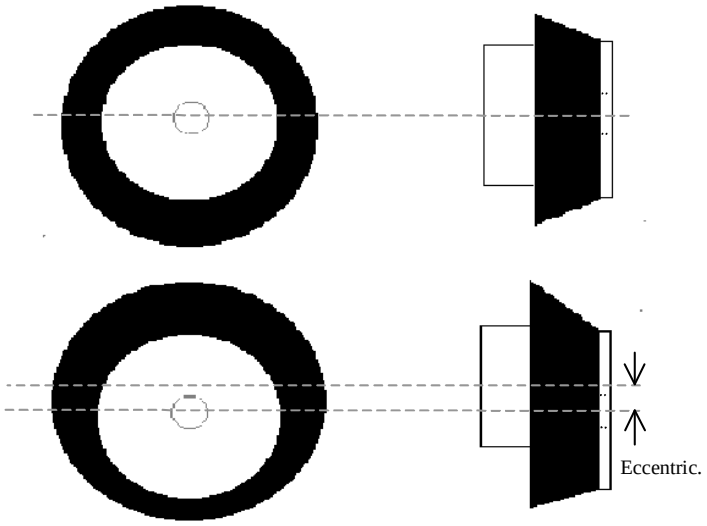
- When an engine is removed for overhaul.
- When sudden stoppage of the propeller or engine occurs.
- When then nacelle engine bay has been exposed to excessive heat (i.e. engine fire).
- When excessive vibration is experienced or reported.
- Any circumstance not identified above that would indicate the airworthiness of the isolator(s) may have been compromised (age weathering, deterioration, etc.).

Removed isolators should be inspected to the same criteria as installed mounts. The areas not normally visible when the isolators are installed will now be available for inspection also. Two additional checks of the molded assemblies should also be performed. One is checking the free height of the molded assembly and the other is checking the eccentricity.

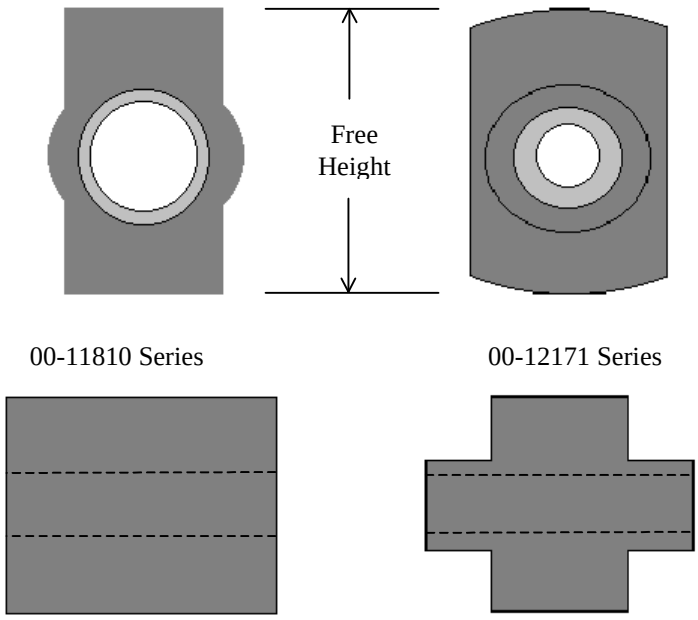


The picture to the left illustrates the free height dimension of a molded assembly. This dimension should only be measured with the molded assembly in an unrestrained (off the aircraft) condition. Table 1 at the end of this document will give the minimum heights for Barry Controls' molded assemblies. The minimum dimension is equal to approximately 90% of the free height of a new molded assembly.

The picture to the right illustrates the eccentricity that can occur on a molded assembly that has been in service. This dimension should only be measured with the molded assembly off the aircraft. Table 1 at the end of this document gives the maximum dimension for Barry Controls' molded assemblies. The maximum eccentricity of a molded assembly is equal to approximately 3% of the outside diameter.



One final item to check when inspecting disassembled isolators is the spacer. Most Barry Controls' isolators have a tubular metal spacer that should be checked for signs of wear or of distortion caused by over-torquing. Signs of overtorquing are not limited to the spacer, but can also be found where the spacer meets the molded assembly's metal washer. Some isolators also include a molded spacer that should be inspected for elastomer deterioration or damage along with the elastomer's free height. This molded spacer should be changed whenever the isolator's molded assemblies are changed.



The picture above illustrates Barry Controls' molded spacers and their free height dimension. Table 2 at the end of this document will give the free height dimension for these molded spacers.

Replacement of Isolators

Whenever the above inspections cause a rejection of a component of an isolator, the isolator must be replaced as an assembly. Mixing of new and used components is not allowed. Barry Controls Aerospace also recommends that isolators be replaced as a set, rather than mixing old and new isolators on an engine.

Technical Support

If you have questions, please call Barry Controls Aerospace Technical Support Department for assistance:

Barry Controls Aerospace

Phone: (818) 843-1000
FAX: (818) 845-6978

Table 1
Dimensions for Inspection of Barry Controls' Molded Assemblies

Molded Assembly Series #	Minimum Free Height	Maximum Eccentricity
00-11900	1.17”	0.09”
00-11901	1.00”	0.09”
00-11908	1.17”	0.09”
00-11920	1.34”	0.09”
00-11921	1.34”	0.09”
00-11926	1.34”	0.09”
00-11940	0.72”	0.08”
00-11980	0.72”	0.06”

Note: Each molded assembly is marked with a Part # such as “00-11900-01” based on a series number. The dimensions for the series is good for all dash numbers of a series.

Table 2
Dimensions for Inspection of Barry Control's Molded Spacers

Molded Spacer Series Number	Minimum Free Height Dimension
00-11810	0.98”
00-12171	1.46”