

General Discussion

Firestone air springs are designed to provide long term, trouble free service. The durability of Firestone air springs is such that they will often outlast other maintenance items in your system.

Firestone Airstroke® actuators and Airmount® isolators are warranted to be free of material and/or workmanship defects.

Since each individual air spring is closely examined and pressure tested at the factory, the vast majority of premature failures and consequent warranty returns are found not to be defective, but fail because of abuse caused by other problems in the system.

Before the installation of a new air spring, a close inspection of the old one should be conducted to examine the cause of failure. In a premature failure, the cause of the problem must be solved, or the newly installed air spring will also fail prematurely.

In the next paragraphs this Technigram 108 will discuss the Firestone Recommended Maintenance and general Air Spring Inspection.

Recommended Maintenance

Every 60 days we recommend a general inspection of an air spring. Covered in this program, Firestone recommends the following:

Tighten Fittings:

Check the tightness of all mounting hardware. If loose, re-torque to the specified amount.

Do not over-tighten.

Fastener Type	Use	Torque Range, Nm
M8 Blind Nut	Bead Plate	25
M12 Stud	Bead Plate	34-41
M12 Blind Nut	Bead Plate	34-41
	End Closure & Piston Mounting	
M22 Combo Stud	Bead Plate	54-61
M22 Stud	End Closure	61-68
M8 Counter Sunk Stud	Bead Ring	23-30
M10 Rib Neck	Bead Ring	38-44

Inspect Surface:

Inspect the outer surface of the air spring. Check for uneven wear, cracks and damaged areas. Replace the air spring if needed.

Inspect Pneumatic Components:

The air supply to the system plays a large role in the air springs' performance. Inspect, clean and replace if necessary any support products to the air springs, valves, regulators, air lines etc.

Area surrounding the Air Spring:

Check the area around the air spring to make sure that nothing could rub against it and that at the maximum diameter the air spring does not make contact with anything.

Check the ambient temperature and temperature of items in direct vicinity of the air spring. The temperature ranges for the particular elastomers are as follows:

- Standard construction: -37° to 57°C
- All natural rubber: -53° to 57°C
- All Firestone neoprene: -37° to 74°C
- Epichlorohydrin: -17° to 107°C

Cleaning:

Clean the air spring with either soap and water, methyl alcohol, ethyl alcohol or isopropyl alcohol. **Do not** use any organic solvents, petrochemical, open flames, abrasives or a direct pressurized steam cleaning system.

Storage:

An unused stored air spring should be kept in a cool, dry place away from direct sunlight or ozone producing equipment. The shelf life in this condition would be approximately 5 years.

Air spring Inspection***Bead Ring Style Parts:***

- ★ 1. The bead area of the air spring is critical to its performance. On the sealing surface, the sealing ribs should be in good condition. Any area where two or more ribs are damaged and/or missing is reason to replace the air spring in question. In addition, this area should be clean and the ribs well defined.
- 2. On the underside of the sealing surface (where the bead ring grips the air spring) the flutes should be in good condition. Some transfer of rubber to the corresponding area of the bead ring is allowable, as long as no cord or fiber material is visible. Any circumferential cracking, cuts, or the appearance of air spring cord material is cause for air spring replacement. In addition, this area will generally collect dirt and foreign material, so this area should be cleaned before reuse. Any imbedded material is cause for replacement.
- 3. The convolutions of the air spring should be spread apart by hand to check the adhesion of the hoop to the air spring. Any visible cracking or separation of the girdle hoop from the base material is cause for replacement. This area should also be checked for foreign and/or imbedded material, and cleaned when necessary.
- ★ 4. The I.D. of the part should be free from visual defects. The innerliner splice will be visible, but any cracking, blistering and/or obvious visual defects is cause for replacement. In addition, any obvious chemical attack (possibly caused by compressor lubricants or RFL's) is cause for replacement.
- 5. Any abrasion on the O.D. that exposes cord material is cause for replacement. As above, also check for obvious signs of chemical attack.
- 6. The rings should be checked for corrosion and pitting. The bead ring surface should be smooth, if not it will cause undue wear on the bead area of the air spring and lead to premature failure. Err the side of caution.

★ Items 1 and 4 can only be inspected when the part is unmounted.
This inspection should only take place if a problem is suspected.

Bead Plate Style Parts:

- 1. The convolutions of the air spring should be spread apart by hand to check the adhesion of the hoop to the air spring. Any visible cracking or separation of the girdle hoop from the base material is cause for replacement. This area should also be checked for foreign and/or imbedded material.
- 2. Any abrasion on the O.D. that exposes cord material is cause for replacement. As above, check for obvious signs of chemical attack.
- 3. Check for a separation of the bellows at the crimped bead plate by depressing the convolution with one hand and checking the area between the two. At the same time check for foreign material in this area that would cause abrasion. If any sign of separation or abrasion is visible the air spring should be replaced.
- 4. On the surface of the bead plate run your hands over the blind nuts. If this area is raised the blind nuts could have been pulled at one time or another, thus causing the bead plate to crack within the blind nut or on its outer edge. Check the blind nuts for leaks by pressurizing the air spring to 1.4-1.7 BAR max. unrestricted. Immerse in water or apply a soap and water mixture in the areas of blind nuts and inspect for indication of leaks.
- 5. Check the outer surface for holes, cuts or damage.