



Trailer Trends

- Larger fleets are performing their own service more often on their trailers, while the trailer dealers are serving owner-operators with service and parts from their counters.
- More air ride usage – While a temporary small shift in specification has been to more mechanical suspensions in the van market recently, primarily due to this segment being the hardest hit through the recession. Generally, the mix hasn't shifted significantly but there is still a soft general trend toward air ride, considering the whole market. In a nutshell, the trend is still toward air suspensions, but not nearly as pronounced as it was ten to 15 years ago.

Most air-ride manufacturers in the past have rushed to market with the lightest weight, and with the most economical design to compete with mechanical suspensions. All air-ride manufacturers seem to have faltered in the required design parameters for durability and have discovered more maintenance issues than anticipated. Combined with the higher cost and the tight economic times, air ride has taken a second seat, with the one exception being food-related motor carriers. We fully expect the air ride market to recover since air ride remains the highest fleet request due to its versatility, from a sensitive mix of loads like electronics and food/related products. (In ArvinMeritor's case, the RideSentry units (MPA) have been designed specifically for the van markets. Focus has been maintained on long term durability, ease maintenance, and superior in Ride / vibration isolation to the cargo & trailer structure, also best in tire wear, braking action, and overall load distribution. For safety, the engineers added a pull pin systems (PinLok) -- a no fault system for any slider box damage. Naturally with the parallelogram design comes the no dock-walk feature (also no fore and aft trailer movement when being loaded), and no roll steer.

- Increased use of side skirting on trailers, as much as 60 percent of trailers outfitted with this component, to aid in aerodynamics and fuel-savings. This product adoption is being largely driven by CARB (California Air Resources Board) regulations which mandate aerodynamic improvements to certain trailer types. Several trailer OEMs have announced availability of side skirts.
- Increased use of automatic tire inflation systems (ATIS) – Nearly one half million Meritor Tire Inflation Systems by PSI units are currently running in North America, excluding military. Some experts estimate that 30 percent of new trailers now specify tire inflation systems – tanker and other vocational usage is low, while usage on dry and refrigerated vans is higher. Retrofit of existing trailers to add tire inflation systems is also growing in popularity with many large fleets adding systems to their existing vehicle population.

Over 12 percent of fleets intend to add ATIS technology to their trailers sometime in the next five years. So, that would be 12 percent of fleets that DON'T already have ATIS on their trailers.

In late 2008, automatic tire inflation was the number one new trailer technology that fleets expected to add in the next five years. Many fleets (both private and for-hire) are

recognizing the value of adding automatic tire inflation systems to "extend the life of the tires" and to improve fuel economy, plus many have shifted to wide-based tires, which makes automatic tire inflation systems even more important. (Source: Chris Kemmer, CK Marketing.)

- Increased interest in air disc brakes on trailer axles and suspensions. More fleets and dealers are asking for disc brake quotations, particularly on tank and other cargo sensitive applications. The great majority of fleet purchases remain with cam foundation brakes.
- Increased specification of Stability Control systems – Almost 10,000 units of SmartTrac stability control systems sold by Meritor WABCO since the introduction of our RSS, sales for FY10 up 97 percent over FY09. The market acceptance continues to grow. Tanker market shows most promise for growth and moving towards going standard. Multiple trailer OEMs have gone standard with RSSplus, including Walker Group Holdings' Brenner, Bulk, and Walker (March 2010). (Noteworthy is the fact that a retrofit program is being accepted by fleets and OEMs. Meritor WABCO's **RSSplus** supports both spring and air-ride suspensions.)

Maintenance Tips

Q: From a maintenance perspective, what have been some of the key advances in trailer suspension systems? How has weight been reduced without sacrificing performance?

A: Today's engineering tools that suspension manufacturers utilize to design suspension products allow designers to think out of the box. Recently this has lead to revolutionary new designs in suspension slide boxes. These designs take advantage of high strength steels and optimized design structures that have advanced slide boxes beyond the historical "ladder style" design. Today's modern slider is structurally more durable while providing lighter weight. This improved slide box structure strength provides added protection to the trailer body and improved life of trailer body components (i.e. door seals and hinges on refrigerated units).

Q: From a Preventive Maintenance standpoint, what components within the suspension require regular inspections and adjustment? What are the signs of failures that need to be addressed? For example, what types of irregular tire wear or changes in ride quality would lead someone to take a closer look at suspension components? Can you offer a few examples of specific effects and their related causes?

A: At a minimum, trailers should be inspected on a yearly basis. The fleet owner should refer to the documentation from the suspension manufacturer as each suspension manufacturer has specific guidelines for inspection periods and components to inspect. In general, inspections should include looking for broken or bent components, loose or missing fasteners, key fastener torques, and trailer and suspension

alignment. Each of those inspection items have significant impact on tire wear and ride quality.

For example, loose fasteners can cause the suspension to go out of alignment and create increased tire wear. Loose fasteners if not addressed will also increase structural wear, increasing repair costs.

Q: How can a tech know that a shock is performing as it should? What are the considerations that come to mind during a replacement?

A: Refer to the shock manufacturer for inspection criteria to determine performance of the shock. When replacing shock, make sure to replace with a shock that is approved by the suspension manufacturer. Not all shocks are the same. Replacing with a different shock (not approved by the suspension manufacturer) there could be a reduction in suspension performance (ride quality) and could potentially cause structural damage to the suspension mounting points and shock.

Q: What is involved in fitting a suspension with new air springs, or replacing trailing arms?

A: Each suspension manufacture has maintenance manuals that walk a technician through the replacements of components on the suspension. In general, it is important when replacing air springs and/or trailing arms, to be sure to replace with components approved by the suspension manufacturer. The suspension components are specifically designed to operate together. Changing a component to one that hasn't been designed for the suspension could lead to decreased suspension performance and potential suspension damage.

Q: What kinds of challenges would emerge if changing to a different style of bushing?

A: Suspension manufacturers design the suspensions to work as a system. Bushings are critical components for the effective operation of the suspension system. When replacing bushings, they need to be replaced with components that are approved by the suspension manufacturer. Another item to consider is the proper installation of the bushing. Suspension manufacturers have identified the proper installation procedures that maximize bushing life. Improperly installing bushings will lead to decreased bushing life.

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A: From the Meritor maintenance manual, we recommend the following:

For Inspection:

1. Inspect air suspension components, the height control valve and axle at regular intervals during normal operation and each time the trailer is serviced. Before each trip, visually inspect the suspension system and listen for any air leaks. Replace damaged fasteners to maintain correct torque value specifications and comply with warranty requirements.
2. Perform the following inspections after the first 1,000 miles (1600 km) of operation and annually thereafter.
3. Check fastener torque values, tighten loose fasteners and replace damaged or missing fasteners.
4. Visually inspect all nuts and bolts for looseness and movement. Tighten loose fasteners to the correct torque values specified in Section 6. Thereafter, inspect the suspension components each time the trailer is serviced.
5. Check for loose pivot bolts. If the bolts are loose: Align the axles before tightening the bolts.

For Maintenance:

1. Inspect for broken and missing fasteners. Repair or replace as needed.
2. Inspect welds for cracks at the trailing arm and axle subassembly and hanger assemblies.
3. Inspect the flex-member of the air springs for any cuts and abrasions. Replace the air spring immediately if it is cut or damaged.
4. Check for obstructions and interference at the air springs that may cause scuffing and abrasions. Relocate and secure items such as air hoses that can contact any part of the air spring.
5. Check for leaks in the air lines, at the air spring upper bead plate, piston and mounting studs. Replace leaking air lines, fittings or air springs.
6. Check the shock absorber bushings for looseness and wear. Inspect the shock absorbers for oil leaks and dents. Replace worn or damaged shock absorbers.
7. Inspect the structure of the following air suspension components.
 - a. Hanger assemblies
 - b. Trailing arm and axle subassembly
 - c. Shock mountings
 - d. Axle-to-trailing arm connection
 - e. Brake interference, cam or chamber
 - f. Hanger assembly bracing at interface points
 - g. Pivot connections