



Future Truck Program Position Paper: 2012-1

Future Tire and Wheel Systems For Light- and Medium-Duty Vehicles

Developed by the Technology & Maintenance Council's (TMC)
Future LMV Task Force

ABSTRACT

Users of light- and medium-duty vehicles (LMVs) have similar expectations for future equipment as do users of heavy-duty vehicles when it comes to matters of performance, maintainability, durability, reliability and serviceability. Those expectations are outlined in other TMC Future Truck Position papers concerning tires, wheels and retread/repair issues. However, LMV users do have some very unique operational circumstances that suppliers and manufacturers should consider. This paper will outline these unique needs as identified by TMC's Future LMV Task Force.

INTRODUCTION

Users of light- and medium-duty vehicles (LMVs) have similar expectations for future equipment as do users of heavy-duty vehicles when it comes to matters of performance, maintainability, durability, reliability and serviceability. Those expectations are outlined in other TMC Future Truck Position papers concerning tires, wheels and retread/repair issues.

However, LMV users do have some very unique operational circumstances that suppliers and manufacturers should consider. This paper will outline these unique needs as identified by TMC's Future LMV Task Force.

A. PRODUCT PERFORMANCE EXPECTATIONS

Product performance, be it for tires, wheels, retreads or repair, must strive to achieve the lowest cost of ownership. LMV fleets operate almost exclusively in high-scrub, low mile, road hazard prone areas. Because their tires are smaller, LMVs often operate at their load capacity peak—unlike typical Class 8 vehicles.

Therefore, the smaller tires used on LMVs should be made to achieve higher miles-per-32nd rate of wear and longer overall removal miles. Furthermore, they should be more resistant to punctures and sidewall damaging road hazards.

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Some type of runflat technology, such as is being applied to passenger tires for example, should be used on LMVs to make these smaller tires more durable. These smaller tires should have higher load capacities allowing for some reserve capacity and not have to operate continuously at their peak load and pressure.

Larger tire fitment would accomplish additional reserve capacity but larger tires are not the goal. Single tires need to be developed to replace duals used, thus meeting or exceeding all the traditional measures of performance achieved by duals while reducing the number of tire/wheel assemblies, making inflation pressure maintenance easier, and vehicle weight lighter. Furthermore, LMVs should not be required to carry an onboard spare.

Even though vehicles in this high-scrub, short mileage, stop-and-go operation traditionally are not considered candidates for low-rolling resistance tires, new tires and applicable retread tread designs should incorporate all the low rolling resistance technologies available to improve fleet fuel economy.

Tread patterns should be designed to optimize performance for:

- low speed, high-scrub, rapid multiple brake applications,
- constantly diminishing loads,
- wear resistance to higher horsepower and torque, and;
- improved wet traction on a wide variety of paved surfaces.

Tire-wheel assemblies, whether using new or retread tires, should not require balance and should have prominent identification marks to reduce theft.

The number of tire and wheel sizes should be reduced to improve fleet standardization issues. Wheels should come in only one size of bolthole circle and all have the same number of boltholes and have larger hand holes

for better access to the valves for easier air pressure maintenance. Wheels should be more resistant to road hazard damage and have a finish coating that lasts the life of the wheel.

TMC asks that vehicle manufacturers offer both a narrower range of tire sizes and an option for fleets to spec specific tire brands and designs by wheel position as they do for larger commercial vehicles. Tires designed for LMV applications should be true commercial-duty truck tires by design—not just reinforced passenger/light truck tires. These future LMV tires must be designed for commercial durability and retreadability.

Tires for LMVs must also be designed for electric and other hybrid vehicles if they require tires with specific non-traditional tire technologies but must still provide traditional tire performance.

B. MAINTENANCE EXPECTATIONS

Tire performance and lowest cost per mile is greatly affected by proper inflation pressure maintenance. Future products should employ better inflation retention features such as:

- better tubeless innerliners,
- electronic tire tags,
- internal puncture sealant, and/or some runflat type of technology or be of some non-pneumatic construction.

Tire and wheel assembly radial and lateral runout must be reduced and achieved during the initial mounting with little or no extra attention other than standard mounting procedures being followed. Tire maintenance must still be able to be accomplished by fleet maintenance or service provider personnel. Drivers should not be relied upon to check and adjust pressures.

C. DRIVER EXPECTATIONS

Because drivers often do not undergo extensive training in most LMV fleets (because the size and operations of some of the smaller vehicles

do not require special licensing), they may be more abusive of equipment. Drivers also often expect equipment to ride and handle as do their own passenger cars. Therefore, tires and wheels must be smooth riding, quiet, and durable.

D. ENVIRONMENTAL ISSUES

Extending useful casing life for tire retread and repairability is paramount to reducing tire scrap. Because LMV tires are smaller and wear out faster, LMV fleets generate a great deal of scrap. Tires and wheels should be constructed in such a manner as to facilitate recycling of the final waste stream.

E. EDUCATION/TRAINING EXPECTATIONS

Future tire/wheel systems will require new and more efficient means of training personnel to handle the newest of technologies. A comprehensive, objective, and recognized program must be readily available, easy to understand and conducted in a short period of time.

Product service and safety training and technician certification should be made available through not only industry suppliers, but also appropriate industry groups, such as TMC, the Tire Industry Association (TIA), and others.

