

RISK COMMUNIQUÉ

Vehicle Selection and Design

Standard Emergency Vehicle Design is completed by most equipment manufacturers in compliance with the NFPA 1900 Standard Series for fire apparatus and DOT's KKK Standard for ambulance design. Typically, these vehicles are of no specific concern from a design perspective.

Many departments, however, purchase vehicles designed for other purposes and have them converted, or convert the vehicles themselves for fire department use. Some typical conversions are:

Original Design	Converted Use
Fuel Oil Truck Milk Tanker	Water Truck
Delivery Vans Ambulances	Rescue Trucks/Salvage Vehicles Personnel Vehicles, Ambulances
Military Vehicles Pick-up Trucks	Brush or Forest Vehicles

Serious problems may occur due to improper design and engineering of these vehicles. VFIS has experienced a large number of claims resulting from these vehicles in the following areas:

Reported Failure	Contributing Factors
Brake Failure/Fade	<ul style="list-style-type: none">• Vehicle overweight• Improper weight displacement• Inadequate brake size
Flip/Rolled Over	<ul style="list-style-type: none">• Vehicle overweight causing springs or axle to break.• Unbaffled or improperly baffled water tanks.• Unstable center of gravity caused by high tank mounting or high storage of heavy portable equipment.

If conversion vehicles are used, evaluate to see if any of the aforementioned conditions exist. This can be accomplished by reviewing the following areas.

1. Verify that the Gross Vehicle Weight (GVW - the weight of the entire vehicle in its fully loaded state) does not exceed the combined axle weight ratings of the front and rear axles. If an accurate weight bill is not available, make a recommendation for the insured to have the vehicle weighed and provide a copy of the weight bill for comparison.
2. Verify that the vehicle weight distribution is maintained in the proper percentage of weight distribution over the front and rear axles in accordance with the original design specifications.

This is a sample guideline furnished to you by VFIS. Your organization should review this guideline and make the necessary modifications to meet your organization's needs. The intent of this guideline is to assist you in reducing exposure to the risk of injury, harm, or damage to personnel, property, and the general public. For additional information on this topic, contact your VFIS Risk Control Representative at (800) 233-1957.

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3. If the conversation weight of the vehicle exceeds the design weight, verify that the brake system is adequate from an engineering perspective.
4. Examine equipment storage areas to determine if weight distribution is such that the center of gravity of the vehicle is not adversely affected.
5. If the vehicle is equipped with a water tank, verify that the water tank is properly baffled.

The following chart may be used as a guide for determining tanker weights.

Tank Size	500 gal.	750 gal.	1,000 gal.
Cubic Feet	66.85	100.27	133.69
Water/lbs.	4,171 lbs.	6,257 lbs.	8,342 lbs.
Fuel Oil/lbs.	3,570 lbs.	5,354 lbs.	7,139 lbs.
Difference	601 lbs.	903 lbs.	1,203 lbs.

Water

$$\begin{array}{r} 7.48 \text{ gals/cu ft} \\ \times 8.34 \text{ lbs/gal} \\ \hline 62.40 \text{ lbs/cu ft} \end{array}$$

Fuel Oil

$$\begin{array}{r} 7.48 \text{ gals/cu ft} \\ \times 7.14 \text{ lbs/gals} \\ \hline 53.40 \text{ lbs/cu ft} \end{array}$$

Milk

$$\begin{array}{r} 7.48 \text{ gals/cu ft} \\ \times 8.60 \text{ lbs/gal} \\ \hline 64.30 \text{ lbs/cu ft} \end{array}$$

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