FAMA BUYER'S GUIDE

TC073

Tanker or Tender Apparatus

Prepared by the FAMA Body Subcommittee

This guide does not endorse any manufacturer or product.

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Introduction

This buyer's guide will focus on the tanker/tender area of your fleet. "Tenders" are more commonly known as "Tankers" in the Midwest and Eastern portions of the country, while on the West coast they are considered "Tenders." In either case, they are vital to your operation for transporting water to the scene of a fire.

The intent of this Tanker or Tender Apparatus Buyer's Guide is to provide an overview of requirements and available options to consider when specifying and purchasing a new tanker/tender. The guide is separated into the major categories of topics that should be evaluated, considered, and thoroughly researched prior to purchasing an apparatus.

Overview

Tankers/tenders are most commonly found in low or no hydrant areas and are becoming more popular with rural departments as a back-up or first out "tanker/tender pumper." Their primary function is to transport water to fires in areas without direct access to a water source.

There are many options to consider and questions to ask when purchasing a new tanker/tender for your department. It is the responsibility of the purchaser to determine their specific needs and relay this information to prospective apparatus bidders, sellers and/or manufacturers.

This guide will present options for the following considerations in general terms:

- Budget
- Tank capacity
- Tank style
- Tank material
- Body material
- Optional items based on need
- Pump options and configurations
- Chassis considerations

It is recommended that the purchaser review the sections in other FAMA Buyer's Guides that pertain to the items that are being installed on their apparatus for more in-depth information (i.e., Water Tank, Water Pump, Lighting, etc.)

NFPA Guidelines

The National Fire Protection Association (NFPA) Standards define voluntary minimum standards for automotive fire apparatus. The most widely used Standard is: NFPA 1900®, Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances.

The current editions should be referenced when specifying new apparatus (www.nfpa.org). It is the responsibility of the purchaser to specify an NFPA compliant tanker/tender, so ensure that you understand the requirements.

For more information, contact the FAMA Member pump, equipment, and apparatus manufacturers listed at www.fama.org.

Tank Capacity

Tank capacity is the key driving factor to the rest of the purchasing process. Many departments that are replacing an existing apparatus consider this their first priority on the new rig. Tank capacity generally ranges from 1250 to 4000 gallons for tanker/tenders. Here are a few things to consider when determining tank size:

- Water capacity of your current tank
- Current capacity requirements for your area
- Space restrictions in your fire hall
- Maneuverability issues/restrictions in your service area
- Road capacities and surface type
- Mutual aid needs
- ISO rating
- Water source availability in your area
- Refer to NFPA for mobile water supply apparatus

Based on a combination of all the above factors, your department can decide the tank size your new apparatus will require. If you need any assistance, please reach out to a FAMA member apparatus manufacturer (https://fama.org/members/list/).

Tank Material

Tanks are available in different styles and materials, and material selection may impact the warranty coverage offered. See the FAMA Water Tanks Buyer's Guide for more detailed information.

POLYPROPYLENE

Polypropylene (a co-polymer) is the material most commonly used in today's fire apparatus tanks. These tanks offer excellent total life cycle costs and will not crack or corrode. They can be easily customized in a wide variety of shapes and can be designed with integrated foam tanks, ladder storage tunnels, and other useful features. Polypropylene tanks have a slight weight savings edge over stainless steel and fiberglass, and they generally come with a limited lifetime warranty.

STEEL/STAINLESS STEEL/ALUMINUM

Metallic tanks can be designed with higher strength than poly tanks and may be required if the tank will be subject to high system operating pressures or a vacuum style application. Steel tanks require yearly treatments against rust, which must be factored into the cost. These metals are also the heaviest material option, with propensities toward cracking and corrosion. Warranties for steel/stainless steel/aluminum tanks usually range from one to seven years.

FIBERGLASS

The benefits of fiberglass include ease of integration of the tank and body structure into one unit, and increased tank volume due to few structural supports required. These tanks are highly resistant to corrosion, but the material itself is brittle which can lead to difficult and costly repairs if water is absorbed into the core material. Apart from this potential issue, fiberglass tanks are mostly considered maintenance free. Typically, they are lighter than stainless steel but heavier than polypropylene tanks. Warranties for fiberglass tanks typically range from one year to a limited lifetime.

Tank Style

DRYSIDE

Dryside tanks refer to a configuration in which the tank itself sits down inside of a painted outer body. This is a very common application for tankers/tenders. The most common shape of dryside tank is the T-style. These tanks are built to accommodate the space remaining once the compartments/placements are chosen. The general shape of a T-Style tank depends on the compartment options chosen by the department. One benefit of the dryside tank is that is separate from the body so that if the tank itself was ever damaged beyond repair it can be replaced without compromising the rest of the apparatus.

WETSIDE

A Wetside tank application indicates that the tank itself is painted and exposed as part of the body. Since an outer painted body is not used in this case, a wetside tank apparatus can be more cost effective. A disadvantage with the wetside tank is that replacing the tank means you are replacing part of the body as well. A new tank will need to be finish painted after installation.

VACUUM/PRESSURE SYSTEM

The Vacuum/Pressure System tank is typically a metallic (aluminum or stainless steel) tank that is completely sealed off to create pressure within the tank. When the time comes to discharge or draft water, it then uses that pressure to do so. A benefit of a vacuum tank is that it can fill itself with water without the need for a crew, freeing up personnel for other roles on the scene.

ELLIPTICAL

Elliptical style tanks are an aesthetic tribute to the past, when fire trucks were converted from old milk trucks. This body style is often chosen by departments who already have elliptical tank apparatus in their fleet and want to maintain a consistent image within the community. A disadvantage of the elliptical tank style is that may have a higher center of gravity than a rectangular tank apparatus of the same capacity. An option some manufacturers offer within the elliptical category, is to wrap the fiberglass or polypropylene tank with stainless steel. This is an aesthetic personal choice that makes the tank material indistinguishable from other stainless steel tanks in appearance.

Body Material

The body of the apparatus can be manufactured using a wide array of materials to match or complement the tank.

POLYPROPYLENE

Polypropylene is rust-proof, corrosion-proof, and highly resistant to dings and dents. The strength of this material is attributed to its thickness, and a mixture of polypropylene and polyethylene for additional impact resistance. Many departments choose this material for its durability and low-maintenance attributes.

STAINLESS STEEL

Stainless steel, another common choice for body material, will not rust. However, corrosion can eventually occur due to the hardness of the metal. Because the metal is more brittle, joints must be designed properly to ensure long life. Many departments appreciate a stainless steel body for its appearance and sturdiness.

ALUMINUM

Aluminum, similar to stainless steel, will not rust but it will corrode. Being a softer metal, it can be more prone to wear and tear than stainless steel and polypropylene. However, it is not as heavy as stainless steel and thus provides considerable weight savings. This is also a very common body material depending on the application.

MILD STEEL

Mild steel is an option that is beginning to phase out within the industry. The main benefit of this metal is its affordability. However, it is prone to rust break down over time, reducing the longevity of your investment.

Optional Items

The options available for customizing your tanker/tender are endless. For every category of options you might need or request, there will be options within that category, and so on. Please consult your purchasing committee and apparatus manufacturer to narrow down what is most necessary and cost-effective for your department. While deciding, some options to consider are:

- Specialized lighting options

- Dump valves, manual and remote control
- Compartment space and placement
- Compartment door type – roll-up or swing/pan door
- Component mounting
- Loose equipment
- Pumps
- Portable tank carrier
- Direct fills
- Tow Eye(s)
- Customized graphics and lettering
- Rear view camera
- Pre-connected hose trays
- Electric rewind hose reels
- Ladders

These are just a sampling of options available for today's fire apparatus customers. For more options and specifics, please consult a FAMA member manufacturer.

Pump Options

In recent years more fire departments have been including a water pump on their new tanker/tender. This creates a workhorse-type vehicle for fire departments, providing them with a back-up engine, or first out vehicle in cases of rural stations.

There are a few options when it comes to pump "drive methods," or how the pump receives the power to turn the pump shaft, creating water flow and pressure. They are:

POWER TAKE-OFF (PTO) DRIVEN PUMP

Power Take-Off (PTO) driven pumps receive power directly from the main engine or transmission, typically through a driveshaft. These pumps are generally limited to 1500 gpm. There are several advantages of a PTO driven pump:

- Allows for pump and roll operation
- If there was an issue with the pump PTO gearbox, usually the apparatus can continue to be driven
- Less expensive than other pump types
- Takes up less space
- Easier install

SPLIT SHAFT PUMP

Split Shaft or "Midship" pumps are integrated into the build of the drive line between the transmission and rear drive axle. Split shaft pumps provide very high flow ranges—up to 6000 GPM—and use the power train to provide the pressure required. A tanker/tender with a split shaft pump will have "road mode" and "pump mode" switches and will not provide pump and roll operation. Since the primary purpose is to transport water rather than pump water, the larger split shaft pump is not as appropriate for a tanker/tender.

DEDICATED ENGINE DRIVEN PUMP

Dedicated engine driven pumps have their own engine that is separate from the main vehicle engine. These are usually low horsepower pumps meant for lower volume flows—usually less than 500 GPM. The main advantage of the engine driven pump is that it can provide pump and roll capabilities independent of the speed of the vehicle.

Chassis Considerations

Depending on the tank capacity your department chooses, the manufacturer will determine the number of axles, ratings, and the recommended horsepower. The department can request preferred chassis type and manufacturer. There are two ways to go about this:

COMMERCIAL CHASSIS

Commercial chassis apparatus are those manufactured on a high-volume chassis produced by manufacturers such as Freightliner, International, Peterbilt, Kenworth, Ford, or GM. If desired, a commercial chassis cab can be ordered with a crew cab that can accommodate up to five firefighters. A two-door cab is also a common choice for rural departments who do not typically respond with more than two personnel on the apparatus. Another consideration for rural departments is that service centers may be more available for maintenance and repairs.

CUSTOM CHASSIS

Custom built chassis are best known for their cab space and superior turning radius. These are most commonly a good fit for metro area departments with full time firefighters where the higher initial cost is offset by personnel efficiencies.

Tanker/Tender Safety

Driving large trucks with a fluid load requires special driver training and consideration. The higher center of gravity and the action of sloshing fluid means that the apparatus must be driven more carefully than other heavy trucks. The Federal Emergency Management Agency (FEMA) has published the Safe Operations of Fire Tankers which describes the ways to drive a tanker/tender safely and can be downloaded for free from the FEMA website at www.usfa.fema.gov.

Apparatus options that a department may consider to reduce the driving risks include:

- Electronic Stability Control
- Vehicle speed limiter

Summary

There are many options available when specifying a tanker/tender. Consult with FAMA Member apparatus manufacturers, component suppliers, and their dealers for more information.