

# THINGS TO KNOW

## Things to know when buying a fire water tanker

Call it what you like, the most important thing a water transporter can do is function as it's needed - and that comes down to selecting the right vehicle.

You'll see many people using words like "tanker" or "water tanker" or just "tenders", all these are motor vehicles with large water-carrying capacity whose function is to provide water for fire fighting in areas not serviced by a municipal hydrant water supply.

Tankers, and their unique operational characteristics, frequently do not get enough respect from fire fighters. This is unfortunate because when it is well-designed, and properly used, a tanker is a valuable water-supply asset.

For many years, tankers in many departments have been a home-grown resource. A department would obtain an old milk or petroleum delivery vehicle and refurbish it to carry water: mount a portable pump on the newly painted truck and - viola! - you have a water tanker. These reincarnated tankers have served their departments, particularly smaller departments serving rural areas, which may be okay. Yet, there are operating problems that arise.

Different liquids have different weights. A truck designed to carry 11,000 litres of milk or petroleum is probably overweight when loaded with 11,000 litres of water.

Trucks designed to deliver milk or petroleum weren't designed for emergency responses that may take the vehicle off a hard-surface road. These vehicles were originally designed with a high centre of gravity, which makes them prone to rollover accidents when not operated properly. Tender rollovers account for a disproportionate number of vehicle accidents for fire and EMS departments each year.

**Basics** - The standard that most applies to the design and construction of new fire department tankers is NFPA 1901 (Standard for Automotive Fire Apparatus). Key apparatus components for tenders that are addressed in the standard include, but are not limited to **brakes, tank design and vehicle weight**.

- Braking systems include service, parking, and auxiliary brakes.
- Because a tender's primary mission is to haul large quantities of water to emergency scenes, the design and mounting arrangements for their water tanks are of greater interest than they are on other types of fire apparatus.
- The vehicle's rated weight capacity is based on a combination of factors, including chassis frame; axles, including the front gross axle weight rating and rear gross axle weight rating; tyres and wheels; spring and suspension system; and weight distribution between the front and rear axles.

NFPA 1901 says that so long as the Gross Axle Weight Rating (GAWR) is not exceeded, the load can be placed on the truck. However, the National Road Traffic's standards in many countries, stipulate that no more than 9,000 kg should be carried on the front axle, no more than 8,600 kg on a single rear axle and no more than 15,400 kg on a tandem rear axle configuration.

Manufacturers, whether custom designed or built on a commercial chassis, should be well aware of these factors. There are several options for them that will allow for heavier GAWR, and thus a heavier Gross Vehicle Weight Rating (GVWR).

A heavier GAWR axle is necessary to handle the heavy load when the vehicle is turning, the time when a tender is most vulnerable to a rollover accident. For an axle to be designated with a heavier GAWR, several components must meet minimum requirements, including:

- Frame members
- Suspension springs
- Brake components, including linings and shoe platforms

- Wheels and all related components
- Tyres
- Steering components such as tie rods, steering gear, etc

**Developing specifications** - A department should work with its manufacturer during the vehicle specification process to accurately identify the environment where the new tender will operate as well as operational expectations. Many of the major apparatus manufacturers have specification templates or worksheets to assist in the process.

Among the things you'll want to discuss with your manufacturer are:

- How much water must it carry?
- What type and size pump does it need?
- What type of roads will it operate on?
- Will its use be strictly as a tender, or must it have fire suppression capabilities - deployable hose lines?

This last point requires a great deal of thought. Are you designing a pumper within a tender or a tender within a pumper?

Many departments make the mistake of specifying multiple tactical functions - a water hauler, an equipment hauler, a fire fighting foam transporter, and a pumper all within a single apparatus. Upon delivery, they may find that they've bought a huge truck that is dangerous to drive and is not efficiently fulfilling every task it was equipped to do.

**Tenders today** - More departments are finding that they have a need for tenders because of urban sprawl and increasing human population of the rural urban interface. Apparatus manufacturers are making concerted efforts to meet these demands and to address those previously mentioned safety factors for tenders. To do that, they are using all-aluminium bodies that promote longer vehicle life and help keep GVM within specified limits.

They are also using elliptical tanks constructed using polymer or polished aluminium materials that help keep the GVM within specified limits; allow for lower tank mounting (which lowers the vehicles centre of gravity and reduces chance of a roll-over accident); and provides for longer tank life.

They have automated jet-dump capabilities that enable the operator to unload at dump site without exiting the cab, thus making for quicker tender turnarounds.

And many now come with PTO-driven pumps, which offer several significant advantages on tenders, including:

- The cost of the pump is about 50 percent less than a mid-ship pump.
- The manifolds on these larger PTO-driven pumps (the top end is 5,600 L/min) are quite simple, and manufacturers can prefabricate custom suction and discharge manifolds.
- PTO-driven pumps make for compact pump modules, and there may not be a need for a pump module at all, freeing up compartment space in the vehicle.
- The apparatus operator engages the pump by simply pushing a button in the cab, regardless of whether the truck is in drive, neutral or park. This is a big advantage on a tender, which in many cases is being operated by one fire fighter.

An efficient rural water supply tender is accomplished through rapid loading of water to the tender at the fill site [open dams, rivers, etc] and rapid unloading of water at the dump site. You don't do it by driving fast between those two points – E-ONE has the [Water Master](#) that will speedup both these functions.

Focus on the objective when specifying your next tender and you'll likely not be disappointed.