Liquid Bulk Freight 101

A Guide for shippers on the unique requirements and responsibilities for tanker truck loads

LIQUID BULK FREIGHT 101

Look around you.

The paint on the wall, the condiments in the fridge, the adhesive under the carpet… just about everything you can see began inside a liquid bulk tank trailer.

It's why transporting liquid bulk is so critical to today's supply chains. But the process is drastically different than moving cartons in a dry van. Even if you've shipped liquids in drums or totes, that doesn't prepare you for the ins and outs of managing liquid bulk.

For newcomers to liquid bulk transport (and even those who just want to bone up), this eBook covers the equipment, the processes and the responsibilities of managing liquid bulk shipments – along with tips on choosing the right partners to help.

WHAT'S DIFFERENT?

BULK LIQUID VS. DRY VAN

Obviously, the first thing that makes a liquid bulk commodity different is that it's not packaged in totes, barrels or other small containers. Bulk liquids slosh around. They can spill; they transport differently than dry loads; and they need different kinds of equipment.

Bulk liquids—especially hazardous chemicals—also carry more risk than other loads. Have an accident with a trailer full of groceries and you lose two pallets of Cheerios. In contrast, a tanker truck collision could trigger the shutdown of a multi-million dollar production line because a crucial raw material has washed over three lanes of Interstate 80.

Other factors that make bulk liquid shipments different from dry van shipments include:

Longer lead times:

There aren't as many tankers on the road as box trailers, so when you need a truck, it might take longer to find one.

Higher rates:

Get ready for sticker shock. Rates are a good deal higher for several reasons:

- Carriers pay more for their equipment—$100,000-$125,000 for the trailer, plus the cost of special equipment, compared with $35,000-$40,000 for a dry van trailer.
- Your shipping costs include deadhead miles every time, since each delivery includes a trip to a tank wash.
- You'll pay the same rate whether you fill the trailer with 6,000 gallons or 2,000. Carriers can't combine your perfume with someone else's paint thinner to create a "full tankload" shipment.

Different driver requirements:

At a minimum, the driver's license needs a tanker endorsement. If he's hauling hazmat or waste, he'll need endorsements for those, as well.

More insurance:

A carrier hauling a hazardous bulk liquid should carry at least $5 million in liability insurance. For non-hazardous commodities, the minimum is $1 million. Those figures come on top of the cargo insurance you'll require, which varies with the value of the load.

TANK TRAILER

The typical liquid bulk trailer holds 6,000-7,000 gallons. It can be made of stainless steel or aluminum. It can be insulated, to protect temperature-sensitive products, or non-insulated. It may consist of a single compartment, or be divided into two to four compartments for hauling different commodities at once.

There are also special food-grade trailers for products such as fruit juice, vegetable oil and food ingredients.

Some carriers offer “tight fill” tanks that hold only up to 5,000 gallons. By filling these smaller tanks completely, you ensure that the liquid won’t get agitated in transit, reducing the chance of forming foam. Foam is nearly impossible to unload from a trailer, leaving you with a “heel” of unusable product, which you’ll be forced to discard. (See page 9 for more on heels.)

At the top of the tank is a dome, which is opened for loading the trailer. It’s extremely important to make sure that nothing but a hose and the liquid product pass through that dome.

WHAT’S THAT SMELL?

A driver hired to transport a load of perfume essence to a beauty products plant decided that, before he loaded the trailer, he would eat a sandwich. Perched on top of the trailer, he didn’t notice when part of the sandwich, including a slice of onion, fell through the dome. But when the receiver’s fragrance expert took a sample, he immediately noticed that the product was tainted. The customer refused the load, and the shipper had to destroy it at a hefty cost. (You can’t make this stuff up!)

TEMPERATURE CONTROL

To protect cold-sensitive liquids, most insulated trailers come with steam coils. When the trailer is parked, you can attach these coils to a source of steam, which then circulates through the coils, helping to maintain the temperature of the product in the trailer.

Some trucks also have piping that draws antifreeze from the tractor's radiator and circulates it around the trailer, warming the product while the truck is on the road. It's important to note that this in-transit heating system is meant only to keep the temperature of a product from cooling off too fast. It is not designed to make a product warmer than it already is.

In fact, in some cases, the antifreeze circulating through the in-transit heat system might be significantly cooler than the product you're shipping. In that case, the system could actually cool your product, taking it significantly below the optimal temperature. Before you ask for in-transit heat, consult with your carrier or broker to make sure this is actually what you need for your specific product.

THE 40-FOOT MOTH BALL

How important is heat protection? Consider what happened to a load of molten naphthalene one cold day when a truck's in-transit heating system failed. The contents "set up," producing what was essentially a 40-foot moth ball. It took two weeks of shoveling and chipping away at that mass to extract it and make the trailer usable again, costing the customer (who had to suspend production) and the carrier tens of thousands of dollars in lost revenue.

WEIGHT AND VOLUME

Although weight matters a lot in a dry van move, in liquid bulk the key measurement is volume. When you book liquid bulk freight, you don't tell the carrier or broker how many pounds you need to move; you tell them how many gallons. That's the only way to figure out whether you need one truck, or two, or more.

Weight does matter, however, when it comes to complying with federal regulations. Given the weight of the typical bulk liquid trailer and the tractor pulling it, don't count on loading more than 45,000 lbs. on one truck if you want to stay within the Department of Transportation's 80,000-lb. limit on gross vehicle weight.

Also, remember the DOT's maximum weights on single and tandem axles. You might be used to the idea that you can move product around inside a trailer to rebalance the weight across the axles. In a tank trailer, that tactic is impossible. Liquid seeks its own level, and there's no rearranging it.

A WEIGHTY DILEMMA

Truckers used to talk about a state border weigh station where inspectors were so strict, if the scale showed even a few extra pounds on an axle, they'd stop the truck until the driver fixed the problem. Since there's no way to shift the weight of a liquid, that put liquid bulk carriers in a really tough spot. The only solution was to offload some of their diesel to whoever would take it. A whole cottage industry sprang up, as entrepreneurs with 12-volt hand pumps swarmed in to move free fuel from the big rigs into the small tanks strapped to their pickups.

PUMPS AND COMPRESSORS

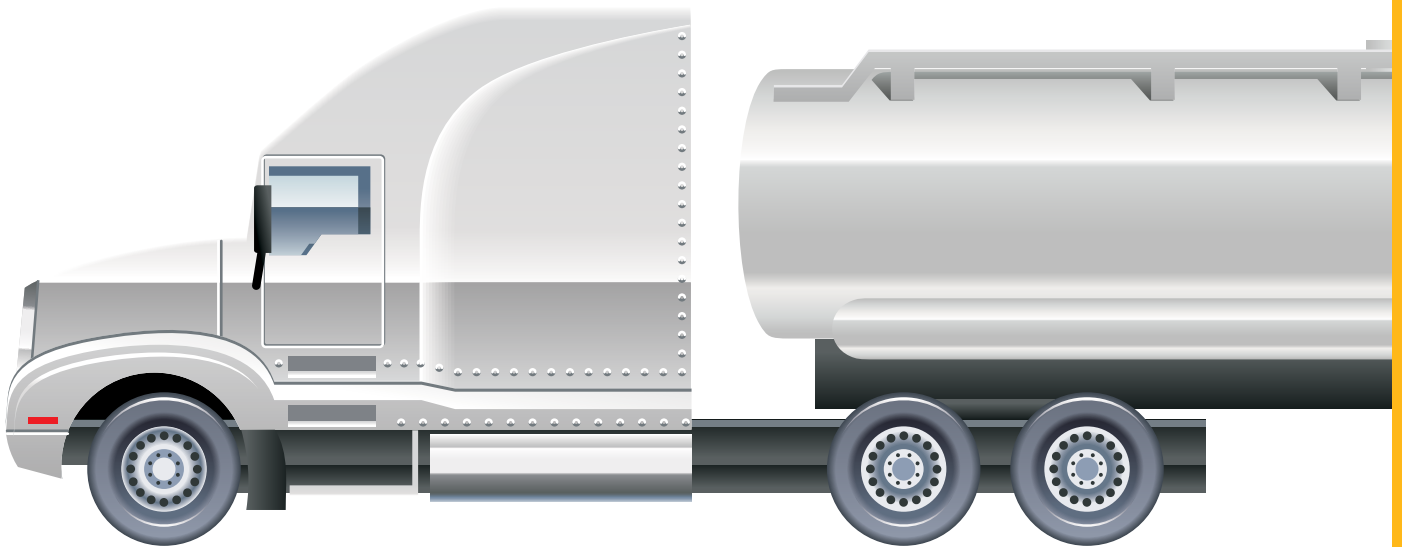
Companies use either air compressors or pumps to load and unload bulk liquids.

An air compressor uses compressed air to blow liquid through a hose. Most people prefer to use an air compressor when possible because it's more convenient than a pump, it makes less of a mess and you don't have to clean it afterwards.

Unfortunately, you can't use an air compressor to move flammable liquids, since it produces static electricity, which can create a spark.

A pump is the equipment of choice for those flammable commodities, as well as for certain other liquids that simply flow more easily when pumped than when pushed by air. The drawback to a pump is that the liquid passes through it. This means that you need to clean it after each use. It also means you can't use a pump for corrosive liquids, which will eat through the metal and eventually ruin it.

Some very viscous liquids—that is, liquids that are thick and sticky—need both methods. The air compressor blows the liquid toward the pump, which then moves the product into the hose.



HOW MUCH FOR THE AIR?

A shipper once called a broker to complain about an invoice. "It says 'carrier air,'" the agitated customer said. "Why do I have to pay for air?" Clearly, that shipper was new to liquid bulk transportation. "Air" is short for "air compressor." The invoice was simply stating that the carrier provided its own equipment for blowing liquid in and out of the trailer.

KEY QUESTIONS THAT DICTATE EQUIPMENT NEED

What Kind of Equipment Do You Need for Your Move?

Before you start looking for equipment to move a liquid bulk shipment, know the answers to these questions your carrier or broker will ask:

- What is the product?
- What are its special properties? (Hazardous? Temperature sensitive? Does it require insulation?)
- How many gallons are you moving?
- From what kind of container(s) will you load it?
- What width of hose do you need for loading, and how many 20-foot lengths?
- What fittings and adapters do you need for loading?
- Into what kind of container(s) will you unload it?
- What width of hose do you need for unloading, and how many 20-foot lengths?
- What fittings and adapters do you need for unloading?
- Do you need a tank that unloads from the center or from the rear?
- Does the receiver's facility require any specific safety equipment?

LOADING

Just as important as having the right equipment is making sure proper procedures and oversight are in place during loading and unloading. It starts with simple communication.

Put your carrier or broker in touch with at least one person at the pickup site, and one at the delivery site, who understands all the necessary requirements. Your service partner will reach out to that point of contact to confirm details about procedures and equipment.

If your driver is responsible for loading and unloading, make sure you have someone supervising that work at all times. The driver might be in charge, but if something goes wrong, the headache is yours.

Every time you prepare to load, first inspect the trailer. It needs to be clean, dry and odor-free. Also, make sure the driver knows if you'll be loading the product out of a tank, a series of drums or other containers, and verify that he has the right equipment to do the job.

SOAPING UP

Did you hear the one about the driver who loaded highly-concentrated liquid detergent into a bulk trailer and then drove away without securing the dome? Soap flew out the top and splashed all over the highway. The next thing the driver knew, police cars and fire trucks were swooping in, and TV news helicopters were filming from above. The load wasn't the least bit hazardous, but that didn't stop the incident from making the 11 o'clock news. And for days afterwards, whenever it rained, the highway erupted in bubbles.

UNLOADING

When a liquid bulk shipment arrives for unloading, the receiver should first take a sample to confirm that the truck has brought the right product, and that the product is in good condition. As the driver attaches the hoses, the receiver should double check to make sure the product will be flowing into the right tank or other container.

There are two primary methods for unloading a trailer, using a compressor or a pump. Air compressors and pumps work pretty much the same way for unloading as for loading, and they're subject to the same restrictions for flammable and corrosive liquids.

Some trailers unload from an opening at the center; others unload from the rear. The difference can be important. If your truck is parked on a surface that pitches upward, toward the rear of the truck, and you're unloading from the rear, some of the liquid will stay stuck in the front end of the trailer. That leftover bit, called the heel, can prove expensive: if you can't get it out, you'll need to dispose of it elsewhere. To avoid waste, make sure the mechanism for unloading fits the environment where you'll be using it.

Another important precaution: if you're unloading with a pump, make sure the dome is open. Otherwise, the pressure set up by the compressor or pump could collapse the trailer walls, ruining a piece of equipment worth over $100,000. On the other hand, if you're unloading with a compressor, make sure the dome is closed.

MYSTERY OF THE TWISTING PIPE

Managers at paint factory wondered why always it always took 4 to 6 hours to unload a liquid raw ingredient that arrived in a tank truck. Finally, someone from the broker checked the pipe in the factory wall where the driver connected his hose. That pipe used to lead straight into a tank. But years ago, the tank had to be moved, requiring 600 feet of extension pipe to reach it. Later, they returned the tank to the front, but the extension pipe remained, twisting and turning through the plant. Once management figured this out, they ran a new, short line from the access point directly to the tank, cutting unloading time by 3 hours!

TANK WASHING

One of the biggest differences between liquid bulk and other kinds of freight is the need to wash the trailer. After dropping a load, the driver might have to travel an hour or more—maybe even to another state—to reach a tank wash station.

This requirement adds extra time to every shipment. It also adds cost, partly because every shipment includes deadhead miles, and partly because the shipper pays for the wash.

There's one exception to the washout requirement. It's when a carrier unloads a liquid product and then plans to load exactly the same commodity.

Not every washing facility is designed to clean every liquid bulk tank. Some handle chemicals only, while others are designed only for food grade loads. The wash station may use detergent, steam or a caustic wash to clean the tank, depending on the last product hauled. Along with the trailer, the station also washes pumps and hoses.

When a driver arrives to pick up your load, you should not only inspect the tank, but also ask the driver for a washout slip from the wash station. This document tells you exactly how the equipment was washed, letting you know if it was done correctly.

The cost of washing the trailer may appear on your freight bill as a separate charge. For some products, the carrier will apply a standard washing charge. For others, the carrier will pass along the actual dollar amount that the wash station charges. To avoid surprises, ask about this charge when you book the load.

WHO'S RESPONSIBLE FOR WHAT?

Plenty needs to be done to ensure liquid bulk loads ship and arrive correctly and safely. It's important to know where specific responsibilities lie to avoid finger pointing. This chart delineates the responsibilities for each party.

Shipper Responsibilities	Receiver Responsibilities	Carrier Responsibilities
• Know the properties of the product you're shipping and communicate that information to the carrier, along with required equipment or certifications. • Know the regulations that apply to the commodity you're shipping. • Give the driver the necessary placards, seals or anything else the shipment requires on the road. • Give the driver the bill of lading (BOL) and any other pertinent paperwork. • Before loading, inspect the trailer to make sure it's clean, dry and odor-free.	• Before unloading, verify that you're receiving the correct commodity and are unloading it into the correct tank or other receptacle(s). • Provide a clean, safe environment for unloading. • Provide an employee to monitor the unloading process so the driver can monitor the process at the truck.	• Provide a clean trailer, covered by appropriate insurance. • Provide a driver who is well trained and drug free. • Provide necessary hoses, fittings, pumps, compressors and other equipment as specified by the customer, or bring "standard" equipment (generally two 20-foot lengths of hose and a pump). • Provide proper driver safety equipment, which could include full personal protection equipment (PPE) for hazmat deliveries. (NOTE: Some facilities won't admit bearded drivers, since facial hair would prevent wearing a respirator.)

Typically, the shipper is responsible for loading a liquid bulk shipment, and the receiver is responsible for unloading. But that's not always the case. When you book a load, establish up front who will load and unload so there are no misunderstandings when the truck arrives.

CHOOSING A CARRIER

The downside risk of choosing an unqualified carrier is significantly greater for tanker truck loads. Don't take chances. Sometimes all it takes is a conversation, peppered with the right kinds of detail-seeking questions, to spot the real experts from the posers.

When qualifying tanker truck carriers to haul for your company, consider the following:

- **Experience**: Look for a long, multi-year track record of safe, compliant shipments.
- **Equipment**: Find out if they have the equipment your commodity and process require.
- **Coverage**: Make sure they regularly offer service in the areas where you need to pick up and deliver your loads.
- **Authority**: Make sure they are licensed to operate in the states where you need service.
- **References**: Ask to connect with some of their customers and call them to gain a greater understanding of the carrier's process and past performance.
- **Safety**: Investigate commercial and government sources to learn about the carrier's safety record.
- **Insurance**: Confirm that the company has the right level of liability and cargo insurance for your load.

CAN A SPECIALIZED FREIGHT BROKER HELP?

If you've stuck with us this long, you've learned at least one thing: shipping liquid bulk commodities is complicated and involves much more risk than dry van shipments. Miss an important detail and you can get into all kinds of trouble.

The question is, do you and your team have the time and know-how to find, qualify and manage the many carriers you'll need to source day-to-day and emergency freight capacity—and to do it all well?

If not, there are brokers who specialize in moving liquid bulk shipments. They give you access to a large portfolio of liquid bulk carriers, all carefully pre-qualified, so you make one phone call, not 17. The broker's experts gain an understanding of your business and execute on your behalf, providing all the information the carrier needs and monitoring shipments, from pickup to delivery.

Most of all, the right freight broker brings expertise developed over years of moving just about every conceivable liquid commodity. That expertise comes with the ultimate benefit for you and your safety-conscious, performance-conscious company: peace of mind.

BULK CONNECTION

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ABOUT BULK CONNECTION

Founded in 1987, Bulk Connection is a licensed, bonded and insured freight broker that gives shippers safe, reliable capacity for bulk freight and other shipments. Our freight specialists average 20 years in the business, so you deal with experts, not order takers, who can advise you on the best shipping methods.

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