Concrete boom trucks

Able to reach over, under, and through, truck-mounted concrete pumps with placing booms are efficient and economical ways to place concrete.

By John A. Koski

Their numbers are growing. Concrete pump and boom trucks can be seen with increasing frequency on all types of jobsites. Part of the reason is reliability. In the early days of placing concrete with a pump and boom it was common to have a second, standby boom truck on the jobsite—just in case. If something happened to the primary boom truck, the standby unit could take over and get the job done.

Things are different today. Dependability is one of the hallmarks of modern boom trucks. They work hard and run long. Breakdowns are
Remote control units allow the operator to position himself so he can see the boom in operation at all times. This unit lets the operator control all boom functions, pump and truck engine speed, and has an emergency engine kill switch.

Boom trucks are ideal for jobsites where space is limited, such as this narrow wharf. Note how two ready mix trucks have been spotted side by side to allow them to place their loads into the pump’s hopper to help ensure a continuous flow of concrete.

Tips for better pumping

1. Before placing concrete into the hopper, lubricate the pipeline by pumping a mixture of cement, sand, and water through the entire length of pipeline. One rule of thumb is to use one cubic yard of the lubricating mixture for every 1,000 feet of pipeline, regardless of diameter.

Why lubricate the line? As concrete flows through the pipeline, it is subjected to wear and friction, which can cause it to become hardened and difficult to pump. Lubrication helps prevent this by reducing friction and allowing the concrete to flow more easily.

How to Make a Concrete Pumping Contractor’s Life Easier

As a matter of economics, most small to mid-size concrete contractors call on a concrete pumping contractor when they need a concrete boom truck. Providing the pumping contractor with complete and accurate information helps prevent problems and allows the job to be completed on time, without delays. Questions that should be answered for the pumping contractor include:

What is the date of the pour? Lead time is important for a pumper in scheduling jobs. Be sure to call at least one week in advance of your pour date.

Who is supplying the concrete and what mix will be used? The properties of the concrete and the materials used to make it determine the type of equipment that will be needed to pump it. Variables taken into consideration by concrete pumpers include: maximum size of coarse aggregate, gradation of fine aggregate, amounts of fine and coarse aggregate, aggregate shape and roughness, whether the mix contains lightweight aggregate, cement content, fly ash content, specified air content for air-entrained concrete, chemical admixtures being used, slump, and whether acceptance tests will be done at the hopper or discharge end. Many pumping contractors are very familiar with local ready mix concrete producers and know their mix designs—even by number.

Where is the job located? Give the exact location and the best way to get to the jobsite. Providing accurate, understandable directions and traffic information can mean the difference between the job starting on time or having its start delayed while the boom truck searches for the jobsite or is trapped in heavy traffic.

How much concrete is needed and how fast must it be placed? Does the same rate need to be maintained all day?

What is being poured? Different equipment is needed for different types of pours. Be sure to tell the pumper whether you’ll be pouring footings, a base mat, columns, walls, a deck, or whatever else.

How far out and how high up does the concrete need to be pumped? Using a truck with a boom that is too short can slow the progress of a job dramatically.

When will the concrete arrive? Set-up time for a boom truck can be up to several hours depending on job requirements and the type of equipment used.

Are there any unique or unusual features of the job that will affect pumping? For example, is the pour in tight quarters, or do pumping activities need to be coordinated with other trades on the jobsite?
Concrete is pumped through a pipeline, it rides on a thin film of grout or mortar. Pumping is greatly impeded if that film is not there. Note, too, that worn couplings or gaskets can let air into the line and allow grout to escape. In either case, pumping performance is affected.

2. When the first load of concrete is placed in the hopper, continue pumping until the concrete begins to come out the discharge end of the pipeline.

3. If pipeline should happen to plug, don’t continue pumping thinking the plug can be pushed through. Doing so, may pack the plug more tightly and can create excessive concrete and hydraulic pressures.

4. Resistance to concrete flow is affected by many factors. For example, the power needed to pump concrete 1 foot vertically will pump the same amount of concrete 6 feet horizontally, using the same size and type of pipeline. Elbows also make a difference: A 90-degree elbow has the same resistance as 40 feet of straight horizontal pipeline, while a 45-degree elbow is equivalent to 20 feet of straight horizontal pipeline.

### Using Concrete Boom Trucks Safely

#### Before leaving the yard:
- Check engine oil, transmission fluid, and coolant levels; look for loose filters and damaged or loose hoses; check tires for low pressure; and make sure all lights and turn signals operate.
- Check that you have all needed safety equipment, such as fire extinguisher and first aid kit.
- Make sure that all reducers, couplings, washout fittings, buckets, and other accessories are properly stowed and secured.
- Check the pipeline wall thickness. Pipe that is too thin can burst during pumping operations.
- Check that outriggers are fully retracted and up for travel.
- Remove the concrete box cover and look for loose gravel or concrete. Use a hoe to clean out the box. Never reach into the valve box with your hand—even if the machine is not running—to remove loose material.
- When checking the machine, don’t step on the hopper grate and never use the valve box as a step for climbing onto the truck bed.
- Know the weight, height, and width of the pump truck.

#### Setting up on the jobsite:
Most truck-mounted concrete pump accidents are caused by one of three things:

- **Working too close to electrical wires:** Look overhead before setting up to be sure there aren’t any power lines overhead. Always maintain adequate clearance. Also, check for other overhead obstructions that might interfere with boom operation.
- **Setting up on sloping or soft surfaces:** Spot the boom truck on pavement or firmly compacted soil. If the soil is soft, use cribbing or pads beneath the outriggers to spread the load over a larger area. Boom trucks generally must be set up so that they are within 3 degrees of level. When setting up near an embankment, observe the one-to-one rule: For every foot of the bank’s height, position the outrigger pads at least one foot back form the edge. If the bank or soil looks unstable, you may have to spot the boom truck even further back from the bank. When in doubt, have a competent person examine the bank.
- **Failure to fully extend outriggers:** Outriggers keep the machine stable while the pump and boom are operating. Always follow the manufacturer’s recommendations when extending and lowering the outriggers. Don’t set outriggers on sidewalks, curbs, or manhole covers.

#### Operating the pump and boom:
- Observe any limitations on boom position or movement set by the pump manufacturer.
- Allow adequate clearance between any part of the boom and the nearest obstruction to prevent pinning a worker between the boom and the obstruction.
- If any part of the boom or placement hose is out of sight of the operator, establish a means of communications with the placing crew foreman by radio or hand signals.
- Never use the boom to lift building materials or tool boxes.
- Don’t rest the boom on formwork, scaffolding, or falsework which may not be designed to carry the additional load.
- Keep hands, arms, feet, and legs away from the hopper grate when the pump is running; never remove the grate while the pump is cycling; and never stand on the grate even if the pump is off.
- Never open a coupling on a pressurized concrete pipeline.
- Use a catcher at the end of the line when using a godevil or cleanout ball.
- Never move the truck while the boom is extended.