

High-Pressure Water Jets: the Quick Answer to Cleaner Tanks and Reactors



The Leader in High-Pressure Water Jet Technology

SAVE TIME AND MONEY WITH WATER JET CLEANING

Manual cleaning methods are slow, and you can't start processing again until cleaning is complete. Using solvents or caustics compounds the problem, because the care required for their use and disposal requires more time and money. And when workers are exposed to potentially hazardous chemicals or caustics, safety and confined space entry become concerns, as well.

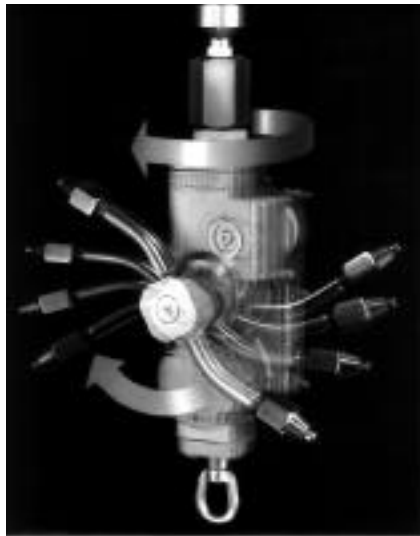
Fortunately, high-pressure water jet systems from NLB Corporation clean tanks and reactors in minutes instead of days. The power of high-pressure water (up to 36,000 psi, or 2,500 bar) can strip away virtually any product build-up, even in tight spaces... without using chemicals and without requiring anyone to enter a tank. You save time, labor and money!

The key is NLB's 3-Dimensional tank cleaning head, which focuses high-velocity water jets through two rotating nozzles. While the head rotates horizontally, the nozzles rotate vertically, powered by the reaction energy of the high-pressure water. The combination of these movements produces a 360° cleaning pattern over the entire interior surface of the tank, tote or reactor. When tanks are large — e.g., 20 to 30 ft. (6 to 9 m) high — the head is inserted into the vessel on a telescoping lance. Six cleaning head models and three lance styles are available to suit virtually any application (see next two pages).



Reactor Capacity	Production Time Lost		Personnel Cost		Net Savings With NLB Systems	
	Present Method	NLB	Present Method	NLB	Production Time	Personnel Costs
3,000 Gallons	14 Hours (Manual)	4 Hours	14 Hrs. x 3 Workers = 42 Hours	4 Hrs. x 2 Workers = 8 Hours	10 Hrs.	34 Hrs.
6,000 Gallons	28 Hours (Chemical)	5 Hours		5 Hrs. x 2 Workers = 10 Hours	23 Hrs.	+10 Hrs.
20,000 Gallons	72 Hours (Manual)	8 Hours	72 Hrs. x 4 Workers = 288 Hours	8 Hrs. x 2 Workers = 16 Hours	64 Hrs.	272 Hrs.

3-D TANK CLEANING HEADS PUT CLEANING POWER WHERE YOU NEED IT

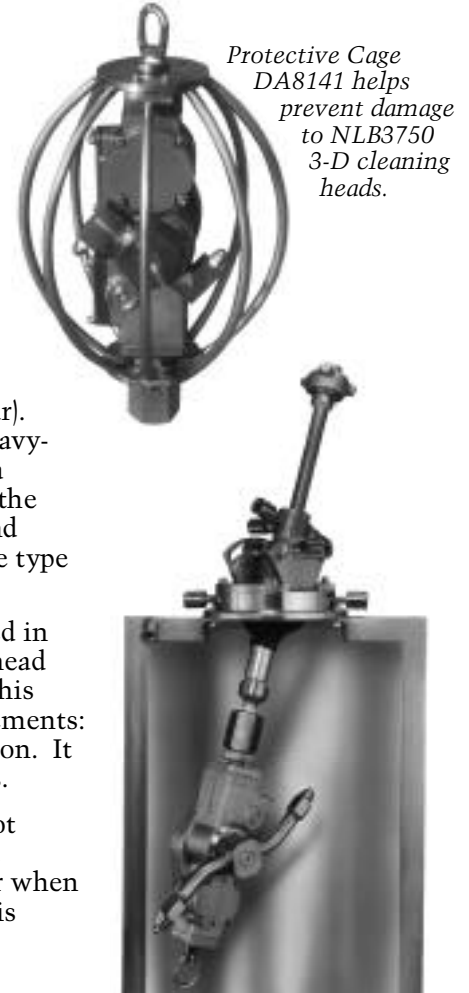


NLB 3750 heads rotate horizontally while water jet nozzles rotate vertically.

NLB 3750 3-D cleaning heads produce 3-dimensional coverage that thoroughly cleans tank, tote and reactor interiors. They are available in three models, delivering flows of 15 to 80 gpm (57 to 302 lpm) at pressures of up to 13,000 psi (896 bar). Each of these models can be ordered in a heavy-duty bronze body, a stainless steel body or a lightweight aluminum body, depending on the application. All rotate from 2 to 40 rpm, and feature adjustable rotating speeds to suit the type of build-up being removed.

Lance Swivel Turret NLB5996 (right) is used in smaller vessels to locate the 3-D cleaning head into the required working position. With this aluminum turret, the lance has three movements: extension/retraction, inclination and rotation. It can also be used for horizontal applications.

Ball and Socket Assembly Model B4496 (not shown) made of stainless steel, can be used instead of the Swivel Socket Lance Adapter when cleaning small vessels. The ball assembly is replaceable.



Protective Cage DA8141 helps prevent damage to NLB3750 3-D cleaning heads.

NLB MODEL	3750-40	3750-50	3750-80
Operating Pressure	4,000-13,000 psi (280-900 bar)	4,000-13,000 psi (280-900 bar)	4,000-8,000 psi (280-550 bar)
Flow Rate	15-50 gpm (57-189 lpm)	25-60 gpm (95-227 lpm)	25-80 gpm (95-302 lpm)
Inlet Connection	1/2"-14 NPT	3/4"-14 NPT or 1-1/4"-11-1/2" NPT	1-1/4"-11-1/2" NPT
Weight	Bronze or Stainless Steel: 23 lbs. (10 kg) Aluminum: 15.5 lbs. (7.0 kg)	Bronze or Stainless Steel: 48 lbs. (22 kg) Aluminum: 36 lbs. (16.3 kg)	Bronze or Stainless Steel: 48 lbs. (22 kg) Aluminum: 36 lbs. (16.3 kg)
Length	13-1/2" (34.3 cm)	20" (50.8 cm)	20" (50.8 cm)
Minimum Width	6" (15.2 cm)	8" (20.3 cm)	8" (20.3 cm)
Maximum Width	12" (30.5 cm)	14" (35.6 cm)	14" (35.6 cm)
Rotor Offsets (in 5mm increments)	4 mm to 20 mm	20 mm to 90 mm	20 mm to 90 mm

Nozzle size and rotor offsets are determined by the supply pump rating and pressure available at the 3-D head inlet. Consult NLB for proper nozzle sizes and rotor offsets to suit your applications.

TELESCOPIC LANCES AND ACCESSORIES GO ANYWHERE

The **Swivel Socket Lance** is generally used in small vessels, and is also ideal for horizontal applications, such as stripping columns, blow-down tanks, flash tanks, and hopper cars. It has three movements: extension/retraction, inclination and rotation. The swivel socket lance mounts to the vessel's manway with a custom-designed adapter.

The **Telescopic Lance** is used in large vessels and in areas where overhead height is limited. It features external handwheels to extend/retract, incline and rotate the 3-D head as needed, and a custom-designed manway adapter. Standard lance lengths range from 100" to 295" to service vessels from 121" to 334" in height. Custom-engineered sizes are also available, as are fully-automated telescopic lances.

The **Lightweight Telescopic Lance** has most of the same features as a standard NLB telescopic lance, but is made of aluminum and therefore weighs about 80% less. This makes it more maneuverable around obstacles in a tank. There are three models to choose from, with a minimum extension of 23.6" (60 cm) and a maximum of 245.4" (6.2 m).

Automated Telescopic Lances are custom-designed to fit a customer's tank, reactor or other vessel for between-batch cleaning. They are generally permanently attached to the vessel. Extension and retraction mechanisms can be electric, hydraulic or pneumatic.

Lance Carts are available to transport telescopic lances and raise them into position.

Lightweight Telescopic Lance Selection Chart

Model No.	Min. Extension	Max. Extension	Vessel Height	Weight
FL3-20L-3/4	23.6" (60 cm)	101.4" (2.8 m)	121-140" (3-3.5 m)	60 lbs. (27 kg)
FL3-32L-3/4	47.6" (121 cm)	173.4" (4.4 m)	193-212" (5-5.5 m)	70 lbs. (32 kg)
FL3-44L-3/4	71.6" (182 cm)	245.4" (6.2 m)	265-284" (6.7-7.2 m)	80 lbs. (36 kg)

Note: Special and custom manufactured lances are also available; please consult factory.



Lightweight Telescopic Lance

Telescopic Lance Features

1. Manway Adapter Base
2. Inclination Tilting Handle
3. High-Pressure Hose
4. Hose Guide
5. Extension Telescopic Handle
6. Turning Handle Base Rotation
7. NLB 3750 Nozzle

Standard Telescopic Lance Selection Chart

Model No.	Min. Extension	Max. Extension	Vessel Height	Weight
TL3-35-3/4	33.9" (86 cm)	137.8" (3.5 m)	158-177" (4-4.5 m)	303 lbs. (138 kg)
TL3-45-3/4	46.9" (119 cm)	177.2" (4.5 m)	197-216" (5-5.5 m)	316 lbs. (143 kg)
TL3-55-3/4	59.8" (152 cm)	216.5" (5.5 m)	237-255" (6-6.5 m)	329 lbs. (149 kg)
TL3-65-3/4	72.2" (184 cm)	255.9" (6.5 m)	276-295" (7-7.5 m)	342 lbs. (155 kg)
TL4-35-3/4	20.9" (53 cm)	137.8" (3.5 m)	158-177" (4-4.5 m)	300 lbs. (136 kg)
TL4-45-3/4	30.7" (78 cm)	177.2" (4.5 m)	197-216" (5-5.5 m)	312 lbs. (142 kg)
TL4-55-3/4	40.6" (103 cm)	216.5" (5.5 m)	237-255" (6-6.5 m)	326 lbs. (148 kg)
TL4-65-3/4	50.4" (128 cm)	255.9" (6.5 m)	276-295" (7-7.5 m)	339 lbs. (154 kg)
TL4-75-3/4	60.2" (153 cm)	295.3" (7.5 m)	315-334" (8-8.5 m)	352 lbs. (160 kg)
TL4-35-1-1/4	26.0" (66 cm)	137.8" (3.5 m)	158-177" (4-4.5 m)	320 lbs. (145 kg)
TL4-45-1-1/4	35.8" (91 cm)	177.2" (4.5 m)	197-216" (5-5.5 m)	342 lbs. (155 kg)
TL4-55-1-1/4	45.7" (116 cm)	216.5" (5.5 m)	237-255" (6-6.5 m)	364 lbs. (165 kg)
TL4-65-1-1/4	55.5" (141 cm)	255.9" (6.5 m)	276-295" (7-7.5 m)	386 lbs. (175 kg)
TL4-75-1-1/4	65.4" (166 cm)	295.3" (7.5 m)	315-334" (8-8.5 m)	408 lbs. (185 kg)

Note: Special and custom manufactured lances are also available; please consult factory.



NLB AUTOMATES BETWEEN-BATCH CLEANING

NLB Automated Tank Cleaning Systems clean between production batches, so product is cleaned from a vessel before it can dry or build up. Dedicated NLB systems are installed on a vessel, eliminating delays for set-up.

As the illustration at right shows a telescopic lance raises the cleaning head after it cycles, closing it off from the tank chamber until it is time for cleaning again.

These cleaning systems are custom-designed and manufactured to meet each facility's individual requirements.

NLB's staff of application engineers are experienced in evaluating your needs and responding to them.

Important considerations in designing these systems include:

- Type of product manufactured
- Vessel size
- Internal vessel configuration
- Overhead room



NLB HIGH-PRESSURE PUMPS

NLB has a wide range of high-pressure pump units for tank cleaning, operating at pressures up to 13,000 psi. (Typical reactor cleaning pressures range from 4,000 to 8,000 psi, or 290 to 580 bar.) All models feature rugged, heavy-duty NLB pumps built for continuous duty

operation. Electric motor drive units are skid- or dolly-mounted; industrial diesel engine-driven models are also available.

NLB systems are thoroughly tested before shipment, and are available for purchase, lease or rent.

NLB Pump Units, Electric-Powered

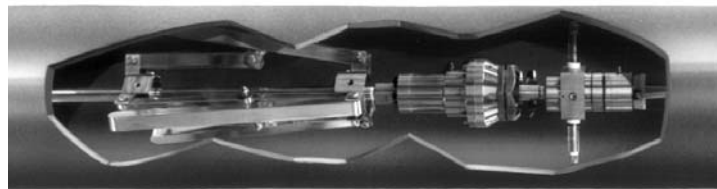
Model No.	Max. Pressure		Max. Volume		Power	
	psi	bar	gpm	lpm	hp	kw
13100	13,000	900	12	45	100	75
10100	10,000	700	15	57	100	75
8100	8,000	580	19	72	100	75
6100	6,000	460	23	87	100	75
13150	13,000	900	21	80	150	112
10150	10,000	700	25	95	150	112
8150	8,000	580	32	121	150	112
6150	6,000	460	40	151	150	112
4150	4,000	290	53	201	150	112
13200	13,000	900	25	95	200	150
10200	10,000	700	34	129	200	150
8200	8,000	580	42	159	200	150
6200	6,000	460	50	189	200	150
13250	13,000	900	35	133	250	186
10250	10,000	700	43	163	250	186
8250	8,000	580	54	204	250	186
6250	6,000	460	65	246	250	186
10400	10,000	700	68	257	400	300
8400	8,700	600	79	299	400	300
7400	7,000	490	95	360	400	300
10600	10,000	700	99	375	600	450
7600	7,000	490	140	530	600	450



ROTARY STACK CLEANERS OPEN UP BLOCKED PIPES OR STACKS IN NO TIME

NLB rotary stack cleaning swivels combine the force of high-pressure (up to 12,000 psi, or 830 bar) water with various nozzle offset angles to produce rotating speeds of up to 3,000 rpm. Rotation speeds are easily adjustable to work most efficiently with the pressure, flow and travel speed being used. Adjustments are made via a built-in magnetic brake adjusting nut, which threads into the body of the stack cleaner to slow the rotation and threads out to increase it.

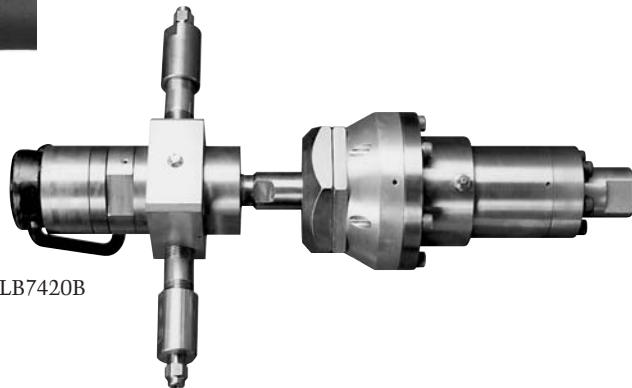
The Model NLB 7500B and the lighter, more compact NLB 7420B are available with optional NLB 7420-1 pull rings, centralizer skids, speed monitors, nozzle blocks, and line mole heads.



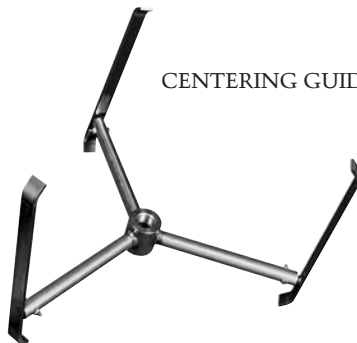
NLB7420B



NLB7500B



NLB7420B



CENTERING GUIDES

SPECIFICATIONS

NLB Model	NLB 7420B	NLB 7500B
Maximum operating pressure	10,000 psi (700 bar)	10,000 psi (700 bar)
Maximum flow	25 gpm (95 lpm)	100 gpm (379 lpm)
Maximum rotating speed	3,000 rpm	3,000 rpm
Minimum rotating speed	270 rpm	200 rpm
Length	12-5/16" (31.3 cm)	17-3/4" (45.1 cm)
O.D.	4-1/2" (11.4 cm)	6-1/4" (15.9 cm)
Weight	26 lbs (11.8 kg)	58 lbs (26.3 kg)

Model No.	Adjustment
DA10094-1	10" to 14" (25.4 to 35.6 cm)
DA10094-2	14" to 23" (35.6 to 58.4 cm)
DA10094-3	23" to 36" (58.4 to 91.4 cm)

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