LF™70 SURFACE CORING FLY DRILL

Technical Overview

BOART LONGYEAR™

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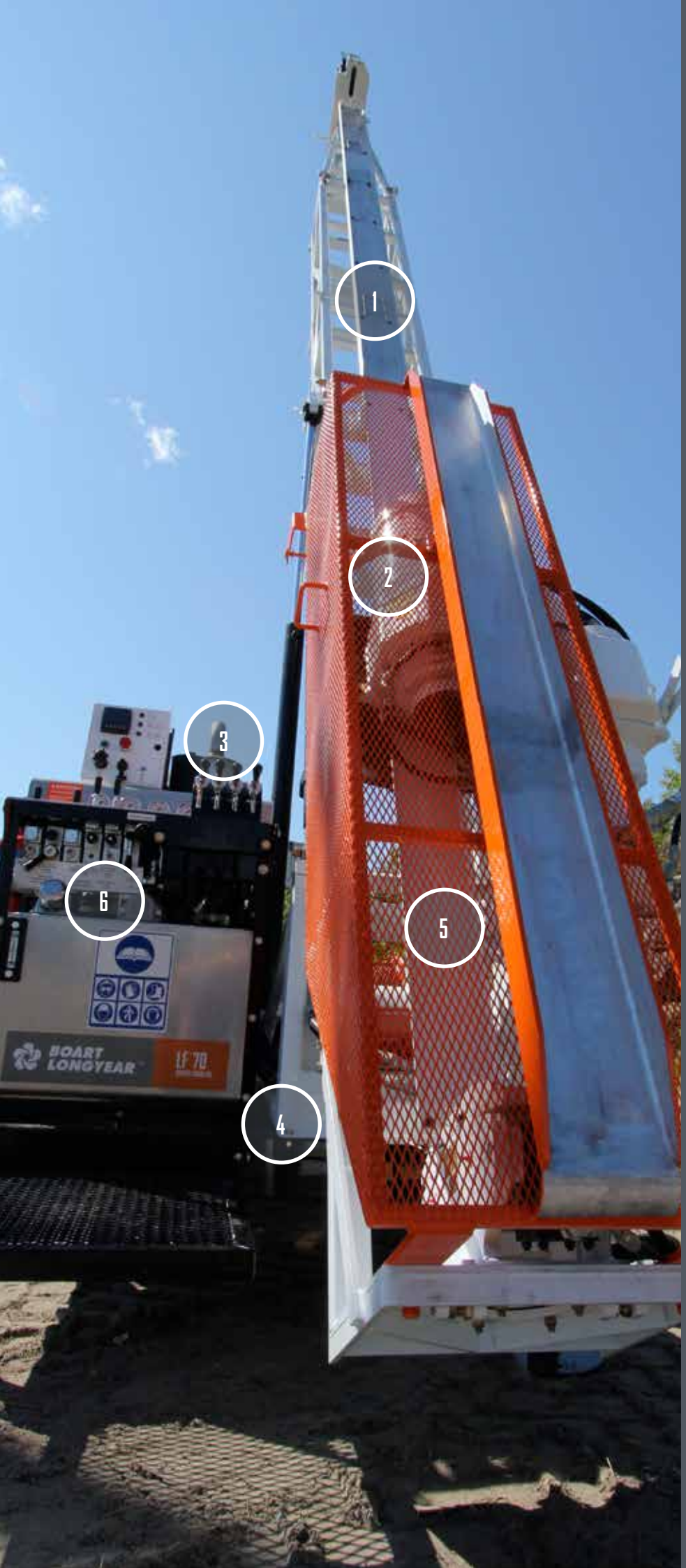
LF™70 DIAMOND CORE FLY DRILL

Mobility
The LF™70 modular design consists of seven sections that are heliportable for reaching remote locations. This drill reduces downtime when mobilizing between sites and significantly decreases the environmental impact to a drill site.

Modular Design
With just seven components, it takes less than one hour to pull down the rig and the same amount of time to reassemble it.

Lightweight
Special attention was given to the overall weight and dimension of the drill's design. Each of its seven components weigh less than 585 kg and are easily transportable by helicopter. The LF70 is ideal for drilling in confined, remote locations.

For more information on the LC™70 scan with a QR code reader on your smart phone.



1 SOLID STRUCTURAL DESIGN

Rigid design provides superior performance and reliability even under the toughest conditions.

2 NITRO-CHUCK™

The patented nitrogen gas spring jaws with hydraulic open/spring close function ensure fail safe operation

3 SIMPLE HYDRAULIC DESIGN

Direct-coupled hydraulic pumps with easy maintenance

4 FLYABLE

The LF™70 easily breaks down into seven flyable modules with a maximum weight of 585 kg

5 PQ ROTATION UNIT

Four-Speed transmission delivers high torque when needed and high speed for diamond drilling

6 SELF-CONTAINED OPERATOR PANEL

The simple hydraulic system is easy to operate and maintain while lift-to-shift levers provide additional operator safety

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U.S. Patent No. 6,719,303; AU Patent No. 2002301549; CA Patent No. 2,378,372; Patent Pending.

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LF™70 TECHNICAL INFORMATION

Drilling Depth Guidelines				
	Dry Hole		Fluid Filled	
Drill Rod / Core Barrel	Hole Depth (meters)	Hole Depth (feet)	Hole Depth (meters)	Hole Depth (feet)
BRQ / BQ	907	2,976	1,039	3,407
BRQTK / BQTK	1,142	3,746	1,308	4,292
NRQ / NQ / NQ2	698	2,290	798	2,619
NRQ V-Wall™	789	2,588	895	2,936
HRQ / HQ	473	1,553	542	1,778
HRQ V-Wall™	596	1,955	674	2,210
PHD / PQ	313	1,026	357	1,171
PHD V-Wall™	426	1,399	478	1,567

The figures in these table are estimates which have been calculated using the applicable pullback capacity of the drill and on an effective rock tensile strengths of 5 MPa. Actual drilling results may vary and will depend on in-hole tools, subsurface and other environmental conditions, drilling techniques and equipment used. Always verify manufacturers' rod depth ratings prior to use.

Prime Mover		
	Metric	**U.S.**
Standard Unit	Cummins QSB 4.5 L, 4 cylinder, turbo charged, after cooled diesel engine.	
Displacement	4.5 L	275 in3
Power (maximum) at 2,300 RPM	110 kW	148 hp
Emissions Certification	CARB Tier 3 - EU Stage III A	CARB Tier 3 - US EPA
Fly Weight	585 kg	1290 lbs

HQ Drill Head - Standard		
	Metric	**U.S.**
Standard HQ - Hollow Spindle		
Maximum Rod Diameter	95 mm	4 in
Rotation Motor	Rexroth hydraulic motor - variable/reversible	
Mechanical Transmission	Funk 4 speed	
Ratios	1st	6.63:1
	2nd	3.17:1
	3rd	1.72:1
	4th	1.00:1
Final Drive	Roller chain drive	
Ratio	2.58:1	
Head Opener	Pivot style — manual operation	
Hydraulic HQ Chuck	Patented Nitro-Chuck™	
	Hydraulically opened, nitrogen gas spring closed.	
	Axial holding capacity of 133 447 N (30,000 lbf)	
Drill Head Lubrication	Force fed bearings, oil bath for roller chain - PTO driven	
Drill Head Lubrication Oil Filtration	25 Micron high pressure oil filter	
Fly Weight	390 kg	860 lb

Torque And RPM Ratings - HQ Head			
(Hydraulic motor at maximum/minimum displacement, prime mover at 2,200 RPM)			
	Speed (no load)	Torque (stall)	
	RPM	Nm	lbft
1st Gear	95 - 190	3,956 - 2,127	2,918 - 1,569
2nd Gear	200 - 400	1,891 - 1,017	1,395 - 750
3rd Gear	370 - 730	1,026 - 552	757 - 407
4th Gear	630 - 1,250	634 - 341	468 - 251
NOTE: Head output speed and torque are infinitely variable in each gear range as indicated.			
Actual rotation speed is affected by engine RPM and hydraulic motor displacement setting.			

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LF™70 TECHNICAL INFORMATION

PQ Drill Head - Optional		
	Metric	**U.S.**
Optional PQ - Hollow Spindle		
Maximum Rod Diameter	122 mm	5 in
Rotation Motor	Rexroth hydraulic motor - variable/reversible	
Mechanical Transmission	Funk 4 speed	
Ratios	1st	6.27:1
	2nd	3.12:1
	3rd	1.75:1
	4th	1.00:1
Final Drive	Straight cut gears	
Ratio	2:1	
Head Opener	Pivoting style: manual operation	
Hydraulic PQ Chuck	Patented Nitro-Chuck™	
	Hydraulically opened, nitrogen gas spring closed	
	Axial holding capacity of 222 400 N (50,000 lbf)	
Drill Head Lubrication	Force fed bearings, oil bath for gears - PTO driven	
Drill Head Lubricating Oil Filtration	25 micron high pressure oil filter	
Fly Weight	580 kg	1,279 lb

Torque And RPM Ratings - PQ Head			
(Hydraulic motor at maximum/minimum displacement, prime mover at 2,200 RPM)			
	Speed (no load)	Torque (stall)	
	RPM	Nm	lbft
1st Gear	122 - 199	3,878 - 2,027	2,861 - 1,495
2nd Gear	246 - 400	1,929 - 1,008	1,423 - 743
3rd Gear	439 - 714	1,084 - 567	800 - 418
4th Gear	769 - 1,250	658 - 344	485 - 253
NOTE: Head output speed and torque are infinitely variable in each gear range as indicated.			
Actual rotation speed is affected by engine RPM and hydraulic motor displacement setting.			

Hydraulic System		
Primary Pump	Axial piston, variable displacement load sensing, pressure compensated with low pressure standby.	
Max Flow	163 L/m	43 gpm
Maximum Pressure (factory setting)	241 bar	3,500 psi
Secondary Pump	Axial piston, variable displacement, pressure compensated	
Max Flow	42 L/m	11 gpm

Hydraulic System (continued)		
Maximum Pressure (factory setting)	138 bar	2,000 psi
Auxiliary Pump	Axial piston, variable displacement pressure compensated.	
Max Flow	42 L/m	11 gpm
Maximum Pressure (factory setting)	138 bar	2,000 psi
Hydraulic Tank Capacity	114 L	30 Gal

Drill Mast And Feed System		
	Metric	**U.S.**
Feed Stroke	1.8 m	6 ft
Max Pull Capacity	78.6 kN	17,671 lbf
Max Thrust Capacity	51.9 kN	11,658 lbf
Rod Pull	3 or 6 m	10 or 20 ft
Drilling Angle	45° off horizontal to 90° vertical down	
Mast Dump (Crowd)	N/A	

Draw Works		
	Metric	**U.S.**
Main Line Hoist	Main Line Hoist Single speed motor	
Hook Load (single part line)		
Bare Drum	53.4 kN	12,000 lb
Hoisting Speed (single part line)		
Bare Drum	1 m/sec	3 ft/sec
Main Hoist Cable	15 mm	0.59 in
Minimum Breaking Strength	226 kN	50,800 lb
Note: Do not use multiple part lines with the main line hoist, use single part line only.		
Foot Clamp Capacity	HWT	
Wireline Hoist		
Level Wind	N/A	
Line Pull		
Bare Drum	9.7 kN	2,190 lb
Full Drum	2.2 kN	502 lb
Line Speed		
Bare Drum	100 m/min	337 ft/min
Full Drum	433 m/min	1,470 ft/min
Drum Capacity 4.8 mm (3/16”) swaged	1,890 m	6,200 ft
Minimum Breaking Strength	22.2 kN	5,000 lb
Note: Wireline cable length to be specified at time of order		

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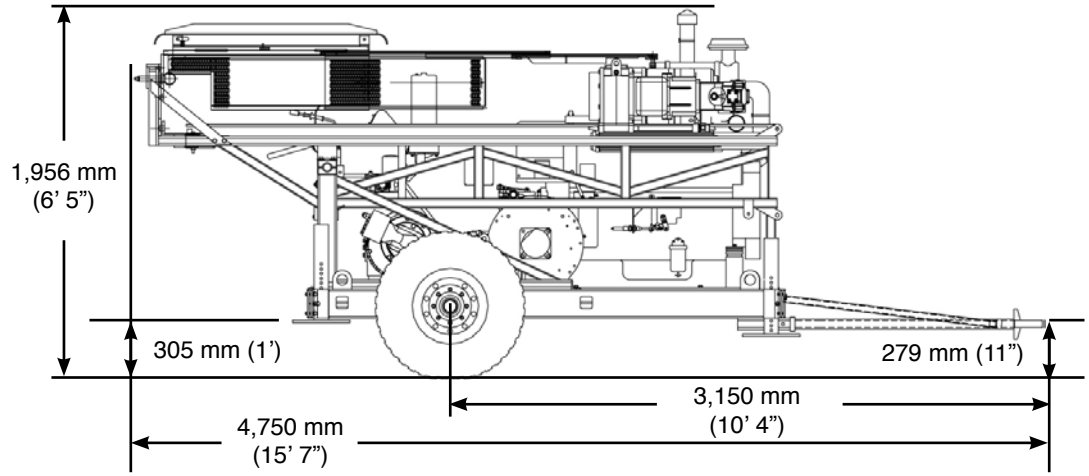
Additional Information		
	Metric	**U.S.**
Fuel Tank Capacity	57 L	15 Gal

Weight - Fly Drill = 2,950 kg (6,500 lbs) HQ Version / 3,740 kg (8,245 lbs) PQ Version
Consisting of:
Cummins 4.5 L QSB , Tier 3, 4 cylinder, water cooled, turbo charged, diesel engine
Hydraulic Module
Draw Works Grp. c/w 12,000 lb Main Line Hoist, Wireline Hoist
3 Piece Lattice Mast Assembly
HQ Rotation Unit Grp. c/w Nitro-Chuck™
Base Frame
Fuel Tank (57 L/15 US gal)
Battery - 12V
Stabilizer Legs (4)

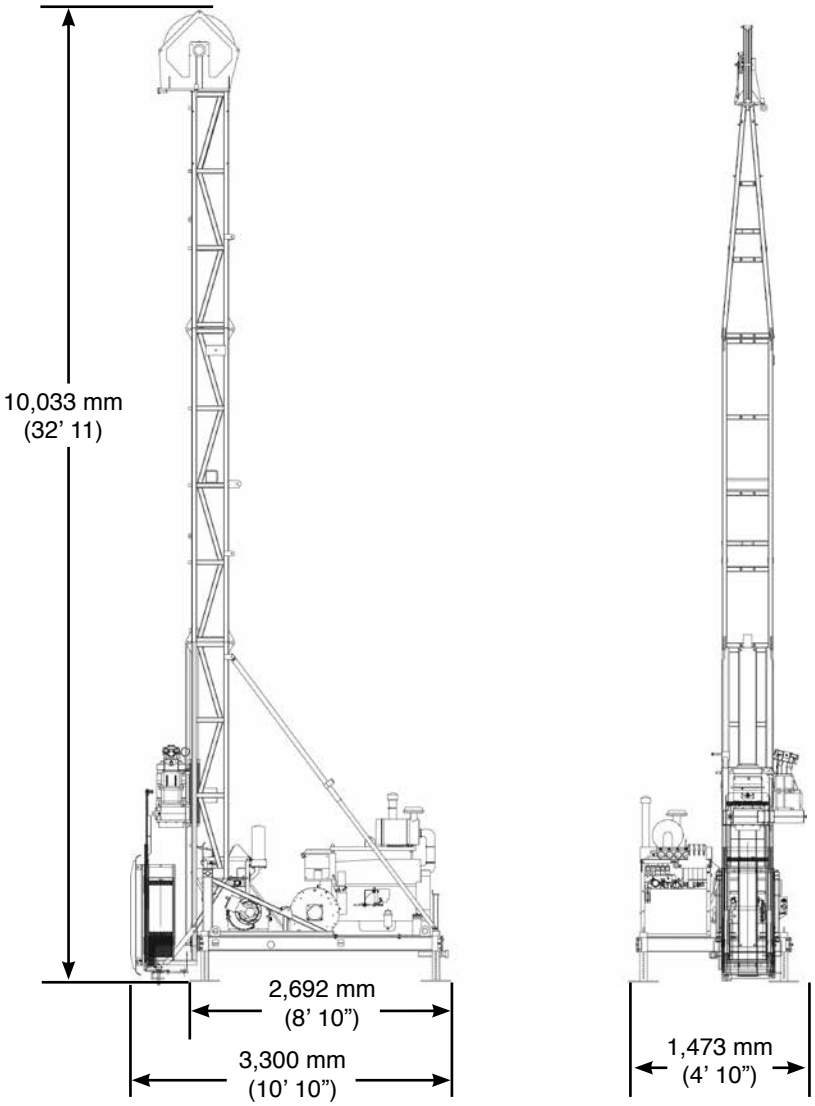
Options
PQ rotation unit group
Decals available in multiple languages
Mast raising cylinders
Wireline cable
Rod rack - WARNING: Do not operate this drill with rods racked in wind velocities in excess of 85 km/h
Mud tank
Towing package - NOTE: Not highway rated
Fluid circulation pumps (diesel supply and pressure)
Mud mixer

Drill Transport Position C/W Optional Towing Package



Side View - Mast at 90°

Wet Weight = 2,950 kg (6,500 lbs) HQ Version / 3,740 kg (8,245 lbs) PQ Version
Dimensions = Deduct 3,233 mm (10’7” from vertical height if middle mast section is removed
Note = Base dimensions are with mechanical stabilizer legs at the uppermost position. Overall height can be increased by 247 mm (9.75”) by adjusting legs downwards.



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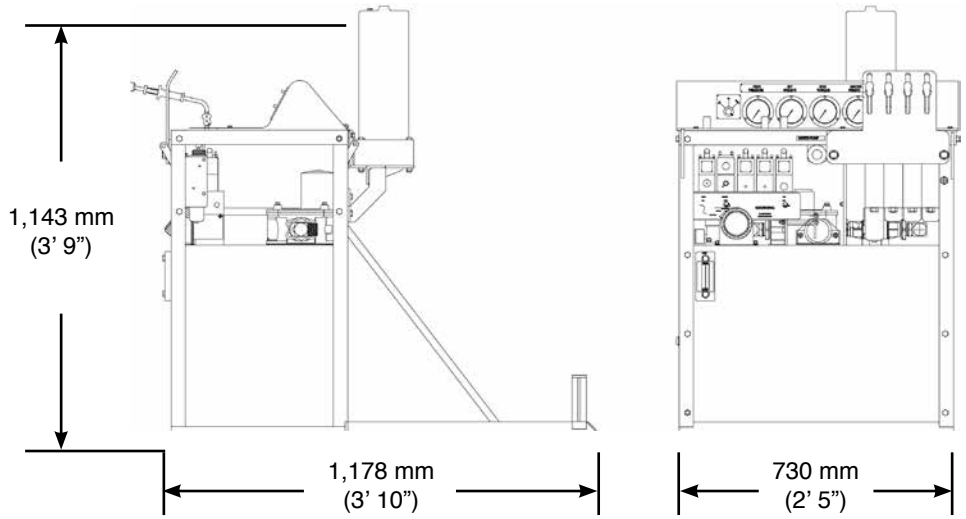
Hydraulic Module

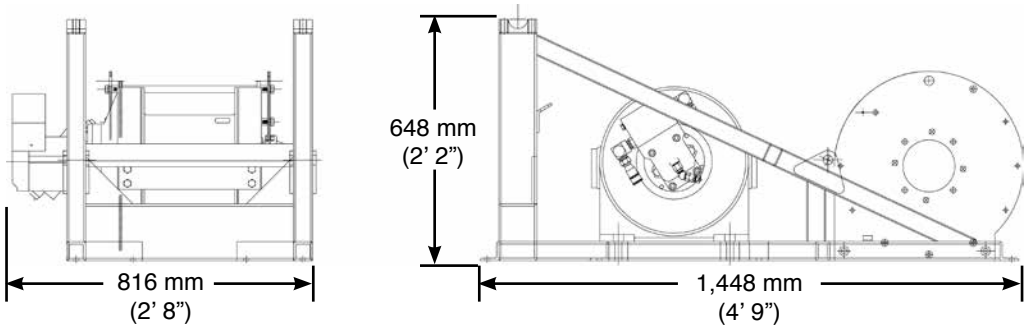
Wet Weight = 417 kg (920 lb)



Draw Works Module (KPL12)

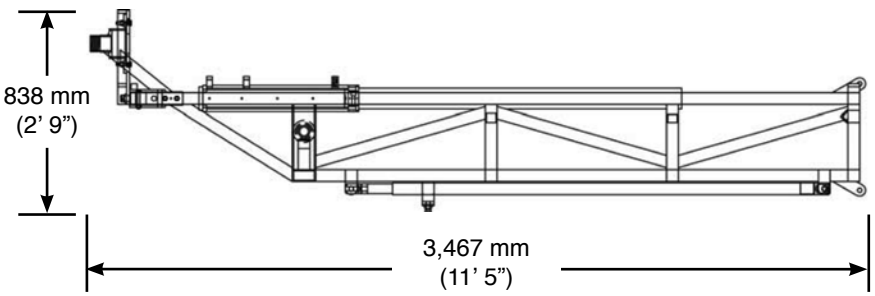
Weight = 450 kg (992 lb) (without cable and mast raising cylinders)
Mainline Hoist Cable = 15 mm x 22.9 m (0.59 in x 75 ft) Single part line - 26 kg (58 lb)
Wireline Hoist Cable = 4.8 mm x 1280 m (0.18 in x 4200 ft) 118 kg (260 lb)

Note: Lengths mentioned do not represent the max. rated drum capacity, they are typical values only.



Lower Mast Section

Weight = 554 kg (1,222 lb) (Footclamp removed)



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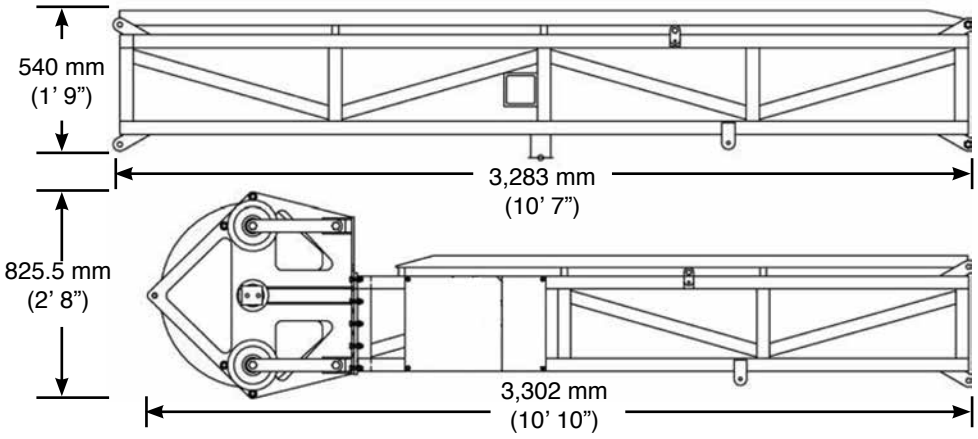
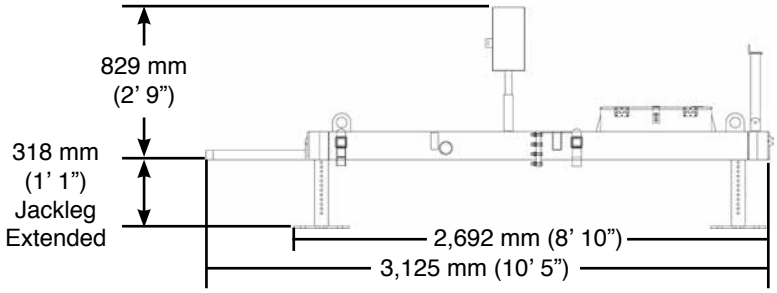
Middle And Upper Mast Sections

Combined Weight = 363 kg (800 lb)



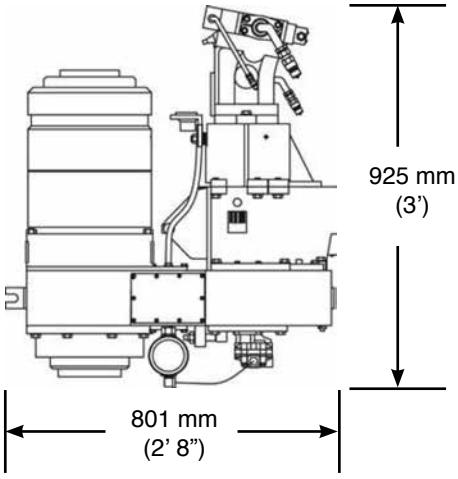
Drill Base

Wet Weight (Bare)	286 kg (630 lb)	Battery Box (including Battery) =	61 kg (134 lb)
Wheel and Stub Axle (each) =	51 kg (112 lb)	Mud Tank Outriggers (each) =	12 kg (26 lb)
Towing Hitch =	25 kg (55 lb)	Stabilizer Legs (each) =	11 kg (25 lb)
Fuel Tank (wet) =	57 kg (125 lb)	Operator Platform =	12 kg (26 lb)



HQ Drill Head C/W Nitro-Chuck™

Dry Weight = 376 kg (860 lb)



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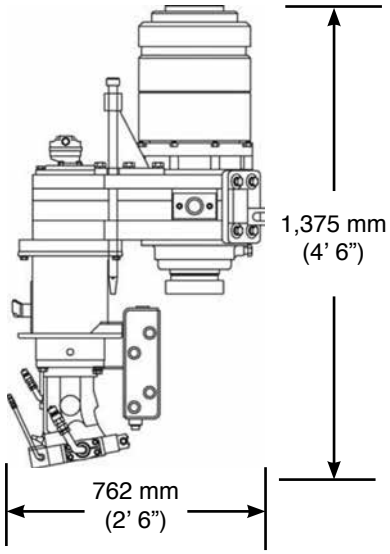
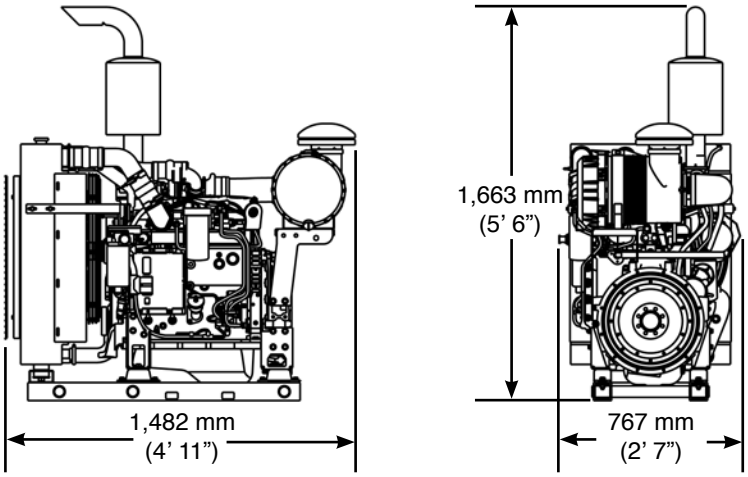
PQ DRILL HEAD C/W NITRO-CHUCK™ (OPTIONAL)

Dry Weight = 580 kg (1,279 lb)



Power Unit - Cummins 4.5 L QSB, Tier 3

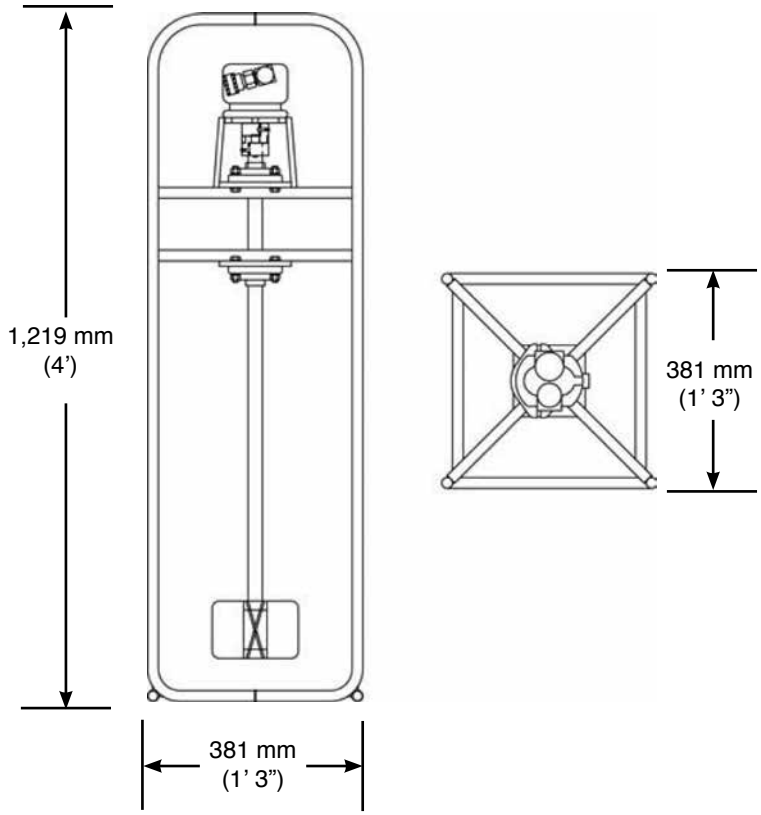
Dry Weight = 585 kg (1,290 lb)



Mud Mixer Assembly (optional)

Wet Weight = 31 kg (68 lb)

Note = Maximum speed of the mud mixer shaft at full flow is 2300 rpm.



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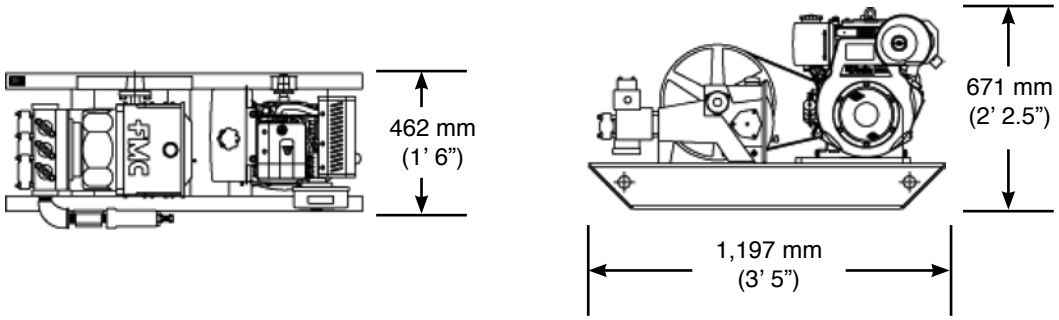
(L09) Fluid Supply Pump Group - Diesel (Optional)

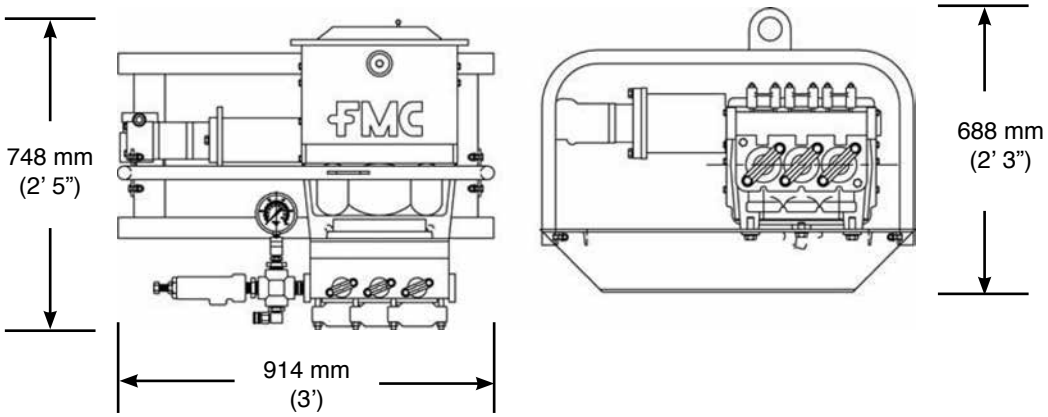
Output: 76 L/m @ 34 bar (20 GPM @ 500 psi)
Weight: 240 kg (530 lbs)



(W11) Fluid Circulation Pump Group (optional)

Wet Weight = 254 kg (560 lb)

The Max. output of the standard 2-speed motor of the W11 is as follows:
High vol. / low pres. 35 gpm @ 300 psi 6.2 hp
Low vol. / high pres. 17 gpm @ 800 psi 7.9 hp



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