



TorkDrive™ Modular Casing-Running and Drilling Tool

TorkDrive tools are the primary components of the Weatherford OverDrive™ system, which provides a safer, more efficient alternative to conventional casing installation. Each TorkDrive tool is a combination of several conventional casing-running tools—the power tong, elevator, fill-up/circulation tool, and weight compensator.

The TorkDrive Modular tool for offshore operations has a universal actuator module and exchangeable clamping modules for a wide range of casing sizes. It provides outstanding performance in demanding applications, such as running long, heavy strings and making up high-torque connections. It is well suited for drilling or reaming with casing and for challenging well applications.

Mounted on the top drive and operated remotely, the TorkDrive Modular tool uses the rotational power of the top drive to make up casing. This configuration eliminates scaffolding, equipment, and personnel typically needed on the rig floor to run casing.

The TorkDrive Modular tool can interface with any top-drive system. It can be installed quickly, without modifications, to the top drive or rig structure and can be used to circulate, push down, reciprocate, and rotate the casing string.

The suite of Weatherford TorkDrive tools also includes the TorkDrive Heavy-Duty, TorkDrive DT, TorkDrive Electronic Modular, and TorkDrive Compact casing-running and drilling tools.



External clamping tool

Applications

The TorkDrive Modular tool is designed for running and pulling casing, reaming with casing, and drilling with casing in a wide range of applications:

- Tapered strings
- Deepwater wells
- Deep wells
- Extended-reach and deviated wells
- Troublesome wells
- Safety-driven operations

TorkDrive™ Modular Casing-Running and Drilling Tool

Features, Advantages, and Benefits

- The TorkDrive Modular tool can be used to push down or reciprocate, circulate, and rotate casing during casing-running operations and drilling-with-casing (DwC™) or reaming-with-casing (RwC™) operations. The tool reduces the possibility of differential sticking and other problems that can lead to nonproductive time.
- The tool enhances rig-floor safety by replacing conventional tongs, elevators, and related personnel. Remotely operated bails eliminate the need for a stabber in the derrick.
- The tool has the flexibility of fast exchange between clamping modules. An external clamping module handles 4 1/2- to 10 3/4-in. tubulars; three internal clamping modules handle 9 5/8- to 22-in. casing.
- The modular design accelerates and simplifies rigging up and exchanging the clamping modules. The separate actuator and clamping modules reduce individual component size and weights on smaller rigs and increase efficiency when running tapered casing strings.
- The fill-up tool design enables switching between fill-up and circulation without repositioning the tool, which enhances operational efficiency.
- A sliding sleeve mechanism enables venting during casing string fill-up to eliminate pressure buildup and sudden release of compressed air as the tool is removed from the casing.
- The flowback feature of the mud-saver valve allows for automatic switching between fill-up and flowback modes, which saves time by eliminating the need to remove the mud-saver valve or reposition the tool.
- The internal full-bore design allows for high-volume circulation while running casing or drilling, as well as for drilling-fluid recovery in tight-tolerance casing-string designs.
- The integral compensator design prevents thread damage by neutralizing tool and joint weight during makeup or breakout and enables fast positioning of the tool over successive joints for maximum efficiency. The long compensation stroke facilitates instant switching between makeup and breakout without repositioning the tool.
- Multiple safety interlocks that prevent dropped strings enhance safety.



Internal clamping tools

TorkDrive™ Modular Casing-Running and Drilling Tool

Features, Advantages, and Benefits (continued)

- The patented external clamping system evenly distributes and maintains gripping force during rotation, reciprocation, and push-down operations to enable running longer, heavier strings at high-circulating pressures and minimize the potential for pipe damage.
- The capability of hoisting with the top-drive connection rather than with the elevator bails (links) enables rotational speeds up to 100 rpm for more efficient makeup cycles and DwC operations.
- A variety of torque-reaction-bracket designs adapt to any rig structure for faster operational response.
- Integral torque/turn monitoring capabilities are completely independent of the top-drive control system and facilitate safe, efficient troubleshooting:
 - The TorkSub™ electronic load cell provides accurate measurements of the applied torque and string weight to indicate string sticking.
 - A high-resolution turns sensor monitors turns/rpm during makeup, which enables response to inadequate or excessive torque.
 - Both the TorkSub load cell and turns sensor are ATEX certified for use in hazardous environments, which eliminates the potential for gas ignition.
- The tool is used with Weatherford TorkPro™ software to display torque data and enable monitoring of dynamic forces that could affect connection makeup.



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Specifications

Clamping Tool	External		Internal	
Pipe sizes (in./mm)	4-1/2 to 10-3/4 114.3 to 273.0	9-5/8 to 10-3/4 244.5 to 273.0	11-3/4 to 15 298.5 to 381.0	16 to 22 ^a 406.4 to 558.8
Rated load ^b (tons, kg)	500 453,592		650 589,670	
Connection to top drive	7 5/8-in. API Reg			
Design standard	API 8C PSL 1			
Maximum push-down force with standard mechanical bumper plate (tons, kg)	50 45,359	25 22,680		
Maximum push-down force with optional hydraulic bumper plate (tons, kg)	—	50 45,359		
Maximum rotating speed (rpm)	100			
Approximate weight, with actuator and fill-up tool (lb, kg)	13,960 6,330	9,700 4,400	9,925 4,500	11,800 5,350
Maximum circulating pressure (psi, bar)	3,625 250			
Operational temperature range (°F, °C)	−4° to 104° −20° to 40°			
Minimum tool ID				
with fill-up tool 9-5/8 to 14 in. (in., mm)	2.756 70	—		
with fill-up tool 6-5/8 to 8-5/8 in. (in., mm)	1.968 50	—		
with fill-up tool 4-1/2 to 5-1/2 in. (in., mm)	1.535 39	—		
with mud bridge 9-5/8 to 10-3/4 in. (in., mm)	—	2.559 65		—
with mud bridge 11-3/4 to 14 in. (in., mm)				
with mud bridge 16 to 22 in. (in., mm)	—			2.756 70

^aThe 22-in. size requires a modified bumper plate; for further information contact an authorized Weatherford representative.

^bThe string weight and circulation pressure load are included.

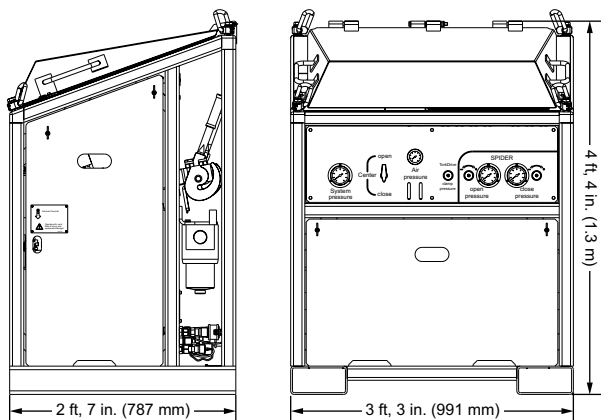
TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)

Control Panel	
Approximate weight (lb, kg)	1,323 600
Maximum hydraulic pressure (psi, bar)	3,046 210
Maximum hydraulic flow (gal/min, L/min)	15.8 to 17.2 60 to 65
Maximum hydraulic fluid temperature (°F, °C)	158° 70°
Oil filtration (µm)	10

Bails	
Weight (lb, kg)	660 300

Power Unit	
Weight, including oil (lb, kg)	3,310 1,500
Length (in., mm)	67.2 1,702
Width (in., mm)	35.3 896
Height (in., mm)	70.2 1,783
Power (hp, kW)	30 at 400 V/50 Hz 22 at 400 V/50 Hz
	34 at 460 V/60 Hz 25 at 460 V/60 Hz



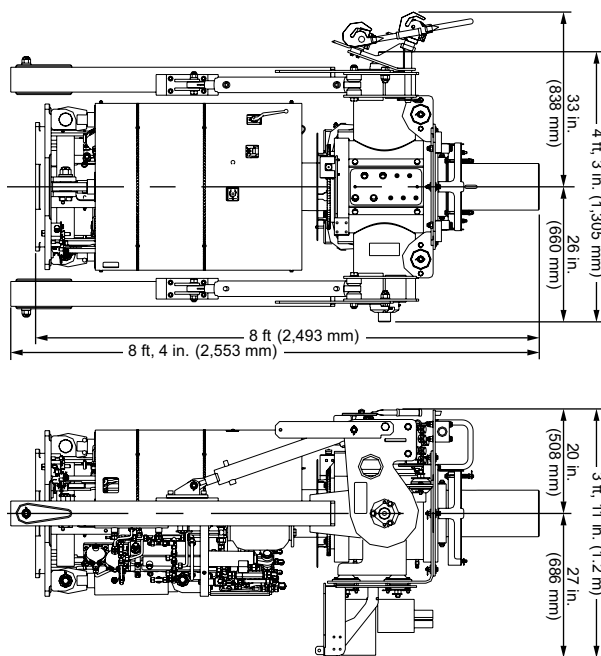
Control panel

TorkDrive™ Modular Casing-Running and Drilling Tool

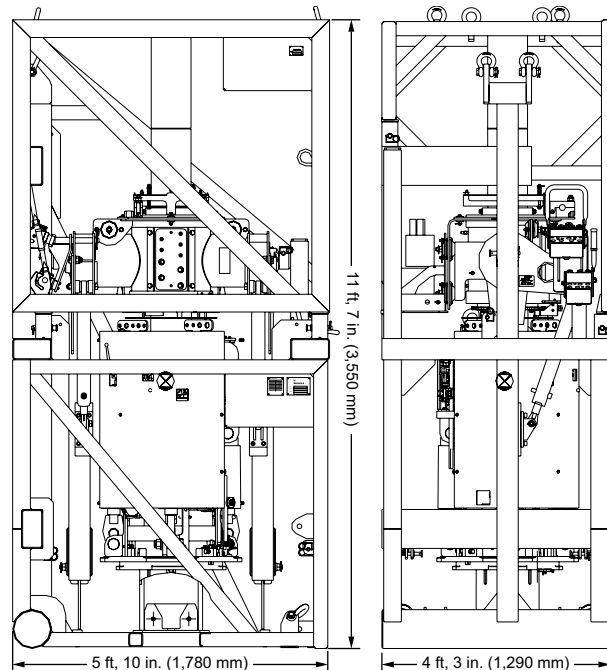
Specifications (continued)

Actuator	
Pipe sizes (in., mm)	4-1/2 to 22 114.3 to 558.8
Approximate weight (lb, kg)	6,702 3,040
Maximum makeup torque capability (ft-lb, N•m)	80,000 108,500
Maximum rotating speed (rpm)	100

Actuator Shipping Container	
Empty weight (lb, kg)	2,870 1,300
Maximum payload (lb, kg)	7,700 3,500
Maximum gross weight (lb, kg)	10,590 4,800



Actuator



Actuator shipping dimensions

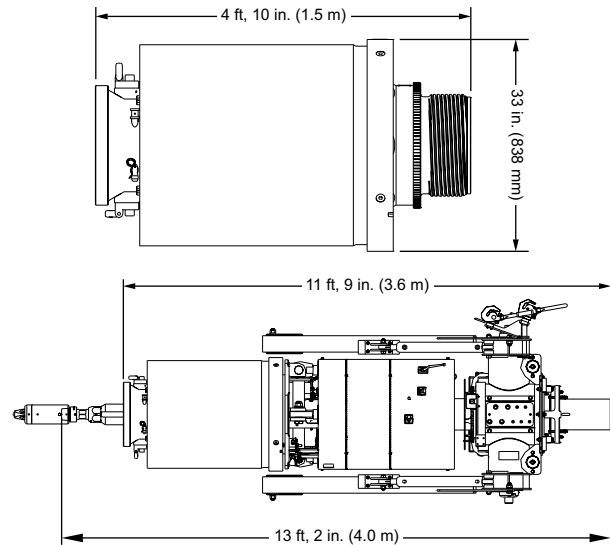
TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)

External Clamping Tool	
Pipe sizes^a (in., mm)	4-1/2 to 10-3/4 114.3 to 273.0
Approximate weight (lb, kg)	6,614 3,000
Maximum makeup torque capability ^b (ft-lb, N•m)	60,000 81,349
Maximum rotating speed (rpm)	100

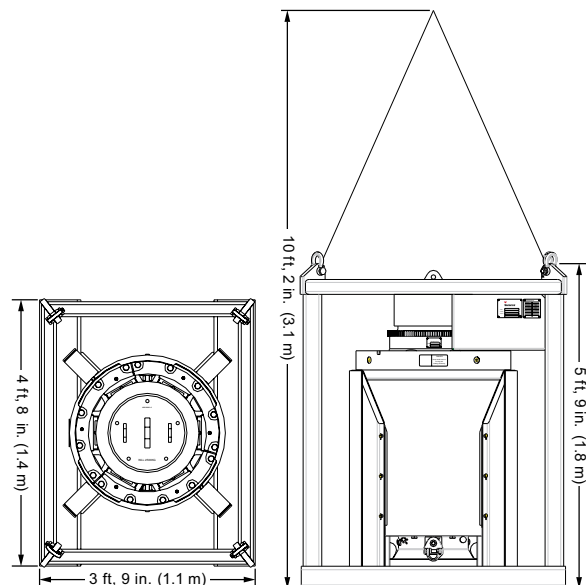
^aThe pipe size depends on the grapple size used.

^bTorque limits for rotating or drilling with casing should be calculated separately. For additional information, contact Weatherford, or refer to the appropriate calculation software.



External clamping tool

External Clamping Tool Shipping Container	
Empty weight (lb, kg)	992 450
Maximum payload (lb, kg)	7,938 3,600
Maximum gross weight (lb, kg)	8,930 4,050



Shipping dimensions for the external clamping tool in frame



TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)

Internal Clamping Tool			
Pipe sizes ^a (in., <i>mm</i>)	9-5/8 to 10-3/4 244.5 to 273.0	11-3/4 to 15 298.5 to 381.0	16 to 22 406.4 to 558.8
Approximate weight (lb, <i>kg</i>)	2,500 1,100	2,700 1,200	4,883 2,215
Maximum makeup torque capability ^b (ft-lb, <i>N•m</i>)	60,000 81,349	80,000 108,000	
Maximum rotating speed (rpm)	100		

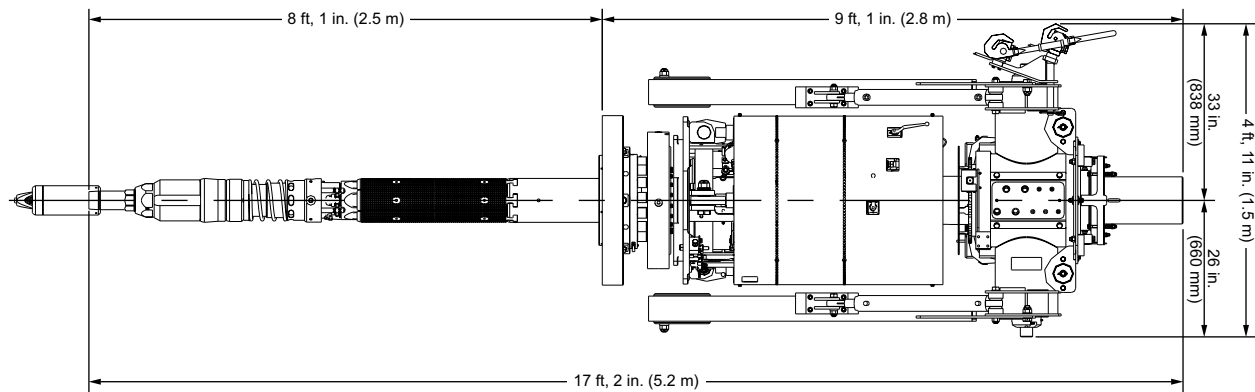
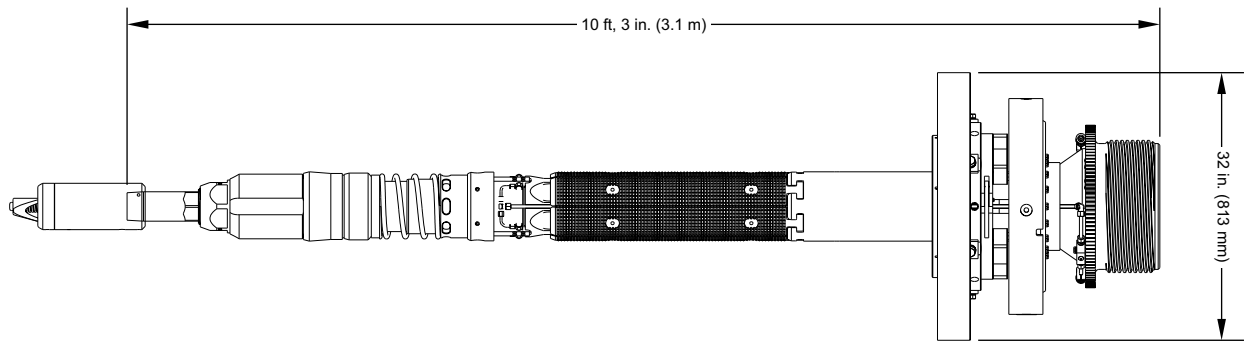
Internal Clamping Tool Shipping Container			
Pipe sizes ^a (in., mm)	9-5/8 to 10-3/4 244.5 to 273.0	11-3/4 to 15 298.5 to 381.0	16 to 22 406.4 to 558.8
Empty weight (lb, kg)	1,770 800		
Maximum payload (lb, kg)	7,050 3,200		
Maximum gross weight (lb, kg)	8,820 4,000		

^aThe pipe size depends on the slip size and clamping tool used.

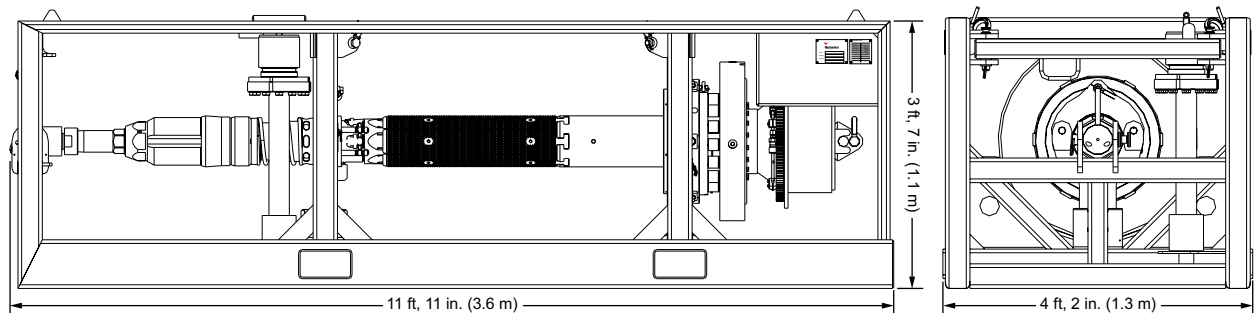
^bTorque limits for rotating or drilling with casing should be calculated separately. For additional information, contact Weatherford, or refer to the appropriate calculation software.

TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)



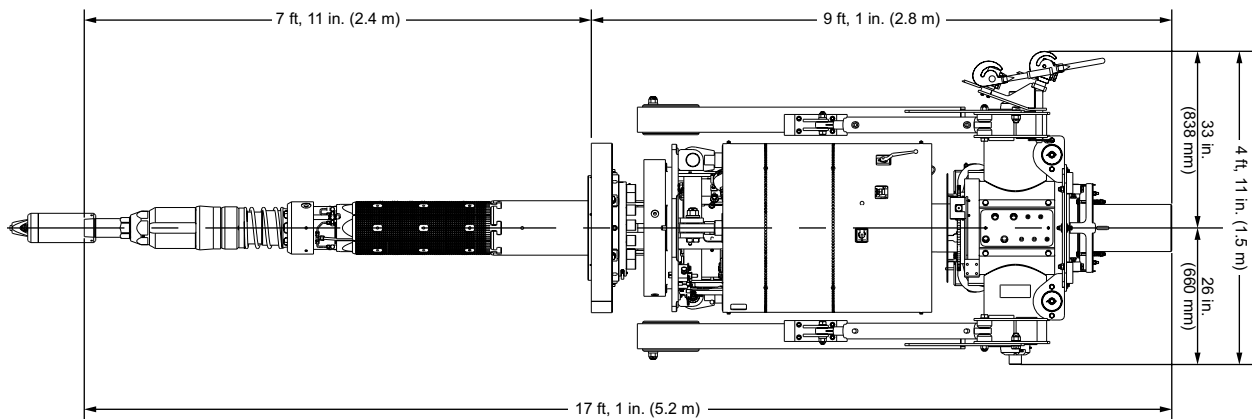
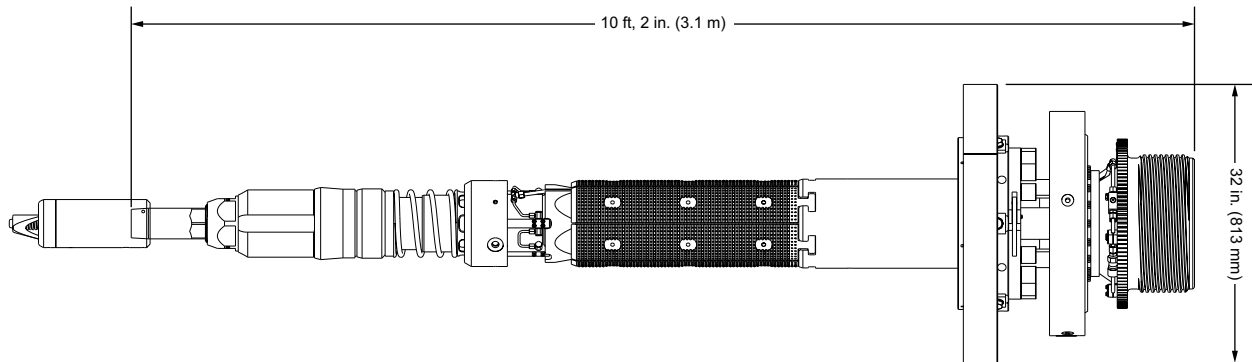
9 5/8- to 10 3/4-in. internal clamping tool



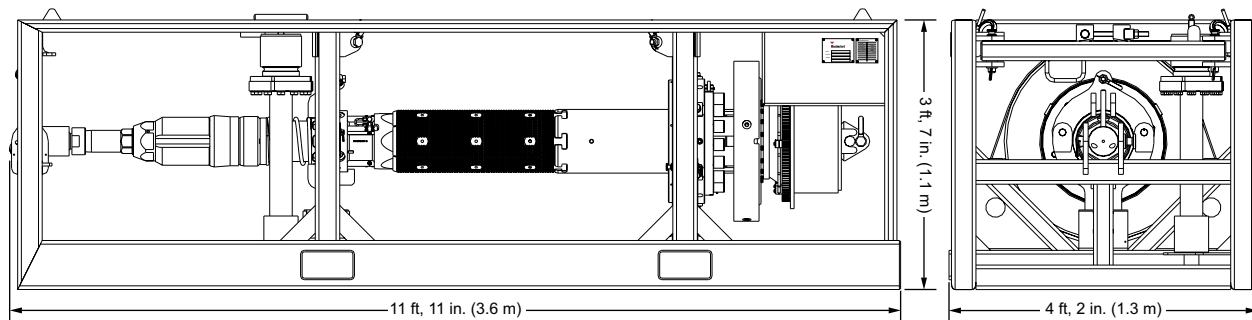
dimensions for the 9 5/8- to 10 3/4-in. internal clamping tool

TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)



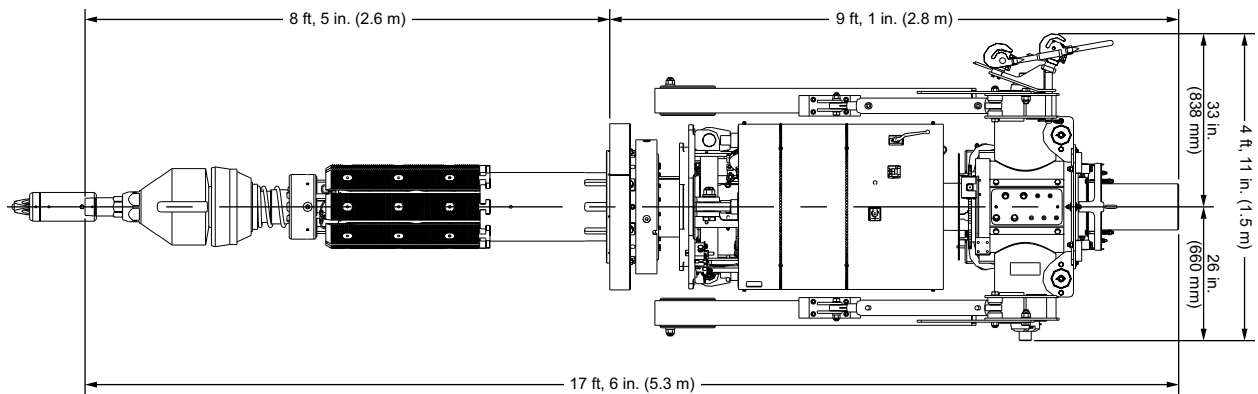
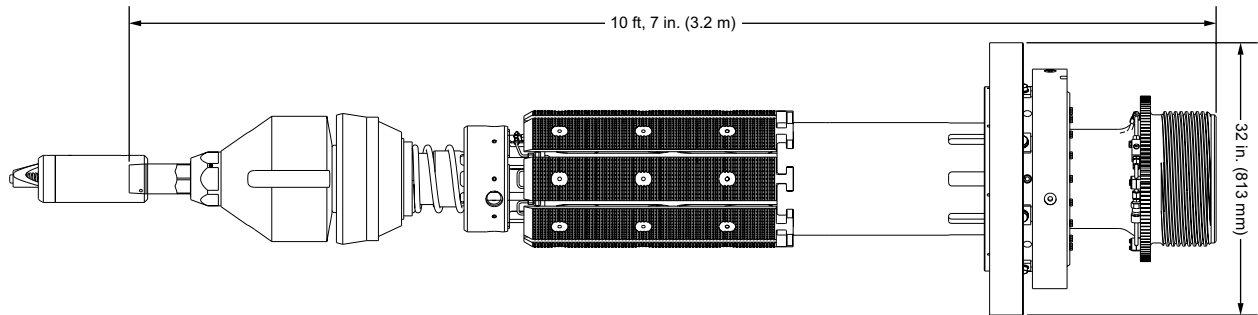
11 3/4- to 15-in. internal clamping tool



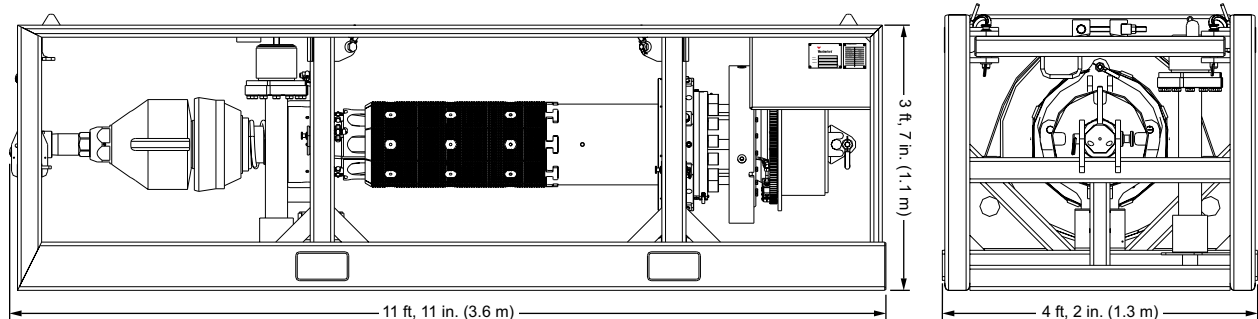
Shipping dimensions for the 11 3/4- to 15-in. internal clamping tool

TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)



16-to 22-in. internal clamping tool

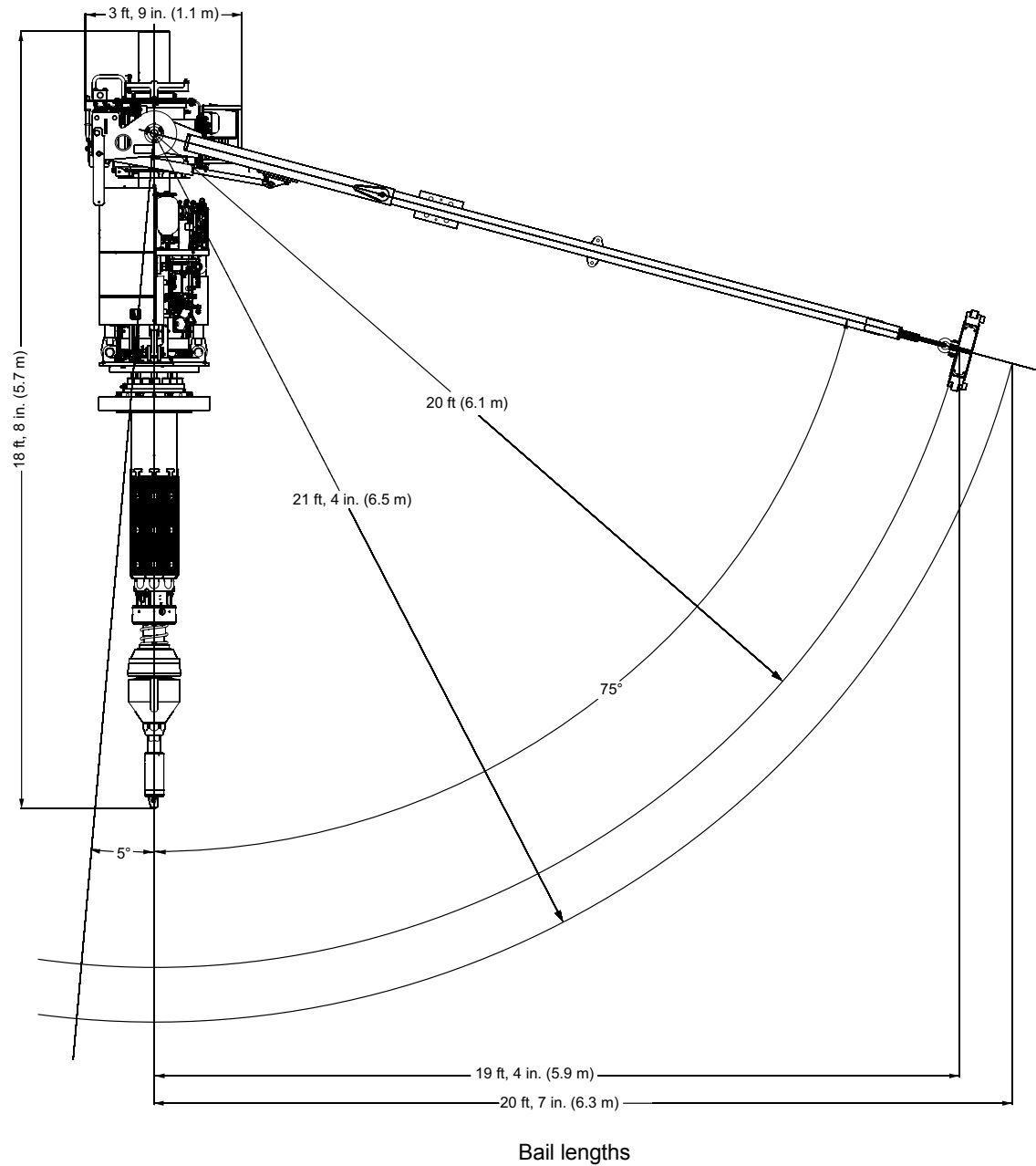


Shipping dimensions for the 16-to 22-in. internal clamping tool



TorkDrive™ Modular Casing-Running and Drilling Tool

Specifications (continued)



TorkDrive™ Modular Casing-Running and Drilling Tool

Options

- The electronic remote panel for the driller can be installed in pressurized drillers' cabins.
- The remotely operated single-joint elevator enables hands-free operation.