TorkDrive™ Heavy-Duty 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 is a combination of several conventional casing-running tools—the power tong, elevator, fill-up/circulation tool, and weight compensator.

The TorkDrive Heavy-Duty tool for offshore operations is highly suited to the most demanding applications, such as drilling with casing or reaming with casing, running heavy casing strings, and making up high-torque connections. Mounted on the top drive and operated remotely, the TorkDrive Heavy-Duty 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 Heavy-Duty 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 Compact, TorkDrive DT, TorkDrive Electronic Modular, and TorkDrive Modular casing-running and drilling tools.

Applications

The TorkDrive Heavy-Duty tool is designed for running casing and reaming with casing in a wide range of applications:

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

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Features, Advantages, and Benefits

- The TorkDrive Heavy-Duty tool can be used to push down or reciprocate, circulate, and rotate casing during casing-running, 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 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.
- 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 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

Top-Drive Casing Makeup Tool	
Pipe sizes (in., *mm*)	**6-5/8 to 14** ***168.3 to 355.6***
Rated load[a] (tons, *kg*)	750 *680,389*
Connection to top drive	7 5/8-in. API Reg
Design standard	API 8C PSL 1
Maximum push-down force (tons, *kg*)	60 *54,431*
Maximum rotating speed (rpm)	100
Base weight (lb, *kg*)	15,763 *7,150*
Approximate weight, with fill-up tool (lb, *kg*)	13,890 *6,300*
Rig-up weight: TorkDrive tool, service frame, and bails (lb, *kg*)	20,062 *9,100*
Maximum circulating pressure (psi, *bar*)	3,625 *250*
Operational temperature range (°F, *°C*)	−4° to 122° *−20° to 50°*
Minimum tool ID with 9 5/8- to 14-in. fill-up tool (in., *mm*)	2.756 *70*
Minimum tool ID with 6 5/8- to 8 5/8-in. fill-up tool (in., *mm*)	1.968 *50*
Maximum makeup torque capability[b] (ft-lb, *N•m)*	80,000 *108,000*

[a]The string weight and circulation pressure load are included.
[b]The torque limits for rotating or drilling with casing should be calculated separately. For additional information, contact Weatherford, or refer to the appropriate calculation software.

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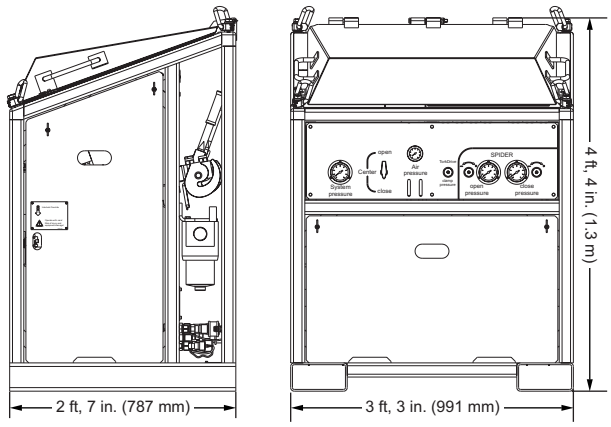
Specifications (continued)

Control Panel	
Approximate weight (lb, *kg*)	1,332 *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

Power Unit	
Weight, including oil (lb, *kg*)	3,300 *1,500*
Length (in., *mm*)	67.3 *1,710*
Width (in., *mm*)	35.4 *900*
Height (in., *mm*)	70.3 *1,785*
Power (hp, *kW*)	30 at 460V/60 Hz *22 at 400V/50 Hz*

Flush-Mounted Spider Adapter Frame	
Weight (lb, *kg*)	330 *150*

Bails	
Weight (lb, *kg*)	660 *300*



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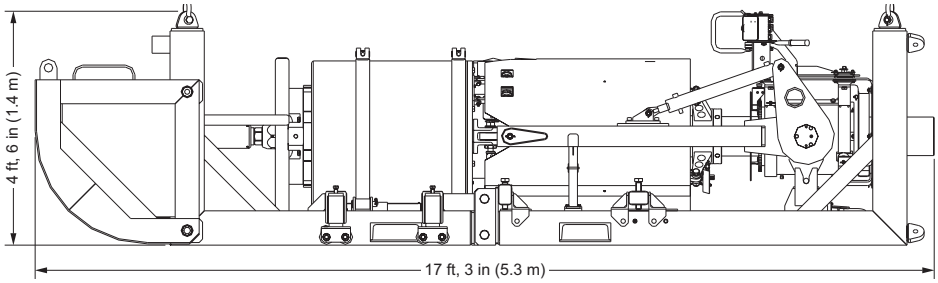
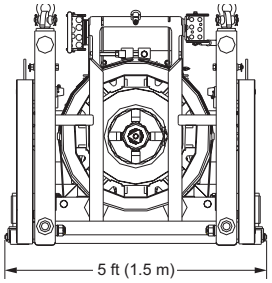
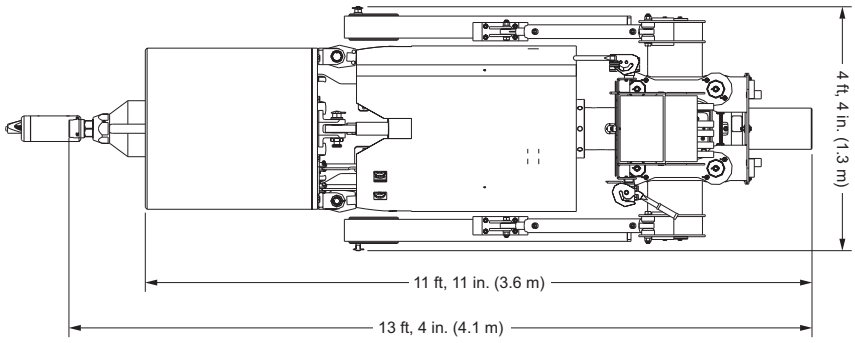
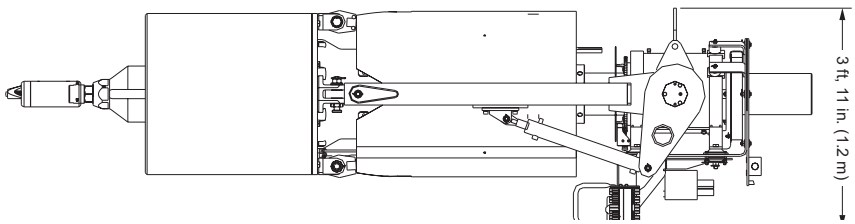
Specifications (continued)





Shipping Container	
Empty weight (lb, *kg*)	3,528 *1,600*
Maximum payload (lb, *kg*)	16,534 *7,500*
Maximum gross weight (lb, *kg*)	20,062 *9,100*





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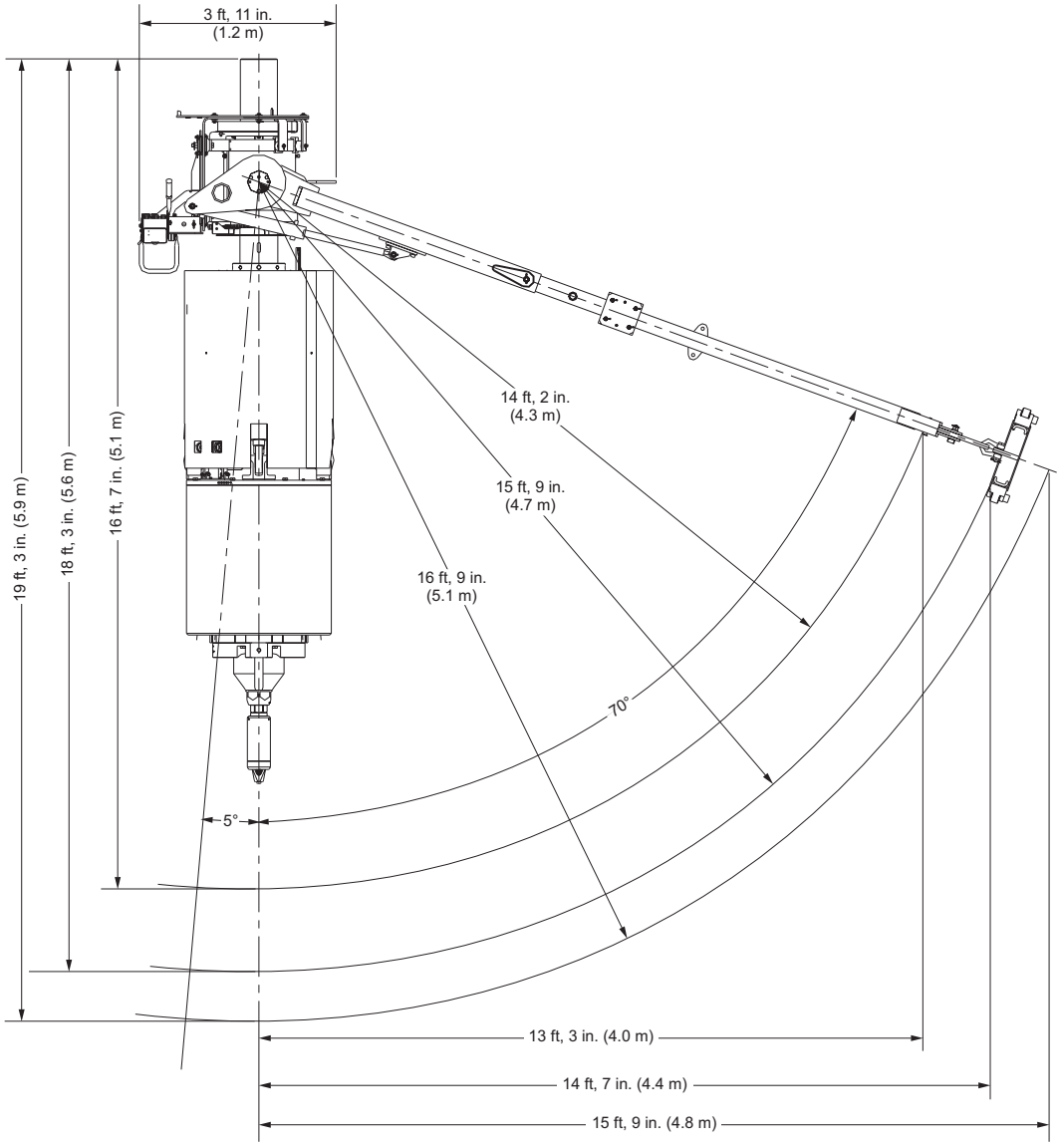
Specifications (continued)



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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.