# PowerFrame® III Tong-Positioning System

The Weatherford PowerFrame III system offers a first and simple step toward mechanizing tubular-handling operations. This patented* tong-manipulation frame lifts and moves the power tong on the rig floor from a standby position to the well center and/or the mousehole. The lightweight frame is adaptable to most rig-floor designs. One person can set up the entire system, which is compatible with Weatherford tubing, casing, and drillpipe tongs.

The tong, with backup, is installed by suspending it from the PowerFrame III system. The frame is controlled by the valve section of the tong, which eliminates the need for an additional control system or power unit. Depending on the tong configuration and project requirements, remote control of the system can be manual, pneumatic, or by programmable logic controller. Any experienced power tong operator can run the PowerFrame III system.

## Applications

- Running drillpipe, casing, tubing, and production risers using tongs weighing up to 3.7 tons (3,357 kg)
- Running tubular goods from a rig floor that can incorporate a rail-mounted device
- Building stands offline, in conjunction with a corresponding tong unit
- Making up and breaking out bottomhole assemblies (BHAs), in conjunction with the corresponding tong

## Features, Advantages, and Benefits

- The PowerFrame III system serves as a single tong-positioning device to cover all tubing, casing, and drillpipe operations that require Weatherford tongs with up to a 3.7-ton (3,357-kg) capacity. This versatility eliminates the need for additional positioning devices in this capacity range.
- One-person tubular handling and running enhances safety, increases efficiency, and reduces costs.
- Plug-and-play technology enables quick tong change-out to save time during operations.
- Compatibility with most Weatherford mechanized power tongs reduces capital investment. This makes the PowerFrame III system a cost-effective tong handling solution.
- BHA makeup capability (in conjunction with a corresponding tong unit) reduces onboard storage.
- The frame is controlled by the valve section of the tong. This eliminates the need for an additional control system, which reduces costs while enhancing ease of operation.

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## Features, Advantages, and Benefits *(continued)*

- The system is operated by one hydraulic cylinder for horizontal movement on the rails and two hydraulic lift cylinders for vertical lifting of the gantry, for a maximum lifting stroke of 39.4 in. (1,000 mm) to accelerate operations.
- Customizable for specific rig requirements, the PowerFrame III fits existing roughneck rails to minimize costly rig modifications.
- The design incorporates multiple safety cutoffs and interlocks that decrease the risk of accidents and injuries. Other features also enhance safety:
  - The frame features a special lifting arrangement to provide maximum protection for the operator under high-load conditions.
  - Two burst-pipe safety valves in the lift-cylinders section prevent unexpected downward movement in the event of hydraulic tube or hose failure.
  - The slip-through/safety sensor shuts off the mechanized tong when it detects backup slipping.
  - The protective cover on back of the frame prevents manual access to the movable parts.
- The system allows offline makeup, which improves operational efficiency.

# *PowerFrame® III Tong Positioning System*

## *Specifications*

| | |
|---|---|
| Minimum design temperature (°F, °C) | -4<br>*-20* |
| Operational temperature (°F, °C) | 32 to 158<br>*0 to 70* |
| Approximate weight[a] (lb, *kg*) | |
| Without tooling | 3,500<br>*1,600* |
| With 24-50 casing tong[b] | 9,700<br>*4,400* |
| With 14-100 casing tong[b] | 11,500<br>*5,200* |
| With 14-80 casing tong[b] | 11,500<br>*5,200* |
| With 14-50 casing tong | 8,200<br>*3,700* |
| With 7.6-30 tubing tong[c] | 6,100<br>*2,780* |
| With 5.5-15 tubing tong[c] | 5,343<br>*2,440* |
| With 7.6-50 high-torque tubing tong[b] | 10,600<br>*4,800* |
| With TorkWrench™ 10-100 iron roughneck[b] | |
| With TorkWrench 10-145 iron roughneck[b] | |
| Maximum height[d] (in., *mm*) | 126.0<br>*3,190* |
| Minimum height[e] (in., *mm*) | 87.2<br>*2,214* |
| Lifting stroke (in., *mm*) | 39.4<br>*1,000* |
| Chassis length (in., *mm*) | 100.6<br>*2,554* |
| Chassis width[f] (in., *mm*) | 63.0<br>*1,600* |
| Rail gauge[g] (in., *mm*) | 59.0 to 90.6<br>*1,498 to 2,300* |
| Chassis width, including wheels (in., *mm*) | Rail gauge + 3.5<br>*Rail gauge + 90* |
| Working load limit[c] (lb, *kg*) | 8,157<br>*3,700* |
| Maximum speed, horizontal (in./sec, *mm/sec*) | 6.3<br>*160* |
| Minimum hydraulic pressure, frame only[h] (psi, *bar*) | 2,466<br>*170* |
| Hydraulic flow, frame only[h] (gal/min, *L/min*) | 18.5<br>*70* |

[a]Without tong
[b]With heavy-duty gantry only
[c]Tong with backup
[d]Frame fully extended; without accessories
[e]Frame fully retracted; without accessories
[f]Without wheels
[g]Depending on wheel set
[h]Frame flow/pressure, tong might require more

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## Options

- The tail-in guide is a gantry-mounted hydraulic cylinder with a roller head to align the pipe and a separate control panel for easier thread alignment. The stroke of the tail-in cylinder is 55 in. (1,400 mm).
- A lifting frame can be specifically constructed to lift the PowerFrame III structure, including the installed tong.
- The gantry frame is available in a standard version and a heavy-duty configuration to accommodate heavier tongs with a maximum weight of 8,100 lb (3,700 kg).
- A positioning cylinder, with a 78.7-in. (2,000-mm) stroke, is available for moving the PowerFrame III system between well center and park position.

## Additional Information

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