# Tornado Motorhead tool

## An advanced alternative to the standard release tool

### Applications

- Field operations in the US, Canada, Latin America, and Middle East regions

### Features and Benefits

- Combining three tools into one
- One-threaded service connection
  - Reduces potential weak points
- Double-flapper check valves
  - Prevents pressure and flow from going up the coiled tubing string
  - Closes valve even at low pressure/flow differentials
- Bleed-off port below flappers
  - Ensures trapped pressure below the flapper can be released prior to removal of the tools
- Ball-activated circulation sub with rearward-facing nozzles for improved hole cleaning
- The design isolates pull-load keys and torque spline from treatment and wellbore fluids
- Suitable for abrasive service
  - Can be used for cementing, sand jet perforating, and acidizing operations
- High tensile rating
  - Does not require that pull loads be held by shear assemblies
- High dynamic torque rating
  - Suitable for drilling/milling

The Baker Hughes **Tornado™ Motorhead tool** is a combination of the double-flapper check valve, a tornado-style-dual-circulation sub, and a ball-operated shear sub (release tool). The design of the release sub is based on the highly successful BOSS Anchor tool, specifically developed for drilling applications. The mechanism has an extensive track record for reliability in a wide variety of heavy-duty operations and is an advanced alternative to the previously standard release tool.

Since its introduction, Tornado Motorhead tool has been used in field operations in the US, Canada, Latin America, and Middle East regions. It has been supplied in sizes ranging from $1^{1}/_{2}$ in. to $3^{1}/_{8}$ in., with the $1^{11}/_{16}$ in. size being most commonly used.

The ball-activated tornado-style circulation sub diverts flow to the wellbore above the rest of the tool string. The circulation sub acts as a ball-drop tornado. Therefore, a Tornado cleanout can be run at the end of a job.

The standard option of pressuring up on a plugged tool string, causing a blown burst disc, also exists. Burst discs are available at activation pressure differentials of 2,000, 3,000, 3,500, 4,500, 5,000, 5,500, and 6,000 psi. For $H_2S$ service, all burst discs are made of Hastelloy C276.

The CTran portion of the **CIRCA™ modeling software program** can be used to model the requirements for successful solids removal from the well.

| Properties/specifications | |
|---|---|
| **Outside diameter (sizes available)** | 1.500 in. (42.9 mm) |
| | 2.125 in. (54.0 mm) |
| | 2.875 in. (72.6 mm) |
| | 3.125 in. (79.4 mm) |
| **Maximum operating temperature (seals)** | 400°F (205°C) |
| **Overall length** | 18.27 in. to 23.3 in. (464 mm to 592 mm) |
| **Maximum differential pressure** | 5,000 to 6,000 psi (34,475 to 41,370 kPa) |
| **TORQUE RATING** | |
| **1 1/2 in. tool** | 175 ft-lb (240 N•m) |
| **1 11/16 in. tool** | 250 ft-lb (339 N•m) |
| **2 1/8 in. tool** | 800 ft-lb (1,085 N•m) |
| **2 7/8 in. tool** | 1,800 ft-lb (2,440 N•m) |
| **3 1/8 in. tool** | 2,000 ft-lb (2,712 N•m) |
| **OPERATING PULL RATING (THIS YIELD SHOULD NOT BE EXCEEDED)** | |
| **1 1/2 in. tool** | 16,500 lb (7,340 daN) |
| **1 11/16 in. tool** | 28,000 lb (12,455 daN) |
| **2 1/8 in. tool** | 37,000 lb (16,458 daN) |
| **2 7/8 in. tool** | 80,000 lb (35,585 daN) |
| **3 1/8 in. tool** | 80,000 lb (35,585 daN) |
| **CIRCULATION FLOW PORTS** | |
| **1 1/2 in. tool** | 0.174 $in.^2$ (112 $mm^2$) |
| **1 11/16 in. tool** | 0.276 $in.^2$ (178 $mm^2$) |
| **2 1/8 in. tool** | 0.388 $in.^2$ (250 $mm^2$) |
| **2 7/8 in. tool** | 0.80 $in.^2$/port (516 $mm^2$/port) |
| **3 1/8 in. tool** | 0.89 $in.^2$ (574 $mm^2$) |
| **Shear pin pressure differential requirement** | 1,000 psi/pin |
| **THREAD CONNECTION** | |
| **1 1/2 in. tool** | 1.125 to 10 Stub Acme or 1.0 MT |
| **1 11/16 in. tool** | 1.125 to 10 Stub Acme or 1.0 MT |
| **2 1/8 in. tool** | 1.7 to 10 Stub Acme or 1.0 MT |
| **2 7/8 in. tool** | 2.125 to 8 Stub Acme or 2.375 in. PAC |
| **3 1/8 in. tool** | 2.5 to 5 Acme or 2.875 in. PAC |
| **COMPATIBLE FLUIDS** | |
| | Brine |
| | Diesel |
| | $H_2S$ (partial pressure dependent) |
| | Inhibited acid |
| | Nitrogen |
| | Sand slurry |
| | Water |

Baker Hughes™