

OPERATING MANUAL

SHOCK TOOL

OWS-WENZEL

DOWNHOLE

TOOLS LTD.

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1. DESCRIPTION

The OWS-Wenzel Shock Tool effectively reduces impact loading on the bit to extend bit life and reduce bit trips. By isolating axial bit vibrations from the drill string, the shock

tool will reduce axial, lateral and torsional drill string vibrations, and related fatigue damage or failure of the rotary connections. The shock tool allows optimum bit speed

to be used under rough drilling conditions, increasing the rate of penetration.

Features / Benefits

- Reliable Belleville disc springs provide optimum load/deflection characteristics
- Effectively reduces impact loading to extend bit life
- Isolates bit induced vibrations from the drill string
- Fully oil-sealed and lubricated for extended service life
- Pressure balanced to eliminate the effect of downhole hydrostatic pressure
- Automatically compensates for pump open force
- Low friction torsional drive permits free vertical movement
- Well-stabilized, with internal lateral support to minimize deflection
- Reduces wear and tear on rig and equipment, and fatigue failures on drill collars and drill pipe

2. PLACEMENT

For maximum effectiveness, the Shock Tool should be located immediately above the bit. Careful attention should be taken when locating the Shock Tool in the bottom-hole assembly, to avoid applying unnecessary bending forces to the Shock Tool. See

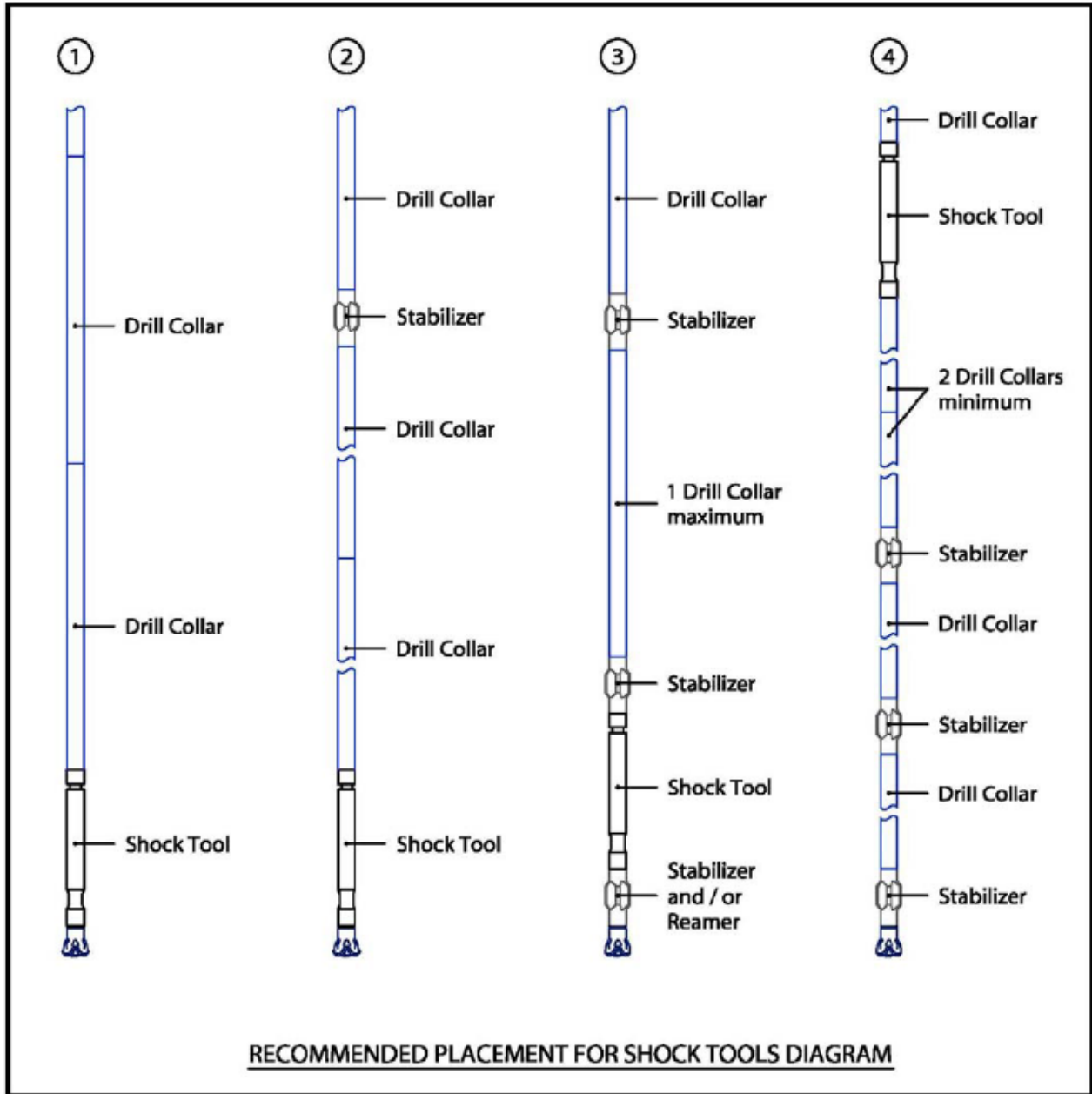
diagram on following page for recommended shock tool placement in various bottomhole assemblies.

- Slick assembly, without stabilization.
- Pendulum assembly: At least two drill collars should be located between the shock tool and the first stabilizer.
- Packed Bottom-hole assembly: When the shock tool is located between two stabilizers, a third stabilizer must be placed one drill collar length above the second stabilizer.
- Above packed bottom-hole assembly: If the Shock Tool is located above the packed bottom-hole assembly, a minimum of two drill collars should be placed between the top stabilizer and Shock Tool to minimize bending stresses in the Shock Tool and provide a clear target for a string shot if required.

Avoid locating the shock tool at a cross over between components of different diameters such as drill collars and heavy weight drill pipe. The shock tool should be placed a minimum of two joints above or below any cross over.

See the next page for Recommended Placements Diagram.

OVS-WENZEL SHOCK TOOL



3. OPERATION

Protect the mandrel sealing surface from possible damage during handling or storage. Never apply tongs, slips, chains or slings to this area.

The Wenzel Shock Tool must be installed in the drill string with the mandrel end up. Apply drill collar thread compound meeting A.P.I. Specification 7 to the end connections. Torque end connections to API specifications.

Rig tongs should only be applied immediately adjacent to the top and bottom connections to avoid breaking or torquing the shock tool body connections. All body connections are torqued to the specified values at the service center. Avoid breaking these connections at the rig.

The unique design of the Wenzel shock tool automatically eliminates the effects of pump open force. It will function effectively under a wide range of normal operating conditions without requiring special operating procedures.

On each round trip the shock tool should be visually inspected. Tool should be replaced if there is any indication of damage, excessive wear or leakage.

Under normal drilling conditions, the recommended rotating hours before servicing the Shock Tool is 400 hours.

Shock Tool should be returned to an approved service facility for complete inspection and service following use in field.

4. MAINTENANCE AND STORAGE

New tools are shipped painted. The end connections are plated with iron-phosphate and coated with rust preventative coating. Thread protectors are installed to prevent mechanical damage. The rust preventative coating must be removed using petroleum base solvent and a stiff bristle brush before the shock tool is installed into the drill string.

When the Shock Tool is to be laid down the following should be done:

- 1 Flush all drilling fluid from the bore with fresh water.
- 2 Wash external surfaces of the tool
- 3 Apply thread compound and protectors to the end connections

5. SPECIFICATION

IMPERIAL

Nominal OD (inch)	Length (ft)	Thru Bore (inch)	Tensile Yield (lbs)	Pump Open Area (inch ²)	Torsional Limit (ft-lbs)	Approx. Weight (lbs)
3.38	7.9	1.00	102 000	5.9	8 000	225
3.50	7.8	1.00	239 000	5.9	10 000	230
4.75	10.7	1.50	561 500	11.0	20 000	540
6.25	11.7	2.25	926 600	19.6	37 900	1000
6.50	11.6	2.25	960 000	19.6	39 500	1030
6.75	11.5	2.75	837 400	21.6	46 400	1100
8.00	11.9	2.75	1 378 800	30.6	104 600	1690
9.00	12.3	3.00	1 502 000	38.5	125 000	2220
9.50	12.3	3.00	1 209 000	41.3	131 000	2500
10.00	12.3	3.00	1 246 500	41.3	132 300	2680
11.00	12.0	3.00	1 628 300	63.6	225 600	3240
11.25	14.6	3.00	1 775 300	56.7	255 800	4120
12.00	12.0	3.00	1 628 300	63.3	345 400	3900

Specifications are based on as new condition and are subject to change without notice.

METRIC

Nominal OD (mm)	Length (m)	Thru Bore (mm)	Tensile Yield (daN)	Pump Open Area (mm ²)	Torsional Limit (Nm)	Approx. Weight (kg)
86	2.4	25	45 400	3 800	11 000	100
89	2.4	25	106 300	3 800	14 000	100
121	3.3	38	249 800	7 000	28 000	250
159	3.6	57	412 200	12 700	53 000	450
165	3.5	57	427 000	12 700	55 000	470
171	3.5	70	372 500	13 900	64 000	500
203	3.6	70	613 300	19 700	145 000	770
229	3.7	76	668 100	24 800	174 000	1010
241	3.7	76	537 800	26 600	182 000	1140
254	3.7	76	554 500	26 600	184 000	1220
279	3.7	76	724 300	41 000	313 000	1470
286	4.4	76	789 700	36 600	355 000	1870
305	3.7	76	724 300	41 000	480 000	1770

Specifications are based on as new condition and are subject to change without notice.