Wireline Engineering System

- Downhole Casing & Tubing Tractor (CTT)
- Downhole Hydraulic Tractor (DHT)
- Gyroscope Orientation Tool-Continuous (GOT-C)
- Free Point Indicator (FPI)
- Hydraulic Plug Setting Tool (PST)
- Through Tubing Permanent Bridge Plug (TBP)
- Mechanical Downhole Cutter-W (MDC-W)
**Introduction**

CTT is used in lateral well or high-inclination well to send toolstring. Toolstring includes Production Logging Tools (PLT), casing check tool, CBL Tools, etc. The CTT uses a single-conductor wireline to supply power and transmits signals. With the surface control panel and software, operator could know about speed, conditions, etc. An Electric Centralizer is used in CTT, and it can close electrically that made CTT through horn successfully.

**Downhole Tool String**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOT-C-TS</td>
<td>GOT-C-Tension Sub</td>
</tr>
<tr>
<td>CTT-CL</td>
<td>Casing Collar Locator</td>
</tr>
<tr>
<td>CTT-E</td>
<td>Electronics Assembly</td>
</tr>
<tr>
<td>CTT-C1</td>
<td>Centralizer-1</td>
</tr>
<tr>
<td>CTT-A</td>
<td>Actuator Assembly</td>
</tr>
<tr>
<td>CTT-T</td>
<td>Tractor Assembly</td>
</tr>
<tr>
<td>CTT-C2</td>
<td>Centralizer-2</td>
</tr>
</tbody>
</table>

**Specifications**

- **Maximum Temperature**: 300°F (150°C) for 3 hours
- **Maximum Pressure**: 15,000 psi (103.4 MPa)
- **Make-up Length**: 24 ft-3.34 in. (7.4 m)
- **Weight**: 188.3 lbs. (85.4 kg)
- **Tool Diameter**: 2.125 in. (54 mm)
- **Maximum Tension**: 10,000 lbs. (4536 kg)
- **Minimum Hole Diameter**: 4.5 in. (114.3 mm)
- **Maximum Hole Diameter**: 9.625 in. (244.5 mm)
- **Maximum Creeping Speed**: 30 ft./min (9.1 m/min)
- **Power Requirements**:
  - **Operating Voltage**: 60-660Vdc
  - **Operating Current**: 30-2000 mA (Limited by the load)
  - **Maximum Continuous Load**: 600 lbs. (273 kg)
  - **End Connectors Top**: GO Female connection
  - **End Connectors Bottom**: GO Male connection
Introduction

The Downhole Hydraulic Tractor (DHT) is designed to transport logging tools and perforating gun in horizontal or highly deviated wells. It is suitable for open hole and case well.

DHT Key Features:
- 12.0 feet length in the basic configuration.
- Conform to diameter changes from 3.625 to 15.0 inches depending on drive wheel used.
- Traction control allowing dynamic adjustment of the arm radial force which reduces the amount of slippage and unnecessary wear. The DHT release is compatible with any tool in the tool string, including addressable switches for guns.

Specifications

- Maximum Temperature: 350°F (175°C)
- Maximum Pressure: 20,000 psi (137.9 MPa)
- Make-up Length: 19 ft.-11.4 in. (6.08 m)
- Weight: 541 lbs. (245.4 kg)
- Tool Diameter: 3.375 in. (85.7 mm)
- Minimum Hole Diameter: 3.625 in. (92 mm)
- Maximum Hole Diameter: 15 in. (381 mm)
- Hole Type: Cased or Open
- Max Payload: 2800 lbs. (1246 kg)
- Nominal Creeping Speed: 30 ft./min (9 m/min)
- Maximum Creeping Speed: 53.3 ft./min (16 m/min)
- Logging While Creeping: No
- Telemetry System: ETS
- Power Delivery: 3-phase, 750 Vac
- Cartridge Power: 200 VDC
Introduction

The DHT tractors allow for the addition of a second tractor in the tool string. Depending on the job at hand, the number of drive sondes can be increased to a maximum of eight. Various adapters and subs are also available to combine the tractor with a variety of logging tools and perforating guns.

- 2 pairs drivers
- 4 pairs drivers
- 8 pairs drivers
Introduction

Gyroscope Orientation Tool provides accurate and free magnetic interference directional survey in drill pipe, cased holes and production tubing, or in areas of magnetic interference. The GOT also can be run into drill pipes. The flexibility of the design allows the combination with additional services such as Gamma Ray, CCL. Also for direction perforating.

Specifications

Max. Temperature 350°F (175°C) for 4 hours
Max. Pressure 15,000 psi (103.4 MPa)
Make-up Length 31 ft. (9.48 m) (without SKB)
Approx. Weight 134 lbs (61 kg) (without SKB)
Tool Diameter 2.25 in. (57 mm)
Max. Hole Diameter 12.0 in. (305 mm)
Max. Logging Speed 100 ft/min (30 m/min)
Orientation Sensor Dynamically Tuned Gyroscope
Power Requirements:
  Operating Voltage & Current 200 Vac, 75 mA
  Max. Tensile Load 14000 lbs (6350 kg)
Wireline Requirements Mono Conductor
Logging Mode Continuous
Sensor Accuracy:
  Azimuth +/-1.5 deg. @ 0 deg.-60 deg.
  +/- 2.5 deg. @ 85 deg.-89 deg.
  Deviation +/- 0.1 deg. @ 0 deg.-60 deg.
  +/- 0.25 deg. @ 60 deg.-89 deg.
  Gravity Tool Face +/- 0.5° (When the deviation is greater than 2 degrees)
  Gyro Tool Face +/- 2° (When the deviation is less than 2 degrees)
Introduction

The Free Point Indicator-A Tool (FPI-A) uses a stretch and a torque sensor to accurately determine the free point in stuck drill pipe, drill collars, tubing or casing. Within the elastic range of the pipe material, the free section of the pipe would deform linearly when the pipes are subjected to a pull or torsion. The FPI-A measures the stretch and torque over a fixed distance and calculates the amount of free pipe according to what the theoretical deformation should be.

Specifications

Free Point Indicator-Anchors (FPI-A)
- Maximum Temperature: 350°F (175°C)
- Maximum Pressure: 20,000 psi (137.9 MPa)
- Make-up Length: 10 ft.-11.1 in. (3.33 m)
- Shipping Length: 12 ft.-7.57 in. (3.85 m)
- Weight: 42.55 lbs. (19.3 kg)
- Tool Diameter: 1.375 in. (35 mm)
- Minimum Hole Diameter: 1.75 in. (44.5 mm)
- Maximum Hole Diameter: 13.375 in. (339.7 mm)
- Maximum Logging Speed: 60 ft./min (18.3 m/min)
- Recommended logging speed (CCL): 30-40 ft./min (9.1 m/min)
- Motor Set Time: 45-70 sec
- Anchoring capabilities: 1.5 to 5 in.
- Maximum hole deviation: 90 deg
- Curves Recorded: CCL / torque / stretch Variable Frequency
- Output Signal: Signal 1.0 Volt Peak to Peak
- Power Requirements:
  - Operating Voltage: Upper Motor: 100-110 Vdc (CHV)
  - Lower Motor: 40-50 Vdc (CHV)
- Measure Point:
  - Sub Bottom to CCL coil Center: 9 ft.-6.14 in. (2.899 m)
  - Upper leg Mount Center to lower Leg Mount Center: 3 ft.-4.68 in. (1.300 m)
  - Sensor Section: 27.625 in. (0.701 m)
- Power Requirements:
  - Operating Voltage:
    - Upper Motor: 100-110 Vdc (CHV)
    - Lower Motor: 40-50 Vdc (CHV)
  - Operating Current:
    - Upper Motor: 200mA(max)
    - Lower Motor: 150mA(max)
- Wireline Requirements: Single conductor cable
- Tool O.D.: 1.375 in. (34.9 mm)
- Total length (close/open): 118.5 in.-133.5 in.
  (301 cm-339.1 cm)
- Maximum hole I.D.:
  (with standard spring): 5.5 in. (14 cm)
- Minimum hole I.D.:
  (with standard spring): 1.5 in. (38.1 mm)
Introduction

The FPI-D uses two sensors, a stretch sensor and a torque sensor to accurately determine the free point in stuck drill pipe, drill collars, tubing, or casing. Within the elastic range of the pipe material, the free section of the pipe would deform linearly when the pipes are subjected to a pull or torsion. The FPI-D measures the stretch and torque over a fixed distance and calculates the amount of free pipe according to what the theoretical deformation should be.

Specifications

Maximum Temperature 350°F (175°C)  
Maximum Pressure 20,000 psi (137.9 MPa)  
Make-up Length 10 ft.-0.05 in. (3.1 m)  
Shipping Length 11 ft. -3.04 in. (3.43 m)  
Weight 31.97 lbs. (14.5 kg)  
Tool Diameter 1.375 in. (35 mm)  
Minimum Hole Diameter 1.75 in. (44.5 mm)  
Maximum Hole Diameter 13.375 in. (339.7 mm)  
Maximum Logging Speed 49.21 ft./min (15 m/min)  
Motor Set Time 56-70 sec  
Anchoring capabilities 1.5 to 5 in.  
Maximum hole deviation 90 deg  
Communications Speed 2400 bps  
Maximum stretch reading 1500 ust  
Minimum stretch reading 10 ust  
Minimum torque reading +/- 0.02 revolution / kft  
Maximum torque reading +/- 1.5 revolution/kft  
Accuracy +/- 10%  
Distance between Arms (upper/lower) 1.854 m  
Power Requirements:  
Operating Voltage 40 to 60 Vdc (CHV)  
Operating Current 60 mA (without motor current)  
60 to 150 mA (one motor plus tool power)  
-120 to -300 mA (two motors closing)  
Wireline Requirements Single conductor cable  
Curves Recorded CCL / torque / stretch Variable Frequency
Hydraulic Plug Setting Tool (PST)

Applications
- Non-explosive setting of bridge-plugs & through-tubing plugs
- Used in deviated or horizontal well.
- Be widely used in workover, pay zones isolation and other constructions.

Introduction
Hydraulic Plug Setting Tool (PST) sets through-tubing plugs inside casing or open hole below the tubing string without pull out tubing. The power-motor pumps oil from piston upper to down. The power piston pulls the bridge-plug rod assembly into the PST. When the bridge-plug rod assembly moves upward, the backups of bridge-plug are released by the compressive force. When the bridge-plug is set completely, the release stud breaks and the PST is released for retrieval.
If the plug is stuck or set completely, but the release stud is not broken. Pull the cable out, the PST shall be free when tensile force is close to 800 lbs for an emergency release.

Specifications
- Maximum Temperature: 350°F (175°C)
- Maximum Pressure: 20000 psi (137.9 MPa)
- Tool Diameter: 2-1/8 in. (54 mm)
- Minimum Restriction: 2.18 in. (55.4 mm)
- Make-up Length: 24 ft.-4.25 in. (7.42 m)
- Shipping Length: 24 ft.-5.63 in. (7.46 m)
- Weight: 132 lbs (60 kg)
- Maximum Logging Speed: 50 ft./min (16.7 m/min)
- Maximum Force Tool Output: 10000 lbs (4545 kgf)
- Setting Hole Size: 4-1/2 to 7-5/8 in. casing
- Plug setting time: 25 to 60 min. Affected by the plug size and temperature
- Oil: Univis HVI 26 (recommended)
- Service: H2S resistant (less than 2%).
- Operation: Emergency Release-800-lbf pull maximum at logging head
- Combinations: Tool requires a CCL. A separate CCL run is required for positive depth correlation.
- Tensile Strength: 92,928 lbs (42,240 kgf)
- Compressional Strength: 2,320 lbs (1,054.8 kgf)
- Power Requirements
  - Operating Voltage & Current: 0-500 Vdc adjustable, 1 A
- Wireline Requirements: Mono-conductor logging cable

Benefits
- Safe and convenience without explosive.
- Hydraulic setting through-tubing plugs in casing or open hole below the tubing string without pulling out tubing, that helps reduce the wellsite costs by saving time.
- Emergency release if needed

Features
- Surface control and obtaining setting curves
- Exact-setting depth by Casing Collar Locator (CCL).
- Composed of setting unit & emergency release unit.
Through Tubing Permanent Bridge Plug (TBP)

**Applications**

- TBP abandons permanently an uneconomical horizon by Hydraulic Plug Setting Tool (PST) and is widely used in workover, pay zones isolation and other constructions:
  - Between zones, lower zone is producing water
  - In perforations, the bottom part of a zone is producing water
  - In sand screens, the plug serves as a diverter for sand/gravel consolidation via resins.
  - In open hole, the plug differential rating is now a function of formation integrity.

**Introduction**

TBP and capping with cement can be a continuous plug operation resulting within one-day. The plug is set in casing by compressing the seal elements causing expansion as the strong metal seal support and rugged anchors deploy. The compression is set with a long-stroke wireline Hydraulic Plug Setting Tool (PST), and released after shearing a 10,000-lbf tension stud. The plug can withstand pressure differential across the plug has been increased to 1000 psi or more in both directions. The drillable plug with a standard casing collar locator is used for depth control.

**Benefits**

- Anchors center plug & tool even in horizontal wells
- Increase production by old well renovation
- No derrick and continuous plug operation resulting within one-day, reduce the wellsite costs by saving time.

**Features**

- Through-tubing and drillable plug
- Big elements ratio 3:1, strong metal seal support and rugged anchors

**Specifications**

<table>
<thead>
<tr>
<th>Casing Size-A</th>
<th>4-1/2 in.</th>
<th>5 in.</th>
<th>5-1/2 in.</th>
<th>7 in.</th>
<th>7-5/8 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing I.D.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Range-B</td>
<td>3.5 in.</td>
<td>4.0 in.</td>
<td>4.5 in.</td>
<td>6.33 in.</td>
<td>6.50 in.</td>
</tr>
<tr>
<td></td>
<td>(88.9 mm)</td>
<td>(101.6 mm)</td>
<td>(114.3 mm)</td>
<td>(160.78 mm)</td>
<td>(165.1 mm)</td>
</tr>
<tr>
<td></td>
<td>4.02 in.</td>
<td>4.52 in.</td>
<td>5.02 in.</td>
<td>6.53 in.</td>
<td>7.02 in.</td>
</tr>
<tr>
<td></td>
<td>(102.11 mm)</td>
<td>(114.81 mm)</td>
<td>(127.51 mm)</td>
<td>(165.86 mm)</td>
<td>(178.31 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum Temperature</th>
<th>350°F (175°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Running O.D.-D</td>
<td>1-11/16 in. (42.86 mm)</td>
</tr>
<tr>
<td>Minimum Restriction</td>
<td>1.77 in. (44.96 mm)</td>
</tr>
<tr>
<td>Distance Tool Bottom to Seal</td>
<td>2.7 in. (68.58 mm)</td>
</tr>
<tr>
<td>Seal Length-F</td>
<td>9 in. (228.6 mm)</td>
</tr>
<tr>
<td>Setting Tool</td>
<td>PST</td>
</tr>
<tr>
<td>Set in Perforations</td>
<td>Yes</td>
</tr>
<tr>
<td>Set in Screen</td>
<td>Yes</td>
</tr>
<tr>
<td>Cement Recommended</td>
<td>Yes</td>
</tr>
<tr>
<td>Set in Cross Flow</td>
<td>Yes</td>
</tr>
<tr>
<td>Set in Open Hole</td>
<td>Yes</td>
</tr>
<tr>
<td>Pressure Difference</td>
<td>1000 psi (6.89 MPa)</td>
</tr>
<tr>
<td>Inside and Outside</td>
<td>500 psi (3.45 MPa)</td>
</tr>
<tr>
<td>Anchor Slip Force</td>
<td>25000 lbf (11340 kgf)</td>
</tr>
<tr>
<td>Assemble Length</td>
<td>90 in. (2286 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>28 lb (12.70 kg)</td>
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<tr>
<td>Set Length-C</td>
<td>39 in. (990.6 mm)</td>
</tr>
<tr>
<td>Anchor to Anchor-G</td>
<td>11 in. (279.4 mm)</td>
</tr>
<tr>
<td>Setting Time (approx.)</td>
<td>20 min</td>
</tr>
</tbody>
</table>
Wireline Hydraulic Plug-Bridge Setting Tool (PST-20)

Applications
- Non-explosive setting of packers, plugs and cement retainers normally conveyed with electric line
- Released of retrievable plugs or packers
- Mechanically punching holes or tubing patches
- Connected to a wireline tractor (DHT) conveyance for deep water and/or high-angle well interventions

Benefits
- Non-explosive operation improves safe and reliability
- Uses the advantage of the fast running capability of wireline and helps reduce the well site costs by saving time

Features
- Offers large setting force
- Combine with packers, cement retainers and plugs of different O/Ds
- Exact-setting depth in conjunction with a casing collar locator
- Surface control and obtaining some setting or releasing curves

Introduction
Wireline Hydraulic Plug-Bridge Setting Tool (PST-20) is a non-explosive hydraulic pump setting tool that is expanding well intervention capabilities beyond the conventional tools. The dual-stage pistons offer the capability to set plugs and packers requiring long setting strokes and higher forces necessary for tubing patches. The tool provides unsurpassed reliability and quality assurance in setting or retrieval of wellbore devices such as packers, cement retainers and plugs. The setting tool connected common adapter kits to the packers, cement retainers and plugs for running and attached to the surface device via wireline. While the plugs or packers have been reached the designed positions, the motor and pump of the PST-20 will convert the hydraulic pressure into an axial force after receiving the orders from surface. When the designated setting force is achieved, the PST-20 separates from the subsurface device such as packers, cement retainers and plugs and can be retrieved from the well. At the wellsite, the tool can be easily reset ready and adapted to set or retrieve devices for another run.

Specifications

<table>
<thead>
<tr>
<th>PST-20</th>
<th>O.D.</th>
<th>3-5/8 in. (92 mm)</th>
<th>5 in.</th>
<th>5-1/2 in.</th>
<th>6-5/8 in.</th>
<th>7 in.</th>
<th>7-5/8 in.</th>
<th>8-5/8 in.</th>
<th>9-5/8 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Set/Retrieve Force</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
<td>60,000 lbf (265.8 kN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stroke Length</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
<td>13 in. (330 mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stage</td>
<td>Dual</td>
<td>Dual</td>
<td>Dual</td>
<td>Dual</td>
<td>Dual</td>
<td>Dual</td>
<td>Dual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weight</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
<td>305 lb (138 kg)</td>
</tr>
</tbody>
</table>

Wireline Retrievable Bridge-Plugs

<table>
<thead>
<tr>
<th>Casing O.D.</th>
<th>Casing Weight</th>
<th>Operating Casing O.D.</th>
<th>Tool O.D.</th>
<th>Release Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 in.</td>
<td>15-18 lbs/ft. (22.32-26.79 kg/m)</td>
<td>4.276 in. (108.61 mm)</td>
<td>4.408 in. (111.96 mm)</td>
<td>4.125 in. (104.78 mm)</td>
</tr>
<tr>
<td>5-1/2 in.</td>
<td>20-23 lbs/ft. (29.76-34.23 kg/m)</td>
<td>4.67 in. (118.62 mm)</td>
<td>4.778 in. (121.36 mm)</td>
<td>4.5 in. (114.33 mm)</td>
</tr>
<tr>
<td>6-5/8 in.</td>
<td>24-32 lbs/ft. (38.69-47.62 kg/m)</td>
<td>5.675 in. (144.15 mm)</td>
<td>5.921 in. (150.39 mm)</td>
<td>5.5 in. (139.77 mm)</td>
</tr>
<tr>
<td>7 in.</td>
<td>32-35 lbs/ft. (47.62-52.09 kg/m)</td>
<td>6.04 in. (152.50 mm)</td>
<td>6.094 in. (154.79 mm)</td>
<td>5.812 in. (147.63 mm)</td>
</tr>
<tr>
<td>7-5/8 in.</td>
<td>33.7-39 lbs/ft. (50.15-58.04 kg/m)</td>
<td>6.625 in. (168.28 mm)</td>
<td>6.765 in. (171.83 mm)</td>
<td>6.453 in. (163.91 mm)</td>
</tr>
<tr>
<td>8-5/8 in.</td>
<td>32-40 lbs/ft. (47.62-59.53 kg/m)</td>
<td>7.725 in. (196.22 mm)</td>
<td>7.921 in. (201.09 mm)</td>
<td>7.531 in. (191.29 mm)</td>
</tr>
</tbody>
</table>

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Applications

- Retrieve the free pipe by cutting pipe above stuck point.
- Easy to remove the tubing closed to useable life and need to be replaced.

Introduction

The MDC-W is an attractive tool that enables efficient, safe drill pipe, tubing and casing recovery operations without the need for explosives or corrosive chemicals. It has a motor with reducer driven rotating head with tree grinding cutting tip that mechanically cut downhole tubulars. Downhole data is transmitted to surface via the wireline to enable the engineer to control the cutting operation. The MDC-W incorporates a ‘fail-safe’ mechanism that prevents the tool from getting stuck.

Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Operating Temperature</td>
<td>300°F (150°C)</td>
</tr>
<tr>
<td>Max Operating Pressure</td>
<td>15,000 psi (103 MPa)</td>
</tr>
<tr>
<td>Outside Diameter (Basic Model)</td>
<td>2.125 in. (54 mm)</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>50 Vdc - 600 Vdc at cablehead</td>
</tr>
<tr>
<td>Operating Current</td>
<td>160 mA - 200 mA while opening/closing anchor</td>
</tr>
<tr>
<td></td>
<td>200 mA - 2000 mA while cutting</td>
</tr>
<tr>
<td>Wireline Requirements</td>
<td>Mono - Conductor Cable</td>
</tr>
<tr>
<td>Weight (Basic Model)</td>
<td>113.5 lbs. (51.5 kg)</td>
</tr>
<tr>
<td>Length (Basic Model)</td>
<td>11.4 ft. (3.47 m)</td>
</tr>
<tr>
<td>Minimum Operating Diameter</td>
<td>2.375 in. (60.3 mm)</td>
</tr>
<tr>
<td>Max Cutting Thickness</td>
<td>0.6 in. (18 mm)</td>
</tr>
<tr>
<td>Pipe Cutting Range</td>
<td>2.375 in. - 4 in. (60.3 - 101 mm)</td>
</tr>
<tr>
<td>Cut-off Time</td>
<td>About 20 - 60 min</td>
</tr>
</tbody>
</table>
**Introduction**

The MDC is designed to cleanly cut downhole tubulars without using dangerously corrosive chemicals or explosives. It has a motor with reducer driven rotating head with a gradually advancing cutting tip that mechanically cut the drill pipe, tubing and casing. Downhole data is transmitted to surface via the wireline to enable the engineer to control the cutting operation. It is an efficient and safe cutting tool.

**Specifications**

- **Maximum Temperature**: 300°F (150°C)
- **Maximum Pressure**: 15,000 psi (103.4 MPa)
- **Make-up Length**: 8 ft. -1.68 in. (2.48 m)
- **Shipping Length**: 9 ft. -2.16 in. (2.80 m)
- **Weight**: 115.7 lbs. (52.5 kg)
- **Tool Diameter**: 2.75 in. (70 mm)
- **Minimum Hole Diameter**: 3 in. (76 mm)
- **Maximum Hole Diameter**: 9.625 in. (244.5 mm)
- **Pipe Cutting Range**: 3 – 6.1in. (76 -155mm), can be extended to 9.625 in. (244.5 mm)
- **Max. Thickness of the cutting**: 0.75in. (19mm)
- **Cut off time**: about 10 minutes
- **Power Requirements**:
  - Operating Voltage: 50-660 Vdc at cable head
  - Current: 160-200 mA while opening/closing anchor at 110 V
  - 200-2000 mA while cutting
- **Wireline Requirements**: Single conductor cable
Introduction
Pipe convey logging system used in horizontal wells and the difficulty logging equipment, which can at high temperature, high pressure, high conductivity mud media of downhole to achieve the docking cable and instruments, the system can remain unchanged in the conventional logging projects. The premise and guarantee the quality of measurement tasks to complete, it can be coring, repeat formation test, dip logging, perforating and so on. Using this system can not only measured by conventional logging the best information, but can also be micro-resistivity scanning operations. In the course of a logging operation, can measure all standard measurements, with significant economic benefits.

Specifications
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Temperature</td>
<td>350°F (175°C)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>20000 psi (137.9 MPa)</td>
</tr>
<tr>
<td>Plug Diameter</td>
<td>1.5in. (38 mm)</td>
</tr>
<tr>
<td>Contact Resistance</td>
<td>&lt;0.1 ohm</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>&gt;200 M ohm</td>
</tr>
<tr>
<td>Fit Drilling Pipe O.D.</td>
<td>3.5 in. &amp; 5 in.</td>
</tr>
<tr>
<td>Max. Latch Dev</td>
<td>90°</td>
</tr>
<tr>
<td>Docking Locking Power</td>
<td>1000lb-1200lb</td>
</tr>
</tbody>
</table>
Applications

- The hole deviation exceeds the limits of the instrument’s freefall.
- Difficult hole conditions warrant PCL-B use such as: washouts, ledges, restrictions, excessive dogleg deviation, high hydrostatic pressure.
- The customer simply elects to reduce this uncertainty.

Introduction

The Pipe Conveyed Logging Tool-B (PCL-B) is used to provide assurance that the logging tools will be able to successfully survey the intended interval of the wellbore.

Specifications

PCL-B
- Maximum Temperature: 350°F (175°C)
- Maximum Pressure: 20,000 psi (137.9 MPa)
- Shipping Length: 7 ft. (2.1 m)
- Weight: 88 lbs. (40 kg)
- Tool Diameter: 5 in. (127 mm)

PCL-B-IC (3 1/2 IF Connector sub)
- Shipping Length: 5 ft. - 0.8 in. (1.76 m)
- Weight: 97 lbs. (44 kg)
- Tool Diameter: 3.5 in. (89 mm)

PCL-B-UC (2 7/8 UPTBG Connector sub)
- Shipping Length: 5 ft. - 0.8 in. (1.76 m)
- Weight: 97 lbs. (44 kg)
- Tool Diameter: 3.5 in. (89 mm)

PCL-B-QC (Quick change Assembly)
- Shipping Length: 2 ft. - 11.4 in. (0.9 m)
- Weight: 66 lbs. (30 kg)
- Tool Diameter: 3.38 in. (86 mm)

PCL-B-X1 (4 1/2-3 1/2 Crossover schedule)
- Shipping Length: 3 ft. - 11.2 in. (1.2 m)
- Weight: 94.8 lbs. (43 kg)
- Tool Diameter: 6.5 in. (165 mm)

PCL-B-X2 (2 7/8-3 1/2 Crossover schedule)
- Shipping Length: 2 ft. - 5.5 in. (0.75 m)
- Weight: 61.7 lbs. (28 kg)
- Tool Diameter: 5 in. (127 mm)

PCL-B-FS (Female sub)
- Shipping Length: 1 ft. - 8.6 in. (0.52 m)
- Weight: 26.4 lbs. (12 kg)
- Tool Diameter: 1.4 in. (34 mm)

PCL-B-MS (Male sub)
- Shipping Length: 1 ft. - 9.7 in. (0.55 m)
- Weight: 17.6 lbs. (8 kg)
- Tool Diameter: 1.4 in. (35 mm)

PCL-B-SB (Sinker bar)
- Shipping Length: 10 ft. (3.05 m)
- Weight: 66 lbs. (30 kg)
- Tool Diameter: 1.65 in. (42 mm)

Vibration & Shock Meets Spec. GV-W1/RD-0039-A/4
Introduction

The SGR-1 is used with wire line perforating guns when very accurate depth control is required. The Gamma/CCL tool is physically attached to the top of a perforating gun after taking the measurement of distance from the ccl to the Gamma Ray measure point and the distance to the top shot in the gun. The assembly is then run into the well. After proper depth has been verified, the Gamma/Gun assembly is positioned opposite the zone to be perforated, and the gun may be fired with the Gamma Ray tool still on the line. Safety is achieved by normally powering the tool on a positive current and then switching to a negative current to fire the gun. A special safety firing circuit prevents the gun from being fired with the Positive polarity current. Different models of the tool may feature either a Scintillation detector or a Geiger Mueller detector with a special shock mounting designed to withstand the blast and shock of the perforator.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Temperature</td>
<td>350°F (175°C) for 20 hours</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>18,000 Psi (124 MPa)</td>
</tr>
<tr>
<td>Tool Diameter</td>
<td>1.69 in. (43 mm)</td>
</tr>
<tr>
<td>Minimum Hole Diameter</td>
<td>2.5 in. (63.5 mm)</td>
</tr>
<tr>
<td>Make-up Length</td>
<td>7 ft.-9.94 in. (2.386 m)</td>
</tr>
<tr>
<td>Shipping Length</td>
<td>8 ft.-9.75 in. (2.686 m)</td>
</tr>
<tr>
<td>Weight</td>
<td>42 lbs. (19.1 kg)</td>
</tr>
<tr>
<td>Recommended Logging Speed</td>
<td>20 ft./min (6 m/min)</td>
</tr>
<tr>
<td>Maximum Logging Speed</td>
<td>30 ft./min ( 9 m/min)</td>
</tr>
<tr>
<td>Curves Recorded</td>
<td>Gamma Ray /</td>
</tr>
<tr>
<td>Sensitivity Approximately</td>
<td>1.3 counts / API unit</td>
</tr>
<tr>
<td>Operating Voltage / Current</td>
<td>85 Vdc at 45 mA at cable head</td>
</tr>
<tr>
<td>Detector Type</td>
<td>0.84 in. X 6 in. Scintillation</td>
</tr>
<tr>
<td>Cable Type</td>
<td>Single Conductor</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated correlation device only</td>
</tr>
<tr>
<td>Stability</td>
<td>+/-15% of count rate over full temperature range</td>
</tr>
<tr>
<td>Shock</td>
<td>&gt;1000g</td>
</tr>
<tr>
<td>Depth of Investigation</td>
<td>12.0 in. (304.8 mm) estimated for a 7.88 in. (200.2 mm) water-filled borehole</td>
</tr>
<tr>
<td>Vertical Resolution</td>
<td>8.00 in. (203.2mm) given proper formation contrast</td>
</tr>
<tr>
<td>Zero Point</td>
<td>18 in. (457.2 mm) from bottom sub</td>
</tr>
<tr>
<td>Measure Point (GR)</td>
<td>18 in. (457.2 mm) from bottom sub</td>
</tr>
<tr>
<td>Measure Point (CCL)</td>
<td>60 in. (1524 mm) from bottom sub</td>
</tr>
<tr>
<td>Line Utilization</td>
<td>GR &amp; CCL: 1 &amp; Armor</td>
</tr>
<tr>
<td>H2S Qualified</td>
<td>No</td>
</tr>
<tr>
<td>Measure Point:</td>
<td></td>
</tr>
<tr>
<td>Shock Sub Bottom to GR Detector Center</td>
<td>2 ft.-11.92 in. (0.912 m)</td>
</tr>
<tr>
<td>Shock Sub Bottom to CCL Coil Center</td>
<td>6 ft.-6.72 in. (2.000 m)</td>
</tr>
<tr>
<td>GR Detector Center to CCL Coil Center</td>
<td>3 ft.-6.84 in. (1.088 m)</td>
</tr>
</tbody>
</table>
Cablehead Releasable (CHR)

Special Features
- Electrically releasable from the surface.
- Withstands more than the safe working load of the strongest wireline.
- Includes safeguards against accidental release.
- Top section removable for rig up and storage.
- Includes a load cell to determine the downhole wireline tension. This is a crucial feature for the efficient assessment of apparent stuck tools. It is now possible to know the magnitude of the downhole pull and determine whether the wireline or the tool is stuck. A variety of special electrical features maximize the reliability and efficiency of the CHR.
- Tool is equipped with redundant circuitry and conductor utilization: three latching relays switched with separate lines, two heaters, and four conductors powering the heaters.
- Diodes isolate the conductors from the heaters to keep a shorted conductor from disabling a heater.

Applications
- The CHR offers the ability to pull harder than a conventional cable head on stuck tools.
- Releasing the latch produces less shock than breaking a conventional wireline weakpoint.

Introduction
The Cablehead Releasable (CHR) has an electrically activated wireline release system as opposed to the tension activated release system of conventional cable heads. Tension activated heads require a safety factor to avoid premature release of the wireline. This safety factor keeps you from utilizing the full safe load on the wireline when trying to free stuck tools from the borehole. The CHR allows you to utilize this extra tension to free stuck tools. This additional tension has proven very successful at freeing stuck tools and avoiding fishing operations. This extra pull also allows you to safely run heavy tool strings in deep wells.

Specifications

**DIMENSIONS AND RATINGS**
- Max Temp: 350°F (175°C)
- Max Press: 20,000 psi (137.9 MPa)
- Max OD: 3.625 in. (92 mm)
- Min Hole: 4.5 in. (114 mm)
- Max Hole: Unlimited
- Length: 6.24 ft. (1.90 m)
- Weight: 135 lbs (61.23 kg)
- OD of Released Parts*: 1.75 in. (4.45 cm)

* Same as Standard DITS Cable Head

**PHYSICAL STRENGTHS**
- Tension: 130,000 lbs (59,000 kg)
- Compression: 130,000 lbs (59,000 kg)
- Torque: 600 lb-ft. (815 N-m)

* Strengths apply to new tools at 70°F (21°C) and 0 psi.
# Multi-Conductor Extreme (MCE)

## Applications
- Prevents stuck or lost tool string.
- Provides a short, compact design and doesn’t require additional tools to enhance its operation.
- Allows electrical “pass through” to the logging companies’ wireline tool string.
- Provides multiple run and activation capability.
- Uses mechanical operation. No time delay issues, or concerns with pressure and temperature.
- Accommodates instant relatching.

## Introduction

The Multi-Conductor Extreme (MCE) is a field-proven, cost-effective way to help prevent stuck tool strings and expensive fishing jobs during wireline logging operations. Precision engineered to operate reliably, the MCE provides instant, unlimited activations, with no waiting periods or time delays. Once line tension exceeds the setting of the jar (indicating a stuck condition), the MCE activates and frees the stuck tool string.

## Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Temperature</td>
<td>400°F (200°C)</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>25,000 psi (172 MPa)</td>
</tr>
<tr>
<td>Tool Diameter</td>
<td>3.375 in. (86 mm)</td>
</tr>
<tr>
<td>Make-up Length (Open)</td>
<td>13 ft.-5.42 in. (4.1 m)</td>
</tr>
<tr>
<td>Make-up Length (Closed)</td>
<td>12 ft.-9.54 in. (3.9 m)</td>
</tr>
<tr>
<td>Shipping Length</td>
<td>15 ft.-1.10 in. (4.6 m)</td>
</tr>
<tr>
<td>Weight</td>
<td>275.6 lbs. (125 kg)</td>
</tr>
<tr>
<td>Maximum Tensile</td>
<td>210,000 lbs. (95,254.4 kg)</td>
</tr>
<tr>
<td>Minimum Setting</td>
<td>4409 lbs. (2000 kg)</td>
</tr>
<tr>
<td>Maximum Setting</td>
<td>10,000 lbs. (4535.9 kg)</td>
</tr>
<tr>
<td>Voltage Rating</td>
<td>1000 V</td>
</tr>
</tbody>
</table>
Hole Finder Sub (HFS)

Applications
- Open hole and cased hole wireline operations, particularly stationary formation tester operations
- High deviations and horizontal wells using alternative conveyance such as pipe or tractor
- Complex well trajectories wells
- Washed-out and rugose hole profiles

Introduction
The Hole finder is flexibly connected to the instrument string, and the top wheel prevents the top from dying on the well wall. It can be bent according to the wellbore trajectory, guiding the instrument string to smoothly pass through the expansion section.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Length</th>
<th>Tool Diameter</th>
<th>Minimum Hole Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFS-7.45</td>
<td>1 ft.4.14 in. (410 mm)</td>
<td>7.8 in. (198 mm)</td>
<td>8.5 in. (216 mm)</td>
</tr>
<tr>
<td>HFS-6</td>
<td>3.625 in. (92 mm)</td>
<td>5.79 in. (147 mm)</td>
<td>6 in. (152 mm)</td>
</tr>
</tbody>
</table>

www.RenheSun.com
www.geovista.cn
Flywheels Centralizer Sub are frequently added to a toolstring to eliminate or mitigate the risks that jeopardize safe and fast wellbore interventions in modern complex wells. These devices are clamped on at multiple points along the toolstring body, their inclusion reduces the surface area in contact with the wellbore and friction forces acting on the toolstring.

**Specifications**

FWC-6:
- Shipping Length: 8.17 in. (207.5 mm)
- Weight: 16.75 lbs (7.6 kg)
- Tool Diameter: 5.79 in. (147 mm)
- Minimum Hole Diameter: 6 in. (152 mm)
- Maximum Hole Diameter: 7.4 in. (188 mm)

FWC-7.45:
- Shipping Length: 8.17 in. (207.5 mm)
- Weight: 36.1 lbs. (16.4 kg)
- Tool Diameter: 7.8 in. (198 mm)
- Minimum Hole Diameter: 8.5 in. (216 mm)
- Maximum Hole Diameter: 28 in. (711 mm)

**Applications**

- For highly deviated well or horizontal well
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