TOP TOOLS

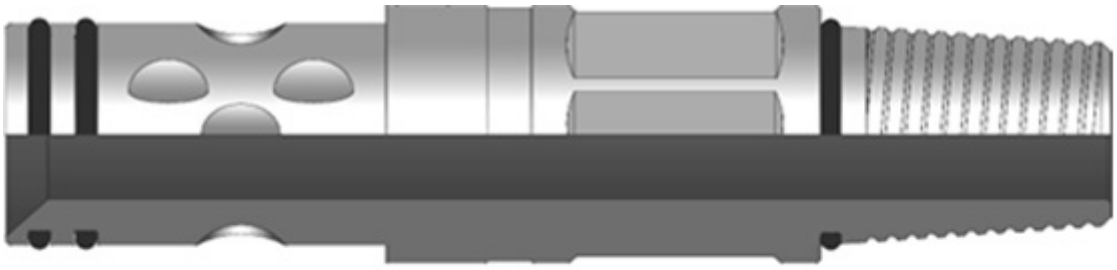
The Oilfield Partner

Internal Coiled Tubing Connector

Coiled Tubing Connectors provide a means of attaching a tool string to the end of the coiled tubing. The connectors, when installed correctly, provide a reliable, strong sealed connection to the coiled tubing. Internal Coiled Tubing Connectors have been designed for most sizes of coiled tubing. The connectors utilize O-ring seals to seal off the coiled tubing in order to maintain pressure integrity for the tool string.

Advantages

- High tensile strength
- High torsional strength for motor applications
- Large ID for maximum flow rates and pump through of actuation balls
- Tools is rated to 400 deg/F (204 deg/C)
- Non upset connection



Specification Guide

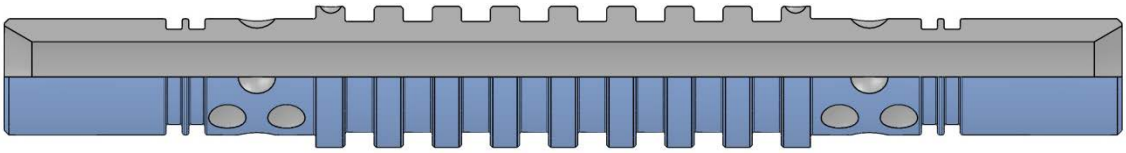
Coiled Tubing OD	Tool OD		Tool ID		Tensile Rating	Standard Connection
in.	in.	mm	in.	mm	lb	
1,25	1,25	31,8	0,75	19,1	25.000	1" AMMT
1,50	1,50	38,1	1,00	25,4	39.000	1" AMMT
1,75	1,75	44,5	1,00	25,4	42.000	1-1/2" AMMT
2,00	2,00	50,8	1,50	38,1	63.000	1-1/2" AMMT
2,38	2,38	60,3	1,00	25,4	65.000	1-1/2" AMMT

Spoolable Coiled Tubing Connector

Spoolable Coiled Tubing Connectors provide a means of attaching of two ends of the coiled tubing. In the case of breakage of the coiled tubing, the Spoolable Connector provides a possibility to get the Toolstring out of the hole. Spoolable Coiled Tubing Connectors have been designed for most sizes of coiled tubing.

Advantages

- Spoolable
- High tensile strength
- Non upset connection



Specification Guide

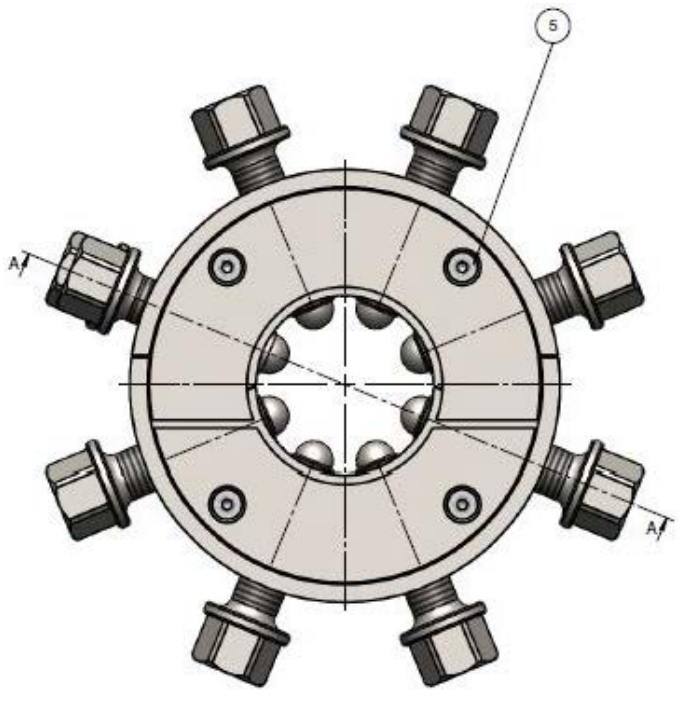
Coiled Tubing OD	Tool OD		Tool ID	
in.	in.	mm	in.	mm
2.375	2,375	60,3	1,185	30

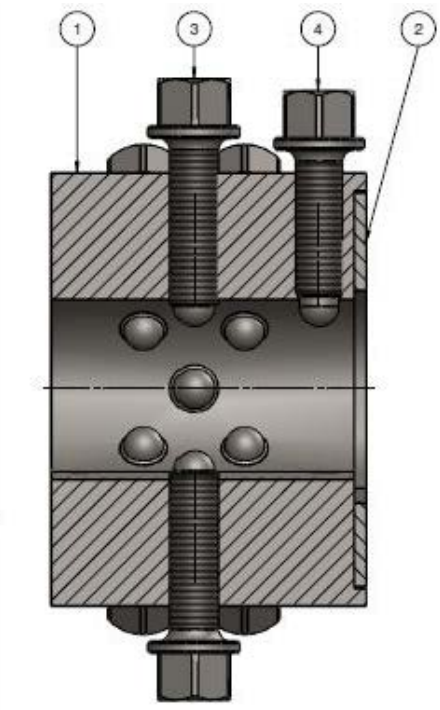
Mechanical Dimpling Tool

The Mechanical Dimpling Tool is designed and manufactured to connect inline coiled tubing connectors to the coiled tubing. The assembly consists primarily of a Dimple Jig, which can be split to facilitate make up of a double ended connector. The Tool is available for the following coiled tubing sizes:

- **1-1/4"**
- **1-1/2"**
- **1-3/4"**
- **2"**
- **2-3/8"**

To operate the Mechanical Dimpling Tool only a torque key with socket wrench is needed.



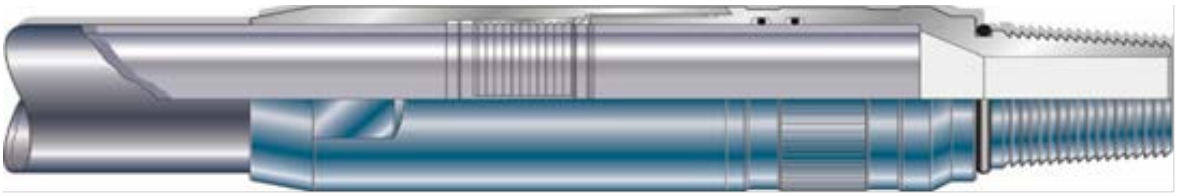


External Coiled Tubing Connector

Coiled Tubing Connectors provide a means of attaching a tool string to the end of the coiled tubing. The connectors, when installed correctly, provide a reliable, strong sealed connection to the coiled tubing. All of the connectors have been designed with either a fishing neck or a slick profile on the OD of the top sub. This will accommodate standard external fishing overshots should the need arise. Coiled Tubing Connectors have been designed for most sizes of coiled tubing. The Coiled Tubing Connectors are a slip type design.
The slip type connectors are equipped with set screws to rotationally lock the thread when used in conjunction with tools that create back torque such as coiled tubing workover motors. The connectors utilize O-ring seals to seal off the coiled tubing in order to maintain pressure integrity for the tool string.

Advantages

- High tensile strength
- High torsional strength for motor applications
- Large ID for maximum flow rates and pump through of actuation balls
- Manufactured with fishing profile on top of connector
- High pressure/high temperature tools rated to 10,000 psi (689 bar) and 400°F (204°C)
- High pressure/high temperature 15,000 psi (1000 bar) and 400°F (204°C) available on request



Specification Guide

Tool OD		Tool ID		Tensile Rating	Standard Connection
in.	mm	in.	mm	lb	
1,69	42,9	0,75	19,1	31.000	1" AMMT
1,69	42,9	0,75	19,1	25.000	1" AMMT
2,13	54,1	0,88	22,4	55.800	1-1/2" AMMT
2,13	54,1	1,00	25,4	49.000	1-1/2" AMMT
2,25	57,2	1,00	25,4	49.000	1-1/2" AMMT
2,88	73,2	1,12	28,4	123.000	2-3/8" PAC DSI
2,88	73,2	1,50	38,1	80.000	2-3/8" PAC DSI
2,88	73,2	1,50	38,1	78.000	2-3/8" PAC DSI
3,00	76,2	1,50	38,1	65.000	2-3/8" PAC DSI
3,50	88,9	1,50	38,1	134.000	2-7/8" PAC DSI
3,50	88,9	1,50	38,1	155.900	2-7/8" PAC DSI
3,50	88,9	1,50	38,1	105.000	2-7/8" PAC DSI

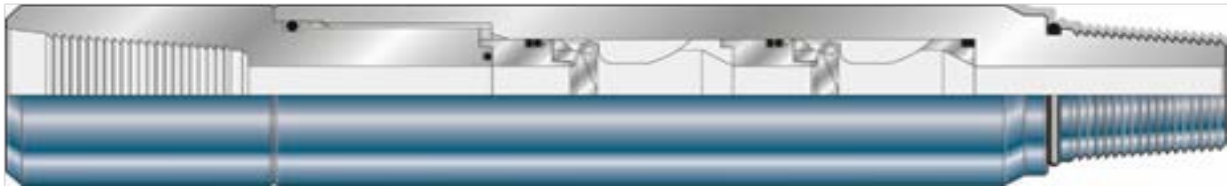
Double Flapper Type Check Valve

The Back Pressure Valve is a flapper type valve that allows flow down the tubing, but stops flow coming back up the tubing. The Back Pressure Valve has two flappers and flapper seals. The second flapper is redundant to the first and can be run where redundant seals are required. The flapper is designed so that a ball can be pumped through it at minimum fluid flow rate.

The Back Pressure Valve is normally run directly below the coiled tubing connector in CT operations and at the top of the BHA in snubbing operations. The Back Pressure Valve is run as a well control measure to prevent wellbore pressure from entering the workstring. No pipe manipulation or pressurization sequence is required to operate the tool.

Advantages

- Dual flapper valves
- Field-proven Viton flapper valve seats
- Short length
- Large ID
- High pressure/high temperature tools rated to 10,000 psi (689 bar) and 400°F (204°C)
- High pressure/high temperature 15,000 psi (1000 bar) and 400°F (204°C) available on request



Specification Guide

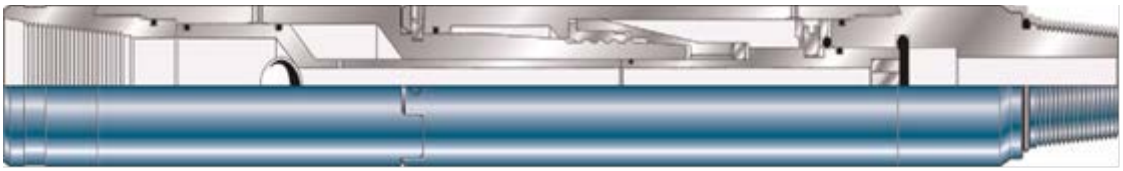
Tool OD		Tool ID		Make up Length		Tensile Rating	Standart Connection
in.	mm	in.	mm	in.	mm	lb	
1,69	42,9	0,69	17,5	18,13	375	31.000	1" AMMT
2,13	54,0	0,81	20,4	15,56	415	72.000	1-1/2" AMMT
2,88	73,0	1,02	25,9	15,56	435	94.000	2-3/8 PAC DSI

Hydraulic Disconnect

The Hydraulic Disconnect (HDI) is a ball-operated emergency release device designed to be run in a coiled tubing application to provide a method of separating from tools below to disconnect. This disconnect incorporates features to withstand forces encountered during fishing, milling and drilling operations. The HDI has high shock load strength, high tensile strength, is rotationally locked, and has a shorter length when compared to other hydraulic disconnects.
The HDI is ideal for applications including use below up or down hydraulic jars, use with impact tools, and with drilling and workover motors. The tool has a positive pressure drop indication when the shear screws have sheared.
Internal debris management is controlled by the use of o-rings and a debris filter at critical locations inside the tool. A rupture disk has been incorporated into the HSI to create a flow path should the lower bottomhole assembly become plugged. The rupture disk can be disabled when required. After disconnecting, the remaining bottoms half of the HDI and tools below can be fished with a standard Hydraulic GS Spear. A torque-through option is available for the GS Spear should rotation through the BHA left in hole be desired.

Advantages

- Able to withstand continuous heavy jarring and impact loads applied in up and down modes
- Increased tensile and torsional strength compared to other disconnects
- Incorporates a debris barrier to prohibit debris and fine sands from entering the tool
- Rotationally locked for downhole motor applications
- Special fishing tools available with probe for transmitting torque after disconnecting
- Positive pressure indication at surface after disconnecting
- Has flow through capability after disconnecting



Specification Guide

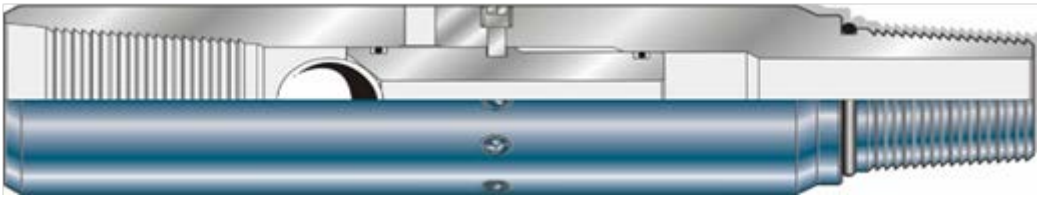
Tool OD		Tool ID		Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	mm	in.	mm	lb	
1,69	42,9	0,44	11,2	14,96	380,0	35,573	1" AMMT
2,13	54,0	0,53	13,5	16,14	410,0	54,768	1-1/2" AMMT
2,88	73,0	0.75	19,1	16,34	415,0	111,696	2-3/8" PAC DSI
Also available with large ID. Sizes on request							

Circulating Sub

The Circulating Sub provides a large area circulation path between the coiled tubing ID and the annulus. The circulation ports are opened by dropping a ball to its seat in the valve and applying pressure in order to shear some shear screws and move a piston downwards. Once the valve has been opened the ball and sear seal in the mandrel ID below the ports effectively blocking off any further fluid bypass to below. This feature allows for the use of the valve for the spotting of fluids above a set inflatable packer with the knowledge that all fluids are being directed out of the circulating valve and not to below the packer. Applications for the circulating valve include chemical treatments above a set packer, cement placement above a permanent bridge plug, debris barrier placement above a retrievable bridge plug, etc. The tool may be supplied with an integral rupture disc port for use when dropping a ball my not be possible, i.e., in a plugged situation. Here the rupture disc may be over pressured in order to achieve circulation in order to allow further use of drop balls.

Advantages

- Large circulation path between tubing and annulus
- Simple, ball operated design
- Ideal for spotting fluids
- Can be run with a rupture disc in case balls cannot be dropped



Specification Guide

Type	Tool OD		Tool ID		Make up Length		Tensile Rating	Standard Connection
	in.	mm	in.	mm	in.	mm	lb	
Dual	1,69	42,9	0,41	10,4	10,63	270,0	47.000	1" AMMT
Dual	2,13	54,1	0,44	11,2	11,42	290,0	84.000	1-1/2" AMMT
Dual	2,88	73,2	0,56	14,1	11,02	280,0	172.000	2-3/8" PAC DSI

Y-Type Circulating Sub

The Y-Type Circulating Sub is designed to allow a circulating path above a mud motor from tubing to annulus. When the motor service is wanted, a ball is circulated down. When the ball lands in the seat of the Y-Type Circulation Sub the flow-path to the annulus is shut off and only flow down to the mud motor is allowed. This saves Motor life on the way into the hole. The Y-Type Circulating Sub is also used to set Packers and Bridgeplugs. The Y-Type Circulating Sub always allows to pump fluid or Nitrogen when it is needed. You can also use the Y-Type Circ. Sub above Flow activated Fishing Tools. This prevents from accidental release of the Fishing Tools during pull out or a pressure bleed down when inside the Raiser.

Advantages

- Saves wear on the mud motor
- Large ID area permits maximum flow rates
- No moving Parts
- Prevents from accidental set of BP and Packers
- Strong design

Specification Guide

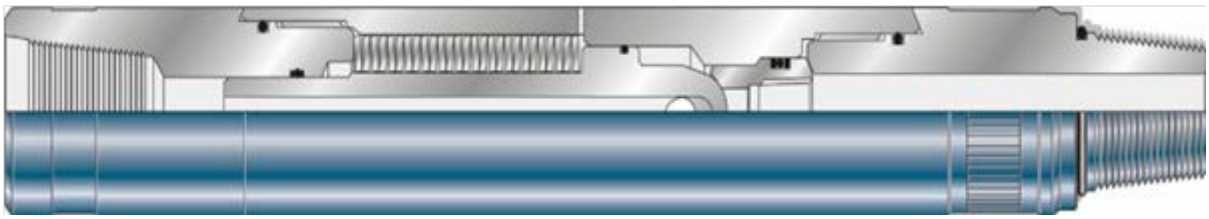
Type	Tool OD		Tool ID		make up length		Tensile Rating	Standard Connection
	in.	mm	in.	mm	in.	mm	lb	
Y	1,69	42,9	0,41	10,4	5,90	150,0	47.000	1" AMMT
Y	2,13	54,1	0,41	10,4	5,90	150,0	80.000	1.5" AMMT
Y	2,88	73,0	0,44	11,2	7,87	200.0	110.000	2-3/8" PAC DSI

Sequence Valve

The Sequence Valve is a check valve designed to support a column of fluid, until such time as an increase in pressure is applied to the column from above. Once the increased pressure is seen at the valve it will open and the column of fluid will be allowed to flow through the valve. By reducing pressure to the column of fluid to its original level the valve will close and the fluid will cease to flow. As pressure is applied to the column of fluid, it sees the selected cross sectional area and begins to compress the disc springs.
The disc springs are compressed, holding the piston nose on seat, preventing the piston from travelling through the tool. Pressure acting on the piston when the pressure is increased the force acting on the piston the fluid is allowed to bypass the piston seat and travel down the tool.
The Cement Valve can be reconfigured to operate at different pressures in a range from 500psi. The Cement Valve was originally developed as a control valve, capable of accurately delivering cement during coiled tubing cementing operation.
The same tool can also be used to deliver any fluid downhole using the same principle.

Advantages

- Works in under balanced situations
- Suitable for most fluid applications
- Multiple operating delivery pressure configuration
- Precision calibrated valve opening pressure against predetermined Bottom Hole Pressure



Dual Acting Impact Hammer

The TOP TOOLS Dual Impact Hammer has a wide range of speed, impact force and flow rates to convert hydraulic fluid energy, created by flow and pressure, into mechanical energy. This positive displacement Impact Hammer produces optimum power output with maximum efficiency. The frequency of the stroke of the tool is dependent on the amount of weight applied to the tool and the volume of fluid being pumped. By lifting or raising the BHA you can change the acting direction.
The Impact Hammer is made from 42CrMo4 quality steel. The pumping fluid is not limited to only water as a circulating medium, xylene, diesel and light bodied fluids also can be used.

Advantages

- Operates on most fluid mediums
- Temperature rated up to 300 deg Celsius
- Does not operate until resistance is met
- Allows circulation at all times
- Short make up length

Specification Guide

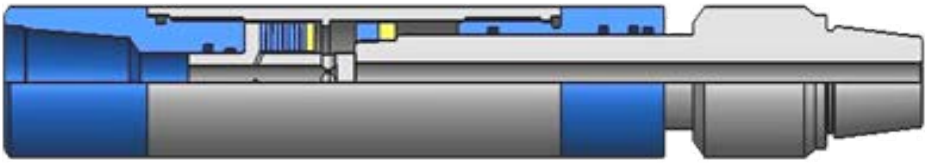
Tool OD		Pump Rate		Tensile Rating	Standard Connection	Max. Diff. Pressure	Make up Length
in.	mm	min. Ltr./min	max. Ltr./min	lb		bar	mm
2,25	57,0	30	190	42.000	1-1/2" AMMT	350	1160

Impact Hammer

The TOP TOOLS Impact Hammer has a wide range of speed, impact force and flow rates to convert hydraulic fluid energy, created by flow and pressure, into mechanical energy. This positive displacement Impact Hammer produces optimum power output with maximum efficiency. The frequency of the stroke of the tool is dependent on the amount of weight applied to the tool and the volume of fluid being pumped. The Impact Hammer is made from 42CrMo4 quality steel. The pumping fluid is not limited to only water as a circulating medium, xylene, diesel and light bodied fluids also can be used.

Advantages

- Operates on most fluid mediums
- Temperature rated up to 300 deg Celsius
- Does not operate until resistance is met
- Allows circulation at all times
- Short make up length



Specification Guide

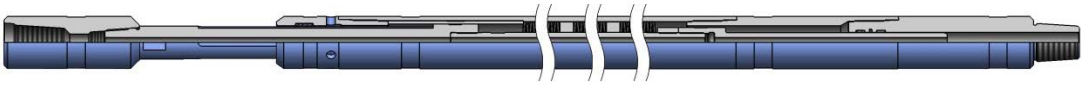
Tool OD		Pump Rate		Tensile Rating	Standard Connection	Max. Diff. Pressure	Make up Length
in.	mm	min. ltr./min	max. ltr./min	lb		bar	mm
1,75	44,5	40	120	25.000	1" AMMT	350	400
2,25	57,0	40	160	42.000	1-1/2" AMMT	350	450
3,13	79,5	60	220	57.000	2-3/8" PAC DSI	350	520

Dual Acting Accelerator

The TOP TOOLS Dual Acting Accelerator is designed to ensure maximum jarring efficiency in directional or crooked holes where wall drag is a problem, or in shallow holes where pipe stretch is insufficient.
The Dual Acting Accelerator is positioned in the bottom hole assembly several drill collars above the jar. As tension is applied, the Intensifier will extend, storing the energy of the applied tension. This stored energy is released when the jar fires, accelerating the drill collars upward.

Advantages

- Fully sealed and lubricated
- Ensures maximum jarring efficiency
- Dependable operation in continuous drilling service
- Operates in both up and down directions



Hydraulic Bent Sub

The Hydraulic Bent Sub (Knuckle Joint) is designed to provide a means of hydraulically "kicking over" a bottomhole assembly for entry into laterals or for fishing applications (i.e., side pocket mandrels or fish laying high side in the completion or liner). The tool is generally run below an indexing tool to allow full radial rotation. The BHA is run in the well to depth and the flow rate is increased to activate the Hydraulic Knuckle Joint. As the flow rate is cycled the indexing tool rotates allowing the fishing tool or entry device to find the fish or lateral. The maximum kick over angle is determined by selection of the appropriate anvil from a minimum of two (2) to a maximum of ten (10) degrees in two degree increments. The Hydraulic Bent Sub requires hydraulic pressure to operate. Either a choke sub or a nozzle below the tool can generate this pressure. The nozzle size can be predetermined to allow maximum kick over force at the tool. The hydraulic release fishing overshot or spear which already uses a nozzle for activation. The tool can also be used with a boost piston to lift larger loads or where only low flow rates are available.

Advantages

- Easily adjusted for deflection of two to ten degrees
- Anvil establishes predetermined deflection angle
- Kick over force easily controlled by hydraulic pressure differential
- Positive rotational control when used with indexing tool

Specification Guide

Tool OD		Tensile Rating	Standard Connection	Max. Diff. Pressure	Make up Length
in.	mm	lb		bar	mm
1,69	43,0	21.000	1" AMMT	350	460
2,13	54,0	42.000	1-1/2" AMMT	350	460
2,88	73,0	60.000	2-3/8" PAC DSI	350	460

Weight/Deployment Bar

The Deployment/Spacer Bar is used to provide a safe means of handling coiled tubing (CT) or small threaded pipe bottom hole assembly (BHA) at surface in applications where the BHA that is run in hole or retrieved from the hole is longer than the riser height available. The Deployment/Spacer Bar is used to hang and seal off parts of a BHA. The Deployment/Spacer Bar OD is the same as the CT or threaded pipe used to deploy the BHA in the hole. The Deployment/Spacer Bar has high tensile and torsion capabilities and the most commonly used small diameters connections.

Advantages

- Increase safety when handling long BHA's
- Available in all standard CT sizes
- High tensile and torsional strength

Specification Guide

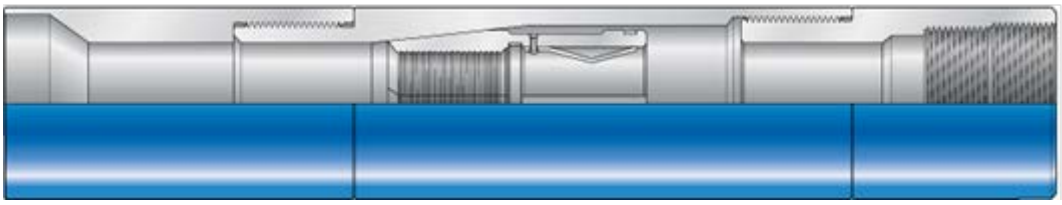
Tool OD		Tool ID		Make up Length		Standard Connection
in.	mm	in.	mm	in.	mm	
1,69	42,9	0,50	12,7	53,15	1350	1" AMMT
1,69	42,9	0,75	19,1	53,15	1350	1" AMMT
2,13	54,0	0,50	12,7	53,15	1350	1-1/2" AMMT
2,13	54,0	0,75	19,1	53,15	1350	1-1/2" AMMT
2,13	54,0	1,00	25,4	53,15	1350	1-1/2" AMMT
2,88	73,2	0,50	12,7	53,15	1350	2-3/8" PAC DSI
2,88	73,2	0,75	19,1	53,15	1350	2-3/8" PAC DSI
2,88	73,2	1,00	25,4	53,15	1350	2-3/8" PAC DSI

Non Releasing Overshots

The Non Releasing Overshot has been designed to allow fishing of coiled tubing that has been lost in the hole. The Non Releasing Overshot has a catch or anchoring mechanism which washes over the top of the coiled tubing which has been left in the hole.
The Non Releasing Overshot utilizes hardened grapple segments to catch the outside of the coiled tubing. These grapples slide over the coiled tubing when washing over, and bite into the tubing when tension is applied to the workstring. Leaf springs attached to each grapple in the expanded position away from the coiled tubing when the Non Releasing Overshot is being moved down over the tubing to prevent wear on the grapple teeth. Once the grapple is engaged with the coiled tubing it can be pushed further down the tubing to get a "bite" lower on the string. The Non Releasing Overshot will not release from the coiled tubing to reengage higher on the string.

Advantages

- Wide catch range
- May be run on threaded or coiled tubing
- Tensile yield equal to top connection



Specification Guide

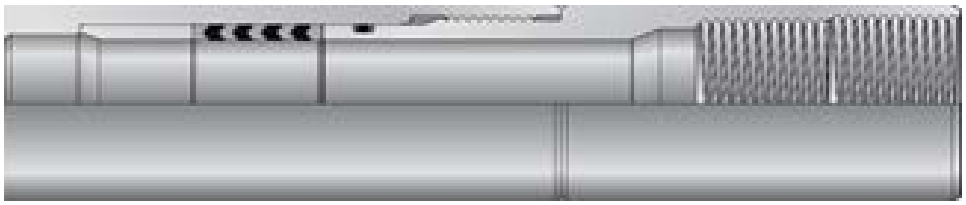
Tool OD		Length		Available for CT size to be engaged					Standard Connection
in.	mm	in.	mm	1"	1-1/4"	1-1/2"	1-3/4"	2"	
1,88	47,7	24,76	629,0	x					1-1/4" CS Hydril Box
2,25	57,1	24,76	629,0	x	x				1-1/2" CS Hydril Box
2,63	66,7	23,62	600,0	x	x	x			1-1/2" CS Hydril Box
3,13	79,5	23,19	589,0	x	x	x	x	x	2-7/8" CS Hydril Box
3,38	85,8	23,35	593,0	x	x	x	x	x	2-7/8" CS Hydril Box

High Pressure Pack off

The High Pressure Pack-Off is designed to be used in conjunction with the continuous tubing and snipper overshot. The High Pressure Pack-Off is run directly above the overshot and provides a high-pressure seal 5,000 psi (350bar) between the coiled tubing being fished and the workstring. This allows efficient circulation capability down through the coiled tubing being fished, which may provide sufficient solids removal at the stuck point to free the tubing. The pressure tight seal between the coiled tubing and the workstring allows a hydraulic release device to be operated in the bottomhole assembly which may allow the workstring to be pulled from the well if the stuck tubing could not be retrieved.

Advantages

- Allows high pressure circulation through a fish
- Packing rings are pressure energized
- May be manufactured with most tubing threads



High Pressure Pack Off

Specification Guide

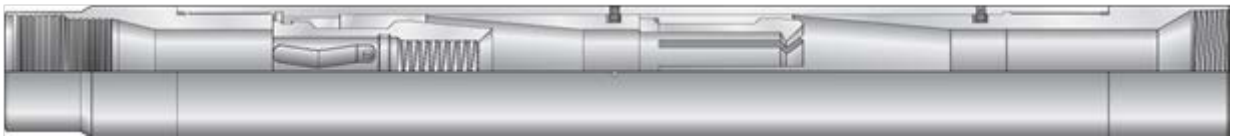
Tool OD		Coiled Tubing Size		Max. Coiled Tubing OD	Max. Burst pressure	Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	mm	in.	psi	in.	mm	lb	
1.858	47,2	1,00	25,4	Coil OD + 0.031	10.000	12,80	325,0	44.000	1-1/4" CS Hydril
1.858	47,2	1,25	31,8	Coil Od + 0.031	10.000	12,80	325,0	52.000	1-1/4" CS Hydril
2.250	57,2	1,00	25,4	Coil OD + 0.031	18.000	12,80	325,0	62.000	1-1/2" CS Hydril
2.250	57,2	1,25	31,8	Coil OD + 0.031	18.000	12,80	325,0	62.000	1-1/2" CS Hydril
2.625	66,7	1,00	25,4	Coil OD + 0.031	18.000	13,50	343,0	62.000	1-1/2" CS Hydril
2.625	66,7	1,25	31,8	Coil OD + 0.031	18.000	13,50	343,0	62.000	1-1/2" CS Hydril
2.625	66,7	1,50	38,1	Coil OD + 0.031	18.000	13,50	343,0	108.000	1-1/2" CS Hydril
2.625	66,7	1,50	38,1	Coil OD + 0.031	24.000	13,50	343,0	108.000	2-1/16" CS Hydril
3.125	79,4	1,00	25,4	Coil OD + 0.031	24.000	12,36	314,0	91.000	2-7/8" CS Hydril Special Clearance
3.125	79,4	1,25	31,8	Coil OD + 0.031	24.000	12,36	314,0	91.000	2-7/8" CS Hydril Special Clearance
3.125	79,4	1,50	38,1	Coil OD + 0.031	24.000	12,36	314,0	91.000	2-7/8" CS Hydril Special Clearance
3.125	79,4	1,75	44,5	Coil OD + 0.031	24.000	12,36	314,0	91.000	2-7/8" CS Hydril Special Clearance
3.125	79,4	2,00	50,8	Coil OD + 0.031	24.000	12,36	314,0	91.000	2-78" CS Hydril Special Clearance
3.375	85,7	1,00	25,4	Coil OD + 0.031	32.000	10,51	267,0	154.000	2-7/8" CS Hydril
3.375	85,7	1,25	31,8	Coil OD + 0.031	32.000	10,51	267,0	154.000	2-7/8 CS Hydril
3.375	85,7	1,75	38,1	Coil OD + 0.031	32.000	10,51	267,0	154.000	2-7/8" CS Hydril
3.375	85,7	1,75	44,5	Coil OD + 0.031	32.000	10,51	267,0	154.000	2-7/8" CS Hydril
3.375	85,7	2,00	50,8	Coil OD + 0.031	32.000	10,51	267,0	154.000	2-7/8" CS Hydril

Snipper Overshots

The Snipper Overshot has been designed to allow cutting and retrieval of a section of coiled tubing that has been left in a well. The objective being to ensure a clean fishneck with a smooth patch to allow a chemical cutter to pass through should it be required. The Snipper Overshot has a catch and cutting mechanism which washes over the top of the coiled tubing. Once the recommended amount of coiled tubing is swallowed by the overshot, the fishing string will cut the tubing by applying overpull. The coiled tubing above the cut will be retrieved in the same trip. The Snipper Overshot utilizes hardened grapple segments to catch the outside of the coiled tubing. These grapples slide over the coiled tubing when washing over, and bite into the tubing when tension is applied to the workstring. Once the grapple is engaged with the coiled tubing it can be pushed farther down the tubing to get a "bite" lower and the string providing the cut has not been made.

Advantages

- Modular design for multiple sizes of CT
- Retrieves coil tubing above cut in same trip
- High tensile strength
- Bowl and slip design for cutting and retrieval



Snipper Overshots

Specification Guide

Tool OD		Coiled Tubing size		Catch Diameter		Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	mm	max (in.)	min (in.)	in.	mm	lb	
1.858	47,2	1,00	25,4	Coil OD + 0.093	Coil OD - 0.063	26,61	676,0	40.000	1-1/4" CS Hydril
1.858	47,2	1,25	31,8	Coil OD + 0.093	Coil OD - 0.063	26,61	676,0	40.000	1-1/4" CS Hydril
2.250	57,2	1,00	25,4	Coil OD + 0.093	Coil OD - 0.063	34,96	888,0	62.000	1-1/2" CS Hydril
2.250	57,2	1,25	31,8	Coil OD + 0.093	Coil OD - 0.063	34,96	888,0	62.000	1-1/2" CS Hydril
2.625	66,7	1,00	25,4	Coil OD + 0.093	Coil OD - 0.063	35,63	905,0	78.000	1-1/2" CS Hydril
2.625	66,7	1,25	31,8	Coil OD + 0.093	Coil OD - 0.063	35,63	905,0	78.000	1-1/2" CS Hydril
2.625	66,7	1,50	38,1	Coil OD + 0.093	Coil OD - 0.063	35,63	905,0	78.000	1-1/2" CS Hydril
2.625	66,7	1,50	38,1	Coil OD + 0.093	Coil OD - 0.063	35,63	905,0	78.000	2-1/16" CS Hydril
3.166	80,4	1,00	25,4	Coil OD + 0.093	Coil OD - 0.063	37,17	944,0	91.000	2-7/8" CS Hydril Special Clearance
3.166	80,4	1,25	31,8	Coil OD + 0.093	Coil OD - 0.063	37,17	944,0	91.000	2-7/8" CS Hydril Special Clearance
3.166	80,4	1,50	38,1	Coil OD + 0.093	Coil OD - 0.063	37,17	944,0	91.000	2-7/8" CS Hydril Special Clearance
3.166	80,4	1,75	44,5	Coil OD + 0.093	Coil OD - 0.063	37,17	944,0	91.000	2-7/8" CS Hydril Special Clearance
3.166	80,4	2,00	50,8	Coil OD + 0.093	Coil OD - 0.063	37,17	944,0	91.000	2-7/8" CS Hydril Special Clearance
3.375	85,7	1,00	25,4	Coil OD + 0.093	Coil OD - 0.063	37,28	947,0	154.000	2-7/8" CS Hydril
3.375	85,7	1,25	31,8	Coil OD + 0.093	Coil OD - 0.063	37,28	947,0	154.000	2-7/8" CS Hydril
3.375	85,7	1,50	38,1	Coil OD + 0.093	Coil OD - 0.063	37,28	947,0	154.000	2-7/8" CS Hydril
3.375	85,7	1,75	44,5	Coil OD + 0.093	Coil OD - 0.063	37,28	947,0	154.000	2-7/8" CS Hydril
3.375	85,7	2,00	50,8	Coil OD + 0.093	Coil OD - 0.063	37,28	947,0	154.000	2-7/8" CS Hydril

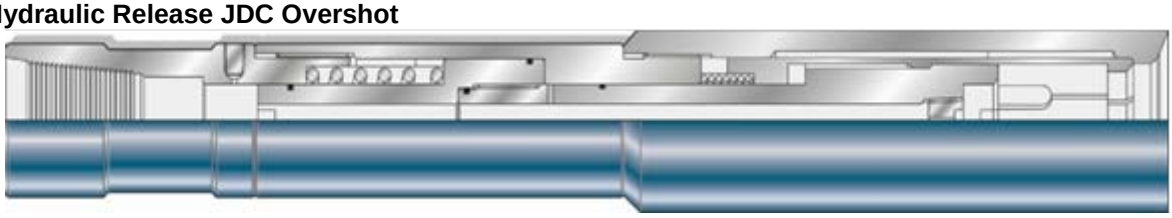
Hydraulic Release Overshots

The Hydraulic Releasing Overshot is used to catch external JDC type fish necks and the Slick catch Overshots is used to catch slick O.D. Profiles.
The Tools are engineered to withstand high tensile and compressive stresses encountered during jarring operations. The Overshot is engaged by applying slight set-down weight at the Tool. A flow path is provided through the Tool for circulation while running in the hole. This path can also be used to wash debris from the top of the fish or profile. In the event that retrieval is not possible, increased flow rate through the tool will allow release from the fish neck or profile ensuring no additional tools are left in the well.

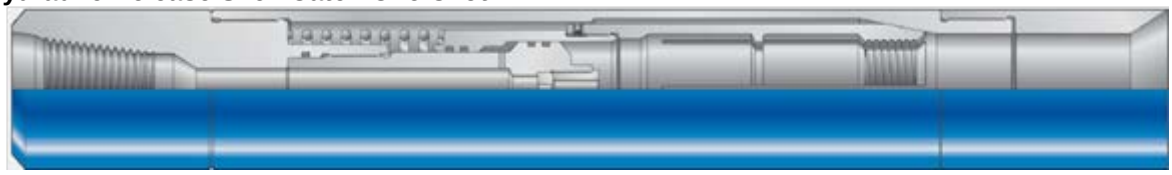
Advantages

- High Strength
- Can be used for jarring operations
- Flow path permits washing debris from the top of the fish or profile
- No Shear screws
- Design minimizes stress on the grapple section
- Tool can be released and relatched repeatedly without tripping to surface

Hydraulic Release JDC Overshot



Hydraulic Release Slick Catch Overshot



Specification Guide

Tool OD		Tool ID		Make up Length		Tensile Rating	Catch Size
in.	mm	in.	mm	in.	mm	lb	
2,75	69.85	0,25	6,4	21,65	550,0	32.000	2,31 FN
2,80	71,1	0,25	6,4	21,65	550,0	41.000	2,31 FN

Hydraulic Release Overshots

Specification Guide (Hydraulic Release JDC Overshot)

Tool OD		External Fishing Neck size	Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	in.	mm	lb	
1,44	36,6	0,88	15,98	406,0	15.000	3/4" CS Hydril
1,44	36,6	1,00	15,98	406,0	17.000	3/4" CS Hydril
1,63	41,4	1,19	15,98	406,0	19.000	3/4" CS Hydril
1,81	46,0	0,88	17,40	442,0	12.000	1" AMMT
1,81	46,0	1,00	17,40	442,0	19.000	1" AMMT
1,81	46,0	1,19	17,40	442,0	24.000	1" AMMT
1,81	46,0	1,38	17,40	442,0	24.000	1" AMMT
2,13	54,1	1,38	13,32	351,0	28.000	1-1/2" AMMT
2,25	57,2	1,00	18,62	473,0	16.000	1-1/2" AMMT
2,25	57,2	1,19	18,62	473,0	21.000	1-1/2" AMMT
2,25	57,2	1,38	18,62	473,0	28.000	1-1/2" AMMT
2,28	57,9	1,75	19,17	487,0	24.000	1-1/2" AMMT
2,63	66,8	1,19	18,00	457,0	20.000	1-1/2" AMMT
2,63	66,8	1,38	18,00	457,0	30.000	1-1/2" AMMT
2,63	66,8	1,75	18,00	457,0	54.000	1-1/2" AMMT
2,75	69,85	2,20	21,65	550,0	32.000	2-3/8" PAC DSI
2,80	71,1	2,31	21,65	550,0	41.000	2-3/8" PAC DSI
2,88	73,0	2,00	24,00	610,0	46.000	2-3/8" PAC DSI
3,00	76,2	1,19	22,24	565,0	24.000	2-3/8" PAC DSI
3,00	76,2	1,38	22,24	565,0	32.000	2-3/8" PAC DSI
3,00	76,2	1,75	22,24	565,0	41.000	2-3/8" PAC DSI
3,00	76,2	2,31	22,24	565,0	59.000	2-3/8" PAC DSI
3,38	85,7	1,19	22,24	565,0	27.000	2-3/8" PAC DSI
3,38	85,7	1,38	22,24	565,0	34.000	2-3/8" PAC DSI
3,38	85,7	1,75	22,24	565,0	63.000	2-3/8" PAC DSI
3,38	85,7	2,31	22,24	565,0	86.000	2-3/8" PAC DSI
3,50	88,9	1,19	22,24	565,0	27.000	2-3/8" PAC DSI
3,50	88,9	1,38	22,24	565,0	34.000	2-3/8" PAC DSI
3,50	88,9	1,75	22,24	565,0	63.000	2-3/8" PAC DSI
3,50	88,9	2,31	22,24	565,0	86.000	2-3/8" PAC DSI
3,75	95,3	2,69	28,90	734,0	101.000	2-3/8" PAC DSI
3,75	95,3	2,75	29,00	737,0	117.000	2-3/8" PAC DSI
4,00	101,6	2,75	22,00	559,0	103.000	2-3/8" Reg
4,00	101,6	3,13	22,00	559,0	116.000	2-3/8" Reg
4,50	114,3	2,88	38,39	975,0	89.000	2-3/8" Reg

Hydraulic Release Overshots

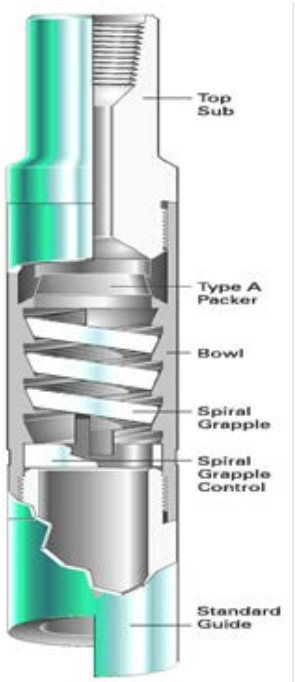
Specification Guide (Hydraulic Release Slick Catch Overshot)

Tool OD		Catch Size OD		Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	mm	in.	mm	lb	
1,81	46,0	0,88	22,2	19,69	500,0	37.000	1" AMMT
1,81	46,0	0,94	23,8	19,689	500,0	37.000	1" AMMT
1,81	46,0	1,00	25,4	19,69	500,0	37.000	1" AMMT
1,81	46,0	1,06	27,0	19,69	500,0	37.000	1" AMMT
1,81	46,0	1,13	28,6	19,69	500,0	37.000	1" AMMT
1,81	46,0	1,19	30,2	19,69	500,0	37.000	1" AMMT
1,81	46,0	1,25	31,8	19,69	500,0	37.000	1" AMMT
2,13	54,1	1,13	28,7	19,25	489,0	60.000	1-1/2" AMMT
2,13	54,1	1,25	31,8	19,25	489,0	60.000	1-1/2" AMMT
2,25	57,2	1,38	35,1	20,43	519,0	80.000	1-1/2" AMMT
2,63	66,8	1,25	31,8	20,94	532,0	87.000	1-1/2" AMMT
2,63	66,8	1,50	38,1	20,94	532,0	87.000	1-1/2" AMMT
2,63	66,8	1,75	44,5	20,94	532,0	87.000	1-1/2" AMMT
3,00	76,2	2,00	50,8	24,25	616,0	107.000	1-1/2" AMMT
3,00	76,2	2,13	54,1	24,25	616,0	107.000	1-1/2" AMMT
3,00	76,2	2,25	57,2	22,64	575,0	107.000	1-1/2" AMMT
3,50	88,9	2,25	57,2	24,41	620,0	182.000	2-3/8" Reg
3,50	88,9	2,38	60,5	24,41	620,0	182.000	2-3/8" Reg
3,50	88,9	2,50	63,5	24,41	620,0	155.000	2-3/8" Reg
3,75	95,3	2,88	73,0	23,62	600,0	155.000	2-3/8" Reg

Mechanical Release Overshots

SERIES 150 OVERSHOTS

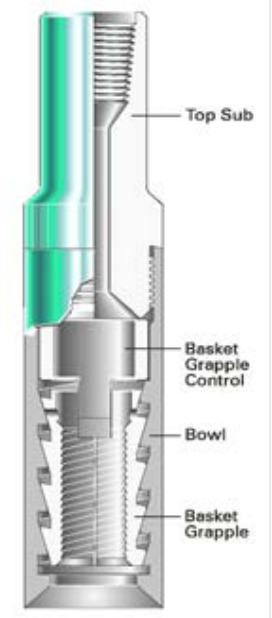
Series 150 Overshots provide the strongest tool available to externally engage, pack-off and pull a fish. The basic simplicity and rugged construction with which it is designed have made it the standard of all external catch fishing tools. The Series 150 Overshot has gained worldwide acceptance for fishing by means of external engagement of a fish. Each Overshot is a carefully engineered unit. In service, it takes a positive grip over a large area of fish and is therefore capable of withstanding extremely heavy pulling, torsional and jarring strains without damage or distortion to either the tool or the fish. Overshots are expertly constructed of the highest quality material and continually developed to new standards of strength and efficiency. Each Series 150 Overshot is a compact unit designed to engage, pack off and pull a specific size of tubing, pipe, coupling, tool joint, drill collar or smooth OD tool. Through the installation or proper undersize parts, they may be adapted to engage and pack off any smaller size.



Series 150 Spiral Grapple Overshot

SERIES 70 SHORT CATCH OVERSHOT

The Series 70 Short Catch Overshot is specifically designed to engage the exposed portion of a fish too short to be engaged with conventional catch overshots and where conditions prevent lowering the overshot past the fish. This tool will firmly engage a very short fish. The four pieces comprising the assembly cannot be incorrectly assembled. This tool is a simple and rugged. Each assembly is designed to catch a specific maximum OD and each assembly may be dressed with an undersized Grapple to engage any diameter smaller than maximum. The operation of the Series 70 Short Catch Overshot is identical to that of the well-known Series 150 Overshot: engagement is effected by slowly lowering the assembly over the fish while maintaining slow right hand rotation; release is accomplished by bumping down heavily and then slowly elevating the fishing string while simultaneously rotating slowly to the right.



Short-Catch Overshot

For detailed information regarding these products, contact our TOP TOOLS representative

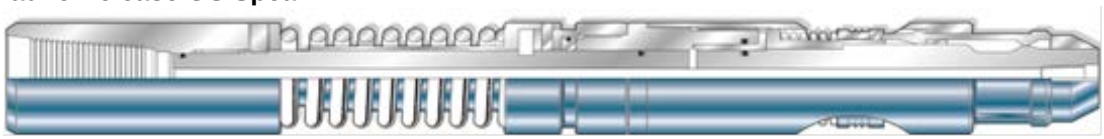
Hydraulic Release Spears

The Hydraulic Releasing GS Spear, specifically designed for thru-tubing fishing operations, is engineered to withstand the high tensile and compressive stresses encountered during jarring operations. These spears are designed to engage standard GS fish necks. The Hydraulic Releasing Slick Catch Spear, also engineered to withstand high tensile and compressive stresses, is used to engage slick ID fish necks. A flow path is provided through the tool to allow circulation while running in the hole. Once the profile/slick ID fish is encountered, the flow path can be used to create a jetting action to wash debris from the profile/slick ID fish.
To engage the profile or the slick ID of a fish, minimal set-down weight is applied which moves the collets into the release position allowing it to enter the fish ID. Once the spear has adequately entered this ID, the collets or slip will snap into the catch position. To release from the fish or GS profile, increased flow rate will move the collet or slip into the release position.

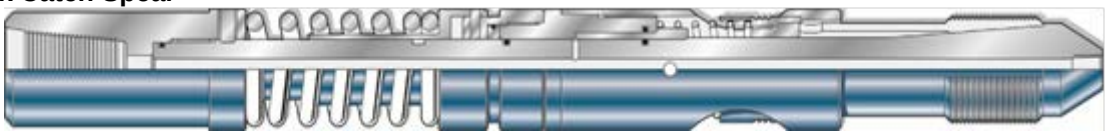
Advantages

- Maximum ID on collets or slips
- High tensile strength
- Pump through capabilities
- No shear screws
- Minimized stress on collets or slips
- Tool can be released and re-latched repeatedly without tripping to surface

Hydraulic Release GS Spear



Slick Catch Spear



Hydraulic Release Spears

Specification Guide (Hydraulic Release GS Spear)

Fishing Neck	Tool OD		Make up Length		Tensile Rating	Standard Connection
	in.	mm	in.	mm	lb	
1.50 GS	1,44	36,6	21,88	555,8	23.000	3/4" CS Hydril
2.00 GS	1,69	42,9	18,11	460,0	30.000	1.00" AMMT
2.50 GS	2,25	57,2	20,35	516,9	50.000	1-1/2" AMMT
3.00 GS	2,70	68,6	24,03	610,4	63.000	1-1/2" AMMT
3.00 GS	2,88	73,0	24,91	632,7	63.000	2-3/8" PAC DSI
3.50 GS	3,00	76,2	22,13	562,1	77.000	2-3/8" PAC DSI
3.00 GS	3,13	79,4	25,03	635,8	63.000	2-3/8" PAC DSI
4.00 GS	3,50	88,9	22,63	574,8	95.000	2-3/8" PAC DSI
5.00 GS	4,50	114,3	23,46	595,9	122.000	2-3/8" PAC DSI
6.00 GS	4,50	114,3	23,46	595,9	122.000	2-3/8" PAC DSI

Specification Guide (Slik Catch Spear)

Tool OD		Catch Range		Make up Length		Tensile Rating	Standard Connection
in.	mm	in.	mm	in.	mm	lb	
1,81	46,0	1.343 - 1.500	34.1 - 38.1	18,39	467,0	30.000	1" AMMT
2,00	50,8	1.440 - 1.625	36.5 - 41.3	18,39	467,0	30.000	1" AMMT
2,00	50,8	1.590 - 1.780	40.4 - 45.2	18,39	467,0	30.000	1" AMMT
2,25	57,2	1.750 - 1.970	44.5 - 50.0	20,43	519,0	66.000	1-1 /2" AMMT
2,25	57,2	1.938 - 2.156	49.2 - 54.8	20,43	519,0	66.000	1-1/2" AMMT
2,70	68,6	2.113 - 2.279	53.7 - 57.9	22,05	560,0	98.000	1-1/2" AMMT
2,70	68,6	2.206 - 2.489	56.0 - 63.2	22,05	560,0	98.000	1-1 /2" AMMT
3,00	76,2	2.460 - 2.810	62.5 - 71.4	22,64	575,0	99.000	2-3/8" PAC DSI
3,38	85,7	2.794 - 3.080	71.0 - 78.2	24,13	613,0	99.000	2-3/8" PAC DSI
3,38	85,7	2.900 - 3.190	73.7 - 81.0	24,13	613,0	99.000	2-3/8" PAC DSI
3,50	88,9	3.125 - 3.375	79.4 - 85.7	24,13	613,0	150.000	2-3/8" PAC DSI

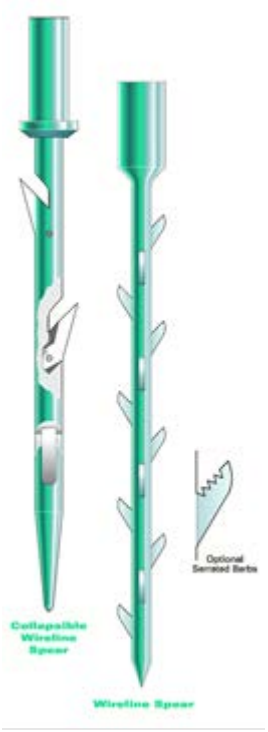
Wireline Slickline Grabs

Rope Spears are wireline fishing tools designed for fishing wire through restrictions or wire that has become balled up. The tools are manufactured from high tensile steel so that the prongs may be forced down into or around a reasonably compacted ball of wire. The design incorporates barbs on the ID only so that wire on the outside of the tools may be easily pulled down rather than having to yield the wire creating smaller unfishable pieces. Similar spears are manufactured without the latch in two and three prong designs.

Advantages

- Tools will fish wire through restrictions
- Tools will fish balls of wire without creating smaller broken pieces of wire
- Manufactured from AISI 4140 heat-treated alloy steel

The Rope Spear is a reliable and efficient wireline and wire rope retrieval tool. The rope spear retrieves all sizes of electric wireline, slick line, braided line or other types of wire rope that have been left downhole. It can also be used to retrieve control line or ESP cable that has been left downhole. This tool has been very successful in recovering these items in cased or open hole.
Note: It is recommended that a wire pusher always be run above the tool. It is recommended not to run this tool out of the bottom of the tubing end.



Advantages

- One of the industry's most reliable, efficient tools for retrieving wireline
- Proven track record of hundreds of successful runs and many years of maintenance free service
- Retrieves cut wireline and rope still attached to a tool stuck downhole

Tubing/Casing Anchors

The Hydraulic/Mechanical Tubing Anchor is used to anchor the bottom hole assembly inside the tubing during cutting operations. The Hydraulic/Mechanical Tubing Anchor uses a cone and collet to anchor the tool to the tubing. The collet is attached to a piston so that hydraulic pressure is used to activate the tool. Mechanical downward force then holds the anchor while other operations are performed. The tool is designed so that the top sub and bottom sub can be reversed. This allows the tool to be run reversed using tension to hold the anchor.

Advantages
Hydraulically activated
Will eliminate movement of coiled tubing while cutting
Can be run in conjunction with a workover mud motor
Optimum slip design
Can be run reversed for upward anchoring use

Specification Guide

Service	Tool OD		Tool ID		max Catch ID		Make up Length		Tensile Rating
	in.	mm	in.	mm	in.	mm	in.	mm	lbs
standard	1,69	42,9	0,47	11,9	1,99	50,5	21,89	556,0	22.000
standard	2,06	52,4	0,63	15,9	2,44	62,0	31,14	791,0	44.000
standard	2,50	63,5	0,63	15,9	3,54	89,9	31,14	791,0	44.000
standard	3,13	79,4	1,00	25,4	4,09	103,9	34,84	898,0	83.000
standard	3,13	79,4	1,00	25,4	4,09	103,9	34,84	885,0	83.000
standard	3,50	88,9	1,00	25,4	4,89	124,2	34,84	898,0	83.000
standard	3,50	88,9	1,00	25,4	4,89	124,2	34,84	885,0	83.000
standard	5,25	133,4	1,00	25,4	6,27	159,3	34,84	898,0	83.000

Work Over Motor

The TOP TOOLS Work Over Motor (Duratorque Series) incorporates a PDM design with modular capabilities and "fit for purpose" power section configurations. The TOP TOOLS Duratorque can be configured and aligned to suit a wide range of Thru Tubing Applications.

The TOP TOOLS Duratorque is a versatile design incorporating separate stator, top sub and bearing housing to allow "plug and play" of new modular power sections, tailored to suit specific work over applications. The modular design allows utilization of proprietary fluid and air power section technology that addresses most well bore temperature ranges and compatibility with well bore fluids. The air power sections specifically address single and two-phase flow applications with nitrogen. The Special Drive Sub increases the ability of the motor to withstand the most severe cyclic and bending stresses encountered during operations.

The operating pressures and flow rates required to run the TOP TOOLS Duratorque are aligned with coiled tubing and slim pipe to achieve optimum horsepower. Slower rotational speeds improve performance of milling and cutting products and increase reliability during workover operations such as milling, underreaming, cutting, wash over or any other operation requiring rotation of a down hole assembly.

Advantages

- Modular design for customized operations
- Controlled rotational speeds protects cutting matrix
- Increased reliability in high end applications (i.e., window milling)
- Proprietary stator technology
- May be powered by fluid/air/foam
- Capable of operating in temperatures up to 218 °C (425 °F)

Specification Guide

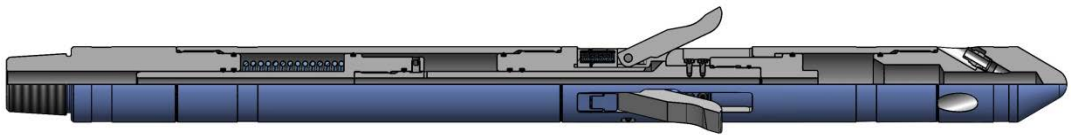
Tool OD		Power Section	Standard Connection	Make up Length		Flow Rate		Speed	Maximum Torque	
in.	mm			ft	m	gpm	lpm	rpm	ft/lbs	Nm
1,69	42,9	169R 5644	1" AMMT Box x Box	9,37	2,86	25-45	95-170	70 290	225	305
2,13	54,1	212R 5660	1-1 /2" AMMT Box x Box	11,38	3,47	20-50	75-190	80 465	320	434
2,88	73,2	288R 5633D	2-3/8" PAC DSI Box x Box	10,82	3,30	30-120	110-450	226 565	1785	2420

Tubing Cutter Type TTR

The TOP TOOLS Tubing Cutter is a 3 bladed hydraulically activated cutting device used to cut downhole production tubing, casing and drill pipe, providing a safe alternative to chemical and explosive cutters. The tool is run in conjunction with a positive displacement motor and can be run on coiled tubing or jointed pipe. A high expansion hydraulic anchor is also available and is typically included in the cutting assembly to prevent any movement of the cutter during activation which is a common cause of failure. The tool incorporates a dual activation piston which increases the axial load on the cutter blades to ensure a clean and efficient cut. Circulation through the jet sub creates the internal pressure required to shift the dual piston and blade cams which force the cutter blades to expand. The jet sub incorporates interchangeable jetting nozzles to adjust the flow rate required to achieve the desired activation pressure. The upward facing jets help to clean the cut area while also cooling the cutter blades. On completion of the cut the spring loaded blade return mechanism ensures the cutter blades are returned to the run-in position and retained within the body of the tool. The cutter blades can be dressed with a variety of cutting structures with each set of blades purpose built and designed to suit the particular size and grade of tubing /casing to be cut.

Advantages

- Modular design for customized operations
- Cutting diameter quickly adjustable by changing the blades
- Arrangement, quantity and diameter of the Jet Nozzles are modifiable
- Dual activation piston for clean and efficient cut
- Three blade design for maximum stability
- Fully field redressable
- Variety of cutting structures to suit all material grades



Specification Guide

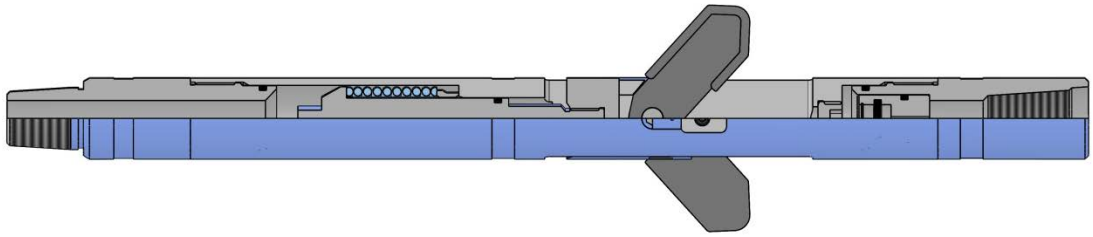
Tool OD		Max. Cutting Diameter		Make up Length		TensileRating
in.	mm	in.	mm	in.	mm	lbs
2,875	73,1	5,9	150	38,5	978	

Hydraulic Under-Reamer

The TOP TOOLS Hydraulic Under Reamer is designed to clean or remove cement or scale from the inside diameter of downhole tubular.
The tool is mostly run in hole in the collapsed position and once the desired depth is reaches, by increasing the pump-rate through the tool, will expand the blades to the correct diameter. Maintaining this flow-rate through the tool maintains the blades at the expanded diameter.
Once the clean-job has been successfully completed, by reducing the blades collapse into the body.

Advantages:

- Positive blade retraction and expansion; this allows pumping at a reduced rate whilest running in hole.
- Tool design allowes reaming in both directions
- Blades can be supplied dressed with any of the conventional cutting matrix depanding upon scale or cement properties



Specification Guide

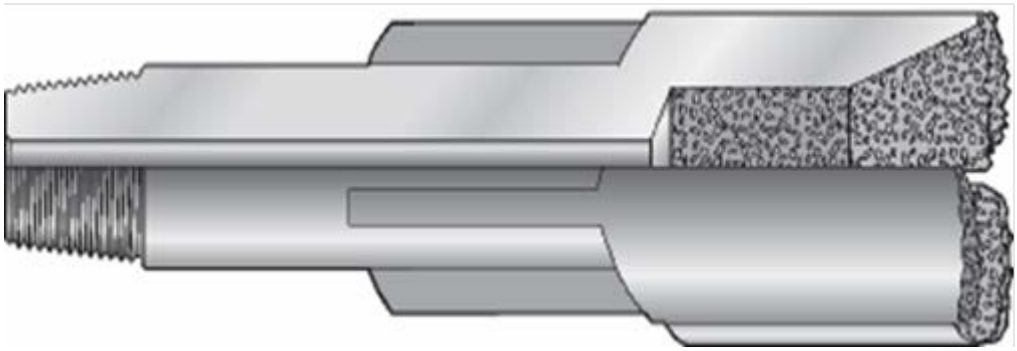
Tool OD		Max. Cutting Diameter		Make up Length		TensileRating
in.	mm	in.	mm	in.	mm	Lbs
2,125	54	7	177,8	38,5	670	

Bladed Superloy Junk Mill

TOP TOOLS Superloy Bladed Junk Mills are designed for the milling of debris where milling inserts are considered to aggressive. These mills operate very well in the removal of composite bridge plugs. TOP TOOLS Superloy Mills are ideal for use on workover motor operations since it creates small cuttings and does not need high set down weight to perform optimally. TOP TOOLS offers a variety of sizes and configurations accommodating all common casing and tubing sizes.

Advantages

- Increased Mill life
- Smaller cuttings
- Accommodates Motor operations

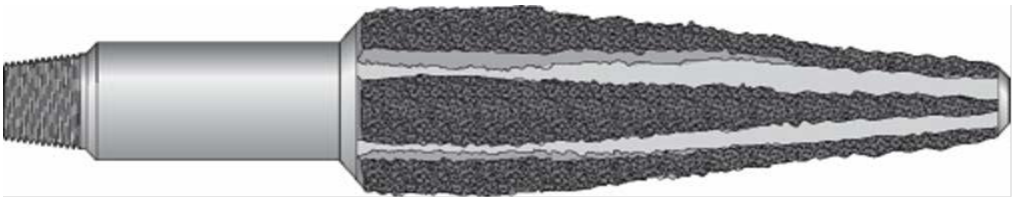


Superloy Taper Mill

The TOP TOOLS Taper Mills are designed to enter restricted areas in casing, tubing, or open hole and remove restrictions or obstructions by milling. Taper Mill designs vary based in the intended use. Taper Mills designed for uses inside casing are dressed with SUPERLOY from the reduced OD at the bottom of the mill to the full drift of the casing. Once full drift OD is reached, the Taper Mill will have a length of smooth, turned down SUPERLOY for stabilization, minimizing any unnecessary casing damage. For openhole applications the rough SUPERLOY Cutting Structure would extend over the entire dressed area of the mill. The Taper Mill also acts as a guide when entering the casing.

Advantages

- Mills restrictions from the casing/tubing ID
- Normally dressed with SUPERLOY
- Can be used to open a damaged window
- Can be dressed rough or smooth OD



Water Melon and String Mill

The TOP TOOLS String and Watermelon Mills are designed with many functions in min. One function of the mill is to elongate casing windows during a whipstock operation. They can also be used to remove tight spots, restrictions, or dog legs in casing. The mills have a standard thread connection to eliminate crossovers.

Advantages

- Mills restrictions from the casing ID
- Normally dressed with SUPERLOY
- May be inserted into workstring at any point
- Can be dressed rough or smooth OD

String Mill

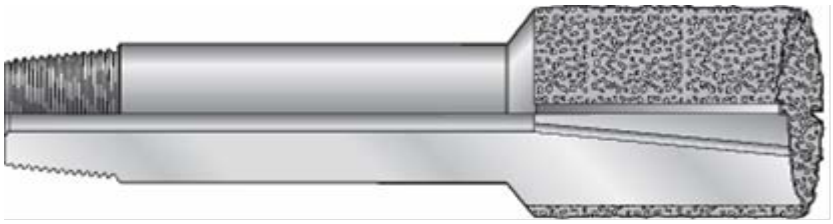
Water Melon Mill

Concave Bottom Superloy Junk Mill

The TOP TOOLS Concave Bottom Junk Mill is dressed with SUPERLOY on the OD and has a slight concave bottom. The mill is used for milling bit cones or other objects where it is advantageous to keep the fish cantered under the mill for greater effectiveness.

Advantages

- Ideal for milling loose Items
- Can be spudded on
- Dressed with SUPERLOY

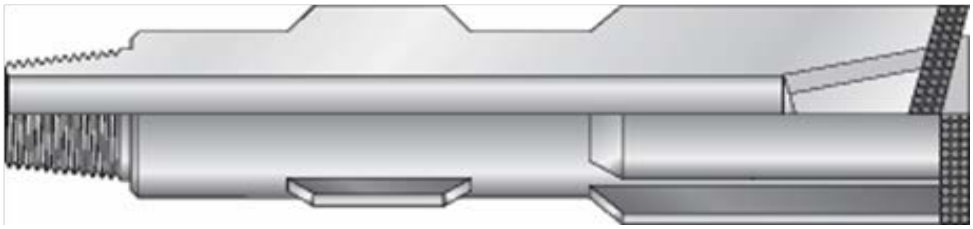


Tungsten Carbide Junk Mill

TOP TOOLS Tungsten Carbide Junk Mills are designed for the milling of several types of obstructions and loose debris.
The Tungsten Carbide Buttons technology stands for maximum rate of penetration and extended mill life. The mill design is ideal for motor operations because of low weight, high speed operations. These are a variety of designs which will meet most milling applications, with special designs manufactured on request. TOP TOOLS maintains a large and varied inventory which will accommodate most casing and tubing sizes.

Advantages

- Increased penetration rates
- Increased mill life
- Smaller cuttings
- Superloy backing



Tungsten Step Mill

The TOP TOOLS Tungsten Step Mill is designed for the removal of nipple profiles using low torque output motors. The design proves to be extremely effective and has been used for the economical removal of any ID restriction, including barium sulphate and other scales. The design allows for only a small amount of cutting per OD increase in the mill. The step feature not only keeps torque and cutting size to a minimum, but also leaves a machine like finish on the surface milled. Wear pads at the largest OD of the mill reduce risk of damage to the tubing or casing string. The step mill has been built in sizes ranging from 1-1/2" (38.1mm) to 8-1/2" (215.9 mm) OD. The mill may be manufactured with a pilot for additional stabilization.

Advantages

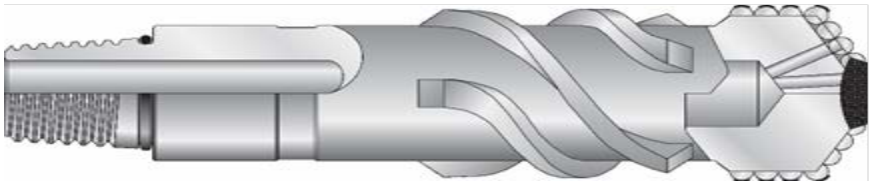
- Low torque application
- Machine like finish left on milled surface
- Longer mill life
- Will not damage outer string

Tungsten Top Scale Mill

The TOP TOOLS Top Scale Mill is designed for the removal of scale utilizing a coiled tubing deployed workover motor. The unique mill face design proves to be extremely effective and has been used for the economical removal of any scale type, including barium sulphate and other hard scales. The design allows for only a small contact area which results in low torque consumption to reduce stalling of the motor. Stabilizers on the body behind the milling matrix reduce the risk of damaging the tubing or casing wall. The Top Scale Mill has been built in various sizes and configurations.

Advantages

- Unique mill face design
- Multiple cutting matrices available
- Small contract area for low torque consumption
- Non-aggressive to tubing wall through stabilization



Rotary Shoes

TOP TOOLS Rotary Shoes are made from heat-treated alloy steel and dressed with SUPERLOY or Tungsten Carbide Buttons. They are used on the bottom of washpipe in washover or milling operations. The specific application will dictate the type shoes best suited for the job.

Note: Consult your TOP TOOLS representative for specific recommendations.

TOP TOOLS Type A Rotary Shoe (Tooth Type)

The Type A Rotary Shoe is used for washing over. Mill tooth design permits maximum circulation consistent with limited clearances. This shoes cuts on the bottom only.

TOP TOOLS Type B Rotary Shoe (Flat Bottom)

The Type B Rotary Shoe is used to cut metal on the fish where clearances are small. This shoe cuts on the inside and bottom only.

TOP TOOLS Type C Rotary Shoe (Flat Bottom)

Similar to the Type B Shoe, the Type C Rotary Shoe has an internal upset for use where clearance permits. This shoe cuts on the inside and bottom only.

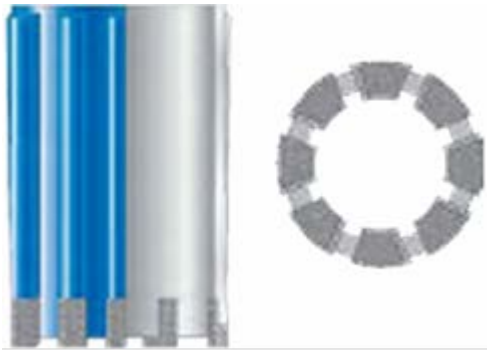
Rotary Shoes

TOP TOOLS Type D Rotary Shoe

The Type D Rotary Shoe (Scallop Bottom) is used to wash over and cut on the bottom face only. Does not cut on the ID or OD.

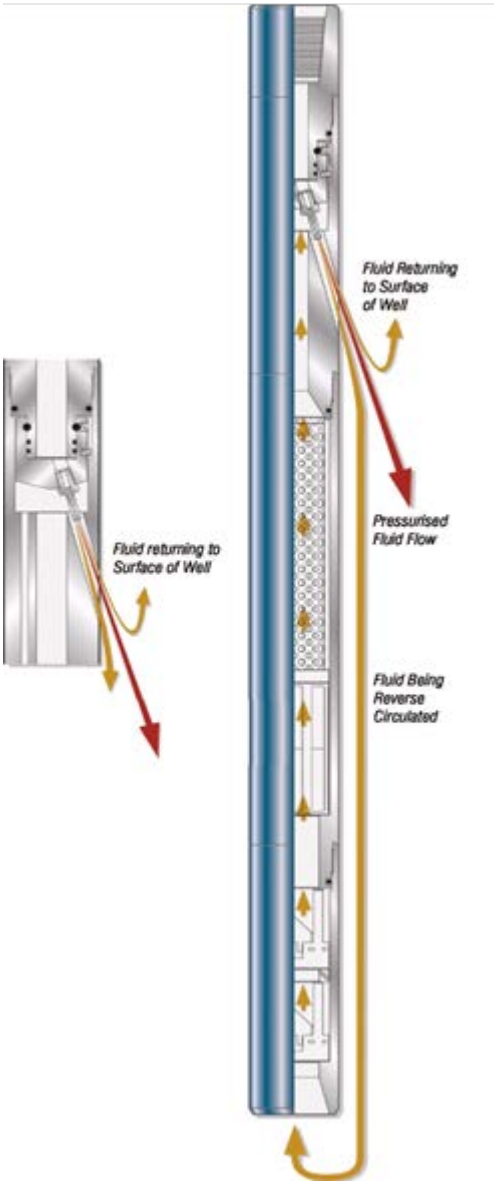
Tungsten Carbide Button Rotary Shoe (Crown Type)

The Tungsten Button Rotary Shoe is used to wash over and cut on the bottom face and ID only.



Venturi Jet Junk Basket

The **Venturi Jet Junk Basket** is used to remove various types of high-density debris and formation particles within small diameter cased and open wellbores that are too heavy to be circulated to surface. Flow in the top of the tool passes to the outside via adjustable jets. The jets cause a pressure drop on the inside of the Venturi Basket, which acts as suction at the bottom inlet of the tool. Fill is stirred up by the flow coming down the outside of the tool. With the suction at the bottom inlet, the fill is then carried through finger cages in to the tool's internal filter. The strained fluid then passes out at the top with the pumped fluid. The fill is then trapped between the filter above and the finger cages below. Extensions increase the amount of fill dirt that can be brought to surface on each trip. Venturi Jet Junk Baskets can be fitted with a dressed shoe and can be run below workover motors to "break up" and retrieve debris which may be compacted.



Advantages

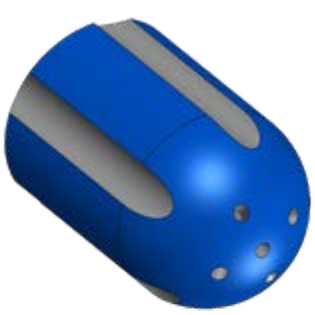
- Fully closed finger or flutter catchers
- Can be run with any type of dressed shoe
- Have adjustable reservoir through extensions

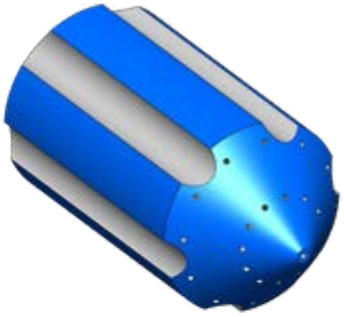
Specification Guide

Tool oD		Standard Connection	Minimum Flow Rate		Maximum Flow Rate	
in.	mm		gpm	lpm	gpm	lpm
1,69	42,9	1" MT Pin	12,5	46,8	85	319
2,06	50,8	1.5" MT Pin	12,5	46,8	85	319
2,63	66,6	1,5" MT Pin	12,5	46,8	120	450
3,13	79,3	2-3/8" PAC DSI Pin	12,5	46,8	135	506

Wash and Jet Nozzels

The TOP TOOLS Wash Nozzles are available in a range from 1-11/16" to 6-1/2", other sizes on request. The Wash Nozzles are designed to clean under different angles with a certain cleaning force. The Wash Nozzle is also useable for gas lifts, sand clean outs, acid washes/squeezes, soaks and with Tungsten inserts as tubing puncher.
The Top Tools Jet Nozzle is specially designed for Coiled Tubing Applications. A wide variety of Jet Nozzles is available for cleaning operations. The TOP TOOLS Jet Nozzles are used on all operations where high velocities of fluid are required. The expected flow rate thru the CT is calculated and then the available pressure drop across the nozzles referenced to ensure the correct number and size of holes in the tool. To prevent the Jet Nozzles from blocking it is recommended to use a downhole and surface Filter.





Indexing / Kickover Tools

The Indexing Tool rotates the bottom hole assemblies in 60 deg increments. You can use the Indexing Tool to by-pass ledgers or obstructions, rotate Fishing Tools, or align BHA with fish. The Indexing Tool is available with either mechanical or hydraulic activation.
The mechanical model rotates by applying slack off weight. Each time slack off weight is applied, partial rotation occurs. When relieved, the bottom sub of the tool completes the 60 deg incremental rotation.
Hydraulic models rotate partially each time the pump rate is increased to exceed the pre-set activation rate. When circulation is stopped, the 60 deg incremental rotation is completed. Hydraulic models also rotate by applying and relieving slack off weight.

Advantages

- Mechanical or Hydraulic/Mechanical
- Large Bore ID
- Rotation Concurrent with Weight Appl.
- Heavy Duty Design for installation in Fishing Strings

A mule shoe attached to the Indexing Tool can help by-pass a liner top.
A cut lip guide or mule shoe attached to an Catching Device and installed below the Indexing Tool can help align with a fish.

Specification Guide

Tool oD		Standard Connection	Tool Length		Maximum Tensile Strenght	
in.	mm		Inch	mm	#	Kg
1,69	42,9	1" MT Pin	29,0	736,0	35000	16000
2,13	50,8	1.5" MT Pin	30,0	762,0	44000	20000

TTX Running Tool

The TOP TOOLS TTX Hydraulic Runningtool is designed to deploy X & R type lock mandrels on coiled tubing. Fully hydraulic, the TTX is capable of landing nipple selection, landing nipple location, lock mandrel closure, and separation (pin shear) between the lock mandrel and running tool. Lock mandrels can be attached to the TTX in either the selective or locate position. A low rate of circulation can be maintained while running in the well. An increased circulation rate exceeding the pre determined setting will activate the tool through the setting cycles.

Advantages

- Fully hydraulic
- Open bore
- Not dependent on ball drop
- No jar action required
- Positive lock out between stages

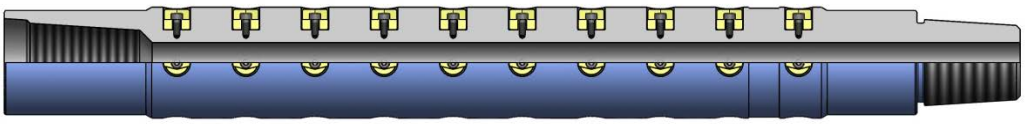
X & R - a trademark of Halliburton Energy Services

String Magnet

The TOP TOOLS magnet tools are specially designed to remove metal debris and (milling) cuttings from the well. Small metal pieces can also be fished from the well, e.g. broken fingers from running/pulling tools. The magnet bar is run in the tool string during milling jobs to help remove milling cuttings in situations with either low annular velocity or well fluids with poor carrying capacity. Normally the magnet bar will be run directly above the motor or milling assembly.

Advantages

- Catch metal debris, cuttings and small metal pieces
- Helps to keep debris out of the mud system
- Magnets are replaceable
- The magnet bar can be run anywhere in the toolstring

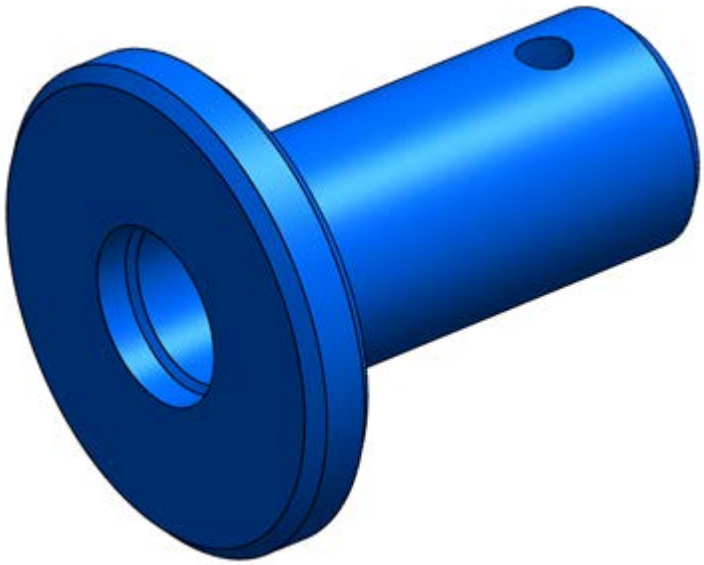


Pull/Pressure Test Plate

The Pull/Pressure Test Plate is a Tool designed to save install a Coiled Tubing Connector. The Pull/Pressure Test Plate can be used to hammer the Coil connector into the correct position because the bleed off port is looking to the side. With the short design it is possible to perform Pull Test against the stripper or raiser connection. The Pull/Pressure Test Plate is available in three different Sizes and is tested to pressures up to 500 bar.

Advantages

- Bleeder Port is at side
- Short design
- Good for 500 bar Pressure

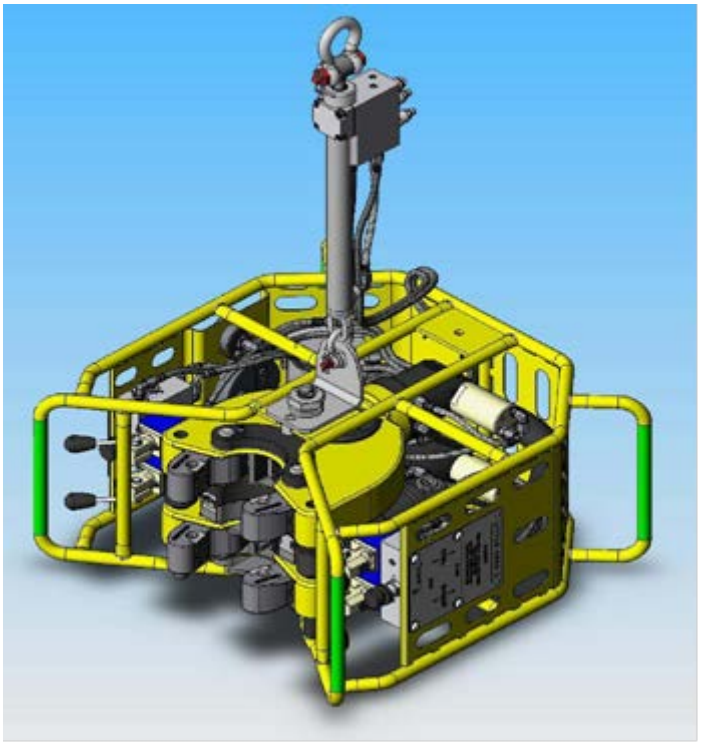


Specification Guide

Type	Plate OD		Pressure Rating		Tensile Rating	standard box Connection
	in.	mm	bar	psi	lb	
PTP	4,50	114,3	500,00	7250,0	60.000	1" AMMT
PTP	5,00	127,0	500,00	7250,0	90.000	1.5" AMMT
PTP	6,50	165,0	500,00	7250,0	130.000	2-3/8" PAC DSI

Hydraulic Tongs

The Mini Tong (Little Jerk 2) was designed with rig floor and service shop safety in mind. Extensive industry operator input was obtained in its development to ensure that the tool was designed to be practical. This compact service tool provides a safe and easy way to make up and break out connections on small tools and pipes. The unit is easily handled and controlled and can be operated from a variety of power sources.



Specification Guide

Size: LxWxH	op.Pressure	Distance between Jaws	Weight	Max. Torque
inch	psi	inch	lbs	ft/lbs
24,25x22,88x15,25	2900	3	226	5000
mm	Kpa	mm	kg	Nm
616x581x400	20000	76	102	6800

Sliding Wedge Overshot

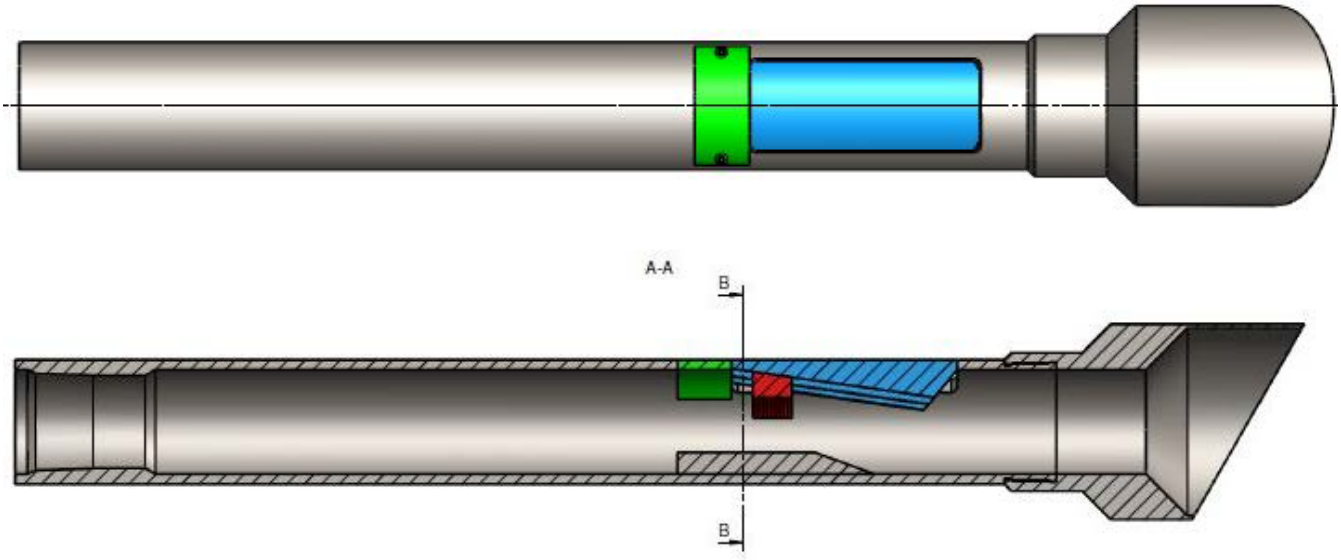
The Sliding Wedge Overshot is a simple bulldog overshot design. It is used to retrieve small diameter work strings, sucker rods or coiled tubing. The Sliding Wedge Overshot has an internal slip which moves up a tapered slip guide. The tapered slip guide is largest at the lower end of the overshot so the slip is pushed up as the fish enters the overshot. When the overshot is raised, the slip slides down the slip guide, pressing the fish against the anvil (opposite the slip guide) and engages the fish.

The Sliding Wedge Overshot is manufactured with wash pipe connections. This allows wash pipe to be run above the overshot if the work string ID is insufficient to swallow the fish. This also allows for a washover shoe to be run below the overshot to dress off or cut debris away from a fish.

The Sliding Wedge Overshot is **not releasable downhole**.

Features/Benefits

- Slip is only moving part.
- Fish is engaged without rotation.
- Simple to operate.
- Slips are carburized for hardness and to retain sharp wickers.
- Optional oversize guides available to prevent overshot from missing fish when washing over.
- Optional guides dressed with Superloy sintered tungsten carbide to mill off flared ends or tops of tubing.
- Can be dressed for multiple catch.



Sliding Wedge Overshot

Specification Guide

Size	Minimum Catch	Maximum Catch
2-1/8	0.000	0.625
2-1/4	0.468	1.062
3-1/8	0.750	1.500
3-1/2	0.625	0.625
3-3/4	0.625	0.625
3-13/16	0.625	0.625
4-1/8	0.750	2.000
	0.000	1.406
4-1/2	0.670	2.062
	0.000	1.391
	0.730	2.179
	0.000	1.449
5-3/4	1.000	1.688
	0.000	0.688
	1.000	1.688
	0.000	0.688
	1.250	2.750
	0.125	1.700
	1.000	1.688
	0.000	0.688
	1.000	1.688
	0.000	0.688
	1.000	1.688