Schlumberger

Fishing Tools and Services

Fishing Tools and Services

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Casing Backoff Tool

Perform casing backoff in vertical and horizontal wells

Applications

Replacing worn or damaged sections of uncemented casing, in vertical or horizontal wells

Benefits

- Provides backoff solution for horizontal wells
- Simplifies operations by eliminating need for left-hand drillstring
- Facilitates operations by leaving threaded connection for re-engaging new casing string after worn casing is removed
- Supports further drilling by eliminating reduced casing drift diameter resulting from internal casing patches
- Contributes to operational safety by maintaining original casing strength and integrity

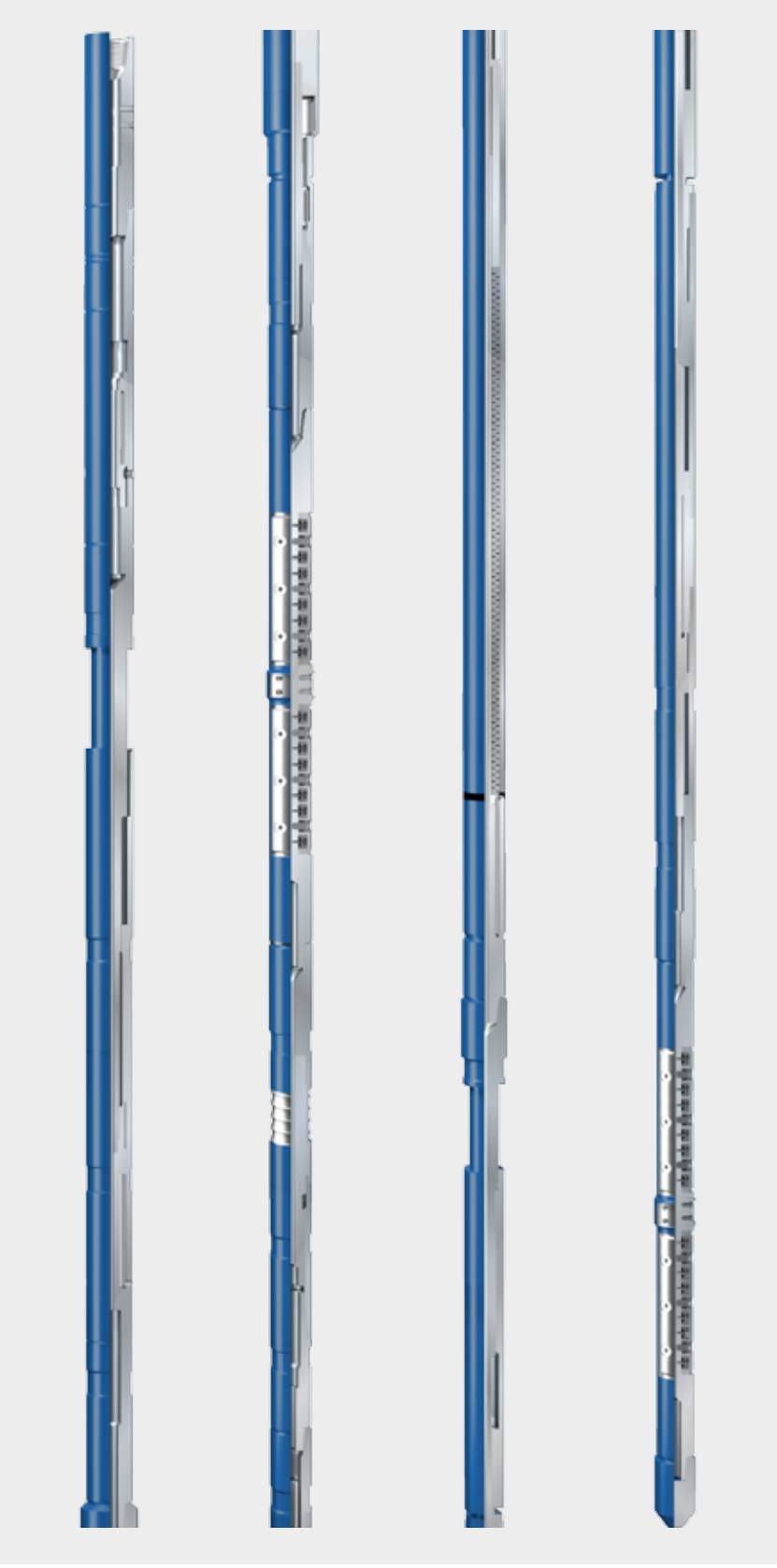
Features

- Hydraulic anchors eliminate need for drill collar weight to achieve backoff
- Tool generates up to 60,000 ft.lbf
- Tool design eliminates need for overtorquing connections in a left-hand workstring on a “blind” backoff from surface

The casing backoff tool facilitates backoff of uncemented casing stumps at a selected coupling location downhole after a section has been cut and retrieved. The tool is effective in vertical or horizontal wells.

The tool features nine subassemblies, including two hydraulic anchors and a torque generator. The hydraulic anchors allow the backoff tool to be used in horizontal wells because drill collar weight is not required to hold the anchors open. The tool is cycled, and, using hydraulic pressure only, the torque generator and anchors work in tandem to breakout and unscrew the casing threaded connectors with approximately one-half turn per cycle. When connection torque is sufficiently lowered, the backoff tool is pulled out of the hole, and a casing spear is run to complete the unscrewing and recovery of the casing stump. A threaded connection remains downhole for the new casing string to be stabbed into and made up.

Schlumberger can also supply subs for aligning the old and new casing strings to facilitate proper makeup downhole.



Casing backoff tool

External Casing and Tubing Patches

Repair casing in regular or slimhole wellbores

Applications

Restoring integrity to damaged tubulars in regular or slimhole sections

Benefits

- Simple, economical installation
- Minimal impact on further drilling because it does not restrict casing ID

Features

- Lead or packer-type sealing mechanisms available
- Extensions for underwater wellhead applications available for packer-type patches
- Corrosion-resistant alloys (CRA) and low-yield alloys available for sour service wells by special order
- Regular or slimhole versions available

External casing and tubing patches are designed to repair damaged casing or tubing strings quickly and economically, without reducing the ID. The casing or tubing string must be removed to a point below the damaged section. The top of the casing or tubing stub is then dressed with a milling tool, and the patch is run over the casing or tubing to a depth sufficient to engage the slip. The external casing patch is available in standard and slimhole types. The slimhole version is ideal for small, restricted wellbores or for use below a restriction.

Ordering instructions: Please specify

- Casing or tubing size and top connection
- Actual casing OD
- Pressure requirements
- Regular or slim (order regular series where clearances permit)

External casing and tubing patches

Internal Casing Patch

Applications

- Repairing downhole casing damage from corrosion or wear
- Sealing old perforations and leaking connections
- Providing added protection to weak casing points

Benefits

- Reduced rig time for patch setting
- Minimal casing ID restriction once set
- Positive anchoring system during all subsequent operations

Features

- Reliable PLI anchoring subassembly
- Effective without high expansion ratios

The internal casing patch is used to repair corroded or worn casing, sealing leaking connections and perforations, and provides added protection to casing weak spots. The internal casing patch is made of three components: anchor setting assembly, expansion assembly, and a steel patch.

Prior to setting the inner casing patch, it is recommended to perform a cleanout run. Brushing, scrapping, milling out previous plugs, and de-burring perforations should be handled during the cleanout run. Once the casing has been cleaned, a caliper or casing drift is recommended to ensure proper patch size.

The patch setting process involves tripping to the desired depth and dropped an activation ball. Once the ball is engaged, pressuring up to 1,800 psi initiates the anchor setting, and is completed in 1 to 2 minutes. Pressure then is increased to 2,000 to 3,000 psi for completion of the anchor setting. Once the anchor is set, increasing pressure to 2,500 psi shears the ball seat. Once the ball seat is sheared, picking up the workstirng with 25,000 to 30,000 lbf releases the setting tool from the casing patch body. When the workstirng is pulled through the patch with a force of 35,000 to 45,000 lbf, the patch expands and creates a seal across the repaired casing interval. Total pickup distance from start to finish is approximately 24 ft.

Specifications		
Casing size and grade	7-in, 23–26 lbf	7-in, 29–32 lbf
Patch OD, in	6	5¾
Patch thickness, in	⅛	⅛
Standard OAL, ft	24	24
Standard patch length, ft	20	20
Max temperature, degF	200	200
Internal pressure rating, psi	1,000	1,000
External pressure rating, psi	500	500
Patch material	carbon steel	carbon steel
Maximum expansion load, lbf	45,000	45,000

Internal casing patch

Casing Swage

Restore casing to original shape

Applications

Restoring dented, buckled, or collapsed casing to near its original shape

Benefits

- Uses force from downhole impact equipment: bumper subs or drilling jars

Features

- Simplified construction enhances tool durability
- Tapered anvil construction efficiently reforms casing
- Incremental sizes enable swaging various degrees of casing collapse

The casing swage restores dented, buckled, or collapsed casing to near its original shape and diameter. The tapered anvil construction of the casing swage uses mechanical force supplied by downhole impact equipment such as bumper subs or drilling jars to open casing obstructions to near their original diameter.

Casing swage

EFL Rotating and Releasing Spear

Conduct fishing operations when external catch tools are not feasible

Applications

- Fishing of drillpipe, casing, tubing, and downhole equipment that cannot be engaged with external catch tools

Benefits

- Reduces maintenance costs by using less expensive disposable wear slips

Features

- Disassembles into five separate components for onsite service
- Resets to catch position downhole with one full left-hand rotation
- Maintains full bore in all sizes to accommodate wireline equipment
- Transmits torque to free fish when necessary

The EFL rotating and releasing spear ensures fishing operation success by engaging the fish ID in situations where external catch tools are not feasible, such as when fishing drillpipe, casing, or tubing. The spear features a full bore to facilitate the use of wireline equipment the during fishing operation.

EFL rotating and releasing spear

Specifications								
Tool OD, in	1 29/32	2 15/16	2 11/16	3 1/8	4 1/8	5 11/16	7 1/4	11 3/4
Tool ID, in	3/8	3/8	1/2	1	1 1/4	2 1/4	3	3 1/2
Spear length, in	30	30	38	40	47	50	55	60
Assembly number	14272	14273	14274	14275	14276	14277	14278	14279
For casing size, in	2 3/8 Tubing	2 7/8 Tubing	3 1/2 Tubing	4–4 1/2 Casing	5–5 1/2 Casing	6 5/8–7 1/8 Casing	8 5/8–11 3/4 Casing	13 3/8–20 Casing
Catch range min.–max., in	1.862–2.546	2.409–3.062	2.733–3.549	3.157–4.106	4.150–5.691	5.703–7.251	7.432–11.115	11.655–19.127
Tensile yield, lbf	98,200	145,000	244,000	187,444	360,000	934,000	1,400,000	4,800,000
Torsional yield, lbf.ft	2,030	3,630	6,530	7,430	17,900	70,600	133,000	600,000
Tool weight, lbm	25	35	50	65	150	250	460	1,560

Releasing Spear

Engages fish with IDs up to 20 in

Applications

- Internally engage and retrieve drillpipe, casing, tubing or any obstruction with a known ID

Benefits

- Reliable recovery with minimal distortion of fish
- Engages fish with IDs up to 20 in

Features

- Grapple and wicker design to ensure nearly 360° engagement
- Releases with right-hand rotation if necessary
- Sub-type nut available to make up tools below the spear
- Compatible with jarring assemblies, backoff, and pulling tools

The Itco-Type releasing spear is a superior fishing spear ensures positive engagement with fish. The Itco-Type releasing spear internally engages and retrieves drillpipe, casing, tubing, or any other obstruction with IDs up to 20 in. It is built to withstand severe jarring and pulling strains. Heavy-duty versions of the spear can be used with pulling tools to increase performance. It engages the fish over a large area to minimize damage or distortion of fish.

Itco-Type releasing spear

Pin Tap/Screw-In Sub

Pin taps provide an economical means to retrieve a tubular fish that is restrained from rotation. Pin taps are designed to mate with a box-up tool joint and include an open bore, allowing wireline tools to be run through the tap.

Note: Pin taps should be run in conjunction with a safety joint.

Pin tap

Taper Tap

Taper taps provide an economical means to retrieve a tubular fish that is prevented from rotating. One-piece taper taps are constructed with a fine thread form that enables the tap to work as a threading tool.

Note: Taper taps should be run in conjunction with a safety joint.

Specifications

Wicker size, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
¾–3⅛	2⅜ Reg	3⅛	1½	5,800	244,500
1–3½	2⅞ Reg	3¾	1½	11,100	413,550
1½–4½	3½ IF	4¾	2¼	19,000	777,000
2–6¼	4½ IF	6½	2 13/16	56,650	1,499,900
2¼–7¾	6⅝ Reg	8	3	96,000	2,077,200
2½–9¼	7⅝ Reg	9½	3¼	159,400	3,008,200

Taper tap

Box Tap/Die Collar

Box taps are designed to externally engage and retrieve tubular fish that can't be rotated. Available with a choice of special guides, box taps are well suited for threading facilitating engagement when threads are damaged.

Specifications

Wicker size, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
1¼–2⅝	2⅜ Reg	3⅛	1½	5,800	244,500
1½–3¼	2⅞ Reg	3¾	1½	11,100	413,550
2½–4⅛	3½ IF	4¾	2¼	19,000	777,000
3¼–5½	4½ IF	6½	2 13/16	56,650	1,499,900
4½–7	6⅝ Reg	8	3	96,000	2,077,200
5¾–8¼	7⅝ Reg	9½	3¼	159,400	3,008,200
7–9¾	7⅝ Reg	11	3¼	159,400	3,008,200

Box tap/die collar

Mechanical Casing Cutter

Easily convert to alternate cutting diameters for flexibility in casing and drillpipe cutting

Applications

- Cutting casing and drillpipe in multiple locations
- Cutting casing where circulation problems are encountered

Benefits

- Reduced rig time by easy conversion to alternate inside cutting diameters
- Greater efficiency with downhole resetting and disengaging capability

Features

- Adjusts to cut multiple casing sizes, often without tool conversion
- Disengages and resets to run-in position automatically when casing is cut

The mechanical casing cutter quickly converts to alternate inside cutting diameters, increasing flexibility while reducing rig time. The tool, used for casing sizes of 4½ in to 13⅜ in, consists of a friction assembly to assist setting the tool in the pipe, a slip assembly to anchor the tool, and a retractable cutting assembly. Frequently, no conversion of the tool is needed for cutting different diameters of pipe; often, only the slips and friction blocks need to be changed. The tool also features an automatic nut, which permits repeated resetting and disengaging of the tool without returning it to the surface.

Ordering instructions: Please specify

- Required tool series
- Size and weight of casing to be cut
- Number of sets of cutting knives required
- Top connection

Specifications

Tool Series	Tool OD, in	Casing Size, in	Top Connection	Fishing Neck OD, in	Tool Weight Approx., lbm
31	3	4–4½	2⅜ PAC	2⅛	45
36	3⅝	4½–5½	2⅜ IF	3⅝	66
37	3¾	4½–7	2⅜ IF	3¾	100
42	4¼	5–7⅝	2⅞ Reg	4¼	180
55	5⁹⁄₁₆	6⅝–9⅝	3½ IF	5⁹⁄₁₆	205
57	5¾	6⅝–13⅜	3½ Reg	4¾	260
77	7¾	9⅝–13⅜	4½ IF	6½	950
82	8¼	9⅝–13⅜	4½ IF	6½	990
117	11¾	13⅜–36	6⅝ Reg	8	2,750
160	16	18⅝–36	7⅝ Reg	9½	7,000

Note: Other connections are available to order, and pipe cutters can be built to cut other casing and tubing sizes. We only show the sizes of casings that we recommend cutting with each size of pipe cutter. Larger sizes can be cut, but because the long cutting arms required are fragile, great care must be exercised.

Internal cutter drag spring

Internal cutter wiper block

Washover Shoes

Frees stuck pipe in the wellbore

Applications

- Releasing stuck pipe lodged in the wellbore as a result of debris or obstructions

Benefits

- Reliably frees stuck pipe

Features

- Rugged N-80 grade or greater casing or tubing construction; higher specification materials available by special order
- Integral joints for job design flexibility
- Available in sizes 2¼ in to 24 in
- Other designs fabricated by special order

Washing over frees stuck pipe in the wellbore by cutting away and circulating out the obstructions blocking the pipe's movement. Schlumberger offers an array of washover shoes in various configurations for a range of downhole conditions. Washover shoes and associated equipment can also be specially fabricated for any job.

I Type

Wavy bottom

T Type

Specifications

Washpipe Size, in	Washpipe Max. OD, in	Max. Fish OD, in	Drift ID, in	Nominal ID, in	Makeup Torque, ft.lbf
5½	5½	4⅝	4.767	4.892	2,370
5¾	5¾	5	5.001	5.124	2,700
6⅝	6⅝	5¾	5.796	5.921	4,000
7⅝	8⅛	6½	6.640	6.765	4,340
7⅝	8⅛	6 11/16	6.750	6.843	4,340
7⅝	7⅝	6 11/16	6.750	6.875	6,120
8⅛	8⅛	7 1/16	7.125	7.250	8,370
9⅝	9⅝	8⅝	8.679	8.835	10,000
10¾	10¾	9½	9.604	9.760	16,000
10¾	10¾	9⅝	9.694	9.850	14,250
11¾	11¾	10⅝	10.724	10.880	16,250
13⅜	13⅜	12⅛	12.259	12.415	15,000
16	16	14½	14.683	14.870	47,000

Note: Additional sizes are available. For a complete listing, contact a Schlumberger representative.

Series 150-Type Releasing Overshot

Successfully retrieve tubular fish, including parted drillpipe and drill collars

Applications

- Engaging, packing off, and retrieving tubular fish especially drillpipe and drill collars
- Baiting damaged external fishing profiles
- Fishing operations requiring wireline compatibility

Benefits

- Range of strength categories provides flexibility
- Reliable fish recovery

Features

- Large open bore for use with wireline equipment
- Full 360° grapples evenly distribute gripping force

The Series 150-Type releasing overshot engages, packs off, and retrieves tubular fish, and is especially suited to retrieve parted drillpipe and drill collars. The Series 150-Type overshot features a large bore for use with wireline tools and is available in a range of strength categories for jarring and backoff operations.

The tool's unique tapered helix internal construction provides 360° wall contact while distributing loads evenly on the tool and fish. Spiral grapples or basket grapples are available. Spiral grapples are used when maximum catch size of the overshot is necessary, and expandable cylinder basket grapples are used when fish ODs are less than one-half inch of the tool's maximum catch size.

The Series 150-Type releasing overshot is available in full strength (FS), semi-full strength (SFS), slimhole (SH), and extra slimhole (XSH), to cover a range of external catch fishing requirements:

- **FS**—Engineered to withstand all pulling, torsional, and jarring strains
- **SFS**—Engineered for special hole conditions where maximum strength is required
- **SH**—Engineered to withstand heavy pulling strains only
- **XSH**—Engineered for pick-up jobs only

Series 150-Type releasing overshot

Specifications

Overshot OD, in	Bowen Assy. No.	Strength	Spiral Max. Catch, in	Basket Max. Catch, in
4⅛	5168	SH	4	3½
5⅝	C3796	FS	4½	3⅞
5⅞	C5171	SH	5	4½
6⅝	C5178	SH	5½	4¾
7⅛	C5196	SH	6	5⅜
7⅝	C5344	SH	6½	5¾
8⅛	C3263	SH	7	6¼
8⅝	12692	SH	7½	6⅞
9⅛	9290	SFS	7½	6¾
9⅝	264	FS	8	7¼
9¾	4837	XSH	8⅝	8
10⅝	C5321	FS	9	8¼
11¾	15250	FS	9½	8¾
11⅞	8969	FS	10	9¼

Note: Additional sizes are available. For a complete listing, contact a Schlumberger representative.

Series 70-Type Releasing Overshot

Retrieve tubular fish with short necks

Applications

- Engaging and retrieving tubular fish
- Baiting damaged external fishing profiles
- Fishing operations requiring wireline compatibility

Benefits

- Successfully retrieves of fish with short necks

Features

- Full 360° grapples to evenly distribute gripping force
- Expandable cylinder basket grapples for smaller diameter fish

The Series 70-Type releasing overshot is designed to engage, pack off, and retrieve tubular fish and is specifically designed to use when the top of the fish is too short to be engaged with a Series 150-Type overshot. With the grapple positioned at the bottom of the tool, the overshot is able to successfully engage fish with short necks.

The tool's unique tapered helix internal construction provides 360° wall contact while distributing loads evenly on the tool and fish. The Series 70-Type releasing overshot is equipped with expandable cylinder basket grapples to be used when fish ODs are less than one-half inch of the tool's maximum catch size. The Series 70-Type overshot is available in full-strength and slimhole configurations to cover a range of external catch fishing requirements:

- **FS**—Engineered to withstand all pulling, torsional, and jarring strains
- **SH**—Engineered to withstand heavy pulling strains only

Series 70-Type releasing overshot

Specifications (Partial Listing)

Overshot OD, in	Bowen Assy. No.	Strength	Basket Max. Catch, in
2 5/16	38506	SH	1 5/8
3 5/8	17615	SH	2 1/2
3 3/4	13535	SH	2 5/8
4 1/8	10434	SH	3 1/16
4 5/8	10290	FS	3 1/16
4 11/16	10543	SH	3 21/32
4 1/4	48881	SH	3 3/4
5 1/2	12785	FS	3 3/4
5 5/8	11297	FS	3 21/32
5 3/4	13065	FS	4 1/4
5 7/8	10560	SH	4 3/4
6 5/8	11303	FS	4 3/4
7 5/8	11630	FS	6
8 1/4	38939	FS	6 1/2

Note: Additional sizes are available. For a complete listing, contact a Schlumberger representative.

Rotating and Releasing Overshot

Externally engage fish under high torsional and tensile loads

Applications

- Externally engages of drillpipe, casing, tubing and downhole tools with right- or left-hand torque
- Functions as a left-hand high-torque overshot for use below the AJ reversing tool

Benefits

- Reliable performance for efficient recovery
- Durable design reduces fishing costs

Features

- Slips designed in segments to endure high-torsion and high-tensile load operations
- Lugs located between each slip provide high-torque lock
- Segmented slips more durable than grapples

The rotating and releasing overshot set the industry standard for reliability and flexibility for externally engaging fish under high-torsion and high-tensile loads. Its unique segmented slip design was developed to surpass the durability of conventional grapples. Lugs located between each of the overshot's slips provide a high-torque lock which provides unmatched gripping strength and reliability.

Schlumberger's standard rotating and releasing overshot assembly consists of a top coupling, body, standard guide, spring, slip carrier, one set of slips, and a blanking ring, all of which are constructed of high-strength steel.

Ordering instructions: Please specify:

- Tool OD
- Connection size and type
- OD of fish (slip catch size)
- Short catch or standard catch overshot body
- Lip guide or mill guide
- Packoff rubbers, carrier bushing, or special carriers (if required)

Rotating and releasing overshot

Specifications														
Tool OD, in		3¾	4⅝₃₂	4¹¹⁄₁₆	5⅜	5½	5¾	5¹⁵⁄₁₆	7¼	7½	7½	7¾	8½	9½
Overall Length, in	**Long**	32	39	41	43	43	44	44	51	50	50	54	54	62
	Short	23	28	30	30	32	32	32	33	33	33	34	37	38
Right-hand Assy. No.	**Long**	14315	14316	14317	14318	14319	14320	14321	14323	14324	14324	14325	14326	14327
	Short	15280	15281	15282	15283	15284	15285	15286	15288	15289	15289	15290	15291	15292
Left-hand Assy. No.	**Long**	15293	15294	15295	15296	15297	15298	15299	15301	15302	15302	15303	15304	15305
	Short	14929	14930	14931	14932	14933	14934	14935	14937	14938	14938	14939	14940	14941
Catch Range, in	**Min.**	⅝	⅝	1⅝	1⁵⁄₁₆	1¹¹⁄₁₆	2	1⅛	2½	2⅞	2⅞	3½	3½	4
	Max.	2¾	3¹⁄₁₆	3¼	4	4⅛	4⅝	4⅞	5¾	6	6	6¼	7	8
Tensile Yield, lbf		30,560	34,539	47,250	135,500	369,700	107,400	40,100	161,700	176,800	176,800	234,000	191,000	219,800
Torque Yield, lbf.ft		23,000	32,000	38,000	60,000	62,000	55,000	61,000	119,000	132,000	132,000	128,000	149,000	205,000
Tool Weight, lbm	**Long**	50	75	90	123	130	140	150	235	250	250	255	275	350
	Short	33	50	60	80	85	85	90	150	170	170	170	190	220

Note: Additional sizes are available upon request.

TMC Single-Acting Hydraulic Fishing Jar (Up Only)

Reliable fishing performance in harsh environments

Applications

- Fishing operations including stuck pipe, packer retrieval, tubing removal, milling, and debris recovery
- Plug and abandonment operations, including pipe recovery and wellhead removal
- Operations that include harsh downhole conditions

Benefits

- Advanced impact characteristics
- Capable of prolonged jarring

Features

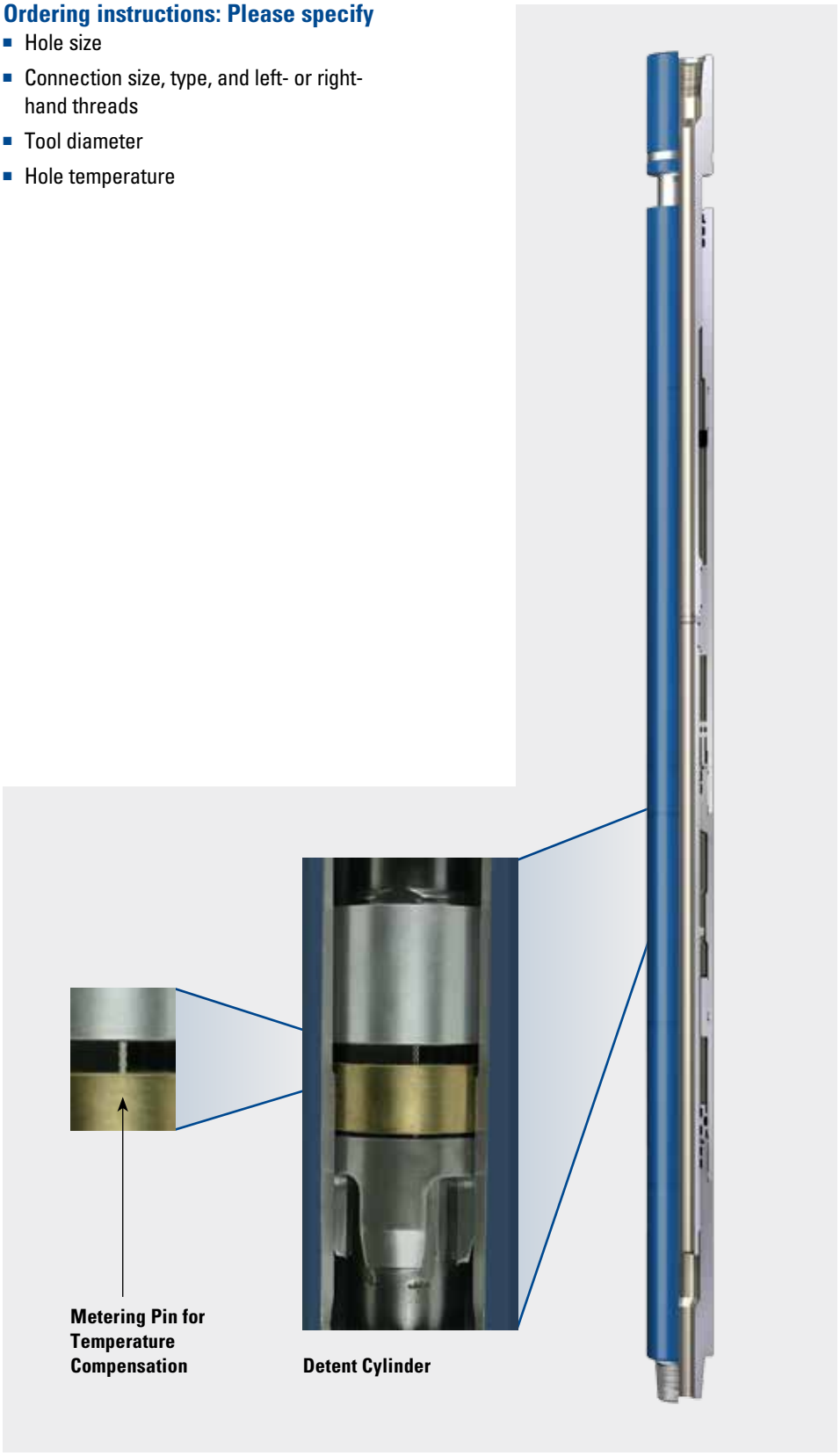
- Long free-travel design to optimize impact
- Hydraulic metering system that enables variable impact loads, controlled by the amount of upward load applied by the operator
- Seals rated to 500 degF and 20,000 psi differential
- Circulation pressure rated to 10,000 psi
- Temperature compensation system to enable prolonged jarring when required
- Closed drive system prevents ingress of wellbore fluid into the drive section, improving reliability
- Interchangeable parts allow conversion between hydraulic jars and accelerator tools

The TMC single-acting hydraulic fishing jar combines optimal impact characteristics with high-endurance construction to provide reliable fishing performance in harsh downhole environments. Tool seals are temperature rated to 500 degF and pressure rated to 20,000 psi, and the temperature compensation system in the detent permits prolonged jarring without loss of impact force. The closed drive system prevents wellbore fluid from entering into the drive section, improving tool performance and reliability.

Note: The Jar-Pact fishing program should be utilized to optimize performance of accelerator tools and TMC jars. Schlumberger recommends that the TMC fishing accelerator tool be used in conjunction with this tool. Contact Schlumberger for more information.

Ordering instructions: Please specify

- Hole size
- Connection size, type, and left- or right-hand threads
- Tool diameter
- Hole temperature



TMC single-acting hydraulic fishing jar (up only)

TMC Single-Acting Hydraulic Fishing Jar (Up Only)

Specifications								
Tool OD, in	1 13/15	1 13/15	2¼	3⅛	3⅛	3¾	3¾	4¼
Tool ID, in	⅜	9/16	½	1	1½	1½	2	2
Tool Joint Connection	1 13/15 WFJ	1 AM MT	1¼ API Reg	2⅜ API Reg	2⅜ EUE	2⅜ API IF	2⅜ EUE	27/8 API IF
Assembly Number	16420	16853	16421	16213	16457	16210	16349	16204
Overall Length, ft	7	5	10	12	11	12.17	11	12.83
Recomm. Max. Overpull Working Load During Restricted Travel, lbf	19,000	17,000	20,000	51,000	32,400	59,000	38,000	73,000
Total Stroke, in	9¾	7¼	12	16	14	16	16	16
Tensile Yield, lbf	56,000	69,000	95,800	192,000	185,000	257,000	233,000	348,000
Torsional Yield, lbf.ft	800	750	1,900	4,100	4,200	6,600	7,400	11,000
Tool Wt., lbm	75	54	125	200	225	240	325	375

Specifications (continued)							
Tool OD, in	4¼	4¾	4¾	6¼	6½	7¾	8
Tool ID, in	2⅞	2	2¼	2¼	2¼	3½	3½
Tool Joint Connection	2⅞ EUE	3½ API FH	3½ API IF	4½ API IF	4½ API IF	6⅝ API Reg	6⅝ API Reg
Assembly Number	16348	16155	16143	16318	16363	16320	16366
Overall Length, ft	11	13	13.5	15	15	16	16
Recomm. Max. Overpull Working Load During Restricted Travel, lbf	39,000	90,000	95,000	180,000	195,000	300,000	300,000
Total Stroke, in	16	16	16	18	18	18	18
Tensile Yield, lbf	320,000	422,000	422,000	900,000	928,000	1,304,000	1,304,000
Torsional Yield, lbf.ft	10,000	14,000	14,000	50,000	50,000	118,000	118,000
Tool Wt., lbm	400	425	375	950	1,078	1,400	1,570

TMC Single-Acting Fishing Accelerator (Up Only)

Improve jar impact regardless of depth

Applications

- Any fishing operation, including stuck pipe, packer retrieval, tubing removal, milling and debris recovery
- Plug and abandonment operations, including pipe recovery and wellhead removal

Benefits

- Endures harsh downhole environments
- Works with parts from the TMC fishing jar

Features

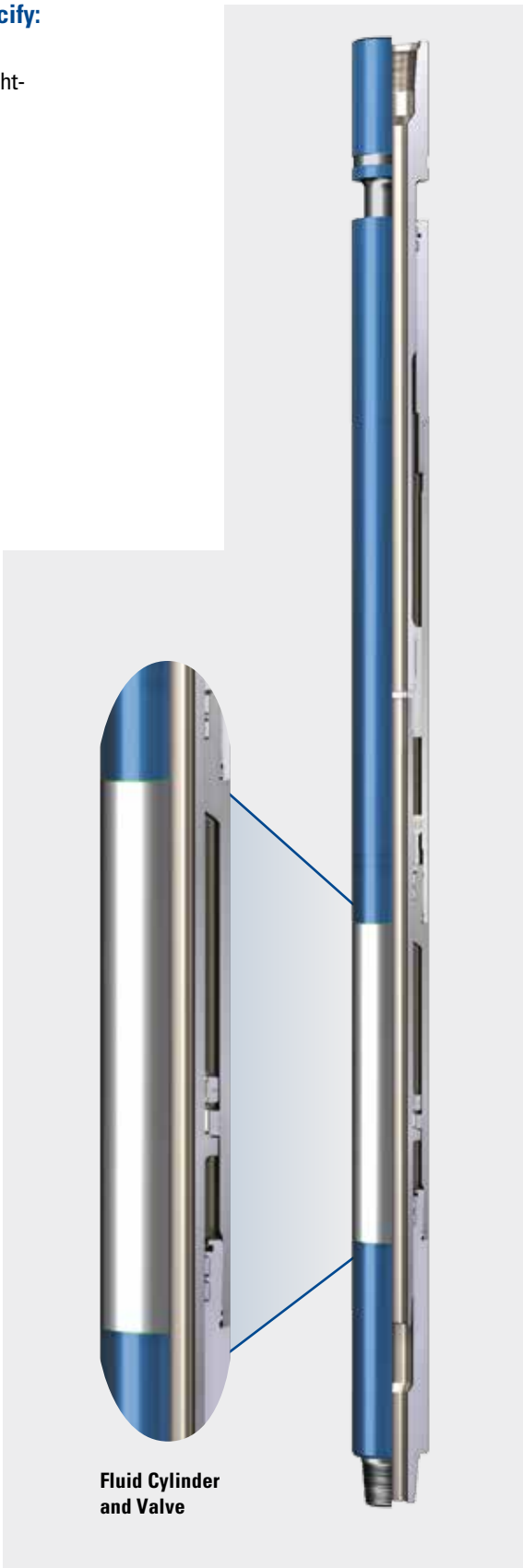
- Absorbs shock waves that propagate up the workstring and damage tool joints, top drives, and other surface components
- Temperature rated to 500 degF
- Seals rated to 20,000 psi differential
- Circulation pressure rated to 10,000 psi
- Closed drive system to prevent ingress of wellbore fluid into the drive section, improving reliability
- Interchangeable parts to allow conversion between accelerator tools and hydraulic jars, reducing parts inventories and increasing flexibility

The TMC fishing accelerator tool improves jar impact and provides a supercharged blow directly above the fish. Used in conjunction with the TMC fishing jar, the TMC accelerator tool maximizes jar impact regardless of depth because it can either replace pipe stretch as the energy source in shallow holes, or supplement the pipe stretch energy in deeper wells. The TMC accelerator tool's robust design, materials quality, and comprehensive QA requirements ensure reliable performance in the harshest of fishing conditions.

Note: The Jar-Pact fishing program should be utilized to optimize performance of accelerator tools and TMC jars. Schlumberger recommends that the TMC fishing accelerator tool be used in conjunction with this tool. Contact Schlumberger for more information.

Ordering instructions, please specify:

- Hole size
- Connection size, type, and left- or right-hand threads
- Tool diameter
- Hole temperature
- Desired operating load



TMC single-acting fishing accelerator (up only)

TMC Single-Acting Fishing Accelerator (Up Only)

Specifications									
Tool OD, in		1 13/16	1 13/16	2 1/4	3 1/8	3 1/8	3 3/4	3 3/4	4 1/4
Tool ID, in		3/8	9/16	1/2	1	1 1/2	1 1/2	2	2
Tool Joint Connection		1 13/16 WFJ	1 AM MT	1 1/4 API Reg	2 3/8 API Reg	2 3/8 EUE	2 3/8 API IF	2 3/8 EUE	2 7/8 API IF
Assembly Number		16422	16854	16423	16214	16459	16211	16384	16206
Overall Length, ft		5.83	4.5	8	10	9	10.33	9	10.67
Tensile Yield, lbf		56,000	69,000	95,800	192,000	185,000	257,000	233,000	348,000
Torsional Yield, lbf.ft		800	750	1,900	4,100	4,200	6,600	7,400	11,000
Total Inches Traveled with Stop Sleeve††		8	7 1/4	10	12	10 1/2	11 3/8	12	11 1/4
Rack Test in Shop at 70 degF for a Nominal BHT of 240 degF,§ in @ lbf		6 3/4 @ 6,000	4 1/4 @ 5,000	7 1/2 @ 6,000	11 @ 29,000	10 @ 13,200	10 @ 31,000	10 1/8 @ 16,000	9 5/8 @ 32,000
Oil Fluid, oz		2	2	2	3	2	3	3	4
Downhole at 240 degF Jar and Accelerator Tool Combination Loads	**Min. Overpull†**	7,500	6,000	5,200	19,000	8,400	22,000	16,000	32,000
	Max. Overpull‡	19,000	17,000	20,000	50,000	32,400	59,000	38,000	73,000
Tool Weight, lbm		60	46	100	160	130	180	160	300

Specifications (continued)								
Tool OD, in		4 1/4	4 3/4	4 3/4	6 1/4	6 1/2	7 3/4	8
Tool ID, in		2 7/16	2	2 1/4	2 1/4	2 1/4	3 1/2	3 1/2
Tool Joint Connection		2 7/8 EUE	3 1/2 API FH	3 1/2 API IF	4 1/2 API IF	4 1/2 API IF	6 5/8 API Reg	6 5/8 API Reg
Assembly Number		15339	16195	16414	16319	16364	16321	16367
Overall Length, ft		11.67	11	11.83	12	12	13	13
Tensile Yield, lbf		320,000	422,000	422,000	900,000	928,000	1,304,000	1,304,000
Torsional Yield, lbf.ft		10,000	14,000	14,000	50,000	50,000	118,000	118,000
Total Inches Traveled with Stop Sleeve††		12	12	10 3/8	10 3/8	12	12	12
Rack Test in Shop at 70 degF for a Nominal BHT of 240 degF,§ in @ lbf		10 7/8 @ 19,000	8 @ 36,000	8 @ 37,800	8 3/4 @ 46,700	8 3/4 @ 46,700	10 @ 72,000	10 @ 72,000
Oil Fluid, oz		3	8	8	12	12	12	12
Downhole at 240 degF Jar and Accelerator Tool Combination Loads	**Min. Overpull†**	15,000	54,000	47,400	66,600	66,600	84,000	84,000
	Max. Overpull‡	39,000	90,000	95,000	107,000‡	107,000‡	150,000‡	150,000‡
Tool Weight, lbm		268	350	325	800	900	1,200	1,350

† Minimum overpull requirement for a jar and Accelerator Tool combination to obtain an efficient impact.

‡ Maximum overpull can be increased in the shop. As the maximum increases, the minimum increases.

§ Settings for other expected bottom hole temperatures are available.

†† Check stroke before loading the Accelerator Tool. If stroke varies, stop sleeves must be modified to obtain stroke as listed.

Packer Milling and Retrieving Tools

Mill and retrieve packers and bridge plugs in a single run

Applications

- Removing packers and bridge plugs

Benefits

- Effective hole cleaning
- Reliable, heavy duty milling performance
- Adaptable to various packer IDs

Features

- Ported mill body
- Spears that can be dressed for various packer IDs
- Washover-type rotary shoes
- Blade-type tools

The packer milling and retrieving tools mill and retrieve production packers and bridge plugs in a single run.

The washover-type system mills over the slip section to disengage the packer. The spear section extends through the packer to catch and retrieve the element once the slips have been removed. The packer mill consists of a mill body and a replaceable mill or long rotary shoe dressed with crushed carbide.

The fixed-blade-type system features four blades dressed with crushed carbide for packer milling. Circulation ports between the blades allow cuttings to be flushed out of the wellbore. The catch assembly is equipped with a milling head dressed with crushed carbide and functions as a guide to remove any obstructions in the packer bore.

Extensions can be added between the spear and the packer mill in both types to provide sufficient length for the spear to pass through the bore of the packer before the mill engages the element. Both washover- and blade-type packer milling and retrieving tools can be released from the packer should it fail to mill up or disengage.

Ordering instructions: Please specify

- Connection size and type
- Casing ID
- Packer make, model and ID length

Fixed blade-type

Washover-type

Specifications

Tool OD, in		3¾	4⅝₂	4¹¹⁄₁₆	5⅜	5½	5¾	5¹⁵⁄₁₆	7¼	7½	7½	7¾	8½	9½
Overall Length, in	Long	32	39	41	43	43	44	44	51	50	50	54	54	62
	Short	23	28	30	30	32	32	32	33	33	33	34	37	38
Right-hand Assy. No.	Long	14315	14316	14317	14318	14319	14320	14321	14323	14324	14324	14325	14326	14327
	Short	15280	15281	15282	15283	15284	15285	15286	15288	15289	15289	15290	15291	15292
Left-hand Assy. No.	Long	15293	15294	15295	15296	15297	15298	15299	15301	15302	15302	15303	15304	15305
	Short	14929	14930	14931	14932	14933	14934	14935	14937	14938	14938	14939	14940	14941
Catch Range, in	Min.	⅝	⅝	1⅝	1⁵⁄₁₆	1¹¹⁄₁₆	2	1⅛	2½	2⅞	2⅞	3½	3½	4
	Max.	2¾	3¹⁄₁₆	3¼	4	4⅛	4⅝	4⅞	5¾	6	6	6¼	7	8
Tensile Yield, lbf		30,560	34,539	47,250	135,500	369,700	107,400	40,100	161,700	176,800	176,800	234,000	191,000	219,800
Torque Yield, lbf.ft		23,000	32,000	38,000	60,000	62,000	55,000	61,000	119,000	132,000	132,000	128,000	149,000	205,000
Tool Weight, lbm	Long	50	75	90	123	130	140	150	235	250	250	255	275	350
	Short	33	50	60	80	85	85	90	150	170	170	170	190	220

TMC Lubricated Bumper Sub

Bump up or down to meet fishing objectives, even in harsh environments

Applications

- Fishing operations, including stuck pipe, packer retrieving, tubing removal, milling, and debris recovery
- Plug and abandonment operations, including pipe recovery and wellhead removal
- Backoff operations where the sub releases spears or overshots, shear pins, dislodges a stuck string, and acts as a feedoff tool

Benefits

- Enables operator to bump up or down until recovery is completed

Features

- Temperature rated to 500 degF
- Seals rated to 20,000 psi differential
- Circulation pressure rated to 10,000 psi
- Closed drive system prevents ingress of wellbore fluid into drive section, improving reliability

The TMC lubricated bumper sub incorporates maximum stroke length and high torque transmission capacity, enabling the operator to bump up or down until fishing objectives are met. The TMC bumper sub's robust design, materials quality, and comprehensive quality requirements ensure reliable performance in the harshest downhole environments.

Ordering instructions: Please specify:

- Hole size
- Connection size, type and left- or right-hand threads
- Tool diameter

TMC lubricated bumper sub

Specifications								
Tool OD, in	1 13/16	1 13/16	2 1/4	3 1/8	3 1/8	3 3/4	3 3/4	4 1/4
Tool ID, in	3/8	9/16	1/2	1	1 1/2	1 1/2	2	2
Tool Joint Connection	1 13/16 WFJ	1 AM MT	1 1/4 API Reg	2 3/8 API Reg	2 3/8 EUE	2 3/8 API IF	2 3/8 EUE	2 7/8 API IF
Assembly Number	16435	N/A	16471	16215	16461	16212	16385	16208
Overall Length, ft	4.67	N/A	6	7.83	6.92	8.17	6.75	8.25
Total Stroke, in	9 3/4	7 1/4	12	16	14	16	16	16
Tensile Yield, lbf	56,000	69,000	95,800	192,000	185,000	257,000	233,000	348,000
†Torsional Yield, lbf.ft	800	750	2,900	4,100	4,200	6,600	7,400	11,000
Tool Weight, lbm	48	54	75	125	100	142	120	232

Specifications (continued)							
Tool OD, in	4 1/4	4 3/4	4 3/4	6 1/4	6 1/2	7 3/4	8
Tool ID, in	2 7/16	2	2 1/4	2 1/4	2 1/4	3 1/2	3 1/2
Tool Joint Connection	2 7/8 EUE	3 1/2 API FH	3 1/2 API IF	3 1/2 API IF	4 1/2 API IF	6 5/8 API Reg	6 5/8 API Reg
Assembly Number	16377	16202	16415	16415	16374	16375	16376
Overall Length, ft	9.33	8.67	9.5	9.67	9.67	10.33	10.33
Total Stroke, in	16	16	16	18	18	18	18
Tensile Yield, lbf	320,000	422,000	510,000	900,000	928,000	1,304,000	1,304,000
†Torsional Yield, lbf.ft	10,000	14,000	14,000	50,000	50,000	118,000	118,000
Tool Weight, lbm	260	337	314	794	890	955	1,110

†Torsional yield strength is based on the tool joint connection.

Hex Bumper Sub

Bump up or bump down with full torque transmission and circulation during fishing operations.

Applications

- Openhole and cased-hole fishing operations when the sub is placed above fishing tools or safety joints to deliver forceful blows
- Backoff operations when the sub releases spears or overshots, shear pins, dislodges a stuck string, and acts as a feedoff tool
- Plug and abandonment operations when low-level jarring may be required or strings of casing are being cut

Benefits

- Reliable performance
- Economical maintenance
- Effective in the harshest downhole conditions

Features

- Hexagonal mandrel to ensure continuous torque transmission up to 36-in stroke for solid bumping action upward or downward
- Full-bore design to minimize pressure losses and provide wireline tool compatibility
- Simple design, with only five major components for low maintenance

The Hex bumper sub provides durable and efficient upward or downward bumping action for fishing operations. Full torque transmission and circulation can be maintained through the tool at all times, in any stroke position. The Hex bumper sub's robust design, materials quality and comprehensive quality requirements ensure reliable performance in the harshest downhole environments.

Ordering instructions: Please specify

- Hole size
- Drillstring component OD where the tool will be utilized
- Connection size and type
- Required stroke length

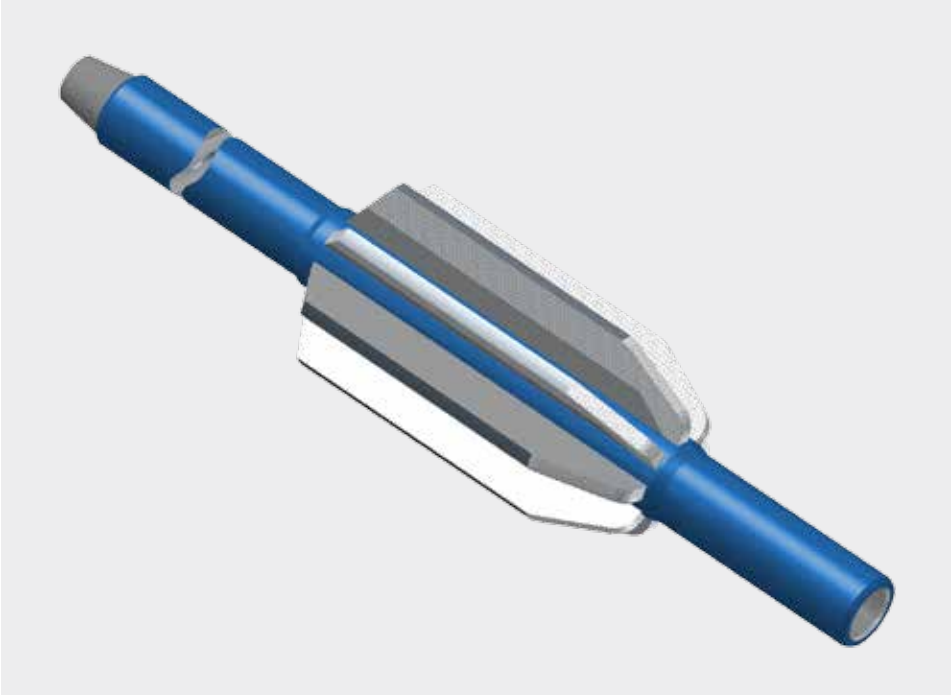
Hex bumper sub

Specifications												
Tool OD, in	1 13/16	3½	3¾	3¾	4¼	4¾	6¼	6¼	6½	6¾	7¾	8
Tool ID, in	⅜	1	1½	1¼	1 15/16	2	2	2¼	2¼	2¾	3½	3½
Tool Joint Connection	1 13/16 WFJ	2⅜ API Reg	2⅜ API IF	2⅞ API Reg	2⅞ API IF	3½ API IF	4½ API IF	4½ API IF	4½ API IF	5½ API Reg	6⅝ API Reg	6⅝ API Reg
Assy. Number	16734	16608	16541	16645	16240	16407	16431	16406	16955	16899	16606	16954
Stroke, in	20	20	20	20	20	20	20	20	20	20	20	20
Tensile Yield, lbf	99,000	193,000	214,000	233,500	352,000	341,400	813,900	705,400	760,000	790,000	900,000	1,200,000
Torsional Yield, lbf.ft	1,150	5,200	7,000	7,000	12,800	14,800	33,000	33,000	34,000	38,000	40,000	40,000
Total Closed Length, in	41¾	62½	61½	61½	59⅛	62½	64½	64½	64⅝	67¼	71⅛	71¼
Tool Weight, lbm	25	95	140	150	140	198	390	375	415	455	655	717

Conductor Taper Mill

Conductor taper mills are used to clean out restrictions in platform or jackup conductor casings. Their design is similar to a normal taper mill, but with a box connection down. This connection is useful for installing a smaller diameter taper mill, junk mill, or other pilot assembly. Conductor taper mills can ream out considerable deformation in one pass. Their heavy, tungsten carbide dressing ensures long life and fast cutting.

Conductor taper mills are available in 15-in to 28-in sizes with 9½-in fishing necks.



Conductor taper mill

Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
15–28	7⅝ Reg	9½	3¼	106,250	2,005,500

String Taper Mill

String taper mills are ideal for cleaning out damaged casing, liners, or tubing, and are also recommended for removing keyseats in open holes. The mill is tapered at the top and bottom, allowing reaming operations from both directions. Pin-down and box-up connections allow the mill to be run in a drill collar string or combined with a smaller pilot assembly to avoid sidetracking when removing obstructions from casing.

String taper mills are available in 3½-in to 17½-in sizes and with 3½-in to 9½-in fishing necks.

String taper mill

Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3½–4½	2⅜ Reg	3⅛	1½	3,850	163,000
4½–5½	2⅞ Reg	3¾	1½	7,400	275,700
5½–7½	3½ Reg	4¾	1¾	10,500	402,300
7⅝–9½	4½ Reg	6¼	2¼	27,650	791,050
9½–12¼	6⅝ Reg	8	3	64,000	1,384,800
14¾–17½	7⅝ Reg	9½	3¼	106,250	2,005,500

Bladed-Junk Mill

Bladed-junk mills are dressed with high-quality tungsten carbide to ensure optimal performance in every application. Bladed-junk mills are suitable for all types of general junk milling, as well as the removal of packers, retainers and squeeze tools.

Bladed-junk mills are available in 3½-in to 28-in sizes with 2⅞-in to 11¼-in fishing necks.

Bladed-junk mill

Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3½–4½	2⅜ PAC	2⅞	1⅜	3,200	158,950
3½–4½	2⅜ Reg	3⅛	1½	3,850	163,000
4½–5½	2⅞ PACDS	3⅛	1½	4,850	179,650
4½–5½	2⅞ Reg	3¾	1½	7,400	275,700
5½–7½	3½ Reg	4¾	1¾	10,500	402,300
7⅝–9½	4½ Reg	6¼	2¼	27,650	791,050
9½–12¼	6⅝ Reg	8	3	64,000	1,384,800
15–17½	7⅝ Reg	9½	3¼	106,250	2,005,500
18⅝–28	8⅝ Reg	11¼	3¼	184,550	2,840,000

Conebuster Mill

Conebuster mills are ideal for heavy milling: bit cones, slips, and pieces of downhole tools. A concave cutting face with a thick cutting structure ensures long service life and efficient milling. This mill type is not recommended for cement cleanout.

Conebuster mills are available in 3½-in to 17½-in sizes with 3⅛-in to 9½-in fishing necks.

Conebuster mill

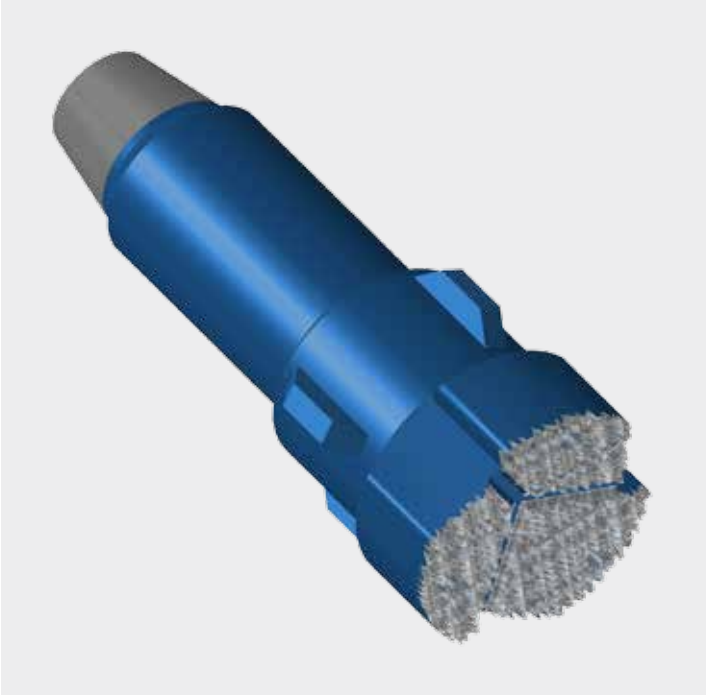
Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3½–4½	2⅜ Reg	3⅛	1½	3,850	163,000
4½–5½	2⅞ Reg	3¾	1½	7,400	275,700
5½–7½	3½ Reg	4¾	1¾	10,500	402,300
7⅝–9½	4½ Reg	6¼	2¼	27,650	791,050
9½–12¼	6⅝ Reg	8	3	64,000	1,384,800
15–17½	7⅝ Reg	9½	3¼	106,250	2,005,500

Cement Mill

Cement mills are designed for light milling: float collars, plugs, bridge plugs, and retainers. An open pattern cuts quickly on tubular fish, and the mill resists clogging by cement or formation. Cement mills cut steel faster and are more durable than a steel-tooth bit. And, when compared with the steel-tooth bit, the cement mill is recommended as a better option.

Cement mills are available in 3½-in to 17½-in sizes with 3⅛-in to 9½-in fishing necks.



Cement mill

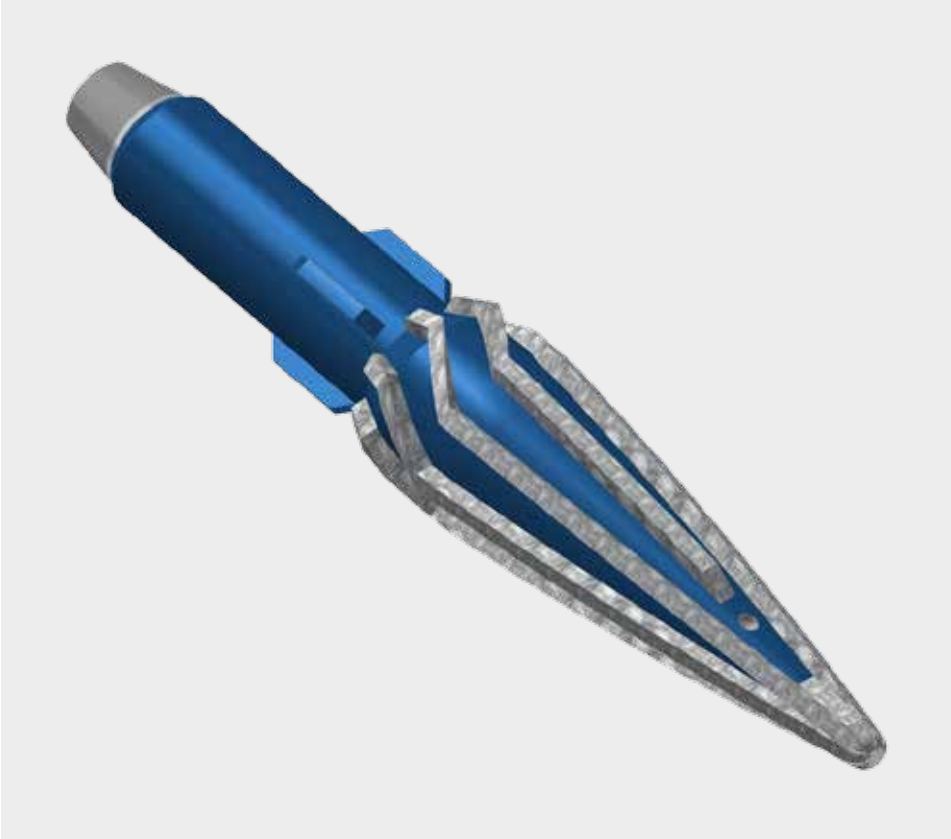
Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3½–4½	2⅜ PAC	2⅞	1⅜	3,200	158,950
3½–4½	2⅜ Reg	3⅛	1½	3,850	163,000
4½–5½	2⅞ PACDS	3⅛	1½	4,850	179,650
4½–5½	2⅞ Reg	3¾	1½	7,400	275,700
5½–7½	3½ Reg	4¾	1¾	10,500	402,300
7⅝–9½	4½ Reg	6¼	2¼	27,650	791,050
9½–12¼	6⅝ Reg	8	3	64,000	1,384,800
15–17½	7⅝ Reg	9½	3¼	106,250	2,005,500

Taper Mill

Taper mills are designed specifically for milling through tight spots in tubulars. Heavy crushed carbide dressing increases on-bottom time, while ground OD and stabilizer pads eliminate the risk of cutting through the casing. Taper mills are recommended for cleaning out liners, tubing, and other collapsed or deformed tubulars. They can also be run ahead of other milling tools to clean out "bird nests."

Taper mills are available in 3½-in to 17½-in sizes with 3⅛-in to 9½-in fishing necks.



Taper mill

Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3½–4½	2⅜ PAC	2⅞	1⅜	3,200	158,950
3½–4½	2⅜ Reg	3⅛	1½	3,850	163,000
4½–5½	2⅞ PACDS	3⅛	1½	4,850	179,650
4½–5½	2⅞ Reg	3¾	1½	7,400	275,700
5½–7½	3½ Reg	4¾	1¾	10,500	402,300
7⅝–9½	4½ Reg	6¼	2¼	27,650	791,050
9½–12¼	6⅝ Reg	8	3	64,000	1,384,800
15–17½	7⅝ Reg	9½	3¼	106,250	2,005,500

Pilot Mill

Pilot mills are suitable for milling sections of tubular junk and can be used as dress mills for the installation of a casing patch. They can be used for milling liner hangers and other downhole tools with a through bore.

Pilot mills are available in 3¼-in to 17-in sizes with 3⅛-in to 8-in fishing necks.

Pilot mill

Specifications

Dressed diameter, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
3¼–4¼	2⅜ Reg	3⅛	1½	3,850	163,000
4–5⅜	2⅞ Reg	3¾	1½	7,400	275,700
5½–7⅞	3½ Reg	4¾	1¾	10,500	402,300
7–10¾	4½ Reg	6¼	2¼	27,650	791,050
9½–17	6⅝ Reg	8	3	64,000	1,384,800
9½–17	7⅝ Reg	9½	3¼	106,250	2,005,500

Junk Magnet

Junk magnets are used to retrieve small, irregular-shaped, magnetic debris. Junk magnets are frequently run in advance of diamond tools to remove debris that could adversely affect the tool's performance. The Junk magnet's internal pole plate is highly magnetized, but the rest of the tool remains nonmagnetic. Junk magnets are available in most hole sizes.

Junk magnet

Specifications

Tool OD, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
4	2⅜ Reg	3⅛	1½	5,800	244,500
5	2⅞ Reg	3¾	1½	11,100	413,550
6	3½ Reg	4¾	1¾	15,750	603,450
8½	4½ Reg	6¼	2¼	41,500	1,186,600
12¼	6⅝ Reg	8	3	96,000	2,077,200
17½	7⅝ Reg	9½	3¼	159,400	3,008,200
22	7⅝ Reg	9½	3¼	159,400	3,008,200
26	7⅝ Reg	9½	3¼	159,400	3,008,200

Impression Blocks

Impression blocks are used to determine the position and condition of the top part of fish or junk obstructing the borehole. Impression blocks feature a steel body that's lower end is fitted with a block of soft material, typically lead. The tool is made up on the running string and lowered without rotation to make contact with the obstruction. The resulting contact with the obstruction leaves an impression on the block's soft material that can be identified at surface. With this information, the appropriate fishing equipment can be deployed.

Impression blocks

Specifications

Tool OD, in	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
4	2⅜ Reg	3⅛	1½	5,800	244,500
5	2⅞ Reg	3¾	1½	11,100	413,550
6	3½ Reg	4¾	1¾	15,750	603,450
8½	4½ Reg	6¼	2¼	41,500	1,186,600
12¼	6⅝ Reg	8	3	96,000	2,077,200
17½	7⅝ Reg	9½	3¼	159,400	3,008,200
22	7⅝ Reg	9½	3¼	159,400	3,008,200
26	7⅝ Reg	9½	3¼	159,400	3,008,200

Core-Type Junk Basket

Core-type junk baskets are used to retrieve small, irregular-shaped shaped debris from the well bottom by cutting a core from the formation and recovering the debris with the cut core. The basket is recommended for soft to medium-soft formations.

The core-type junk basket is available in most hole sizes and can be dressed with a variety of shoe types, depending on formation properties and fishing objectives.

Specifications

Tool OD, in	Hole size, in	Shoe OD, in	Maximum fish diameter, in
3⅝	3¾–4⅛	3⅝	2 23/32
3¾	4¼–4½	4 1/16	2 31/32
3⅞	4⅝–5	4½	3 9/32
3⅞	4⅝–5	4½	3⅜
4¼	5⅛–5½	4⅞	3 23/32
5⅛	5⅝–6	5⅛	3 25/32
4-¾	5⅝–6	5⅜	4 1/16
5¾	6⅛–6½	5¾	4 13/32
5⅛	6⅛–6½	5⅞	4 5/16
5¼	6⅛–6½	5⅞	4½
5¾	6⅝–7	6¼	4 13/16
6½	7¼–8	7⅛	5 7/16
7½	8¼–9	8⅛	6 3/16
8½	9¼–10⅛	9⅛	7 3/16
9⅜	10¼–11⅝	10⅛	8 1/16
10⅜	11¾–12½	11¼	9 1/16
11⅜	12⅝–15	12¼	10 1/16
13¾	15–20	14½	12 1/16

Core-type junk basket

Boot Basket

Boot baskets catch debris that is too heavy to circulate out of the hole during drilling and milling operations. As cuttings flow past the boot basket's larger OD, smaller OD, and its top connection, a sudden decrease in annular velocity is created, allowing the boot basket to trap junk. Boot baskets should be run as closely as possible to the mill, bit, or junk basket, and they can be run in tandem to increase junk-retrieval capacity. Boot baskets are available in a range of sizes to run with most BHAs.

Specifications

Tool series	Top connection, box	Fishing neck diameter, in	Pin ID, in	Yield torque, ft.lbf	Tensile yield, lbf
35	2⅜ Reg	3⅛	1½	5,800	244,500
35	2⅜ PAC	2⅞	1⅜	4,800	238,400
40	2⅞ Reg	3¾	1½	11,100	413,550
46	2⅞ PACDS	3⅛	1½	7,300	269,500
50, 52	3½ Reg	4⅜	1¾	15,750	603,450
70	4½ Reg	6¼	2¼	41,500	1,186,600
96	6⅝ Reg	8	3	96,000	2,077,200
133, 160	7⅝ Reg	9½	3¼	159,400	3,008,200

Boot basket

Jet Junk Basket

Retrieve stubborn debris from the hole bottom

Applications

- Cased or openhole operations that require removal of small debris from wellbore
- Vertical and horizontal applications
- Most formations when running as jet basket or as a core basket in soft formations

Benefits

- Removes even the most stubborn small wellbore debris efficiently
- Converts to conventional core basket for operational flexibility

Features

- Jet nozzles produce a Venturi effect to force junk from the hole bottom
- Versatile dual configuration provides additional options without extra equipment
- Open jets enable workstring to be pulled dry, improving rig floor efficiency and working conditions
- Extended junk sleeves available for retrieving longer items

The Jet junk basket produces a circulating force capable of scavenging the most stubborn items from hole bottoms, including bit cones, slips, tail chains, shot remnants, and other small debris. The Jet junk basket can easily be converted to a conventional core basket by removing jet components and attaching the junk retaining assembly directly to the top sub.

Jet junk basket

Debris Catcher

Applications

- Vacuum setup for removing small wellbore debris prior to completions
- Debris removal caused by milling bridge plugs, packers, or both
- Large fish recovery setup for bit cones and other large debris

Benefits

- Tool retains all collected debris
- Milled cuttings never reach surface
- Tool eliminates need for expensive milling fluid
- Wellbore debris can be removed despite poor lifting capacity of fluid, high equivalent circulating density not possible with open perforations, or insufficient pump capacity to provide adequate annular velocities for hole cleaning

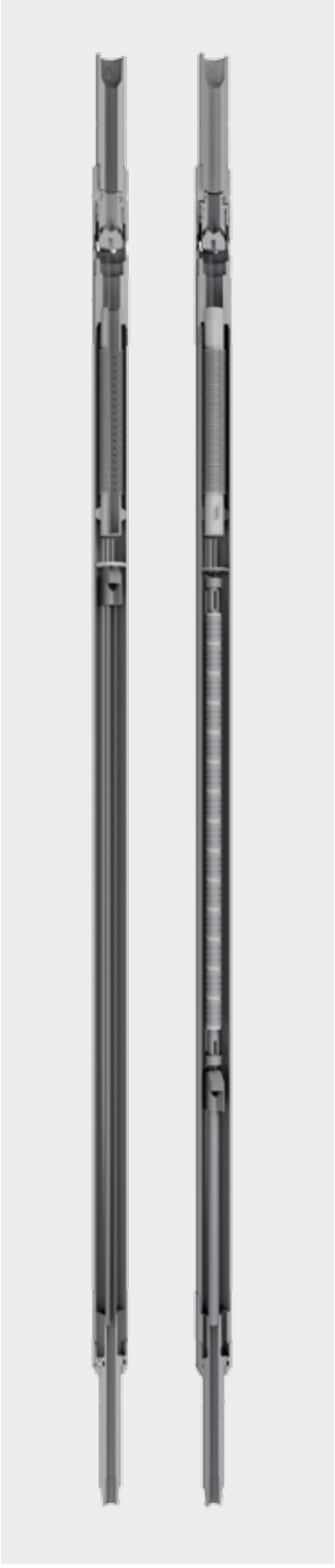
Features

- Interchangeable jets for hydraulic optimization downhole
- Removable trash cap to empty debris at surface
- High-volume suction flow
- Large debris capacity

The Schlumberger Debris Catcher is a modular system, which uses reverse circulation to remove debris from the wellbore. Pumping through the tool provides energy to lift debris and fish from the bottom of the hole, object, or obstruction point. The lower end of the tool can be configured in one of three ways depending on the application, while the same jet section is used for all three applications:

- One application is a vacuum setup for removing small debris from a wellbore. The lower end of the tool uses a chamber for debris storage. When the job is completed, the tool's trash cap can be removed and the debris chamber emptied without disassembling the tool.
- A second application is for fishing large debris from the wellbore. The tool's debris chamber, on its lower end, is replaced with a rotary shoe which has an internal finger basket to capture fish.
- An additional application is for packer, plug, and milling operations. A washover shoe is attached to the bottom end of the tool and milling debris is collected inside the tool. When the job is completed, the trash cap can be removed to empty debris from the tool.

Debris Catcher Specifications		
Tool size OD, in	5½	7⅞
Top connection	3½ IF Box	4½ IF Box
Bottom connection	3½ IF Pin	4½ IF Pin
Maximum torque, ft.lbf	8,900	22,700
Maxium tensile yield strength, lbf	204,000	340,000
Tool Length		
Vacuum setup, in	368	310
Vacuum setup—one extension, in	676	531
Vacuum setup—two extensions, in	984	841
Milling setup, in	368	310
Fishing setup, in	64	83
Tool Capacities		
Vacuum, in³ [galUS]	2,995 [13]	5,100 [22]
Vacuum—one extension, in³ [galUS]	6,570 [28.4]	12,390 [53.6]
Vacuum—two extensions, in³ [galUS]	11,560 [50]	19,420 [84]



Debris catcher

Casing Scrapers

Remove irregularities from the inner surfaces of a tubular

Applications

- Removing undesirable irregularities from tubular IDs
- Cleaning casing prior to setting packers and bridge plugs

Benefits

- Ensures clean tubular contact for packers and bridge plugs

Features

- Pressure-compensated construction endures hydrostatic and circulation pressures
- Designed to operate with conventional or reverse circulation

Casing scrapers are used to remove paraffin, hardened mud, cement, or burrs resulting from tool runs or perforations from the inner surfaces of a tubular. Casing scrapers are particularly useful for cleaning the casing before setting a packer. A broad range of casing scraper types and sizes are available for a variety of applications.

Ordering instructions: Please specify:

- Tool OD
- Connection size and type

Casing scrapers

Safety Joints

Ensure parting ability if workstring becomes stuck

Applications

- Openhole and cased hole fishing
- Washover operations
- Pipe recovery and well abandonment operations

Benefits

- Provides an additional level of protection against stuck fish
- Ensures parting ability if workstring becomes stuck during fishing operations

Features

- Positive releasing mechanism to free catching tool from wellbore
- Internal seals eliminate leak paths, enabling high circulating pressure
- Canfield thread form available for washpipe applications

Safety joints provide an additional level of protection against stuck fish by securing the entire fishing string in the wellbore and provides a positive releasing mechanism if the catch tool cannot be released. Safety joints are available for washover, drilling, and fishing applications.

Safety joints are equipped with O-rings to ensure hydraulic integrity when used with high-circulation washpipe. Safety joints are designed to withstand high torsional, axial, and impact loadings.

Safety joints are available for a broad range of applications. Contact a Schlumberger representative for more information.

Ordering instructions: Please specify

- Tool OD
- Type
- Connection size and type
- Optional Canfield thread form (for washpipe only)

Safety joints