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**CASING SCRAPER**

**Casing Scraper**

The Casing Scraper is used to clean cement, mud, embeded bullets, rust, mill scale, paraffin, perforation burrs and other substances from the inside walls of casing. Maintaining a clean casing I. D is important to the operation of all tools used in drilling the well. Likewise, packers and similar tools must have a clean surface to grip. Foreign materials on casing walls will frequently cause these tools to become difficult to operation. The bit is run below the scraper to serve as a guide and prevent plugging the circulation hole through the scraper.

To scrape and clean the casing, simply pass the scraper through either with or without rotation. To check a perforated section for smoothness, run the scraper through the section without rotating. If the weight indicator does not show any irregularities the casing has been cleaned.

The Casing Scraper is manufactured from a solid piece of heat treated steel. The scraper blades fit into machined recesses and are securely held by a dovetail keeper and spacer. The scraper blades feature left hand helical grooves and are hard faced for maximum service. There are sufficient blades in the body to completely scrape the casing surface without rotating the tool.

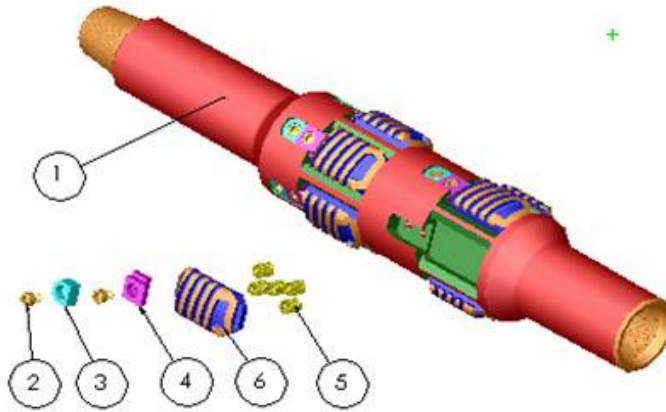
Standard connections on the Casing Scraper are API Reg. box and pin. This allows the scraper to be installed in the drilling string between the bit and the bit sub



**Size and Spec**

Casing Size	Conn.	Body OD (in)	Length (in)	ID (in)	Number of Blade
4 1/2	2 3/8 Reg	3 5/8	35 1/2	3/4	2 x 3
5	NC26	3 3/4	35 1/2	3/4	2 x 3
5 1/2	NC31	4 3/8	39 5/8	1	2 x 3
6 5/8	3 1/2 Reg	5 3/8	39 5/8	1 3/16	2 x 3
7	3 1/2 Reg	5 3/8	39 5/8	1 3/16	2 x 3
9 5/8	4 1/2 Reg	8	47 3/4	2 1/4	2 x 5
10 3/4	6 5/8 Reg	9	59	3 1/4	2 x 5
13 3/8	6 5/8 Reg	11 1/4	54	2 7/8	2 x 7

Spare parts:

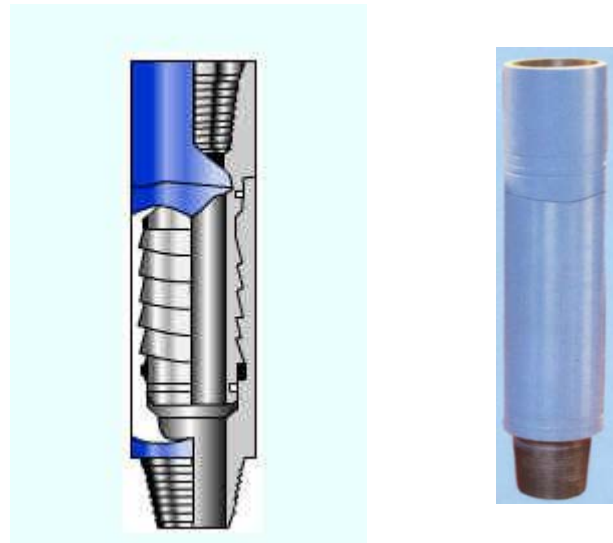


S/N	Parts Name	Qty	
		5 1/2 OD	7" OD
1	Body	1	1
2	Screw	12	12
3	Spacer	6	6
4	Keeper	6	6
5	Spring	18	30
6	Scraper Blade	6	6

SAFETY JOINT

**Safety Joint**

Safety Joint is manufactured to provide safe and easy release and make-up whenever disengagement becomes necessary. This dependable, field-tough tool is designed to transmit torque in either direction when placed in the drill, fishing, or wash over string



Type	OD (mm)	ID (mm)	Conn.	Yield Pull (KN)	Yeild Torque (KN-M)	Max. Workng pull force (KN)	Max. Working Torque (KN-M)
AJ41	95	54	NC31	2015	19.10	1340	12.70
AJ73	105	47	2 7/8IF	2038	17.34	1365	11.90
AJ89	115	72	3 1/2TBG	905	-	600	-
AJ46	121	57	NC38	2275	26.50	1515	17.65
AJ102	127	88	4 TBG	1021	-	658	-
AJ50	127	57	NC38	2290	27.00	1550	17.80
AJ62	159	80	NC50	4665	58.40	3110	38.90
AJ165	165	83	NC50	4987	69.40	3360	48.90
AJ70	178	92	5 1/2FH	5080	85.50	3385	57.00
AJ197	197	89	6 5/8REG.	5480	124.10	3650	82.75
AJ203	203	89	6 5/8 REG	5500	86.00	3700	83.50

### **Releasing and Circulating Overshot**

Releasing and Circulating Overshot is an external catch fishing tool designed to retrieve tubular items from the well bore. It is rugged, economical, and easy to use. Overshots come with a wide range of available accessories. These fishing tools have proven to be the most versatile and reliable in the field.

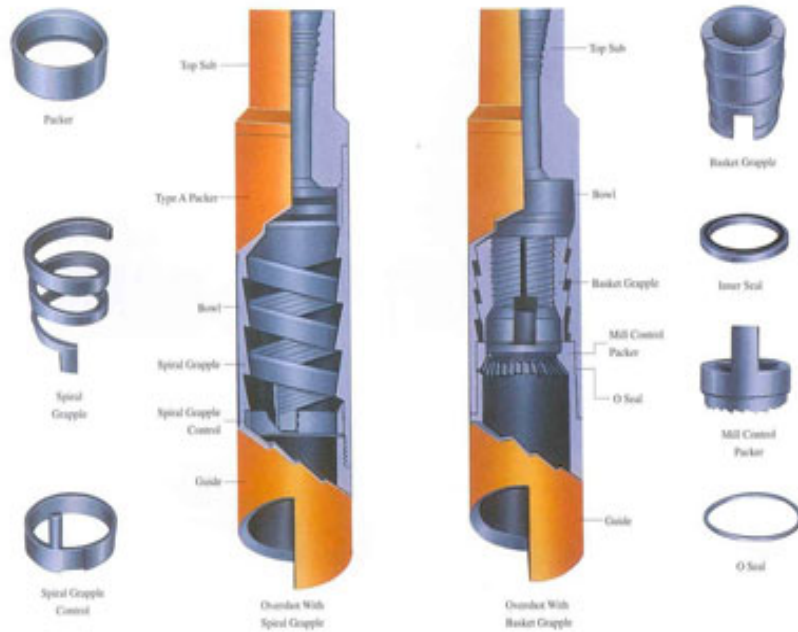
### **Standard Components:**

**Top sub** - The top sub is the uppermost component of the assembly. It is equipped with a box connection, as specified by the customer, to assure proper make-up with the fishing string.

**Bowl** - The bowl is the major working component of the overshot. The upper end of the bowl is threaded for assembly with the top sub. The lower end is threaded for assembly with the standard guide.

**Standard guide** - The standard guide is the lowermost component of the assembly. It guides the fish into the overshot, allowing the internal gripping mechanism to properly engage and grip the fish.

**Spiral Grapple** - The spiral grapple is a left-hand helix that conforms to the inside of the overshot bowl. Especially hardened wicker threads assure a positive grip to engage the fish securely



Type	OD (mm)	OD (in)	Max. Catch Size			Conn.
				mm	in	
LT/S-T48A	92	3 5/8	48.3~55	1 7/8~2 11/64	NC26	LT/S-T48A
LT/S-T60A	102	4	60.3~65.9	2 3/8~2 19/32	2 7/8 Reg.	LT/S-T60A
LT/S-T73A	108	4 1/4	73~78	2 7/8~3 1/16	2 7/8 Reg.	LT/S-T73A
LT/S-T89A	124	4 7/8	89~95	3 1/2~3 3/4	2 7/8 Reg.	LT/S-T89A
LT/S-T102A	140	5 1/2	101.6~108	4~4 1/4	NC38	LT/S-T102A
LT/S-T114A	152	6	141~121	4 1/2~4 3/4	4 1/2 Reg	LT/S-T114A
LT/S-T48B	76	3	48.3	1 7/8	2 3/8 Reg	LT/S-T48B
LT/S-T60B	86	3 3/8	60.3	2 3/8	NC26	LT/S-T60B
LT/S-T73B	102	4	73	2 7/8	2 7/8 Reg	LT/S-T73B
LT/S-T81B	114	4 1/2	81.5	3 13/64	NC31	LT/S-T81B
LT/S-T89B	114	4 7/8	88.9	3 1/2	NC31	LT/S-T89B
LT/S-T102B	124		101	4	2 7/8 Reg.	LT/S-T102B

### **Grapple Releasing Spear**

Grapple Releasing Spear is an internal catch fishing tool designed to retrieve tubular members from the well bore. It is a rugged, dependable, and inexpensive device. The simple design assures positive engagement throughout the fishing operation is easy to release and re-engage if necessary and may be run in conjunction with other equipment such as pack-off attachments and internal cutting tools.

### **Construction**

The basic Grapple Releasing Spear consists of a mandrel, a grapple, a bull nose nut, and a release ring. The mandrel is made of specially heat treated high strength alloy steel; and may be ordered either as a flush type to enter completely into a fish or as a shoulder type to provide a positive landing position on top of the fish. Size and type of the upper box connection is provided according to customer's exact specifications.

### **Assembly and Operation**

First screw the grapple onto the mandrel. (Note: This is a left hand thread.) Slip the release ring onto the end of the mandrel and make up the nut. Screw the grapple down the mandrel hand tight against the release ring. This puts the tool into the run-in position.

Make up spear to bottom of fishing string. Run in and position the spear in the fish, then rotate the mandrel one full turn to the left. The grapple should now be engaged. Pulling straight up will cause the tapers on the mandrel to expand the grapple and will allow the grapple to bite into the fish.

To disengage the grapple, bump down and rotate to the right several turns. Pulling straight up should free the spear. When coming out of the fish, continue to rotate slowly to the right.

### **Standard Components**

**Mandrel** - The mandrel has an upper box type connection cut according to customer's specifications. The lower end is threaded to accept the bull nose nut or can also accept a mill nose, sub, or side hill nut. The central body of the mandrel has a helical tapered configuration where the grapple is installed. This tapered O.D. matches the I.D. of the grapple and provides the basic mechanism for proper engagement and retrieval.

**Grapple** - Each grapple is machined to fit a specific size and weight of pipe, tubing, or casing. This assures maximum surface engagement and minimum fish distortion.

**Bull Nose Nut with release ring** - A Bull Nose Nut and release ring are standard components of the Grapple Releasing Spear.

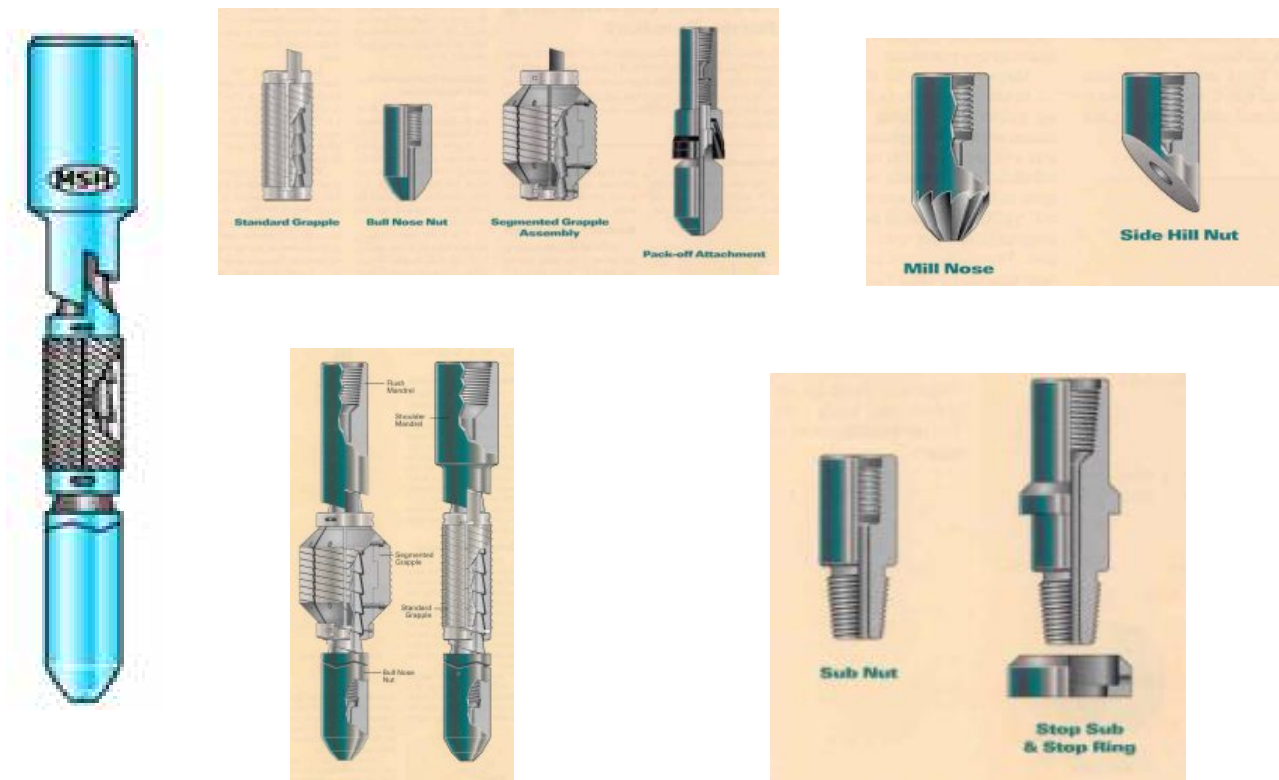
## Optional Components

**Segment Spear Grapples** - The 8 5/8-inch and 9 5/8-inch spears can be fitted with a segmented grapple assembly. With this assembly, the 8 5/8-inch spear can be used to pull up to 13 3/8-inch casing. The 9 5/8-inch tool can be used to pull up to 20-inch casing. This greatly enhances the spear's usefulness.

**Mill Nose, Side Hill and Sub Nuts** - These components are available as accessories. The mill nose nut can be used to clean the top of the fish in case it is badly distorted and obstructs the entrance of the spear. The side hill nut design allows the spear to be inserted when the fish is partially embedded in the side of the hole. The sub nut allows additional tools to be assembled below the spear.

**Pack-off Attachment** - A pack-off assembly is available to attach below the spear when using the sub nut.

**Stop Sub** - A shouldered stop sub can be ordered to convert the flush type spear into a shouldered type. A stop ring can be added to increase the shouldered diameter.





JUNK BASKET

**Reverse Circulating Junk Basket (RCB)**

Reverse Circulating Junk Basket (RCB) is a junk retrieval tool designed to remove all types of objects from the bottom of the well bore. This superior tool removes such items as slips, hand tools, bit cones, and any other small pieces of junk from the well. The RCB uses reverse circulation to aid junk recovery.

**Construction:**

The tool consists of a top sub, barrel assembly, catcher, and shoe. The catcher consists of an inner and outer barrel, valve seat, cup, and ball. A lift sub assist in handling.

**Assembly and Operation**

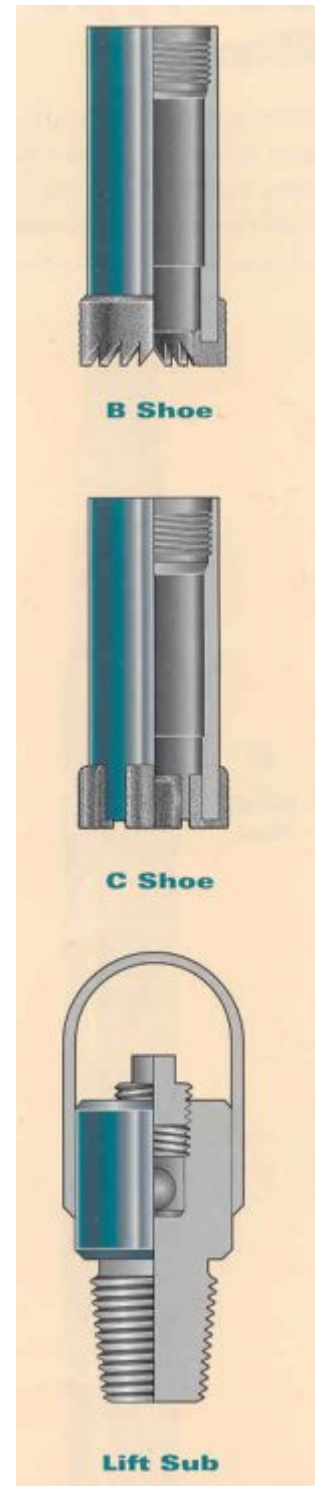
Make up the junk basket to the bottom of the string and run into the hole. When the tool is approximately 10 feet from the bottom of the hole, the ball is dropped down the drill pipe. The ball will position itself in the ball seat and reverse circulation will begin. Circulate and begin coring. Combined with the reverse circulation, this guarantees that any junk on the bottom is pumped into the barrel and caught by the catcher assembly. The tool is removed from the hole after cutting 10 to 20 inches of core.

**Optional Components and Accessories**

**Shoes** - Four types of shoes are available to fit the Reverse Circulating Junk basket.

Type A mill shoe is supplied as standard equipment with the cutting teeth dressed with hard metal and has side wings. The type A mill shoe is used where the formation is relatively soft and the fish is a loose piece.

Type B mill shoe is equal in design to the type A shoe; however it is hard faced with Gotcoloy a sintered tungsten carbide in an extremely tough matrix, which will effectively and rapidly mill up junk during the fishing operation. This shoe will cut on O.D., I.D. and bottom.

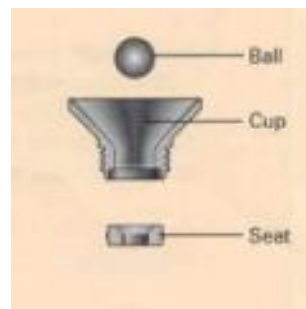
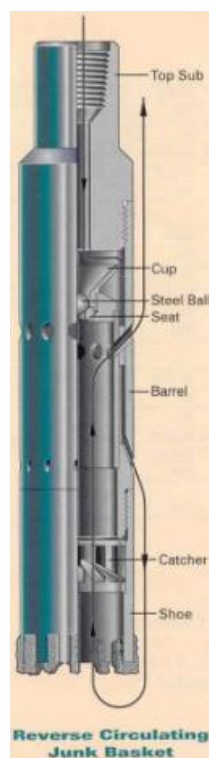


Type C mill shoe is also hard faced with Gotcoloy, however, is designed with a flat bottom, and the Gotcoloy is placed on the inner face and the outer face. This design is used to mill up junk and is extremely effective for cutting cores.

Type B or type C Gotcoloy dressed milling shoes are used if the formation is hard or if the fish is embedded in the formation. Use of these two designs also cuts away protruding excess metal to allow free entry of the junk into the basket.

**Finger Shoe** - For retrieving loose junk on the bottom of the hole which may exceed the maximum catch of the RCB can be retrieved by use of a finger shoe assembly. The assembly consists of a shoe extension and the finger replacement. The entire assembly is used in place of a mill shoe. The fingers are designed to close in beneath the fish when slowly lowered during rotation. Finger replacements can be replaced easily and are very inexpensive.

**Magnet Inserts** - The RCB can be easily converted to a fishing magnet by removing the catcher assembly and replacing it with a magnet insert. The insert still allows direct or reverse circulation and can be used with A, B, or C type shoes or special shoes designed to customer specifications. The magnet insert is the same design as the Fishing magnet and by adding a top sub to the magnet insert; it can be used independently as a fishing magnet.



**JZ Mechanical Drilling Jar**

JZ Mechanical Drilling Jar integrates the up jarring with the down jarring with wide load range. The special flexible extended shaft can cut down the flexural stress of the jar body efficiently.



Type	OD (m)	ID (mm)	Max. Tensile Load (MN)	Max. Working Torque (KN.M)	Pumping Area (cm2)	Up Jar Stroke (mm)	Down Jar Stroke (mm)	Conn.	Overall Length (in locked position) (mm)
JZ95	95	28	0.8	8	32	200	200	2 7/8 Reg.	5800
JZ108	108	36	0.8	10	38	203	203	NC31	6404
JZ121	121	51.4	1.4	13	60	198	205	NC38	6343
JZ159III	159	57	2.2	15	100	149	166	NC46	6517
JZ165	165	57	2.2	15	100	149	166	NC50	6517
JZ178	178	57	2.3	15	100	147.5	167.5	NC50	6570
JZ203	203	71.4	2.5	20	176	144.5	176.5	6 5/8 Reg.	7244
JZ229	229	76	2.5	22	181	203	203	7 5/8 Reg.	7753

**Hydromechanical Drilling Jar Type ZSJ & ZXJ**

This hydro mechanical drilling jar consists of two independent components, i.e. hydraulic up jar type ZSJ and mechanical down jar type ZXJ, which can be used either independently or in one. It is connected above the drill string neutral point. When resistance or stuck accident is encountered in downhole drilling operation, the drilling jar can be started to up jar or down jar at any time for relief. It's an important tool to reduce the stuck accident during drilling deep well, complicated well and slant well.



Model	OD (mm)	ID (mm)	Conn.	Max. Tensile (MN)	Max. Working Torque (KN.M)	Max. Jarring Load (KN)	Max. Stroke (mm)	Overall Length (mm)
ZSJ46	121	51	NC38	1.4	13	270	305	6391
ZXJ46	121	51	NC38	1.4	13	250	182	5125
ZSJ56	146	57	4 1/2FH	2.0	15	450	330	5738
ZXJ56	146	57	4 1/2FH	2.0	15	400	182	5000
ZSJ62II	159	57	NC46	2.2	15	550	346	6738
ZXJ62	159	57	NC46	2.2	15	550	182	5371
ZSJ64	165	57	NC50	2.2	15	550	346	6736
ZXJ64	165	57	NC50	2.2	15	550	182	5457
ZSJ70	178	70	5 1/2FH	2.3	15	550	346	6359
ZXJ70	178	70	5 1/2FH	2.3	15	550	182	5457
ZSJ76	197	71.4	6 5/8 Reg.	2.5	18	750	370	6670
ZXJ76	197	71.4	6 5/8 Reg.	2.5	18	600	181	5249
ZSJ80	203	71.4	6 5/8 Reg.	2.5	20	750	370	6597
ZXJ80	203	71.4	6 5/8 Reg.	2.5	20	600	181	5249

**Intensifier Jar Type YJQ**

The accelerator type “YJQ” is hydraulic and is essentially a fluid spring which stores energy when a strain is pulled on the fishing string. The tool is run in conjunction with a hydraulic fishing jar type Z or super fishing jar of the same size. It can absorb much of jarring shock to protect tools and strings from damages while strengthening the jarring force.

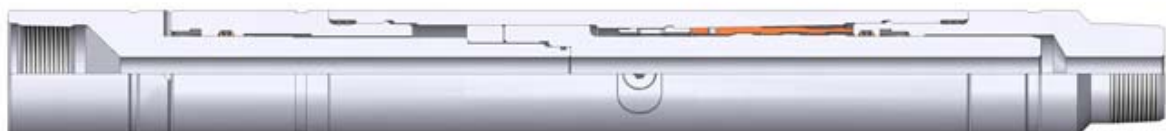


Specification Series and Performance Parameter

Type	O.D. mm	I.D. mm	Tool Joint Connection API	Overall Length mm	Max. Tensile load KN	Max. Working Torque kN-m	Max.Overpull KN	Max. Stroke mm
GJ73	73	20	2 3/8TBG	2620	250	3	80~100	218
GJ80	80	25.4	2 3/8REG	2845	300	3	90~120	218
GJ89	89	28	NC26	2760	400	3.5	110~150	218
YJQ36	95	32	NC26	2845	500	4	150~200	330
YJQ40	102	32	NC31	3878	600	5	200~250	330
YJQ108	108	32	NC31	3878	700	6	200~250	330
YJQ44	114	38	NC31	3422	800	7	250~300	216
YJQ46 II	121	38	NC38	3254	900	8	300~350	234
YJQ62	159	57	NC50	4375	1500	13	600~700	338
YJQ168	168	57	NC50	4375	1600	14	600~700	338
YJQ70 II	178	60	NC50	4019	1800	15	700~800	320
YJQ76	197	78	6 5/8REG	4238	2100	17	900~1000	341
YJQ80	203	78	6 5/8REG	4238	2200	18	900~1000	341
YJQ90	229	76	7 5/8REG	4180	2500	20	1100~1200	341

### Mechanical Fishing Jar Type JSQ

The mechanical fishing jar type "JSQ" is a up jarring tool for releasing sticking that adopts mechanical friction principle. Installed close to the fish in the fishing operation, it can deliver an intensive jarring impact upward on the fish directly. The jarring blow is pre-adjusted prior to the run.



Specification Series and Performance Parameters

Type	O.D. mm	I.D. mm	Working Stroke mm	Connection API	Overall Length mm	Max. Tensile Load KN
JSQ108	108	32	250	NC31	2128	700
JSQ114	114	30	178	31/2TBG	1651	300

### **Hydraulic Fishing Jar Type Z**

The Hydraulic Fishing Jar type "Z" is a up jarring tool that utilizes the drill tool's elastic potential energy resulted from the elastic deformation to realize the jarring action. It is used for fishing, coring, reaming, and side tracking. When used in combination with the jar intensifier type "YJQ", it can generate better jarring effect.



#### **Specification Series and Performance Parameters**

Type	O.D. mm	I.D. mm	Stroke mm	Tool Joint Connection API	Max. Working torque kN-m	Max. Working Load kN	Max. Tensile load kN	Sealing pressure MPa	Make-up Torque of Outer Parts kN-m	Make-up Torque of Guide Rod kN-m	Overall Length (Locked) mm
GS73	73	20	216	2 3/8TBG	3	100	250	20	1.96	0.98	1724
GS80	80	25.4	216	2 3/8REG	3	120	300	20	2.45	1.27	1724
GS89	89	28	216	NC26	3.5	150	400	20	2.94	1.27	1724
GS95	95	28	305	NC26	4	150	500	20	3.92	1.47	1724
YSJ36	95	38	305	NC26	4	160	500	20	3.92	1.47	2 041
YSJ40	102	32	229	NC31	5	176	600	20	4.9	1.47	1 804
YSJ108	108	38	305	NC31	6	200	700	20	6.86	1.96	2 041
YSJ44	114	38	288	2 7/8REG	7	240	800	20	9.8	1.96	1 986
YSJ46 II	121	38	290	NC38	8	280	900	20	9.8	1.96	2 114
YSJ62	159	57	381	NC50	13	560	1500	20	24.5	2.94	2 690
YSJ70III	178	60	381	NC50	15	640	1800	20	29.4	2.94	2 616
YSJ80	203	71	381	6 5/8REG	18	800	2200	20	34.3	4.9	2 616
YSJ90	229	76	381	7 5/8REG	20	960	2500	20	39.2	4.9	2 61

## **Lubricated Bumper Jar Type BXJ**

The lubricated bumper sub type "BXJ" is a dependable tool that is suitable for allfishing operations, especially down hole applications and deep workover operations. It is capable of producing an intensive jarring impact downward and is more effective for use in sticky or expansion formations and use in freeing key-seated or cave-in stuck tools.



Specification Series and Performance Parameters

Type	O.D. mm	I.D. mm	Tool Joint Connection API	Max. Tensile load MN	Max. Working Torque kN.m	Max. Stroke mm	Overall Length "Extended" mm
BXJ73	73	20	2 3/8TBG	0.3	3	268	1 837
BXJ89	89	28	NC26	0.4	3.5	268	1 837
BXJ95	95	32	NC26	0.5	4	266	1 837
BXJ105	105	32	NC31	0.6	5	400	2 285
BXJ108	108	32	NC31	0.7	6	400	2 285
BXJ44	114	38	2 7/8REG	0.8	7	268	1 832
BXJ46	121	38	NC38	0.9	8	405	2 285
BXJ62	159	50	NC50	1.5	13	467	2 763
BXJ70	178	70	NC50	1.8	15	470	2 952
BXJ80	203	78	6 5/8REG	2.2	18	462	2 952

## **Bumper Sub Type LXJ**

The bumper sub type "KXJ" is a down jarring tool and is manufactured from high-strength alloy steel. The tool can engage or disengage overshoot or spears, or be used as a feed-off tool in milling or cutting operations. It can be used in conjunction with an overshoot or spear.



### Specification Series and Performance Parameters

Type	O.D. mm	I.D. mm	Tool Joint Connection API	Max. Tensile load MN	Max. Working Torque kN.m	Max. Stroke mm	Overall Length (Locked) mm
KXJ36	95	38	NC26	0.5	4	508	1 800
KXJ40	102	32	23/8REG	0.6	5	700	1 900
KXJ44	114	38	NC31	0.8	7	440	1 500
KXJ46	121	38	NC38	0.9	8	914	1 986
KXJ62	159	51	NC50	1.5	13	1400	2 627
KXJ165	165	51	NC50	1.6	14	1400	2 633
KXJ70	178	70	NC50	1.8	15	1552	2 737
KXJ80	203	70	65/8REG	2.2	18	1600	2 901
KXJ90	229	76	75/8REG	2.5	20	1600	2 881