

LT–T Type Releasing Overshot Operation Instruction

TOPLAND OILFIELD SUPPLIES LTD.

1. General

The releasing grapple fishing overshot is the special external fishing tool used for fishing drill collar, drill collar, drill pipe, oil tube and other fishes in drilling and work over operation. It is designed according to the sizes of drill collar, drill pipes, couplings and other oil well tubes. When fish is gripped but can not be released, the releasing overshot is used to release the fish and lift it up to the ground.

After catching the fish, the releasing overshot can make high pressure mud circulating. The fishing overshot is matched with drill mill which can repair effectively the burr and crack available on the fish top so that the fish can be smoothly dropped into overshot. When areas of gripping shall be increased, the oversize guide shall be connected with; When fish top deviate from the well wall, the wall hook shall be used; The extension sub shall be connected when gripping location is too far from fish top.

The fishing overshot is made of super quality steel, finished by heat treatment. The tool has some advantages of strong anti-tensile strength and high torsion, and both the tool and fish will not be damaged even under the complicated loading condition. It is simple in construction, flexible in use and easy in operation.

2. Construction

The outside of releasing fishing overshot is composed of top sub, bowl, guide. Inside of it is consisting of gripping grapple, packer and drill mill or control ring. The construction is shown as in fig. 1 and 2.

The gripping members are divided with spiral slip and basket grapple which are available with different sizes. When make fishing, a kind of slip applicable to outside diameter of fish can be selected and put into bowl.

The spiral grapple likes a spring, exterior is wide-tooth with left-hand thread, engaged with internal thread of bowl, the pitch is same, but the thread face is more narrow than bowl. The interior has multi-heads left-hand buttress gripping tooth which is sharp and hard. The spiral slip has lower end welded with a finger key, the cooperation of finger key and control card stops the rotation of spiral grapple in bowl. The spiral slip is generally designed into three kinds of sizes which the total gripping size in at a range of 9 to 12 mm. In consideration of the wearing of pipe, the gripping size of each slip is less than standard slip size within 3 mm so as to suit for the wear changes of pipe string.

Basket grapple is in column, likes a basket. The exterior is same with that of spiral grapple, but it is available with perfect wide-tooth left-hand threads. The interior is available with multi-heads left-hand

threads. Lower end is made with key slot, and transversal equally expansion and contraction slot, just like a spring card head. In consideration of pipe wear, each slip size at 3 mm less than standard grapple.

Control card is made with control card sleeve and card key by welding for spiral slip use. The function is that the spiral grapple can be moved up and down in the bowl but not rotated.

Drill mill or control ring. The control ring has lower end at bell equipped with mill tooth, called mill shoe, used for basket slip. The function are two: The engagement for finger key of control card and key slot of basket slip makes that the basket grapple can move up and down but not rotate in the bowl. Another function is pack-off mechanism. R type of packers applicable to different sizes of basket slip are coated in slot to effect the sealing from outside diameter of fish. On the exterior, o type seal ring is equipped, which is used to seal control ring against internal wall of bowl. When the lower end at bell is with mill tooth, the mill tooth can be used to repair the burr and cracks from fish top.

“A” type packer. It is a rubber short sleeve type, has a internal sealing lip. The packer seals the O.D. of fish against the internal wall of bowl and can be used with different sizes of spiral slip, the packer is installed on the top of bowl. By means of taper face of top sub, the packer provides greater sealing ability. “A” type packer also can be installed when used spiral grapple.

“R” type packer: It has a internal seal lip, the outer face is coated in the internal slot of control ring, the packer can be used with baskets with different sizes.

Top sub: with two functions, one is that top end with connection thread can be connected with fishing string. Two is that lower end with thread can be connected with bowl. The lower end face is tapered which can be sealed against “A” type packer.

Bowl: Two ends with threads, top end is connected with top sub or extension sub, and the lower end thread is connected with guide or wall hook. The wide-saw tooth threads in the interior can be engaged with wide-buttress tooth thread of spiral grapple or basket grapple.

Guide: The O.D. is same as the O.D. of bowl, the top end with thread can be connected with bowl, and the taper face of top end of guide seals against the O-type seal ring. The lower end of guide forms a spiral mouth which can attract the fish enter overshot.

Fishing overshot accessories: It includes extension sub, oversize guide and wall hook as showed in fig. 3, fig. 5. Selections are at operator's option.

3. Gripping and releasing mechanism

The gripping members are spiral grapple and basket grapple with structure as above said. Due to the fact that both exterior wide tooth thread and interior grapple are in left-hand threads, it has a big clearance from bowl of overshot, this condition makes the grapple in bowl expansion and contraction in stroke. After the fish is guided in overshot, only an axile pressure is provided, the grapple in overshot shall moves up. Because that the axile pressure makes fish drop in bowl, at the time the grapple moves up and expands bigger, it grips firmly the fish with sharp tooth and spring force. When lift up fishing string, the grapple in bowl is moves downward. Due to that the transversal section of wide-tooth thread is tapered face, the grapple will certainly moves to small end of taper body with heavy fish, at this time, gripping is more firm as the weight of fish increase. The total weight is transmitted to bowl from grapple.

It was above said that the wide-tooth thread of bowl and internal and external thread of grapple are belonged to left-hand thread, after the grapple is engaged with bowl, the control card or control ring prevents the grapple from rotating, as a result, the fish can be released from bowl hy giving a force and rotating of rotary fishing string in clockwise. The fish is released quickly because of multi-head threads.

4. Operation

No matter spiral grapple or basket grapple is installed in bowl, the operating mechanism for fishing or releasing of fish or bowl is in same method in fishing opering, Overshot equipped with: Select grapple and packer according to the fish size. Select guide or oversize guide or wall hook according to the hole condition or hole diameter. Determine that the extension sub is needed or not according to the gripping position of fish.

4.1 Fish catching operation

4.1.1 Connection of fishing overshot with fishing string, the tong should not clamp in the bowl to avoid that the bowl is damaged, and the piping up torsion equals to the fishing string.

4.1.2 Start pump circulating to wash the coverings around fish when the overshot is dropped to 0.3 to 0.5 meter from fish top.

4.1.3 Stop pump circulating and slowly drop down overshot by rotating. When happen to be jumping, measures shall be taken after analysis of reasons, refishing also can be made by lifting of fishing string up.

4.1.4 When the fish is expected in bowl, stop rotating and provide certain axially force to force the fish drop in grapple.

4.1.5 Lift fishing string up, if lifting weight is increased, it means the fish is caught.

4.1.6 Start pump circulating of mud fully and notice the changes of pump pressure.

4.1.7 Before tripping out of drill tool, lift fish to 0.5 to 0.8 meter from bottom hole and brakes by 2 to 3 times in such way to find the fish is gripped firmly, then tripping out of drill tool can be made.

4.1.8 When trip out and disconnect pipe string, rotary breakout can not be used, breakout shall be carried by rotary wire line, chain, rotary wireline device or automatic tong can be used. And attention shall be paid that the fishing string under rotary table shall be prevented from rotating.

4.1.9 After lift the fish out of holehead, clean it with fresh water, don't be anxious to release fish at holehead, even loose the fishing overshot at hole-head, the fishing overshot can be pressing loosed on rig floor when possible.

4.1.10 Elevating of the overshot gripped with fish off the rig floor, then trip out.

4.1.11 One chain pliers is used to clamp the fishing overshot, another chain pliers is used to clamp the fish and rotates in clockwise, then the fish is released from grapple tooth.

Notes: If fish is not released by above methods, recommend to loose it by striking on the rig-floor and wash the settings between bowl and grapple by inserting in a water tube, then release the fish. If the fish is still not released, recommend taking to maintenance station where the fish may be released on the hydraulic disassembly-assembly frame.

4.2 Release overshot in hole.

4.2.1 Drops overshot down to ensure that grapple is at the big taper end of bowl wide tooth thread, as this time, the grapple is in expansion strain.

4.2.2 Rotates in clockwise the fishing string and lift it up until the fishing overshot is released from.

4.2.3 If overshot can not be released, recommend to use ground jar, requires that jarring by many times with low tons.

5. Discharge and assembly

5.1 Discharge

5.1.1 Clamps the bowl by pliers and discharge off the guide while gripped guide by pliers.

5.1.2 Takes out of control card.

5.1.3 Takes out of grapple.

5.1.4 Changes the tong space, and disconnect the top sub.

5.1.5 Takes out "A" type packer.

5.2 Assembling

Before assemble, check carefully the grapple tooth and sealing parts, unsuitable parts shall be replaced by new one. The selected parts shall be cleaned carefully and coated with grease, connected thread shall be lubricated with grease special for connection of drill pipe. For control ring or mill shoe, check the seal lip of “R” type packer is well sealed and pasted firmly. O type seal ring is put in control ring to form a seal assembly of control ring.

5.2.1 Screw the grapple coated with grease in bowl (left-hand). Adjust the grapple to move up and down at an optimum range.

5.2.2 Assembling of control card or control ring (mill shoe).

5.2.2.1 The control card shall be used with spiral grapple, the finger keys of them shall be contacted closely to limit the rotating of spiral grapple in bowl.

5.2.2.2 The control ring or mill shoe is used with basket grapple, before putting in control ring, the key groove of basket grapple shall be fitted with key groove of bowl.

5.2.3 The bowl is clamped in the pliers and connected with guide (oversize guide or wall hook and be screwed on.

5.2.4 Check out whether the grapple is flexible in moving up and down in the bowl.

5.2.5 Changes the tong space, put the “A” type packer from top of bowl, and adjust the packer in perfect condition.

5.2.6 Connected top sub with bowl and piped up.

6. Maintenance

6.1 When the overshot is taken out hole and put on the rig-floor, cleaning it with water shall be made.

6.2 Completely discharge and checked on the maintenance station, damaged part shall be replaced by new one.

6.3 Connected threads which is little damaged allow to be repaired for use by using of fine file, abrasive paper or oil stone.

6.4 Guide, oversize guide, wall hook, or pressed seal ring of top sub or contacting end-face of packer shall be sealed only when they are kept well with no damages.

6.5 The “A” type packer is pasted in internal wall of control ring by high strength paste. When replace, the old packer can be easily taken off by steeping in acetone liquid or heating with blowlamp. After taking old packer off, the left sticky residues shall be removed by cleaning agents, then recoated new “A” type

packer in control ring.

6.6 The fishing overshot suffered from heavy load or strong jarring with big torsion during fishing operation. After fishing working, all main parts shall be ultrasonic tested.

6.7 When the overshot is stored or out of use, all metal parts shall be lubricated with anti-rust grease, and the rubber seal part shall be taken off and packed for storing (the rubber seal part can be kept for 1.5 years).

6.8 The parts with thread shall be equipped with thread protector before connected with.

6.9 The place of storing shall be dry and clean with air condition.

7. Specifications and technical parameters see below tables.

8. How to order

- 1). Indicate the specification, name and quantity of body or part.
- 2). Indicate type of grapple and fishing sizes.
- 3). Specify that the parts for overshot is needed or not, if need, specification and name shall be specified.
- 4). Specify the type and name for rubber seal part.
- 5). If connection is special not belong to our standard, please indicate the required connection type and sizes.

Specifications for fishing overshot in drilling operation

Type			LT-T89 (3 1/2)	LT-T92 (3 5/8)	LT-T95 (3 3/4)	LT-T105 (4 1/8)	LT-T117 (4 5/8)	LT-T127 (5)
Spiral grapple	Max. Fishing size (mm) in		60 (2 3/8)	76 (3)	77.5 (3 1/16)	85.5 (3 1/4)	89 (3 1/2)	95 (3 3/4)
	Tensile load 10KN (t)		137.2 (140)	56.8 (58)	90.2 (92)	66.6 (68)	113.7 (116)	227.4 (232)
Basker grapple	Max. Fishing (mm) Inch		47.5 (1 7/8)	66.5 (2 5/8)	68 (2 11/16)	85.5 (3 1/4)	89 (3 1/2)	95 (3 3/4)
	Tensile yield Load 10KN (t)	With shoulder	117.6 (120)	47 (48)	89.2 (91)	59.8 (21)	106.8 (109)	199.9 (204)
		Without Shoulder	73.5 (75)	24.5 (25)	83.3 (85)	38.2 (39)	73.4 (80)	142.1 (145)
Overshot O.D. mm Inch			89 (3 1/2)	92 (3 5/8)	95 (3 3/4)	105 (4 1/8)	117 (4 5/8)	127 (5)
Internal connection			NC26 (2 3/8IF)	NC26 (2 3/8IF)	NC26 (2 3/8IF)	NC31 (2 7/8IF)	NC31 (2 7/8IF)	NC38 (3 1/2IF)
Weight of main body			25	26.5	30	35	42	53

Type			LT-T143 (5 5/8)	LT-T152 (6)	LT-T162 (6 3/8)	LT-T168 (6 5/8)	LT-T187 (7 3/8)	LT-T194 (7 5/8)
Spiral grapple	Max. Fishing size (mm) in		121 (4 3/4)	127 (5)	133.5 (5 1/4)	140 (5 1/2)	146 (3 1/2)	159 (3 3/4)
	Tensile load 10KN (t)		133.3 (135)	167.2 (170)	179.3 (183)	193.2 (197)	203.7 (208)	205 (209)
Basker grapple	Max. Fishing (mm) Inch		108 (4 1/4)	105 (4 1/8)	117.5 (4 5/8)	121 (4 3/7)	127 (4 3/7)	140 (3 1/8)
	Tensile yield Load 10KN (t)	With shoulder	114.4 (117)	156.8 (160)	157.8 (161)	180.4 (184)	188 (192)	199.9 (204)
		Without Shoulder	82.3 (84)	112.7 (115)	113.7 (116)	157.7 (161)	163.4 (166.7)	170.1 (173.5)
Overshot O.D. mm Inch			143 (5 5/8)	152 (6)	162 (6 3/8)	168 (6 5/8)	187 (7 3/8)	194 (7 5/8)
Internal connection			NC38 (3 1/2IF)	NC38 (3 1/2IF)	NC50 (4 1/2IF)	NC50 (4 1/2IF)	NC50 (4 1/2IF)	NC50 (4 1/2IF)
Weight of main body			62	69	86	88	113	120

Type			LT-T200 (7 7/8)	LT-T206 (8 1/8)	LT-T219 (8 5/8)	LT-T225 (8 7/8)	LT-T232 (9 1/8)	LT-T244 (9 5/8)
Spiral grapple	Max. Fishing size (mm) in		159 (6 4/4)	178 (7)	178 (7)	197 (7 3/4)	203 (8)	213 (8 3/8)
	Tensile load 10KN (t)		288 (294)	192 (196)	292 (298)	190 (194)	192 (196)	188 (192)
Basker grapple	Max. Fishing (mm) Inch		127 (5)	159 (6 1/4)	162 (6 3/8)	178 (7)	187 (7 3/8)	197 (7 3/4)
	Tensile yield Load 10KN (t)	With shoulder	250 (255)	176 (180)	240 (245)	182 (186)	173 (177)	175 (179)
		Without Shoulder	185 (189)	138 (141)	190 (194)	148 (151)	133 (136)	136 (139)
Overshot O.D. mm Inch			200 (7 7/8)	206 (8 1/8)	219 (8 5/8)	225 (8 7/8)	232 (9 1/8)	244 (9 5/8)
Internal connection			NC50 (4 1/2IF)	NC50 (4 1/2IF)	NC50 (4 1/2IF)	NC50 (4 1/2IF)	6 5/ 8REG	6 5/ 8REG
Weight of main body			126	130	141	146	159	167

Type			LT-T254 (10)	LT-T260 (10 1/4)	LT-T273 (10 5/8)	LT-T286 (11 1/4)	LT-T340 (13 3/8)	LT-T406 (16)
Spiral grapple	Max. Fishing size (mm) in		225 (8 7/8)	228 (9)	241 (9 1/2)	245 (9 5/8)	286 (11 1/4)	340 (13 3/8)
	Tensile load 10KN (t)		220 (224)	250 (255)	272 (278)	292 (298)	343 (350)	398 (406)
Basker grapple	Max. Fishing (mm) Inch		206 (8 1/8)	210 (8 1/4)	225 (8 7/8)	225 (8 7/8)	254 (10)	286 (11 1/4)
	Tensile yield Load 10KN (t)	With shoulder	198 (202)	231 (236)	240 (245)	256 (261)	280 (286)	340 (347)
		Without Shoulder	159 (162)	202 (206)	190 (194)	206 (210)	230 (235)	300 (306)
Overshot O.D. mm Inch			254 (10)	260 (10 1/4)	273 (10 5/8)	286 (11 1/4)	340 (13 3/8)	406 (16)
Internal connection			6 5/ 8REG	6 5/ 8REG	6 5/ 8REG	6 5/ 8REG	7 5/ 8REG	7 5/ 8REG
Weight of main body			178	184	198	238	498	607

Specifications For Spiral Grapple Overshot in Workover

Type	LT/S-T48A 1.90	LT/S-T60 (2 3/8)	LT/S-T73A (2 7/8)	LT/S-T89A (3 1/2)	LT/S-T102A (4)	LT/S-T114A (4 1/2)
Fishing size range(mm)	48.3~55	60.3~66	73~79	89~95	101.6~108	114~121
Tensile yield load mm (t)	95 (97)	98 (100)	93 (95)	102 (104)	110 (113)	118 (121)
O.D. of Overshot(mm)	95	102	114	127	140	152
Connection	NC26 (2 3/8IF)	2 7/8 REG	NC31 (2 7/8IF)	NC38 (3 1/2IF)	NC38 (3 1/2IF)	NC38 (3 1/2IF)
Weight of main body (kg)	25	31	37	46	58	72

Specifications For Basket Grapple Overshot in Workover

Type	LT/S-T48A 1.90	LT/S-T60B (2 3/8)	LT/S-T73B (2 7/8)	LT/S-T89B (3 1/2)	LT/S-T102B (4)	LT/S-T114B (4 1/2)
Fishing size range(mm)	48.3	60.3	73	89	101.6	114
Tensile yield load mm (t)	73 (75)	76 (78)	78 (80)	93 (95)	95 (97)	98 (100)
O.D. of Overshot(mm)	95	102	114	127	140	152
Connection	NC26 (2 3/8IF)	2 7/8 REG	NC31 (2 7/8IF)	NC38 (3 1/2IF)	NC38 (3 1/2IF)	NC38 (3 1/2IF)
Weight of main body (kg)	27	33	39	48	60	73

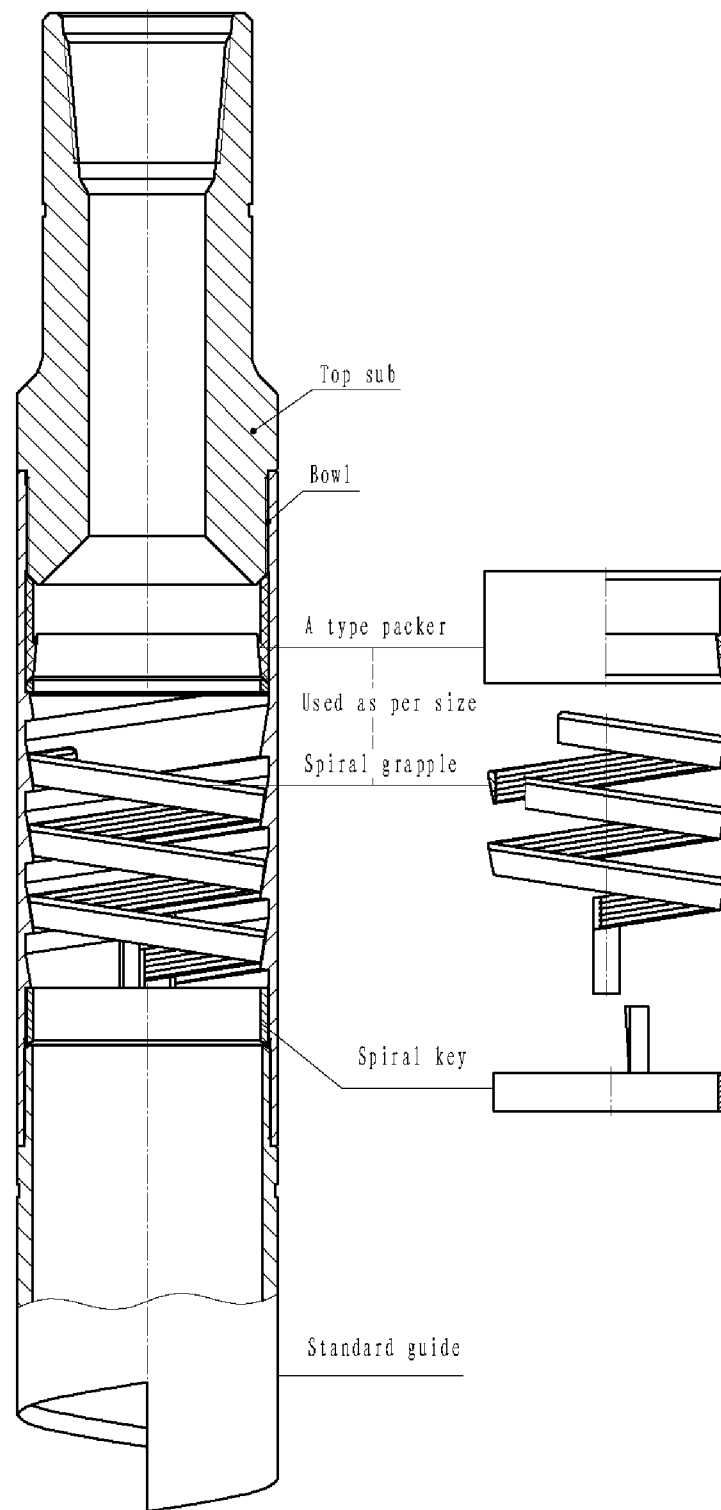


Fig.1. Installation of
spiral grapple

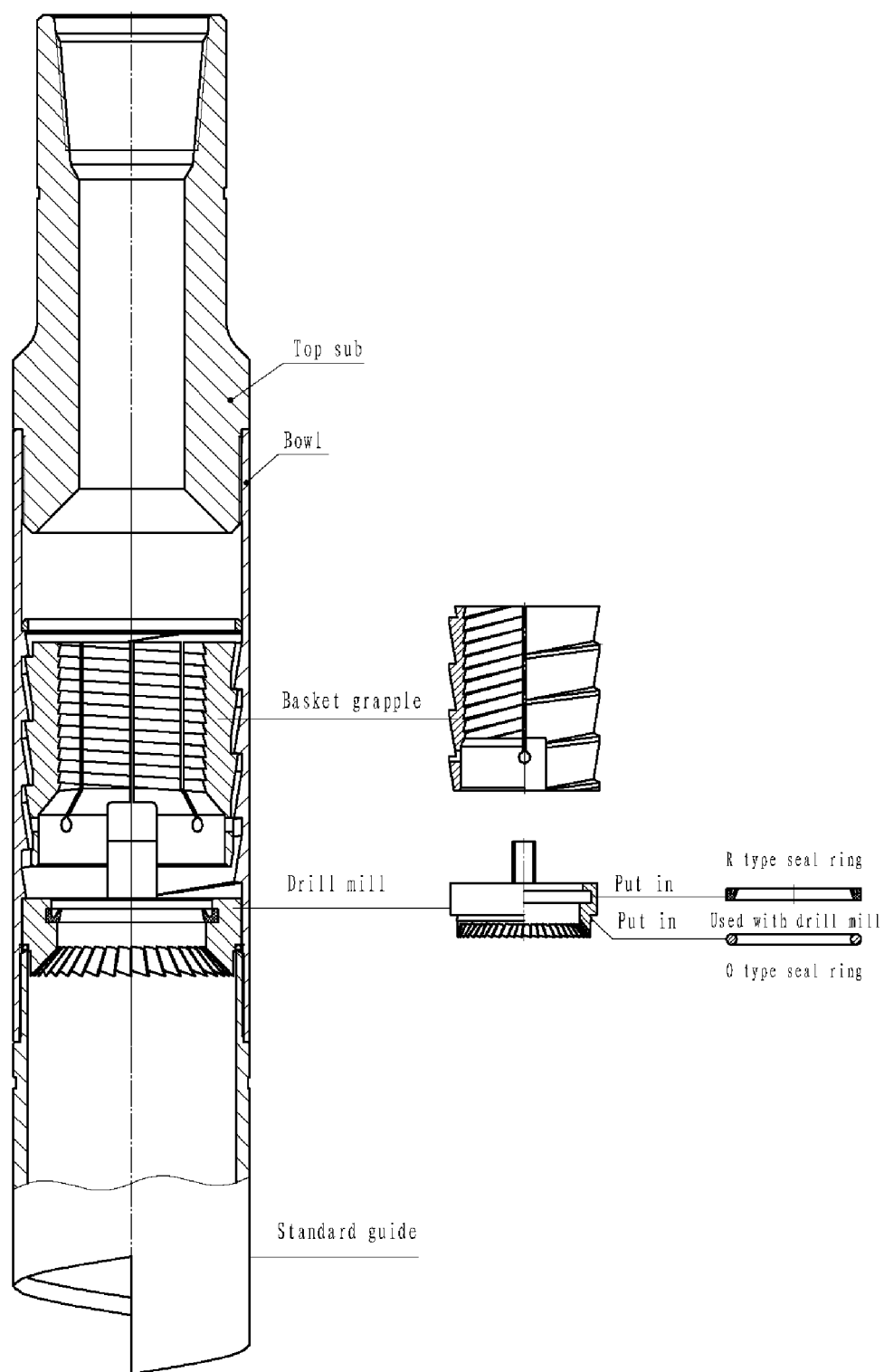
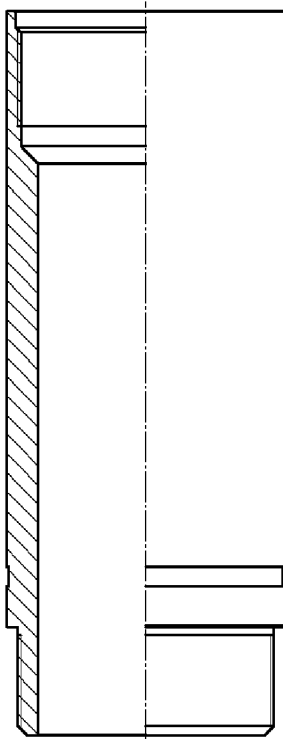
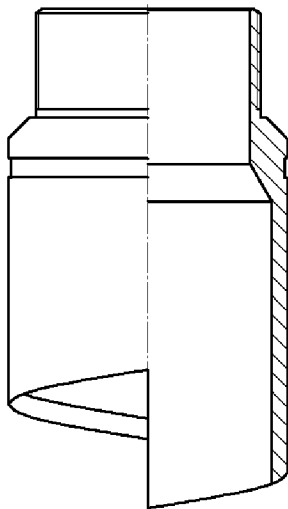


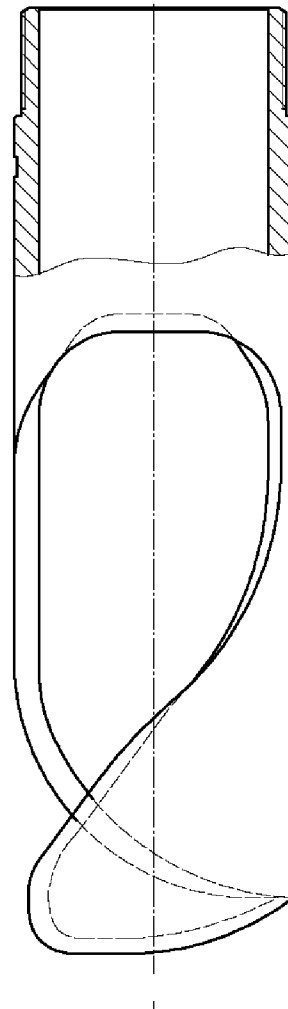
Fig.2. Installation of
basket grapple



Extension sub



Oversize Guide



Wall Hook

产品目录

PRODUCT LIST

系列 Series	名称 Product name	规格型号 Specification(in)	系列 Series	名称 Product name	规格型号 Specification (in)
井口工具 Well head tools	钻杆旋转工具 Drill pipe rotary tool	全规格 In all sizes	钻柱工具 Drill stem tools	钻杆提丝 Drill pipe lift plug	全规格 In all sizes
	提升短节 Lifting sub	全规格 In all sizes		钻头提丝 Drill bit lift plug	全规格 In all sizes
	滚子方补芯 Roller Kelly bushings	3 1/2, 4 1/4, 5 1/4		套管快卸护丝 Casing quick-release thread protector	全规格 In all sizes
	槽形磁铁 Ditch magnets	全规格 In all sizes		单流阀 Check valve	全规格 In all sizes
	钻头卸扣器用于三牙轮钻头 Bit breaker for three cone bit	6~28		顶驱接头 Top drive sub	全规格 In all sizes
	钻头卸扣器用于PDC钻头 Bit breaker for PDC drill bit	6~12 1/4		方钻杆旋塞阀 Kelly valve	全规格 In all sizes
	泥浆防溅盒 Savers	3 1/2, 5		箭形止回阀 Arrow type check valve	全规格 In all sizes
钻柱工具 Drill stem tools	转换接头 Crossover sub	全规格 In all sizes		投入式止回阀 Drop-in check valve	全规格 In all sizes
	循环接头 Circulating sub	全规格 In all sizes		方钻杆防浅阀 Kelly splash valve	6 1/2, 7
	钻杆接头 Drill pipe tool joint	全规格 In all sizes		钻具内防喷器 Inside BOP	5, 3 1/2, 2 7/8
	整体螺旋稳定器 Integral spiral blade stabilizer	6~26		普通钻铤 Slick drill collar	全规格 In all sizes
	整体直棱稳定器 Integral straight rib stabilizer	6~26		螺旋钻铤 Spiral drill collar	全规格 In all sizes
	非旋转稳定器 Non-rotation stabilizer	6~28		整体加重 Integral heavy weight drill pipe	全规格 In all sizes
	可换套稳定器 Replaceable sleeve stabilizer	全规格 In all sizes		短钻杆 Short drill pipe	全规格 In all sizes
	偏重单头或多头稳定器 Unbalanced single-spiral or multi-spiral stabilizer	8~12 1/4		方钻杆(四、六) (Square, Hexagonal) Kelly	全规格 In all sizes
	随钻扩孔器 Roller reamer	全规格 In all sizes		牙轮扩孔器 Cone hole opener	全规格 In all sizes
	球形稳定器 Spherical stabilizer	6~12 1/4	定向井工具 Directional well tools	定向弯接头 Oriented bent sub	5 1/2, 6 1/4, 7, 8
	浮阀稳定器 Float valve stabilizer	6 1/4~26		定向接头 Oriented sub	5 1/2, 6 1/4, 7, 8
	双向减震器 Double way shock absorber	9, 8, 7, 6 1/4	取芯工具 Coring tools	取芯工具 Coring tool	庆 84- I 川 7-4、8-3、 Qing 84- I Chuan 7-4、
	单向减震器 One way shock absorber	9, 8, 7, 6 1/4	固井工具 Cementing tools	微台阶尾管悬挂器 Mini-bench liner hanger	9 5/8× 7, 7× 5, 9 5/8× 5 1/2
	浮阀接头 Float valve sub	全规格 In all sizes		坐井式尾管悬挂器 Sitting well type liner hanger	5 1/5× 4
	耐磨接头 Saver sub	4 3/4, 6 5/8, 7 3/4, 7, 9, 10 3/4		轨道式尾管悬挂器 Railway liner hanger	7× 5
	套管试压堵塞器 Casing test pressure plug	4~24		套管铸造铁引鞋 Casing cast iron guide	全规格 In all sizes

产品目录

PRODUCT LIST

系列 Series	名称 Product name	规格型号 Specification(in)	系列 Series	名称 Product name	规格型号 Specification(in)
固井 工具 Cementing tools	套管稳定器 Casing centralizer	全规格 In all sizes	修井 工具 Workover tools	长锥面胀管器 Long pyramid pipe expander	全规格 In all sizes
	浮鞋、浮箍 Float shoe, Float collar	5~13 3/8		梨形胀管器 Pear-shaped pipe expander	全规格 In all sizes
	可钻式浮鞋、 浮箍 Drillable float shoe,float collar	5~13 3/8		外钩 External hook	全规格 In all sizes
	单塞水泥头 Single plug cement head	5 1/2, 7, 9 5/8, 10 3/4		内钩 Internal hook	全规格 In all sizes
	双塞水泥头 Double plug cement head	5 1/2, 7, 9 5/8, 10 3/4, 13 3/8	震击解 卡工具 Jarring tools	随钻震击器 (液压机械式) Drilling jar (hydraulic- mechanical)	4 3/4, 5 1/4, 6 1/4, 6 1/2, 7, 7 3/4, 8
	钻杆水泥头 Drill pipe cement head	2 7/8~5		全机械随钻震击器 Full mechanical drilling jar	6 1/4, 8
	水利扩张式封 隔器 Hydraulic expanding packer	5 1/2		超级震击器 Super fishing jar	8~4 1/2
套管开窗 工具 Casing sidetracking tools	钻绞式开 窗铣锥 Reaming slotted milling tap	4 1/2~8 1/2		地面震击器 Surface bumper jar	7, 4 3/4
	一次坐封开窗 工具 Primary setting slotting tool	5 3/4, 4 1/2		闭式下击器 Lubricated fishing bumper sub	7, 6 1/4
	液压锚定式导 斜器 Hydraulic anchor whipstock	4 1/2~8		开式下击器 Fishing bumper sub	4 1/2~8
	液压锚定封隔 器式导斜器 Hydraulic anchor packing whipstock	4 1/2~8		液压上击器 Hydraulic up jar	4 1/2~8
修井 工具 Workover tools	短鱼头打捞筒 Short catch overshot	全规格 In all sizes	打捞套 铣工具 Fishing and washover tools	震击加速器 Jar intensifier	4 1/2~8
	滑块卡瓦 打捞矛 Sliding block spear	1.9~7		套铣管 Washover pipe	全规格 In all sizes
	活页式打捞筒 Flap overshot	2 3/8~4 1/2		公锥、母锥 Taper tap,Die collar	全规格 In all sizes
	多功能打捞筒 Multi-function overshot	全规格 In all sizes		套铣管转换接头 Crossover sub for washover pipe	全规格 In all sizes
	一把抓 Finger type junk basket	2 3/4, 3 1/2, 4		倒扣捞矛 Reversing spear	1.9~7
	鱼顶修整器 Fish top trimmer	4 1/8~6		提放式可退捞筒 Lifting-lowering and releasing overshot	1.9~4 1/2
	套管刮削器 Casing scraper	全规格 In all sizes		提放分瓣捞矛 Lifting-lowering flapper spear	2 3/8~5 1/2