



# ASI-X PACKER

## 6" X 2-7/8"

Manual No:  
**DL-603-6000-384**

Revision: **B**

Revision Date:  
**10/23/2018**

Authored by: S. White

Approved by: D. Hushbeck

### A) DESCRIPTION

The ASI-X Anchor is a mechanically set double grip tubing anchor designed to be exceptionally durable and debris tolerant. This anchor is based on the proven ASI-X Packer design, but has been shortened, simplified and does not have a sealing element. This anchor is suited for treating, testing, injecting, pumping wells, and flowing wells, deep or shallow. This anchor is built using durable ASI-X Packer parts making redress both quick and economical.

The double slip design allows the anchor to be left in tension or compression, depending on well conditions and the required application. The J-slot design allows easy setting and releasing; 1/4 turn right-hand set, right-hand release. With the variety of J-body configurations available, this anchor can also be set with other packers in tandem. This anchor is also equipped with an adjustable straight pickup emergency shear release and when released in this manner, the anchor will reset when moved down the hole.

### B) RELATED TOOLS (sold separately)

B-1) 2-7/8" DT-2 On/Off Tool (P/N varies)—refer to technical manual *DL-515-2875-1027*.

B-2) 2-7/8" Stinger—actual P/N varies depending on customer requirements.

### C) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	GAGE OD (INCHES)	ID (INCHES)		
6	10	5.672	5.375	2.50	2-7/8 EUE	60361 60361H <sup>1</sup> 60361V <sup>2</sup>

Elastomer Trim Options: <sup>1</sup>HSN, <sup>2</sup>Viton

**NOTE<sub>1</sub>:** Tools listed are right-hand set / right-hand release.

**NOTE<sub>2</sub>:** Use of a Double Hook J-slot Packer is recommended when running with a pumpjack to help prevent the packer from unsetting during well production.

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
7,000 PSI	90,000 LBS

### D) PRE-INSTALLATION INSPECTION PROCEDURES

**CAUTION<sub>1</sub>:** D&L ships tool connections made-up **HAND TIGHT**—labeled with hand-tight tape on the tool (Fig. 1)—unless stated otherwise. Tighten/torque all connections properly before operating tool.



Fig. 1

GENERAL THREAD CONNECTION TORQUE RECOMMENDATIONS			
STUB ACME / ACME THREADS	INTERNAL TAPERED TUBING THREADS		PREMIUM THREADS
	UP TO 2-3/8"	GREATER THAN 2-3/8"	
600 – 800 FT-LBS	600 – 800 FT-LBS	800 – 1,200 FT-LBS	Consult thread manufacturer's recommendations.

D & L OIL TOOLS  
P.O. BOX 52220 TULSA, OK 74152  
PHONE: (800) 441-3504 [www.dlmfg.com](http://www.dlmfg.com)



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### D) PRE-INSTALLATION INSPECTION PROCEDURES (cont'd)

GENERAL SCREW TORQUE RECOMMENDATIONS									
SCREW SIZE (INCHES)	#6	#8	#10	1/4	5/16	3/8	7/16	1/2	5/8 and larger
TORQUE RANGE (INCH-POUNDS)	5 – 8	10 – 15	18 – 25	25 – 40	50 – 80	90 – 135	160 – 210	250 – 330	450 – 650

Before first use, D&L recommends disassembly and inspection of the tool unless stated otherwise. Ensure parts have not been damaged during shipping. Replace damaged parts with D&L replacement parts. Contact D&L sales for replacement part information.

Re-assemble the tool after inspection. Install parts in the correct order and orientation. Properly tighten connections.

Before re-using the tool, D&L recommends disassembly and inspection of the tool. Clean parts and ensure parts are in good working condition. Replace worn or damaged parts with D&L replacement parts.

When redressing the tool, D&L recommends replacement of all seals, elements, o-rings, shear screws, etc. Contact D&L sales for redress kit and/or other replacement part information.

### E) SETTING PROCEDURES

#### E-1) COMPRESSION SET

Run the packer to setting depth. Pick up the tubing to allow for setting stroke (12-13") plus desired tubing load. Rotate the tubing 1/4 right-hand turn at the packer, and then lower the tubing while releasing torque. Slack off on the tubing sufficient weight to set the packer (12,000 lbs). Pull tension to assure that the upper slips are set. The tubing can then be left in tension, compression or neutral. If insufficient weight is available to set the packer with compression, tension can be applied after slack-off to pack off the elements.

#### E-2) TENSION SET

Run to setting depth, pick up on the tubing and rotate 1/4 turn to the right at the packer then lower the tubing slacking off available weight to set the packer lower slips. Pull tension to set upper slips and pack off elements (12,000 lbs). After setting the packer, the tubing can be left in compression, tension or neutral.

### F) RELEASING PROCEDURES

The releasing procedures are the same whether the packer has been tension or compression set. Set down weight on the packer to unseat the J-pin from the tension shoulder of the J-slot. Refer to the Pressure Affected Area Guide to determine necessary set down weight on the packer. Rotate the tubing 1/4 right-hand turn at the packer and pick up while holding right-hand torque. Weight in addition to pipe weight may be required to pick up on packer - refer to Pressure Affected Area Guide. The internal by-pass will open, allowing pressure to equalize. After pressure is equalized, continue to pick up to release the upper slips, relax the elements and release the lower slips thus allowing the packer to be re-set or removed from the well.

**CAUTION:** High differential pressure below the ASI-X Packer may cause the upper slips to wedge in tighter, requiring an extra amount of tension to release the upper slips.

#### F-1) EMERGENCY RELEASE

If the packer will not release in the normal manner, apply hard right-hand torque (800-1,000 ft-lbs) to break the tack weld on the J-pin ring. Rotate the work string to the right approximately 15 turns to release the J-pin ring and retrieve the packer. When released in this manner, the packer will reset when moved down the hole.



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### G) STORAGE RECOMMENDATIONS

When preparing the tool for storage, follow the Pre-Installation Inspection Procedures. Re-assemble the tool with connections hand-tight only and in running position if applicable. Elements should be in a relaxed state—free from tension, compression, and other stresses that could cause deformation.

Store the tool, if possible, in an enclosed, temperature and humidity controlled environment. Avoid excessively high temperatures over long periods of time. Shield elastomeric parts from ultraviolet light sources. Keep tool dry and protected from condensation. Do not store in contact with or near volatile or corrosive chemicals. Do not store near ozone generating equipment or operations such as welding.

### H) PRESSURE AFFECTED AREA GUIDE

PACKER SIZE (INCHES)	TUBING SIZE (INCHES)	PRESSURE AFFECTED AREA (SQ. INCHES)	
		ABOVE	BELOW
6	2.375	3.87 (DOWN)	-5.17 (UP)
	2.875	1.81 (DOWN)	-3.62 (UP)

**Example:** Consider a 6" X 2-7/8" ASI-X Packer set on 2.375" tubing with a differential pressure of 3,000 psi in the annulus around the tubing above the packer. What is the force acting on the seal area of the mandrel?

To calculate the force (lbs) acting on the seal area of the mandrel, refer to the Pressure Affected Area Guide for a 6" X 2-7/8" ASI-X Packer run on 2.375" tubing. In this example, the differential pressure from above the packer acts on the seal area of the packer mandrel across a pressure affected area of 3.87 in<sup>2</sup>. Multiplying the differential pressure (3,000 psi) by the pressure affected area (3.87 in<sup>2</sup>) results in a force of 11,610 lbs. The piston effect on the packer mandrel is a downward force of 11,610 lbs.

### I) ELASTOMER TRIM TEMPERATURE GUIDE

NITRILE (STD)			
TEMPERATURE RANGE (F°)	DUROMETER		
	END	MIDDLE	END
40° - 125°	80	70	80
125° - 250°	90	70	90
150° - 250°	90	80	90
250° +	Contact D&L Sales		

RUBBER TYPE	TEMPERATURE RANGE
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F



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## J) RECOMMENDED TOOLS

### J-1) HAND TOOLS

- VISE
- GLOVES
- ALLEN WRENCHES
- TAPE MEASURE
- O-RING PICK
- BAR
  - 1/2-INCH
  - 3/4-INCH
- PAINT BRUSH, 2-INCH
- PIPE WRENCH, 3-FT (2 EA)
- "CHEATER" PIPE, 4-FT LONG
- ADJUSTABLE WRENCH, 12-INCH
- CORDLESS DRILL, 18V
- SNAP RING SPREADER PLIERS
- ALIGNING PUNCH
- SCREWDRIVER SET, FLAT-TIPPED
- SOCKET SETS
  - 3/8-INCH DRIVE
  - 1/2-INCH DRIVE
- HAMMERS
  - SLEDGE
  - BALL PEEN
  - DEAD BLOW

### J-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	DRAG BLOCK ASSEMBLY TOOL	AT070110

## K) DISASSEMBLY

### K-1) Clamp top sub (1) in vise.

K-1.1) Unscrew and remove set screws (32) from J-pin bottom sub (23). Move J-body (20) as needed.

K-1.2) Unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

**NOTE<sub>3</sub>:** Drag block body assembly must be free to rotate.

K-1.2.1) Remove o-ring (35) from J-pin bottom sub (23).

K-1.3) Compress drag blocks (22) using drag block body assembly tool (T1).

K-1.4) Unscrew and remove set screws (33) from drag block body (18). Move drag block retainer (21) as needed to access screws.

K-1.5) Unscrew and remove J-body (20) from drag block body (18) (**NOTE<sub>4</sub>:** Left-hand threads)

K-1.5.1) Remove retaining ring (31) from J-body (20).

K-1.6) Remove drag block retainer (21) from drag block body (18).

K-1.7) Release drag blocks. Remove drag blocks (22) and drag block springs (3) from drag block body (18).

K-1.8) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

**NOTE<sub>5</sub>:** For added leverage, insert a rod thru rubber retainer (15) and rubber mandrel (11) as needed.

K-1.9) Wedge lower slips (17) outwards (if needed). Remove drag block body assembly and disassemble:

K-1.9.1) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).

K-1.10) Unscrew and remove lower cone (16) from rubber retainer (15).

K-1.11) Unscrew rubber mandrel (11) from center coupling (10).

**NOTE<sub>6</sub>:** For added leverage, insert a rod thru upper cone (9) as needed.

K-1.12) Remove rubber mandrel assembly from inner mandrel (2) and disassemble:

K-1.12.1) Remove gage ring (29), elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).

K-1.13) Unscrew and remove center coupling (10) from upper cone (9).

K-1.13.1) Remove bonded seal (24) and o-ring (36) from center coupling (10).

K-1.13.1.1) Remove o-ring (34) from bonded seal (24).

K-1.14) Remove upper cone (9) and bearing bushing (30) from inner mandrel (2).



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## K) DISASSEMBLY (cont'd)

K-2) Remove top sub (1) from vise and clamp inner mandrel (2) in vise.

**NOTE7:** Do NOT wrench or clamp on seal surface.

K-2.1) Unscrew and remove spring cage cap (27) from spring cage (5).

**CAUTION2:** Compression spring (4) is compressed with spring tension against upper slip body assembly.

K-2.2) Unscrew and remove top sub (1) from inner mandrel (2).

K-2.3) Remove compression spring (4) from spring cage (5).

K-2.4) Unscrew and remove spring cage (5) from upper slip body (6).

K-2.5) Wedge releasing slip (7) and upper slips (8) outwards (if needed). Remove upper slip body assembly and disassemble:

K-2.5.1) Remove spring retaining ring (28) from upper slip body (6).

K-2.5.2) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) and upper slip springs (26) from upper slip body (6).

K-3) Remove inner mandrel (2) from vise.

## L) ASSEMBLY

**NOTE8:** Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order & orientation.

L-1) Clamp inner mandrel (2) in vise.

**NOTE7:** Do NOT wrench or clamp on seal surface.

L-1.1) Assemble upper slip body assembly and install:

L-1.1.1) Install spring retaining ring (28) into upper slip body (6).

L-1.1.2) Install upper slips (8), releasing slip (7) and upper slip springs (26) into upper slip body (6).

**NOTE9:** Uses two (2ea) springs per slip (Fig. 1).

L-1.1.3) Wedge releasing slip (7) and upper slips (8) outwards. Install spring cage assembly onto inner mandrel (2). Remove wedges.

L-1.2) Screw spring cage (5) into upper slip body (6).

L-1.3) Install compression spring (4) into spring cage (5).

L-1.4) Screw top sub (1) onto inner mandrel (2).

L-1.5) Screw spring cage cap (27) onto spring cage (5).

**CAUTION2:** Compression spring (4) will be compressed with spring tension against upper slip body assembly.

L-2) Remove inner mandrel (2) from vise. Clamp top sub (1) in vise.

L-2.1) Install upper cone (9) and bearing bushing (30) onto inner mandrel (2).

L-2.2) Install o-ring (36) in groove in center coupling (10).

L-2.3) Install o-ring (34) in groove in bonded seal (24).

L-2.4) Install bonded seal (24) into center coupling (10).

**CAUTION3:** Do not rip or tear o-ring during installation.

L-2.5) Screw center coupling (10) onto upper cone (9).

**NOTE6:** For added leverage, insert a rod thru upper cone (9) as needed.

L-2.6) Assemble and install rubber mandrel assembly:

L-2.6.1) Install rubber retainer (15), elements (13, 14), rubber spacers (12) and gage ring (29) onto rubber mandrel (11).

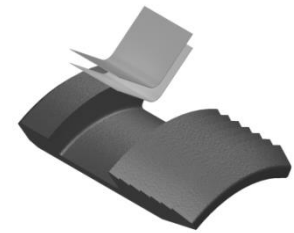


Fig. 1



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## L) ASSEMBLY (cont'd)

L-2.6.2) Install rubber mandrel assembly onto inner mandrel (2).

L-2.6.3) Screw rubber mandrel (11) into center coupling (10).

**CAUTION<sub>3</sub>**: Do not rip or tear o-ring during installation.

L-2.7) Screw lower cone (16) into rubber retainer (15).

L-2.8) Assemble drag block body assembly and install:

L-2.8.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge lower slips (17) outwards.

**NOTE<sub>9</sub>**: Uses two (2ea) springs per slip (Fig. 2).

L-2.8.2) Install drag block body assembly onto rubber mandrel (11). Remove wedges.

L-2.9) Screw rubber mandrel cap (19) onto rubber mandrel (11).

**NOTE<sub>5</sub>**: For added leverage, insert a rod thru rubber retainer (15) and rubber mandrel (11) as needed.

L-2.10) Install drag blocks (22) and drag block springs (3) into drag block body (18). Compress drag blocks (22) using drag block body assembly tool (T1).

**NOTE<sub>10</sub>**: Uses (6ea) drag block springs per drag block (Fig. 3).

L-2.11) Install drag block retainer (21) onto drag block body (18) capturing ends of drag blocks (22). Align holes in drag block retainer (21) with threaded holes in drag block body (18).

L-2.12) Install retaining ring (31) onto J-body (20).

L-2.13) Screw J-body (20) into drag block body (18) (**NOTE<sub>4</sub>**: Left-hand threads).

L-2.14) Screw set screws (33) into drag block body (18). Release drag blocks (22).

L-2.15) Install o-ring (35) in groove in J-pin bottom sub (23).

L-2.16) Screw J-pin bottom sub (23) onto inner mandrel (2).

**CAUTION<sub>3</sub>**: Do not rip or tear o-ring during installation.

**NOTE<sub>3</sub>**: Drag block body assembly must be free to rotate.

L-2.17) Screw set screws (32) into J-pin bottom sub (23). Move J-body assembly as needed.

L-3) Unclamp top sub (1) from vise and remove assembled tool.

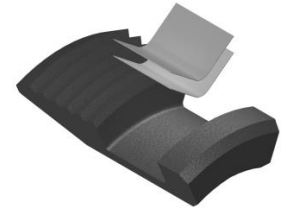


Fig. 2



Fig. 3



# ASI-X PACKER 6" X 2-7/8"

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## M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60361
1	1	TOP SUB	DLMS80	60070610
2	1	INNER MANDREL	DLMS80	60361210
3	24	DRAG BLOCK SPRING	INCONEL	9101900
4	1	COMPRESSION SPRING	DLMCRSP	60370920
5	1	SPRING CAGE	DLMS60	60370310
6	1	UPPER SLIP BODY	DLMS35	60361320
7	1	RELEASING SLIP	DLMS110	60065125
8	2	UPPER SLIP	DLMS35	60065115
9	1	UPPER CONE	DLMS60	60361410
10	1	CENTER COUPLING	DLMS35	60361620
11	1	RUBBER MANDREL	DLMS60	60361220
12	2	RUBBER SPACER	DLMS35	60261840
13	1	ELEMENT	70 DURO NITRILE	60261511
14	2	ELEMENT	90 DURO NITRILE	60261513
15	1	RUBBER RETAINER	DLMS80	60361850
16	1	LOWER CONE	DLMS60	60361420
17	4	LOWER SLIP	DLMS35	60065135
18	1	DRAG BLOCK BODY	DLMS60 / DLMS35	60361335
19	1	RUBBER MANDREL CAP	DLMS60	60070230
20	1	J-BODY	DLMS60	60361340
21	1	DRAG BLOCK RETAINER	DLMS60	60361910
22	4	DRAG BLOCK	DLMSDB8	9060900
23	1	J-PIN BOTTOM SUB	DLMS110 / DLMS80	60370650
24	1	BONDED SEAL	90 DURO NITRILE	60070520
25	8	LOWER SLIP SPRING	ELGILOY	7170901
26	6	UPPER SLIP SPRING	ELGILOY	7170902
27	1	SPRING CAGE CAP	DLMS80	60361810
28	1	SPRING RETAINING RING	DLMS60	60070820
29	1	GAGE RING	DLMS80	60261830
30	1	BEARING BUSHING	DLMS60	60370224
31	1	RETAINING RING	DLMS60	60361911



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### M) PARTS LIST(cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60361
32	2	SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037
33	3	SET SCREW 5/16-18 UNC X 1/2	STEEL	SSS031C050
34	1	153 O-RING	90 DURO NITRILE	90153
35	1	233 O-RING	90 DURO NITRILE	90233
36	1	242 O-RING	90 DURO NITRILE	90242

REDRESS KIT (RDK)	60361050
ASSEMBLED WEIGHT	257 LBS

### M-1) ELASTOMER TRIM OPTIONS

**NOTE2:** For temperature range, refer to Elastomer Trim Temperature Guide.

#### M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60361H
13	1	ELEMENT	70 DURO HSN	60261511H
14	2	ELEMENT	90 DURO HSN	60261513H
24	1	BONDED SEAL	90 DURO HSN	60070520H
34	1	153 O-RING	90 DURO HSN	90153H
35	1	233 O-RING	90 DURO HSN	90233H
36	1	242 O-RING	90 DURO HSN	90242H

REDRESS KIT (RDK)	60361050H
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#### M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60361V
13	1	ELEMENT	70 DURO VITON	60261511V
14	2	ELEMENT	90 DURO VITON	60261513V
24	1	BONDED SEAL	90 DURO VITON	60070520V
34	1	153 O-RING	90 DURO VITON	90153V
35	1	233 O-RING	90 DURO VITON	90233V
36	1	242 O-RING	90 DURO VITON	90242V

REDRESS KIT (RDK)	60361050H
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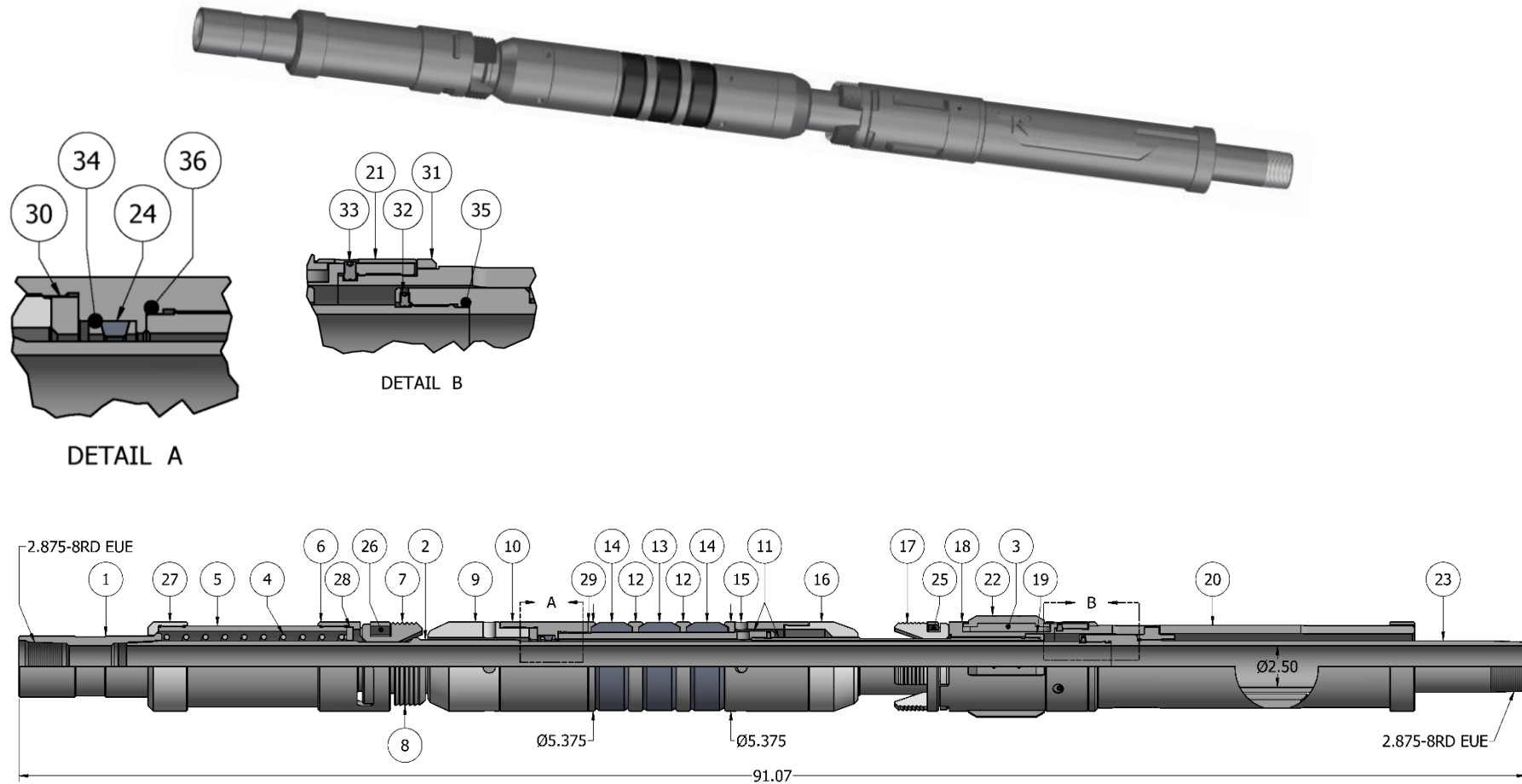
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## N) TECHNICAL ILLUSTRATION



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## O) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
10/23/2018	B	Revised entire manual	J.Anderson	C.Colvin
06/10/13	A	Created new manual.	-	-