



ASI-X PACKER

11-3/4" X 4-1/2"

Manual No:
DL-603-11750-086

Revision: **F**

Revision Date:
03/09/2022

Authored by: S. White

Approved by: H. Bringham

A) DESCRIPTION

The D&L ASI-X Packer is the most versatile of the mechanically set retrievable packers and may be used in any production application. The ASI-X Packer is suited for treating, testing, injecting, pumping wells, and flowing wells, deep or shallow. The ASI-X Packer can be left in tension or compression, depending on well conditions and the required application. A large internal by-pass reduces swabbing when running and retrieving. The by-pass closes when the packer is set and opens prior to releasing the upper slips when retrieving to allow pressure equalization. The J-slot design allows easy setting and releasing; 1/4 turn right-hand set, right-hand release.

B) RELATED TOOLS (sold separately)

B-1) 4-1/2" DT-2 On/Off Tool and Stinger—refer to technical manual DL-512-4500-140.

C) SPECIFICATION GUIDE

CASING			TOOL OD (INCHES)	TOOL ID (INCHES)	THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)				
11-3/4	42.0 - 65.0	10.682 – 11.084	10.438	4.00	4-1/2 EUE	60311 60311H ¹ 60311V ² 60311C ³ 60311HC ⁴ 60311VC ⁵
	66.7 - 80.5	10.406 – 10.656	10.200	4.00	4-1/2 EUE	60311Y 60311YH ¹ 60311YV ² 60311YC ³ 60311YHC ⁴ 60311YVC ⁵

Tool Options: ¹HSN, ²Viton, ³Nitrile, Carbide, ⁴HSN, Carbide, ⁵Viton, Carbide

NOTE1: Tools listed are right-hand set / right-hand release.

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
6,000 PSI	156,000 LBS

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

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D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION₁: 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.

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

CAUTION₂: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

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 (25,000 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 (25,000 lbs). After setting the packer, the tubing can be left in compression, tension or neutral.



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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.

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. Elastomers should be in a relaxed state—free from tension, compression or other 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 (SQ. INCHES)	
		ABOVE	BELOW
11-3/4	2.875	11.11 DOWN	12.92 UP
	3.500	7.98 DOWN	10.56 UP
	4.000	5.03 DOWN	7.71 UP
	4.500	1.70 DOWN	5.04 UP

Example: Consider a 11-3/4" ASI-X packer set on 3.500" 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 11-3/4" ASI-X packer set on 3.500" 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 7.98 in². Multiplying the differential pressure (3,000 psi) by the pressure affected area (7.98 in²) results in a force of 23,940 lbs. The piston effect on the packer mandrel is a downward force of 23,490 lbs.



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I) ELASTOMER TRIM TEMPERATURE RANGE

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 (F°)
NITRILE	40° - 250°F
HSN (HNBR)	70° - 300°F
VITON	100° - 350°F

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	DRAW BLOCK ASSEMBLY TOOL	AT016110

K) DISASSEMBLY

NOTE₃: Ensure vise is capable of handling weight of tool.

NOTE₄: Support tool during disassembly and assembly with jack stands as necessary.

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

K-1.1) Unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

NOTE₂: Drag block body assembly must be free to rotate.

K-1.1.1) Remove o-ring (39) from J-pin bottom sub (23).

K-1.2) Unscrew and remove set screws (36) from drag block body support (28).

K-1.3) Unscrew and remove J-body (20) from drag block body support (28) (**NOTE₅:** Left-hand threads).

K-1.4) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

NOTE₇: For added leverage, insert a rod through lower cone (16) and rubber mandrel (11) as needed.

K-1.5) Remove drag block body assembly and disassemble:

K-1.5.1) Compress drag blocks (22) using drag block body assembly tool (T1).

K-1.5.2) Rotate drag block retainer (21) as needed to unscrew and remove set screws (36) from drag block body (18).

K-1.5.3) Unscrew and remove drag block body support (28) from drag block body (18) (**NOTE₅:** Left-hand threads).

K-1.5.4) Remove drag block retainer (21) from drag block body (18).



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K) DISASSEMBLY (cont'd)

- K-1.5.5) Release and remove drag blocks (22) and drag block springs (3) from drag block body (18).
- K-1.5.6) Wedge lower slips (17) outward (if needed). Unscrew and remove socket cap screws (35) from drag block body (18).
- K-1.5.7) Remove lower slip support (32) from drag block body (18).
- K-1.5.8) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).
- K-1.6) Unscrew and remove lower cone (16) from rubber retainer (15).
- K-1.7) Unscrew rubber mandrel (11) from center coupling (10).
- K-1.8) Remove rubber mandrel assembly and disassemble:
 - K-1.8.1) Remove elements (13, 14), rubber spacers (12) and rubber retainer (15) from secondary rubber mandrel (34).
 - K-1.8.2) Remove secondary rubber mandrel (34) from rubber mandrel (11).
 - K-1.8.3) Remove o-ring (38) from rubber mandrel (11).
- K-1.9) Unscrew and remove gage ring (29) from center coupling (10).
- K-1.10) Unscrew and remove center coupling (10) from upper cone (9).
 - K-1.10.1) Remove o-rings (37) and bonded seal (24) from center coupling (10).
- K-1.11) Remove upper cone (9) and bearing bushing (30) from inner mandrel (2).
- K-2) Remove top sub (1) from vise. Clamp inner mandrel (2) in vise.
 - CAUTION₅:** Do not wrench or clamp on seal surface.
 - K-2.1) Unscrew and remove spring cage cap (27) from spring cage (5).
 - CAUTION₆:** 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 inner mandrel (2).
 - K-2.4) Unscrew and remove spring cage (5) from upper slip support (33).
 - K-2.5) Remove upper slip body assembly and disassemble:
 - K-2.5.1) Remove spring retaining ring (31) from upper slip support (33).
 - K-2.5.2) Wedge releasing slip (7) and upper slips (8) outwards (if needed). Unscrew and remove upper slip support (33) from upper slip body (6).
 - K-2.5.3) Remove wedges. 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

- NOTE₆:** Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.
- CAUTION₇:** To ensure tool operates properly, install o-rings in o-ring grooves, **NOT** thread reliefs unless stated otherwise (Fig. X).
- NOTE₃:** Ensure vise is capable of handling weight of tool.
- NOTE₄:** Support tool during disassembly and assembly with jack stands as necessary.
- L-1) Clamp inner mandrel (2) in vise.

CAUTION₅: Do not wrench or clamp on seal surface.

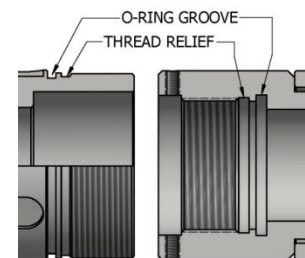


Fig. 2



ASI-X PACKER

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L) ASSEMBLY (cont'd)

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

L-1.1.1) Install upper slips (8), releasing slip (7) and upper slip springs (26) into upper slip body (6).

NOTE₈: Install two (2ea) springs per slip (Fig. 3).

L-1.1.2) Wedge releasing slip (7) and upper slips (8) outwards. Screw upper slip support (33) into upper slip body (6).

L-1.1.3) Install spring retaining ring (31) into upper slip support (33).

L-1.1.4) Install upper slip body assembly onto inner mandrel (2).

L-1.2) Screw spring cage (5) into upper slip support (33).

L-1.3) Install compression spring (4) onto inner mandrel (2) and 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).

CAUTION₆: Compression spring (4) is 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) onto inner mandrel (2). Install bearing bushing (30) into upper cone (9).

L-2.2) Install o-rings (37) in grooves in center coupling (10).

L-2.3) Install bonded seal (24) into center coupling (10).

CAUTION₄: Do not rip or tear o-rings during installation.

L-2.4) Screw center coupling (10) onto upper cone (9).

L-2.5) Screw gage ring (29) onto center coupling (10).

L-2.6) Assemble rubber mandrel assembly and install:

L-2.6.1) Install o-ring (38) in groove in rubber mandrel (11).

L-2.6.2) Install secondary rubber mandrel (34) onto rubber mandrel (11).

CAUTION₄: Do not rip or tear o-ring during installation.

L-2.6.3) Install rubber retainer (15), elements (13, 14) and rubber spacers (12) onto secondary rubber mandrel (34).

L-2.6.4) Install rubber mandrel assembly onto inner mandrel (2).

L-2.7) Screw rubber mandrel (11) into center coupling (10).

CAUTION₄: Do not rip or tear o-ring during installation.

L-2.8) Screw lower cone (16) into rubber retainer (15).

L-2.9) Assemble drag block body assembly and install:

L-2.9.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge slips outward.

NOTE₈: Install two (2ea) springs per slip (Fig. 4).

L-2.9.2) Install lower slip support (32) into drag block body (18).

L-2.9.3) Align holes in lower slip support (32) with threaded holes in drag block body (18). Screw socket cap screws (35) into drag block body (18). Remove wedges from slips.

L-2.9.4) Install drag blocks (22) and drag block springs (3). Compress drag blocks (22) using drag block body assembly tool (T1).

NOTE₉: Install six (6ea) springs per block (Fig. 5).

L-2.9.5) 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).

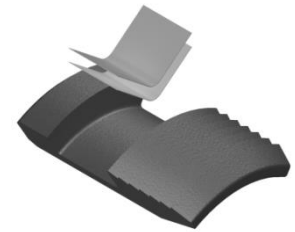


Fig. 3

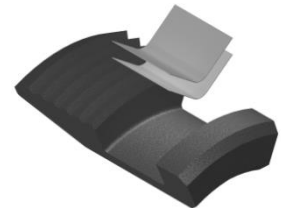


Fig. 4



Fig. 5



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L) ASSEMBLY (cont'd)

L-2.9.6) Screw drag block body support (28) into drag block body (18) (**NOTE**₅: Left-hand threads).

L-2.9.7) Screw set screws (36) into drag block body (18). Release drag blocks (22).

L-2.9.8) Install drag block body assembly onto rubber mandrel (11).

L-2.10) Screw rubber mandrel cap (19) onto rubber mandrel (11).

NOTE₇: For added leverage, insert a rod through lower cone (16) and rubber mandrel (11) as needed.

L-2.11) Screw J-body (20) onto drag block body (18) (**NOTE**₅: Left-hand threads).

L-2.12) Screw set screws (36) into drag block body support (28).

L-2.13) Install o-ring (39) into groove in J-pin bottom sub (23).

L-2.14) Screw J-pin bottom sub (23) onto inner mandrel (2).

NOTE₂: Drag block body assembly must be free to rotate.

CAUTION₄: Do not rip or tear o-ring during installation.

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

M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60311	P/N 60311Y
1	1	TOP SUB	DLMS60	60195610	
2	1	INNER MANDREL	DLMS80	60395210	
3	48	DRAG BLOCK SPRING	-	9101900	
4	1	COMPRESSION SPRING	DLMCRSP	60395920	
5	1	SPRING CAGE	DLMS60	60195310	
6	1	UPPER SLIP CAGE	DLMS110	60311320	60311Y320
7	2	RELEASING SLIP	DLMS110	60011125	
8	3	UPPER SLIP	DLMS35	60011115	
9	1	UPPER CONE	DLMS35	60311410	
10	1	CENTER COUPLING	DLMS35	60011620	
11	1	RUBBER MANDREL	DLMS60	60313220	
12	2	RUBBER SPACER	DLMS35	60211840	60211Y840
13	1	ELEMENT	70 DURO NITRILE	60211511	60211Y511
14	2	ELEMENT	90 DURO NITRILE	60211513	60211Y513
15	1	RUBBER RETAINER	DLMS35	60211850	60211Y850
16	1	LOWER CONE	DLMS110	60311420	
17	5	LOWER SLIP	DLMS35	60011135	
18	1	DRAG BLOCK BODY	DLMS80	60311335	60311Y335
19	1	RUBBER MANDREL CAP	DLMS60	60195230	



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M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60311	P/N 60311Y
20	1	J-BODY	DLMS60	60113340	
21	1	DRAG BLOCK RETAINER	DLMS60	60311911	60311Y911
22	8	DRAG BLOCK	DLMSDB8	9070900	9060900
23	1	BOTTOM SUB	DLMS80	60395650	
24	1	BONDED SEAL	90 DURO NITRILE	60095520	
25	10	LOWER SLIP SPRING	-	7170901	
26	10	UPPER SLIP SPRING	-	7170902	
27	1	SPRING CAGE CAP	DLMS35	60095810	
28	1	DRAG BLOCK BODY ADAPTER	DLMS80	60311330	60311Y330
29	1	GAGE RING	DLMS35	60211830	60211Y830
30	1	BEARING BUSHING	DLMS110	60310224	
31	1	SPRING RETAINING RING	DLMS35	60313820	
32	1	LOWER SLIP SUPPORT	DLMS60	60311912	60311Y912
33	1	UPPER SLIP SUPPORT	DLMS35	60311880	60311Y880
34	1	SECONDARY RUBBER MANDREL	DLMS35	60311221	
35	2	CAP SCREW 1/2-13 UNC X 3/4	STEEL	SCS050C075	
36	4	SET SCREW 3/8-16 UNC X 5/8	STEEL	SSS037C062	
37	2	160 O-RING	90 DURO NITRILE	90160	
38	1	254 O-RING	90 DURO NITRILE	90254	
39	1	348 O-RING	90 DURO NITRILE	90348	

REDRESS KIT (RDK)		60311050	60311Y050
ASSEMBLED WEIGHT		762 LBS	753 LBS



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T) PARTS LIST (cont'd)

M-1) ELASTOMER TRIM OPTIONS

NOTE11: For temperature range, refer to Elastomer Trim Temperature Guide.

M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60311H	P/N 60311YH
13	1	ELEMENT	70 DURO HSN	60211511H	60211Y511H
14	2	ELEMENT	90 DURO HSN	60211513H	60211Y513H
24	1	BONDED SEAL	90 DURO HSN	60095520H	
37	2	160 O-RING	90 DURO HSN	90160H	
38	1	254 O-RING	90 DURO HSN	90254H	
39	1	348 O-RING	90 DURO HSN	90348H	

REDRESS KIT (RDK)		60311050H	60311Y050H
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M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60311V	P/N 60311YV
13	1	ELEMENT	70 DURO VITON	60211511V	60211Y511V
14	2	ELEMENT	90 DURO VITON	60211513V	60211Y513V
24	1	BONDED SEAL	90 DURO VITON	60095520V	
37	2	160 O-RING	90 DURO VITON	90160V	
38	1	254 O-RING	90 DURO VITON	90254V	
39	1	348 O-RING	90 DURO VITON	90348V	

REDRESS KIT (RDK)		60311050V	60311Y050V
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M-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60311C	P/N 60311YC
8	3	CARBIDE UPPER SLIP	DLMS110	60011115C	
17	5	CARBIDE LOWER SLIP	DLMS110	60011135C	
22	8	CARBIDE DRAG BLOCK	DLMSDB4	9070900C	9060900C



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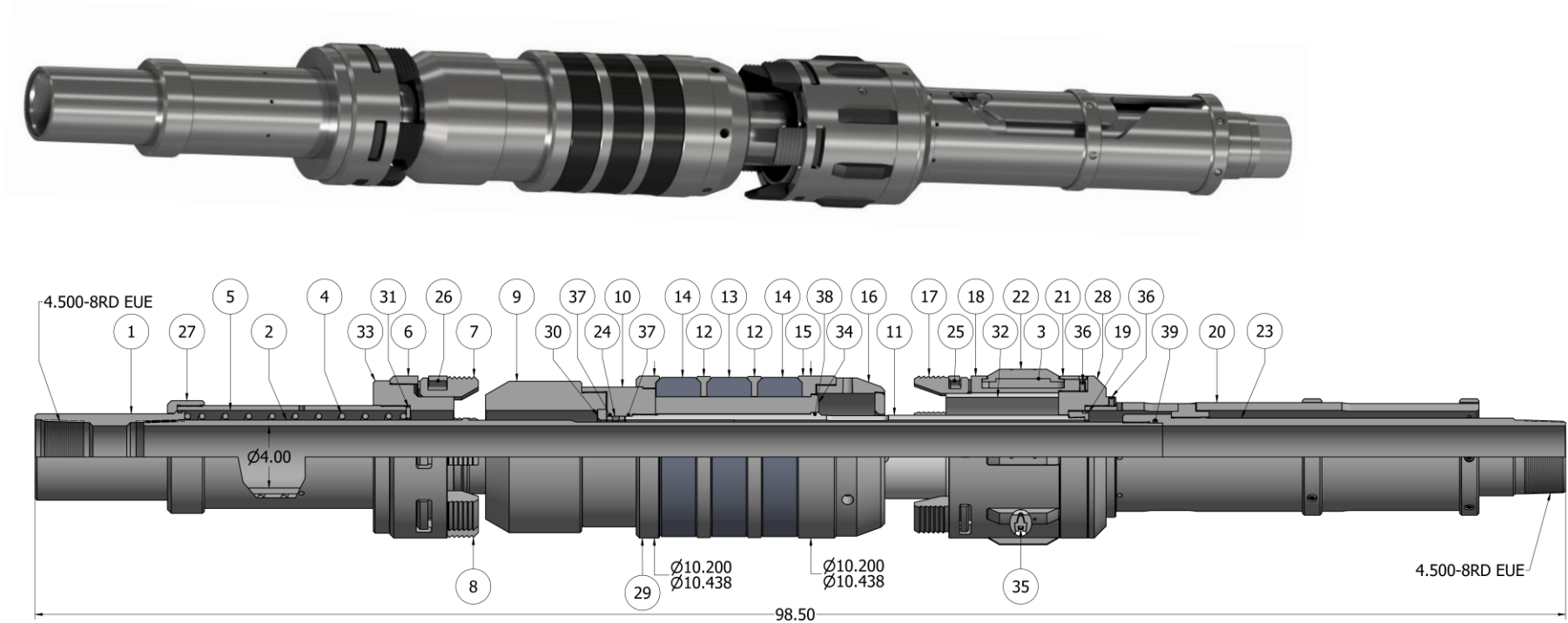
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N) TECHNICAL ILLUSTRATION



	<h1>ASI-X PACKER</h1> <h2>11-3/4” X 4-1/2”</h2>	Manual No: DL-603-11750-086
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O) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
03/09/2022	F	Revised elastomer trim temp. ratings, 60195610 was 60095610, 60195310 was 60395310, 60113340 was 60313340, 60195230 was 60095230; Added trim and carbide options	J.Anderson	E.Visaez
03/13/14	E	Revised releasing procedures, PN SCS050C075 was SCS062C100; Added PN 60311Y, related tools, drift diameter, pre-installation inspection and storage procedures, max. tensile load, recommended hand tools, revision history	J.Anderson	K.Riggs