



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

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

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			THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	OD (INCHES)	NOMINAL ID (INCHES)	DRIFT ID (INCHES)		
10-3/4	32.75 - 51.0	9.850 - 10.192	9.625	4.00	3.833	4-1/2 EUE	60301 60301H ¹ 60301V ²
	51.0 - 65.7	9.560 - 9.850	9.312	4.00	3.833	4-1/2 EUE	60310 60310H ¹ 60310V ²

¹HSN Option ²Viton Option

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) 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.

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

This document is uncontrolled when printed. For the current revision, refer to the electronic copy in the Vault database.



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

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

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 (Fig. 1).

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.

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.

In the event, the packer will not release in the normal manner, hard right-hand torque can be applied (800-1,000 Ft-lbs) which will break the tack weld on the J-pin ring. Continued rotation of approximately 15 turns will release the J-pin ring and allow the packer to be pulled. When released in this manner, the packer will reset when moved down the hole.

CAUTION₁: 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.



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

G) STORAGE PROCEDURES

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 (IN ²)	
		ABOVE	BELOW
10-3/4" X 4-1/2"	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	5.30 UP

Example: Consider a 10-3/4" X 4-1/2" 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. How much force is 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 10-3/4" X 4-1/2" ASI-X Packer run on 3.500" tubing. In this example, the differential pressure from above the packer acts down on the seal area of the 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 downward force of 23,940 lbs. 23,940 lbs is the force which needs to be neutralized when releasing the packer.

I) ELEMENT SELECTION GUIDE

NITRILE (STD)			
TEMPERATURE RANGE (F°)	DUROMETER		
	END	MIDDLE	END
70° - 125°	80	70	80
125° - 250°	90	70	90
250° - 300°	90	80	90
300° +	Contact D&L Sales		

RUBBER TYPE	TEMPERATURE RANGE
NITRILE	70° - 300°F
HSN (HNBR)	70° - 325°F
VITON	100° - 350°F



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

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	AT010110

K) DISASSEMBLY

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 (35) from drag block body (18). Rotate drag block retainer (21) as needed.

K-1.3) Unscrew and remove J-body (20) from drag block body (18) (**NOTE₃:** Left-hand threads).

K-1.3.1) Remove retaining ring (31) from J-body (20).

K-1.4) Compress drag blocks (22) using drag block body assembly tool (T1). Remove drag block retainer (21) from drag block body (18).

K-1.5) Release drag blocks (22). Remove drag blocks (22) and drag block springs (3) from drag block body (18).

K-1.6) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

NOTE₄: For added leverage, insert a rod thru lower cone (16) and rubber mandrel (11) as needed.

K-1.7) Remove drag block body assembly and disassemble:

K-1.7.1) Unscrew and remove socket cap screws (36) from drag block body (18).

K-1.7.2) Wedge lower slips (17) outwards (if needed).

K-1.7.3) Remove lower slip support (32) from drag block body (18).

K-1.7.4) Remove wedges. Remove lower slips (17) and lower slip springs (25) from drag block body (18).

K-1.8) Unscrew and remove lower cone (16) from rubber retainer (15).

K-1.9) Unscrew rubber mandrel (11) from center coupling (10).

K-1.10) Remove rubber mandrel assembly and disassemble:

K-1.10.1) Remove elements (13, 14), rubber spacers (12) and rubber retainer (15) from secondary rubber mandrel (28).

K-1.10.2) Remove secondary rubber mandrel (28) from rubber mandrel (11).

K-1.10.3) Remove o-ring (38) from rubber mandrel (11).

K-1.11) Unscrew and remove gage ring (29) from center coupling (10).



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

K) DISASSEMBLY (cont'd)

K-1.12) Unscrew and remove center coupling (10) from upper cone (9).

K-1.12.1) Remove bonded seal (24) and o-rings (37) from center coupling (10).

K-1.13) Remove upper cone (9) and bearing bushing (30) from inner mandrel (2).

K-2) Remove top sub (1) from vise. Clamp lower part of inner mandrel (2) in vise.

NOTE₅: 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 support (33).

K-2.5) Remove upper slip body assembly and disassemble:

K-2.5.1) Remove spring retaining ring (34) 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 & orientation.

CAUTION₁: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs unless stated otherwise (Fig. 2).

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

NOTE₅: Do **NOT** wrench or clamp on seal surface.

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).

NOTE₇: Install two (2ea) springs per slip (Fig. 3).

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

L-1.1.3) Remove wedges.

L-1.1.4) Install spring retaining ring (34) into place in upper slip support (33).

L-1.1.5) 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).

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-rings (37) in grooves in center coupling (10).

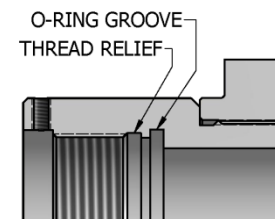


Fig. 2

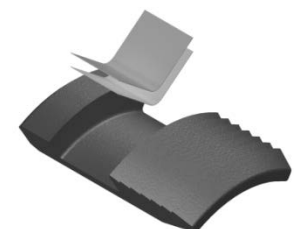


Fig. 3



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

L) ASSEMBLY (cont'd)

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

CAUTION₃: 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 (28) onto rubber mandrel (11).

CAUTION₃: 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 (28).

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

L-2.6.5) Screw rubber mandrel (11) into center coupling (10).

CAUTION₃: 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 slips outward.

NOTE₇: Install two (2ea) springs per slip (Fig. 4).

L-2.8.2) Install lower slip support (32) into drag block body (18).

L-2.8.3) Align threaded holes in drag block body (18) with holes in lower slip support (32). Screw socket cap screws (36) into drag block body (18). Remove wedges.

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

NOTE₄: For added leverage, insert a rod thru lower cone (16) and rubber mandrel (11) as needed.

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

NOTE₈: Install six (6ea) springs per drag block (Fig. 5).

L-2.11) Install drag block retainer (21) onto drag block body (18) capturing ends of drag blocks (22).

NOTE₉: Align holes in drag block retainer (21) to access 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) (**NOTE₃:** Left-hand threads).

L-2.14) Screw set screws (35) into drag block body (18).

L-2.15) Release drag blocks (22).

L-2.16) Install o-ring (39) in groove in J-pin bottom sub (23).

L-2.17) Screw J-pin bottom sub (23) onto inner mandrel (2).

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

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

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

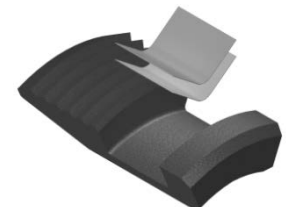


Fig. 4

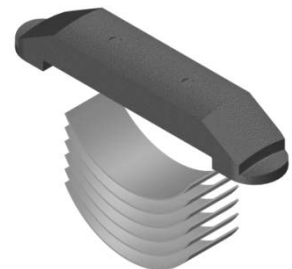


Fig. 5



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60301 (32.75 – 51.0#)	P/N 60310 (51.0 - 65.7#)
1	1	TOP SUB	1026	60095610	
2	1	INNER MANDREL	L-80	60395210	
3	36	DRAG BLOCK SPRING	INCONEL	9101900	
4	1	COMPRESSION SPRING	CHROME VANADIUM	60395920	
5	1	SPRING CAGE	1026	60395310	
6	1	UPPER SLIP BODY	P-110/1026	60310320	
7	2	RELEASING SLIP	P-110	60010125	
8	3	UPPER SLIP	1026	60010115	
9	1	UPPER CONE	L-80	60310410	
10	1	CENTER COUPLING	1026	60095620	
11	1	RUBBER MANDREL	1026	60313220	
12	2	RUBBER SPACER	1026	60301840-SRM	60310840-SRM
13	1	ELEMENT	70 DURO NITRILE	60201511	60310511
14	2	ELEMENT	90 DURO NITRILE	60201513	60310513
15	1	RUBBER RETAINER	1026	60301850-SRM	60310850-SRM
16	1	LOWER CONE	P-110/1026	60310420	
17	6	LOWER SLIP	1026	60010135	
18	1	DRAG BLOCK BODY	P-110/1026	60310335	
19	1	RUBBER MANDREL CAP	1026	60095230	
20	1	J-BODY	1026	60395340	
21	1	DRAG BLOCK RETAINER	1026	60310910	
22	6	DRAG BLOCK	8620	9080900	9070900
23	1	J-PIN BOTTOM SUB	L-80	60395650	
24	1	BONDED SEAL	90 DURO NITRILE	60095520	
25	12	LOWER SLIP SPRING	ELGILOY	7170901	
26	10	UPPER SLIP SPRING	ELGILOY	7170902	



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60301 (32.75 – 51.0#)	P/N 60310 (51.0 - 65.7#)
27	1	SPRING CAGE CAP	1026	60095810	
28	1	SECONDARY RUBBER MANDREL	1026	60095221	
29	1	GAGE RING	1026	60301830	60310830
30	1	BEARING BUSHING	P-110	60310224	
31	1	RETAINING RING	1026	60095911	
32	1	LOWER SLIP SUPPORT	1026	60310912	
33	1	UPPER SLIP SUPPORT	1026	60310880	
34	1	SPRING RETAINING RING	1026	60010820	
35	3	SET SCREW 3/8-16 UNC X 5/8	STEEL	SSS037C062	
36	2	SOCKET CAP SCREW 1/2-13 UNC X 1"	STEEL	SCS050C100	
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)		60301050	60310050
ASSEMBLED WEIGHT		633 LBS	625 LBS



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

Revision: **F**

Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

N) OPTIONS PARTS LIST

N-1) HSN

NOTE₁₀: For temperature range, refer to element selection guide.

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60301H (32.75 - 51.0#)	P/N 60310H (51.0 - 65.7#)
13	1	ELEMENT	70 DURO HSN	60201511H	60310511H
14	2	ELEMENT	90 DURO HSN	60201513H	60310513H
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)		60301050H	60310050H
-------------------	--	-----------	-----------

N-2) VITON

NOTE₁₀: For temperature range, refer to element selection guide.

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60301V (32.75 - 51.0#)	P/N 60310V (51.0 - 65.7#)
13	1	ELEMENT	70 DURO VITON	60201511V	60310511V
14	2	ELEMENT	90 DURO VITON	60201513V	60310513V
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)		60301050V	60310050V
-------------------	--	-----------	-----------



ASI-X PACKER

10-3/4" X 4-1/2"

Manual No:
DL-603-10750-085

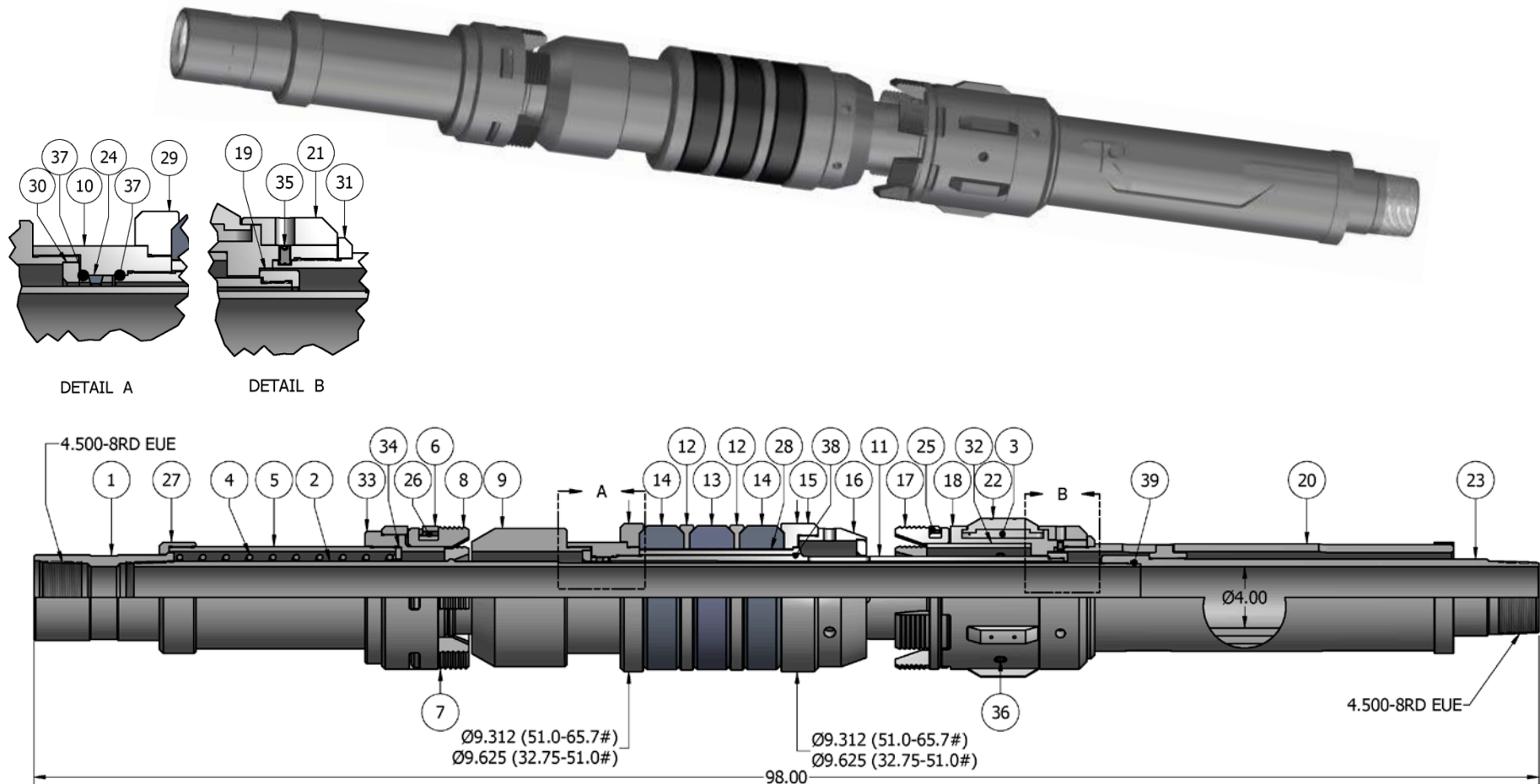
Revision: **F**


Revision Date:
05/16/2014

Authored by: S. White

Approved by: H. Bringham

O) TECHNICAL ILLUSTRATION



	ASI-X PACKER 10-3/4” X 4-1/2”	Manual No: DL-603-10750-085
		Revision: F
		Revision Date: 05/16/2014
Authored by: S. White		Approved by: H. Bringham

P) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
05/16/14	F	Revised assembly tool PN AT010110 was DBAT10, PNs 90160H and 90160V qty was 1; Added related tools, tool drift ID, pre-installation inspection and storage procedures	J.Anderson	K.Plunkett
07/19/13	E	Revised Pressure Affected Area Guide Example, Disassembly and Assembly instructions, P/N 60201511 was 60301511, 60201513 was 60301513, Assembly Tool P/N DBAT10 was AT010110; Added HSN and Viton Options (P/N 60301H, 60301V, 60310H, 60310V), max tensile load, Recommended Hand Tools, Options Parts List, Revision History; Removed Aflas from Element Selection Guide.	S. McEntire	H. Bringham