



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

A) DESCRIPTION

The ASI-X Single String Double-Grip Production Packer is the most versatile of the mechanically set retrievable packers and may be used in any production application. This packer is suited for treating, testing, or injection applications, in pumping or flowing wells, either deep or shallow. This 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, 1/4 turn right-hand release.

The ASI-X HT Packer is designed for differential pressures up to 10,000 PSI (unless noted otherwise). The HT version allows this packer to be utilized in completions where high pressure treating operations are performed and it is desirable to leave the tool in the well for production.

B) RELATED TOOLS (sold separately)

B-1) 2-7/8" DT-2 On/Off Tool - refer to technical manual *DL-512-2875-146*.

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)	NOMINAL ID (INCHES)		
5-1/2	14.0#	5.012	4.813	2.38	2-7/8 EUE	60358HT 60358HTH ¹ 60358HTV ²
	14.0 – 20.0#	4.778 – 5.012	4.625	2.38	2-7/8 EUE	60356HT 60356HTH ¹ 60356HTV ²
	20.0 – 23.0#	4.670 – 4.778	4.500	2.38	2-7/8 EUE	60359HT 60359HTH ¹ 60359HTV ²

Elastomer Trim Options: HSN¹ Viton²

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

NOTE₂: 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)
10,000 PSI	86,500 LBS 76,000 LBS (20.0 – 23.0#)

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



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

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 tools 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 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 work string to allow for setting stroke (12-13") plus desired work string load. Rotate the work string 1/4 right-hand turn at the packer, and then lower the work string while releasing torque. Slack off on the work string sufficient weight to set the packer (12,000 lbs minimum). Pull tension to assure that the upper slips are set. The work string 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 work string and rotate 1/4 turn to the right at the packer, then lower the work string slacking off available weight to set the packer lower slips. Pull tension to set upper slips and pack off elements (12,000 lbs minimum). After setting the packer, the work string can be left in compression, tension or neutral.



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

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 work string 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.

CAUTION₃: High differential pressure below the ASI-X HT Packer may cause the upper slips to wedge in tighter, requiring an extra amount of tension to release the upper slips.

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

When set downhole, the packer mandrel is subjected to a force created by differential pressure above or below the packer that acts on the pressure affected area (i.e., the piston effect). Depending on the tubing size and weight and the seal area of the packer the force created by differential pressure acts upwards or downwards on the packer mandrel. An upward force, designated as a negative (-) value, acts to push the packer mandrel up hole and must be accounted for to ensure that the packer remains set. A downward force, designated as a positive value, acts to push the packer mandrel down hole and must be accounted for when releasing the packer. Other factors (e.g., tubing movement due to temperature change) must be considered separately to determine all the forces acting on the packer.

PACKER SIZE (INCHES)	TUBING SIZE (INCHES)	PRESSURE AFFECTED AREA (SQ. INCHES)	
		ABOVE	BELOW
5-1/2" X 2-7/8"	2.375	2.06 (DOWN)	-3.37 (UP)
	2.875	0.00	-1.81 (UP)

Example: Consider a 5-1/2" ASI-X HT 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 5-1/2" ASI-X HT 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 2.06 in². Multiplying the differential pressure (3,000 PSI) by the pressure affected area (2.06 in²) results in a force of 6,180 lbs. The piston effect on the packer mandrel is a downward force of 6,180 lbs.



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

I) ELASTOMER TRIM TEMPERATURE GUIDE

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

RUBBER TYPE	TEMPERATURE RANGE
NITRILE	70° - 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	DRAG BLOCK ASSEMBLY TOOL	AT055110

K) DISASSEMBLY

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

K-1.1) Unscrew and remove bottom nipple (28) from J-pin bottom sub (23).

K-1.2) Unscrew and remove set screws (6) from J-pin bottom sub (23). Move J-body (20) as needed to access screws.

K-1.3) Unscrew and remove J-pin bottom sub (23) from inner mandrel (2).

NOTE₃: Drag block body assembly must be free to rotate.

K-1.3.1) Remove o-ring (33) from J-pin bottom sub (23).

K-1.4) Compress drag blocks (22) with drag block assembly tool (T1).

K-1.5) Unscrew and remove set screws (31) from J-body (20).

K-1.6) Unscrew and remove J-body (20) from drag block body (18) (**NOTE₄:** Left-hand threads).

K-1.7) Remove drag block retainer (21) from drag block body (18).

K-1.8) Release drag blocks (22). Remove drag blocks (22) and drag block springs (3) from drag block body (18).

K-1.9) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

NOTE₅: For added leverage, insert rod through rubber retainer (15) and rubber mandrel (11) as needed.

K-1.10) Wedge lower slips (17) outward (if needed). Remove drag block body assembly and disassemble:

K-1.10.1) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

K) DISASSEMBLY (cont'd)

- K-1.11) Unscrew and remove lower cone (16) from rubber retainer (15).
- K-1.12) Unscrew rubber mandrel (11) from center coupling (10).
- K-1.13) Remove rubber mandrel assembly and disassemble:
 - K-1.13.1) Remove gage ring (29), elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).
 - K-1.13.2) Unscrew and remove center coupling (10) from upper cone (9).
 - K-1.13.2.1) Remove o-ring (34) from center coupling (10).
 - K-1.13.2.2) Remove bonded seal (24) from center coupling (10).
 - K-1.13.2.3) Remove o-ring (32) from bonded seal (24).
- K-1.14) Remove bearing bushing (30) and upper cone (9) from inner mandrel (2).
- K-2) Unclamp and remove top sub (1) from vise. Clamp lower end of inner mandrel (2) in vise.
 - CAUTION₄:** Do **NOT** wrench or clamp on seal surface (see SEAL SURFACES).
- K-2.1) Unscrew and remove spring cage cap (27) from spring cage (5).
 - CAUTION₅:** Compression spring (4) may have tension against spring cage 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) Wedge releasing slip (7) and upper slips (8) outwards (if needed). Remove spring cage assembly and disassemble:
 - K-2.4.1) Remove wedges (if needed). Remove releasing slip (7), upper slips (8), and upper slip springs (26) from spring cage (5).
- K-3) Unclamp and remove inner mandrel (2) from vise.

L) ASSEMBLY

NOTE₇: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

CAUTION₆: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread relief (Fig. 2).

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

CAUTION₄: Do **NOT** wrench or clamp on seal surface (see SEAL SURFACES).

- L-1.1) Install upper slips (8), releasing slip (7), and upper slip springs (26) into spring cage (5). Wedge slips outwards.

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

- L-1.2) Install spring cage assembly onto inner mandrel (2). Remove wedges.
- 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) into spring cage (5).

CAUTION₅: Compression spring (4) may have tension against spring cage assembly.

- L-2) Unclamp and remove inner mandrel (2) from vise. Clamp top sub (1) in vise.

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

NOTE₉: Bearing bushing (30) must facing proper direction (see Technical Illustration - Detail A).

- L-2.2) Install o-ring (34) in o-ring groove in center coupling (10).
- L-2.3) Install o-ring (32) in o-ring groove in bonded seal (24).

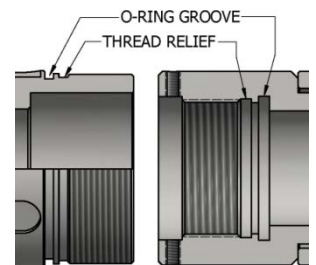


Fig. 2



Fig. 3



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016

Authored by: J.Anderson

Approved by: D.Hushbeck

L) ASSEMBLY (cont'd)

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

CAUTION₇: Do not rip or tear o-ring during installation.

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

L-2.6) Assemble rubber mandrel assembly and install:

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

L-2.6.2) Install rubber mandrel assembly onto inner mandrel (2). Screw rubber mandrel (11) into center coupling (10).

CAUTION₇: 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.

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

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

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

NOTE₅: For added leverage, insert rod through 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 blocks with drag block assembly tool (T1).

NOTE₆: Install four (4ea) 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).

L-2.12) Screw J-body (20) onto drag block body (18) (**NOTE₄**: Left-hand threads).

L-2.13) Screw set screws (31) into J-body (20). Release drag blocks (22).

L-2.14) Install o-ring (33) in o-ring groove in J-pin bottom sub (23).

L-2.15) Screw J-pin bottom sub (23) onto inner mandrel (2).

CAUTION₇: Do not rip or tear o-ring during installation.

NOTE₃: Drag block body assembly must be free to rotate.

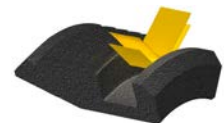


Fig. 4



Fig. 5

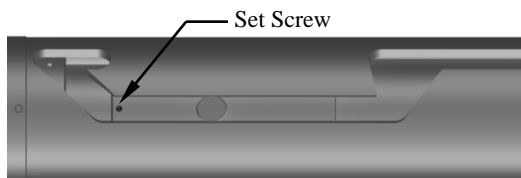


Fig. 6

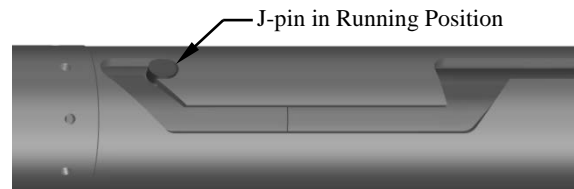


Fig. 7

L-2.16) Screw set screws (6) into J-pin bottom sub (23). Move J-body (20) as needed (Fig. 6).

L-2.17) Screw bottom nipple (28) into J-pin bottom sub (23).

L-2.18) Position J-pin in running position in J-slot of J-body (20) (Fig. 7).

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



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

Revision: **E**

Revision Date:
07/12/2016


Authored by: J.Anderson

Approved by: D.Hushbeck

M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	14.0# P/N 60358HT	14.0 – 20.0# P/N 60356HT	20.0 – 23.0# P/N 60359HT
1	1	TOP SUB *	DLMS110	60156610HT (60070610HT*)		
2	1	INNER MANDREL	DLMS110	60356210HT		60359210HT
3	16	DRAG BLOCK SPRING	INCONEL	9100900		
4	1	COMPRESSION SPRING	DLMCRSP	60356920		
5	1	SPRING CAGE *	DLMS110/DLMS60	60156325HT (60356325HT*)		60159325HT (60359325HT*)
6	2	SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037		
7	1	RELEASING SLIP	DLMS110	60058125	60056125	60056125
8	2	UPPER SLIP	DLMS35	60058115	60056115	60056115
9	1	UPPER CONE	DLMS110	60356410HT		
10	1	CENTER COUPLING	DLMS80	60056620		
11	1	RUBBER MANDREL	DLMS110	60056220HT		60059220HT
12	2	RUBBER SPACER	DLMS35	60258840	60256840	60259840
13	1	ELEMENT	80 DURO NITRILE	60258512	60256512	60259512
14	2	ELEMENT	90 DURO NITRILE	60258513	60256513	60259513
15	1	RUBBER RETAINER	-	60258850	60256850	60259850


* P/N may be substituted.

	<h1>ASI-X HT PACKER</h1> <h2>5-1/2” X 2-7/8”</h2>	Manual No: DL-603-5500-117
		Revision: E
		Revision Date: 07/12/2016
Authored by: J.Anderson		Approved by: D.Hushbeck

M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	14.0# P/N 60358HT	14.0 – 20.0# P/N 60356HT	20.0 – 23.0# P/N 60359HT
16	1	LOWER CONE	DLMS110	60056420HT		60059420HT
17	4	LOWER SLIP	-	60058135	60056135	
18	1	DRAG BLOCK BODY	-	60056335		60059335
19	1	RUBBER MANDREL CAP *	DLMS60	60156230 (60056230*)		
20	1	J-BODY *	DLMS60	60156340 (60356340*)		
21	1	DRAG BLOCK RETAINER	DLMS60	60058910	60056910	60059910
22	4	DRAG BLOCK	DLMS088	9055900		9045900
23	1	J-PIN BOTTOM SUB	DLMS110	60356634HT		
24	1	BONDED SEAL	90 DURO NITRILE	60056520		
25	8	LOWER SLIP SPRING	-	7155901		
26	6	UPPER SLIP SPRING	-	7155902		
27	1	SPRING CAGE CAP *	DLMS60	60158810 (60058810*)	60156810 (60056810*)	60159810 (60059810*)
28	1	BOTTOM NIPPLE	DLMS80	60370636		
29	1	GAGE RING	-	60258830	60256830	60259830
30	1	BEARING BUSHING	DLMS60	60056224		

*P/N may be substituted.

	<h1>ASI-X HT PACKER</h1> <h2>5-1/2” X 2-7/8”</h2>	Manual No: DL-603-5500-117
		Revision: E
		Revision Date: 07/12/2016
Authored by: J.Anderson		Approved by: D.Hushbeck

M) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	14.0# P/N 60358HT	14.0 – 20.0# P/N 60356HT	20.0 – 23.0# P/N 60359HT
31	3	SET SCREW 5/16-18 UNC X 3/8	STEEL	SSS031C037		
32	1	151 O-RING	90 DURO NITRILE	90151		
33	1	231 O-RING	90 DURO NITRILE	90231		
34	1	235 O-RING	90 DURO NITRILE	90235		

* P/N may be substituted.

REDRESS KIT (RDK)		60358050HT	60356050HT	60359050HT
ASSEMBLED WEIGHT		186 LBS	183 LBS	173 LBS


M-1) ELASTOMER TRIM OPTIONS

NOTE₁₀: For temperature range, refer to Elastomer Trim Temperature Guide.

M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	14.0# P/N 60358HTH	14.0 – 20.0# P/N 60356HTH	20.0 – 23.0# P/N 60359HTH
13	1	ELEMENT	80 DURO HSN	60258512H	60256512H	60259512H
14	2	ELEMENT	90 DURO HSN	60258513H	60256513H	60259513H
24	1	BONDED SEAL	90 DURO HSN	60056520H		
32	1	151 O-RING	90 DURO HSN	90151H		
33	1	231 O-RING	90 DURO HSN	90231H		
34	1	235 O-RING	90 DURO HSN	90235H		

REDRESS KIT (RDK)		60358050HTH	60356050HTH	60359050HTH
-------------------	--	-------------	-------------	-------------

	<h1>ASI-X HT PACKER</h1> <h2>5-1/2” X 2-7/8”</h2>	Manual No: DL-603-5500-117
		Revision: E
		Revision Date: 07/12/2016
<i>Authored by: J.Anderson</i>		<i>Approved by: D.Hushbeck</i>

M) PARTS LIST (cont'd)

M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	14.0# P/N 60358HTV	14.0 – 20.0# P/N 60356HTV	20.0 – 23.0# P/N 60359HTV
13	1	ELEMENT	80 DURO VITON	60258512V	60256512V	60259512V
14	2	ELEMENT	90 DURO VITON	60258513V	60256513V	60259513V
24	1	BONDED SEAL	90 DURO VITON	60056520V		
32	1	151 O-RING	90 DURO VITON	90151V		
33	1	231 O-RING	90 DURO VITON	90231V		
34	1	235 O-RING	90 DURO VITON	90235V		

REDRESS KIT (RDK)		60358050HTV	60356050HTV	60359050HTV
-------------------	--	-------------	-------------	-------------



ASI-X HT PACKER

5-1/2" X 2-7/8"

Manual No:
DL-603-5500-117

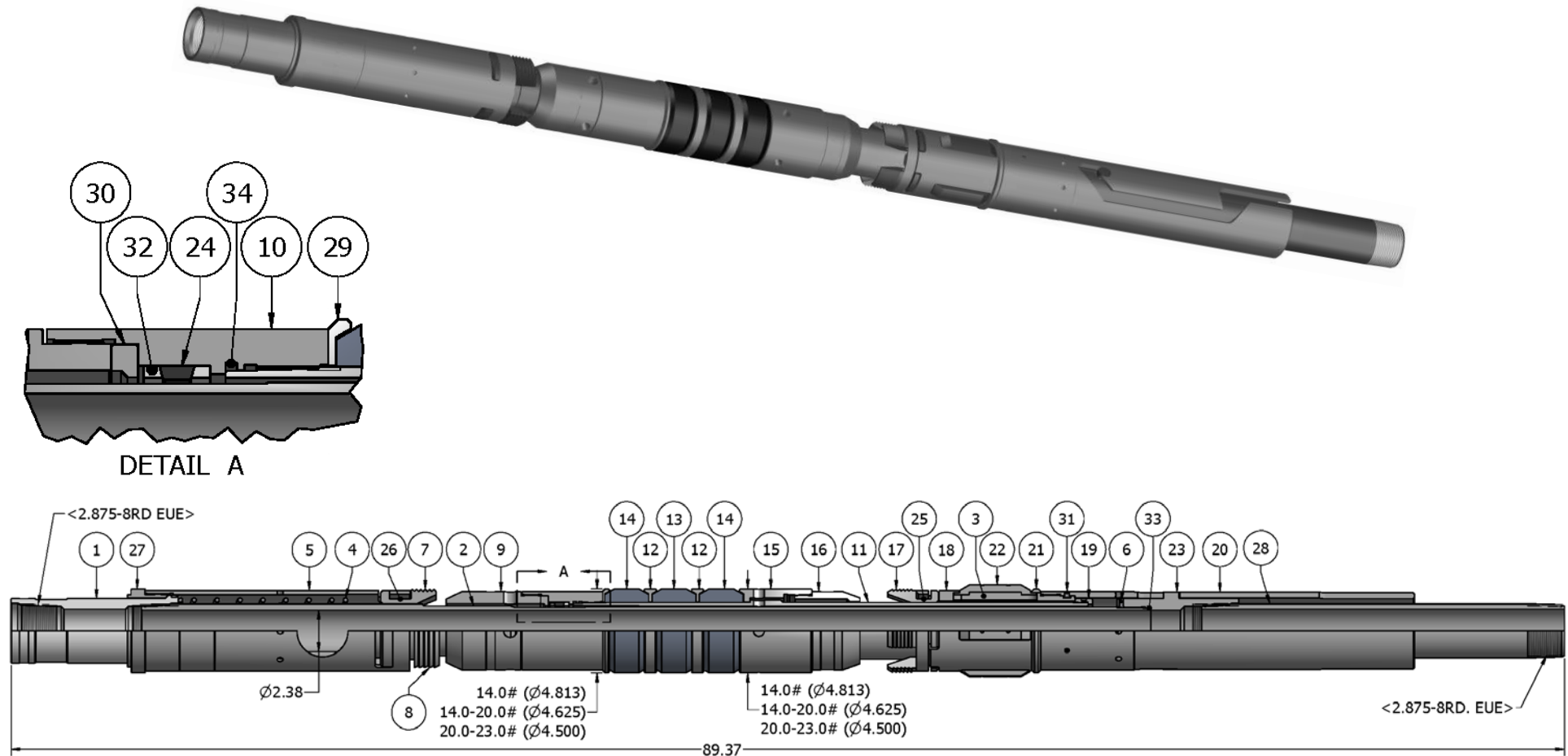
Revision: **E**


Revision Date:
07/12/2016

Authored by: J.Anderson

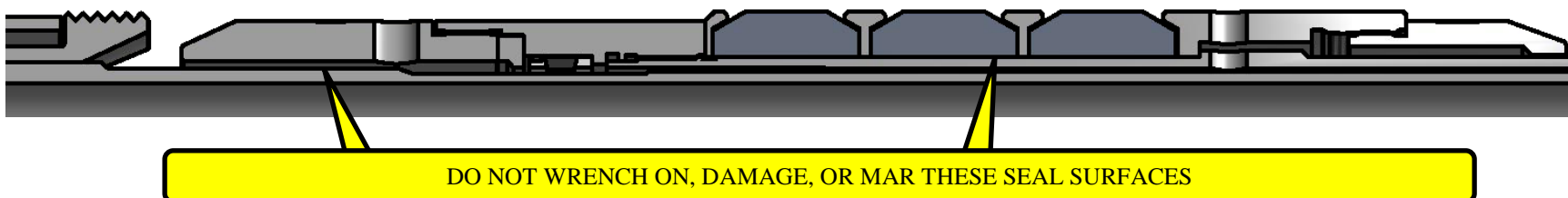
Approved by: D.Hushbeck

N) TECHNICAL ILLUSTRATION



	ASI-X HT PACKER 5-1/2” X 2-7/8”	Manual No: DL-603-5500-117
		Revision: E
		Revision Date: 07/12/2016
Authored by: J.Anderson		Approved by: D.Hushbeck

O) SEAL SURFACES



P) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
07/12/2016	E	Removed tool drift ID; Added General Screw Torque Recommendations; Revised Elastomer Trim Temperature Guide Nitrile and HSN temperature ratings, P/N SSS025C037 was SSS025C050	J.Anderson	N.Banker
03/17/2015	D	Added RELATED TOOLS, Drift ID, Note2, Elastomer Trim Options, PRE-INSTALLATION INSPECTION PROCEDURES, Caution2, STORAGE PROCEDURES; Caution6, Fig. 2, Note9, Fig. 6, Fig. 7, L-2.18), Parts List - P/N's that can be substituted (as noted with an asterisk), Section identifying SEAL SURFACES; Revised Description, References to "work string" was "tubing", ELASTOMER TRIM TEMPERATURE GUIDE was ELEMENT SELECTION GUIDE, Caution4 (added "(see SEAL SURFACES))", Note7, Fig. 3, Material was P-110 (P/N's 60356210HT, 60359210HT), O-Ring Material was NITRILE (P/N 90151, 90231, 90235), ELASTOMER TRIM OPTIONS PARTS LIST was OPTIONS PARTS LIST, TECHNICAL ILLUSTRATION – Detail A, All Assembly P/N's in Tech Manual are in order by Casing Weight;	B.Mathis	T.Myerly
09/16/13	C	Revised - P/N 60156610HT was 60070610HT, P/N 60156325HT was 60356325HT, P/N 60159325HT was 60359325HT, P/N 60156230 was 60056230, P/N 60156340 was 60356340, P/N 60156810 was 60056810, P/N 60158810 was 60058810, P/N 60159810 was 60059810, P/N 60359HT assembled weight was 172 lbs; Added - recommended hand tools, HSN and Viton options (P/Ns 60356HTH, 60356HTV, 60358HTH, 60358HTV, 60359HTH, 60359HTV);	J.Anderson	H.Bringham