



# ASI-X HT PACKER

## w/SHEAR RELEASE BOTTOM

### 7" X 3-1/2"

Manual No:  
**DL-603-7000-093**

Revision: **D**

Revision Date:  
**08/04/2022**

Authored by: S. White

Approved by: H. Bringham

#### 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. The ASI-X Packer with Shear Release Bottom features a J-pin ring equipped with an emergency shear release in the event the packer will not release in the normal manner.

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 7" X 3-1/2" ASI-X HT Packer is designed for differential pressures up to 10,000 PSI. This feature allows the 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.

In the event the packer will not release in the normal manner, the J-pin ring is equipped with an emergency shear release.

#### B) RELATED TOOLS (sold separately)

B-1) 3-1/2" DT-2 On/Off Tool—refer to technical manual *DL-512-3500-131*.

B-2) 3-1/2" 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)		
7	26.0 – 32.0	6.094 – 6.276	5.875	3.00	3-1/2 EUE	60373HTSR 60373HTSRH <sup>1</sup> 60373HTSRV <sup>2</sup> 60373HTSRC <sup>3</sup> 60373HTSRHC <sup>4</sup> 60373HTSRVC <sup>5</sup>

Tool Options: <sup>1</sup>HSN, <sup>2</sup>Viton, <sup>3</sup>Nitrile, Carbide, <sup>4</sup>HSN, Carbide, <sup>5</sup>Viton, Carbide

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)
10,000 PSI	154,000 LBS

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

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## **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.

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**

**CAUTION<sub>2</sub>:** Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

### **E-1) TENSION 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 (14,000 lbs). 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) COMPRESSION 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 (14,000 lbs). After setting the packer, the work string 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 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.

**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

In the event the packer will not release in the normal manner, the J-pin ring is equipped with an emergency shear release. The shear screws can be sheared with straight pickup above pipe weight. The shear release value is adjustable from 5,500 lbs to 66,000 lbs (in 5,500 lb/screw increments - See illustration) by adding or removing screws from the J-pin ring. 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. 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
7	2.375	6.43 (DOWN)	-7.74 (UP)
	2.875	4.37 (DOWN)	-6.19 (UP)
	3.500	1.24 (DOWN)	-3.83 (UP)

**Example:** Consider a 7" X 3-1/2" ASI-X Packer set on 2.875" 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 7" X 3-1/2" ASI-X Packer run on 2.875" 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 4.37 in<sup>2</sup>. Multiplying the differential pressure (3,000 PSI) by the pressure affected area (4.37 in<sup>2</sup>) results in a force of 13,110 lbs. The piston effect on the packer mandrel is a downward force of 13,110 lbs.



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## H) PRESSURE AFFECTED AREA GUIDE (cont'd)

**NOTE<sub>2</sub>:** The pressure affected area above allows load to transmit to the releasing shear pins when differential pressure is applied to a set ASI-X Packer. This load must be accounted for when using the packer in that if the load exceeds the shear pin value the packer will unset prematurely. An example of the calculation to find this force is as follows:

**EXAMPLE<sub>2</sub>:** 7" X 3-1/2" ASI-X HT Packer w/Shear Release run on 3.500" tubing with 48,000# shear release. Set with 20,000# tension on the packer. Treating pressure is 8,000 PSI.

$$F = 8,000 \text{ PSI} \times 3.82 \text{ in}^2 \text{ (UP)}$$

$$= 30,560\# \text{ (UP)}$$

$$\text{Load on shear screws} = 30,560\# + 20,000\#$$

$$= 50,560\# - \text{Packer shears during treating}$$

## 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 (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	AT070110

## K) DISASSEMBLY

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

K-1.1) Remove external ring (31) from J-pin bottom sub (23).

K-1.2) Unscrew and remove set screws (34) 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).

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

K-1.3.1) Remove o-ring (37) from J-pin bottom sub (23).

K-1.3.2) Unscrew and remove shear screws (33) from J-pin ring (28)



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## K) ASSEMBLY (cont'd)

- K-1.3.3) Remove J-pin ring (28) 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 (35) from J-body (20).
- K-1.6) Unscrew and remove J-body (20) from drag block body (18) (**NOTE**<sub>4</sub>: Left-hand threads.).
- K-1.7) Remove drag block retainer (21) from drag block body (18).
- K-1.8) Remove drag block assembly tool (T1). 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).  
**NOTE**<sub>5</sub>: For added leverage, insert a rod thru rubber retainer (15) and rubber mandrel (11) as needed.
- K-1.10) Wedge lower slips (17) outwards (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).
- 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 elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).
    - K-1.13.1.1) Unscrew and remove gage ring (29) from rubber retainer (15).
- K-1.14) Unscrew and remove gage ring (29) from center coupling (10).
- K-1.15) Unscrew and remove center coupling (10) from upper cone (9).
  - K-1.15.1) Remove bonded seal (24) and o-ring (38) from center coupling (10).
    - K-1.15.1.1) Remove o-ring (36) from bonded seal (24).
- K-1.16) Remove bearing bushing (30) and upper cone (9) from inner mandrel (2).
- K-2) Unclamp and remove top sub (1) from vise. Clamp inner mandrel (2) in vise.  
**CAUTION**<sub>4</sub>: Do NOT wrench or clamp on seal surface.
- K-2.1) Unscrew and remove spring cage cap (27) from spring cage (5).  
**CAUTION**<sub>5</sub>: 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 wedges (if needed). Remove releasing slip (7), upper slips (8), and upper slip springs (26) from upper slip body (6).
  - K-2.5.2) Remove spring retainer ring (32) from upper slip body (6).
- K-3) Unclamp and remove inner mandrel (2) from vise.



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## L) ASSEMBLY

**NOTE<sub>6</sub>:** Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

**CAUTION<sub>6</sub>:** 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.

**CAUTION<sub>4</sub>:** Do **NOT** wrench or clamp on seal surface.

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

L-1.1.1) Install spring retainer ring (32) 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). Wedge releasing slips outwards.

**NOTE<sub>7</sub>:** Uses two (2ea) springs per slip (Fig. 3).

L-1.1.3) Install upper slip body assembly onto inner mandrel (2). Remove wedges.

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

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).

**CAUTION<sub>5</sub>:** Compression spring (4) is compressed with spring tension against upper slip body.

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).

L-2.2) Install o-ring (38) in o-ring groove in center coupling (10).

L-2.3) Install o-ring (36) in o-ring groove in bonded seal (24).

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

**CAUTION<sub>7</sub>:** Do not rip or tear o-rings during installation.

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

L-2.6) Screw gage ring (29) onto center coupling (10).

L-2.7) Assemble rubber mandrel assembly and install:

L-2.7.1) Screw gage ring (29) onto rubber retainer (15).

L-2.7.2) Install rubber retainer (15), elements (13, 14), and rubber spacers (12) onto rubber mandrel (11).

L-2.7.3) Install rubber mandrel assembly onto inner mandrel (2).

L-2.7.4) Screw rubber mandrel (11) into center coupling (10).

**CAUTION<sub>7</sub>:** Do not rip or tear o-rings 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.

**NOTE<sub>7</sub>:** Uses two (2ea) springs per slip (Fig. 4).

L-2.9.2) Install drag block body assembly onto rubber mandrel (11). Remove wedges.

L-2.10) 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.

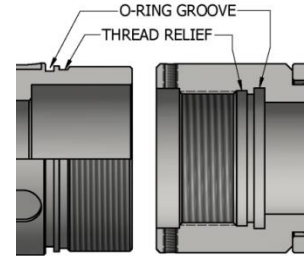


Fig. 2

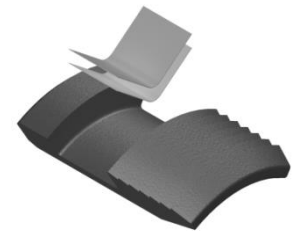


Fig. 3

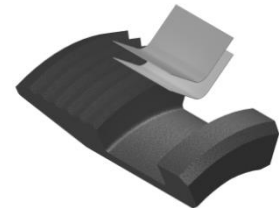


Fig. 4



# ASI-X HT PACKER w/SHEAR RELEASE BOTTOM 7" X 3-1/2"

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## L) ASSEMBLY (cont'd)

- L-2.11) Install drag blocks (22) and drag block springs (3) in drag block body (18).  
Compress drag blocks (22) using drag block body assembly tool (T1).

**NOTE<sub>8</sub>**: Uses six (6ea) drag block springs per drag block (Fig. 5).

- L-2.12) Install drag block retainer (21) capturing ends of drag blocks (22).

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

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

- L-2.14) Screw set screws (35) into J-body (20).

- L-2.15) Install o-ring (37) in o-ring groove in J-pin bottom sub (23).

- L-2.16) Install J-pin ring (28) onto J-pin bottom sub (23). Align holes in J-pin ring (28) with pocket holes in J-pin bottom sub (23).

- L-2.17) Screw shear screws (33) into J-pin ring (28). Tighten until shear screws make contact with J-pin bottom sub (23). Back shear screws out 1/4 turn.

- L-2.18) Screw J-pin bottom sub (23) onto inner mandrel (2).

**CAUTION<sub>7</sub>**: Do not rip or tear o-rings during installation.



Fig. 5

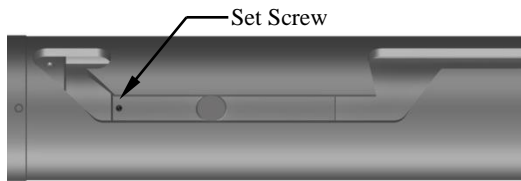


Fig. 6

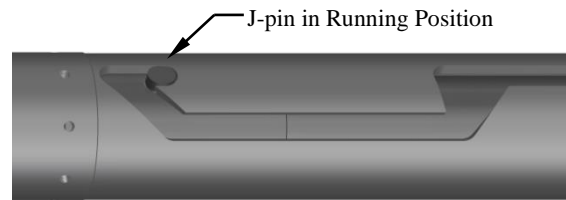


Fig. 7

- L-2.19) Screw set screws (34) into J-pin bottom sub (23). Move J-body (20) as needed (Fig. 6).

- L-2.20) Position J-pin in running position in J-slot of J-body (20) (Fig. 7).

- L-2.21) Install external ring (31) in groove in J-pin bottom sub (23).

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





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## M) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60373HTSR
1	1	TOP SUB	DLMS110	60173610HT (60073610*)
2	1	INNER MANDREL	DLMS110	60373210HT
3	24	DRAG BLOCK SPRING	-	9101900
4	1	COMPRESSION SPRING	DLMCRSP	60373920
5	1	SPRING CAGE	DLMS60	60174310 (60373310*)
6	1	UPPER SLIP BODY	DLMS80	60073320HT
7	1	RELEASING SLIP	DLMS110	60073125
8	2	UPPER SLIP	DLMS35	60073115
9	1	UPPER CONE	DLMS110	60373410HT
10	1	CENTER COUPLING	DLMS80	60273620
11	1	RUBBER MANDREL	DLMS60	60073220
12	2	RUBBER SPACER	DLMS60	60273840
13	1	ELEMENT	80 DURO NITRILE	60273512
14	2	ELEMENT	90 DURO NITRILE	60273513
15	1	RUBBER RETAINER	DLMS60	60273850
16	1	LOWER CONE	DLMS110	60073420HT
17	4	LOWER SLIP	DLMS35	60073135
18	1	DRAG BLOCK BODY	DLMS35	60073335
19	1	RUBBER MANDREL CAP	DLMS60	60173230 (60073230*)
20	1	J-BODY	DLMS60	60173340HT (60373340HT*)
21	1	DRAG BLOCK RETAINER	DLMS60	60073910
22	4	DRAG BLOCK	DLMSDB8	9070900
23	1	J-PIN BOTTOM SUB	DLMS110	60373655
24	1	BONDED SEAL	DLMS60 / 90 DURO NITRILE	60073520
25	8	LOWER SLIP SPRING	-	7170901
26	6	UPPER SLIP SPRING	-	7170902
27	1	SPRING CAGE CAP	DLMS60	60174810 (60073810*)
28	1	J-PIN RING	DLMS110	60373875
29	2	GAGE RING	DLMS60	60273830
30	1	BEARING BUSHING	DLMS35	60373224
31	1	SMALLEY EXTERNAL RING	-	WST-375
32	1	SPRING RETAINER RING	DLMS60	60073820
33	12	SHEAR SCREW (5500#) 1/2-13 UNC X 1/2	DLM360BRS	BSSSLT050C050
34	2	SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037
35	3	SET SCREW 3/8-16 UNC X 3/8	STEEL	SSS037C037
36	1	155 O-RING	90 DURO NITRILE	90155





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

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60370HTSR
37	1	237 O-RING	90 DURO NITRILE	90237
38	1	243 O-RING	90 DURO NITRILE	90243

REDRESS KIT (RDK)		60373050HT
ASSEMBLED WEIGHT		315 LBS

\*P/N may be substituted.

#### M-1) ELASTOMER TRIM OPTIONS

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

##### M-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60373HTSRH
13	1	ELEMENT	80 DURO HSN	60273512H
14	2	ELEMENT	90 DURO HSN	60273513H
24	1	BONDED SEAL	90 DURO HSN	60073520H
36	1	155 O-RING	90 DURO HSN	90155H
37	1	237 O-RING	90 DURO HSN	90237H
38	1	243 O-RING	90 DURO HSN	90243H

REDRESS KIT (RDK)		60373050HTH
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##### M-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60373HTSRV
13	1	ELEMENT	80 DURO VITON	60273512V
14	2	ELEMENT	90 DURO VITON	60273513V
24	1	BONDED SEAL	90 DURO VITON	60073520V
36	1	155 O-RING	90 DURO VITON	90155V
37	1	237 O-RING	90 DURO VITON	90237V
38	1	243 O-RING	90 DURO VITON	90243V

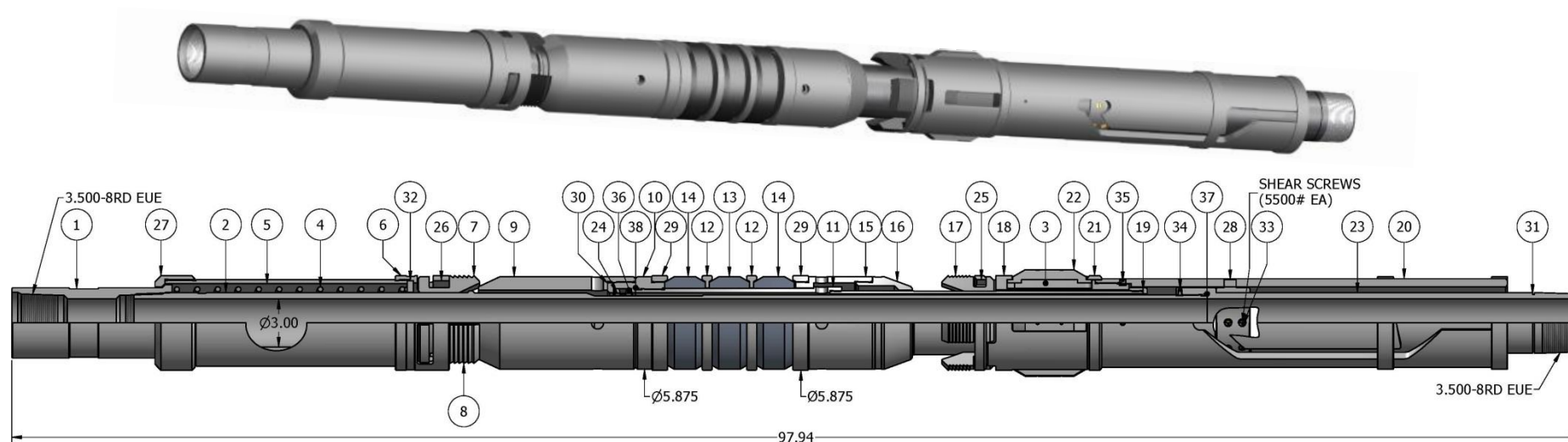
REDRESS KIT (RDK)		60373050HTV
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#### M-2) CARBIDE OPTIONS

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 60373HTSRC
8	2	CARBIDE UPPER SLIP	DLMS110	60073115C
17	4	CARBIDE LOWER SLIP	DLMS110	60073135C
22	4	CARBIDE DRAG BLOCK	DLMSDB4	9070900C

	<b>ASI-X HT PACKER</b> <b>w/SHEAR RELEASE BOTTOM</b> <b>7" X 3-1/2"</b>		Manual No: <b>DL-603-7000-093</b>
			Revision: <b>D</b>
			Revision Date: <b>08/04/2022</b>
<i>Authored by: S. White</i>		<i>Approved by: H. Bringham</i>	

## N) TECHNICAL ILLUSTRATION



## O) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
08/04/2022	D	Revised P/N 60373410HT was 60373410, elastomer temp. ratings; Added screw torque recommendations, carbide options	J.Anderson	E.Visaez
08/19/2015	C	Added Related Tools, tool drift ID, HSN and Viton options, Pre-Installation Inspection Procedures, Storage Recommendations, Recommended Hand Tools, P/N 60173610HT, 60174310, 60173230, 60173340HT, 60174810; Revised Pressure Affected Area Guide, P/N SSS037C037 qty was 4; Removed AFLAS from Elastomer Trim Temperature Guide	J.Anderson	K.Plunkett