



ASI-X ANCHOR

7" X 2-7/8"

Manual No:
DL-323-7000-720

Revision: **G**

Revision Date:
07/17/2019

Authored by: J.Anderson

Approved by: B.Oligschlaeger

A) DESCRIPTION

The ASI-X Anchor is a mechanically set double grip tubing anchor designed to be exceptionally durable and debris tolerant. The ASI-X Anchor is an adaptation of the ASI-X Packer and is suited for treating, testing, injecting, pumping wells, and flowing wells, deep or shallow. 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.

B) 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	17.0 – 26.0	6.276 – 6.538	6.000	2.50	2-7/8 EUE	32372 32372H ¹ 32372V ²
	26.0 – 32.0	6.094 – 6.276	5.875	2.50	2-7/8 EUE	32370 32370H ¹ 32370V ²
	29.0 – 35.0	6.004 – 6.184	5.812	2.50	2-7/8 EUE	32371 32371H ¹ 32371V ²

Elastomer Trim Options: ¹HSN, ²Viton

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

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)	TORQUE THRU TOOL (MAX)
10,000 PSI	125,000 LBS*	800 FT-LBS

*This is the maximum tensile value that can be pulled through the tool. If weight is hung through the anchor, the shear release plus the hanging weight cannot exceed this value.

C) 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.dloilttools.com



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C) 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.

D) SETTING PROCEDURES

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

D-1) COMPRESSION SET

Run the anchor 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 anchor, and then lower the work string while releasing torque. Slack off on the work string sufficient weight to set the anchor (14,000 lbs). Pull tension (14,000 lbs) to assure that the upper slips are set. The work string can then be left in tension or compression.

D-2) TENSION SET

Run to setting depth, pick up on the work string and rotate 1/4 turn to the right at the anchor then lower the work string slacking off available weight to set the anchor lower slips. Pull tension to set upper slips (10,000 lbs). After setting the anchor, the work string can be left in compression or tension.

E) RELEASING PROCEDURES

The releasing procedures are the same whether the anchor has been tension or compression set. Set down weight on the anchor to unseat the J-pin from the tension shoulder of the J-slot. Rotate the work string 1/4 right-hand turn at the anchor and pick up while holding right-hand torque. Weight in addition to pipe weight may be required to pick up on anchor. Continue to pick up to release the slips thus allowing the anchor to be re-set or removed from the well.

E-1) EMERGENCY RELEASE

In the event the anchor 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 tubing weight. The shear release value is adjustable from 24,000 lbs to 72,000 lbs (6,000 lbs/screw) by adding or removing shear screws from the J-pin ring. When released in this manner, the anchor will reset automatically when moved down the hole.



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F) 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.

Store the tool, if possible, in an enclosed, temperature and humidity controlled environment. Avoid excessively high temperatures over long periods of time. 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.

G) ELASTOMER TRIM TEMPERATURE GUIDE

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

H) RECOMMENDED TOOLS

H-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

H-2) SPECIAL TOOLS

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

I) DISASSEMBLY

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

I-1.1) Remove Smalley heavy duty external ring (24) from shear bottom sub (23).

I-1.2) Unscrew and remove set screws (28) from shear bottom sub (23). Move J-body (20) as necessary to access set screws.

I-1.3) Unscrew and remove shear bottom sub (23) from inner mandrel (2).

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

I-1.3.1) Remove o-ring (27) from shear bottom sub (23).

I-1.3.2) Unscrew and remove shear screws (14) from J-pin ring (10).

I-1.3.3) Remove J-pin ring (10) from shear bottom sub (23).

I-1.4) Compress drag blocks (22) using drag block body assembly tool (T1).

I-1.5) Unscrew and remove set screws (16) from J-body (20). Move drag block retainer (21) as necessary to access set screws.



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I) DISASSEMBLY (cont'd)

I-1.6) Unscrew and remove J-body (20) from drag block body (18) (**NOTE**₄: Left-hand threads).

I-1.6.1) Remove retaining ring (26) from J-body (20).

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

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

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

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

I-1.10.1) Remove wedges (if needed). Remove lower slips (17) and slip springs (12) from drag block body (18).

I-1.11) Unscrew rubber mandrel (11) from cone (9) and remove from inner mandrel (2).

I-1.12) Remove cone (9) from inner mandrel (2).

I-2) Unclamp and remove top sub (1) from vise. Clamp lower part of inner mandrel (2) in vise.

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

I-2.1) Unscrew and remove spring cage cap (25) from spring cage (5).

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

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

I-2.3) Remove compression spring (4) from inner mandrel (2).

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

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

I-2.5.1) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) and slip springs (13) from upper slip body (6).

I-2.5.2) Remove spring retaining ring (15) from upper slip body (6).

I-3) Unclamp and remove inner mandrel (2) from vise.

J) ASSEMBLY

NOTE₂: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

CAUTION₄: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

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

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

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

J-1.1.1) Install spring retaining ring (15) into upper slip body (6).

J-1.1.2) Install upper slips (8), releasing slip (7), and slip springs (13) into upper slip body (6).

NOTE₆: Install two (2ea) springs per slip (Fig. 3).

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

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

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

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

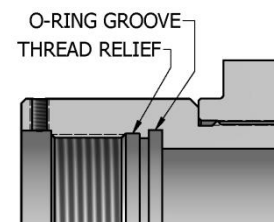


Fig. 2

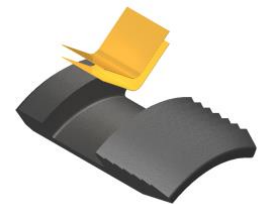


Fig. 3



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J) ASSEMBLY (cont'd)

J-1.5) Screw spring cage cap (25) into spring cage (5).

CAUTION₃: Compression spring (4) will be compressed with spring tension against upper slip body assembly.

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

J-2.1) Install cone (9) onto inner mandrel (2).

J-2.2) Install rubber mandrel (11) onto inner mandrel (2) and screw into cone (9).

J-2.3) Assemble drag block body assembly and install:

J-2.3.1) Install lower slips (17) and slip springs (12) into drag block body (18). Wedge slips outward.

NOTE₆: Install two (2ea) springs per slip (Fig. 4).

J-2.3.2) Install drag block body assembly onto rubber mandrel (11).

J-2.4) Screw rubber mandrel cap (19) onto rubber mandrel (11).

J-2.5) 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).

NOTE₇: Install six (6ea) springs per block (Fig. 5).

J-2.6) 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).

J-2.7) Install retaining ring (26) onto J-body (20).

J-2.8) Screw J-body (20) onto drag block body (18) (**NOTE₄:** Left-hand threads).

J-2.9) Screw set screws (16) into J-body (20). Release drag blocks (22).

J-2.10) Install J-pin ring (10) onto shear bottom sub (23). Align threaded holes in J-pin ring (10) with recessed holes in shear bottom sub (23)

J-2.11) Screw shear screws (14) into J-pin ring (10). Tighten until shear screws (14) make contact with shear bottom sub (23). Back shear screws (14) out 1/4 turn.

J-2.12) Install o-ring (27) in groove in shear bottom sub (23).

J-2.13) Screw shear bottom sub (23) onto inner mandrel (2).

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

CAUTION₅: Do not rip or tear o-ring during installation.

J-2.14) Screw set screws (28) into shear bottom sub (23). Move J-body (20) as necessary to access threaded holes in bottom sub.

J-2.15) Install Smalley heavy duty external ring (24) into ring groove of shear bottom sub (23).

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

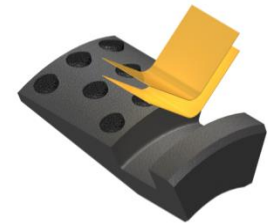


Fig. 4

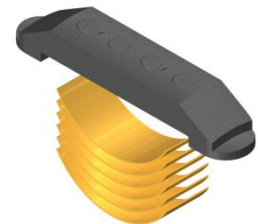


Fig. 5



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K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	17.0 – 26.0# P/N 32372	26.0 – 32.0# P/N 32370	29.0 – 35.0# P/N 32371
1	1	TOP SUB	DLMS80	60170610		
2	1	INNER MANDREL	DLMS110	32370210	32367210	
3	24	DRAG BLOCK SPRING	-	9101900		
4	1	COMPRESSION SPRING	DLMCRSP	60870920		
5	1	SPRING CAGE	DLMS80	32370310		
6	1	UPPER SLIP BODY	DLMS35 / DLMS60	60070320		
7	1	RELEASING SLIP	DLMS110	60070125		
8	2	UPPER SLIP W/CARBIDE	DLMS110	60070115C		
9	1	CONE	DLMS110	32372410	32370410	32371410
10	1	J-PIN RING	DLMS125	32370875		
11	1	RUBBER MANDREL	DLMS110	32370220	32371220	
12	8	LOWER SLIP SPRING	-	7170901		
13	6	UPPER SLIP SPRING	-	7170902		
14	12	SHEAR SCREW (6000#)	DLMSLS	32370910-6		
15	1	SPRING RETAINING RING	DLMS35	60070820		
16	3	SET SCREW 5/16-18 UNC X 7/16	STEEL	SSS031C043		
17	4	LOWER SLIP W/CARBIDE	DLMS110	60070135C		



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K) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	17.0 – 26.0# P/N 32372	26.0 – 32.0# P/N 32370	29.0 – 35.0# P/N 32371
18	1	DRAG BLOCK BODY	DLMS60 / DLMS35	60070335	32370335	
19	1	RUBBER MANDREL CAP	DLMS60	60170230		
20	1	J-BODY	DLMS60	32370345		
21	1	DRAG BLOCK RETAINER	DLMS60	60070910		
22	4	DRAG BLOCK W/CARBIDE	DLMSDB4	9080900C	9070900C	9060900C
23	1	SHEAR BOTTOM SUB	DLMS110	32370655		
24	1	SMALLEY HEAVY DUTY EXTERNAL RING	DLMSC	WSM-325		
25	1	SPRING CAGE CAP	DLMS35	60170810	60171810	
26	1	RETAINING RING	DLMS60	60070911		
27	1	233 O-RING	90 DURO NITRILE	90233		
28	2	SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037		

REDRESS KIT (RDK)		32372050	32370050	32371050
ASSEMBLED WEIGHT		188 LBS	188 LBS	182 LBS



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K) PARTS LIST (cont'd)

K-1) ELASTOMER TRIM OPTIONS

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

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	17.0 – 26.0# P/N 32372H	26.0 – 32.0# P/N 32370H	29.0 – 35.0# P/N 32371H
27	1	233 O-RING	90 DURO HSN	90233H		

REDRESS KIT (RDK)		32372050H	32370050H	32371050H
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K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	17.0 – 26.0# P/N 32372V	26.0 – 32.0# P/N 32370V	29.0 – 35.0# P/N 32371V
27	1	233 O-RING	90 DURO VITON	90233V		

REDRESS KIT (RDK)		32372050V	32370050V	32371050V
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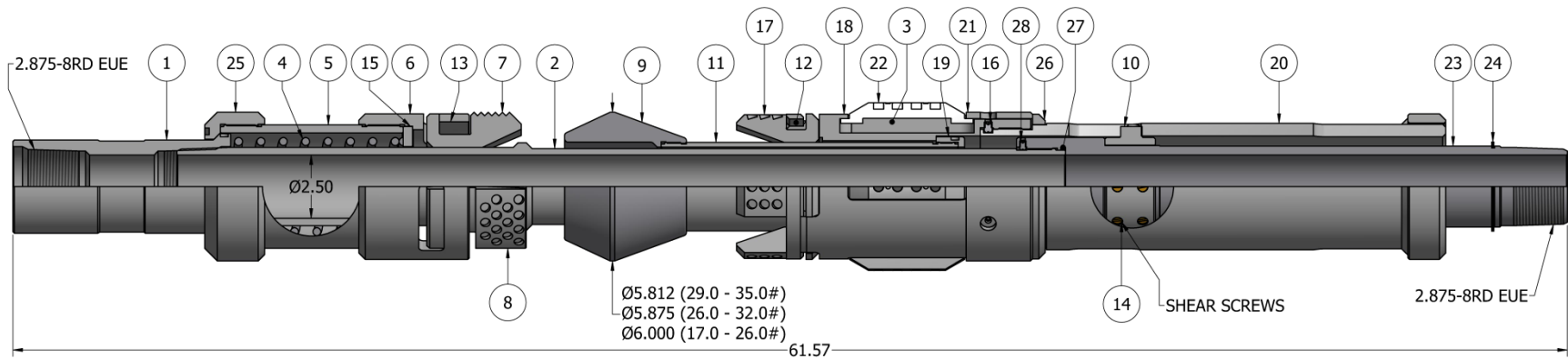
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L) TECHNICAL ILLUSTRATION



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M) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
07/16/2019	G	Revised 32370875 was 60070875, 32370910-6 was BSSSLT050C050	J.Anderson	N.Banker
07/31/2017	F	Added P/N 32371	J.Anderson	J.Johnson
04/27/2017	E	Revised max. tensile load with note, Elastomer Trim Temperature Guide Nitrile temp. rating	J.Anderson	D.Hushbeck
08/18/2016	D	Removed tool drift ID; Added General Screw Torque Recommendations; Revised Elastomer Trim Temperature Guide Nitrile and HSN temp. ranges, for P/N 32370 32370335 was 60070335	J.Anderson	K.Riggs
05/20/2015	C	Added P/N SSS025C037, HSN and Viton option; Revised Tech Illustration	J.Anderson	J.McArthur
08/22/14	B	Removed carbide option part numbers; Revised P/N 32370345 was 32370340	J.Anderson	K.Plunkett
07/29/14	A	Created new manual	-	-