	ASI-X ANCHOR 5-1/2” X 2-3/8”	Manual No: **DL-323-5500-878** Revision: **B** Revision Date: **04/27/2017**
Authored by: J.Anderson		*Approved by: J.McArthur*

A) DESCRIPTION

The ASI-X Anchor is a mechanically-set double-grip tubing anchor designed to be exceptionally durable and debris tolerant. This anchor is based on the proven ASI-X Packer design, but has been shortened, simplified and does not have a sealing element. This anchor is suited for treating, testing, injecting, pumping wells, and flowing wells, deep or shallow. This anchor is built using durable ASI-X Packer parts making redress both quick and economical.

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. With the variety of J-body configurations available, this anchor can also be set with other packers in tandem.

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)		
5-1/2	20.0 – 23.0	4.670 – 4.778	4.500	2.38	2-3/8 EUE	32359-XBAB 32359H-XBAB[1] 32359V-XBAB[2]

Elastomer Trim Options: [1]HSN, [2]Viton

NOTE$_1$: Tools listed are right-hand set / right-hand release.

DIFFERENTIAL PRESSURE (MAX)	**TENSILE LOAD THRU TOOL** (MAX)	**TORQUE THRU TOOL** (MAX)
10,000 PSI	92,000 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

CAUTION$_1$: 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

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 o-rings, etc. Contact D&L sales for redress kit and/or other replacement part information.

D) SETTING PROCEDURES

CAUTION$_2$: 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 (11,000 lbs). Pull tension (11,000 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 (11,000 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 17,200 lbs to 51,600 lbs (4,300 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.

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	AT055110

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 (15) 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).

NOTE$_2$: Drag block body assembly must be free to rotate.

I-1.3.1) Remove o-ring (25) 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) with drag block assembly tool (T1).

I-1.5) Unscrew and remove set screws (16) from J-body (20).

I-1.6) Unscrew and remove J-body (20) from drag block body (18) (**NOTE$_3$**: Left-hand threads).

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

I) DISASSEMBLY (cont'd)

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$_5$: Do NOT wrench or clamp on seal surface.

I-2.1) Unscrew and remove spring cage cap (6) from spring cage (5).

CAUTION$_3$: Compression spring (4) is compressed with spring tension against spring cage 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) Wedge slips outwards (if needed). Remove spring cage assembly and disassemble:

I-2.4.1) Remove wedges (if needed). Remove releasing slip (7), upper slips (8) and slip springs (13) from spring cage (5).

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

J) ASSEMBLY

NOTE$_4$: 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$_4$: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

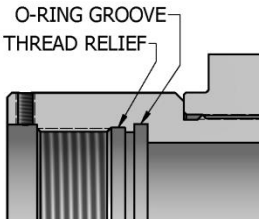

Fig. 2

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

CAUTION$_5$: Do NOT wrench or clamp on seal surface.

J-1.1) Assemble spring cage assembly and install:

J-1.1.1) Install upper slips (8), releasing slip (7), and slip springs (13) into spring cage (5).

NOTE$_5$: Install two (2ea) springs per slip (Fig. 3).

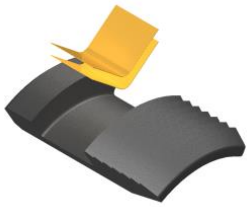
Fig. 3

J-1.1.2) Wedge releasing slip (7) and upper slips (8) outwards. Install spring cage assembly onto inner mandrel (2). Remove wedges.

J-1.2) Install compression spring (4) onto inner mandrel (2) and into spring cage (5).

J-1.3) Screw top sub (1) onto inner mandrel (2).

J-1.4) Screw spring cage cap (6) into spring cage (5).

CAUTION$_3$: Compression spring (4) will be compressed with spring tension against spring cage assembly.

J-2) Unclamp and 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) ASSEMBLY (cont'd)

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.

NOTE$_5$: Install two (2ea) springs per slip (Fig. 4).

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

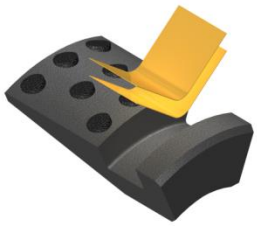

Fig. 4

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) with drag block assembly tool (T1).

NOTE$_6$: Install four (4ea) springs per block (Fig. 5).

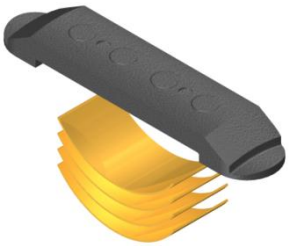

Fig. 5

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 (21) onto J-body (20).

J-2.8) Screw J-body (20) onto drag block body (18) (**NOTE$_3$**: 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 pocket 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 (25) in o-ring groove in shear bottom sub (23).

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

NOTE$_2$: Drag block body assembly must be free to rotate.

CAUTION$_6$: Do not rip or tear o-ring during installation.

J-2.14) Screw set screws (15) 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.

K) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32359-XBAB
1	1	TOP SUB	DLMS110	60156610HT-YBAB
2	1	INNER MANDREL	P-110	32359210
3	16	DRAG BLOCK SPRING		9100900
4	1	COMPRESSION SPRING	CHROME VANADIUM	61056920
5	1	SPRING CAGE	DLMCRSP	32359325
6	1	SPRING CAGE CAP	P-110/1026	60159810
7	1	RELEASING SLIP	DLMS60	60056125
8	2	UPPER SLIP W/ CARBIDE	DLMS110	60056115C
9	1	CONE	DLMS110	32356410

K) PARTS LIST (cont'd)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32359-XBAB
10	1	J-PIN RING	DLMS110	60056875
11	1	RUBBER MANDREL	P-110	32359220
12	8	LOWER SLIP SPRING	-	7155901
13	6	UPPER SLIP SPRING	-	7155902
14	12	SHEAR SCREW (4300#) 7/16-20 UNF X 7/16	DLM360BRS	BSSSLT043F043
15	2	SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037
16	3	SET SCREW 5/16-18 UNC X 5/16	STEEL	SSS031C031
17	4	LOWER SLIP W/ CARBIDE	DLMS110	60056135C
18	1	DRAG BLOCK BODY	DLMS60	60059335
19	1	RUBBER MANDREL CAP	DLMS60	60156230
20	1	J-BODY	DLMS60	32356345
21	1	DRAG BLOCK RETAINER	DLMS60	60059910
22	4	DRAG BLOCK W/ CARBIDE	DLMSDB4	9045900C
23	1	SHEAR BOTTOM SUB	DLMS80	32351655-WBAB
24	1	SMALLEY HEAVY DUTY EXTERNAL RING	DLMSC	WSM-312
25	1	231 O-RING	90 DURO NITRILE	90231

REDRESS KIT (RDK)		32359050
ASSEMBLED WEIGHT		107 LBS

K-1) ELASTOMER TRIM OPTIONS

NOTE$_7$: For temperature range, refer to Elastomer Trim Temperature Guide.

K-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32359H-XBAB
25	1	231 O-RING	90 DURO HSN	90231H

REDRESS KIT (RDK)		32359050H

K-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32359V-XBAB
25	1	231 O-RING	90 DURO VITON	90231V

REDRESS KIT (RDK)		32359050V

L) TECHNICAL ILLUSTRATION

M) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
04/27/2017	B	Removed tool drift ID; Revised tensile load thru tool and note, Elastomer Trim Temperature Guide Nitrile and HSN temp. ratings; Added General Screw Torque Recommendations, Emergency Release	J.Anderson	D.Hushbeck
06/25/2015	A	Created new manual	-	-