



HYDRAULIC TUBING ANCHOR

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

Manual No:
DL-324-5500-128

Revision: **E**

Revision Date:
05/23/2018

Authored by: *B.Mathis*

Approved by: *Don Hushbeck*

A) DESCRIPTION

The Hydraulic Tubing Anchor is a hydraulically-activated retrievable anchor designed to hold the tubing string in tension or compression. The Hydraulic Tubing Anchor catcher prevents movement of the tubing during pumping strokes and holds it stationary if it should part. The use of a tubing anchor increases pump efficiency, reduces rod and tubing wear, and keeps tubing and rods from falling into the well in case of a part.

The Hydraulic Tubing Anchor is operated by applying pressure to the tubing. This pressure shears screws that hold the anchor unset. A setting piston drives the slips set while locking the setting force in place. The Hydraulic Tubing Anchor utilizes special designed slips - heat-treated steel alloy double-acting slips for maximum holding power in tension or compression. Slips are fully enclosed for extra breakage resistance and will be retained if slips break. The Hydraulic Tubing Anchor is retrieved by shearing screws with tension. Shear pins are added in 5,000 lb increments to achieve the desired shear value necessary to release.

B) RELATED TOOLS (sold separately)

B-1) Pump-Out Plug (P/N varies)—refer to technical manual *DL-597-0000-431*.

C) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	TOOL OD (INCHES)	NOMINAL ID (INCHES)		
5-1/2	13.0 – 23.0	4.670 – 5.044	4.500	2.44	2-7/8 EUE	32455 32455H ¹ 32455V ²

Elastomer Trim Options: ¹HSN, ²Viton

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU TOOL (MAX)	TORQUE THRU TOOL (MAX)
6,000 PSI	115,000 LBS	2,000 FT-LBS

D) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION: 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



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

E) 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.

The Hydraulic Tubing Anchor is operated by applying pressure to the tubing. The applied pressure shears the setting shear screws which set the anchor. The setting piston sets the slips set while locking the setting force in place.

A tubing plug (ball seat, pump-out plug, etc.) must be run below the anchor so pressure can be applied to the tubing. The initial setting pressure is controlled by shear screws in the setting piston. The shear screws are rated to 470 psi per screw and the pressure to initiate setting will be determined by the quantity of shear screws.

F) RELEASING PROCEDURES

A straight pull shears the releasing shear screws and the anchor can be retrieved. The anchor must be re-dressed before it can be reset.

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.

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.



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H) ELASTOMER TRIM TEMPERATURE GUIDE

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

I) RECOMMENDED 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
- STRAP WRENCH
- 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) DISASSEMBLY

J-1) Clamp coupling (1) in vise.

J-1.1) From lower end of tool, unscrew and remove shear screws (15) from inner mandrel (2).

J-1.2) Remove shear ring (11) from inner mandrel (2).

J-1.3) Unscrew and remove set screws (14) from upper cone (7).

J-1.4) Remove slip body assembly from inner mandrel (2) and disassemble:

J-1.4.1) Remove slips (9) from slip body (8).

J-1.4.2) Unscrew and remove button head cap screws (12) from slips (9) and remove springs (13).

J-1.4.3) Remove lower cone (10) from slip body (8).

J-2) Unclamp and remove coupling (1) from vise. Clamp lower part of inner mandrel (2) in vise.

J-2.1) From upper end of tool, unscrew and remove coupling (1) from upper mandrel (2).

J-2.2) Unscrew and remove shear screws (16) from setting piston (5).

J-2.3) Remove shear cap (3) from setting piston (5) and inner mandrel (2).

J-2.3.1) Remove o-rings (17, 19) from shear cap (3).

J-2.4) Remove stop ring (4) from inner mandrel (2).

J-2.5) Unscrew and remove setting piston (5) from upper cone (7).

J-2.5.1) Remove o-ring (18) from setting piston (5).

J-2.6) Unscrew upper cone (7) downward from lock ring (6).

J-2.7) Unscrew and remove lock ring (6) from inner mandrel (2) (**NOTE**₁: Left-hand threads).

NOTE₃: Using snap ring spreader pliers, lock ring (6) may be spread slightly to be removed from inner mandrel (2).

J-2.8) Remove upper cone (7) from inner mandrel (2).

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



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K) ASSEMBLY

NOTE₃: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order, and orientation and tighten/torque all connections properly.

K-1) Clamp lower end of inner mandrel (2) in vise.

K-1.1) From upper end of tool, install upper cone (7) onto inner mandrel (2).

K-1.2) Install lock ring (6) onto inner mandrel and screw and/or slide lock ring (6) onto upper end of ratchet thread on inner mandrel (2) (**NOTE₁:** Left-hand threads).

NOTE₂: Using snap ring spreader pliers, lock ring (6) may be spread slightly to be installed onto inner mandrel (2).

NOTE₄: Threads on lock ring (6) are directional and **MUST** be installed in correct direction for tool to work properly.

K-1.3) Carefully screw upper cone (7) onto lock ring (6).

K-1.4) Install o-ring (18) in o-ring groove in setting piston (5).

K-1.5) Install setting piston (5) onto inner mandrel (2) and carefully screw onto upper cone (7).

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

K-1.6) Install stop ring (4) into upper stop ring groove in inner mandrel (2).

K-1.7) Install o-rings (17, 19) in o-ring grooves in shear cap (3).

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

K-1.8) Install shear cap (3) onto inner mandrel (2) and into setting piston (5). Align threaded holes in setting piston (5) with pocket holes in shear cap (3).

K-1.9) Screw shear screws (16) into setting piston (5). Tighten until shear screws (16) make contact with shear cap (3). Back shear screws (16) out 1/4 turn.

K-1.10) Screw coupling (1) onto inner mandrel (2).

K-2) Unclamp and remove inner mandrel (2) in vise. Clamp coupling (1) in vise.

K-2.1) Assemble slip body assembly and install:

K-2.1.1) Install lower cone (10) into slip body (8).

K-2.1.2) Set springs (13) in place on slips (9).

K-2.1.3) Screw with button head cap screws (12) into slips (9) to secure springs (13).

NOTE₅: Uses two (2ea) springs per slip (Fig. 2).

K-2.1.4) Install slips (9) into slip body (8). Wedge slips (9) outwards.

K-2.1.5) From lower end of tool, install slip body assembly onto inner mandrel (2). Align slots in slip body (8) with threaded holes in upper cone (7).

K-2.1.6) Screw set screws (14) into upper cone (7). Remove wedges.

K-2.2) Install shear ring (11) onto inner mandrel (2). Align threaded holes in shear ring (11) with pocket holes in inner mandrel (2).

K-2.3) Screw shear screws (15) into shear ring (11). Tighten until shear screws (15) make contact with inner mandrel (2). Back shear screws (15) out 1/4 turn.

K-3) Unclamp coupling (1) from vise and remove assembled tool.



Fig. 2



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L) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32455
1	1	COUPLING	DLMS80	CP-BAC-B
2	1	INNER MANDREL	DLMS80	32455210
3	1	SHEAR CAP	DLMS80	32455740
4	1	STOP RING	DLMS110	32455980
5	1	SETTING PISTON	DLMS80	32455750
6	1	LOCK RING	DLMS80	32455011
7	1	UPPER CONE	DLMS110	32455410
8	1	SLIP BODY	DLMS80	32555320
9	3	SLIP	DLMS35	32055112
10	1	LOWER CONE	DLMS80	32555420
11	1	SHEAR RING	DLMS80	32555930
12	3	BUTTON HEAD CAP SCREW #8-32 UNC X 3/8	STEEL	BHSC832C037
13	6	SLIP SPRING	DLMINC625	32055950
14	3	SET SCREW 1/2-20 UNF X 1/2	STEEL	SSS050F050
15	12	SHEAR SCREW (5000#) 5/8-18 UNF X .45	DLM360BRS	32045910
16	8	SHEAR SCREW (2375#)	DLM360BRS	60100990
17	1	235 O-RING	90 DURO NITRILE	90235
18	1	338 O-RING	90 DURO NITRILE	90338
19	1	342 O-RING	90 DURO NITRILE	90342

REDRESS KIT (RDK)	32455050
ASSEMBLED WEIGHT	77 LBS

L-1) ELASTOMER TRIM OPTIONS

NOTE2: For temperature range, refer to Elastomer Trim Temperature Guide.

L-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32455H
17	1	235 O-RING	90 DURO HSN	90235H
18	1	338 O-RING	90 DURO HSN	90338H
19	1	342 O-RING	90 DURO HSN	90342H

REDRESS KIT (RDK)	32455050H
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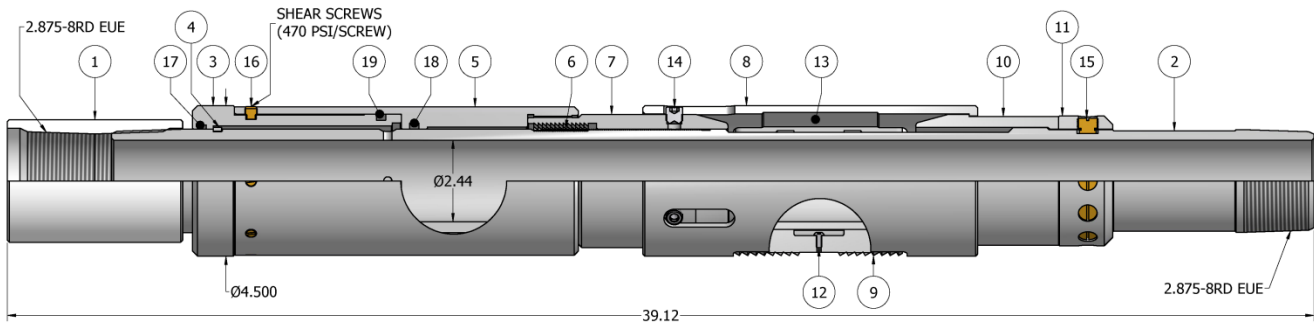
M) PARTS LIST (cont'd)

L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 32455V
17	1	235 O-RING	90 DURO VITON	90235V
18	1	338 O-RING	90 DURO VITON	90338V
19	1	342 O-RING	90 DURO VITON	90342V

REDRESS KIT (RDK)	32455050V
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M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
05/23/2018	E	Revised differential pressure was 5,000 lbs, tensile load was 100,000 lbs; Removed setting force guide	J.Anderson	C.Colvin
04/19/2017	D	Revised differential pressure 5,000 lbs was 10,000 lbs, Elastomer Trim Temperature Guide Nitrile temp rating; Added General Screw Torque Recommendations	J.Anderson	D.Hushbeck
01/20/2016	C	Added HSN and Viton options, torque thru tool, Elastomer Trim Temperature Guide, Recommended Hand Tools; Revised P/N CP-BAC-B was CP2875E5872E; Removed tool drift ID	J.Anderson	N.Banker
06/11/14	B	Revised entire manual	J.Anderson	R.Dyer