A) DESCRIPTION

The HD Abandonment Packer is a heavy duty service packer ideally suited for all types of squeeze cementing, formation fracturing, high pressure acidizing, etc. This packer is a large opening compression set packer with hydraulic button-type hold down. This packer withstands high pressure from above or below and uses a 3-element packing system, J-slot, and a drag block mechanism for easy setting. This packer has a built-in unloader which circulates across the hold down buttons to improve retrievability and run in performance.

B) SPECIFICATION GUIDE

CASING			TOOL		THREAD CONNECTIONS BOX UP / PIN DOWN	PART NUMBER
SIZE (INCHES)	WEIGHT (LBS/FT)	RECOMMENDED HOLE SIZE (INCHES)	GAGE OD (INCHES)	NOMINAL ID (INCHES)		
13-3/8	54.5 – 77.0	12.275 – 12.615	12.000	3.50	4-1/2 EUE	61513HD-YBAG 61513HDH-YBAG[1] 61513HDV-YBAG[2]

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

NOTE$_1$: Tools listed are right-hand auto set / straight pick-up.

DIFFERENTIAL PRESSURE (MAX)	TENSILE LOAD THRU UNSET TOOL (MAX)	HANGING WEIGHT ON SET TOOL (MAX)*	TORQUE THRU TOOL (MAX)
6,000 PSI	500,000 LBS	350,000 LBS*	2,000 FT-LBS

*Casing must be cemented for this load rating.

CAUTION$_1$: Before running the tool, check the pressure affected areas chart, and consider other effects to be certain that the unloader will remain closed during operation.

CAUTION$_2$: If the HD Packer is run with a Retrievable Bridge Plug, make sure the Retrievable Bridge Plug J-slot is compatible with the J-slot on the packer. Whichever direction you set the Retrievable Bridge Plug, the packer should set in the **opposite** direction.

C) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION$_3$: D&L ships tool connections made-up hand-tight—labeled with hand-tight tape on the tool—unless stated otherwise. Properly tighten connections before operating tool (Fig. 1).

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

C) PRE-INSTALLATION INSPECTION PROCEDURES (cont'd)

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$_4$: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

Run to setting depth. The unloader remains open while running in. Pick up the tubing and rotate 1/4 turn at the packer. Slack off weight and set down on the packer to set the slips, close the unloader and compress the packing elements. A minimum weight of 35,000 lbs at the packer is required to pack off the elements.

CAUTION$_5$: Run the tool slowly, as with any hold down type packer, to help prevent dulling of the hydraulic buttons.

E) RELEASING PROCEDURES

Pick up on the tubing to open the unloader, allowing time for the tubing and casing pressure to equalize. Refer to Pressure Affected Area Guide to determine weight in addition to pipe weight required to pick up on packer. Continued upward movement of the tubing unsets the slips, relaxes the packing elements and re-jays the packer. The tool may now be moved and reset, or pulled from the well.

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. Elastomers 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).

G) 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.

G) PRESSURE AFFECTED AREA GUIDE (cont'd)

PACKER SIZE (IN)	DRILL PIPE TO PACKER			PRESSURE AFFECTED AREA (IN^2)			
	SIZE (IN)	WEIGHT (LB/FT)	ID (IN)	ABOVE		BELOW	
13-3/8	2.375	4.85	1.995	11.154	(DOWN)	3.335	(DOWN)
		6.65	1.815	11.154	(DOWN)	2.797	(DOWN)
	2.875	6.85	2.441	9.093	(DOWN)	4.889	(DOWN)
		10.40	2.151	9.093	(DOWN)	3.843	(DOWN)
	3.500	8.50	3.063	5.963	(DOWN)	7.578	(DOWN)
		13.30	2.764	5.963	(DOWN)	6.210	(DOWN)
		15.50	2.602	5.963	(DOWN)	5.527	(DOWN)
	4.000	11.85	3.476	3.018	(DOWN)	9.699	(DOWN)
		14.00	3.340	3.018	(DOWN)	8.971	(DOWN)
		15.70	3.240	3.018	(DOWN)	8.454	(DOWN)
	4.500	13.75	3.958	-0.320	(UP)	12.513	(DOWN)
		16.60	3.826	-0.320	(UP)	11.706	(DOWN)
		20.00	3.640	-0.320	(UP)	10.616	(DOWN)
		22.82	3.500	-0.320	(UP)	9.831	(DOWN)
	5.000	16.25	4.408	-4.051	(UP)	15.470	(DOWN)
		19.50	4.276	-4.051	(UP)	14.570	(DOWN)
		25.60	4.000	-4.051	(UP)	12.776	(DOWN)
	5.500	19.20	4.892	-8.174	(UP)	19.005	(DOWN)
		21.90	4.778	-8.174	(UP)	18.140	(DOWN)
		24.70	4.670	-8.174	(UP)	17.338	(DOWN)
	5.875	23.40	5.153	-11.524	(UP)	21.065	(DOWN)
		24.17	5.045	-11.524	(UP)	20.199	(DOWN)
	6.625	25.20	5.965	-18.887	(UP)	28.155	(DOWN)
		27.70	5.901	-18.887	(UP)	27.559	(DOWN)
	ABANDONED	N/A	PLUGGED	15.584	(DOWN)	0.210	(DOWN)

*Drill pipe sizes not recommended.

Example: Consider a 13-3/8" X 4-1/2" HD Abandonment Packer set on 4.500", 16.60 lb/ft drill pipe with a differential pressure of 3,000 PSI in the annulus around the drill pipe 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 13-3/8" X 4-1/2" HD Abandonment Packer run on 4.500", 16.60 lb/ft drill pipe. 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 -0.320 in^2. Multiplying the differential pressure (3,000 PSI) by the pressure affected area (-0.320 in^2) results in a force of -960 lbs. The piston effect on the packer mandrel is an upward force of 960 lbs.

H) ELASTOMER TRIM TEMPERATURE GUIDE

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°
HSN (HNBR)	70° - 300°
VITON	100° - 350°

I) RECOMMENDED TOOLS

I-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
- JACK STANDS

I-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	DRAG BLOCK ASSEMBLY TOOL	AT016110
T2	1	BUTTON REMOVAL TOOL	AT-BRT000
T3	1 GAL	KOPR-KOTE® ANTI-SEIZE LUBRICANT	DL-KOPR-KOTE-1G

J) DISASSEMBLY

NOTE$_2$: Ensure vise is capable of handling weight of tool.

NOTE$_3$: Support tool during disassembly and assembly with jack stands as necessary.

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

J-1.1) Unscrew and remove set screws (32) from J-pin sub (23).

J-1.2) Unscrew and remove bottom sub (28) from J-pin sub (23).

J-1.3) Unscrew and remove set screws (33) from J-pin sub (23). Slide J-body (20) and drag block body assembly as needed to access screws.

J-1.4) Unscrew and remove J-pin sub (23) from mandrel (2).

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

J-1.4.1) Remove o-rings (47, 48) from J-pin sub (23).

J-1.5) Unscrew and remove set screws (34) from drag block body support (27).

J-1.6) Unscrew and remove J-body (20) from drag block body support (27) (**NOTE$_1$**: Left-hand threads).

J-1.7) Unscrew and remove rubber mandrel cap (19) from rubber mandrel (11).

NOTE$_3$: For added leverage, insert a rod through lower cone (16) and rubber mandrel (11) as needed.

J) DISASSEMBLY (cont'd)

J-1.8) Remove drag block body assembly and disassemble:

J-1.8.1) Compress drag blocks (22) with drag block assembly tool (T1).

J-1.8.2) Unscrew and remove set screws (39) from drag block body (18). Rotate drag block retainer ring (21) as needed to access screws.

J-1.8.3) Unscrew and remove drag block body support (27) from drag block body (18) (**NOTE$_1$**: Left-hand threads).

J-1.8.4) Remove drag block retainer ring (21) from drag block body (18).

J-1.8.5) Remove drag block assembly tool (T1). Remove drag blocks (22) and drag block springs (3) from drag block body (18).

J-1.8.6) Unscrew and remove cap screws (40) from drag block body (18).

J-1.8.7) Wedge lower slips (17) outward (if needed). Remove lower slip support (38) from drag block body (18).

J-1.8.8) Remove wedges (if needed). Remove lower slips (17) and lower slip springs (25) from drag block body (18).

J-1.9) Unscrew and remove lower cone (16) from rubber retainer (15).

J-1.10) Unscrew rubber mandrel (11) from valve body (30).

J-1.11) Remove rubber mandrel assembly and disassemble:

J-1.11.1) Remove elements (13, 14), rubber spacers (12), and rubber retainer (15) from rubber mandrel (11).

J-1.11.2) Remove rubber mandrel sleeve (37) from rubber mandrel (11).

J-1.11.3) Remove o-ring (44) from rubber mandrel (11).

J-1.12) Unscrew and remove upper gage ring (29) from valve body (30).

J-1.13) Unscrew and remove valve body (30) from central body (10).

J-1.13.1) Remove o-ring (42) from valve body (30).

J-1.14) Unscrew and remove central body (10) from hold down body adapter (31).

J-2) Unclamp and remove top sub (1) from vise. Clamp lower end of mandrel (2) in vise.

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

J-2.1) Unscrew and remove set screws (33) from top sub (1).

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

J-2.2.1) Remove o-ring (47) from top sub (1).

J-2.3) Unscrew and remove upper hold down retaining ring (7) from hold down body (6).

J-2.4) Unscrew lower hold down retaining ring (7) from hold down body (6). Slide lower hold down retaining ring (7) temporarily down out of way to be removed in later step.

J-2.5) Remove hold down button assemblies from hold down body (6) and disassemble:

J-2.5.1) Unscrew and remove flat head cap screws (41) from hold down body (6).

J-2.5.2) Remove hold down straps (36) from hold down body (6).

J-2.5.3) Remove hold down button springs (3) from hold down buttons (26).

J-2.5.4) Remove hold down buttons (26) from hold down body (6) with button removal tool (T2).

J-2.5.4.1) Remove o-rings (46) from hold down buttons (26).

J-2.6) Unscrew and remove upper hold down body adapter (4) from hold down body (6).

J-2.6.1) Remove o-rings (49, 53) from upper hold down body adapter (4).

J-2.7) Unscrew and remove hold down body (6) from hold down body adapter (31).

J-2.7.1) Remove o-rings (52) from hold down body (6).

J) DISASSEMBLY (cont'd)

J-2.8) Remove hold down body adapter (31) from mandrel (2).

J-2.8.1) Remove o-ring (51) from hold down body adapter (31).

J-2.9) Remove lower hold down retaining ring (7) from mandrel assembly.

J-2.10) Remove compensating piston (9) from compensating mandrel (8).

J-2.10.1) Remove o-rings (50, 51) from compensating piston (9).

J-2.11) Unscrew and remove compensating mandrel (8) from seal receptacle (5)

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

J-3.1) Unscrew and remove seal retainer (35) from seal receptacle (5).

J-3.2) Remove seal receptacle (5) from mandrel (2).

J-3.2.1) Remove o-rings (43, 45) and seal (24) from seal receptacle (5).

K) ASSEMBLY

NOTE$_8$: 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$_7$: To ensure tool operates properly, install o-rings in o-ring grooves **NOT** thread reliefs (Fig. 2).

NOTE$_9$: Apply KOPR-KOTE® anti-seize lubricant (T3) on STUB ACME and drill pipe connections when making up connections.

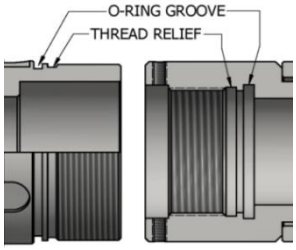


Fig. 2

NOTE$_2$: Ensure vise is capable of handling weight of tool.

NOTE$_3$: Support tool during disassembly and assembly with jack stands as necessary.

K-1) Assemble seal receptacle assembly and install:

K-1.1) Install o-rings (43, 45) in o-ring grooves in seal receptacle (5).

K-1.2) Set seal (24) in place on seal receptacle (5).

K-1.3) Screw seal retainer (35) onto seal receptacle (5).

CAUTION$_5$: Do not rip or tear o-ring or seal during installation.

K-1.4) From lower end of mandrel (2), install seal receptacle assembly onto mandrel (2).

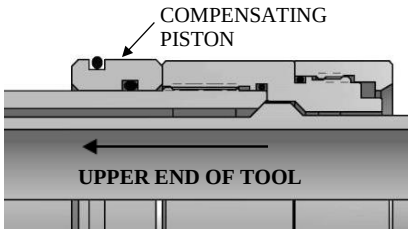


Fig. 3

K-2) Clamp lower end of mandrel (2) in vise.
CAUTION$_5$: Do NOT wrench or clamp on seal surface.

K-2.1) Assemble compensating mandrel assembly and install:

K-2.1.1) Install o-rings (50, 51) in o-ring grooves in compensating piston (9).

K-2.1.2) Install compensating piston (9) onto compensating mandrel (8).

NOTE$_8$: Compensating piston MUST be installed in correct direction (Fig. 3).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-2.1.3) Screw compensating mandrel (8) into seal receptacle (5).

K-2.2) Loosely install lower hold down retaining ring (7) onto mandrel (2) to be installed onto hold down body (6) in later step.

K-2.3) Assemble hold down body assembly and install:

K-2.3.1) Install o-rings (52) in o-ring grooves in hold down body (6).

K-2.3.2) Install o-ring (51) in o-ring groove in hold down body adapter (31).

K-2.3.3) Screw hold down body adapter (31) into hold down body (6).

K-2.3.4) Install o-rings (49, 53) in o-ring grooves in upper hold down body adapter (4).

K) ASSEMBLY (cont'd)

K-2.3.5) Screw upper hold down body adapter (4) into hold down body (6).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-2.3.6) Install hold down body assembly onto mandrel (2).

CAUTION$_4$: Do not rip or tear o-rings during installation.

Fig. 4

K-2.4) Assemble hold down buttons and install:

K-2.4.1) Install o-rings (46) in o-ring grooves in hold down buttons (26).

K-2.4.2) Install hold down buttons (26) into hold down body (6) (Fig. 4).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-2.4.3) Align slot in hold down buttons (26) with slot in hold down body (6).

K-2.4.4) Install drag block springs (3) into hold down buttons (26).

NOTE$_9$: Install two (2ea) springs per button (Fig. 5).

K-2.4.5) Set hold down straps (36) in slots in hold down buttons (26) and hold down body (6) (Fig. 5).

K-2.4.6) Screw flat head cap screws (41) into hold down body (6) to secure hold down straps (34) in place (Fig. 5).

Fig. 5

K-2.5) Screw lower hold down retaining ring (7) onto hold down body (6) capturing lower ends of hold down straps (36).

K-2.6) Screw upper hold down retaining ring (7) onto hold down body (6) capturing upper ends of hold down straps (36).

K-2.7) Install o-ring (47) in o-ring groove in top sub (1).

K-2.8) Screw top sub (1) onto mandrel (2).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-2.9) Screw set screws (33) into top sub (1).

K-3) Unclamp and remove mandrel (2) from vise. Clamp top sub (1) in vise.

K-3.1) Screw central body (10) onto hold down body (6).

CAUTION$_4$: Do not rip or tear o-rings during installation.

K-3.2) Install o-ring (42) in o-ring groove in valve body (30).

K-3.3) Screw valve body (30) into central body (10).

K-3.4) Screw upper gage ring (29) onto valve body (30).

K-3.5) Assemble rubber mandrel assembly and install:

K-3.5.1) Install o-ring (44) in o-ring groove in rubber mandrel (11).

K-3.5.2) Install rubber mandrel sleeve (37) onto rubber mandrel (11).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-3.5.3) Install rubber retainer (15), rubber spacers (12), and elements (13, 14) onto rubber mandrel sleeve (37).

K-3.5.4) Install rubber mandrel assembly onto mandrel (2). Screw rubber mandrel (11) into valve body (30).

CAUTION$_4$: Do not rip or tear o-ring during installation.

K-3.6) Screw lower cone (16) into rubber retainer (15).

K) ASSEMBLY (cont'd)

K-3.7) Assemble drag block body assembly and install:

Fig. 6

K-3.7.1) Install lower slips (17) and lower slip springs (25) into drag block body (18). Wedge slips outward.

NOTE$_{12}$: Install two (2ea) springs per slip (Fig. 6).

K-3.7.2) Install lower slip support (38) into drag block body (18).

K-3.7.3) Align holes in lower slip support (38) with threaded holes in drag block body (18). Screw cap screws (40) into drag block body (18). Remove wedges.

K-3.7.4) 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$_{10}$: Install six (6ea) drag block springs per drag block (Fig. 7).

Fig. 7

K-3.7.5) Install drag block retainer ring (21) capturing ends of drag blocks (22).

K-3.7.6) Screw drag block body support (27) into drag block body (18) (**NOTE$_{1}$**: Left-hand threads).

K-3.7.7) Screw set screws (39) into drag block body (18). Move drag block retainer ring (21) as needed to access threaded holes in drag block body (18). Release drag blocks (22).

K-3.7.8) Install drag block body assembly onto rubber mandrel (11).

K-3.8) Screw rubber mandrel cap (19) onto rubber mandrel (11). Move drag block body assembly as needed.

K-3.9) Screw J-body (20) into drag block body support (27) (**NOTE$_{1}$**: Left-hand threads).

K-3.10) Screw set screws (34) into drag block body support (27).

K-3.11) Install o-rings (47, 48) in o-ring grooves in J-pin sub (23).

K-3.12) Screw J-pin sub (23) onto mandrel (2).

NOTE$_{2}$: Drag block body assembly must be free to rotate.

CAUTION$_{4}$: Do not rip or tear o-ring during installation.

K-3.13) Screw set screws (33) into J-pin sub (23). Move J-body (20) as needed to access threaded holes in J-pin sub (23)

K-3.14) Screw bottom sub (28) into J-pin sub (23).

CAUTION$_{4}$: Do not rip or tear o-ring during installation.

K-3.15) Screw set screws (32) into J-pin sub (23).

K-4) Unclamp top sub (1) from vise and remove assembled tool.

L) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61513HD-YBAG
1	1	TOP SUB	P-110	61595612
2	1	MANDREL	P-110	61513215
3	48	DRAG BLOCK SPRING	INCONEL	9101900
	20	HOLD DOWN BUTTON SPRING	INCONEL	9101900
4	1	UPPER HOLD DOWN BODY ADAPTER	P-110	61313326

L) PARTS LIST (cont’d)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61513HD-YBAG
5	1	SEAL RECEPTACLE	DLMS110	61395730
6	1	HOLD DOWN BODY	P-110	61313320
7	2	HOLD DOWN RETAINING RING	P-110	61313370
8	1	COMPENSATING MANDREL	DLMS110	61395240
9	1	COMPENSATING PISTON	DLMS110	61395715
10	1	CENTRAL BODY	DLMS110	61395385
11	1	RUBBER MANDREL	DLMS110	60313220HT
12	2	RUBBER SPACER	1026	61513841
13	1	ELEMENT	80 DURO NITRILE	61513512
14	2	ELEMENT	90 DURO NITRILE	61513513
15	1	RUBBER RETAINER	P-110	61513851
16	1	LOWER CONE	P-110	61513420
17	6	LOWER SLIP W/ CARBIDE	P-110	60013135C
18	1	DRAG BLOCK BODY	P-110	60313335HT
19	1	RUBBER MANDREL CAP	DLMS60	60095230
20	1	J-BODY	P-110	61313340
21	1	DRAG BLOCK RETAINER RING	DLMS35	60313910
22	8	CARBIDE DRAG BLOCK	4140	9080900C
23	1	J-PIN SUB	DLMS110	61595620
24	1	QUAD SEAL	90 DURO NITRILE	61395520
25	12	LOWER SLIP SPRING	ELGILOY	7170901
26	10	HOLD DOWN BUTTON	STRESSPROOF	61310974
27	1	DRAG BLOCK BODY SUPPORT	DLMS35	60313330
28	1	BOTTOM SUB	P-110	61762620-CBAG
29	1	UPPER GAGE RING	P-110	60313830HT
30	1	VALVE BODY	P-110	61313350

L) PARTS LIST (cont’d)

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61513HD-YBAG
31	1	HOLD DOWN BODY ADAPTER	P-110	61313325
32	4	SET SCREW 1/4-20 UNC X 1/2	STEEL	SSS025C050
33	5	SET SCREW 3/8-16 UNC X 3/8	STEEL	SSS037C037
34	2	SET SCREW 3/8-16 UNC X 1/2	STEEL	SSS037C050
35	1	SEAL RETAINER	DLMS110	61395530
36	5	HOLD DOWN STRAP	P-110	61313360
37	1	RUBBER MANDREL SLEEVE	DLMS35	61513225
38	1	LOWER SLIP SUPPORT	1026	60313912
39	2	SET SCREW 3/8-16 UNC X 5/8	STEEL	SSS037C062
40	2	CAP SCREW 1/2-13 UNC X 3/4	STEEL	SCS050C075
41	5	FLAT HEAD CAP SCREW 5/16-24 UNF X 5/8	STEEL	FHSC031F062
42	1	160 O-RING	90 DURO NITRILE	90160
43	1	253 O-RING	90 DURO NITRILE	90253
44	1	254 O-RING	90 DURO NITRILE	90254
45	1	256 O-RING	90 DURO NITRILE	90256
46	10	338 O-RING	90 DURO NITRILE	90338
47	2	346 O-RING	90 DURO NITRILE	90346
48	1	348 O-RING	90 DURO NITRILE	90348
49	1	351 O-RING	90 DURO NITRILE	90351
50	1	356 O-RNG	90 DURO NITRILE	90356
51	2	363 O-RING	90 DURO NITRILE	90363
52	2	366 O-RING	90 DURO NITRILE	90366
53	2	427 O-RING	90 DURO NITRILE	90427

REDRESS KIT (RDK)		61511050
ASSEMBLED WEIGHT		974 LBS

L) PARTS LIST (cont’d)

L-1) ELASTOMER TRIM OPTIONS

NOTE$_{13}$: For temperature range, refer to Elastomer Trim Temperature Guide.

L-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61513HDH-YBAG
13	1	ELEMENT	80 DURO HSN	61513512H
14	2	ELEMENT	90 DURO HSN	61513513H
24	1	QUAD SEAL	90 DURO HSN	61395520H
42	1	160 O-RING	90 DURO HSN	90160H
43	1	253 O-RING	90 DURO HSN	90253H
44	1	254 O-RING	90 DURO HSN	90254H
45	1	256 O-RING	90 DURO HSN	90256H
46	10	338 O-RING	90 DURO HSN	90338H
47	2	346 O-RING	90 DURO HSN	90346H
48	1	348 O-RING	90 DURO HSN	90348H
49	1	351 O-RING	90 DURO HSN	90351H
50	1	356 O-RNG	90 DURO HSN	90356H
51	2	363 O-RING	90 DURO HSN	90363H
52	2	366 O-RING	90 DURO HSN	90366H
53	2	427 O-RING	90 DURO HSN	90427H

REDRESS KIT (RDK)		61513050H

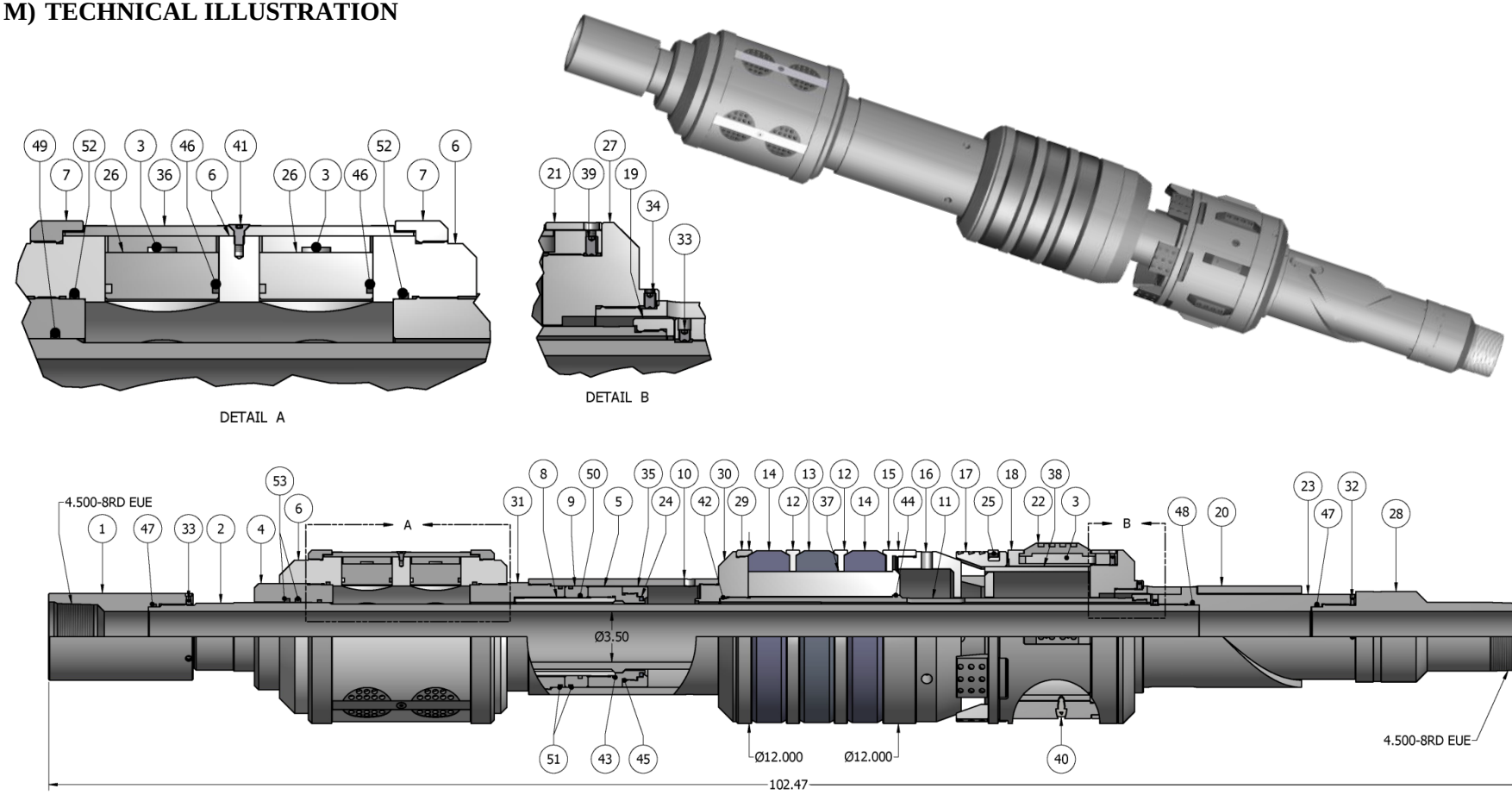
L) PARTS LIST (cont’d)

L-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 61513HDV-YBAG
13	1	ELEMENT	80 DURO VITON	61513512V
14	2	ELEMENT	90 DURO VITON	61513513V
24	1	QUAD SEAL	90 DURO VITON	61395520V
42	1	160 O-RING	90 DURO VITON	90160V
43	1	253 O-RING	90 DURO VITON	90253V
44	1	254 O-RING	90 DURO VITON	90254V
45	1	256 O-RING	90 DURO VITON	90256V
46	10	338 O-RING	90 DURO VITON	90338V
47	2	346 O-RING	90 DURO VITON	90346V
48	1	348 O-RING	90 DURO VITON	90348V
49	1	351 O-RING	90 DURO VITON	90351V
50	1	356 O-RNG	90 DURO VITON	90356V
51	2	363 O-RING	90 DURO VITON	90363V
52	2	366 O-RING	90 DURO VITON	90366V
53	2	427 O-RING	90 DURO VITON	90427V

REDRESS KIT (RDK)		61513050V

M) TECHNICAL ILLUSTRATION



N) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
05/23/2017	L	Added General Screw Torque Recommendations; Revised Pressure Affected Area Guide, Elastomer Trim Temperature Guide Nitrile temp. rating	J.Anderson	K.Plunkett
12/14/2015	K	Revised: Elastomer Durometer Temperatures – Nitrile (90/80/90 Duro) was 250° - 300°F, Nitrile (Contact D&L Sales) was 300°F +, Rubber Type Temperature Ranges – Nitrile was 70° - 300°F, HSN was 70° - 325°F;	B.Mathis	B.Oligschlaeger
11/17/2015	J	Added: TORQUE THRU TOOL, HAND TOOLS – Jack Stands; Revised: STORAGE RECOMMENDATIONS was STORAGE PROCEDURES, PRESSURE AFFECTED AREA GUIDE, PARTS LIST – MATERIAL was P-110 (P/N's 61395730, 61395240, 61395715, 61395385, 60313220HT, 61395530, 61595620), MATERIAL was 1026 (P/N's 60095230, 60313910, 60313330, 61513225); Removed: Drift ID;	B.Mathis	K.Riggs
01/14/2015	H	Added: tool Drift ID, HSN and Viton options, Pre-Installation Inspection and Storage Procedures, Special Tool P/N DL-KOPR-KOTE-1G (T3) Revised: Pressure Affected Area Guide, P/N 90346 qty was 1, assembled weight was 1,208 lbs;	J.Anderson	J.McArthur
10/04/2013	G	Added: max. differential pressure, recommended hand tools Revised: example calculation for pressure affect area guide, item numbers in parts list, disassembly and assembly;	J.Anderson -	D.Hushbeck