



ROTATIONAL BALL VALVE

2-3/8"

Manual No:
DL-826-2375-1267

Revision: **A**

Revision Date:
11/22/2019

Authored by: *J.Anderson*

Approved by: *K.Plunkett*

A) DESCRIPTION

The Rotational Ball Valve is a designed for downhole well shut off with a simple 1/4 turn operation. The ball valve is capable of holding pressure from above and below. It features a large bore through the valve.

B) SPECIFICATION GUIDE

SIZE (INCHES)	TOOL OD (INCHES)	TOOL ID (INCHES)	THREAD CONNECTION BOX UP / PIN DOWN	PART NUMBER
2-3/8	3.850	1.79	2-3/8 EUE	82623 82623H ¹ 82623V ²

Elastomer Trim Options: ¹HSN, ²Viton

DIFFERENTIAL PRESSURE (MAX)	TORQUE THRU TOOL (MAX)	TENSILE LOAD THRU TOOL (MAX)
6,000	500	50,000

C) 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.

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.

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



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

When redressing the tool, D&L recommends replacement of all o-rings, shear screws, etc. Contact D&L sales for redress kit and/or other replacement part information.

D) OPERATING PROCEDURES

CAUTION₂: Do not run the tool without properly tightening connections. Running the tool with loose connections may damage the tool and cause malfunction.

CAUTION₃: Limit differential openings to less than 1,000 psi.

Run and set lower completion at the desired location. With the tubing in neutral position, the valve can be opened and closed. Rotate 1/4 turn to the right at the valve to open the valve. Rotate 1/4 turn to the left at the valve to close the valve

E) 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.

F) ELASTOMER TRIM TEMPERATURE GUIDE

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

G) RECOMMENDED TOOLS

G-1) HAND TOOLS

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • VISE • GLOVES • ALLEN WRENCHES • TAPE MEASURE • O-RING PICK • BAR <ul style="list-style-type: none"> - 1/2-INCH - 3/4-INCH | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • SCREWDRIVER SET, FLAT-TIPPED • SOCKET SETS <ul style="list-style-type: none"> - 3/8-INCH DRIVE - 1/2-INCH DRIVE • HAMMERS <ul style="list-style-type: none"> - SLEDGE - BALL PEEN - DEAD BLOW • HYDRAULIC PRES |
|--|--|--|

G-2) SPECIAL TOOLS

ITEM	QTY	DESCRIPTION	PART NUMBER
T1	1	SEAT SEAL GUIDE	AT82623901
T2	1	SEAT SEAL INSTALL TOOL	AT82623900
T3	1	SEAL FORMING TOOL	AT82623903



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H) DISASSEMBLY

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

H-1.1) Unscrew and remove set screws (13) from bottom sub (7).

H-1.2) Unscrew retainer (2) from bottom sub (7).

H-1.3) Remove bottom sub (7) from tool assembly.

H-1.4) Remove smalley wave spring (11) from lower seat (4).

H-1.5) Remove lower seat (4) from ball (9) and shifting sleeve (3).

H-1.5.1) Remove o-ring (14) and seat seal (6) from lower seat (4).

H-1.6) Remove pins (12) from ball (9) and shifting sleeve (3).

H-1.7) Remove shifting sleeve assembly and disassemble:

H-1.7.1) Rotate ball (9) as necessary to remove from shifting sleeve (3).

H-1.8) Remove upper seat assembly from top sub (1) and disassemble:

H-1.8.1) Remove wave spring (11) from upper seat (5).

H-1.8.2) Remove o-ring (14) and seal (6) from upper seat (5).

H-1.9) Remove thrust washer (8) and bearings (10) from lower end of top sub (1).

H-2) Unclamp and remove top sub (1) from vise.

H-2.1) Remove retainer (2) and bearings (10) from top sub (1).

H-2.2) Remove o-ring (15) from top sub (1).

I) 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.

I-1) Install bearings (10) and retainer (2) onto top sub (1).

I-2) Install o-ring (15) in o-ring groove in top sub (1).

I-3) Clamp upper end of top sub (1) in vise.

I-3.1) Install bearings (10) and thrust washer (8) onto lower end of top sub (1).

I-3.1.1) Install seat seal (6) in seal groove in upper seat (5).

I-3.2) Assemble seat seal assemblies:

I-3.2.1) Insert seat seal guide (T1) into seal end of upper seat (5).

I-3.2.2) Very lightly grease seat seal (6) and fit seat seal (6) over seat seal guide (T1).

I-3.2.3) Place seat seal install tool (T2) over the seat seal guide (T1) and onto seat seal (6).

I-3.2.4) Using a hydraulic press, press down on seat seal assembly with 8,000 lbs. Release hydraulic press, rotate assembly 90 degrees, and press again with 8,000 lbs.

I-3.2.5) Remove seat seal assembly from hydraulic press and remove seat seal install tool (T2) and seat seal guide (T1) from seat seal assembly.

I-3.2.6) Place seal forming tool (T3) onto seat seal (6).

I-3.2.7) Using a hydraulic press, press down on seat seal assembly with 8,000 lbs. Release hydraulic press, rotate assembly 90 degrees, and press again with 8,000 lbs.

I-3.2.8) Remove seal forming tool (T3) from seat seal assembly. Remove any flashing from inner surfaces of seat seal (6) and upper seat (5).

CAUTIONs: DO NOT scratch seat seal (6) or upper seat (5) when removing flashing.

I-3.2.9) Repeat steps (I-1.2.1 – I-1.2.8) to assemble lower seat (4).



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I) ASSEMBLY (cont'd)

I-3.3) Assemble upper seat assembly and install:

I-3.3.1) Install o-ring (14) in o-ring groove in upper seat (5).

I-3.3.2) Install wave spring (11) onto upper end of upper seat (5).

I-3.3.3) Install seat (5) into top sub (1).

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

I-3.4) Assemble shifting sleeve assembly and install:

I-3.4.1) Install ball (9) into shifting sleeve. Align holes for pins (12) in ball (9) with slots in shifting sleeve (3).

I-3.4.2) Align pins in shifting sleeve (3) with slots in top sub (1). Install shifting sleeve (3) into top sub (1).

I-3.4.3) Move ball (9) until it contacts seat seal (6) in upper seat (5). As necessary, realign pin holes in ball (9) with slots in shifting sleeve (3).

I-3.4.4) Install pins (12) into shifting sleeve (3) and ball (9).

I-3.5) Assemble lower seat assembly and install:

I-3.5.1) Install seat seal (6) in seal groove in lower seat (4).

I-3.5.2) Install o-ring (14) in o-ring groove in lower seat (4).

I-3.5.3) Install wave spring (11) onto lower end of lower seat (4).

I-3.5.4) Install seat (4) into shifting sleeve (5). Move seat (4) forward until seat seal (6) contacts ball (9).

I-3.6) Align slots in bottom sub (7) with pins in shifting sleeve (3). Install bottom sub (7) onto shifting sleeve (5) and top sub (1).

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

I-3.7) Screw retainer (2) onto bottom sub (7).

I-3.8) Screw set screws (13) into bottom sub (7).

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



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J) PARTS LIST

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 82623
1	1	TOP SUB	DLMS110	82623610
2	1	RETAINER	DLMS110	82623210
3	1	SHIFTING SLEEVE	-	82623470
4	1	LOWER SEAT	DLM13CR110	82623915
5	1	UPPER SEAT	DLM13CR110	82623910
6	2	SEAT SEAL	ARLON 1330	82623900
7	1	BOTTOM SUB	DLMS110	82623650
8	1	THRUST WASHER	DLMS110	82623660
9	1	BALL	DLM13CR110	82623500
10	4	BEARING	DLM660BRZ	82623665
11	2	SMALLEY WAVE SPRING	STAINLESS STEEL	CM60-H2
12	2	PIN	DLMS110	82623550
13	4	SOCKET SET SCREW 1/4-20 UNC X 3/16	STEEL	SSS025C018
14	2	227 O-RING	90 DURO NITRILE	90227
15	1	235 O-RING	90 DURO NITRILE	90235

REDRESS KIT (RDK)	82623050
ASSEMBLED WEIGHT	48 LBS

J-1) ELASTOMER TRIM OPTIONS

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

J-1.1) HSN

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 82623H
14	2	227 O-RING	90 DURO HSN	90227H
15	1	235 O-RING	90 DURO HSN	90235H

REDRESS KIT (RDK)	82623050H
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J-1.2) VITON

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 82623V
14	2	227 O-RING	90 DURO VITON	90227V
15	1	235 O-RING	90 DURO VITON	90235V

REDRESS KIT (RDK)	82623050V
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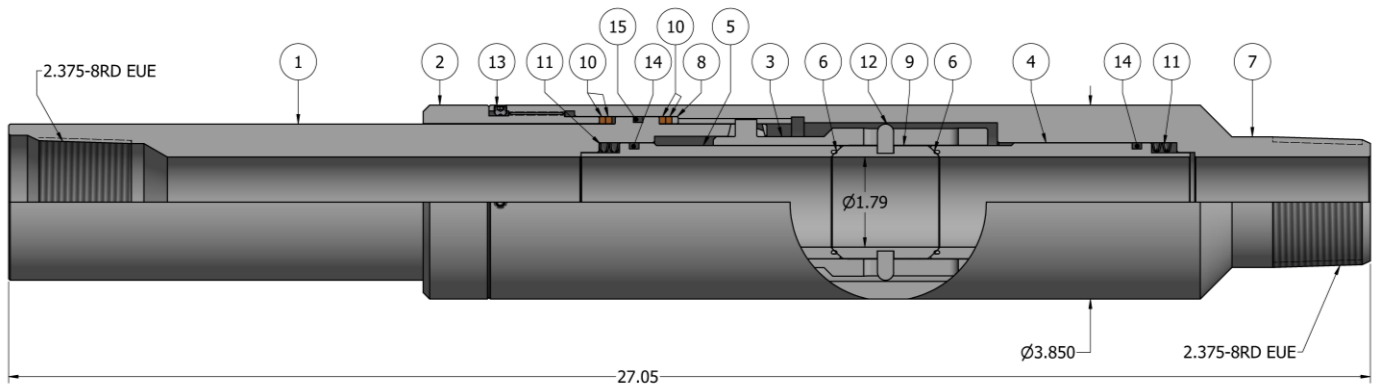
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K) TECHNICAL ILLUSTRATION



L) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
11/22/2019	A	Created new manual	-	-