



CERAMIC DISC SUB, MULE SHOE, 10K/10K

Manual No:
DL-592-0000-1391

Revision: **B**

Revision Date:
02/13/2024

Authored by: *J.Anderson*

Approved by: *K.Plunkett*

A) DESCRIPTION

The Ceramic Disc Sub is a simple and economical tool used for snubbing and pump-out applications. The disc sub uses a proven ceramic burst disc with a concave shape that provides outstanding pressure resistance below the sub. A dual disc option is available that provides high pressure resistance above and below the sub. The ceramic burst disc offers excellent resistance to harsh chemicals and temperature variations downhole.

The disc sub is run on the bottom of the tubing or below a production packer. After setting the packer, the disc is burst to allow for production. The single disk option can be opened with pressure or a drop bar. While the dual disk option must be opened with a drop bar. The sub's full open ID after pump out allows for unrestricted flow through the tubing with little to no debris left in the wellbore.

D&L offers Ceramic Disc Subs in a variety of sizes, configurations, and ODs for a wide range of applications.

B) SPECIFICATION GUIDE

TUBING SIZE (INCHES)	TOOL		THREAD CONNECTION BOX UP	PART NUMBER
	GAGE OD (INCHES)	ID (INCHES)		
2-3/8	3.04	2.00	2-3/8 EUE	59220MS-2
2-7/8	3.65	2.45	2-7/8 EUE	59227MS-2
3-1/2	4.50	2.99	3-1/2 EUE	59235MS-2

DIFFERENTIAL PRESSURE ABOVE (MAX)	DIFFERENTIAL PRESSURE BELOW (MAX)
10,000 PSI	10,000 PSI

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.

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.

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



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D) 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. 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.

E) ELASTOMER TRIM TEMPERATURE GUIDE

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

F) 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

G) DISASSEMBLY

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

G-1.1) Unscrew and remove mule shoe bottom (2) from disc housing (4).

G-1.2) If required, remove o-ring (6) from mule shoe bottom (2).

G-1.3) If required, unscrew and remove set screws (8) from disc housing (4).

G-1.4) Unscrew disc housing (4) from top sub (1). Remove disc housing assembly and disassembly:

G-1.4.1) Remove o-rings (7) from burst discs (3) and disc housing (4).

G-1.4.2) Remove burst discs (3) from disc housing (4).

G-1.4.3) Remove o-rings (5) from disc housing (4).

G-1.4.4) If required, remove o-rings (6) from disc housing (4).

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

G-3) If required, remove o-ring (6) from top sub (1).



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H) ASSEMBLY

NOTE2: Clean and inspect all parts. Replace all worn and damaged parts. Install parts in proper order and orientation.

H-1) If required, install o-ring (6) in o-ring groove in top sub (1).

H-2) Clamp top sub (1) in vise.

H-2.1) Assembly disc housing assembly and install:

H-2.1.1) If required, install o-rings (6) in o-ring grooves disc housing (4).

H-2.1.2) Install o-rings (5) in o-ring grooves disc housing (4).

H-2.1.3) Install burst discs (3) into disc housing (4).

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

H-2.1.4) Install o-rings (7) in spaces between disc housing (4) and burst discs (3).

H-2.1.5) Screw disc housing (4) onto top sub (1).

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

H-2.2) If required, install o-ring (6) in o-ring groove in mule shoe bottom (2).

H-2.3) Screw mule shoe bottom (2) into top sub (1).

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

H-2.4) If required, screw set screws (8) into disc housing (4).

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

I) PARTS LIST

I-1) 2-3/8"

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59220MS-2
1	1	TOP SUB	DLMS110	59220612
2	1	MULE SHOE BOTTOM	DLMS80	59220616
3	2	CERAMIC BURST DISC 2-3/8	DLMAD	59220101
4	1	DISC HOUSING	DLMS110	59220620
5	2	144 O-RING	90 DURO HSN	90144H
6	2	230 O-RING	90 DURO HSN	90230H
7	2	330 O-RING	90 DURO HSN	90330H

ASSEMBLED WEIGHT	17 LBS
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D) PARTS LIST (cont'd)

I-2) 2-7/8"

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59227MS-2
1	1	TOP SUB	DLMS110	59227612
2	1	MULE SHOE BOTTOM	DLMS80	59227616
3	2	CERAMIC BURST DISC 2-7/8	DLMAD	59227101
4	1	DISC HOUSING	DLMS110	59227620
5	2	151 O-RING	90 DURO HSN	90151H
6	2	234 O-RING	90 DURO HSN	90234H
7	2	334 O-RING	90 DURO HSN	90334H

ASSEMBLED WEIGHT	24 LBS
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I-3) 3-1/2"

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59235MS-2
1	1	TOP SUB	DLMS110	59235612
2	1	MULE SHOE BOTTOM	DLMS80	59235616
3	2	CERAMIC BURST DISC 3-1/2	ALUMINA	100745
4	1	DISC HOUSING	DLMS110	59235620
5	2	238 O-RING	90 DURO HSN	90238H
6	2	237 O-RING	90 DURO HSN	90237H
7	2	338 O-RING	90 DURO HSN	90338H
8	8	SOCKET SET SCREW 1/4-20 UNC X 3/8	STEEL	SSS025C037

ASSEMBLED WEIGHT	38 LBS
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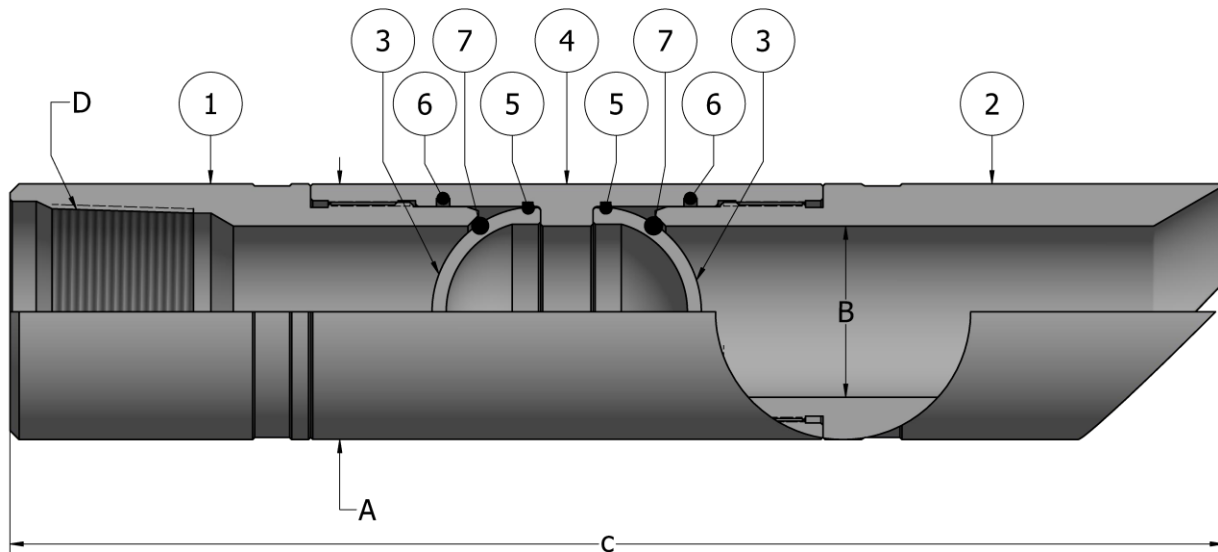
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J) TECHNICAL ILLUSTRATION

J-1) 59220MS-2, 59227MS-2



PART NUMBER	A	B	C	D
	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	TOOL LENGTH (INCHES)	THREAD CONNECTION
59220MS-2	3.04	2.00	16.62	2-3/8 EUE
59227MS-2	3.65	2.45	17.36	2-7/8 EUE



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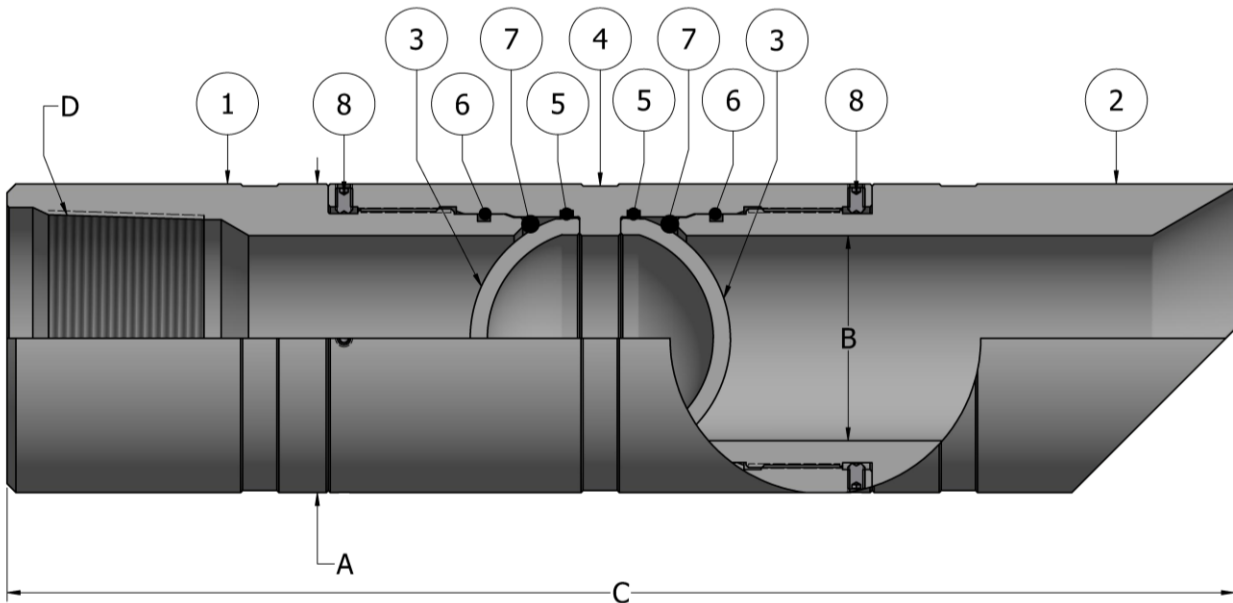
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J) TECHNICAL ILLUSTRATION (cont'd)

J-2) 59235MS-2



PART NUMBER	A	B	C	D
	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	TOOL LENGTH (INCHES)	THREAD CONNECTION
59235MS-2	4.50	2.99	17.92	3-1/2 EUE

K) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
02/13/2024	B	Revised P/N 59220101 was 100441, 59227101 was 100442	J.Anderson	D.McKeon
10/12/2020	A	Created new manual	-	-