



PUMP-OUT PLUG

Manual No:
DL-597-0000-431

Revision: **J**

Revision Date:
03/29/2023

Authored by: J.Anderson

Approved by: D.Hushbeck

A) DESCRIPTION

The Pump-Out Plug provides a means to temporarily plug the tubing string. The Pump-Out Plug can be set up to either be run in as a solid plug or with a ball seat that allows the string to fill on the trip in. The pressure required to shear the pins and pump the plug out of the pump out plug housing is adjustable.

When run as a solid plug, pressure from below does not load the shear pins. When an expendable ball seat is used the string is pressure balanced.

NOTE₁: Any hydrostatic pressure below the plug must be overcome before the shear pins are loaded and must be considered when calculating pump out pressure.

B) PRE-INSTALLATION INSPECTION PROCEDURES

CAUTION₁: 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.

C) 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.

D) ELASTOMER TRIM TEMPERATURE GUIDE

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

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



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E) 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

F) DISASSEMBLY

- F-1) Clamp body (1) in vise.
- F-1.1) Unscrew and remove shear screws (3) from body (1).
- F-1.2) Remove plug (2) from body (1).
- F-1.2.1) Remove o-ring (4) from plug (2).
- F-2) Unclamp body (1) and remove from vise.

G) ASSEMBLY

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

- G-1) Clamp body (1) in vise.
- G-1.1) Install o-ring (4) in groove in plug (2).
- G-1.2) Install plug (2) into body (1).
- CAUTION:** Do not rip or tear o-ring during installation.
- G-1.3) Screw shear screws (3) into body (1). Tighten until shear screws (3) contact plug (2). Back shear screws (3) out 1/4 turn.
- G-2) Unclamp body (1) and remove assembled tool from vise.

H) PARTS LIST

H-1) 1.050” Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59710E
1	1	BODY	1026	59710E610
2	1	PLUG	ALUMINUM-6061	59710E710
3	6	SHEAR SCREW (750#) #10-32 UNF X 3/8	DLM360BRS	BSSSLT1032F037
4	1	212 O-RING	90 DURO NITRILE	90212

ASSEMBLED WEIGHT	2 LBS
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H) PARTS LIST (cont'd)

H-2) 1.315" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59713E
1	1	BODY	1026	59713E610
2	1	PLUG	2011-ALUMINUM	59713E710
3	6	SHEAR SCREW (750#) #10-32 UNF X 5/16	DLM360BRS	BSSSLT1032F031
4	1	218 O-RING	90 DURO NITRILE	90218

ASSEMBLED WEIGHT		2 LBS
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H-3) 1.600" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59716E	P/N 59716N
1	1	BODY	1026	59716E610	59716N610
2	1	PLUG	2011-ALUMINUM	59716N710	
3	6	SHEAR SCREW (1200#) 1/4-20 UNC X 5/16	DLM360BRS	BSSSLT025C031	
4	1	220 O-RING	90 DURO NITRILE	90220	

ASSEMBLED WEIGHT		3 LBS	2 LBS
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H-4) 1.900" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59719E	P/N 59719N
1	1	BODY	1018	59719E610	59719N610
2	1	PLUG	ALUMINUM-6061	59719E710	59719N710
3	8	SHEAR SCREW (1200#) 1/4-20 UNC	DLM360BRS	BSSSLT025C050 (1/2" LONG)	BSSSLT025C037 (3/8" LONG)
4	1	O-RING	90 DURO NITRILE	90223	90221

ASSEMBLED WEIGHT		3 LBS	2 LBS
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H-5) 2-3/8" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59720E
1	1	BODY	DLMS60	59720610
2	1	PLUG	DLM6061T6	59720710
3	9	SHEAR SCREW (3000#) 3/8-16 UNC X 1/2	DLM360BRS	BSSSLT037C050
4	1	331 O-RING	90 DURO NITRILE	90331

ASSEMBLED WEIGHT		4 LBS
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H) PARTS LIST (cont'd)

H-6) 2-7/8" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59727E
1	1	BODY	DLMS60	59727610
2	1	PLUG	DLM6061T6	59727710
3	9	SHEAR SCREW (3000#) 3/8-16 UNC X 1/2	DLM360BRS	BSSSLT037C050
4	1	335 O-RING	90 DURO NITRILE	90335

ASSEMBLED WEIGHT	7 LBS
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H-7) 3-1/2" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59735E
1	1	BODY	DLMS60	59735610
2	1	PLUG	DLM6061T6	59735710
3	12	SHEAR SCREW (3000#) 3/8-16 UNC X 1/2	DLM360BRS	BSSSLT037C050
4	1	340 O-RING	90 DURO NITRILE	90340

ASSEMBLED WEIGHT	11 LBS
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H-8) 4-1/2" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59745E
1	1	BODY	DLMS80	59745E001
2	1	PLUG	DLM6061T6	59745E002
3	12	SHEAR SCREW (4000#) 3/8-16 UNC X 5/8	STEEL	SSSSTL037C062
4	1	348 O-RING	90 DURO NITRILE	90348

ASSEMBLED WEIGHT	21 LBS
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H-9) 5-1/2" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59755LTC
1	1	BODY	1026	59755LTC001
2	1	PLUG	ALUMINUM-6061	59755LTC002
3	12	SHEAR SCREW (5500#) 1/2-13 UNC X 1/2	DLM360BRS	BSSSLT050C050
4	1	353 O-RING	90 DURO NITRILE	90353

ASSEMBLED WEIGHT	24 LBS
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H) PARTS LIST (cont'd)

H-10) 6-5/8" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59766LTC
1	1	BODY	DLMS60	59766LTC001
2	1	PLUG	ALUMINUM-6061	59766LTC002
3	12	SHEAR SCREW (8000#) 5/8-18 UNF	DLM360BRS	32045910-8
4	1	360 O-RING	90 DURO NITRILE	90360

ASSEMBLED WEIGHT	32 LBS
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H-11) 7" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59770LTC
1	1	BODY	1026	59770LTC001
2	1	PLUG	ALUMINUM-6061	59770LTC002
3	15	SHEAR SCREW (10,000#) 5/8-18 UNF	1026-CD	32045910-10
4	1	362 O-RING	90 DURO NITRILE	90362

ASSEMBLED WEIGHT	31 LBS
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H-12) 8-5/8" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59786LTC
1	1	BODY	DLMS60	59786LTC001
2	1	PLUG	ALUMINUM-6061	59786LTC002
3	12	SHEAR SCREW (8000#) 5-8-18 UNF	DLM360BRS	32045910-8
4	1	369 O-RING	90 DURO NITRILE	90369

ASSEMBLED WEIGHT	57 LBS
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H-13) 9-5/8" Pump-Out Plug

ITEM	QTY	DESCRIPTION	MATERIAL	P/N 59796LTC
1	1	BODY	DLMS60	59796LTC001
2	1	PLUG	ALUMINUM-6061	59796LTC002
3	12	SHEAR SCREW (15,000#) 5/8-18 UNF	4130-4140	32045910-15
4	1	373 O-RING	90 DURO NITRILE	90373

ASSEMBLED WEIGHT	75 LBS
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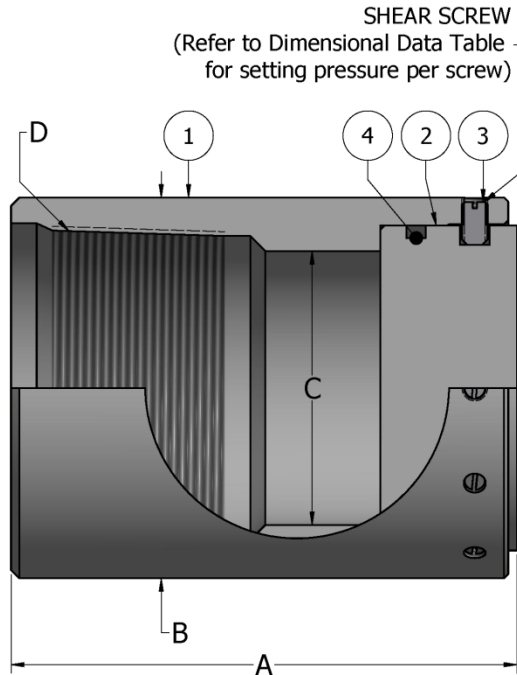
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I) TECHNICAL ILLUSTRATION

I-1) Pump-Out Plug



I-1.1) Dimensional Data

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59710E	4.31	1.660	0.824	1.050 EUE	756
59713E	4.56	1.900	1.20	1.315 EUE	426
59716E	4.56	2.200	1.38	1.660 EUE	579
59716N	4.31	2.062	1.38	1.660 NUE	579
59719E	4.69	2.500	1.50	1.900 EUE	407
59719N	4.69	2.200	1.50	1.900 NUE	536
59720E	5.00	3.060	2.00	2-3/8 EUE	551
59727E	5.25	3.670	2.50	2-7/8 EUE	389
59735E	5.50	4.500	3.46	3-1/2 EUE	270
59745E	7.27	5.560	4.00	4-1/2 EUE	226
59745LTC	7.27	5.560	4.00	4-1/2 LTC	226
59755LTC	8.69	6.000	5.13	5-1/2 LTC	242
59766LTC	8.14	7.390	6.23	6-5/8 LTC	260



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D) TECHNICAL ILLUSTRATION (cont'd)

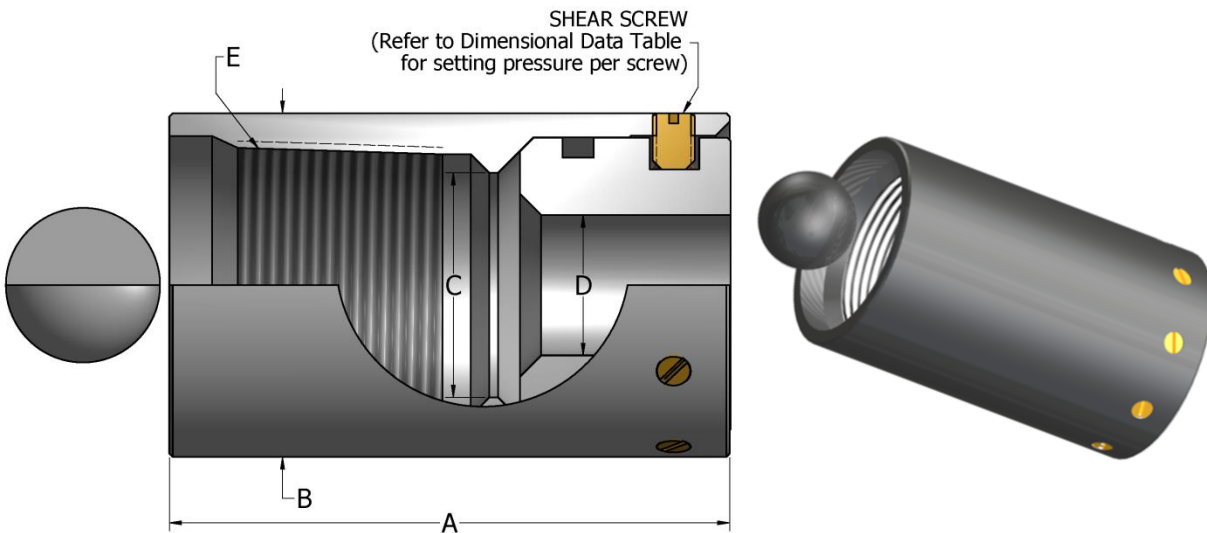
I-1) Pump-Out Plug (cont'd)

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59770LTC	8.14	7.650	6.60	7 LTC	290
59786LTC	9.00	9.620	8.18	8-5/8 LTC	150
59796LTC	10.00	10.620	9.17	9-5/8 LTC	225

*Other threads are available. Contact D&L sales for more information.

I-2) Pump-Out Plug with Ball Seat

NOTE3: Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-2.1) Dimensional Data

PART NUMBER	A	B	C	D	E	BALL SIZE (INCHES)	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	PLUG ID (INCHES)	THREAD CONNECTION*		
59719NWB	4.69	2.200	1.50	0.63	1.900 NUE	1.000	536
59720E-WB	5.00	3.060	2.00	1.25	2-3/8 EUE	1.375	551
59727E-WB	5.25	3.670	2.50	1.25	2-7/8 EUE	1.375	389
59735E-WB	5.50	4.500	3.46	1.25	3-1/2 EUE	1.375	270
59745WB	7.27	5.560	4.00	1.25	4-1/2 EUE	1.375	226
59755LTCWB-6	8.69	6.000	5.13	0.50	5-1/2 LTC	0.625	242

*Other threads are available. Contact D&L sales for more information.



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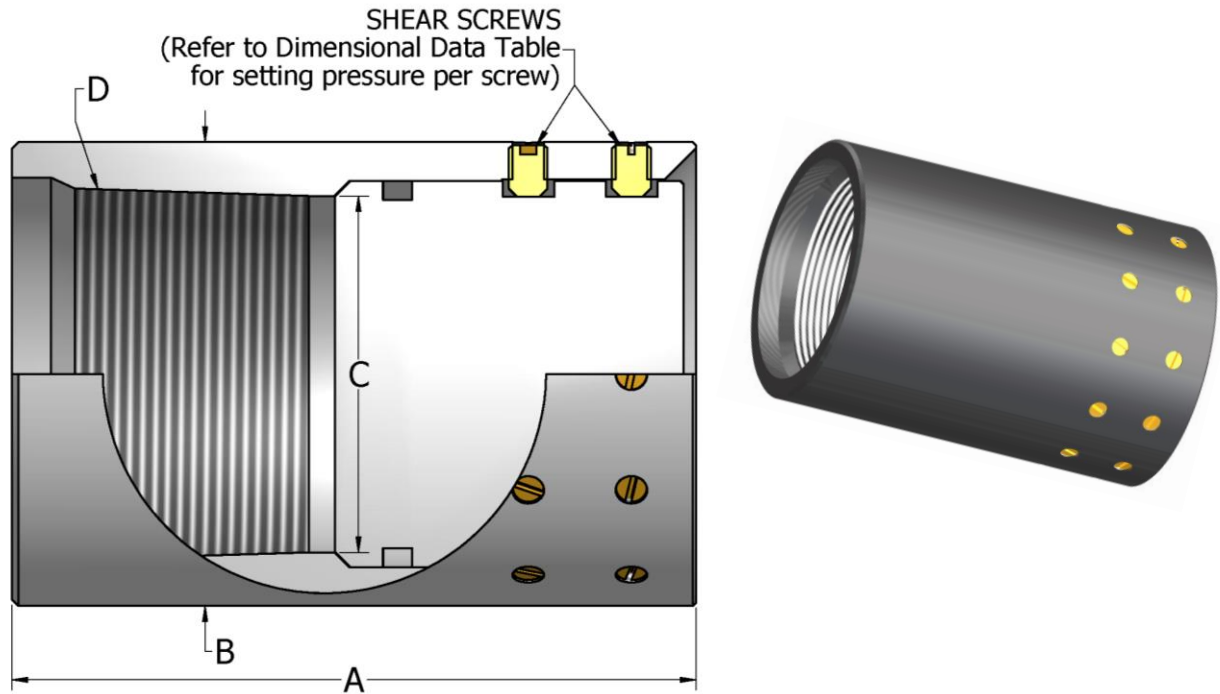
Authored by: J.Anderson

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D) TECHNICAL ILLUSTRATION (cont'd)

I-3) Pump-Out Plug with Double/High Shear

NOTE₃: Special design. Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-3.1) Dimensional Data

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59720E-2	6.00	3.060	1.25	2-3/8 EUE	551
59727E-HS	6.09	3.670	2.50	2-7/8 EUE	707
59727EDS	6.25	3.670	1.25	2-7/8 EUE	389
59735E-HS	6.63	4.500	3.46	3-1/2 EUE	270
59735-DS	6.63	4.500	1.25	3-1/2 EUE	270
59745E-HS	7.40	5.560	4.00	4-1/2 EUE	450

*Other threads are available. Contact D&L sales for more information.



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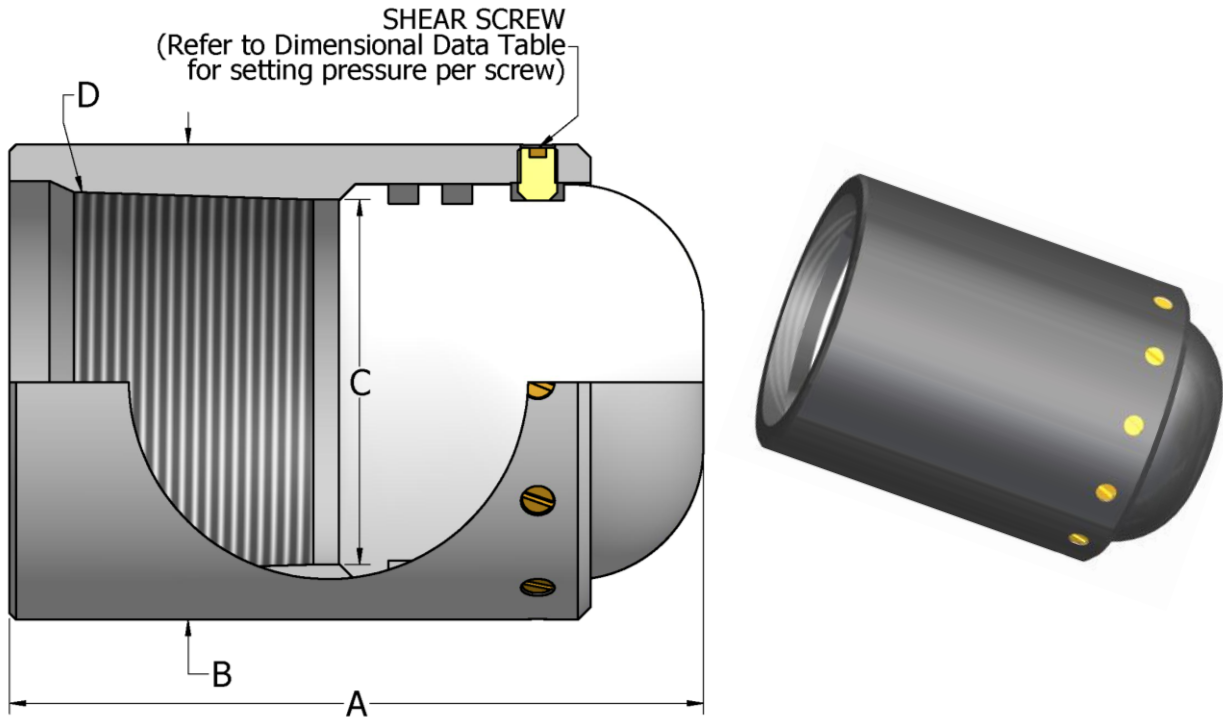
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D) TECHNICAL ILLUSTRATION (cont'd)

I-4) Pump-Out Plug with Round Nose Plug

NOTE3: Special design. Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-4.1) Dimensional Data

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59720E-H	6.08	3.060	2.00	2-3/8 EUE	551
59727E-H	6.31	3.670	2.50	2-7/8 EUE	389
59735E-H	6.57	4.500	3.46	3-1/2 EUE	270

*Other threads are available. Contact D&L sales for more information.



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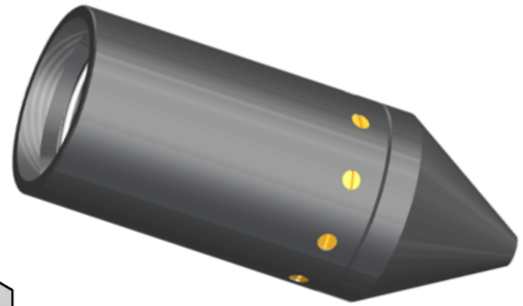
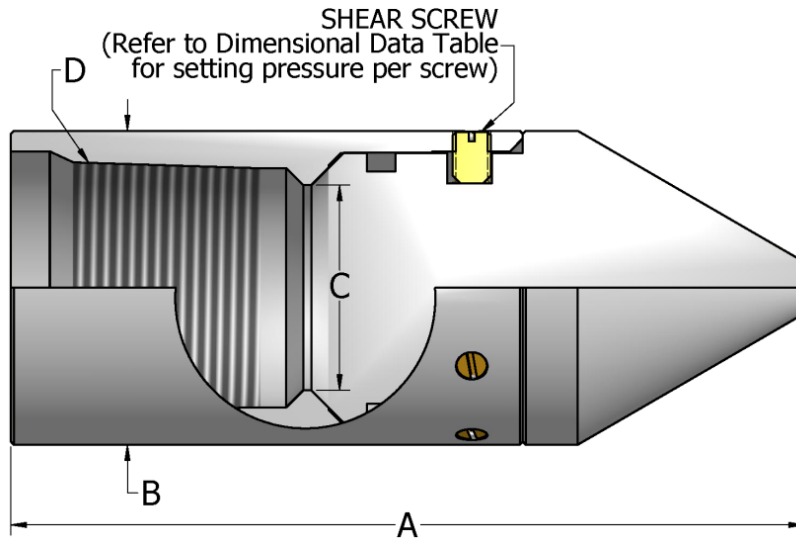
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D) TECHNICAL ILLUSTRATION(cont'd)

I-5) Pump-Out Plug with Bullet Nose Plug

NOTE3: Special design. Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-5.1) Dimensional Data

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59720BN	7.75	3.060	2.00	2-3/8 EUE	551
59727BN	8.01	3.670	2.50	2-7/8 EUE	389

*Other threads are available. Contact D&L sales for more information.



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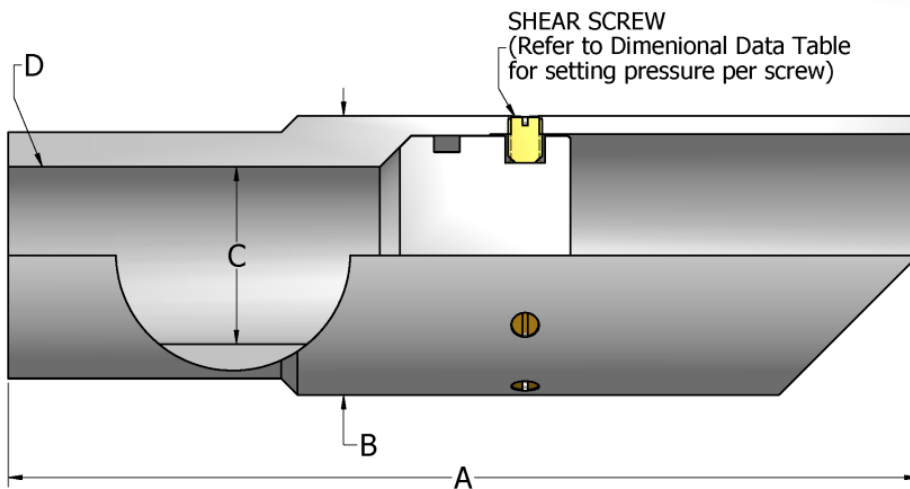
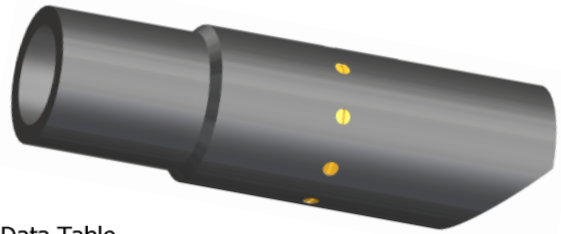
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D) TECHNICAL ILLUSTRATION (cont'd)

I-6) Pump-Out Plug with Half Mule Shoe

NOTE3: Special design. Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-6.1) Dimensional Data

PART NUMBER	A	B	C	D	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	THREAD CONNECTION*	
59720-1-BHBAA	12.00	3.060	2.00	2-3/8 (4.6#) JFE BEAR BOX	551
59720-1-BYFA	10.00	3.060	2.00	2-3/8 (4.7#) BTS-8 BOX	551
59727-MS	7.38	3.670	2.50	2-7/8 EUE	389
59735EMS	7.75	4.500	3.46	3-1/2 EUE	270

*Other threads are available. Contact D&L sales for more information.



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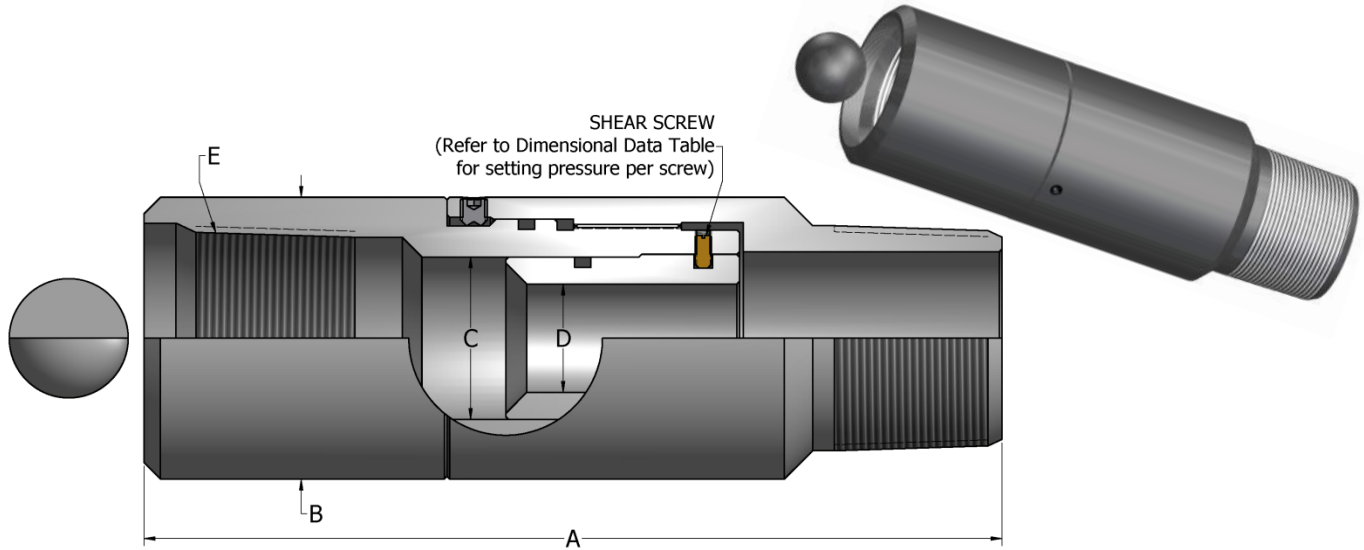
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D) TECHNICAL ILLUSTRATION (cont'd)

I-7) Pump-Out Plug with Pin

NOTE3: Special design. Can be made in different sizes and thread configurations. Contact D&L sales for more information.



I-7.1) Dimensional Data

PART NUMBER	A	B	C	D	E	SETTING PRESSURE (PSI/SCREW ±15%)
	TOOL LENGTH (INCHES)	MAX. TOOL OD (INCHES)	MIN. TOOL ID (INCHES)	PLUG ID (INCHES)	THREAD CONNECTION BOX UP / PIN DOWN*	
59719N-PIN	6.04	3.25	1.53	-	1.900 NUE	378
59720E-PIN	9.92	3.25	1.88	1.25	2-3/8 EUE	270

*Other threads are available. Contact D&L sales for more information.



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J) REVISION HISTORY

DATE	REVISION	DESCRIPTION OF CHANGES	REVISED BY	APPROVED BY
03/29/2023	J	Revised 59735E-WB was 59735WB	J.Anderson	E.Visaez
10/24/2022	H	Revised P/N 59727E-WB was 59727E-WB-1, 59727EDS was 59727-DS; Added ball size to plugs with ball seats	J.Anderson	K.Plunkett
04/10/2020	G	Revised P/N 59727-MS thread was 2-3/8" EUE	J.Anderson	Z.Speer
01/19/2018	F	Revised shear value for P/N BSSSLT037C050 was 3,400 lbs, min. setting pressure was 625 psi/screw for P/N 59720 assemblies, was 441 for 59727 assemblies and was 308 psi/screw for P/N 59735 assemblies, Elastomer Trim Temp. Guide Nitrile was 70-250; Added ±15% to psi/screw	J.Anderson	N.Banker
05/27/2016	E	Revised P/N BSSSLT037C050 shear value was 3,000 lbs/screw, psi/screw for P/Ns 59727E, 59727E-WB-1, 59727E-H, 59727-DS, 59727BN, 59727-MS, 59720E, 59735e, 59745E, 59745LTC, 59720E-WB, 59735WB, 59745WB, 59720E-2, 59735E-HS, 59735-DS, 59720E-H, 59735E-H, 59720BN, 59720-1-BHBAA, 59720-1-BYFA, 59735EMS, 59719N-PIN, 59720E-PIN	J.Anderson	N.Banker
01/26/2016	D	Added Pre-Installation Inspection Procedures, Storage Recommendations, Elastomer Trim Temperature Guide; Recommended Hand Tools	J.Anderson	T.Myerley
11/19/14	C	Added P/N 59710E; Revised P/N 59720E-PIN min. setting pressure was 551 psi/screw	J.Anderson	K.Plunkett
07/07/14	B	Added min. tool ID to pump-out plug with ball seat and pin	J.Anderson	K.Riggs
02/19/14	A	Created new manual	-	-