



SEAL BORE ACCESSORIES

7.000”

Manual No:
DL-581-7000-822

Revision: **C**

Revision Date:
10/02/2020

Authored by: J.Anderson

Approved by: K.Plunkett

A) DESCRIPTION

The D&L 7.000” Seal Bore Accessories are designed to work with D&L Permapak Packers with 7.000” seal bores.

NOTE₁: Other seal bore accessories are available. Contact D&L Sales for more information.

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/VTR | 100° - 350°F |
| ATR | 100° - 400°F |



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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
- 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) ANCHOR LATCH ASSEMBLY

The D&L Anchor Latch is used to hold tubing in tension, or compression. The D&L Anchor Latch will automatically latch into the packer upon set down. To release the Anchor Latch from the packer put 1 to 2 points tension (1,000-2,000 lbs) on the tubing and rotate 8-10 turns to right at packer. The D&L Anchor Latch works with standard packer latch thread.

F-1) SPECIFICATION GUIDE

| PACKER BORE SIZE (INCHES) | ASSEMBLY OD (INCHES) | ASSEMBLY BORE (INCHES) | TENSILE LOAD THRU TOOL (MAX) | THREAD CONNECTION BOX UP / PIN DOWN | PART NUMBER |
|---------------------------|----------------------|------------------------|------------------------------|-------------------------------------|---|
| 7.00 | 8.040 | 5.84 | 467,000 LBS | 6-5/8 LTC / 6.5000 STUB ACME | 58270 58270H ¹ 58270V ² 58270ATR ³ 58270VTR ⁴ |

¹HSN Option, ²Viton Option, ³AFLAS, Teflon, Ryton Seal Stack Option, ⁴Viton, Teflon, Ryton Seal Stack Option

F-2) DISASSEMBLY

F-2.1) Clamp top sub (1) in vise.

F-2.1.1) Remove bonded seals (4) and seal spacer (5) from seal mandrel (2).

F-2.1.1.1) Remove o-rings (6) from bonded seals (2).

F-2.1.2) Unscrew and remove seal mandrel (2) from top sub (1).

F-2.1.3) Remove collet (3) from seal mandrel (2).

F-2.2) Unclamp and remove top sub (1) from vise.

F-3) 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.

F-3.1) Clamp top sub (1) in vise.

F-3.1.1) Install collet (3) onto seal mandrel (2).

F-3.1.2) Screw seal mandrel (2) into top sub (1).

CAUTION₁: Do not rip or tear o-rings during installation

F-3.1.3) Install o-rings (6) in o-ring grooves in bonded seals (4).

F-3.1.4) Install bonded seals (4) and seal spacer (5) onto seal mandrel (2).

CAUTION₁: Do not rip or tear o-rings during installation

F-3.2) Unclamp top sub (1) from vise and remove assembled tool.



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F) ANCHOR LATCH ASSEMBLY (cont'd)

F-4) PARTS LIST

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58270 |
|------|-----|--------------|-----------------|-----------|
| 1 | 1 | TOP SUB | L-80 | 58270610 |
| 2 | 1 | SEAL MANDREL | P-110 | 58270210 |
| 3 | 1 | COLLET | P-110 | 58270003 |
| 4 | 2 | BONDED SEAL | 90 DURO NITRILE | 58070520* |
| 5 | 1 | SEAL SPACER | 1026 | 58070550* |
| 6 | 2 | 166 O-RING | 90 DURO NITRILE | 90166* |

*Not part of ATR and VTR assemblies. Refer to ATR and VTR Seal Stack Assembly (H.4).

| | |
|------------------|---------|
| ASSEMBLED WEIGHT | 120 LBS |
|------------------|---------|

F-4.1) ELASTOMER TRIM OPTIONS

F-4.1.1) HSN

NOTE₃: For temperature range, refer to Elastomer Trim Temperature Guide.

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58270H |
|------|-----|-------------|-------------|------------|
| 4 | 2 | BONDED SEAL | 90 DURO HSN | 58070520H |
| 6 | 2 | 166 O-RING | 90 DURO HSN | 90166H |

F-4.1.2) VITON

NOTE₃: For temperature range, refer to Elastomer Trim Temperature Guide.

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58270V |
|------|-----|-------------|---------------|------------|
| 4 | 2 | BONDED SEAL | 90 DURO VITON | 58070520V |
| 6 | 2 | 166 O-RING | 90 DURO VITON | 90166V |



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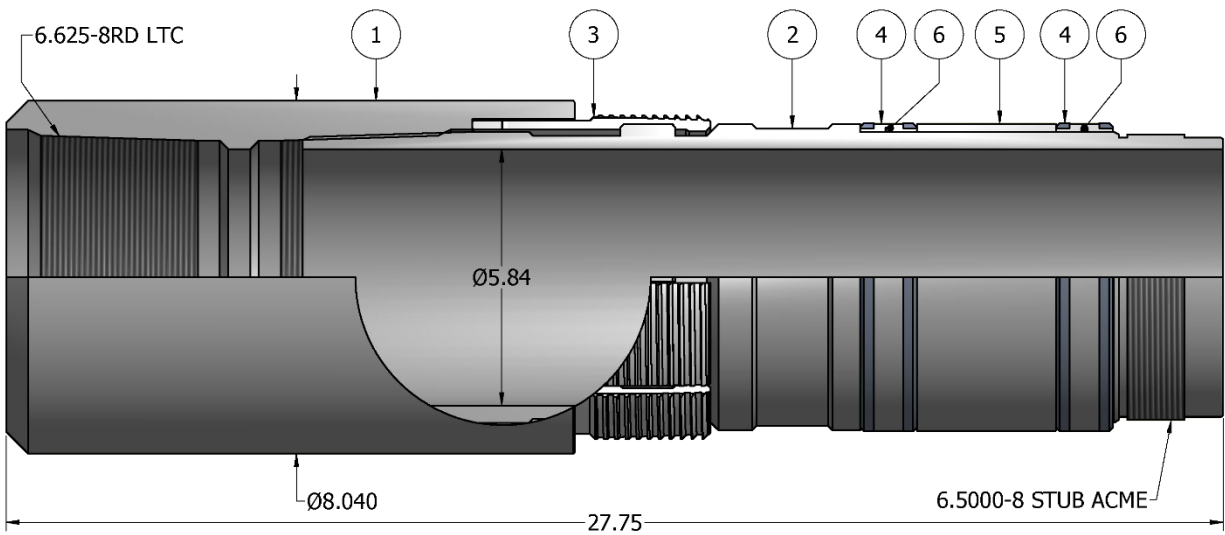
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F) ANCHOR LATCH ASSEMBLY (cont'd)

F-5) TECHNICAL ILLUSTRATION





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G) SNAP LATCH ASSEMBLY

The Snap Latch Seal Assembly latches into the packer upon set down (like our Anchor Latch Seal Assembly). It can be removed with straight pull of 2,000 to 4,000 lbs. above tubing weight. The Snap Latch Seal Assembly is used where a mechanical indication is required to verify the seal assembly is properly positioned in the packer bore.

G-1) SPECIFICATION GUIDE

| PACKER BORE SIZE (INCHES) | ASSEMBLY OD (INCHES) | ASSEMBLY BORE (INCHES) | THREAD CONNECTION BOX UP / PIN DOWN | PART NUMBER |
|---------------------------|----------------------|------------------------|-------------------------------------|---|
| 7.000 | 8.040 | 5.84 | 6-5/8” LTC / 6.500 STUB ACME | 57870 57870H ¹ 57870V ² 57870ATR ³ 57870VTR ⁴ |

¹HSN Option, ²Viton Option, ³AFLAS, Teflon, Ryton Seal Stack Option, ⁴Viton, Teflon, Ryton Seal Stack Option

G-2) DISASSEMBLY

G-2.1) Clamp top sub (1) in vise.

G-2.1.1) Remove bonded seals (4) and seal spacer (5) from seal mandrel (2).

G-2.1.1.1) Remove o-rings (7) from bonded seals (2).

G-2.1.2) Unscrew and remove seal mandrel (2) from top sub (1).

G-2.1.3) Unscrew and remove set screws (6) from top sub (1).

G-2.1.4) Unscrew and remove snap latch collet (3) from top sub (1).

G-2.2) Unclamp and remove top sub (1) from vise.

G-2.3) Remove o-ring (8) from top sub (1).

G-3) 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.

G-3.1) Install o-ring (8) in o-ring groove in top sub (1).

G-3.2) Clamp top sub (1) in vise.

G-3.2.1) Screw snap latch collet (3) into top sub (1).

G-3.2.2) Screw set screws (6) into top sub (1).

G-3.2.3) Screw seal mandrel (2) into top sub (1).

CAUTION₁: Do not rip or tear o-rings during installation

G-3.2.4) Install o-rings (7) in o-ring grooves in bonded seals (4).

G-3.2.5) Install bonded seals (4) and seal spacer (5) onto seal mandrel (2).

CAUTION₁: Do not rip or tear o-rings during installation

G-3.3) Unclamp top sub (1) from vise and remove assembled tool.



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G) SNAP LATCH ASSEMBLY (cont'd)

G-4) PARTS LIST

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 57870 |
|------|-----|---------------------------------------|-----------------|------------|
| 1 | 1 | TOP SUB | DLMS80 | 57870610 |
| 2 | 1 | SEAL MANDREL | DLMS80 | 57870210 |
| 3 | 1 | SNAP LATCH COLLET | DLMS80 | 57870003 |
| 4 | 2 | BONDED SEAL | 90 DURO NITRILE | 58070520* |
| 5 | 1 | SEAL SPACER | DLMS60 | 58070550* |
| 6 | 6 | SOCKET SET SCREW 5/16-18 UNC X 1/2 | STEEL | SSS031C050 |
| 7 | 2 | 166 O-RING | 90 DURO NITRILE | 90166* |
| 8 | 1 | 259 O-RING | 90 DURO NITRILE | 90259 |

*Not part of ATR and VTR assemblies. Refer to ATR and VTR Seal Stack Assembly (H.4).

| | |
|------------------|--------|
| ASSEMBLED WEIGHT | 58 LBS |
|------------------|--------|

G-4.1) ELASTOMER TRIM OPTIONS

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

G-4.1.1) HSN

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 57870H |
|------|-----|-------------|-------------|------------|
| 4 | 2 | BONDED SEAL | 90 DURO HSN | 58070520H |
| 7 | 2 | 166 O-RING | 90 DURO HSN | 90166H |
| 8 | 1 | 259 O-RING | 90 DURO HSN | 90259H |

G-4.1.2) VITON

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 57870V |
|------|-----|-------------|---------------|------------|
| 4 | 2 | BONDED SEAL | 90 DURO VITON | 58070520V |
| 7 | 2 | 166 O-RING | 90 DURO VITON | 90166V |
| 8 | 1 | 259 O-RING | 90 DURO VITON | 90259V |



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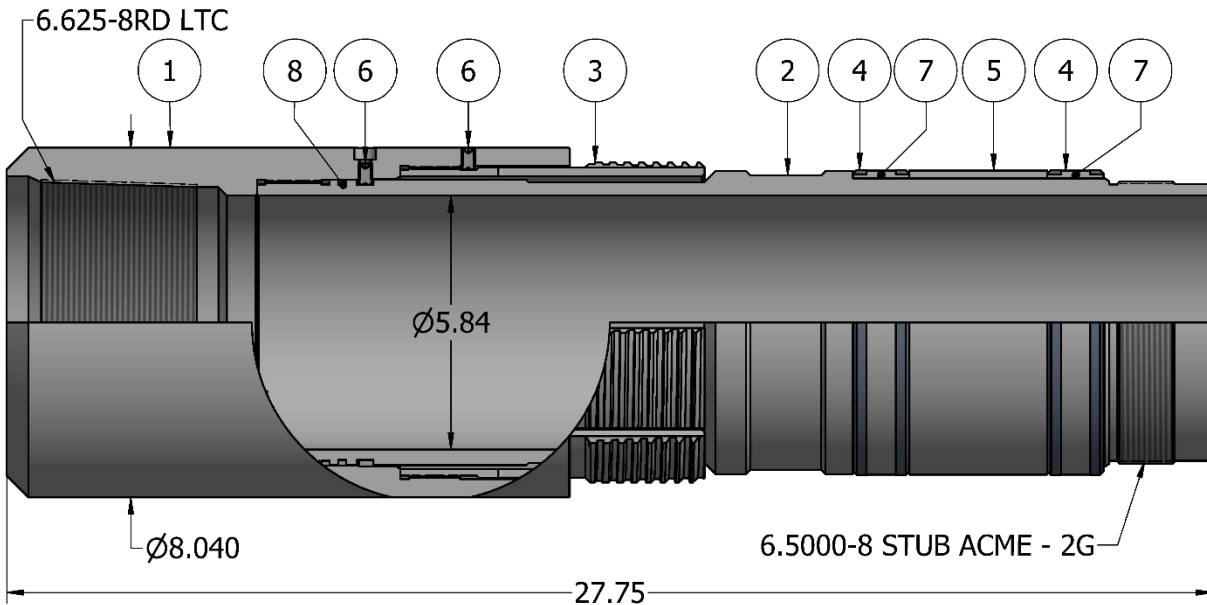
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G) SNAP LATCH ASSEMBLY (cont'd)

G-5) TECHNICAL ILLUSTRATION



H) SEAL UNIT ASSEMBLY

The D&L Seal Unit Assembly is used in conjunction with the D&L Anchor Latch or Locator Assembly to increase the length of seals. The D&L Seal Unit Assembly is installed between the Anchor Latch or Locator Assembly and the Mule Shoe.

H-1) SPECIFICATION GUIDE

| PACKER BORE SIZE (INCHES) | ASSEMBLY OD (INCHES) | ASSEMBLY BORE (INCHES) | THREAD CONNECTION BOX UP / PIN DOWN | PART NUMBER |
|---------------------------|----------------------|------------------------|-------------------------------------|---|
| 7.000 | 6.990 | 5.84 | 6.5000-8 STUB ACME | 58170 58170H ¹ 58170V ² 58170ATR ³ 58170VTR ⁴ |

¹HSN Option, ²Viton Option, ³AFLAS, Teflon, Ryton Seal Stack Option, ⁴Viton, Teflon, Ryton Seal Stack Option



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H) SEAL UNIT ASSEMBLY (cont'd)

H-2) DISASSEMBLY

H-2.1) Clamp seal mandrel (1) in vise.

H-2.1.1) Remove bonded seals (2) and seal spacer (3) from seal mandrel (1).

H-2.1.1.1) Remove o-rings (4) from bonded seals (2).

H-2.2) Unclamp and remove seal mandrel (1) from vise.

H-2.3) Remove o-ring (5) from seal mandrel (1).

H-3) 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.

H-3.1) Install o-ring (5) in o-ring groove in seal mandrel (1).

H-3.2) Clamp seal mandrel (1) in vise.

H-3.2.1) Install o-rings (4) in o-ring grooves in bonded seals (2).

H-3.2.2) Install bonded seals (2) and seal spacer (3) onto seal mandrel (1).

CAUTION₁: Do not rip or tear o-rings during installation

H-3.3) Unclamp seal mandrel (1) from vise and remove assembled tool.

H-4) PARTS LIST

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58170 |
|------|-----|--------------|-----------------|-----------|
| 1 | 1 | SEAL MANDREL | L-80 | 58170012 |
| 2 | 2 | BONDED SEAL | 90 DURO NITRILE | 58070520* |
| 3 | 1 | SEAL SPACER | 1026 | 58070550* |
| 4 | 2 | 166 O-RING | 90 DURO NITRILE | 90166* |
| 5 | 1 | 259 O-RING | 90 DURO NITRILE | 90259 |

*Not part of ATR and VTR assemblies. Refer to ATR and VTR Seal Stack Assembly (H.4).

| | |
|------------------|--------|
| ASSEMBLED WEIGHT | 36 LBS |
|------------------|--------|



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H) SEAL UNIT ASSEMBLY (cont'd)

H-4.1) ELASTOMER TRIM OPTIONS

H-4.1.1) HSN

NOTE₃: For temperature range, refer to Elastomer Trim Temperature Guide.

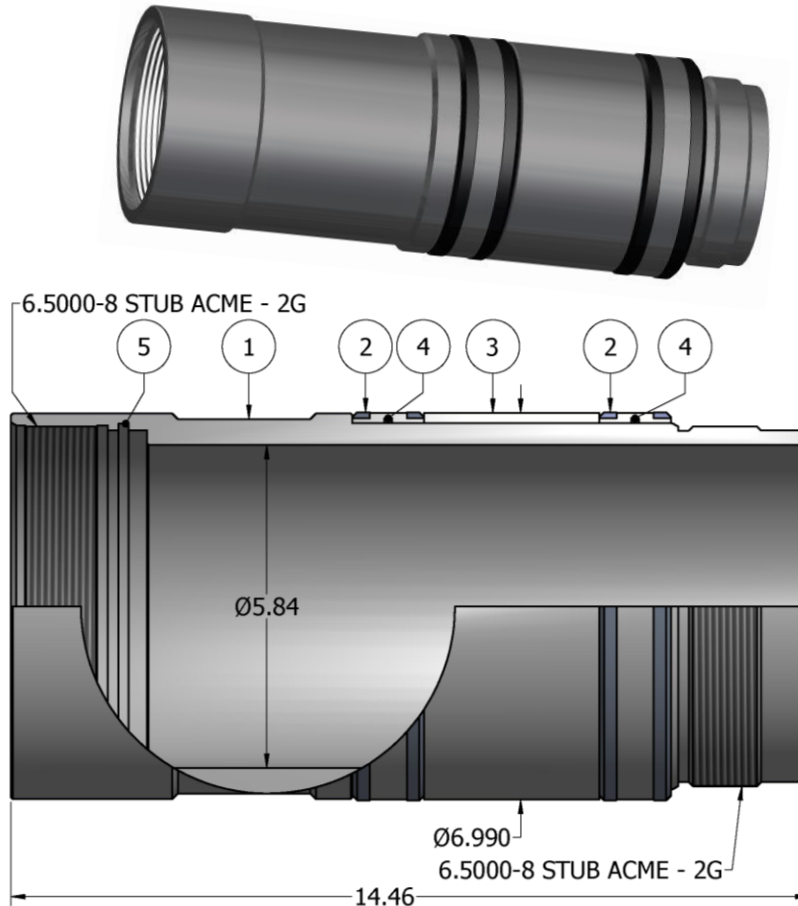
| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58170H |
|------|-----|-------------|-------------|------------|
| 2 | 2 | BONDED SEAL | 90 DURO HSN | 58070520H |
| 4 | 2 | 166 O-RING | 90 DURO HSN | 90166H |
| 5 | 1 | 259 O-RING | 90 DURO HSN | 90259H |

H-4.1.2) VITON

NOTE₃: For temperature range, refer to Elastomer Trim Temperature Guide.

| ITEM | QTY | DESCRIPTION | MATERIAL | P/N 58170V |
|------|-----|-------------|---------------|------------|
| 2 | 2 | BONDED SEAL | 90 DURO VITON | 58070520V |
| 4 | 2 | 166 O-RING | 90 DURO VITON | 90166V |
| 5 | 1 | 259 O-RING | 90 DURO VITON | 90259V |

H-5) TECHNICAL ILLUSTRATION





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I) MULE SHOE

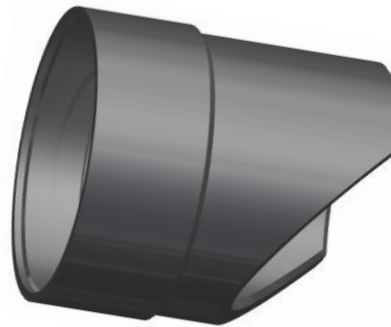
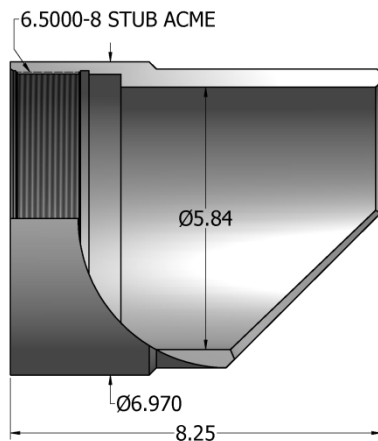
The D&L Mule Shoe is installed on the bottom of the D&L Anchor Latch, Seal Locator, or Seal Unit. The D&L Mule Shoe allows for rotation of the tubing to help guide the seals into the packer seal bore.

I-1) SPECIFICATION GUIDE

| PACKER BORE SIZE (INCHES) | PART OD (INCHES) | PART BORE (INCHES) | THREAD CONNECTION | PART NUMBER |
|---------------------------|------------------|--------------------|-------------------|-------------|
| 7.000 | 6.970 | 5.84 | 6.5000 STUB ACME | 58470615 |

| | |
|--------|--------|
| WEIGHT | 15 LBS |
|--------|--------|

I-2) TECHNICAL ILLUSTRATION



J) ATR AND VTR SEAL STACK OPTION ASSEMBLY

The ATR and VTR seal stack options are available for all seal bore accessories. Refer to Elastomer Trim Temperature Guide for temperature range.

J-1) ASSEMBLY

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

J-1.1) Clamp seal bore accessory in vise. Follow assembly instructions given above for seal bore accessory for all other parts.

J-1.2) Install end spacer (S.5) onto seal bore accessory.

J-1.3) Install three (3) AFLAS/Viton rings (S.1), Teflon rings (S.2), and Ryton rings (S.3) in order onto seal bore accessory.

CAUTION₄: Rings must be installed in the proper order and orientation. Refer to Technical Illustration below.

J-1.4) Install center spacer (S.4) onto seal bore accessory.



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J) ATR AND VTR SEAL STACK OPTION ASSEMBLY (cont'd)

J-1.5) Install three (3) Ryton rings (S.3), Teflon rings (S.2), and AFLAS/Viton rings (S.1) in order onto seal bore accessory.

CAUTION: Rings must be installed in the proper order and orientation. Refer to Technical Illustration below.

J-1.6) Install end spacer (S.5) onto seal bore accessory.

J-1.7) Unclamp seal bore accessory from vise and remove assembled tool.

J-2) ATR OPTION PARTS LIST

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

| ITEM | QTY | DESCRIPTION | MATERIAL | PART NUMBER |
|------|-----|-----------------------|----------|-------------|
| S | 1 | 6.000" ATR SEAL STACK | - | 58770ATRSS |
| S.1 | 6 | AFLAS RING | AFLAS | 587AF700 |
| S.2 | 6 | TEFLON RING | TEFLON | 587TF700 |
| S.3 | 6 | RYTON SPACER | RYTON | 587RY700 |
| S.4 | 1 | CENTER SPACER | 1026 | 587CS700 |
| S.5 | 2 | END SPACER | 1026 | 587ES700 |

J-3) VTR OPTION SEAL STACK

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

| ITEM | QTY | DESCRIPTION | MATERIAL | PART NUMBER |
|------|-----|-----------------------|----------|-------------|
| S | 1 | 5.000" VTR SEAL STACK | - | 58770VTRSS |
| S.1 | 6 | VITON RING | VITON | 587VF700 |
| S.2 | 6 | TEFLON RING | TEFLON | 587TF700 |
| S.3 | 6 | RYTON SPACER | RYTON | 587RY700 |
| S.4 | 1 | CENTER SPACER | 1026 | 587CS700 |
| S.5 | 2 | END SPACER | 1026 | 587ES700 |



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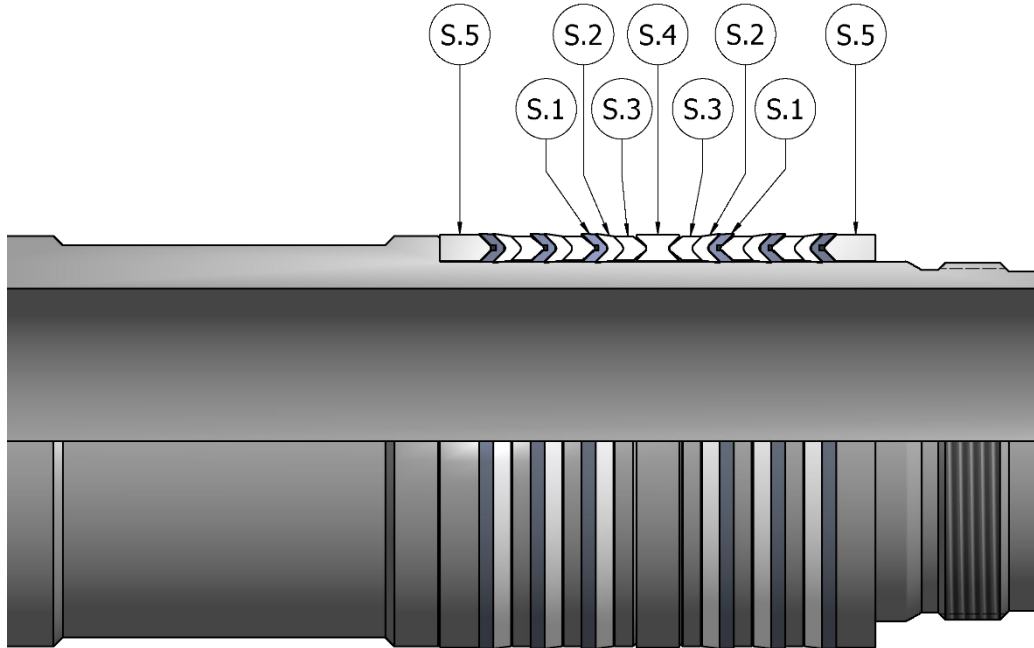
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J) ATR AND VTR SEAL STACK OPTION ASSEMBLY (cont'd)

J-4) TECHNICAL ILLUSTRATION

NOTE4: Generic assembly shown. Order, orientation and quantity typical of all assemblies.



K) REVISION HISTORY

| DATE | REVISION | DESCRIPTION OF CHANGES | REVISED BY | APPROVED BY |
|------------|----------|--|------------|-------------|
| 10/02/2020 | C | Revised snap latch straight pull release amount; Added tensile load thru anchor latch, Pre-Installation Inspection Procedures, Storage Recommendations | J.Anderson | D.Hushbeck |
| 12/05/2019 | B | Added Snap Latch | J.Anderson | D.Hushbeck |
| 04/30/15 | A | Created new manual | - | - |